Emergency Medical Services
Clinical Practice Guidelines (CPGs)

Effective November 1, 2018

UTSW/ Parkland BioTel EMS Medical Direction Team

Medical Director – S. Marshal Isaacs, MD, FACEP, FAEMS

Clinical Practice Guidelines, Policies and All Other Content Approved By:

S. Marshal Isaacs MD September 1, 2018

S. Marshal Isaacs, MD, FACEP, FAEMS **Date**

Medical Director

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✦ QUICK REFERENCE GUIDE

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✦ Medical Director's Introduction and Philosophy of Patient Care

"What's in a name? That which we call a rose
By any other name would smell as sweet."

William Shakespeare
Romeo and Juliet (II, ii, 1-2)

When I arrived in Dallas in 2006, the protocols, policies and guidelines that EMS Providers utilized to care for patients in the "BioTel" system were referred to as the "Guidelines for Therapy" or "Treatment Guidelines". Now, after much consideration, I have decided to rename these assessment and management strategies as "Clinical Practice Guidelines", or "CPGs", to reflect the current state of the art and science of out-of-hospital emergency medical care.

Emergency Medical Services in the UT Southwestern/Parkland BioTel System is the CLINICAL PRACTICE of emergency medicine outside of the hospital by well-educated and well-trained EMS professionals who work under my medical authority, utilizing GUIDELINES to assist them in providing the highest quality care to our patients. There is no single guideline, protocol, or algorithm that can cover every patient presentation or scenario, and there is no guideline that can or should be utilized without applying sound judgment and the principle of "beneficence ", which is always acting in the patients' best interests.

While some may argue that a treatment "protocol" more clearly mandates adherence to a prescribed set of assessments, medications, and/or interventions, BioTel EMS Providers should not make the mistake of assuming that these CPG's are mere suggestions. THEY ARE NOT! It is my expectation that these CPG's shall be adhered to, unless EMS Providers deviate from them for reasons of clinical judgment. Such deviation from the CPG's must be in the best interest of that patient and must be documented in the medical record (ePCR).

For example, the "Spinal Motion Restriction" CPG requires that a patient with altered mental status who has evidence of trauma above the clavicles shall have spinal motion restrictions applied. This is NOT merely a suggestion. It is a requirement regardless of whether we refer to the mandate as a CPG, a protocol, or a treatment guideline. Failure to apply spinal stabilization to such a patient would fail to meet the standard of care unless there is documentation on the ePCR indicating an appropriate reason for the CPG deviation. Should a patient be so combative that EMS providers cannot safely or adequately perform spinal stabilization, they must document that they did their best to minimize patient movement while rapidly transporting the patient to a receiving hospital emergency department for more definitive care in a more controlled environment. Such a deviation from the CPG requirement in a case such as this would be reasonable and appropriate. So, what we call a "required action" in the CPG's is less important than how we care for our patients, how we document what we do, and why we do it. The term "CPG" is simply a "rose by any other name", meaning that regardless what we call these, that doing the right thing for our patients is the critical element.

The "Easy Button": CALL BioTel

I often wish I had an "Easy Button" to help me with the many challenging decisions I must make every day. Fortunately, BioTel EMS Providers have such a button. While perhaps not always making their jobs "Easy", BioTel is most certainly designed to make their jobs and difficult decisions "EasiER". For whenever a challenging case or question arises, EMS providers may simply contact BioTel for assistance. Not sure of a drug dosage? Contact BioTel. Not sure of the most appropriate destination for

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a patient? Contact BioTel. Not sure how to apply a particular policy to a patient in the custody of law enforcement? Contact BioTel. BioTel staff have the answer or will quickly find the answer, 24/7/365.

BioTel exists to serve our EMS Agencies, EMS Providers, and our patients. It is my expectation that interactions among BioTel, EMS Providers, and officers shall ALWAYS be professional and cordial. We are a team, and our goal is to work together to provide the best possible care for our patients. If that is ever not the case, I want to know about it so I may personally review the recording of the interaction and take appropriate action when indicated.

EMS providers are reminded that once BioTel has been consulted, any orders or recommendations made by BioTel staff or a Medical Control Physician MUST be followed. If EMS providers disagree with an order and are not intending to follow the direction given by BioTel, it is my expectation that I (or my designee) shall be immediately contacted to discuss why BioTel's orders are not being followed.

The "Mom Test"

Whenever you find yourself unsure about the best course of action to take in order to optimally care for your patient, consider the "Mom Test". To apply the "Mom Test", simply ask yourself, "What would I want an EMS provider to do for MY mother if this is how she presented?" The answer will almost always be obvious. Care for your patient as if he/she were your own mother.

If the answer is not obvious, EMS providers shall be guided by the following principles;

1. ALWAYS act in what you believe to be the best interests of your patient.
2. *Primum non nocere*, which is Latin for "First, do no harm".
3. When in doubt, provide treatment and offer transport.

If you are still not sure what the best course of action is, CONTACT BIOTEL for consultation and assistance.

Emergency Medical SERVICE:

As we all know, the "S" in "EMS" refers to "SERVICE". We exist first and foremost to be of SERVICE to others. We must never lose sight of this primary mission. It is my expectation (and I know this is shared by our BioTel City Fire Chiefs and EMS Chiefs) that we always act in the best interests of our patients. This sometimes means we must advocate for our patients, even when they are not capable of advocating for themselves. We are the "safety net" for our healthcare system, ensuring that those who have nowhere else to turn for help, or those who have fallen through the cracks in the system, receive appropriate and compassionate care.

We know that not every call we respond to will be for what EMS and 911 was developed for – a patient with a life- or limb-threatening emergency. I would ask you to remember that it is a privilege to wear the patch of a Texas EMS Provider and to serve as a BioTel paramedic or EMT.

That privilege means that we are often called to assist a patient with a more minor medical problem. Nevertheless, we must treat every patient with dignity and respect, regardless of their complaint or their life circumstances. Consider the less "glorious" EMS responses to be the dues we pay for the privilege of sometimes being given the opportunity to save someone's life. For this, we are truly blessed.

Continued on the next page…

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Thank You

The development of this CPG set was challenging, to say the least. I want to extend my sincere thanks to the UTSW Medical Direction team along with all the paramedics, EMTs, firefighters, Chief Officers, nurses, administrators, educators, subject matter experts, stakeholders and editors/reviewers who generously gave their time and expertise to this project. I am grateful to Dr. Deborah Diercks, Chair of the UTSW Department of Emergency Medicine, for her confidence in me and for her unwavering support. I am grateful to Dr. Paul Pepe, Emeritus Medical Director, and Dr. Ray Fowler, UTSW EMS Division Chief, as well as EMS System founders Dr. James Atkins and Dr. Erwin Thal [RIP] for their many years of service and for their laying a solid foundation for the growth of the UTSW/Parkland BioTel EMS System.

I also want to thank BioTel Director Melody Gardner and BioTel Manager LuAnn McKee as well as all of the BioTel staff for their assistance in developing and revising these guidelines. The project could not have been completed without the administrative support and tireless efforts of Ms. Silvia Ramirez and Ms. Deborah Jarrett, along with the technical expertise of Mr. Rick LaChance.

In 2017, BioTel welcomed two new team members, the new EMS Fellows, Dr. Brian Miller and Brandon Morshedi. These young EMS physicians stepped up as leaders in the CPGs revision project, especially in the development of the innovative BioTel PEDI-Guide©. I am extremely grateful for their enormous contributions to the project. Now that they have completed their EMS Fellowships to join our EMS Division faculty and the BioTel Medical Direction team, I look forward to many years of rewarding professional collaboration with these outstanding physicians.

Lastly, I cannot adequately express my gratitude to Dr. Ronna Miller for the countless hours and expert leadership she provided in the development of these guidelines. I know this was a labor of love for her. Let there be no doubt that it is because of her efforts that we have what I believe to be one of the best sets of evidence-based EMS treatment guidelines in the nation, if not the world. From all of us, thank you, Dr. Miller.

I consider being your Medical Director to be the greatest honor and privilege of my life. I am grateful for the opportunity to serve you and our patients and I am immensely proud of all that you do, each and every day, in service of our patients and our communities.

In humble gratitude, I am,

S. Marshal Isaacs, MD, FACEP, FAEMS

Medical Director

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Idris, A	UTSW	Thompson, C	BioTel
Isaacs, SM	UTSW	Tibbs, B	THR-Presby Dallas
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✦ ABBREVIATIONS AND DEFINITIONS

Airway Pressure refers to the pressure created during airway ventilation. Positive airway pressure is created during assisted ventilation with a BVM, or via CPAP, an extraglottic device, or an endotracheal tube.

BioTel EMS Providers refers to Basic and Advanced EMS Providers within the University of Texas Southwestern Medical Center at Dallas/Parkland BioTel ("BioTel") EMS System.

BioTel Contact/Consultation refers to real-time contact and consultation with Parkland BioTel online medical control staff and (as specified) EMS Online Medical Control Physician(s).

BioTel MACC refers to the BioTel Medication Administration Cross-Check procedure.

BioTel PEDI-Guide© refers to the BioTel Pediatric Emergency Drug and Interventions Guide©.

BLS Medications/Pharmaceuticals refers to medications/pharmaceuticals that may be administered by Basic Life Support (BLS) Providers with specific training and Medical Director prior authorization, as appropriate and, if possible, under direct supervision of an ALS Provider. As of 1 April 2018, these include: albuterol, aspirin, DuoDote® (or similar nerve agent antidote kit), epinephrine auto-injector (or similar unit-dose administration kit), glucose oral 40% gel, hemostatic gauze, intranasal (IN) naloxone, Nitronox®, and oxygen.

Brief, Resolved, Unexplained Event (BRUE) refers to the new term that replaces "Apparent Life-Threatening Event" (ALTE) when describing acute, resolved events in infants under one year of age.

Consider refers to an optional (not required) step, procedure, or medication. In the context of a protocol, procedure or policy, the intervention may be appropriate for some patients, but not for others. EMS Providers may consult with BioTel to determine the specific conditions under which they should implement a treatment consideration.

Delirium refers to an acute state of altered mental status, presumed to be caused by an organic (not psychiatric) condition, until proven otherwise. It differs from dementia, which is a slower, chronic alteration of mentation.

DOAC refers to Direct Oral Anticoagulant. Previously known as NOAC (Novel Oral Anticoagulant), this is a class of prescription blood thinners being prescribed with increasing frequency. These medications are associated with negative patient outcomes after trauma (especially head injury) and may play a role in hospital management of acute stroke, acute myocardial infarction and other conditions. It is critically important that EMS Providers elicit a history of ***any*** blood thinner use, especially DOACs, for all patients. Examples of DOACs include: dabigatran (Pradaxa®), apixaban (Eliquis®), rivoroxaban (Xarelto®), edoxaban (Savaysa®), betrixaban, and other "__aban" medications.

ECG Monitoring refers to continuous, 3-lead, electrocardiographic monitoring (a.k.a. "EKG Monitoring"). This is neither the same as nor a substitute for a 12-lead ECG when the latter is clinically indicated.

Emergency Detention refers to an arrest made by a peace officer in which the peace officer has probable cause to believe that the subject arrested is an immediate threat to him/herself or others and requires mental health services. (This replaces "APOWW" – Arrest by a Peace Officer Without a Warrant.)

Endotracheal Intubation Attempt refers to the introduction of a laryngoscope into the patient's mouth.

ePCR refers to the electronic Patient Care Report. If an ePCR is unavailable, a paper PCR may be substituted.

Extraglottic Airway (EGA) refers to a device inserted into the supraglottic or retroglottic structures to indirectly oxygenate and ventilate a patient, without intubating the trachea. It is considered a type of Advanced Airway.

High-risk Pregnancy/Delivery refers to a pre-term delivery, breech presentation, multiple births, meconium staining, placenta previa, placental abruption, shoulder dystocia, prolapsed cord, nuchal cord, preeclampsia, eclampsia (may occur up to 4 weeks post-partum), maternal drug abuse, or lack of prenatal care.

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Intrathoracic Pressure refers to the pressure created within the thoracic cavity during inhalation and exhalation. Positive intrathoracic pressure is created when providing assisted ventilation, or when there is abnormal air or fluid within the thoracic cavity (e.g. pneumothorax). Excessive positive intrathoracic pressure results in diminished ability to inflate the lungs, and also compresses the structures of the mediastinum, reducing venous return and cardiac output.

LDK refers to "Low-Dose Ketamine", the analgesic dose of ketamine (approximately 1/10th the sedation dose)

Oxygenation refers to the delivery to and enrichment of cells and tissues with oxygen. Sick or injured patients may require treatment for abnormalities of oxygenation, ventilation, or both of these separate-but-related processes. Excessive over-supplementation with high-flow oxygen may be harmful in certain clinical conditions.

Pediatric refers to anyone who has not reached his/her 14th birthday, *unless otherwise specified*. For *cardiac arrest and defibrillation*, "pediatric" refers to anyone who does not appear to have reached puberty. For *legal* matters, such as the right to give consent or to refuse treatment, a pediatric patient is anyone who has not reached his or her 18th birthday. Unless otherwise specified, protocols, policies and standing orders apply to both adults and children. Specific pediatric assessment and treatment information is notated throughout this document by a pink box ("pink = pedi"):

Perfusion refers to the delivery of oxygen to end-organs through the bloodstream. Hypoperfusion refers to abnormally decreased perfusion and is a critical feature of shock.

PetCO_2 Monitoring refers to continuous, waveform capnography monitoring of end-tidal CO_2 (a.k.a. "Capnography", "Waveform Capnography", "ETCO_2").

POC Glucose refers to a point-of-care blood glucose analysis using a portable glucometer (a.k.a. "D-stick", "fingerstick blood glucose", "capillary blood glucose").

Prodrome refers to the early, initial sign(s) and symptom(s) of a disease, illness or condition, before full signs/symptoms develop. **Prodromal** refers to the time period between the appearance of initial signs/symptoms and the development of the full disease, illness or condition.

PROM refers to breakage of the amniotic sac ("bag of waters") before the onset of labor.

Return of Spontaneous Circulation (ROSC) refers to return of a palpable pulse following resuscitation efforts.

Sepsis refers to the life-threatening systemic condition that may result from infection. Without timely recognition and treatment, sepsis may lead to tissue damage, organ failure and death. Adults over 65 years of age, infants under one year of age (especially newborns), those with weakened immune systems and those with chronic medical conditions are at higher risk for developing sepsis.

Shock refers to a severe state of hypoperfusion, arising from a variety of causes, including cardiac emergencies (obstruction to blood flow and pump failure), hypovolemia (both hemorrhagic and non-hemorrhagic), sepsis, and neurological conditions.

SpCO Measurement/Monitoring refers to carbon monoxide (CO) co-oximetry measurement/monitoring.

SpO_2 Monitoring refers to continuous pulse oximetry monitoring (a.k.a. "Pulse Ox", "Pulse Ox monitoring", "Pulse Oximetry").

TBSA refers to Total Body Surface Area when calculating the approximate size of thermal or chemical burns.

Ventilation refers to the mechanical transfer of air or oxygen from the outside environment into the airways, and the transfer of carbon dioxide from the body to the outside environment. Ventilation may occur spontaneously (driven by normal physiology), or artificially (driven by an outside entity, as when an EMS provider delivers a breath using BVM or other assisted ventilation modality).

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✦ UNIVERSAL CARE – ADULT

Goal: Facilitate appropriate initial assessment and management of any EMS patient and refer to appropriate *specific* CPG(s), as dictated by the findings within this universal care CPG
Inclusion Criteria: All patient encounters with and care delivery by BioTel EMS Providers
Exclusion Criteria: None (refer to UNIVERSAL CARE – PEDIATRIC for specific pediatric care)
Refer to: Patient Evaluation and Transport Policy for the definition of a PATIENT in the BioTel EMS System and for other evaluation and transport guidelines

All persons meeting the definition of a PATIENT shall be assessed in a manner consistent with standard EMS clinical practice. The ***ONLY*** exception shall be if it is determined to be unsafe to perform such an assessment.

1. **Assess scene safety:** evaluate for hazards to EMS Providers, patient and bystanders
    a. Determine number of patients
    b. Determine mechanism of injury
    c. Request additional resources, if needed, especially in case of:
        i. Multiple victims (especially if adult and pediatric patients at the same scene)
        ii. Childbirth
        iii. Cardiac arrest
        iv. Excited Delirium Syndrome
        v. Agitated or violent patient
2. Use appropriate **Personal Protective Equipment (PPE)**
3. Consider spinal motion restriction **(SMR)** if trauma, per Spinal Motion Restriction (SMR) Policy
4. **Primary survey** (Airway, Breathing, Circulation sequence, unless otherwise specified):
    a. Airway: Refer to Airway Management CPG, as needed
    b. Breathing: Provide supplemental oxygen to maintain SpO_2 at least 94%, unless specified otherwise:
        i. In most cases of critically ill or injured patients, high-flow supplemental oxygen is acceptable during initial resuscitation
        ii. Titrate oxygen supplementation to maintain SpO_2 94-99% after initial resuscitation, unless otherwise specified
        iii. Supplemental oxygen is not beneficial for patients who are not hypoxemic
    c. Circulation:
        i. If pulseless, refer to Cardiac Arrest CPG
        ii. If major hemorrhage, refer to Trauma & Hemorrhage Control/Tourniquet Use CPGs
    d. Disability: If suspected acute Stroke, refer to Stroke CPG
        i. GCS (or AVPU): *Motor score is the most predictive and important factor*
        ii. Arousability should be assessed by response to nailbed pressure, axillary skin fold pinch or trapezius muscle pinch; use of sternal rub is discouraged

EYE OPENING (4)	
Spontaneous	4
To Speech	3
To Pressure	2
None	1
VERBAL RESPONSE (5)	
Oriented & Appropriate	5
Confused Speech	4
Inappropriate Words	3
Incomprehensible Sounds or Moans	2
None	1
BEST MOTOR RESPONSE (6)	
Follows Commands	6
Localizes Pressure	5
Withdraws from Pressure	4
Abnormal Flexion	3
Abnormal Extension	2
None	1
TOTAL (3 to 15)	____

    e. Exposure & Environment: Consider patient modesty when feasible; keep patient warm

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5. **Secondary survey** (do not delay transport of critically ill or injured patients; tailor to patient presentation and complaint)
    a. Head and face
    b. Neck
    c. Chest
    d. Abdomen/back/flanks/buttocks
    e. Extremities
    f. Neurologic
6. **Baseline vital signs for ALL patients (and at least TWO sets, at least 5 minutes apart and documented, for all transported patients):**
    a. Palpated pulse (Heart Rate, HR)
    b. Blood pressure (BP)
    c. Respiratory rate (RR) and effort
    d. Oxygen saturation (SpO_2)
    e. Temperature (Temp)
    f. POC Glucose (need not be repeated, unless abnormal or unless clinical condition warrants repeat)
    g. Neurologic status (GCS) (Refer to Stroke CPG, if acute stroke is suspected)
    h. **NOTE:** Unstable patients shall have repeat vital signs documented every 5 to 10 minutes
7. **Acutely ill or injured patients, patients with altered LOC, and any patient with an advanced airway:**
    a. Continuous ECG monitoring
    b. Continuous pulse oximetry (SpO_2) monitoring
    c. Continuous waveform capnography ($ETCO_2$) monitoring
8. **12-Lead ECG Acquisition for all patients with cardiac or respiratory complaints:**
    a. EMS Providers MUST acquire a 12-Lead ECG for any patient who meets EITHER of these criteria:
        i. Patient 20 years of age or older with ANY Acute Coronary Syndrome (ACS) sign or symptom;
        ii. Any age patient with ACS signs or symptoms AND a history of:
            1. Hypertension
            2. Cardiac disease
            3. Tobacco use (any form)
            4. Diabetes Mellitus
            5. Severe obesity
            6. High cholesterol
            7. Family history of cardiac disease, especially sudden cardiac death
            8. Recent recreational drug use
    b. When in doubt, obtain 12-Lead ECG & transmit STEMI ECG or to request consultation
    c. **NOTE:** Continuous, 3-lead ECG monitoring is NOT the same as a 12-Lead ECG and does NOT substitute for the acquisition and transmission of a 12-Lead ECG
9. **OPQRST History for pain or a similar symptom:**
    a. **O**nset of the event or symptom: sudden or gradual? What was patient doing when it started?
    b. **P**rovocation or **P**alliation: what makes it worse? What makes it better?
    c. **Q**uality: open-ended question, such as “Can you describe it for me?”
    d. **R**adiation/Region: does it extend to another part of the body?
    e. **S**everity: refer to Pain CPG for numeric and other pain rating scales
    f. **T**ime (history): how long has it been happening? Has it changed since onset? has it happened before? If it stopped, when did it stop?
10. **SAMPLE History for all patients**, when possible:
    a. S: Symptoms
    b. A: Allergies (medications, environmental, food)
    c. M: Medications (prescription, over-the-counter; BRING CONTAINERS to hospital, if possible)
        i. NOTE: Aspirin, warfarin and other blood thinners are very important, especially for trauma (even “minor” trauma) and especially for elderly patients
    d. P: Past Medical/Surgical History
        i. Look for medical alert tags, portable medical records and advance directives (DNR)
        ii. Look for medical devices and implants (e.g. dialysis shunt, insulin pump, pacemaker or implanted defibrillator, central venous catheter/port, gastric tubes, bladder catheter)
        iii. Consider possibility of pregnancy in any female patient older than 10 years of age
    e. L: Last oral intake
    f. E: Events leading up to the 911 call
        i. For a patient with altered LOC, syncope, seizure or acute stroke:

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1. Consider transporting the family member/guardian on-scene to the hospital, OR
2. Obtain contact information (mobile or other telephone number) to provide to E.D. personnel

11. **Specific patient considerations:**
    a. "Geriatric" definition varies according to the specific CPG and receiving hospital
        i. 65 years of age is the general definition in most cases, unless otherwise specified
    b. "Pediatric" definition and general guidelines are covered in UNIVERSAL CARE – PEDIATRIC
12. **Specific treatment considerations:**
    a. **Reduced medication doses** may apply to patients with kidney or liver disease, to geriatric patients, or to patients on prescription medications with known, drug-drug interactions
    b. **Endotracheal medication administration:**
        i. Because of lack of efficacy/benefit, endotracheal medication administration is not used in the BioTel EMS system
    c. **Intranasal medication administration, as device availability permits:**
        i. ONLY the following medications may be administered by the intranasal (IN) route, as clinically indicated, in the BioTel system:
            1. Diazepam (optional medication; adults only)
            2. Fentanyl (optional medication)
            3. Glucagon
            4. Ketamine (optional medication)
            5. Midazolam (optional medication)
            6. Naloxone
    d. **Vascular access and fluid administration:**
        i. Normal Saline (0.9% Saline) is the only IV/IO fluid routinely used in the BioTel EMS system:
            1. HOWEVER, in the event of supply-chain or other issues with the availability of Normal Saline, the Medical Director may issue an advisory permitting the substitution of other forms of isotonic crystalloid, such as Lactated Ringers (LR), Normosol®, PlasmaLyte®, or other available, similar products
            2. Administration of the alternate IV fluid product will be identical to the Normal Saline administration for each CPG, unless otherwise specified
            3. BioTel agencies are not required to carry more than one type of IV fluid at any given time
        ii. Vascular access:
            1. Antecubital or external jugular veins are preferred for adults in cardiac arrest
            2. External jugular (EJ) peripheral access may be used for administration of fluids and certain medications in critically ill adult patients at least 14 years of age when other peripheral IV sites or intraosseous access are unavailable or unsuccessful:
                a. Refer to the External Jugular IV Access Procedure
            3. Paramedics may use existing central venous lines in critical cases, if the paramedic has the specialized knowledge and equipment to do so
            4. Intraosseous (IO) access may be performed in critically ill or injured patients when fluids and/or medications are necessary, but is not the first-line access modality:
                a. In adult cardiac arrest, IO administration may be less effective than IV
                b. Paramedics shall not establish IO access to replace routine IV access that is unsuccessful or difficult to establish
        iii. Fluid administration:
            1. For routine IV placement, fluid may be administered at a TKO rate or a saline lock may be substituted.
            2. Selected, hypotensive trauma patients, such as those in traumatic cardiac arrest, may benefit from initial fluid administration at "wide open" rate, until ROSC (palpable radial pulse) or other appropriate clinical response is achieved.
            3. For patients requiring fluid resuscitation, infuse 20 mL/kg **(maximum 1000 mL (1L) per bolus)**, with frequent reassessment after each bolus
            4. For patients with hemorrhagic shock due to uncontrollable external or internal bleeding, administer only enough IV/IO fluid to maintain a palpable radial pulse (equivalent to approximately SBP 80 mmHg)
13. **Cardiac Arrest considerations** (Refer to the Cardiac Arrest, Asystole/PEA and VF/VT CPGs):
    a. **Survival determinants** with good neurologic function after out-of-hospital cardiac arrest (OOH-CA):
        i. Immediate, minimally-interrupted, high-quality, "pit-crew" CPR – 1st priority for every OOH-CA

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ii. Prompt defibrillation for a shockable rhythm

b. The BioTel EMS system uses **"Continuous Chest Compressions" for adults and adolescents,** either with BVM-assisted ventilation OR with an advanced airway:
   i. Chest compression rate: 100-120 compressions per minute
   ii. Chest compression depth: 2" (5 cm) to 2.5" (6 cm)
      1. Allow for complete chest recoil, without leaning on the chest
   iii. Asynchronous ventilations: 8 to 10 per minute (1 breath every 6 to 8 seconds)
      1. Do not pause compressions to provide ventilations
      2. Six breaths per minute (1 breath every 10 seconds) if TRAUMATIC arrest
   iv. Hand placement: Two hands, midline, lower half of sternum
   v. Chest recoil: Allow full recoil after each compression; do not lean on chest after compression

c. **Chest compression fraction:**
   i. Minimal interruptions to effective chest compressions improve survival and recovery
   ii. Chest compression pauses for *rhythm check or shock*: no more than 5-10 seconds
   iii. The chest compressor role should be rotated during the brief pause to perform rhythm check

d. **Metronomes** enhance accuracy of chest compression rate (100-120 per minute), are associated with improved survival and recovery outcomes, and should be used for ***all*** CPR incidents

e. **AED Deployment** (without interrupting chest compressions):
   i. Power on the AED FIRST
   ii. Place hands-free pads on bare chest as soon as possible
   iii. Follow ALL visual and voice prompts by the AED until paramedics arrive

f. **Manual monitor-defibrillator deployment** (without interrupting chest compressions):
   i. PADS/PADDLES lead, NOT Lead II, immediately upon patient contact and throughout resuscitation
   ii. MANUAL mode preferred over "AED mode" whenever possible

g. **Suspected asystole:**
   i. Quick check for loose/disconnected leads, defibrillator power and signal strength ("gain")
   ii. Do NOT interrupt effective chest compressions to confirm asystole in multiple leads
   iii. If fine ventricular fibrillation ("fine VFib") cannot be excluded, proceed with treatment according to the Ventricular Fibrillation/Pulseless Ventricular Tachycardia CPG

h. **Advanced airway placement:**
   i. BVM with oro- or nasopharyngeal airway on-scene for at least 6 minutes (3 rounds of CPR)
      1. EXCEPTION: Active regurgitation may require earlier advanced airway placement
   ii. There is no survival or recovery benefit to earlier advanced airway placement

i. **Patient movement during CPR:**
   i. Perform CPR on-scene for a minimum of 10 minutes, unless scene is unsafe
   ii. There is no survival or recovery benefit to earlier patient movement to the ambulance

j. **Patient transport during or after cardiac arrest:**
   i. High-quality resuscitation on-scene correlates with the best chance of favorable outcome
   ii. Very few patients who do not achieve Return of Spontaneous Circulation (ROSC) in the field will be successfully resuscitated in the E.D.
   iii. If a patient is transported EITHER with CPR in progress OR after achieving ROSC, there must be at least two rescuers in the back of the ambulance
   iv. Refer to Field Termination Policy for details about termination of resuscitation efforts

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✦ UNIVERSAL CARE – PEDIATRIC

Goal: Facilitate appropriate initial assessment and management of the PEDIATRIC EMS patient and refer to appropriate specific CPGs, as dictated by the findings within this universal care CPG
Inclusion Criteria: All PEDIATRIC patient encounters with and care delivery by BioTel EMS Providers
Exclusion Criteria: Adult patients, generally defined as older than 14 years of age, unless specified
Refer to: UNIVERSAL CARE - ADULT for general care guidelines; to Airway Management – Pediatric for management of the pediatric airway; and to Medication Administration Cross-Check; and the PEDI-Guide©
Refer to: Evaluation and Transport Policy for the definition of a PATIENT in the BioTel EMS System and for other evaluation and transport guidelines
Refer to: Destination Policy for destination decision-making guidance for pediatric patients

PEDIATRIC AGE DEFINITIONS: Age definitions for a "pediatric" patient differ, depending on the condition and on receiving hospital criteria. In general, a patient is considered "Pediatric" for most assessment and treatment in this BioTel EMS CPG set if s/he is younger than the 14th birthday.

EXCEPTIONS:

- **CARDIAC ARREST, CPR and AED/Defibrillator Use:**
  - Age 0 to 1st birthday: INFANT
  - Age 1 year to puberty (or 8 years of age): CHILD
- **TRAUMA:**
  - "Pediatric" definition differs at different adult and pediatric Trauma Centers (TCs)
  - Consult Destination Policy or BioTel for the current minimum/maximum age accepted at a given TC
- **LEGAL AGE of CONSENT:**
  - Under 18 years of age (unless emancipated)

All persons meeting the definition of a PATIENT shall be assessed in a manner consistent with standard EMS clinical practice. The ***ONLY*** exception shall be if it is determined to be unsafe to perform such an assessment.

This section outlines the pediatric-specific aspects of *universal* care in the BioTel EMS System.
Specific pediatric definition, assessment and treatment considerations are presented in each CPG and Policy.
REFER to the BioTel PEDI-Guide© for emergency medication dosing & intervention guidance.

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Approximate Normal Pediatric Vital Signs by Age

Zone	Weight	Age	HR (per min)	RR (per min)	SBP (mmHg)	Handtevy® Weight	Age
GRAY	3, 4 and 5 kg	Less than 3 mo	100-180	30-60	At least 60		
PINK	6-7 kg	3-5 mo	100-180	30-45	At least 70		
RED	8-9 kg	6-11 mo	100-180	30-45	At least 70		
PURPLE	10-11 kg	12-23 mo	80-150	25-40	At least 75	10 kg	1 yr
YELLOW	12-14 kg	24-35 mo	80-150	25-40	At least 75		
WHITE	15-18 kg	3-4 yr	80-140	22-35	At least 75	15 kg	3 yr
BLUE	19-23 kg	5-6 yr	70-120	18-30	At least 80	20 kg	5 yr
ORANGE	24-29 kg	7-9 yr	70-120	18-30	At least 85	25 kg	7 yr
GREEN	30-36 kg	10-11 yr	60-100	12-20	At least 90	30 kg	9 yr
BLACK	37-50 kg	12-13 yr	60-100	12-20	At least 100		

Blood Pressure Estimation (mmHg):

Normal mean Systolic BP (SBP) estimate: 80 + (2 X age in years)
Hypotension definition: SBP *less than* 70 + (2 X age in years) (less than 5th-percentile)
NOTE: Hypotension is a very late, ominous sign of pediatric shock

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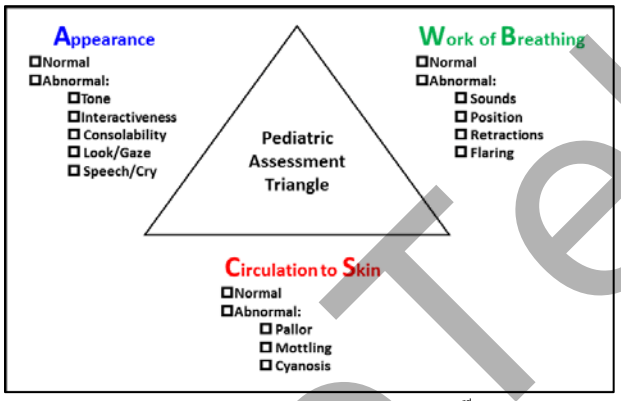
Weight Estimation (kg):

- Length-based resuscitation tape
- BioTel PEDI-Guide©
- "Handtevy®" method (see Table above)
- ((Age in years X 2) + 8 (or 10))
- Mobile app, such as PediSTAT

1. **Scene safety:** Same as for adults
2. **PPE:** Same as for adults
3. **Spinal Motion Restriction (SMR):** Same as for adult, except:
    a. Torso padding (top of shoulders to buttocks) for young children to achieve neutral spinal alignment
    b. Additional padding may be needed on the child's sides, to reduce side-to-side movement
4. **Primary Survey: Pediatric Assessment Triangle (PAT)**



(Adapted from Pediatric Education for Prehospital Providers, 3rd edition)

    a. PAT Impression:
        a. All Components Normal: Stable
        b. Breathing Abnormal: Respiratory Distress
        c. Breathing + Appearance Abnormal: Respiratory Failure
        d. Circulation Abnormal ± Appearance Abnormal: Shock
        e. Appearance Abnormal: CNS/Metabolic
        f. All Components Abnormal: Cardiopulmonary Failure
    b. Disability:
        a. Pediatric GCS modified for infants and young children less than 5 years of age
        b. Arousability should assessed by response to nailbed pressure, axillary skin fold pinch, or trapezius muscle pinch; use of sternal rub is discouraged

EYE OPENING (4)	
Spontaneous	4
To Speech	3
To Pressure	2
None	1
VERBAL RESPONSE (5)	
Coos, Babbles (infant)/Talks normally	5
Irritable Cry (infant)/Words	4
Cries to Pressure (infant)/Sounds	3
Moans to Pressure	2
None	1
BEST MOTOR RESPONSE (6)	
Spontaneous Movement	6
Withdraws to Touch	5
Withdraws from Pressure	4
Abnormal Flexion	3
Abnormal Extension	2
None	1
TOTAL (3 to 15)	____

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c. Exposure & Environmental Control: Prevention of heat loss/hypothermia is absolutely critical

5. **Secondary Survey:** Same as for adults
   a. Do not delay transport of critically ill or injured patients; tailor to patient presentation or complaint
6. **Baseline Vital Signs:** Same as for adults (at least two sets, at least 5 minutes apart and documented):
   a. NOTE: Do not omit POC Glucose in any sick infant or child
   b. NOTE: Hypotension is a late, ominous sign of pediatric shock
7. **Acutely ill or injured patients, altered LOC, and any patient with advanced airway:** Same as for adults
   a. Continuous ECG monitoring
   b. Continuous pulse oximetry (SpO_2) monitoring
   c. Continuous waveform capnography ($ETCO_2$) monitoring
8. **12-Lead ECG Acquisition:** Refer to Syncope/presyncope, Tachycardia, and Bradycardia CPGs
9. **OPQRST History for pain or similar symptom:** Same as for adults
10. **SAMPLE History for all patients, when possible:** Same as for adults, plus, as indicated:
    a. Pregnancy/birth/neonatal history (neonates and young infants), immunization history, ill contacts
    b. Social and environmental history, e.g. consider abuse/neglect, non-accidental trauma
11. **Specific patient considerations:**
    a. Anatomic, physiologic, emotional and developmental differences
       i. Hypothermia/heat loss
       ii. Multi-system trauma very common
    b. Intentional injury (abuse/neglect): Refer to Child/Elderly/Disabled Abuse/Neglect Reporting Policy
    c. Children with Special Healthcare Needs
    d. Consent Issues: Legal Age of Consent is 18, unless Emancipated
       i. Refer to Evaluation and Transport Policy
12. **Specific treatment considerations:**
    a. **WEIGHT-/LENGTH- OR AGE-BASED Medication dosing (REFER to the BioTel PEDI-Guide©)**
    b. Vascular access
       i. IV preferred for non-critical patients
       ii. IO may be preferable for critically ill or severely injured patient
          1. Any age patient, as long as appropriate equipment is available
       iii. 20 mL/kg (up to 1000 mL (1L) maximum per bolus) is the standard pediatric IV/IO fluid bolus:
          1. EXCEPTION: If cardiogenic shock is suspected, administer only 5 or 10 mL/kg
          2. Reassess patient for clinical response after each bolus
       iv. For infants and small children, use the "pull-push" stopcock and syringe method for administration of small fluid and medication volumes (use caution to avoid air embolism)
    c. Pediatric equipment, especially airway management
    d. No traction splint for femur fracture (stabilize and pad)
    e. Currently, there is no Field Termination for pediatric patients in the BioTel EMS system
13. **Cardiac arrest considerations:**
    a. **Survival determinants**: Same as for adults, with focus on high-quality CPR
    b. **CPR method for at least 2 Rescuers:**

Component	Infant (under 1 year of age) Excludes: Newly Born	Children 1 year of age - Puberty
Compressions-to-Breaths	15:2 Avoid over-ventilation	15:2 Avoid over-ventilation
Compression Rate	100 to 120 per minute	100 to 120 per minute
Compression Depth	At least ⅓ chest depth (1.5" or 4 cm)	At least ⅓ chest depth (2" or 5 cm)
Hand Placement	2 thumb-encircling hands, midline, just below nipple line	1 or 2 hands, midline, lower ½ of sternum
With Advanced Airway	1 breath every 6 seconds (10 breaths per minute)	1 breath every 6 seconds (10 breaths per minute)

    c. **CPR fraction:** Same as for adults – minimize interruptions to chest compressions
    d. **Chest recoil:** Same as for adults – allow full recoil between compressions and do not lean on chest
    e. **Metronomes:** Same as for adults – they should be used for ***all*** CPR incidents
    f. **AED: Focus should be on high-quality CPR – do not delay resuscitation for AED placement**
       i. Infants under 1: AED may be used (pediatric equipment preferred, if available)
       ii. Children 1 to puberty: AED may be used (pediatric equipment preferred, if available)

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g. **Manual monitor-defibrillator:** Same as adults (for shock doses, refer to VF/pVT CPG)
    i. **Refer to the BioTel PEDI-Guide© for defibrillation and cardioversion dosing**
h. **Suspected asystole:** Same as adults
i. **Advanced Airway:** Unless active regurgitation, do not attempt for at least 3 CPR cycles (6 minutes)
    i. **Refer to the BioTel PEDI-Guide© for advanced airway equipment sizes**
j. **Patient movement during CPR:** Same as for adults
    i. Infant or child must be on a firm surface (e.g. floor or table) for effective CPR
k. **Patient transport during CPR or with ROSC:** Same as for adults

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✦ RESUSCITATION

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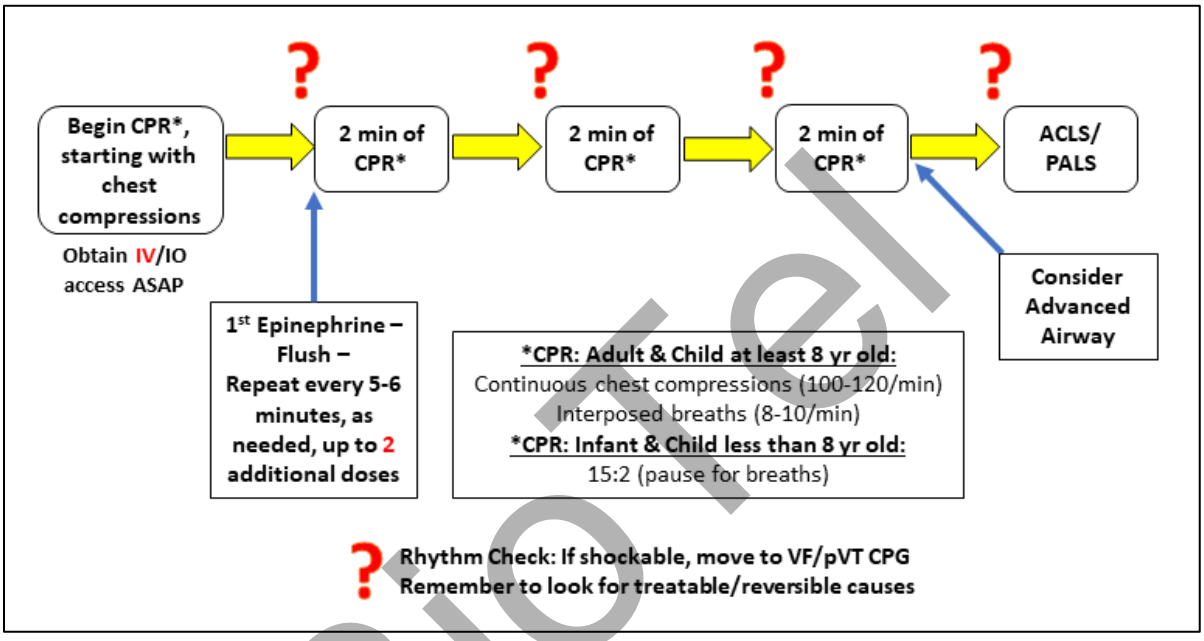
Asystole/PEA

Goals: Return of Spontaneous Circulation (ROSC) with preserved neurologic function
Inclusion Criteria: Patients in cardiac arrest with "non-shockable" cardiac rhythm
Exclusion Criteria: Severe hypothermia (see Cold Emergencies CPG); valid out-of-hospital DNR order; blunt traumatic cardiac arrest with confirmed asystole (not PEA); neonates (refer to Neonatal Care CPG)
Refer to: Cardiac Arrest, VFib/pulselessVTach and Post-Cardiac Arrest CPGs; Determination of Death Policy

- **NOTE:** Refer to Determination of Death, Resuscitation Termination and Do Not Resuscitate (DNR) Policy for criteria in which resuscitation need not be initiated or termination of resuscitation may be considered.



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Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, using the modified "CAB" sequence for cardiac arrest:
    a. **C (Circulation):** Immediately begin high-quality, minimally-interrupted CPR, starting with chest compressions:
        i. Place the patient supine on a firm surface with adequate space to perform team-based CPR
        ii. Power on AED/defibrillator and apply hands-free defibrillation pads to patient's bare chest
        iii. A metronome shall be used for all CPR incidents (chest compression rate: 100-120/minute)
    b. **A (Airway):** Ensure airway patency, using OPA and/or NPA adjunct and suctioning
        i. Jaw thrust is preferred if trauma is suspected; refer to Spinal Motion Restriction Policy
    c. **B (Breathing):** Assist ventilations with 100% FiO_2 and 8-10 gentle, one-handed BVM breaths per minute over 1-1.5 seconds each, just enough to cause chest rise (avoid over-ventilation)
2. If time permits, perform a POC Glucose analysis and treat according to the Diabetic Emergencies CPG:
    a. Do not administer glucose unless there is documented hypoglycemia
3. Perform a focused Secondary Survey and SAMPLE history, as conditions permit:
    a. Look for signs of traumatic injury (including drowning), drug overdose and other special conditions

Advanced Level

1. Assess and support vital functions, focusing on immediate, high-quality, minimally-interrupted CPR:
    a. Initiate $PetCO_2$ monitoring as soon as possible:
        i. Low $PetCO_2$ value may indicate overly aggressive ventilation or inadequate chest compressions
        ii. Normal or high $PetCO_2$ value may indicate ROSC, even before a pulse is palpable
    b. Ensure that manual monitor/defibrillator is in MANUAL mode and in PADS/PADDLES lead:

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i. Exception: some agencies may use a manual device in "AED mode" for ADULTS only, depending on AED mode configuration, agency MOP/SOP, and specific Medical Direction authorization.

2. Confirm asystole (if suspected) by checking lead connections, monitor power and signal gain:
   a. However, do not waste time to confirm asystole by checking multiple leads
3. Do not attempt advanced airway placement for at least 6 minutes (three, 2-minute cycles of CPR), unless necessary because of regurgitation:
   a. Minimize interruption to chest compressions during advanced airway insertion
4. Establish IV/IO access as soon as possible, but NOT before CPR or AED/defibrillator application:
   a. IV (especially antecubital) preferred over IO
5. Administer epinephrine **(0.1 mg/mL)**:
   a. ADULT at least 14 years of age: 1 mg (10 mL) IVP or IO, with Normal Saline (NS) flush
      i. May repeat up to two more doses, **every 5 to 6 minutes, as needed** (**maximum total = 3 doses**)
         1. If patient re-arrests after achieving ROSC, up to three additional epi doses may be given
      ii. Contact BioTel for authorization for additional doses, if needed

b. Pediatric patients less than 14 years of age: 0.01 mg/kg (0.1 mL/kg) IVP or IO, with NS flush
i. May repeat up to two more doses, **every 5 to 6 minutes, as needed** (**maximum total = 3 doses**)
1. If patient re-arrests after achieving ROSC, up to three additional epi doses may be given
ii. Contact BioTel for authorization for additional doses, if needed

4. Search for and treat potentially reversible causes and special circumstances:
   a. **Hypoxia:** Assist ventilations with 100% FiO_2; confirm airway patency and/or proper advanced airway placement with continuous $PetCO_2$ monitoring
   b. **Hypothermia:** Protect from further heat loss; refer to Cold Emergencies CPG
   c. **Overzealous ventilation:** Provide only 8 to 10 gentle breaths over 1-1.5 seconds each during CPR
   d. **Hypovolemia:** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO
      i. May repeat twice, as needed, if no signs of volume overload (rales, JVD, frothy sputum)
   e. **Hyperkalemia (renal failure or dialysis) OR pre-existing metabolic acidosis (e.g. methanol ingestion, aspirin overdose) OR tricyclic antidepressant overdose**: Sodium bicarbonate 1 mEq/kg IVP or IO
   f. **Opioid overdose (known or suspected):** Administer naloxone after starting CPR
      i. ADULT at least 14 years of age: 0.4 mg IV/IO/IM or 2 mg IN; repeat once after 4 minutes, if needed

ii. Pediatric patients less than 14 years of age: 0.1 mg/kg IV/IO/IM (maximum single dose: 2 mg)
1. Contact BioTel for additional doses if patient does not improve or cannot maintain SpO_2 94%

   g. **Beta-Blocker overdose:**
      i. ADULT at least 14 years of age: Administer Glucagon 1-2 mg IV/IO/IM/IN
         1. May repeat once after 20 minutes, if needed

ii. Pediatric patients less than 1 year of age: Glucagon 0.5 mg IV/IO/IM/IN
iii. Pediatric patients 1 to 13 years of age: Glucagon 1 mg IV/IO/IM/IN
1. May repeat once after 20 minutes, if needed

   h. **Calcium-Channel Blocker overdose:**
      i. ADULT at least 14 years of age: Administer 10% calcium chloride: 1g (10 mL) IVP or IO (optional medication)

ii. Pediatric patients less than 14 years of age: Administer 20 mg/kg (0.2 mL/kg) of 10% calcium chloride (maximum single dose: 1 g (10 mL)) (optional medication)

   i. **Tension pneumothorax (known or suspected):** Perform needle thoracostomy on affected side and contact BioTel as soon as possible (Refer to Needle Thoracostomy Procedure)
   j. **Cardiac tamponade (suspected, based on history/mechanism):** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO
   k. **Prolonged resuscitation (greater than 15 minutes):**
      i. Consider sodium bicarbonate 1 mEq/kg IVP or IO
      ii. Consider calcium chloride (as above, section 6.h.)
5. In the event of return of spontaneous circulation (ROSC), refer to Post-Cardiac Arrest Care CPG
6. If there is no response to therapy and no evidence of reversible causes of asystole or PEA, consider terminating resuscitation efforts in the field: Refer to Termination of Resuscitation Efforts section of the Determination of Death Policy
7. For additional assistance and Medical Control physician guidance, contact BioTel

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Cardiac Arrest

Goals: Return of Spontaneous Circulation (ROSC) with preserved neurologic function
Inclusion Criteria: Patients in cardiac arrest
Exclusion Criteria: Valid out-of-hospital DNR order; conditions incompatible with life for which resuscitation need not be attempted (refer to Determination of Death Policy); neonates (refer to Neonatal CPG)
Refer to: Asystole/PEA, VFib/pulselessVTach and Post-Cardiac Arrest CPGs; Determination of Death Policy

- **NOTE:** On-scene CPR and ALS resuscitation for **at least 10 minutes** is preferable to immediate transport (as long as the scene is safe) and is associated with higher survival rates with good neurological function

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, as clinically indicated, using the modified "CAB" sequence for cardiac arrest:
    a. **C (Circulation):** Immediately begin high-quality, minimally-interrupted CPR, starting with chest compressions:
        i. Place the patient supine on a firm surface with adequate space to perform team-based CPR
        ii. Power on AED/defibrillator and apply hands-free defibrillation pads to patient's bare chest
        iii. A metronome shall be used for all CPR incidents (**chest compression rate: 100-120/minute**)
        iv. If possible, do not pause chest compressions for more than 10 seconds for any reason
    b. **A (Airway):** Ensure airway patency, using OPA and/or NPA adjunct and suctioning
        i. Jaw thrust is preferred if trauma is suspected; refer to Spinal Motion Restriction Policy
    c. **B (Breathing):** Assist ventilations with 100% FiO_2 and 8-10 gentle, one-handed BVM breaths per minute over 1-1.5 seconds each, just enough to cause chest rise (avoid over-ventilation)

Age	Compression Depth	CPR Ratio	Ventilations
Infant (Less than 1 yr)	Approx. 1.5 inches	15:2	Pause compressions to give breaths
Child (1 to 8 yr)	Approx. 2 inches		
Adolescent and Adult (At least 8 yr)	2-2.5 inches	Continuous Chest Compressions (CCC)	8 to 10 per minute, without pausing compressions

2. For cardiac arrest in cases of suspected trauma, BLS units should begin transport if transfer to the closest appropriate Trauma Center is faster than waiting for an ALS unit:
    a. Minimize scene time and continue treatment en route
    b. Contact BioTel as soon as possible, in order to expedite Trauma Center notification and preparation
3. As soon as an AED or defibrillator arrives, POWER ON the device first, and then apply hands-free pads
    a. Minimize chest compressions interruptions during pad placement

b. Infants less than 1 year of age:
i. AED: May be used (front/back pad placement, if needed), but should not delay high-quality CPR
ii. Manual defibrillator: Use pediatric pads when available
c. Children 1 to 8 years of age:
i. AED: Use pediatric AED pads or other device-specific pediatric modification when available
ii. Manual defibrillator: Use pediatric pads when available

4. AED general guidelines:
    a. Follow ALL visual and voice prompts and leave AED applied until advanced level providers arrive
5. After each 2-minute CPR cycle, briefly (less than 5 seconds) pause chest compressions to check rhythm:
    a. If the rhythm is organized, check for palpable pulse:
        i. If palpable pulse consistent with ROSC, refer to the Post-Cardiac Arrest Care CPG
        ii. If no palpable pulse, resume CPR refer to the Asystole/PEA CPG
    b. If patient remains in a shockable rhythm (VFib or pulseless VTach), resume CPR and refer to the VFib/pulseless VTach CPG

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6. For all defibrillation attempts:
    a. Consider pre-charging manual defibrillator to the next energy level during CPR, before the next shock
    b. Perform chest compressions (without ventilations) while the AED/defibrillator charges
    c. Immediately after rhythm check/shock, resume high-quality CPR for 2 full minutes
    d. Do not administer "stacked" shocks
    e. Do not interrupt chest compressions for more than 5 seconds before or after a shock
7. If time permits, perform and a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented hypoglycemia
8. Perform a focused Secondary Survey and SAMPLE history, as conditions permit
    a. Look for signs of traumatic injury, drug overdose and other special conditions

Advanced Level

9. Assess and support vital functions, focusing on immediate, high-quality, minimally-interrupted CPR:
    a. Initiate $PetCO_2$ monitoring as soon as possible:
    i. Low $PetCO_2$ value may indicate overly aggressive ventilation or inadequate chest compressions
    ii. Normal or high $PetCO_2$ value may indicate ROSC, even before a pulse is palpable
    b. Ensure that manual monitor/defibrillator is in MANUAL mode and in PADS/PADDLES lead:
    i. Exception: some agencies may use a manual device in "AED mode" for ADULTS only, depending on AED mode configuration, agency MOP/SOP, and specific Medical Direction authorization
10. Do not attempt advanced airway placement for at least 6 minutes (three, 2-minute cycles of CPR), unless necessary because of regurgitation:
    a. Minimize interruption to chest compressions during advanced airway insertion
    b. After securing the advanced airway, deliver ventilations without interrupting chest compressions
    i. Medical etiology: 10 ventilations per minute (once every 6 seconds)
    ii. Trauma etiology: 6-8 ventilations per minute (once every 10 seconds)
    iii. Do NOT over-ventilate
11. Establish IV/IO access ASAP (IV preferred), but NOT before CPR or AED/defibrillator application:
    i. Medical etiology: TKO unless hypovolemia suspected
    ii. Trauma etiology: Wide open until ROSC is achieved, then decreased to TKO
12. Special circumstances:
    a. **Tension pneumothorax (known or suspected):** Perform needle thoracostomy on affected side and contact BioTel as soon as possible (Refer to Needle Thoracostomy Procedure)
    b. **Cardiac tamponade (suspected, based on history/mechanism):** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO
    c. **Pregnancy:**
    i. Request additional EMS resources AND notify BioTel as soon as possible
    ii. If definite pulse, but no breathing or abnormal breathing: Provide 1 ventilation every 5-6 seconds
    iii. If no pulse: Begin CPR immediately with same hand placement as non-pregnant patient
    iv. If uterus is palpable at or above umbilicus, perform continuous aortocaval decompression:
        1. If rescuer is available: One- or two-handed (preferred), manual left uterine displacement

(Adapted from American Heart Association)

        2. If rescuer is unavailable: Left lateral tilt on long spine board is a less effective alternative

(Adapted from American Heart Association)

13. Identify presenting dysrhythmia and treat according to the specific CPG (Asystole/PEA or VFib/pulseless VT)
14. In the event of Return of Spontaneous Circulation (ROSC), refer to the Post-Cardiac Arrest CPG
15. If there is no response to therapy and patient meets criteria, consider terminating resuscitation efforts in the field: Refer to Termination of Resuscitation Efforts section of the Determination of Death Policy
16. For additional assistance and Medical Control physician guidance, contact BioTel
17. **Refer to the age-based Summary Cardiac Arrest Resuscitation on the next page (Table 1)**

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Table 1: Summary of BLS Cardiac Arrest Resuscitation (Adapted from American Heart Association 2015)			
Therapy	**Adolescent and Adult (8th Birthday and older)**	**Child (1 to 7 years)**	**Infant* (Less than 1 year)**
CPR	Continuous Chest Compressions (CCC) (no pause for ventilations)	15 compressions to 2 ventilations (pause for ventilations)	
Compression to Ventilation Ratio, *without advanced airway*	8 to 10 ventilations per minute (do NOT pause compressions)	15 compressions to 2 ventilations (pause for ventilations)	
Ventilation Volume	Gentle, one-handed BVM squeeze over 1 to 1.5 seconds each, Sufficient to cause visible chest rise		
Compression Rate	100-120 per minute Use metronome!		
Hand Placement	2 hands on lower ½ of sternum	1 or 2 hands on lower ½ of sternum	"2 thumbs-encircling hands" in center of chest, just below nipple line
Chest Compression Depth	2 to 2.5 inches (~5 to 6.4 cm)	At least ⅓ chest depth (Approx. 2 inches (5 cm))	At least ⅓ chest depth (Approx. 1.5 inches (4 cm))
Chest Recoil	Allow full chest recoil after every compression; Do not lean on the chest after compression		
Defibrillation	Adult AED/defibrillator pads	**1st choice:** Manual defibrillator with pediatric pads Dose: 2 J/kg, 4 J/kg, 4-10 J/kg **2nd choice:** AED with device-specific pediatric AED pads or pediatric setting **3rd choice:** AED with adult pads (place front and back on left chest, if necessary)	
Compression to Ventilation Ratio, *with advanced airway*	Continuous compressions:100-120/minute Medical: one ventilation every 6 seconds (10 per minute) Trauma: one ventilation every 10 seconds (6 per minute)	Continuous compressions:100-120/minute Provide one ventilation every 6 seconds (10 per minute)	

*Refer to Neonatal Care CPG for resuscitation guidelines for newly-born infants

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Determination of Death, Resuscitation Termination and Do Not Resuscitate (DNR)

LINK TO POLICY

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External Jugular IV Access

Purpose: To provide alternate intravenous access for critically ill adult patients
Inclusion Criteria: Critically ill adult patients at least 14 years of age for whom other peripheral IV or intraosseous access is unavailable or unsuccessful
Exclusion Criteria: Pediatric patients less than 14 years of age
Refer to: Shock, Trauma and symptom-specific CPGs; Universal Care – Adult; Universal Care – Pediatric; Intraosseous Access Procedure

Indications:
- Peripheral venous access for administration of fluid and selected medications* in critically ill adult patients

Contraindications:
- Patients less than 14 years of age (unless specifically authorized by a Medical Command physician)
- Inability to tolerate or contraindications to "head down" (Trendelenburg) position, such as:
  - Respiratory distress
  - Active vomiting
  - Traumatic brain injury or stroke
  - Suspected spinal injury/C-Collar in place
  - Agitation or inability to hold head still
  - VP shunt on side of insertion
  - Infection or injury at insertion site
  - Inability to visualize anatomic landmarks

Equipment:
1. Non-sterile gloves (and other PPE, as needed)
2. Appropriately sized over-the-needle IV catheter:
   a. Catheter should be smaller than the vein
3. Antiseptic solution
4. Flushed and primed saline lock
5. Flushed and primed IV tubing and bag
6. Paper tape
7. Transparent dressing
8. Gauze

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)

1. Position the patient supine, head down and with head turned slightly to the opposite side
2. Expose the external jugular (EJ) vein by having patient bear down (if possible) and/or application of mild finger pressure of the non-dominant hand over the vein just above the patient's clavicle
3. Cleanse the site, as far from the clavicle as possible to avoid inadvertent lung puncture
4. Stabilize the vein by gentle thumb traction on the vein above the insertion site (closer to the mandible)
5. Align the catheter with the vein (bevel up), aiming towards the ipsilateral shoulder
6. Puncture the skin over the vein first and then the vein itself
7. Proceed as with extremity IV, taking care to avoid puncturing the back wall of the vein

Special Considerations:
- Take care to prevent air embolism during insertion (e.g. by covering the catheter hub after needle removal)
- *Avoid infusion of hypertonic solutions, such as calcium chloride, D50/D25, or vasoactive medications
- Difficulty advancing the catheter during insertion may be due to catheter position against a venous valve
- Poor flow rates after insertion may be due to patient positioning
- Monitor the insertion site closely for extravasation, tissue infiltration, hematoma or bleeding from the site

Possible Complications:
- Local: hematoma, infection, thrombosis, phlebitis and extravasation/tissue necrosis
- Systemic: air embolism, bacteremia, catheter fragment embolus

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Intraosseous Access

Purpose: To provide emergency vascular access when IV access is unavailable, unsuccessful, or may result in excessive treatment delay
Inclusion Criteria: Adult and pediatric patients at weighing at least 3 kg
Exclusion Criteria: Neonates weighing less than 3 kg
Refer to: Shock and other, symptom-specific CPGs; Universal Care – Adult; Universal Care – Pediatric

Indications:

- Any critical illness or injury where rapid IV access is unavailable within 1 or 2 attempts, or 90 seconds
- Multi-system trauma with severe hypovolemia
- Severe dehydration with vascular collapse and/or loss of consciousness
- Respiratory failure or respiratory arrest

Contraindications:

- Fracture of the selected extremity
- Infection at the insertion site
- Excessive tissue at the insertion site
- Inability to locate anatomic landmarks
- Vascular compromise of the extremity
- IO insertion within prior 24 hours
- Orthopedic procedure at same site
- Hypertonic (3% or greater) saline infusion

Equipment:

1. Intraosseous driver/drill
2. Intraosseous needle/cannula (correct size for age***)
3. Iodine (or alcohol) swab
4. 1 or 2 10-mL syringes of Normal Saline
5. Standard IV infusion set (regardless of patient age): **flushed and primed**
6. Pressure bag
7. 1 Liter bag of Normal Saline (NS)
8. 3-way stopcock, if available (pediatric patient)
9. **Flushed and primed** IV extension set
10. IO needle stabilizer or gauze/tape
11. 1 pre-filled syringe of 2% lidocaine (optional)

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)

1. Locate and cleanse the insertion site using aseptic technique
2. Prepare the driver/drill and needle set:
   a. Use **clinical judgment** to select appropriate needle kit based on weight, anatomy & tissue depth*
   b. 5 mm of catheter (at least 1 black line) must be visible outside the skin
3. Stabilize the limb: use towels, blankets, bags of NS or other items, NOT a provider's hand(s)
4. Standard site is proximal tibia; *proximal humerus or other sites for providers trained to use them***
5. Insert the needle set onto tibial site (or other approved site) at 90-degree angle to the bone surface
6. Gently power the driver/drill until the needle penetrates into the bone to the desired depth, indicated by the black line on the needle
7. Remove the driver/drill
8. Remove the stylet from the catheter
9. Confirm placement and attach primed extension tubing and 3-way stopcock (if available)
10. Consider administration of 40 mg (2 mL) of 2% lidocaine in the adult, conscious patient; wait 15 seconds:
11. For a conscious, pediatric patient sensitive to pain, contact BioTel for possible lidocaine dosing
12. IMMEDIATELY flush with at least 10 mL of Normal Saline – "No Flush = No Flow"
13. Connect IV infusion set and pressure bag
14. Administer fluid, adjusting flow rate, as needed
15. Secure the tubing and catheter using IO stabilizer, or gauze and tape
16. Provide sufficient tubing slack to prevent dislodgement with patient movement
17. Avoid excessive or circumferential tape or gauze (risk of infiltration/compartment syndrome)
18. Document procedure details in ePCR
19. Monitor site frequently for dislodgement, leak/extravasation, infiltration or compartment syndrome

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Considerations:

1. Flow rates:
    a. Due to intraosseous space anatomy, fluid flow rates will be slower than those achieved through a peripheral IV catheter.
    b. Regular IV infusion sets must be used, regardless of patient age (no micro-drip set!)
    c. IO needle must be flushed with 10 mL of Normal Saline immediately after insertion to prevent clotting and obstruction.
    d. A pressure bag will be needed for continuous infusion.
    e. Use of a 3-way stopcock is preferred for medication administration in pediatric patients.
    f. Excessive tape, gauze or other dressings can hinder fluid flow, lead to tissue infiltration, and cause limb-threatening compartment syndrome.
2. Pain:
    a. Intraosseous *insertion* in conscious patients causes transient, mild-to-moderate discomfort that is typically no more painful than insertion of a large-bore, peripheral IV.
    b. Intraosseous *infusion* can be painful in conscious patients.
    c. In the **conscious, adult** patient, **slow** infusion of 2 mL (40 mg) of 2% cardiac lidocaine through the needle hub, followed by a 15-second pause before the Normal Saline flush can reduce that pain:
        a. **IMPORTANT NOTE:** Avoid excessive delay after lidocaine infusion – flush within 15 seconds with 10mL of Normal Saline to avoid clotting of the IO needle/cannula.
        b. Pediatric dosing: impractical because of tiny volume (0.025 mL/kg) and treatment delay.

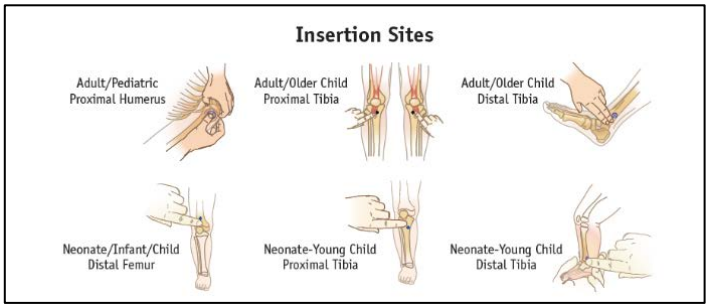
Possible Complications:

- Extravasation
- Dislodgement
- Compartment syndrome
- Fracture
- Pain
- Reduced flow
- Infection

Removal:

1. The intraosseous catheter should be removed within 24 hours of insertion
2. Removal instructions:
    a. Stabilize the extremity
    b. Connect a sterile, Luer-Lock syringe to the catheter hub
    c. Rotate the catheter ***clockwise***, while gently pulling straight back:
        a. Do NOT rock or bend the catheter during removal
        b. Rocking or bending the catheter with a syringe may cause the catheter to separate from the hub
    d. Immediately after removal, place the catheter in an appropriate biohazard container
    e. Apply a sterile bandage to the insertion site

*EZ-IO Needle Kit Sizes (Note: All needles are 15 g. - only the length differs among sizes):		
Color/Size	**Patient Weight Range**	**Notes**
PINK (15 mm)	3 to 39 kg.	Also: smaller adults with minimal tissue at insertion site
BLUE (25 mm)	At least 3 kg.	Patients with too much tissue at insertion site for pink needle (including some larger infants and children)
YELLOW (45 mm)	At least 40 kg. or excessive tissue or proximal humerus	Examples: edema, large musculature, or obesity



**Alternate sites other than proximal tibia may be used after verified hands-on training

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Post-Cardiac Arrest Care

Goal: Optimize neurologic and other function following return of spontaneous circulation (ROSC) after cardiac arrest resuscitation
Inclusion Criteria: Patient with ROSC after cardiac arrest resuscitation
Exclusion Criteria: None
Refer to: Asystole/PEA, Cardiac Arrest, and Vfib/pulseless VTach CPGs; Determination of Death Policy

NOTES:

- **Definition: The UTSW/Parkland BioTel EMS System defines ROSC as: return of an organized cardiac rhythm with a palpable pulse (carotid, femoral or radial)**
- **Avoid excessive ventilation (rate and/or depth)**
- **Prehospital cooling with cold IV fluids is no longer routinely recommended**
- **During transport of a patient in cardiac arrest or ROSC, two rescuers should be present – when possible – in the patient compartment of the ambulance**

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    b. A (Airway): Ensure airway patency with suctioning and OPA or NPA
    c. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of **94 to 99%** (continuous monitoring) and assist ventilations as needed (avoid over-ventilation; see below, section 6.b.)
    d. C (Circulation): Initiate continuous ECG monitoring as soon as possible
    e. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    f. E (Exposure/Environmental): Assess for and avoid measures that may contribute to hyperthermia
2. Positioning:
    g. If trauma is not suspected, position the patient supine or (if aspiration risk) in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        i. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and assist with treatment according to the Diabetic Emergencies CPG
4. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

5. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring:
    a. If possible, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
    b. Avoid hyperventilation – do not attempt to aggressively correct above-normal $PetCO_2$ values:
        i. Medical etiology: no more than 10 to 12 breaths per minute
        ii. Trauma etiology: 6 to 8 breaths per minute
    c. Routine administration of anti-arrhythmics, especially infusions, after ROSC is not recommended
6. Consider advanced airway management:
    a. If ROSC occurs before advanced airway placement, but the patient does not regain consciousness, or if SpO_2 remains less than 90%, insert Advanced Airway (ET Tube or extraglottic device)
7. Treat hypotension:
    a. ADULT at least 14 years of age (SBP less than 90 mmHg):
        i. Fluid bolus: 20 mL/kg NS IV/IO (1 L maximum per bolus)
            1. May repeat once, if needed (do not administer if signs/symptoms of volume overload)
            2. Consider norepinephrine infusion: 4 to 10 mcg/min IV/IO (medical etiology only)

b. PEDIATRIC patient less than 14 years of age (SBP less than 5th-percentile for age):
i. Fluid bolus: 20 mL/kg IV/IO NS (1 L maximum per bolus)
ii. If respiratory etiology or heart failure confirmed/suspected: 5 to 10 mL/kg
iii. BioTel must authorize additional fluid boluses or vasopressor infusion

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8. Obtain and 12-Lead ECG ASAP & transmit STEMI ECG or to request consultation:
    a. Patients with STEMI or suspicion of acute myocardial infarction should be transported to a hospital with 24-hour cath lab capability, even if the patient is not awake (does not follow commands)
    b. Transport *all* patients in ROSC after cardiac arrest to a facility with 24-hour cath lab capability because of availability of comprehensive, critical care capabilities
9. Treat hypoglycemia according to the Diabetic Emergencies CPG (D10W preferred over D50 or D25)
10. Treat seizures according to the Seizure CPG
11. Assess for and avoid/treat common causes of post-resuscitation hypotension:
    a. Hyperventilation
    b. Hypovolemia
    c. Tension pneumothorax (refer to Needle Thoracostomy Procedure)
12. For patient awakening (coughing, gagging or movement) with advanced airway in place post-cardiac arrest:
    a. Extraglottic airway: consider removing the airway or follow sedation guidelines for intubated patients
    b. Endotracheal tube:
        i. ADULT at least 14 years of age:
            1. Midazolam 2.5 to 5 mg IV/IO/IN/IM; may repeat once, after 5-10 minutes; **OR**
            2. Diazepam 2.5 to 5 mg IV/IO/IN/IM; may repeat once, after 5-10 minutes
            3. Contact BioTel if the patient requires additional sedation doses

ii. PEDIATRIC patient less than 14 years of age:
1. Midazolam 0.2 mg/kg IV/IO/IN/IM (maximum single dose: 5 mg)
2. May repeat once, after 5-10 minutes
3. Contact BioTel if the patient requires additional sedation doses

13. Initiate transport as soon as possible to an appropriate receiving hospital, according to Hospital Capabilities Matrix and the Destination Policy
14. For additional assistance and Medical Control physician guidance, contact BioTel

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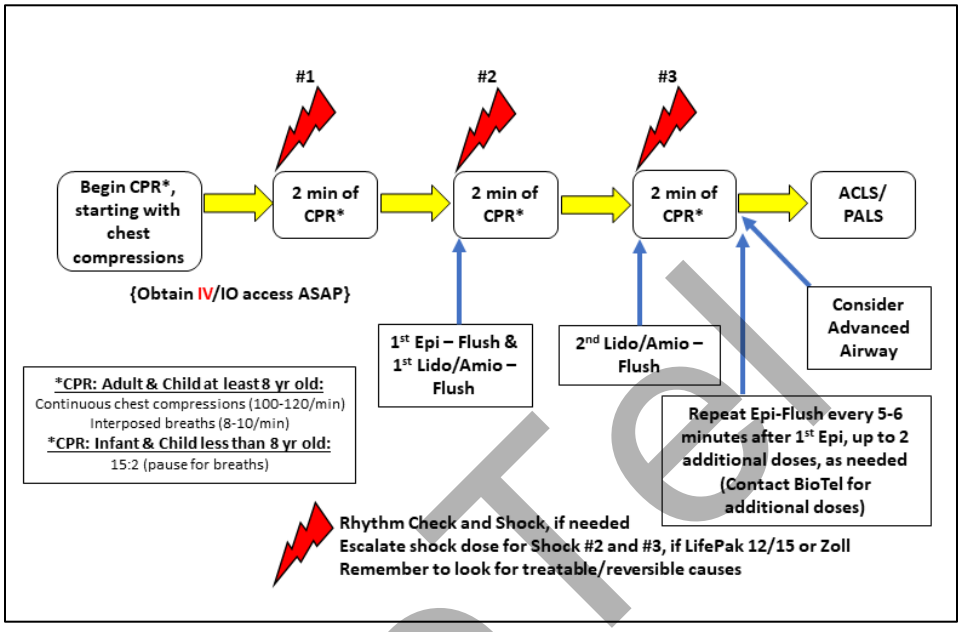
Ventricular Fibrillation/pulseless Ventricular Tachycardia

Goals: Return of Spontaneous Circulation (ROSC) with preserved neurologic function
Inclusion Criteria: Patients in cardiac arrest with "shockable" cardiac rhythm (VFib or pulseless VT)
Exclusion Criteria: Valid out-of-hospital DNR order; neonates (refer to Neonatal Care CPG)
Refer to: Asystole/PEA, Cardiac Arrest, and Post-Cardiac Arrest CPGs; Determination of Death Policy



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Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC AND perform CPR using the modified "CAB" sequence in the Cardiac Arrest CPG
2. Assist advanced level providers

Advanced Level

3. Follow the Cardiac Arrest CPG, with focus on high-quality, team-based CPR:
   a. Initiate $PetCO_2$ monitoring and vascular access during CPR and after the 1st shock
   b. Do not interrupt chest compressions for these procedures
4. Defibrillate according to the energy protocol specified by the manual defibrillator device manufacturer:
   a. **Adolescent and adult at least 8 years of age** (dose in Joules):

	1st shock	2nd shock	3rd and subsequent shock
LifePak 12 or LifePak 15	200	300	360
Philips	150	150	150
Zoll	120	150	200

b. **Pediatric patients less than 8 years of age** (with pediatric pads):
   i. Manual defibrillator: 1st shock – 2 J/kg; 2nd shock – 4 J/kg; 3rd and subsequent shock – 4 to 10 J/kg
   ii. AED: Use special pediatric AED pads or device-specific pediatric settings

5. If rescuers deliver one or more shocks prior to arrival of ALS Providers, remember to increase the energy level accordingly, taking the prior shocks into account (in other words, do not start at lowest energy level)
6. At the end of each 2-minute CPR cycle, check the ECG rhythm and pulse:
   a. In the event of Return of Spontaneous Circulation (ROSC), refer to the Post-Cardiac Arrest CPG
   b. If asystole or PEA develops, resume CPR and refer to the Asystole/PEA CPG

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c. If VFib/pVT persists or reoccurs, resume chest compressions while charging the defibrillator:
   i. Immediately resume high-quality CPR for 2 minutes without first checking rhythm or pulse

7. If VFib/pVT persists or reoccurs after 1st shock, resume chest compressions while charging the defibrillator:
   a. Immediately AFTER the 2nd shock, resume CPR for 2 full minutes and administer both epinephrine **AND** an anti-arrhythmic, followed by a Normal Saline (NS) flush:
      i. Adolescent and adult at least 14 years of age (IV access preferred over IO):
         1. Epinephrine **(0.1 mg/mL)**: 1 mg IVP/IO and NS flush; **AND**
         2. Anti-arrhythmic:
            a. Lidocaine 1 to 1.5 mg/kg IVP/IO and NS flush (preferred); ***OR***
            b. Amiodarone 300 mg IVP/IO and NS flush

ii. **Pediatric patients less than 14 years of age**:
1. Epinephrine **(0.1 mg/mL)**: 0.01 mg/kg (0.1 mL/kg) IVP or IO, with NS flush; **AND**
2. Lidocaine 1 mg/kg IVP or IO, with NS flush (maximum dose 100 mg); **OR**
3. Amiodarone: 5 mg/kg IVP or IO, with NS flush (maximum single dose = 300 mg)

8. If VFib/pVT persists or reoccurs after 2nd shock, resume chest compressions while charging the defibrillator:
   a. Immediately AFTER the 3rd shock, resume CPR for 2 full minutes and administer a second dose of an anti-arrhythmic, followed by a Normal Saline flush:
      i. Adolescent and adult at least 14 years of age (IV access preferred over IO):
         1. Anti-arrhythmic:
            a. Lidocaine 1 to 1.5 mg/kg IVP/IO and NS flush (preferred); ***OR***
            b. Amiodarone ~~300 mg~~ IVP/IO and NS flush ← Correct dose: 150 mg

ii. **Pediatric patients less than 14 years of age**:
1. Consider: Repeat lidocaine or amiodarone dose, as above

9. If Vfib/pVT persists or reoccurs after 3rd shock, resume chest compressions while charging the defibrillator:
   a. Attempt defibrillation with a single shock at the highest energy level recommended for that device
   b. Immediately resume high-quality CPR for 2 minutes after each shock
      i. Repeat this cycle if Vfib/pVT persists or reoccurs
      ii. Consider causes of ineffective defibrillation:
         A. Increased resistance (sweat/moisture, excessive body hair, or poor pad contact):
            I. Replace pads, dry the chest or shave body hair, if applicable
            II. Use gloved hands and a thick towel to place pressure on pads to increase pad contact (but ensure that no bare skin of EMS Provider is in contact with the patient)
         B. Non-optimal pad location or need for alternate electrical vector (pathway of shock delivery):
            I. Consider changing pad location from anterolateral to anteroposterior (or vice versa) or to bilateral axillae
   c. Consider advanced airway placement
   d. Search for treatable and reversible causes ("Hs and Ts")
   e. Consider early transport to a PCI-capable facility, IF high-quality CPR can be maintained en route, e.g. with a mechanical CPR device

10. Repeat epinephrine every 5-6 minutes up to 2 more times, *if needed*, immediately after a shock, if possible:
   a. Adolescent and adult at least 8 years of age: as per **step 7.a.i.1**, above

b. **Pediatric patients less than 14 years of age**: as per **step 7.a.ii.1**, above

11. Medication Notes:
   a. The 2nd dose of amiodarone/lidocaine may be administered as soon as possible after the start of a 2-minute CPR cycle whenever a subsequent rhythm check shows persistent or recurrent VFib/pVT
   b. Do NOT administer more than 2 total doses of amiodarone/lidocaine without BioTel authorization
   c. Do NOT administer lidocaine or amiodarone after ROSC is achieved without BioTel authorization
   d. Do NOT administer more than 3 total doses of epinephrine per arrest without BioTel authorization
12. Potentially reversible causes and special circumstances (refer to Asystole/PEA CPG):
   a. **Hyperkalemia (renal failure or dialysis) OR pre-existing metabolic acidosis (e.g. methanol ingestion, aspirin overdose) OR tricyclic antidepressant overdose:** Sodium bicarbonate 1 mEq/kg IVP or IO, as per Asystole/PEA CPG
   b. **Torsades de Pointes – Administer Magnesium Sulfate:**
      i. ADULT at least 14 years of age: Dilute 2 g with 6 mL NS; administer 10 mL IV over 2 minutes

ii. Pediatric patients less than 14 years of age: **Contact BioTel ASAP (before dose if possible)**
1. Cardiac arrest (pulseless): See Magnesium Sulfate drug sheet and BioTel Pedi-Guide©
2. With pulse: See Magnesium Sulfate drug sheet and BioTel Pedi-Guide©

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c. **Beta-Blocker overdose**: Consider glucagon, as per Asystole/PEA CPG
d. **Calcium-Channel Blocker overdose:** Consider calcium chloride, as per Asystole/PEA CPG
e. **Prolonged resuscitation (>15 minutes):** Consider sodium bicarbonate and/or calcium chloride, as per Asystole/PEA CPG
f. **Tension pneumothorax:** Perform needle thoracostomy, as per Needle Thoracostomy Procedure
g. **Lightning/Lightning Strike:** Refer to Lightning/Lightning Strike CPG

12. For additional assistance and Medical Control physician guidance, contact BioTel

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✦ CARDIOVASCULAR

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Bradycardia

Goals: To maintain adequate perfusion while treating the underlying cause of symptomatic bradycardia
Inclusion Criteria: Patients of all ages with abnormally slow heart rate for patient age
Exclusion Criteria: No specific exclusions (newly born infants should be treated per Neonatal CPG)
Refer to: Chest Pain, Head Injury, Poisoned Patient and Overdose, Shock, Stroke, Toxic Chemical Exposure and other, symptom-specific CPGs; Transcutaneous Pacing (TCP) Procedure

NOTES:

- **Hypoxia is a common cause of bradycardia and must be treated or excluded from the differential diagnosis before using these guidelines.**
- In adults, symptomatic bradycardia most commonly occurs with heart rate less than 50-60 beats per minute.
- **Unstable/symptomatic bradycardia** is defined as:
  - Abnormally slow heart rate for that patient (based on age, physical conditioning, comorbidities, etc.)
  - Signs/symptoms: **hypotension, altered LOC, shock, acute heart failure or pulmonary edema, chest pain, frequent escape PVCs, shortness of breath, weakness, dizziness, or (pre)syncope.**
  - The signs/symptoms are due to the slow heart rate
- If pulseless arrest develops, begin CPR and refer to PEA CPG

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
   a. A (Airway): Ensure airway patency, with suctioning and OPA or NPA, as needed
   b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
   c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG and treat chest pain/discomfort according to the Chest Pain CPG; initiate continuous ECG monitoring; AND ***apply hands-free defibrillation pads immediately, if patient is unstable/symptomatic***
   d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; assess for and treat possible acute stroke according to the Stroke CPG
   e. E (Exposure/Environmental): Assess for evidence of traumatic injury, especially head injury; if present, treat according to the Head Injury CPG
2. Positioning:
   a. Place the patient in a position of comfort
   b. If there is evidence of shock, treat the patient according to the Shock CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
   a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
4. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

5. Initiate continuous ECG monitoring (if not already done); initiate continuous $PetCO_2$ monitoring if there are signs/symptoms of shock, hypoperfusion or respiratory distress
6. Obtain 12-Lead ECG, preferably before transport, & transmit any STEMI ECG or to request consultation:
   a. Do not delay care or transport of an unstable patient to obtain the 12-Lead ECG
7. Establish IV/IO access at TKO, then proceed to **Step 8, Step 9, Step 10, or Step 11,** per patient condition
8. **STABLE** Patients:
   a. Monitor vital signs, SpO_2, neurologic status and ECG; transport as soon as possible
9. **UNSTABLE** Patients:
   a. **ADULT at least 14 years of age with 3rd-degree/complete heart block:**
      i. Immediately begin Transcutaneous Pacing (TCP) per Transcutaneous Pacing Procedure
      ii. Refer to sedation guidelines on the next page (do not delay TCP if patient is unconscious)
      iii. Do NOT initiate TCP if 1st- or 2nd-degree heart block, *unless* there are signs/symptoms of shock
      iv. Do NOT initiate TCP if asymptomatic bradycardia, PEA or asystole
      v. Consider one dose of atropine (0.5 mg IV/IO) if TCP is ineffective or unavailable (BioTel authorization required)

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b. **PEDIATRIC patient less than 14 years of age with heart rate less than 60 beats per minute:**
i. Gently assist ventilation with 100% oxygen for one full minute at 12 to 20 breaths/minute
ii. **Do NOT over-ventilate**
iii. **If heart rate is still less than 60, despite oxygenation and ventilation, begin CPR (for children 8 years of age and younger) AND (for ALL infants/children less than 14 years of age):**
iv. Administer **epinephrine (0.1 mg/mL)**: 0.01 mg/kg (0.1 mL/kg) IV/IO
v. Repeat epinephrine dose every 3 to 5 minutes, as needed, up to maximum total 3 doses
vi. Contact BioTel to authorize additional epinephrine doses, as needed
vii. Consider **atropine** if increased vagal tone or primary AV block: 0.02 mg/kg (0.2 mL/kg) IV/IO
viii. Maximum single dose: 0.5 mg (5 mL); Maximum total dose: 1 mg (child), 3 mg (adolescent)
ix. Consider Transcutaneous Pacing: contact BioTel for guidance and settings

10. **BETA-BLOCKER (BB) or CALCIUM-CHANNEL BLOCKER (CCB) overdose (confirmed or suspected)**:
    a. ADULT at least 14 years of age with confirmed/suspected beta-blocker (BB) overdose:
        i. Administer glucagon 1 to 2 mg IV/IO/IM/IN
        ii. May repeat once after 10 minutes, if no response, if available

b. PEDIATRIC patient less than 14 years of age with confirmed/suspected BB overdose:
i. Glucagon 0.5 mg (less than 1 year of age) or 1 mg (at least 1 year of age) IV/IO/IM/IN
ii. May repeat once after 10 minutes, if no response

    c. ADULT at least 14 years of age with confirmed/suspected calcium-channel blocker (CCB) overdose:
        i. Calcium chloride, 1 g (10 mL of 10% solution) IV/IO over 10 minutes (1 mL/minute) (optional medication)

d. PEDIATRIC patient less than 14 years of age with confirmed/suspected CCB overdose:
i. Administer 20 mg/kg (0.2 mL/kg) of 10% calcium chloride IV/IO (maximum dose: 1 g) over 10 minutes (optional medication)
1. MANDATORY: Contact BioTel as soon as possible after administration

11. **ORGANOPHOSPHATE toxicity (confirmed or suspected):**
    a. **SCENE SAFETY and PPE are paramount**
    b. **Organophosphate toxidrome: "DUMBBELS" (refer to Toxic Chemical Exposure CPG)**
    c. ADULT at least 14 years of age:
        i. Administer nerve agent antidote IM via auto-injector OR administer atropine 1-2 mg IV/IO
        ii. May repeat twice, every 5 minutes, if incomplete response

d. PEDIATRIC patient less than 14 years of age:
i. Administer nerve agent antidote IM via auto-injector
ii. OR administer atropine 0.02 mg/kg (0.2 mL/kg) IV/IO
iii. May repeat twice, every 5 minutes, if incomplete response

12. Monitor vital signs, SpO_2, neurologic status and ECG; transport as soon as possible
13. For additional assistance and Medical Control physician guidance, such as atropine administration or vasoactive medication infusion (epinephrine, norepinephrine or dopamine), contact BioTel

TCP Procedural Sedation Guidelines (Conscious Patient)	
ADULT at least 14 years of age	PEDIATRIC patient less than 14 years of age
Midazolam 2.5 – 5 mg slow IV/IO/IM/IN	**BioTel authorization required for TCP**
May repeat once after 5-10 minutes, if needed	
OR	Midazolam 0.1 mg/kg IV/IO/IM/IN
Diazepam 2.5 – 5 mg slow IV/IO (Optional med)	May repeat once (BioTel authorization required)
May repeat once after 5-10 minutes, if needed	**OR**
OR	Consider ketamine (sedation dose)
Ketamine 2 mg/kg IV/IO or 4 mg/kg IM	Refer to BioTel PEDI-Guide for dosing details
(Optional medication; authorized agencies only)	

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Chest Pain/Discomfort

Goals: Prompt evaluation, triage, treatment and appropriate transport of patients with ischemic chest pain (Acute Coronary Syndrome – ACS) in order to minimize myocardial damage and preserve myocardial function
Inclusion Criteria: Patients with pain or discomfort in the chest or other body areas (jaw, neck, arm, or epigastrium) of suspected cardiac origin; and/or shortness of breath, sweating, nausea, vomiting, dizziness, syncope, shock or acute congestive heart failure of suspected cardiac origin
Exclusion Criteria: Chest pain due to blunt trauma
Refer to: Bradycardia, Pain, Shock, Tachycardia-Stable and Tachycardia-Unstable CPGs; Right-Sided and Posterior ECG Procedure and Transcutaneous Pacing Procedure; Destination Policy

NOTES:

- Acute Coronary Syndrome (ACS) includes: ST-Elevation Myocardial Infarction (STEMI), non-ST-Elevation Myocardial Infarction (n-STEMI) and unstable angina.
- Ischemic chest pain may present as an "anginal equivalent" (e.g. epigastric pain/pressure; shoulder, neck or jaw pain/pressure; indigestion; shortness of breath; sweating and pallor; or AMS).
- Such "atypical" presentations are especially common in elderly, female and diabetic persons.
- Chest pain in persons after stimulant drug ingestion/injection should be assumed to be ischemic.
- Contact BioTel for all care of pediatric patients less than 14 years of age under this CPG.
- Be prepared for CPR and prompt defibrillation for any patient with possible ischemic chest pain.
- Do NOT administer nitroglycerin to any patient who has taken Viagra® (sildenafil), or Levitra® (vardenafil) within the past 24 hours, or Cialis® (tadalafil) within the past 48 hours.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of **94 to 99%** (continuous monitoring)
        i. Do NOT administer supplemental oxygen unless room air SpO_2 is less than 94%
    c. C (Circulation): Initiate continuous ECG monitoring; treat shock according to the Shock CPG
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    e. E (Exposure/Environmental): Initiate measures to prevent hyperthermia
2. Positioning:
    a. Minimize patient exertion
    b. Position the patient in a position of comfort or supine (if signs/symptoms of shock, if tolerated)
3. If confirmed or suspected history of diabetes, perform and document a POC Glucose analysis and treat hypoglycemia according to the Diabetic Emergencies CPG
4. Administer aspirin: **EITHER** 324 mg (4 "baby" aspirin) **OR** 325 mg (one adult, non-enteric coated aspirin) by mouth (chewed before swallowing), even if the patient reports having taken aspirin prior to EMS arrival
5. Obtain a complete medication history, especially: cardiac/BP, blood thinner, and erectile dysfunction meds
6. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

7. Initiate continuous $PetCO_2$ monitoring (if signs/symptoms of shock/hypoperfusion) and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    d. If possible, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
8. Treat hemodynamically-significant dysrhythmias according to the relevant CPG
9. Obtain 12-Lead ECG as soon as possible & transmit any ECG showing STEMI or to request consultation:
    a. **NOTE:** 3-Lead ECG monitoring is not a substitute for a 12-Lead ECG
    b. Initial 12-Lead ECG should be obtained BEFORE giving nitroglycerin (NTG)
    c. Treatment based on 12-Lead ECG interpretation is outlined in Section 12, below
    d. Obtain at least one repeat 12-Lead ECG after 5-10 minutes, especially if 1st ECG appears normal
10. Immediately initiate transport to an appropriate hospital E.D. with 24-hour cath lab capability
11. Establish IV/IO access at TKO rate or use a saline lock, but do not delay nitroglycerin administration:

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a. **EXCEPTION:** If the 12-Lead ECG suggests acute inferior-wall MI, vascular access must be established BEFORE administering the first nitroglycerin dose
b. For IV access, right antecubital is preferred

12. Perform 12-Lead ECG interpretation to identify STEMI and in order to guide therapy:
    a. **INFERIOR** wall MI **(ST-elevation in leads II, III and aVF) AND**:
        i. **SBP less than 100 mmHg** (or at least 30 mmHg below patient's baseline):
            1. Do not administer nitroglycerin (NTG)
            2. Position patient supine, with legs elevated, if tolerated
            3. Administer 20 mL/kg NS IV/IO (1 L maximum)
            4. If SBP remains less than 100 mmHg and no pulmonary edema, repeat fluid bolus once
            5. Do not administer additional IV/IO fluid without BioTel authorization
            6. Contact BioTel for authorization for fentanyl or morphine analgesia
        ii. **SBP at least 100 mmHg AND Heart Rate between 50 and 110 bpm:**
            1. Obtain IV/IO access BEFORE nitroglycerin (NTG) administration
            2. Administer nitroglycerin 0.4 mg SL
            3. May repeat up to two more times, every 5 minutes (maximum total: 3 doses), as long as SBP remains at least 100 mmHg
            4. Observe for hypotension
            5. If SBP less than 100 or HR less than 50 or greater than 110 bpm, do not administer NTG
            6. For pain unrelieved by three doses of nitroglycerin, consider opioid analgesia:
                A. Fentanyl: 1 mcg/kg IN or SLOW IVP/IO (maximum single dose: 100 mcg); repeat once after 15 minutes, if needed (maximum total cumulative dose: 200 mcg); **OR**
                B. Morphine: 2 to 4 mg SLOW IVP/IO; repeat once after 15 minutes, if needed, as long as SBP is at least 100 mmHg (alternative if fentanyl is unavailable)
    b. **OTHER STEMI/NSTEMI patterns AND:**
        i. **SBP at least 100 mmHg AND Heart Rate between 50 and 110 bpm:**
            1. Do not delay nitroglycerin (NTG) administration for IV/IO access attempts
            2. Administer nitroglycerin 0.4 mg SL
            3. May repeat up to two more times, every 5 minutes (maximum total: 3 doses), as long as SBP remains at least 100 mmHg
            4. Observe for hypotension
            5. If SBP less than 100 or HR less than 50 or greater than 110 bpm, do not administer NTG
            6. For pain unrelieved by three doses of nitroglycerin, consider opioid analgesia:
                A. Fentanyl: 1 mcg/kg IN or SLOW IVP/IO (maximum single dose: 100 mcg); repeat once after 15 minutes, if needed (maximum total cumulative dose: 200 mcg); **OR**
                B. Morphine: 2 to 4 mg SLOW IVP/IO; repeat once after 15 minutes, if needed, as long as SBP is at least 100 mmHg (alternative if fentanyl is unavailable)
    c. **NORMAL or inconclusive 12-Lead ECG, or ST-elevation in V1, or ST-depression in V1-V3:**
        i. Strongly consider performing Right-Sided (V4R) ECG and Posterior ("15-Lead") ECG
        ii. **If NO evidence of RV infarction, AND SBP is at least 100 mmHg, AND Heart Rate is between 50 and 110 bpm:**
            1. Treat according to **Section 12.b.i**, above
        iii. **If Right-Sided ECG suggests RV infarction, OR SBP is less than 100 mmHg, OR Heart Rate is less than 50 or greater than 110 bpm**, treat according to **Section 12.a.i**, above.
13. **If SBP falls to less than 100 mmHg** or more than 30 mmHg below patient's baseline after nitroglycerin, fentanyl or morphine administration, treat according to **Section 12.a.i**, above
14. If chest pain is suspected to be stimulant-induced (e.g. cocaine, methamphetamine, PCP, or "bath salts"), follow the guidelines outlined above to exclude or treat STEMI/NSTEMI AND:
    a. Administer sedation and monitor for respiratory depression:
        i. Midazolam: 2.5 to 5 mg IV/IO/IN/IM; repeat every 5-10 minutes, if needed
            1. Do not exceed 10 mg maximum, total, cumulative dose; **OR**
        ii. Diazepam: 2.5 to 5 mg IV/IO/IN/IM; repeat every 5-10 minutes, if needed
            1. Do not exceed 10 mg maximum, total, cumulative dose
15. Monitor vital signs (incl. temp), ECG, SpO_2 and $PetCO_2$ en route to hospital with 24-hour cath lab capability
16. Obtain at least one additional 12-Lead ECG, especially if 1st ECG appears normal
17. **BioTel and/or the hospital E.D. MUST be contacted for STEMI as soon as possible – no exceptions!**
18. For additional assistance and Medical Control physician guidance, contact BioTel

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Right-Sided (V4R) ECG and Posterior ("15-Lead") ECG

Purpose: To aid EMS Providers in the use of right-sided and posterior ECG leads in the timely diagnosis of Right Ventricular (RV) infarction with acute inferior wall MI (IWMI) or posterior myocardial infarction
Inclusion Criteria: Any patient with suspected ischemic chest pain suggestive of acute STEMI in regions of the heart not well-visualized on standard 12-Lead ECG (formal indications below)
Exclusion Criteria: No specific exclusions (this procedure is rarely indicated in pediatric patients)
Refer to: Chest Pain CPG and other symptom-specific CPGs

NOTES:

- **Up to 40-50% of patients with acute IWMI may have Right Ventricular (RV) infarction/ischemia.**
  - Prompt identification of these patients is critical, as their EMS management differs from that of other acute STEMI patients.
  - Nitrates (e.g. nitroglycerin) are contraindicated and hypotension is treated with volume (preload).
- **Up to 15-20% of all acute MIs involve the posterior wall of the Left Ventricle (LV), either alone or in association with inferior or lateral MI.**
  - Prompt identification of these patients is critical, as mortality is high.

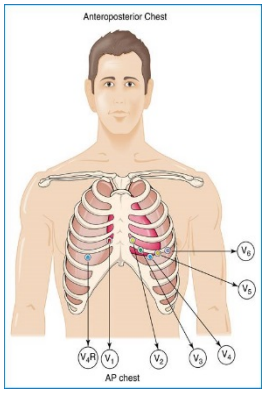
Indications for performing V4R and Posterior ECG (aka "15-Lead ECG"):

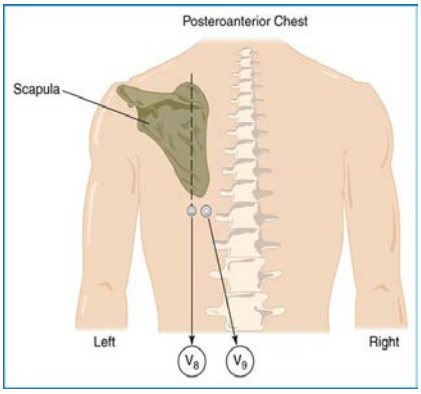
Initial 12-Lead ECG shows ANY of the following:

a. Acute inferior wall MI (IWMI) (e.g. ST-elevations in leads II, III and aVF)
b. Acute lateral wall MI (e.g. ST-elevations in leads I, aVL, V3-V6)
c. ST-elevation in lead V1 (especially if there is also ST-depression in lead V2)
d. ST-depression in leads V1-V3
e. Any patient complaining of chest pain/discomfort suggestive of myocardial ischemia with a normal, initial 12-Lead ECG
f. Any patient for whom the paramedic suspects an acute MI with RV or posterior involvement

Procedure (observe Body Substance Isolation Precautions and employ appropriate PPE):

1. Unsnap the electrodes from the lead wires from V4, V5 and V6 and follow the steps and illustrations below
2. Place a fresh electrode on V4 wire and apply at the right, 5th intercostal space, mid-clavicular line: now **V4R**
3. Place fresh electrodes on the V5 and V6 wires and apply them as follows:
   a. Apply the "V5" lead in the left, 5th intercostal space, mid-scapular line: now **V8**
   b. Apply the "V6" lead in the left, 5th intercostal space, between V8 and the spine: now **V9**
4. Leave the remaining leads and electrodes in place
5. Perform a new 12-Lead ECG
6. Assess for ST-elevation in V4R, V8 and V9 and treat according to the Chest Pain CPG
7. **IMPORTANT:** Write "V4R and POSTERIOR ECG" on the printout
8. **IMPORTANT:** Label V4, V5 and V6 leads on the printout as V4R, V8 and V9, respectively, as shown below





(With permission of Dr. Mark Gamber)

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Stroke (Acute) and Transient Ischemic Attack (TIA)

Goals: To provide timely recognition of possible acute stroke or Transient Ischemic Attack (TIA), initiate care, and determine eligibility for transport to an appropriate stroke center
Inclusion Criteria: Patients of all ages with suspected acute stroke or TIA
Exclusion Criteria: Hypoglycemia or known/suspected Traumatic Brain Injury
Refer to: Altered LOC, Diabetic Emergencies, Head Injury/TBI, Seizure and Trauma CPGs; Destination Policy

NOTES:

- Ischemic strokes are much more common than hemorrhagic strokes (intracranial hemorrhage). The clinical picture may be indistinguishable in the field. Emergency head CT in the E.D. will be needed.
- **The key point is to determine the time the patient was Last Known Normal (LKN).**
- A thorough medical history, especially the use of any **blood thinners** (including antiplatelet agents), is critical.
- Consider the diagnosis of acute stroke in pediatric patients, especially those with a history of sickle cell disease, cardiac surgery or acute infectious/inflammatory illness (especially with dehydration or altered LOC).

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG
    d. D (Disability): Assess and document GCS; and assess pupillary size and reactivity
    e. E (Exposure/Environmental): Assess for evidence of traumatic injury, especially head injury
2. Positioning:
    a. Place the patient in a position of comfort, preferably with the head of the bed elevated 30 degrees
    b. If there is evidence of shock, treat the patient according to the Shock CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
4. **ASCERTAIN THE SPECIFIC TIME THE PATIENT WAS "LAST KNOWN NORMAL" (or at baseline):**
    a. If the patient cannot communicate the time, or if there is no witness present to report the time, obtain a phone number for such a witness, if possible
    b. NOTE: If, for example, the patient was last known normal going to bed the night before, this is the time to document, not the "wake up" time
5. **Perform a PRIMARY STROKE SCREEN:**

CINCINNATI PRE-HOSPITAL STROKE SCREEN (CPSS)/ "Face-Arm-Speech"
CPSS Screen is positive if *at least one* of the three elements is abnormal
FACIAL DROOP (Have patient show teeth or smile)
o NORMAL: Both sides of face move equally
o ABNORMAL: One side of face does not move as well as the other side
ARM DRIFT (Patient closes eyes and holds both arms straight out, with palms up, for 10 seconds)
o NORMAL: Both arms move the same, *or* both arms do not move at all
o ABNORMAL: One arm does not move, *or* one arm drifts down, compared with the other
ABNORMAL SPEECH (Have the patient say "You can't teach an old dog new tricks")
o NORMAL: Patient uses correct words with no slurring
o ABNORMAL: Patient slurs words, uses wrong words, ***or*** is unable to speak

6. Obtain SAMPLE history and detailed secondary physical examination, as time permits:
    a. NOTE: **Sudden** onset of **any** of the following suggests the possibility of acute stroke:
        i. Numbness or weakness of face, arm or leg (especially on one side of the body)
        ii. Confusion
        iii. Trouble speaking or understanding language
        iv. Trouble seeing in one or both eyes, or double vision
        v. Trouble walking
        vi. Dizziness

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vii. Loss of balance or coordination
viii. Sudden onset of severe headache with no known cause (suggests hemorrhagic stroke)
ix. Any asymmetry of the neurologic exam

b. For pediatric patients less than 18 years of age, altered LOC also may be a presenting sign

7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Minimize on-scene time whenever possible
9. **If Primary Stroke Screen is positive, and if Last Known Normal (LKN) time is less than 24 hours, perform SECONDARY STROKE SEVERITY TRIAGE:**

CINCINNATI STROKE ASSESSMENT TRIAGE (C-STAT) TOOL	
C-STAT is positive if score is at least 2 points*	
GAZE: Normal left and right eye movement?	If NO: 2 points
LANGUAGE: o Provides correct age and current month? o **AND** o Follows two simple commands (eye closure and opening/closing hand)?	If BOTH are NO: 1 point
ARMS: Holds arms out (palms up) for 10 seconds without right or left arm falling to bed or stretcher?	If NO: 1 point

10. Initiate continuous ECG monitoring and maintain until transfer of care to hospital staff
    a. Treat hemodynamically significant dysrhythmias according to the symptom-specific CPG
11. Initiate continuous $PetCO_2$ monitoring if respiratory distress, shock or hemodynamic instability is present
12. Obtain a 12-Lead ECG (may be obtained while en route – do not delay transport for ECG)
13. Establish IV/IO access at TKO rate or use a saline lock, if possible, without delaying transport:
    a. RIGHT Antecubital IV site, at least 18g or 20g, is preferred
14. **REGARDLESS OF SYMPTOM DURATION, EMS PROVIDERS MUST CONTACT AS SOON AS POSSIBLE EITHER BIOTEL OR THE STROKE CENTER DESTINATION FOR PRE-NOTIFICATION ("Activation"):**

a. **For pediatric patients, EMS Providers must contact BioTel as soon as possible**

    b. Report **must** include pertinent past medical history, current vital signs and GCS and LKN time
15. Initiate rapid transport according to the destination decision-making guidelines below
    a. Limit scene time to 10 minutes or less, if possible
    b. Additional guidance: refer to the Destination Policy and current Hospital Capabilities Matrix
16. For additional assistance, destination guidance, or other Medical Control physician advice, contact BioTel

Stroke Patient Destination Decision-Making

A. **Adult patients at least 18** years of age with signs and symptoms of acute stroke shall be transported according to the following criteria, according to the time that the patient was **Last Known Normal (LKN)**:
   1. **Onset of symptoms less than 24 hours and a negative C-STAT score (*0 or 1 point, suggesting no large vessel occlusion (LVO)):** Transport to the closest designated stroke center
      i. **EXCEPTION:** For a patient with isolated aphasia (inability to speak or understand language) on primary stroke screen (CPSS – Section 5, above) for less than 24 hours, but NO facial droop or arm drift, AND with a C-STAT score less than 2, consider transport to a Comprehensive Stroke Center (CSC)
      ii. If the EMS provider is uncertain if the desired destination hospital is a designated stroke center, contact BioTel for consultation regarding hospital capabilities
   2. **Onset of symptoms less than 24 hours and positive C-STAT score (*2 or more points, suggesting possible large vessel occlusion (LVO)):** Unless immediate intervention (e.g. ABCs, cardiac arrest, etc.) is required, these stroke patients should be preferentially transported to a Comprehensive Stroke Center (CSC), if such a facility is available with less than 15 minutes of additional transport time

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   i. If the EMS provider is uncertain if the desired destination hospital is a Comprehensive Stroke Center (CSC), contact BioTel for consultation regarding hospital capabilities
3. **Onset of symptoms 24 hours or longer, or unknown Last Known Normal (LKN) time:**
   i. If C-STAT is negative (0 or 1 point): Transport to the closest designated stroke center
   ii. If C-STAT is positive (2 or more points): Consider transport to a Comprehensive Stroke Center
4. **Blood Thinners:**
   i. Patients with sudden, severe headache who are on blood thinners (other than aspirin), with no history of trauma and **C-STAT score less than 2** should be transported to the closest designated stroke center
   ii. Patients with sudden, severe headache who are on blood thinners (other than aspirin), with no history of trauma and **C-STAT score of 2 or more** should be transported to a Comprehensive Stroke Center

Special Considerations – Pediatric Stroke (Infants and Children less than 18 years of age)

Consider stroke in any child with headache and/or new-onset focal neurologic signs or symptoms.

A. Causes include: congenital heart conditions/surgery; Sickle Cell Disease and other hematologic conditions, such as those causing abnormal blood clotting; infectious/inflammatory (vasculitis) and non-inflammatory blood vessel conditions; metabolic conditions; and cocaine or methamphetamine ingestion.
B. Presentation may differ from adults:
   1. Infants: focal weakness; altered level of consciousness and seizures are common
   2. Children: focal neurologic deficit, headache; altered level of consciousness and seizures also common
C. Refer to UNIVERSAL CARE – PEDIATRIC
D. Specific management is similar to that in adults and hinges on timely recognition of the possibility of stroke:
   1. History: "Last Known Normal" (LKN) time and child's change in presentation over initial minutes to hours
   2. BLS Care: treat hypoxia (SpO_2 less than 94%); position head of bed flat (monitor airway, breathing)
   3. ALS Care: treat hypoglycemia (POC Glucose less than 70 mg/dL) (Diabetic Emergencies CPG), dehydration (Shock CPG) and seizures (Seizure CPG)

E. **Destination Decision-Making for Pediatric patients less than 18 years of age with possible stroke:**
1. Transport to a Pediatric Stroke Center - either to Children's Medical Center Dallas (NOT Children's Medical Center Plano) or to Medical City Children's Hospital
2. Contact BioTel as soon as possible en route for pre-notification and for further guidance

F. For additional assistance and Medical Control physician guidance, contact BioTel

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Syncope/Presyncope

Goals: Stabilization and resuscitation, when necessary; initiation of monitoring and diagnostic procedures; transfer for further evaluation
Inclusion Criteria: Patients of all ages with confirmed or suspected sudden loss of consciousness and loss of postural tone(syncope) or prodromal syncope symptoms (presyncope or pre-arrest)
Exclusion Criteria: Trauma (refer to Trauma and Head Injury CPGs); Coma (refer to AMS CPG)
Refer to: Altered Mental Status (AMS), Bradycardia, Cardiac Arrest, Chest Pain, Diabetic Emergencies, OB-Gyn, Shock, Seizure, Stroke, Tachycardia-Stable, Tachycardia-Unstable, and other, symptom-specific CPGs

NOTES:

- Syncope is heralded by both abrupt loss of consciousness AND loss of postural tone.
- It resolves spontaneously without medical intervention - EMS Providers may find the patient awake and alert.
- Presyncope consists of prodromal syncope symptoms, lasting seconds to minutes; it may be described by the patient as “nearly blacking out” or “nearly fainting”.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency, with positioning, suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG; initiate continuous ECG monitoring:
        i. Orthostatic vital signs are not necessary and may worsen the patient’s condition
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; refer to the Altered Mental Status CPG
    e. E (Exposure/Environmental): Consider trauma (especially in the elderly); treat per the Trauma CPG
2. Positioning:
    a. If trauma is not suspected, position the patient supine or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway
    b. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
4. Perform and document results of initial evaluation and screening according to the Stroke CPG
5. Obtain SAMPLE history from patient/bystanders, with attention to cardiovascular and neurologic illness/injury:
    a. NOTE: Consider ruptured ectopic pregnancy in any woman of childbearing age with syncope, lightheadedness or fainting (refer to the OB-Gyn CPG)
    b. NOTE: Obtain a complete medication/drug history and signs/symptoms leading up to the event:
        i. Example: Syncope that occurs during exercise suggests an ominous cardiac cause
        ii. Example: Obtain history of fluid losses (vomiting, diarrhea, blood loss) and fluid intake
6. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

7. Maintain continuous SpO_2 and ECG monitoring until patient care has been transferred to hospital staff
8. Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion or respiratory distress
9. Obtain 12-Lead ECG (before or during transport) & transmit any STEMI ECG or to request consultation
10. Treat hemodynamically significant dysrhythmias according to the relevant CPG:
    a. Examples: Bradycardia CPG, Tachycardia-Stable CPG, or Tachycardia-Unstable CPG
11. Treat chest pain/discomfort or anginal equivalents according to the Chest Pain CPG
12. Establish IV/IO access at TKO rate or with a saline lock:
    a. Treat shock/hypotension with fluid resuscitation according to the Shock CPG
13. All patients with syncope shall be encouraged to accept ambulance transport to a hospital E.D. for further evaluation
14. For additional assistance and Medical Control physician guidance, contact BioTel

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Tachycardia with Pulse: Stable

Goals: Maintain adequate oxygenation, ventilation and perfusion; correct the rhythm disturbance, when indicated; search for the underlying cause
Inclusion Criteria: Patients of all ages with abnormally fast heart rate for age, and a cardiac rhythm other than sinus tachycardia, with good perfusion (palpable pulses)
Exclusion Criteria: Patients with tachycardia and signs/symptoms of hemodynamic compromise (acutely altered mental status, hypotension or shock, chest pain/discomfort or acute heart failure); sinus tachycardia
Refer to: Chest Pain, Heat-Related Emergencies, Poisoned Patient and Overdose, Shock, Stroke, Tachycardia-Unstable, Toxic Chemical Exposure and other, symptom-specific CPGs

NOTES:

- **This CPG is intended to treat hemodynamically stable patients with narrow- or wide-complex tachydysrhythmia, not sinus tachycardia.**
- Sinus tachycardia should be treated according to the underlying cause.
- If signs/symptoms of hemodynamic compromise develop, refer to Tachycardia-Unstable CPG.
- If pulseless arrest develops, immediately begin CPR and refer to the Cardiac Arrest, Asystole/PEA and Vfib/pulseless VTach CPGs, as appropriate.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency, with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG and treat chest pain/discomfort according to the Chest Pain CPG; initiate continuous ECG monitoring
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; assess for and treat possible acute stroke according to the Stroke CPG
    e. E (Exposure/Environmental): Treat traumatic injuries according to the Trauma CPG and heat-related illness according to the Heat-Related Emergencies CPG
2. Positioning:
    a. Place the patient in a position of comfort
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
4. Obtain SAMPLE history, focusing on prescription and OTC meds, stimulants, and cardiac history (CHF)
5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

6. Maintain continuous SpO_2 and ECG monitoring until patient care has been transferred to hospital staff
7. Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion or respiratory distress are present or develop (refer to the Tachycardia-Unstable CPG)
8. Obtain 12-Lead ECG, preferably before transport, & transmit any STEMI ECG or to request consultation:
    a. **NOTE:** 3-Lead ECG monitoring is not a substitute for a 12-Lead ECG
    b. Treatment based on 12-Lead ECG interpretation is outlined in Sections 11 and 12, below
9. Obtain a thorough "SAMPLE" history and perform a thorough physical examination to exclude sinus tachycardia as the likely cause of the patient's symptoms:
    a. ADULT: Narrow-complex tachycardia (NCT) with a rate greater than (220 – patient age (years)) is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia

b.	PEDIATRIC patient less than 14 years of age:
	i. Child older than 1 year of age: HR greater than 180 bpm is more likely to be SVT
	ii. Infant less than 1 year of age: HR greater than 220 bpm is more likely to be SVT

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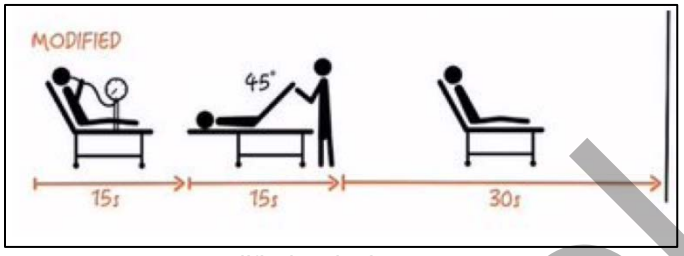
10. Establish IV/IO access at TKO (if signs/symptoms of shock, refer to Tachycardia-Unstable CPG)
11. Proceed to **EITHER Step 12 OR Step 13**, depending on the 12-Lead ECG interpretation
12. **STABLE** patient with **NARROW-Complex Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):**
    a. "NARROW-Complex" definition: QRS duration less than/equal to 0.12 sec (0.09 sec in pediatric pt.)
    b. ADULT patient at least 14 years of age:
        i. If QRS is narrow and rhythm is regular: attempt Modified Valsalva Maneuver:
            i. Position patient sitting up at an approximately 45° angle
            ii. Ask patient to blow continuously into the tip of a 10-mL syringe, displacing the plunger, for **15 seconds**
            iii. Immediately lower the head of the bed to flat **AND** elevate the patient's legs at a 45° angle at the hips for **15 seconds**
            iv. Return the patient to sitting position for **30 seconds**



Modified Valsalva Maneuver
(Adapted from: medmastery.com/magazine/modified-valsalva-maneuver-video-review)

        ii. If no response, administer adenosine: 12 mg RAPID IVP + flush with 10-20 mL NS
        iii. If no response, repeat adenosine: 12 mg RAPID IVP + flush with 10-20 mL NS
        iv. **NOTE:** ECG monitor must run continuously (preferably with paper strip printout) during Valsalva maneuver, adenosine administration and response

c. PEDIATRIC patient less than 14 years of age
i. If HR greater than 180 (child over 1 year of age) or 220 (infant) suggestive of SVT
ii. And if QRS is narrow and rhythm is regular: consider Valsalva maneuver
iii. If no response, contact BioTel and establish IV access (if not already done)
iv. BioTel may authorize adenosine: 0.1 mg/kg RAPID IVP (maximum 6 mg) + NS flush
v. If no response, BioTel may authorize repeat (0.2 mg/kg) (maximum 12 mg) + NS flush
vi. **NOTE:** ECG monitor must run continuously, as described above for ADULT patient

    d. **NOTE:** Do NOT administer adenosine if:
        i. Rhythm is irregularly-irregular (suggestive of Atrial Fibrillation)
        ii. Rhythm shows "saw-tooth" pattern (suggestive of Atrial Flutter)
        iii. Poisoning- or drug-induced tachycardia is suspected
13. **STABLE** patient with **WIDE-Complex Tachycardia (WCT) (possible Ventricular Tachycardia):**
    a. "WIDE-Complex" definition: QRS duration greater than 0.12 sec (0.09 sec in pediatric pt.)
    b. ADULT and PEDIATRIC patient with non-sustained WCT:
        i. Initiate transport and monitor vital signs, ECG and SpO_2
        ii. Prepare for clinical deterioration and the need for synchronized cardioversion or other care
    c. ADULT patient at least 14 years of age with sustained (greater than 30 seconds) WCT:
        i. Initiate transport and monitor vital signs, ECG and SpO_2
        ii. Prepare for clinical deterioration and the need for synchronized cardioversion or other care
        iii. Consider lidocaine or amiodarone infusion: Contact BioTel for dosing guidance
        iv. Do not administer adenosine if ECG shows irregular WCT suggestive of Wolff-Parkinson-White

d. PEDIATRIC patient less than 14 years of age with sustained WCT:
i. Contact BioTel for guidance AND
ii. Prepare for possible IV/IO anti-arrhythmic administration and/or cardioversion
iii. **NOTE:** ECG monitor must run continuously, as described above for ADULT patient

14. If patient develops altered mental status, hypotension/shock, chest pain/discomfort or acute heart failure during evaluation, treatment or transport, follow the guidelines in the Tachycardia-Unstable CPG
15. For additional assistance and Medical Control physician guidance, contact BioTel

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Tachycardia with Pulse: Unstable

Goals: Maintain adequate oxygenation, ventilation and perfusion; correct the rhythm disturbance; search for the underlying cause
Inclusion Criteria: Patients of all ages with abnormally fast heart rate for age, a cardiac rhythm other than sinus tachycardia (with palpable pulses), and poor perfusion (acutely altered mental status, hypotension or shock, chest pain/discomfort or acute heart failure)
Exclusion Criteria: Patients with tachydysrhythmia and good perfusion; sinus tachycardia
Refer to: Chest Pain, Heat-Related Emergencies, Poisoned Patient and Overdose, Shock, Stroke, Tachycardia-Stable, Toxic Chemical Exposure, Vfib/pulseless VTach, and other, symptom-specific CPGs

NOTES:

- **This CPG is intended to treat hemodynamically unstable patients with narrow- or wide-complex tachydysrhythmia and HR usually greater than 150 bpm, not sinus tachycardia.**
- Sinus tachycardia should be treated according to the underlying cause.
- If the patient is stable with good perfusion, refer to Tachycardia-Stable CPG.
- If pulseless arrest develops, immediately begin CPR and refer to the Cardiac Arrest, Asystole/PEA and Vfib/pulseless VTach CPGs, as appropriate.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency, with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG and treat chest pain/discomfort according to the Chest Pain CPG; initiate continuous ECG monitoring
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; assess for and treat possible acute stroke according to the Stroke CPG
    e. E (Exposure/Environmental): Treat traumatic injuries according to the Trauma CPG and heat-related illness according to the Heat-Related Emergencies CPG
2. Positioning:
    a. Place the patient in a position of comfort; treat shock according to the Shock CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
4. Obtain SAMPLE history, focusing on the "Hs and Ts", prior cardiac history, and medications/drugs
5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

6. Maintain continuous SpO_2 and ECG monitoring and initiate continuous $PetCO_2$ monitoring until patient care has been transferred to hospital staff
7. Obtain 12-Lead ECG ASAP, preferably before transport, & transmit STEMI ECG or to request consultation:
    a. **NOTE:** 3-Lead ECG monitoring is not a substitute for a 12-Lead ECG
    b. **NOTE:** Do NOT delay care of the unstable patient for 12-Lead ECG acquisition
8. Obtain a rapid, focused "SAMPLE" history and physical examination to exclude sinus tachycardia as the likely cause of the patient's symptoms:
    a. ADULT: Narrow-complex tachycardia (NCT) with a rate greater than (220 – patient age (years)) is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia

b.	PEDIATRIC patient less than 14 years of age:
	i. Child older than 1 year of age: HR greater than 180 bpm is more likely to be SVT
	ii. Infant less than 1 year of age: HR greater than 220 bpm is more likely to be SVT

9. Establish IV/IO access at TKO (do NOT delay care of the unstable patient for vascular access)
    a. Prepare for immediate, synchronized cardioversion, especially if IV/IO access is problematic
10. Proceed to **EITHER Step 11 OR Step 12**, depending on the width of the QRS complex on the ECG
11. **UNSTABLE** patient with **NARROW-Complex Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):**
    a. "NARROW-Complex" definition: QRS duration less than/equal to 0.12 sec (0.09 sec in pediatric pt.)

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b. ADULT patient at least 14 years of age:
   i. Immediate, synchronized cardioversion: Initial and subsequent recommended doses depend on the device manufacturer's recommendations:
      1. Narrow QRS, regular rhythm (probable SVT): Initial synchronized dose is 50 to 100 J
      2. Escalate subsequent synchronized shock doses, up to 200 J, or as specified by the device manufacturer
   ii. If the patient is conscious and IV/IO access is in place, consider sedation:
      1. Midazolam 2.5 to 5 mg slow IV/IO/IM/IN
      2. May repeat once after 5-10 minutes (maximum total, cumulative dose: 10 mg); **OR**
      3. Diazepam 2.5 to 5 mg slow IV/IO/IM
      4. May repeat once after 5-10 minutes (maximum total, cumulative dose: 10 mg)
   iii. **NOTE:** If ECG rhythm is narrow and regular, AND rate is greater than 220 – age (years), AND if an antecubital IV access is in place, consider adenosine: 12 mg IVP + 10-20 mL NS flush prior to attempting cardioversion
      1. **NOTE:** ECG monitor must run continuously (preferably with paper strip printout) during adenosine administration and response

c. PEDIATRIC patient less than 14 years of age:
i. And if QRS is narrow and rhythm is regular, prepare to administer adenosine:
ii. Dose: 0.1 mg/kg (maximum 6 mg) RAPID IVP + NS flush (5-10 mL)
iii. If no response, may repeat once: 0.2 mg/kg (maximum 12 mg) RAPID IVP + NS flush
iv. **NOTE:** ECG must run continuously, as described above for ADULT patient
v. **If IV access is unavailable, or if adenosine is unavailable or ineffective, prepare for immediate synchronized cardioversion:**
vi. Initial synchronized shock dose: 0.5 to 1.0 J/kg
vii. Repeat synchronized shock dose: 1 to 2 J/kg
viii. BioTel may authorize sedation with midazolam (0.1 mg/kg IV/IO/IM/IN)
ix. Contact BioTel as soon as possible after adenosine or cardioversion

d. **NOTE:** Do NOT administer adenosine if:
   i. Rhythm is irregularly-irregular (suggestive of Atrial Fibrillation)
   ii. Rhythm shows "saw-tooth" pattern (suggestive of Atrial Flutter)
   iii. Poisoning- or drug-induced tachycardia is suspected

12. **UNSTABLE** patient with **WIDE-Complex Tachycardia (WCT) (possible Ventricular Tachycardia):**
   a. "WIDE-Complex" definition: QRS duration greater than 0.12 sec (0.09 sec in pediatric pt.)
   b. ADULT patient at least 14 years of age with WCT:
      i. Immediate, synchronized cardioversion: Initial and subsequent recommended doses depend on the device manufacturer's recommendations:
         1. Wide QRS, regular rhythm (probable VTach): Initial synchronized shock dose is 100 J
         2. Escalate subsequent synchronized shock doses, up to 200 J, or as specified by the device manufacturer
      ii. If the patient is conscious, consider sedation, as in Section 11.b.ii
      iii. **NOTE:** If WCT and IRREGULAR rhythm, deliver unsynchronized DEFIBRILLATION shock
         1. Defibrillation shock doses depend on device manufacturer (refer to VF/pVT CPG)
      iv. **NOTE:** If WCT morphology suggests Torsades de Pointes, administer magnesium sulfate:
         1. Add 2 g to 100 mL NS; infuse IVPB over 15 minutes (contraindicated if dialysis pt.)

c. PEDIATRIC patient less than 14 years of age with WCT (QRS greater than 0.09 sec):
i. Prepare for immediate synchronized cardioversion
ii. Contact BioTel prior to cardioversion attempt, if possible
iii. Initial synchronized shock dose: 0.5 to 1.0 J/kg
iv. Repeat synchronized shock dose: 1 to 2 J/kg
v. BioTel may authorize sedation with midazolam (0.1 mg/kg IV/IO/IM/IN)
vi. BioTel may authorize magnesium sulfate: 2 g in 250 mL NS; administer 5 mL/kg (40 mg/kg) IVPB over approximately 15 minutes
vii. Contact BioTel as soon as possible, if not already done

13. Initiate transport and monitor vital signs, level of consciousness, ECG, SpO_2 and $PetCO_2$
14. For additional assistance and Medical Control physician guidance, contact BioTel

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Transcutaneous Pacing (TCP)

Purpose: To aid EMS Providers in the use of transcutaneous pacing (TCP) for patients with bradycardia
Inclusion Criteria: Adult patients (at least 14 years of age) with symptomatic bradycardia for whom TCP may be an appropriate treatment modality
Exclusion Criteria: Pediatric patients under 14 years of age (consult BioTel for TCP guidance)
Refer to: Bradycardia, Chest Pain and Poisoned Patient CPGs for additional guidance

Indications:

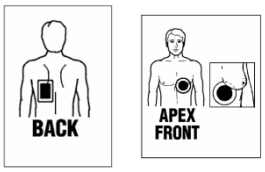
1. Adult patients with heart rate less than 60 bpm due to 3rd-degree heart block, with hemodynamic compromise:
    a. **Hypotension, shock, chest pain, altered LOC, or acute heart failure/pulmonary edema**
    b. In some patients, especially the elderly with underlying cardiac disease, TCP may be safer and more effective than atropine administration (because atropine may worsen myocardial ischemia)
    c. TCP must be initiated promptly in order to optimize patient outcome
2. Consider TCP for 1st- or 2nd-degree heart block, **IF** there are signs or symptoms of hypoperfusion, as above

Contraindications:

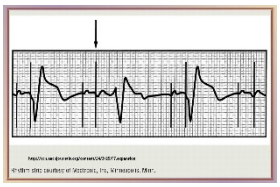
1. Absolute: Asystole, Pulseless Electrical Activity (PEA) or asymptomatic Sinus Bradycardia

Procedure (observe Body Substance Isolation Precautions and employ appropriate PPE):

1. Patient preparation:
    a. Continuous ECG, SpO_2 and $PetCO_2$ monitoring
    b. Supplemental oxygen to maintain SpO_2 at least 94%
2. Equipment needed:
    a. Manual monitor-defibrillator with pacing capability
    b. Limb leads **AND**
    c. Hands-free defibrillation pads
    d. Establish IV/IO access for administration of:
        i. Sedation for conscious patient (if time permits) – Refer to Bradycardia CPG
            1. Midazolam 2.5 – 5 mg slow IV/IO/IM/IN; May repeat once after 5-10 minutes; **OR**
            2. Ketamine 2 mg/kg IV/IO or 4 mg/kg IM/IN, if no contraindications
            3. Contact BioTel for additional dosing authorization or parenteral analgesia dosing
            4. Monitor for respiratory depression
        ii. Resuscitation and other cardiac medications



3. **Initial settings:**
    a. Rate: 60 bpm (may need to be increased to 70 or (rarely) 80 bpm)
    b. Current: 20 mAmp
4. Increase current until **electrical capture** is achieved:
    a. Definition: Pacer spike before every wide, slurred QRS complex
    b. Most adults achieve electrical capture between 60 and 100 mAmp



5. Verify **mechanical capture**
    a. Definition: improved level of consciousness, skin color and signs of perfusion; and palpable pulse (femoral preferred)
6. Assess **blood pressure** and other vital signs:
    a. Patients with both electrical and mechanical capture may still be hypotensive
    b. Consider small IV/IO fluid bolus: 500 mL of Normal Saline if SBP less than 90 mmHg and no signs of acute heart failure
    c. Consider vasoactive medication infusion: dopamine or epinephrine generally preferred
        i. Consult BioTel for dosing assistance, if needed, and ASAP after starting infusion
7. Monitor vital signs, neurologic status, SpO_2, $PetCO_2$; transport
8. If TCP is unsuccessful, turn off pacing function, but continue monitoring and resuscitation interventions:
    a. Contact BioTel for further guidance and assistance en route to an appropriate receiving hospital
    b. BioTel may authorize administration of atropine (0.5 – 1 mg IV/IO)

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Ventricular Assist Device (VAD)

Goals: To assist UTSW/Parkland BioTel EMS Providers when evaluating and treating a patient with a Ventricular Assist Device (VAD)
Inclusion Criteria: All patients with a Ventricular Assist Device (VAD)
Exclusion Criteria: Patients without a Ventricular Assist Device (VAD)
Refer to: UNIVERSAL CARE – ADULT and to Cardiac Arrest and other relevant, symptom-specific CPGs

Definition

1. A Ventricular Assist Device (VAD) is an implantable device used to artificially augment cardiac output and to support circulation in patients with significant ventricular dysfunction:
    a. VAD mechanics differ, depending on the manufacturer

Special Considerations of VAD Patients

1. **Chest compressions should not be started in an unresponsive patient until the pump is checked**:
    a. CPR or blunt chest/abdominal trauma may dislodge VAD tubing, resulting in fatal bleeding:
        i. This bleeding risk is greatest in the immediate post-operative period, and less likely after that
    b. **Indications for chest compressions are outlined in Patient Care, section 2.e.ii (next page)**
2. A VAD patient **may not have a palpable pulse**, as most VADs support circulation with laminar (continuous) flow:
    a. Even if present, the palpable pulse may not match the true heart rate
3. A VAD patient **will have a heart rate and rhythm on ECG**:
    a. ECG monitoring is the only way to determine the VAD patient's heart rate and rhythm
    b. Dysrhythmias should be treated according to standard BioTel CPGs and ACLS Guidelines, EXCEPT for chest compressions
    c. Defibrillation or cardioversion may be performed according to standard guidelines
4. A VAD patient **may not have an SBP or DBP** obtainable by standard methods with a manual or automated BP cuff:
    a. Measurement of mean blood pressure (typical range 65-85 mmHg) may require a Doppler device, if auscultation is unsuccessful
    b. Pulseless Electrical Activity (PEA) or Hypotensive Electrical Activity (HEA) is common and treatable
5. **Pulse oximetry** may not be measurable or accurate
6. **Continuous waveform capnography** should be used for all VAD patients
7. There are **no medication contraindications** related to the VAD
8. **Overall clinical assessment is the most important clinical observation** (e.g. responsiveness, skin color and perfusion, respiratory rate and effort)
9. A VAD patient will most likely be accompanied by a trained companion:
    a. The companion is familiar with the VAD and with emergency troubleshooting
    b. **The companion should accompany the patient during transport and be responsible for the VAD whenever possible**
10. VAD patients and their companions are taught, in an emergency, to call 911 and then to page the on-call VAD Coordinator immediately:
    a. The **VAD Coordinator** will typically be on the phone to help EMS Providers when they arrive
    b. The patient/companion will know how to contact the on-call VAD Coordinator, if necessary
    c. In addition, **contact information for the VAD Coordinator and VAD Implant Center is usually attached to or located inside the patient's VAD equipment bag**
11. **The VAD equipment bag, power source, battery and charger should be transported with the patient**
12. A VAD patient should typically be transported to the nearest appropriate VAD center, with preference given to **their implanting VAD center whenever possible:**
    a. Contact BioTel for current hospital capabilities and destination decision-making assistance

Continued on the next page…

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Patient Care

1. RESPONSIVE patient:
    a. Check VAD for alarms
        i. If alarms are activated, contact the VAD Coordinator or BioTel
    b. Check the VAD battery indication
        i. Change batteries or connect to AC power, if indicated
    c. Management per symptom-specific CPG
        i. Synchronized cardioversion or defibrillation may be performed, if necessary
        ii. If evidence of dehydration, establish IV/IO access and administer 250 mL NS bolus
            a. Reassess and repeat once to restore MAP to at least 65 mmHg
            b. Do not administer additional fluid without BioTel or VAD Coordinator authorization
    d. Obtain the patient's Emergency Contact Card, travel batteries, charger and battery pack
    e. Contact BioTel for destination decision-making assistance
        i. If possible, transport to the patient's implanting VAD center
2. UNRESPONSIVE patient:
    a. Do NOT begin chest compressions before checking the pump (see Section e, below)
    b. Evaluate airway and support with positioning, adjuncts and assisted ventilation with BVM and supplemental oxygen (refer to Airway Management – Adult CPG):
        i. Place advanced airway (extraglottic airway or ET tube) as needed (advanced level only)
            a. Initiate continuous waveform capnography ($PetCO_2$ monitoring)
    c. Assess VAD pump for function:
        i. Check peripheral pulses
        ii. Auscultate for humming sound at left upper abdominal quadrant
        iii. Check for capillary refill
    d. If pump **IS** functioning:
        i. Initiate continuous ECG monitoring using hands-free defibrillator pads, not limb leads
        ii. Manage patient according to symptom-specific CPG
        iii. If evidence of dehydration, establish IV/IO access and administer 250 mL NS bolus
            a. Reassess and *repeat once* with an additional 250-mL bolus if MAP is less than 50 mmHg or if the alarm is for "suction event"
            b. Do not administer additional fluid without BioTel or VAD Coordinator authorization
    e. If there is **NO INDICATION** of pump function:
        i. Evaluate the VAD for power loss/equipment issues:
            a. Change batteries, if necessary
            b. Connect to AC power
        ii. Chest compressions may be performed in an unresponsive patient, IF the pump is not functioning and cannot be restarted in a timely manner
    f. Obtain the patient's Emergency Contact Card, travel batteries, charger and battery pack
    g. Contact BioTel for destination decision-making assistance
        i. If possible, transport to the patient's implanting VAD center
3. For additional assistance and Medical Control physician guidance, contact BioTel

Refer to the flow diagram on the following page for additional guidance

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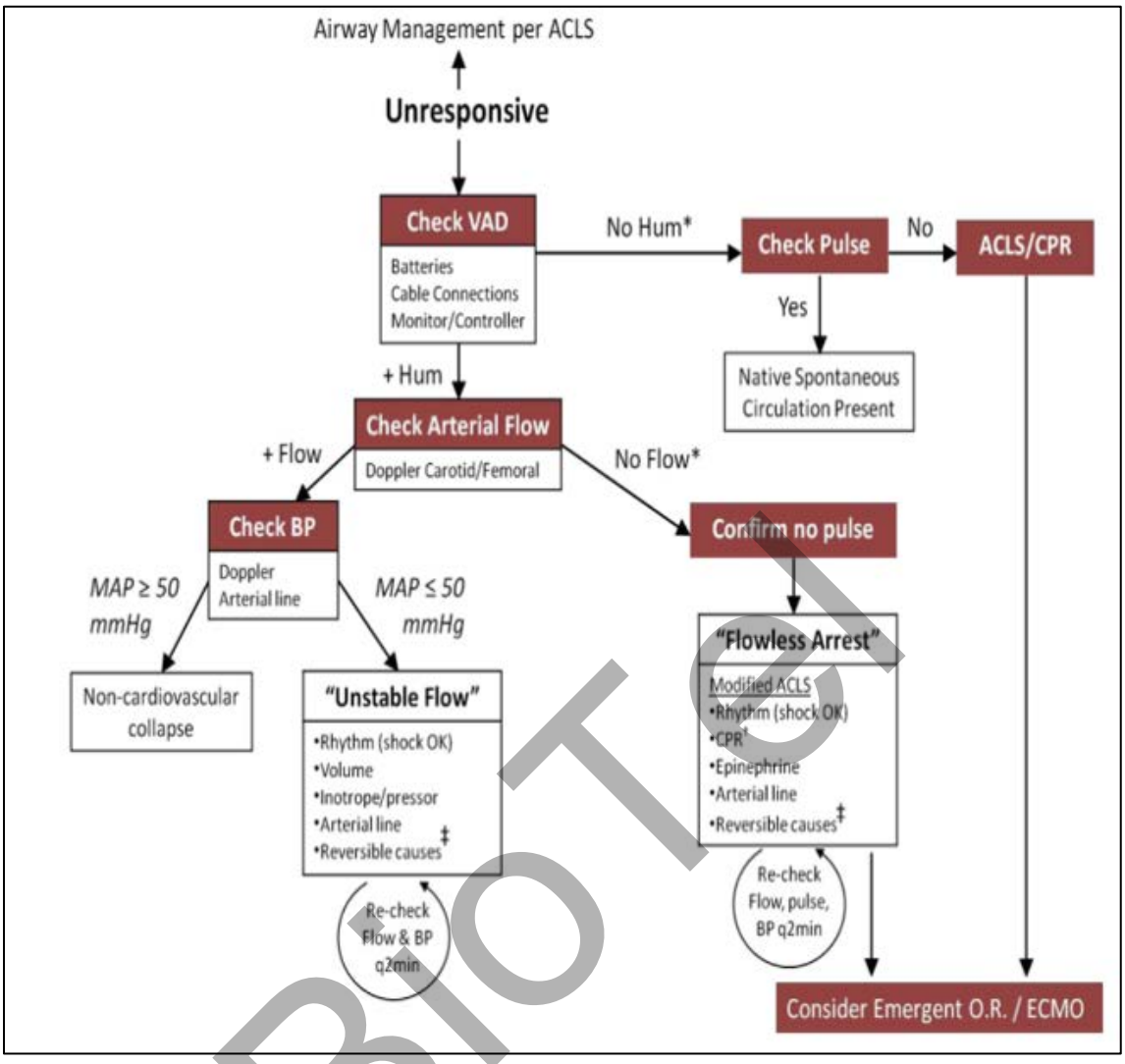

Management of the Unresponsive VAD Patient

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✦ RESPIRATORY

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Airway Management (Adult)

Goals: Provide effective oxygenation and ventilation; recognize and alleviate respiratory distress or failure; provide necessary interventions quickly and safely to patients who need respiratory support; promptly identify a potentially difficult airway
Inclusion Criteria: Adults at least 14 years of age with signs/symptoms of respiratory distress or failure, or with evidence of hypoxemia and/or hypoventilation
Exclusion Criteria: Patients less than 14 years of age; newly born infants; patients with tracheostomies; patients for whom oxygenation and ventilation are adequate with supplemental oxygen alone, via nasal cannula or simple face mask
Refer to: Airway Management – Pediatric Guidelines; CPAP, Cricothyrotomy, Nasotracheal Intubation, PAI and Tracheostomy/Stoma Care Procedures; Neonatal Care, Respiratory Distress – Adult and Respiratory Distress – Pediatric CPGs; and Universal Care – Adult Guidelines

1. **Patient Assessment:**
    a. History – Assess for:
        i. Time of symptom onset
        ii. Associated symptoms
        iii. History of asthma, COPD or other breathing disorders
        iv. Choking or other evidence of upper airway obstruction
        v. History of trauma
    b. Physical Examination – Assess for:
        i. Shortness of breath
        ii. Abnormal skin color (cyanosis, pallor or mottling)
        iii. Abnormal respiratory rate and/or effort
        iv. Use of accessory muscles, including retractions
        v. Patient positioning, e.g. “tripoding”
        vi. Abnormal mental status
        vii. Quality of air exchange, including depth and equality of breath sounds (all lung fields)
        viii. Abnormal respiratory sounds: wheezing, rhonchi, rales, grunting or stridor
        ix. Cough, including presence and color of sputum
        x. Evidence of hypoxemia (do not assume low SpO_2 is due to equipment malfunction)
        xi. Signs of difficult airway: short jaw or limited jaw thrust; small thyromental space; upper airway obstruction; large tongue; obesity; large tonsils; thick neck; craniofacial abnormalities or injuries; excessive facial hair; etc.
2. **Treatment and Interventions:**

NOTE: These guidelines present an **escalation of EMS care**, **beginning with supplemental oxygen** and possibly ending with endotracheal intubation or needle cricothyrotomy. Most patients would likely follow this sequence. Based on patient’s clinical presentation and acuity, however, the EMS provider may need to proceed directly to more advanced airway techniques. **The foundation of all advanced airway management is effective basic airway management (BVM, positioning, suctioning, etc.).** ***Nearly all patients can be effectively managed, at least temporarily, with supplemental oxygen and/or properly implemented basic airway maneuvers.***

NOTE: The goal of treatment is not *necessarily* “100% SpO_2” and/or 35-45 mmHg $PetCO_2$, but rather adequate oxygenation and ventilation for that particular patient, relief of respiratory distress/failure, and a patent airway (with or without an artificial, advanced airway, as clinically indicated).

a. **Basic Airway Management, including continuous SpO_2 monitoring, to achieve SpO_2 94-98%:**
    i. Apply **supplemental oxygen** as per the Respiratory Distress – Adult CPG and other relevant, symptom-specific CPGs, using the following devices, as clinically indicated:
        1. Nasal cannula (NC)
        2. Simple mask
        3. Venti-mask (if available)
        4. Non-rebreather mask (NRBM)

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ii. If needed, additional respiratory support may be provided by **CPAP** (Continuous Positive Airway Pressure), a form of non-invasive positive pressure ventilation (NIPPV):
   1. **NOTE:** This is an ALS skill in the BioTel EMS System, unless BLS Providers have been completed approved, hands-on training and have received written Medical Director authorization.
   2. Refer to the CPAP Procedure for indications, contraindications and procedural details
   3. Brief overview of patients possibly suitable for a CPAP trial:
      a. Respiratory distress
      b. Awake, oriented and able to cooperate (GCS at least 11)
      c. Ability to maintain a patent airway
      d. Systolic BP at least 90 mmHg
      e. Use of accessory muscles during spontaneous respirations.

iii. If needed, additional respiratory support may be provided for respiratory failure or respiratory arrest by assisted ventilation with a **bag-valve mask (BVM)**:
   1. BVM ventilation should be performed by two or three rescuers, if possible.
   2. A proper sized mask completely covers the patient's nose and mouth and provides an effective seal around the cheeks and chin.
   3. Ventilation should use the minimal volume and force needed to achieve chest rise.
   4. The recommended rates of BVM ventilation for specific clinical conditions (post-cardiac arrest, medical, trauma or head injury) are explained below, **Section c.**
   5. Proper BVM assisted ventilation should follow this useful mnemonic:
      a. **C** Cervical spine motion restriction, when clinically indicated
      b. **O** Oropharyngeal airway (OPA) in place (or NPA, if appropriate)
      c. **P** Proper head and neck positioning
      d. **E** Elevation of the jaw (gently pull the jaw into the mask)
      e. **S** Seal the mask to the face (two hands)
      f. –
      g. **S** Steady, slow, single-hand, 1- to 1.5-second gentle bag squeeze, followed by quick release and full exhalation
      h. **O** Oxygen supply: sufficient and functioning properly
      i. **S** Suction available (always) and Sellick's maneuver, if needed (no longer routinely recommended, but may be helpful in selected circumstances).

iv. Positive End Expiratory Pressure Valves **(PEEP Valves), if available,** may be used by appropriately trained personnel for refractory hypoxia in patients receiving BVM ventilation:
   1. PEEP Valves should be considered (if no contraindications) in cases of known or suspected asthma/reactive airways disease, COPD, pulmonary edema, ARDS, pneumonia, drowning or aspiration.
   2. PEEP Valve initial setting is 5 cm H_2O; PEEP may be increased to a maximum of 10 cm H_2O, based on patient condition and tolerance:
      a. Further PEEP increase must be authorized by online medical control physician.
   3. PEEP Valves contraindications:
      a. Hypotension (SBP less than 90 mmHg or age-appropriate pediatric equivalent)
      b. Cardiac arrest (reduces effectiveness of CPR)
      c. Pneumothorax (may exacerbate or convert to tension pneumothorax)
      d. Recent lung, trachea of bronchial surgery (may cause barotrauma)
      e. Neonatal patients (unless advised by online medical control physician).
   4. Special considerations:
      a. Monitor patient closely for pneumothorax
      b. Monitor patient for "stacked" breaths ("auto-PEEP") and associated air-trapping and hemodynamic compromise, due to incomplete exhalation
      c. If ventilation becomes difficult or if hypotension develops, remove PEEP valve.

b. **Advanced Airway Management:**

iv. An **extraglottic airway (EGA) device** may be needed in patients tolerating BVM-assisted ventilation without resistance due to altered mental status (AMS) or unresponsiveness, or who need airway protection (e.g. during cardiac arrest):

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1. EGAs are designed for placement into posterior oropharynx, above the vocal cords, and may be inserted blindly and, in many cases, more rapidly than an endotracheal tube:
    a. EGA placement is currently an ALS skill in the BioTel EMS System
    b. EGAs are considered an "Advanced Airway" in the BioTel EMS System
2. General indications to consider EGA placement:
    a. Pulseless, apneic patient (without interrupting chest compressions)
    b. Apneic patient who tolerates an OPA (absent gag reflex)
    c. Need for advanced airway management when endotracheal intubation is unavailable
    d. "Rescue" device for the "can't intubate, can't ventilate" scenario
3. Relative contraindications:
    a. Non-supine positioning
    b. Patients with increased risk of regurgitation or aspiration
4. Potential complications:
    a. Regurgitation and aspiration
    b. Device malposition
    c. Gastric inflation
    d. Bronchospasm or laryngospasm
    e. Oropharyngeal edema or soft tissue damage
    f. Laryngeal or hypoglossal nerve injury
    g. Over-ventilation leading to respiratory alkalosis and decreased cardiac output
5. Patient preparation:
    a. Don appropriate PPE and use isolation precautions (contact, droplet or airborne)
    b. Maintain continuous SpO_2 monitoring and $PetCO_2$ monitoring
    c. Ensure availability of portable suction device and suction cannula
    d. Manually open the patient's airway
    e. Insert adjunct (OPA or NPA)
    f. Assist ventilation and preoxygenate with BVM at 8-10 gentle breaths per minute, using only enough volume to achieve chest rise: avoid over-ventilation!
6. EGA placement – general procedure:
    a. Refer to the manufacturer's instructions/recommendations for the specific device
    b. Lubricate the distal tip of the device
    c. Position the patient properly (sniffing position ± "ramped up" (obese patient)), if cervical spine injury is not suspected
    d. Perform a tongue-jaw lift
    e. Insert device to proper depth (per manufacturer recommendations)
    f. Inflate device cuff(s), if applicable to the device
    g. Ventilate patient and confirm adequate ventilation (correct lumen and insertion depth) by auscultation over epigastrium, bilateral axillae and anterior lung fields
    h. Adjust ventilation as needed (correct lumen and insertion depth)
    i. Verify proper tube placement using continuous $PetCO_2$ and SpO_2 monitoring
    j. Secure device using commercial tube holder, tape or other suitable means
    k. Continue to provide assisted ventilation at proper rate & volume, avoiding over-ventilation due to excessive ventilation rate and/or volume

v. **Endotracheal intubation** without use of paralytic agents is an advanced airway option for patients with absent gag reflex due to medical or traumatic conditions:
1. Indications:
    a. Less invasive methods are unavailable, unsuccessful or ineffective
    b. "Can't ventilate, can't oxygenate" scenario
    c. Severe burns (including smoke inhalation and/or thermal airway burns)
    d. Severe multi-trauma
    e. Altered mental status
    f. Loss of normal, protective airway reflexes
2. Potential complications:
    a. Aspiration

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b. Hypoxia and/or hypercarbia
c. Oral, dental or airway trauma
d. Worsening of cervical spine injury
e. ET tube malposition (esophageal or right mainstem intubation)
f. Adverse effects of sedation
g. Prolonged interruption of chest interruptions during CPR
h. Over-ventilation leading to respiratory alkalosis and decreased cardiac output

3. In situations that warrant advanced airway placement, but the patient's level of consciousness precludes ET tube insertion, refer to the Pharmacologically-Assisted Intubation (PAI) Procedure (applies ONLY to agencies authorized by the Medical Director)
4. Patient/equipment preparation:
    1. Don appropriate PPE and use isolation precautions (contact, droplet or airborne)
    2. Maintain continuous ECG, SpO_2, and $PetCO_2$ monitoring
    3. Ensure availability of portable suction device and suction cannula
    4. Manually open the patient's airway
    5. Insert adjunct (OPA or NPA)
    6. Assist ventilation and preoxygenate with BVM at 8-10 gentle breaths per minute, using only enough volume to achieve chest rise: avoid over-ventilation!
    b. Select the appropriate size ET tube
    c. Select backup equipment: ET tubes ½ size larger and smaller, bougie, larger or smaller laryngoscope blade, EGA device, etc.
    d. Lubricate the tip of the tube and insert the stylet
    e. Inflate cuff and check for cuff leak, then deflate cuff
    f. Check laryngoscope operation and bulb brightness
    g. Position the patient properly (sniffing position ± "ramped up" (obese patient)), if cervical spine injury is not suspected
5. Endotracheal intubation procedure using direct laryngoscopy:
    a. Insert laryngoscope into the patient's mouth and sweep tongue to the left
    b. Elevate patient's mandible with laryngoscope to visualize vocal cords
    c. Suction, as needed
    d. Second rescuer may perform Sellick's maneuver, "BURP" maneuver or bimanual laryngoscopy, if needed, to improve vocal cord visualization
    e. Introduce the ET tube between the vocal cords, to the proper depth
    f. Inflate ET tube cuff to proper pressure and remove syringe from cuff inlet port
    g. Confirm proper tube placement with continuous waveform capnography ($PetCO_2$):
        1. **This is MANDATORY and must be documented in the ePCR**
        2. A 4-phase capnography waveform should be present with proper tube placement, even under low-perfusion conditions
    h. Confirm and document tube placement with additional, **adjunct** methods*:
        1. Visualization of the tube passing between the vocal cords
        2. Absence of breath sounds over the epigastrium
        3. Presence of symmetrical breath sounds over bilateral lung fields
        4. Chest rise and fall with ET tube ventilation
        5. Tube fogging with ET tube ventilation
        6. Improving SpO_2: least reliable method
    i. Secure the tube with commercial tube holder, tape, or another device
    j. A cervical collar may help to reduce neck movement & risk of tube displacement
    k. Continue to provide assisted ventilation at proper rate & volume, avoiding over-ventilation due to excessive ventilation rate, force and/or volume
6. Abandon ET intubation attempt and ventilate with 100% oxygen if ANY of the following events occurs:
    a. Heart rate falls by 10 beats per minute below baseline
    b. SpO_2 falls by 10 points below baseline

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c. $PetCO_2$ rises by more than 5 mmHg above baseline

7. If ET intubation is unsuccessful after ONE attempt (defined as laryngoscope introduction into the patient's mouth), provide BVM ventilation & then insert an approved EGA device
8. *Additional tube placement confirmation guidelines:
    a. No one single tube placement confirmation method ensures either correct or incorrect tube placement
    b. More methods used to confirm tube placement = more accurate verification
    c. Continuous waveform capnography ($PetCO_2$) monitoring must be used and documented during and at frequent intervals after intubation to monitor care of the intubated patient, especially after patient movement
    d. Absence or loss of a 4-phase capnography waveform should prompt IMMEDIATE re-evaluation and reconfirmation of ET tube position:
        1. During CPR or other low-perfusion states, the $PetCO_2$ waveform will be smaller, but should still be detectable
        2. During prolonged cardiac arrest, or in the setting of massive pulmonary embolism or poor chest compressions $PetCO_2$ may be very low, falsely suggesting improper tube placement
        3. NOTE: $PetCO_2$ may be normal with right mainstem intubation
    e. The value of SpO_2 measurement to confirm ET tube placement is limited:
        1. A normal reading does not exclude respiratory distress or the need for advanced airway management
9. If there is ANY doubt about the proper placement of an ET tube, REMOVE the tube and ventilate the patient with a BVM while preparing for insertion of an EGA rescue device

vi. **Nasotracheal intubation** may be a good option for certain **spontaneously breathing** patients:
1. Indications:
    a. Conscious, spontaneously breathing patients with intact gag reflex (e.g. COPD, asthma, burns)
    b. Unconscious patients with GCS less than 8 due to trauma or medical conditions
    c. Patients with possible cervical spine injury whose injury may be exacerbated by neck movement
    d. Significant swelling of lips, tongue or mouth (e.g. angioedema) or limited mouth opening
2. Contraindications:
    a. Absolute:
        1. Apnea
        2. Age less than 14 years of age
        3. Severe traumatic or congenital midface deformity
        4. Nasal airway obstruction
    b. Relative:
        1. Suspected basilar skull fracture
        2. Coagulopathy
        3. Anticoagulants
        4. Acute hypertension
        5. Suspected elevated intracranial pressure (trauma, stroke, etc.)
3. Refer to the Nasotracheal Intubation Procedure for equipment requirements, procedural details and potential complications

vii. **Needle Cricothyrotomy** may be indicated in certain, extenuating circumstances when risk of death for not escalating airway management may outweigh risk of procedural complications:
1. Possible indications:
    a. Apnea with inability to ventilate and/or oxygenate AND failure of other measures
    b. Massive facial trauma
2. NOTE: This procedure provides limited, temporary ability to oxygenate, but little ability to ventilate – hypercarbia will develop eventually
3. Refer to the Cricothyrotomy (Needle) Procedure for equipment requirements, procedural details and potential complications

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viii. **Percutaneous/surgical cricothyrotomy** may be indicated in extremely rare circumstances:
   1. This procedure is restricted in the BioTel EMS System to use only by ALS Providers specifically trained to perform it and authorized by the Medical Director
   2. Equipment requirements and procedural details depend on the device used

c. Assisted ventilation rates and $PetCO_2$ values – general guidelines:
   i. Continuous ECG, SpO_2, and waveform capnography/$PetCO_2$ monitoring shall be used for every patient with moderate or severe respiratory distress, shock or hemodynamic instability, critical illness or injury, and/or the need for advanced airway management
   ii. $PetCO_2$ monitoring/waveform analysis helps to guide assisted ventilation rate and volume
   iii. Avoid excessive positive-pressure ventilation (rate, volume or force) to reduce risk of:
      1. Impaired venous return and cardiac output
      2. Impaired cerebral perfusion
      3. Barotrauma (pneumothorax and direct lung injury)
      4. Gastric insufflation, with regurgitation and pulmonary aspiration
   iv. Assisted ventilation via advanced airway should be performed as follows:
      1. Technique: gentle, one-handed bag squeeze over 1 to 1.5 seconds each
      2. Volume: sufficient to achieve chest rise
      3. Rate: 8 to 10 breaths per minute, adjusted judiciously to maintain $PetCO_2$ values within normal limits, unless clinically indicated otherwise, such as:
         a. During CPR, do not attempt to titrate $PetCO_2$ levels by adjusting ventilation rate
         b. During post-cardiac arrest (ROSC), do not exceed 10-12 breaths per minute, even if $PetCO_2$ level is transiently elevated (as expected)
         c. If hypovolemia or severe pulmonary expiratory obstruction (e.g. asthma or COPD) is present, reduce rate to approximately 6 breaths per minute

d. **Rapidly transport the patient to the closest appropriate hospital for airway stabilization when respiratory failure cannot be successfully managed in the prehospital setting**

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Advanced Airway Checklist

(For all advanced airway procedures, including Pharmacologically Assisted Intubation (PAI))
(Only paramedics specifically trained and authorized by the Medical Director shall perform PAI.)
(Confidential and Privileged. For quality assurance/improvement purposes only. Pursuant to Section 160.007 of Texas Occupations Code, Texas Health and Safety Code 161.032 and 42 USC Sec. 11101 et seq.)

Date of Procedure: _____ Agency/EMS Run #: _____

At least three rescuers must be present for this procedure:

Rescuer 1 Name (Time Keeper and Monitor): _____

Rescuer 2 Name (Medications ± Laryngeal Manipulation): _____

Rescuer 3 Name (Intubator): _____

Pre-Intubation Evaluation: Complete 3 Minutes Prior to Intubation

Time Completed: _____ Spontaneous Respiratory Rate: _____

Heart Rate: _____ BP: _____/_____ SpO_2: _____ On how much oxygen? _____

$PetCO_2$: _____ mmHg GCS: _____ Head/neck trauma? ☐ Yes ☐ No

Moving all extremities? ☐ Yes ☐ No ☐ No, only the right ☐ No, only the left

Equipment available: ☐ Suction ☐ BVM ☐ Extraglottic device ☐ Bougie

Two Minutes Prior to Intubation

Infant (Less than 1 Year of Age) Pre-Medication Refer to BioTel PEDI-Guide©	Dose Given	Time
Atropine 0.02 mg/kg (0.2 mL/kg) IV/IO (If less than 1 year of age and no contraindications exist)		

One Minute Prior to Intubation

ADULT Sedation Medication	Dose Given	Time
Etomidate 0.3 mg/kg slow IV/IO over 30 seconds (adult) (If no contraindications exist) ---------- **OR** Ketamine 2 mg/kg slow IVP/IO, **OR** 4 mg/kg IM (adult) ---------- **OR** Midazolam 2.5 to 5 mg slow IV/IO: maximum 5 mg (adult) AND Fentanyl 1 mcg/kg slow IV/IO: maximum 200 mcg (adult)		

Pediatric (age less than 14 years) sedation doses (refer to BioTel PEDI-Guide©) AND additional procedure steps are on the next page

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One Minute Prior to Intubation

PEDIATRIC Sedation Medication	Dose Given	Time
Etomidate 0.3 mg/kg slow IV/IO over 30 seconds (pediatric) (If no contraindications exist) ---------- **OR** Ketamine 2 mg/kg slow IVP/IO, **OR** 4 mg/kg IM (pediatric) ---------- **OR** Midazolam 0.1 mg/kg slow IV/IO: maximum 5 mg (pediatric) AND Fentanyl 1 mcg/kg slow IV/IO: maximum 100 mcg (pediatric)		

Intubation

Abandon intubation attempt and ventilate with a BVM if **ANY** of the following occurs (check all that apply):

_____ Heart rate falls by 10 beats per minute below pre-intubation level

_____ Pulse oximeter falls by 10% below pre-intubation level

_____ $PetCO_2$ rises by 5 mmHg above pre-intubation level

Intubation Successful? ☐ No ☐ Yes, with ETT ☐ Yes, with Extraglottic Airway

Time Completed: _____

Only one attempt allowed. If unsuccessful, insert an extraglottic airway.

Confirmation of ET Tube/Extraglottic Airway Intubation

MANDATORY: 4-phase $PetCO_2$ waveform AND $PetCO_2$ reading at least 5 mmHg? ☐ Yes ☐ No

$PetCO_2$ reading: _____ mmHg

Did medic visualize tube passing between vocal cords? ☐ Yes ☐ No

Is there chest rise and fall with each ventilation? ☐ Yes ☐ No

Are epigastric sounds heard with each ventilation? ☐ Yes ☐ No

Are breath sounds heard in at least 4 places (2 high and 2 lateral)? ☐ Yes ☐ No

30 to 60 Seconds Following Intubation Attempt

Time Completed: _____ Assisted Respiratory Rate: _____

Heart Rate: _____ B/P:_____/_____ SpO_2: _____ on 100% oxygen.

$PetCO_2$: _____ GCS: _____ Tube Depth: _____ mm Tube Size: _____

During Transport

If patient exhibits movement or coughing that might lead to extubation, administer ONE medication:

Medication	Dose(s) Given	Time(s)
Ketamine 2 mg/kg IVP/IO/IM (adult or pediatric) • May repeat once after 10-15 minutes **OR** Midazolam 2 to 5 mg (adult) or 0.1 mg/kg (pediatric) IV/IO/IM/IN • May repeat once after 15 minutes		

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Continuous Positive Airway Pressure (CPAP)

Purpose: To provide non-invasive ventilatory support for patients with respiratory distress due to asthma, COPD, acute pulmonary edema, CHF, pneumonia and other cardiorespiratory conditions
Inclusion Criteria: Adult patients at least 14 years of age
Exclusion Criteria: Pediatric patients (unless prior Medical Director authorization has been granted)
Refer to: Symptom-specific CPGs; Airway Management – Adult; Airway Management – Pediatric

Indications: Any patient with shortness of breath NOT due to pneumothorax *AND*:

1. Respiratory distress
2. Awake, oriented and able to cooperate
3. Able to maintain a patent airway (GCS at least 11)
4. SBP at least 90 mmHg (or normal for age in pediatric patient)
5. Uses accessory muscles during respiration

Contraindications:

- Children under 5 (unless Medical Director authorization)
- Facial deformities (congenital or traumatic)
- Face too small for mask seal: no mask fit, no CPAP
- Agonal respirations or respiratory arrest
- Pneumothorax
- Tracheostomy
- Unconsciousness or altered mental status
- Active vomiting or GI bleeding

Precautions: Use extreme caution when administering CPAP if the patient has:

- Impaired mental status (GCS 10 or less)
- Inability to cooperate with the procedure
- History of failed CPAP attempts
- Complaints of nausea
- Inadequate respiratory effort
- Excessive secretions

Equipment:

- Suction equipment
- CPAP Equipment

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)

1. Explain procedure to the patient
2. Place patient on continuous SpO_2 and $PetCO_2$ monitoring
3. Ensure adequate oxygen supply to the CPAP device (100% to start)
4. Place delivery device over the patient's nose and mouth
5. Secure the mask with the straps or devices provided
6. Use 5 cm H_2O of PEEP and check for air leaks
7. If respiratory status does not improve & patient tolerates CPAP, ↑ PEEP, up to 15 cm H_2O, if available
8. Monitor and document patient's clinical response continuously and vital signs at least every 5 minutes:
    a. Consider switching to assisted BVM ventilation if patient does not improve in 5-10 minutes
    b. CPAP can cause decreased cardiac output and decreased BP, nausea and vomiting
9. Coach the patient to keep the mask in place, readjusting the mask as needed
10. ***If the patient's respiratory status deteriorates, remove the device and provide assisted BVM ventilation and/or an advanced airway (ET tube or EGA)***

Removal Considerations:

1. ***Remove CPAP therapy ONLY if/when the patient cannot tolerate the mask, experiences continued or worsening respiratory distress/failure, or actively vomits with the mask in place***
2. If assisted BVM ventilation and/or advanced airway placement is needed, CPAP device must be removed

Special Notes:

- **Contact BioTel ASAP so that hospital can prepare for patient arrival**
- Do NOT remove CPAP at hospital until hospital is ready to place their own device
- CPAP does not violate a patient's DNR or "Do Not Intubate" order

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Cricothyrotomy (Needle)

(with Percutaneous Transtracheal Ventilation (PTV))

Purpose: To provide temporary oxygenation for patients failing all other emergency airway interventions
Inclusion Criteria: Any patient with inability to oxygenate or ventilate by BVM, non-invasive methods, extraglottic Airway (EGA), or oral or nasal endotracheal intubation
Exclusion Criteria: Ability to oxygenate/ventilate by other means and methods
Refer to: Respiratory Distress; Trauma and other CPGs; Airway Management – Adult or Pediatric

Indications:
1. Inability to establish or maintain oxygenation/ventilation by other means
2. Completely obstructing upper airway foreign body that cannot be removed by BLS maneuvers or Magill forceps with direct visualization

LIMITATIONS:
- PTV provides only short-term (30-45 minutes) oxygenation, and very little ventilation:
  - Hypercarbia will develop quickly
  - Patient may remain hypoxic and unstable

Contraindications:
1. Ability to oxygenate and ventilate by other means
2. Tracheal transection

Equipment:
1. Oxygen tubing with a hole approximately 40% of the tubing circumference cut in the side, near one end
   a. Compatible, plastic "Y" or "T" connector, if available, may be used instead of side hole
2. Antiseptic skin cleanser
3. Large IV catheter:
   a. 12g or 14g (adult) or 14g or 16 g (pediatric)
4. 10-mL syringe (connect to the IV catheter)
5. ET tube adapter from a 3 Fr. or 3.5 Fr. ET tube, to fit into hub of the IV catheter after insertion
6. Oxygen tank with regulator with (as full as possible, to provide at least 50 psi)
7. Strip of ½" adhesive tape to secure the catheter in place

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)
1. **Contact BioTel as soon as possible** and maintain continuous ECG, SpO_2 and $PetCO_2$ monitoring
2. Position the patient supine and cleanse the skin with antiseptic:
   a. If C-spine injury is not suspected, dangling patient's head off the end of stretcher may facilitate anatomic landmark identification, especially in female patients
3. Palpate cricothyroid membrane in midline, between thyroid cartilage (Adam's apple) and cricoid cartilage
4. Stabilize larynx and trachea with non-dominant hand
5. Puncture skin with needle/syringe at midline, directly over the cricothyroid membrane
6. Insert the needle at a 45-degree angle toward the patient's feet while continuously withdrawing the syringe plunger to create negative pressure
7. **Aspiration of air into the syringe confirms entry into the tracheal lumen**
8. Remove the syringe and withdraw the needle, while simultaneously advancing the plastic catheter downward into position:
   a. Take care not to puncture posterior tracheal wall or to inadvertently withdraw the catheter itself
9. Loop a strip of ½" adhesive tape around the catheter hub and secure the ends of the loop to patient's skin:
   a. Avoid kinking or occluding the catheter
10. Secure oxygen tubing to the catheter hub, using the 3 Fr. or 3.5 Fr. ET tube connector, if needed
11. Provide INTERMITTENT ventilation – **1 second on, 4 seconds off**:
    a. Occlude the open hole in the tubing (or Y/T connector, if used) for 1 sec., then release for 4 sec.
    b. Repeat: 1 second "on", 4 seconds "off"; and so on
12. Monitor lung inflation, breath sounds, vital signs, ECG, SpO_2 and $PetCO_2$: watch for tension pneumo!

Complications:
1. Inability to oxygenate and/or ventilate, leading to hypoxia and death
2. Pneumothorax (including tension pneumothorax)
3. Subcutaneous or mediastinal emphysema
4. Laceration of trachea, thyroid gland or esophagus
5. Bleeding into skin, tissues or trachea

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Nasotracheal Intubation

Purpose: To provide an advanced airway for adult patients requiring definitive airway management for whom orotracheal intubation or extraglottic airway insertion is impossible or contraindicated
Inclusion Criteria: Adult patients at least 14 years of age
Exclusion Criteria: Pediatric patients less than 14 years of age
Refer to: Burns and other relevant CPGs; Airway Management – Adult; Airway Management – Pediatric

Indications:

1. Conscious, spontaneously breathing patients with intact gag reflex (e.g. COPD, asthma, burns)
2. Unconscious patients with GCS less than 8 due to trauma or medical conditions
3. Patients with possible C-spine injury whose injury may be worsened by neck movement

ABSOLUTE Contraindications:

- Apnea
- Age less than 14 years
- Severe midface congenital or traumatic deformity
- Nasal airway obstruction

RELATIVE Contraindications:

- Suspected basilar skull fracture (raccoon's eyes, Battle's sign, CSF leakage from ears or nose)
- Coagulopathy (e.g. hemophilia, liver disease)
- Anticoagulants (aspirin, heparin, Coumadin, DOACs)
- Acute hypertension
- Suspected elevated intracranial pressure

Equipment:

1. ET Tubes ½ to 1 size smaller than that for oral intubation (or a tube slightly smaller than patient's nostril)
2. Lidocaine jelly or sterile lubricant: if time permits, apply lidocaine jelly to an NPA and insert several minutes before NTI
3. Bag-mask device with high-flow oxygen
4. BAAM® "whistle-tip" device
5. 10 mL syringe
6. Soft suction catheter
7. $PetCO_2$ detection (preferably waveform capnography)
8. Tape or commercial tube holder

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)

1. Complete PAI Checklist as soon as possible
2. Prepare tube: wrap in circular shape for 1 minute and attach BAAM® device; lubricate tube
    a. If BAAM® unavailable: remove stethoscope bell & insert tubing into the ET tube for auscultation
3. Place the patient in "sniffing" position, ***IF C-SPINE TRAUMA IS NOT SUSPECTED***
4. Insert the tube straight back into the right nostril, parallel to the ground, anterior to posterior:
    a. Do not angle the tip upwards towards the skull, or downwards
    b. Insert with the tube bevel facing the nasal septum
    c. Use a slight back-and-forth rotation of the tube, if minor resistance is felt
    d. If significant resistance is encountered, remove the tube and insert into the opposite nostril
5. Once the tube tip reaches the pharynx, listen for breath sounds through the BAAM® device and observe for condensation in the tube
6. Advance the tube:
    a. Conscious patient: ask the patient to take a deep breath, and gently advance the tube during inhalation:
        i. Asking patient to protrude the tongue during this step reduces risk of esophageal insertion
    b. Unconscious patient: advance the tube during inhalation
7. Confirm tube placement:
    a. Patient coughs; condensation in the tube; $PetCO_2$ detection; conscious patient is unable to speak; auscultation of symmetrical, bilateral breath sounds; & stable/improving SpO_2
8. If tube placement is confirmed, advance the tube another 1-1½ inches and remove the BAAM® device
9. Inflate the cuff and secure the tube

Complications:

- Bleeding (common), nasal fracture, vomiting or aspiration; intracranial placement (theoretical)

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Needle Thoracostomy (Pleural Decompression)

Purpose: To provide emergency, out-of-hospital treatment for tension pneumothorax
Inclusion Criteria: Any patient with clinically confirmed or suspected **tension** pneumothorax
Exclusion Criteria: Hemodynamically stable patients with suspected **simple** pneumothorax
Refer to: Respiratory Distress; Shock; Trauma and other CPGs

Common clinical settings to *consider* possibility of tension pneumothorax:
1. Trauma (especially thoracic trauma, blast injury or traumatic cardiac arrest)
2. Asthma, COPD or any acute or chronic underlying lung disease
3. Cardiac arrest (especially PEA without other obvious case) or refractory bradycardia with poor perfusion
4. ANY patient on positive pressure ventilation (BVM or advanced airway)

Differential diagnosis:
- Massive hemothorax (dullness to percussion; no JVD; signs of hemorrhagic shock)
- Cardiac tamponade (symmetrical breath sounds & chest wall excursion; muffled heart tones)
- Right mainstem intubation (no hypotension/shock; no hyperresonance to percussion; no JVD)
- Simple pneumothorax (no hypotension/shock; no cyanosis; no resistance to assisted ventilation)

INDICATIONS – Suspected TENSION Pneumothorax:
1. SHOCK/HYPOTENSION
2. INCREASED RESISTANCE TO BAGGING **AND**
3. Severe respiratory distress
4. Decreased/absent breath sounds (affected side)
5. Poor chest wall excursion (affected side)
6. Hypoxia
7. Hyperresonance to percussion (affected side)
8. Pallor or cyanosis **AND**
9. JVD (may be absent if patient hypovolemic)
10. Tracheal deviation (hard to detect: palpation only!)

Equipment:
- Large, long, NON-needle-guard IV catheter**:
  a. Adult: 14 or 16 g.; preferably **at least 3½"** long
  b. Pediatric: 18 g, longest available
- Iodine or other germicidal skin cleanser
- **A commercial device may be used, if available (see next page)

Procedure: (Observe Body Substance Isolation Precautions and employ appropriate PPE)
1. For **ADULTS at least 14 years of age**, locate **STANDARD** anatomic landmarks:
   a. 2nd rescuer hold the arm or use soft restraint to position patient's arm above his/her head
   b. Anterior/mid-axillary line, 4th or 5th intercostal space, no lower than nipple line (male) or inframammary crease level (female)
   c. Chest wall is relatively thinner between the pectoralis and the latissimus dorsi muscles
2. Prep with betadine or similar antiseptic on affected side
3. Palpate 5th or 6th rib at anterior- or mid-axillary line (refer to Figure 1, below):

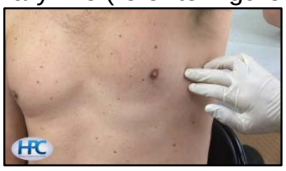

Figure 1

4. Insertion site: **anterior-/mid-axillary line, over the top of the 5th or 6th rib (4th or 5th intercostal space):**
   a. Refer to locations C and B, respectively, in Figure 2 below:

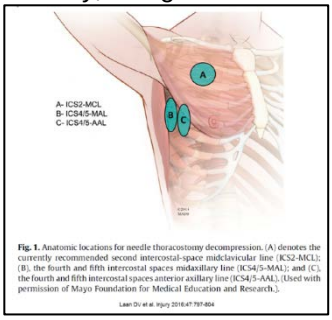

Figure 2

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5. Remove cotton plug from catheter and insert perpendicular to chest wall (do not angle the needle)
6. Listen and feel for "pop" and rush of air when needle enters the pleural cavity:
    a. Conscious patient: may report immediate relief of dyspnea
    b. Unconscious patient: may become easier to ventilate
7. Advance catheter over needle until catheter hub is flush with skin (do not advance the needle itself)
8. Withdraw and remove needle, leaving catheter in place
9. Reassess and document patient's clinical response, vital signs, SpO_2, $PetCO_2$, bilateral breath sounds, chest wall excursion, ease of "bagging" (if assisted ventilation), JVD and level of consciousness
10. Prepare for transport
11. Reassess frequently: tension pneumothorax may reoccur if catheter clots, kinks or becomes dislodged:
12. If this occurs, leave 1st catheter in place & insert a 2nd catheter adjacent to it, using same procedure

Alternate Site for Children Less Than 14 years of Age or When Standard Location Cannot Be Used:

1. Locate **ALTERNATE** anatomic landmarks:
    a. 2nd intercostal space at the midclavicular line (affected side) (Red **X** in Figure 3 below):

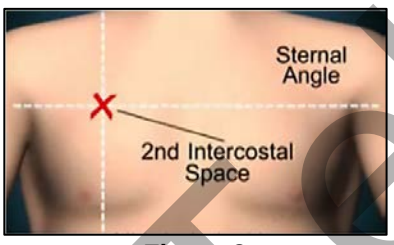

Figure 3

2. Prep insertion site on affected side with betadine or similar antiseptic
3. Palpate clavicle, then 2nd rib, then 3rd rib at mid-clavicular line (1st rib is not palpable) (**A** in Figure 4 below):

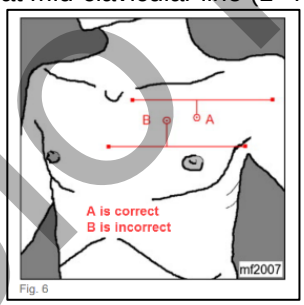

Figure 4

4. Insertion site: **mid-clavicular line, over the top of the 3rd rib (2nd intercostal space)**
5. Steps 5 through 12, as above

Possible Complications:

- Failure to relieve tension pneumothorax (failure rate as high as 50% in mid-clavicular location):
    - Common reasons: needle/catheter too short for chest wall thickness; incorrect insertion landmarks
    - Strongly consider performing procedure using ALTERNATE site on affected side
- Local bleeding (usually minor)
- Lung or blood vessel laceration

****Commercial pleural decompression devices:**

1. Use of such devices is restricted to Advanced Level Providers who have received specific, hands-on training on the device carried by their EMS agency and who are familiar with its insertion procedure:
    a. Follow manufacturer's recommendations, package insert and other official guidance
    b. For some products, mid-clavicular line, 2nd-intercostal space insertion site must be used
2. Indications, contraindications, anatomic landmarks, and possible complications are the same as for those using standard IV catheter

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Pharmacologically-Assisted Intubation (PAI)

OPTIONAL PROCEDURE (Not required for every agency)

Purpose: To provide an advanced airway before or during transport for patients requiring sedation, when standard methods are contraindicated, have failed, or may lead to delayed patient care
Inclusion Criteria: **Only paramedics specifically trained and authorized by the Medical Director shall perform this procedure.** **At least THREE rescuers are necessary to perform this procedure safely.**
Exclusion Criteria: No specific recommendations.
Refer to: Respiratory Distress and other CPGs; Airway Management – Adult; Airway Management – Pediatric

Indications:

1. Trauma with GCS less than 8 with intact gag reflex
2. Trauma with significant facial trauma and poor airway control
3. Burns with airway involvement (thermal or smoke)
4. Traumatic brain injury (TBI) or stroke requiring mild hyperventilation (RARE)
5. Severe asthma or COPD with hypoxia and impending respiratory failure
6. Overdose, with decreased respiratory drive and inability to protect the airway
7. Combative, agitated or confused patient needing definitive airway
8. Any other patient approved by BioTel Medical Control Physician

Special Notes:

- Rapid, focused neurologic exam must be documented before PAI for TBI or stroke patient
- Refer to the **PAI Checklist** for evaluation, documentation and preparation requirements

Contraindications:

- When any indication is present, there are no absolute contraindications

Procedure:

Three (3) Minutes Prior to Intubation:

1. **Pre-oxygenate and Prepare:**
   a. Allow patient to breathe 100% oxygen by NRBM (assist ventilation only if necessary)
   b. Ensure continuous ECG, SpO_2 and $PetCO_2$ monitoring are in place
   c. Ensure functional and secure IV (preferable) or IO access
   d. Assemble required equipment and personnel:
      i. **PAI Checklist**
      ii. Oral airway (OPA), suction, stethoscope, oxygen, ET tube (AND EGA (rescue)), stylet, laryngoscope, BVM, tape or commercial tube holder, 10-mL syringe, and C-collar
      iii. Pretreatment medications: atropine (if indicated); sedation medication(s)
      iv. **NOTE:** Two rescuers MUST confirm appropriate drug doses
      v. **NOTE:** At least 3 rescuers are necessary (1 to intubate, 1 for medication administration, and 1 for time-keeping and monitoring (and possible Sellick maneuver, if needed)

Two (2) Minutes Before Intubation – Infant (Less than 1 year of age) Premedication:

2. **Premedicate infants less than 1 year of age**:
   a. Atropine 0.02 mg/kg (0.2 mL/kg), if the patient is less than 1year of age and no contraindications

One (1) Minute Before Intubation – ADULT (at least 14 years of age) SEDATION:

3. **Sedate using ONLY ONE of these options for ADULTS at least 14 years of age:**

   a. OPTION 1: Etomidate 0.3 mg/kg slow IV/IO over 30 seconds, if available and no contraindications
      i. If sufficient sedation does not occur within three minutes, administer one additional dose of 0.1 mg/kg; maximum, total, cumulative dose: 0.4 mg/kg
   b. OPTION 2: Ketamine 2 mg/kg slow IV/IO **OR** 4 mg/kg IM, if available and no contraindications
   c. OPTION 3: Midazolam 2.5 to 5 mg slow IV/IO (maximum dose: 5 mg) **AND** Fentanyl 1 mcg/kg slow IV/IO (maximum dose: 200 mcg)

Pediatric dosing and additional steps on the next page…

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One (1) Minute Before Intubation – PEDIATRIC (less than 14 years of age) SEDATION:

Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions

4. **Sedate using ONLY ONE of these options for PEDIATRIC patients less than 14 years of age:**
    a. OPTION 1: Etomidate 0.3 mg/kg slow IV/IO over 30 seconds, if available and no contraindications
    b. OPTION 2: Ketamine 2 mg/kg slow IV/IO **OR** 4 mg/kg IM, if available and no contraindications
    c. OPTION 3: Midazolam **0.1 mg/kg** slow IV/IO (maximum dose: 5 mg) **AND** Fentanyl 1 mcg/kg slow IV/IO (maximum dose: **100** mcg)

Intubation Time:

5. **Perform orotracheal intubation within 30 seconds and inflate cuff:**
    a. If unsuccessful, ventilate with 100% oxygen and BVM, slow, steady ventilation: no hyperventilation!
    b. Abandon intubation attempt and ventilate with 100% oxygen if ANY of the following events occurs:
        i. Heart rate drops by 10 bpm below baseline; OR
        ii. SpO_2 drops by 10% points below baseline; OR
        iii. $PetCO_2$ rises by 5 mmHg above baseline
    c. If unable to intubate the trachea (defined as passage of the ET tube tip past the teeth), insert an approved extraglottic airway (EGA) device

Thirty (30) to Sixty (60) Seconds After Intubation:

6. Confirm tube placement with waveform capnography (4-phase waveform and PetCO2 at least 5 mmHg), auscultation (epigastrium and at least 4 lung fields), observation for chest rise and tube fogging, and steady/rising SpO_2
7. Secure tube and restrict patient's head movement with a cervical collar
8. Obtain an ECG rhythm strip, current vital signs and capnography waveform
9. Complete post-intubation portion of the **Advanced Airway Checklist**

During Transport:

10. Maintain continuous ECG, SpO_2 and $PetCO_2$ monitoring until patient care is transferred to E.D. personnel
11. If patient exhibits movement, coughing or other activity that might lead to tube dislodgement, administer:
    a. Midazolam 2.5 to 5 mg (adult) or 0.2 mg/kg (pediatric) IV/IO/IM/IN
        i. May repeat once after 15 minutes

    OR

    b. Ketamine 2 mg/kg IV/IO/IM (adult or pediatric)
        i. May repeat once after 10-15 minutes

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Respiratory Distress (Adult)

Goals: Timely recognition of respiratory distress; differentiation between upper and lower respiratory tract conditions vs. cardiovascular causes; prompt treatment to prevent deterioration and cardiorespiratory arrest
Inclusion Criteria: Adult patients with signs/symptoms of respiratory distress: tachypnea, dyspnea, increased work of breathing, stridor/wheezing, and/or signs of volume overload
Exclusion Criteria: Pediatric patients less than 14 years of age (refer to Respiratory Distress – Pediatric CPG)
Refer to: Airway Management – Adult, Allergic Reaction, Chest Pain, Burns, Toxic Chemical Exposure, Trauma and other, relevant CPGs; CPAP, Cricothyroidotomy, Nasotracheal Intubation, Needle Thoracostomy, and Pharmacologically-Assisted Intubation (PAI) Procedures

NOTES:

- EMS care of patients with respiratory distress hinges on timely recognition of the likely cause – upper airway vs. lower airway vs. cardiovascular illness or injury.
- In the setting of confirmed or suspected infectious illness, EMS Provider safety through the use of agency-specific infection control measures and EMS Provider PPE (including a HEPA or N95 respirator) is critical:
  - If fever plus respiratory symptoms are present, or for patients with coughing, sneezing or generation of airborne droplets, consider placing a HEPA or N95 mask (if tolerated) or a 100% NRB mask on the patient to reduce infection transmission.
- Emergency, initial treatment of respiratory distress under special conditions:
  - Suspected tension pneumothorax: ***immediate*** Needle Thoracostomy
  - Severe anaphylaxis with stridor/laryngospasm: ***immediate*** IM epinephrine, per Allergic Reaction CPG
  - Suspected blunt or penetrating airway trauma with obstruction: consider immediate Cricothyroidotomy
  - Status asthmaticus: ***immediate*** relief of bronchospasm (see below, Step 13):
    - Advanced airway placement: reserved for patients who do not respond to other measures.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT and to Airway Management – Adult:
   a. A (Airway): Ensure airway patency with positioning, suctioning and OPA or NPA, as needed
      i. If stridor is present, treat for anaphylaxis (Allergic Reaction CPG) or foreign body, as indicated
   b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring); assist ventilations with BVM, as needed:
      i. During initial evaluation and care, continue high-flow oxygen to maintain SpO_2 at least 94%
      ii. If STEMI, acute stroke, or TBI is suspected, or during post-cardiac arrest care with ROSC, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
      iii. If confirmed or suspected risk for hypercarbic arrest (e.g. COPD patient on home oxygen therapy) or if $PetCO_2$ rises or level of consciousness decreases in response to supplemental oxygen, titrate FiO_2 to maintain SpO_2 88-92%
      iv. If wheezing is present and there are no signs of volume overload or congestive heart failure, administer albuterol 2.5 mg via nebulizer, every 5 minutes, up to a total of 3 doses
   c. C (Circulation): Initiate continuous ECG monitoring
   d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
   e. E (Exposure/Environmental): Assess for cardiac or renal disease, overdose, sepsis, toxic chemical exposure and other etiologies; treat chest trauma according to the Trauma CPG
2. Positioning:
   a. If trauma is not suspected, position the patient in a position of comfort
   b. If shock is present, position patient supine (with legs elevated, if tolerated) or in the left lateral decubitus position, facing EMS Providers, if tolerated, in order to monitor and manage the airway
   c. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
4. Perform a SAMPLE history and focused secondary assessment
5. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

6. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    a. Anticipate the need and prepare for possible CPAP or advanced airway management (PAI, awake Nasal Intubation, supgraglottic airway/endotracheal intubation, or Cricothyroidotomy)
    b. Consider using PEEP Valve if no contraindications (refer to Airway Management – Adult)
7. Treat hemodynamically-significant dysrhythmias according to the relevant CPG
8. Establish IV (preferred) or IO access at TKO rate or with saline lock
    a. IV/IO access should be obtained BEFORE nitroglycerin administration, if possible
9. Assess breath sounds and for signs of cardiovascular causes of respiratory distress, and then proceed to **Step 10, Step 11, Step 12, OR Step 13,** based on the patient's history and physical examination

10. If **upper airway obstruction** is confirmed or suspected:
    a. Smoke inhalation/thermal airway burns: consider early advanced Airway Management (PAI or awake Nasal Intubation)
    b. Foreign body obstruction: perform BLS maneuvers to remove foreign body
    c. Anaphylaxis: treat according to the Allergic Reaction CPG
    d. Traumatic injury to upper airway: consider one attempt at oral advanced airway placement before proceeding to emergency Cricothyroidotomy

11. If **tension pneumothorax** is suspected, due to dyspnea, tachypnea, hypoxia, decreased breath sounds and decreased chest wall excursion on the affected side, accompanied by hemodynamic compromise and high airway resistance to assisted ventilation, proceed immediately to Needle Thoracostomy
    a. Tracheal deviation is a late, ominous sign that may be difficult to detect on physical examination

12. If **volume overload** is suspected (e.g. rales, JVD or peripheral edema; history of missed dialysis):
    a. Administer nitroglycerin 0.4 mg SL (as long as SBP is at least 100 mmHg)
        i. May repeat twice, as needed, if SBP remains above 100 mmHg
        ii. Consider small IV/IO fluid bolus (10 mL/kg, up to 500 mL) if hypotension develops
        iii. NOTE: Acquire 12-Lead ECG before NTG administration, if possible
    b. If no response, apply CPAP at 5 cm H_2O pressure, if available and if there are no contraindications
        i. If severe dyspnea, CPAP may be applied with the initial nitroglycerin therapy
        ii. If no response to CPAP, increase pressure to 10 cm H_2O
    c. If wheezing is also present, BioTel *may* authorize albuterol or other interventions:
        i. NOTE: Epinephrine and albuterol may worsen acute, severe pulmonary edema
    d. Transmit ASAP any 12-Lead ECG showing STEMI or to request consultation (3-lead strip is not sufficient)

13. If **wheezing is present <u>without</u> signs of volume overload:**
    a. Mild-moderate wheezing:
        i. Administer albuterol: 2.5 mg via nebulizer (may repeat every 5 minutes, up to 3 total doses)
        ii. If no response to 1st albuterol dose, add ipratropium 0.5 mg to the 2nd and 3rd nebulizer doses
    b. If severe respiratory distress or no response to inhaled bronchodilators:
        i. Apply CPAP at 5 cm H_2O pressure, if available and if there are no contraindications
    c. If no response to CPAP:
        i. Administer magnesium sulfate: 2 g in 100 mL Normal Saline IVPB over 15 minutes; AND
            1. BioTel must authorize for patients on kidney dialysis or with COPD
        ii. Administer methylprednisolone: 60 – 125 mg IV/IO/IM (optional medication) or dexamethasone 10 – 16 mg IV/IO/IM/PO (optional medication)
    d. If no response to the above measures, with impending respiratory arrest:
        i. Epinephrine (1 mg/mL): 0.3 – 0.5 mg (0.3 – 0.5 mL) IM, every 5 minutes, up to 3 total doses

13. If **status asthmaticus** or impending respiratory failure is present or develops, <u>simultaneously</u> administer:
    a. Albuterol 2.5 mg with ipratropium 0.5 mg via nebulizer every 5 minutes, up to 3 doses (as above)
    b. Epinephrine (1 mg/mL): 0.3 – 0.5 mg (0.3 – 0.5 mL) IM, if not already done (as above)
    c. CPAP at 5 cm H_2O, if available, increasing to 10 cm H_2O, as needed (as above)
    d. Magnesium sulfate: 2 g in 100 mL Normal Saline IVPB over 15 minutes (as above)
    e. Methylprednisolone 60-125 mg IV/IO/IM (as above)

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f. Consider advanced airway placement (extraglottic device or ET intubation) if other measures fail

14. Initiate transport with close monitoring of ABCs, unless specific non-transport criteria are met (see below*)
15. For additional assistance and Medical Control physician guidance, especially for patient refusals of transport, contact BioTel

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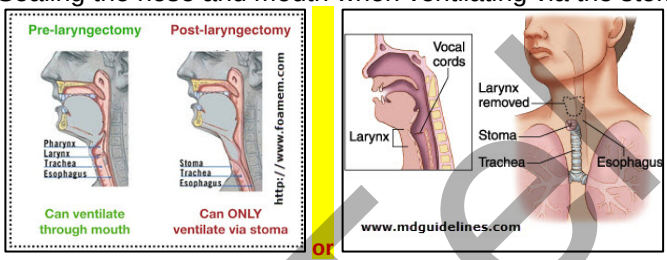
Tracheostomy and Stoma Care

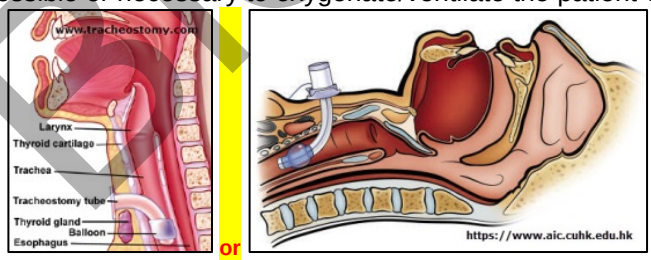
Goals: Adequate oxygenation and ventilation
Inclusion Criteria: Patients of all ages with a tracheostomy tube or laryngectomy stoma
Exclusion Criteria: Patients with neither a tracheostomy tube nor a laryngectomy stoma
Refer to: Airway Management – Adult, Airway Management – Pediatric, Respiratory Distress – Adult, and Respiratory Distress – Pediatric CPGs; Advanced Airway Checklist

DEFINITIONS:

- **Total laryngectomy:** Removal of the entire larynx, necessitating creation of a stoma in the front of the neck through which all oxygenation/ventilation occurs. There is NO continuity between the upper airways (nose and mouth) and the lower airways (trachea, bronchi and lungs). ALL oxygenation and ventilation must be performed via the stoma. Sealing the nose and mouth when ventilating via the stoma is not necessary.



- **Partial laryngectomy:** Removal of part of the larynx. In some cases, there may be continuity between the upper and lower airways. Sealing the mouth and nose when ventilating via the stoma might be necessary to prevent air leakage.
- **Tracheostomy stoma:** A surgical opening in the trachea through which the patient breathes, with or without a tracheostomy tube. There are many reasons for a tracheostomy – partial or complete laryngectomy is only one reason. Others include: upper airway obstruction due to trauma, surgery or birth defect; the need to clear secretions; and the need for long-term mechanical ventilation. In general, continuity between the upper and lower airways has been maintained (except in cases of total laryngectomy). As such, in certain, circumstances, it may be possible or necessary to oxygenate/ventilate the patient via the nose and mouth.



- **Tracheostomy tube ("Trach Tube"):** An artificial airway inserted through a tracheostomy stoma.

Patients, parents, family members and caregivers are usually trained in "trach care": ask for their help

Equipment and Supplies:

• Suction device	• Tracheostomy tape, ties or tube-holder
• Sterile suction catheters	• 5- or 10-mL syringe
• Supplemental oxygen	• Scissors
• Bag-mask device with adult and pediatric/infant masks	• Sterile Normal Saline
• Tracheostomy tube device (appropriately sized for the patient)	• Stethoscope
• Endotracheal tubes (adult and pediatric sizes)	• Sterile lubricant
•	• Laryngoscope handle and blades
•	• Sterile gauze

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Use appropriate PPE and Body Substance Isolation precautions, including eye protection, for ALL care

Procedure:

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT and Airway Management – Adult, or UNIVERSAL CARE – PEDIATRIC and Airway Management – Pediatric, as clinically indicated, with:
    a. Continuous ECG, SpO_2 and $PetCO_2$ monitoring
2. BVM Ventilation of the TOTAL laryngectomy patient:
    a. Positioning: Ensure "neutral" positioning of the head
    b. Remove secretions or mucus plugs from the stoma
    c. Ventilate "mask to stoma" using a round infant or child mask
    d. If unsuccessful, stomal intubation with an appropriately sized ET tube may be necessary (ALS only)
3. BVM Ventilation of the PARTIAL laryngectomy patient:
    a. Positioning: Ensure "neutral" positioning of the head
    b. Remove secretions or mucus plugs from the stoma
    c. Ventilate "mask to stoma" using a round infant or child mask
        i. It may be necessary to seal the patient's nose and mouth to prevent air leakage
    d. If unsuccessful, consider sealing the stoma and ventilating with a BVM via patient's nose and mouth
    e. If unsuccessful, stomal intubation with an appropriately sized ET tube may be necessary (ALS only)
4. BVM Ventilation via a TRACHEOSTOMY TUBE:
    a. Positioning: Ensure "neutral" positioning of the head
    b. Remove secretions or mucus plugs from the tracheostomy device
    c. For a double-cannula tracheostomy, the inner cannula must be in place
        i. Infants: Double cannulas are uncommon due to small airway size
    d. Connect the bag-valve portion of the BVM directly to the tracheostomy tube and assist ventilations:
        i. The BVM will not connect to a double-cannula tube whose inner cannula has been removed
    e. If bag-to-tracheostomy ventilation remains inadequate, proceed to troubleshooting for a possibly dislodged or occluded tracheostomy tube (see section 5 and/or section 6, below)
5. Troubleshooting for a DISLODGED TRACHEOSTOMY tube:
    a. Inspect and reinsert it, IF both the tube and the stoma are patent and/or can be cleared
6. Troubleshooting for a possibly OBSTRUCTED TRACHEOSTOMY tube:
    a. Except in cases of total laryngectomy, provide supplemental oxygen to the patient's nose/mouth
    b. Attempt to suction the tube using a portable suction machine:
        i. The caregiver may have suction catheters, equipment and supplies on-hand
        ii. Insert the suction catheter approximately 3.5 inches (9 cm) – do not suction during insertion
            a. A spare trach is the best guide to estimate suctioning depth (adult and pediatric)
        iii. Cover the suction port and suction for 3-5 seconds (no more than 10 seconds), slowly withdrawing the catheter in a circular motion:
            a. Monitor for bradycardia, especially in infants and young children
            b. Stop suctioning immediately and provide supplemental oxygen if bradycardia develops
        iv. Consider instilling up to 3 mL of Normal Saline (1-2 mL for infants and young children) into the tube in order to loosen secretions and reattempt suctioning
        v. Infants and young children: Use a small towel roll under the shoulders
    c. If suction equipment/catheters are not available, insert and then remove the tracheostomy tube obturator to try to clear the obstruction
    d. If unsuccessful, the obstructed tube must be removed and replaced with another device
    e. Connect a syringe to the tracheostomy tube pilot balloon, if present, and remove ALL air
        i. NOTE: cutting the balloon will NOT deflate the cuff
    f. Cut the ties or trach holder device and remove the old trach tube with one hand, using a slow, steady, outward motion
    g. Suction the stoma as needed
    h. GENTLY insert the new tracheostomy tube, if available:
        i. If a double-cannula tube, remove the inner cannula, clean it and then reinsert it or replace it
        ii. If replacing the inner cannula fails to relieve the obstruction, remove the outer cannula, as well, and replace BOTH
    i. If the new tube cannot be easily inserted, withdraw and reinsert:
        i. Use of a flexible suction catheter inserted as a guide into the trachea via the stoma may help to prevent creating a "false passage" in the soft tissues of the neck
    j. If unsuccessful, consider using a smaller tracheostomy tube, if available

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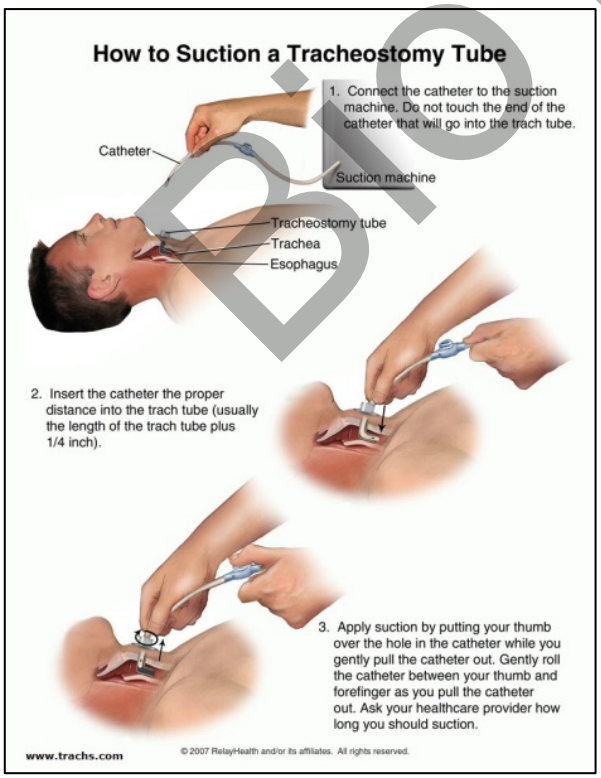
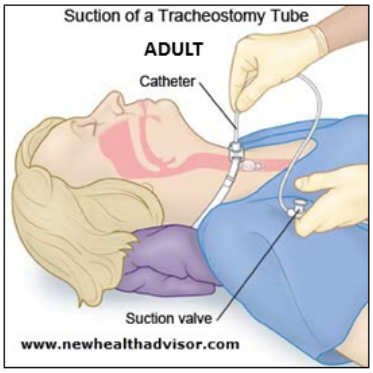
k. If the smaller tube is unavailable or cannot be inserted, attempt to insert into the stoma an appropriately sized endotracheal (ET) tube:
   i. Use of a flexible suction catheter inserted as a guide into the trachea via the stoma (without applying suction) may help to prevent creating a "false passage" in the soft tissues of the neck
   ii. Select a tube with an inner diameter equal to or smaller than the last tube
   iii. The tip should be aimed downward during insertion
   iv. Do NOT insert the tube more than 2 inches into the opening
   v. Do NOT cut the tube to shorten it

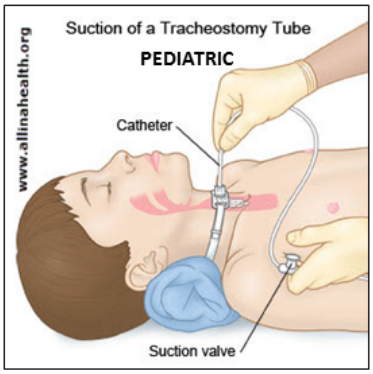
l. Confirm proper placement of ANY new or reinserted device per the Airway Management – Adult or Airway Management – Pediatric CPG and the Advanced Airway Checklist:
   i. Clues to improper placement:
      a. Resistance during insertion
      b. Insertion site bleeding
      c. Lack of chest rise with ventilation
      d. High resistance during assisted ventilation
      e. Subcutaneous emphysema (air in the soft tissues of the neck and chest)
      f. Lack of patient improvement

m. Once placement is confirmed, secure the tube in place

7. NEVER force a tracheostomy tube, ET tube or catheter into a stoma: If clearing, reinserting or replacing a tracheostomy tube is unsuccessful, initiate immediate transport to the closest hospital E.D.:
   a. Consider the following emergency ventilation procedures while en route:
      i. Orotracheal intubation (except in cases of total laryngectomy)
      ii. Ventilating the stoma directly, using a stoma mask (if available) or infant/child mask
      iii. Ventilating the nose/mouth with a BVM, while occluding the stoma with sterile gauze
   b. Notify BioTel and/or the receiving hospital as soon as possible, to expedite emergency care upon arrival







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✦ GENERAL MEDICAL

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Allergic Reaction

Goals: Timely recognition and treatment of potentially life-threatening reactions to known or suspected allergens in order to prevent cardiorespiratory collapse, shock or death; symptomatic relief for symptoms due to exposure to known or suspected allergens; and reduced incidence of "late phase" reaction
Inclusion Criteria: Patients of all ages with suspected allergic reaction
Exclusion Criteria: No specific exclusions
Refer to: Respiratory Distress and Shock CPGs

CRITICAL POINTS:

- ***Immediate*** **IM epinephrine dosing (auto-injector or syringe) is the #1 treatment priority for anaphylaxis**
- **Hypotension minutes to hours after exposure to a known allergen for that patient is all that is necessary to suspect anaphylaxis (Refer to Figure 1, below, for NIAID anaphylaxis diagnostic criteria)**

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency and assess for stridor; insert nasopharyngeal or oropharyngeal airway as needed; monitor vomiting patients for possible aspiration risk
    b. B (Breathing): Assist ventilations with supplemental oxygen (15 lpm) and BVM, as needed:
        i. Assess breath sounds
        ii. If wheezing, stridor or shock is present and advanced level providers are not present on-scene, administer any available epinephrine auto-injector (EA) or BioTel-approved BLS Epi kit:
            1. The EA should be injected into the muscle of the anterolateral, mid-thigh, holding the EA firmly against the skin for 3 seconds (or per manufacturer recommendations)
            2. Massage the injection site for 10 seconds and monitor for clinical response
            3. Repeat every 5-10 minutes, if needed (maximum 3 total doses) under ALS supervision
        iii. Administer supplemental oxygen to maintain SpO_2 of at least 94%
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG
    d. D (Disability): Assess and document GCS; and assess pupillary size and reactivity
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum
        ii. Reassess and document every 5 to 10 minutes in patients with significant instability
    e. E (Exposure/Environmental): Assess for flushing, hives and other skin signs of allergic reaction
        i. Isolate the patient from the source of the allergen, if possible
2. Positioning:
    a. Place a stable patient with minimal symptoms in a position of comfort; HOWEVER
    b. If there is evidence of respiratory distress or shock, treat the patient according to the Shock CPG
        i. **NOTE: Positioning patient in sitting position or change from supine to upright position is associated with sudden death in anaphylaxis**
3. Obtain SAMPLE history and detailed secondary physical examination, as time permits
4. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

5. Initiate continuous ECG and $PetCO_2$ monitoring, especially if respiratory distress or shock is present, anticipated or develops
6. Consider establishing IV/IO access at a TKO rate or use a saline lock if respiratory distress or shock is present, anticipated or develops
7. **Assess for anaphylactic reaction**, characterized by **acute onset of ANY** of these signs/symptoms (**Fig. 1**):
    a. **Minutes-hours after exposure to a KNOWN** allergen for that patient: **hypotension/shock; OR**
    b. **Two or more** of the following that occur rapidly after exposure to a **LIKELY** allergen for that patient:
        i. **Skin and/or mucosa:** Flushing, itching, hives or angioedema (swelling of lips/tongue)
        ii. **Respiratory:** dyspnea, wheezing/bronchospasm, stridor or hypoxemia
        iii. **BP or end-organ:** cardiovascular collapse, syncope or incontinence
        iv. **GI (especially in infants):** vomiting, cramping abdominal pain or diarrhea; **OR**

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c. **Acute onset** (minutes to hours) of an illness with these signs/symptoms:
   i. **Skin and/or mucosa:** Flushing, itching, hives or angioedema; **AND EITHER**
   ii. **Respiratory:** dyspnea, wheezing/bronchospasm, stridor or hypoxemia; **OR**
   iii. **BP or end-organ:** cardiovascular collapse, syncope or incontinence

8. If ***ANY*** of the above criteria are met, immediately administer IM epinephrine (approximately 0.01 mg/kg):

AGE (If weight is unknown)	WEIGHT (kg)	IM EPI DOSE (mL) 1 mg/mL (1:1,000)		EPINEPHRINE AUTO-INJECTOR (EA) Or Approved Epi Kit*
Less than 12 months	Less than 10	0.05 – 0.1 mL		No (Unless infant EA available)
12 to 23 months	10 – 11.9	0.1 mL	OR	Consider "Jr" if known weight is at least 10 kg
24 to 35 months	12 – 14.9	0.15 mL		
3 to 6 years	15 – 23.9	0.2 mL	OR	0.15 mg ("Jr") GREEN DEVICE
7 to 9 years	24 – 29.9	0.25 mL		
10 to 11 years	30 – 36.9	0.3 mL	OR	0.3 mg (Adult) YELLOW DEVICE
12 to 13 years	37 - 50	0.4 mL		
At least 14 years & adult	More than 50	0.5 mL		
NOTE: 2nd or 3rd dose might be needed – every 5-10 minutes – in 25-30% of patients NOTE: Consider adding glucagon for patients on beta-blockers (which may blunt response to epinephrine)				

NOTE: *EA or kit – if available – may be used by ALS Providers to expedite IM epinephrine administration

9. **In addition to epinephrine, administer IV/IO fluid bolus to patients with hypoperfusion or hypotension:**
   a. Any age patient: 20 mL/kg **(up to 1000 mL (1 L) per bolus)** Normal Saline IV/IO over 15 minutes
      i. **Repeat fluid bolus up to two more times (maximum 1 L per bolus), as needed**
      ii. Maximum, total fluid volume: 3 L (contact BioTel if additional fluid boluses are needed)

10. For **persistent cardiovascular collapse** (hypotension with altered mental status, pallor or poor perfusion) despite up to three doses of IM epinephrine and three fluid boluses, consider IV/IO **epinephrine infusion**:

Dose of Epinephrine	Epinephrine Strength	Added To	Final Concentration
For adults and teenagers at least 14 years of age:			
10 mL (1 mg)	0.1 mg/mL (1:10,000)	1000 mL Normal Saline*	1 *mcg*/mL
OR			
1 mL (1 mg)	1 mg/mL (1:1000)	1000 mL Normal Saline*	1 *mcg*/mL
ADULTS/TEENS: Use 10 gtt/mL drip set and refer to Epinephrine Formulary Sheet for dosing			
For infants and children less than 14 years of age:			
10 mL (1 mg)	0.1 mg/mL (1:10,000)	250 mL Normal Saline	4 *mcg*/mL
OR			
1 mL (1 mg)	1 mg/mL (1:1000)	250 mL Normal Saline	4 *mcg*/mL
Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions			
*** Refer to Epinephrine Formulary Sheets (here & here) for alternate instructions if 1-L NS is unavailable**			

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11. ALTERNATIVE: For **persistent cardiovascular collapse** (hypotension with altered mental status, pallor or poor perfusion) despite up to three doses of IM epinephrine and three fluid boluses, **ONLY in adults between 14 and 55 years of age**, *consider* dilute epinephrine IV/IO bolus:

Dose of Epinephrine	Epinephrine Strength	Added To	Final Concentration
1 mL (0.1 mg)	**0.1 mg/mL** (1:10,000)	**9 mL Normal Saline**	**10 *mcg*/mL**
Dosing: Administer 10 mL (0.1 mg) IV VERY SLOW PUSH OVER **5-10 MINUTES** (10-20 mcg/min) **NOTE:** This is 1/10th the adult dose of IV epinephrine administered during cardiac arrest			

    a. **Due to risk for adverse cardiac events, this should be used only if infusion cannot be used (e.g. if 250- or 1000-mL bags of Normal Saline are unavailable, or other operational limitation)**
12. For persistent wheezing unresponsive to IM epinephrine, consider albuterol 2.5 mg via nebulizer (any age):
    a. Monitor for clinical response and repeat up to two times, if needed (total number of doses = three)
13. For patients with anaphylaxis who are clinically improved **after IM epinephrine and fluids**, consider diphenhydramine for symptomatic relief (see step #14 and step #15, below)
14. For **adults with localized SKIN reaction ONLY** (e.g. hives, flushing, itching):
    a. Administer diphenhydramine 25 to 50 mg IM, IV or IO

15. **Pediatric patients less than 14 years of age with localized SKIN reaction ONLY:**
    a. Administer diphenhydramine 1 mg/kg (0.02 mL/kg) of 50 mg/mL formulation
        i. IM/IV/IO administration (Do not dilute): Administer 1 mg/kg (0.02 mL/kg)

16. There is no proven benefit to use of corticosteroids in acute management of allergic reaction/anaphylaxis:
    a. Adults: IV/IO methylprednisolone (or dexamethasone) may be considered, if transport time permits:
        i. Methylprednisolone 60-125 mg IM or slow IV/IO (over 2 minutes) (optional medication) **OR**
        ii. Dexamethasone 10 to 16 mg IM, IV/IO or PO (optional medication)

17. **Pediatric patients less than 14 years of age:**
    a. Consider optional corticosteroids, if transport time permits:
        i. Methylprednisolone: Refer to Formulary Drug Sheet or BioTel PEDI-Guide© (optional med); **OR**
        ii. Dexamethasone: 0.6 mg/kg IM, IV/IO or PO; maximum dose 16 mg (optional med)

18. **Patients with acute dystonic reaction** (e.g. oculogyric crisis (nystagmus), torticollis or facial grimacing) **due to neuroleptic drugs** (e.g. anti-psychotic medications, such as haloperidol or risperidone) **MUST be transported for assessment/treatment by a qualified medical provider in a medical facility**:
    a. Initiate on-scene treatment with diphenhydramine, as detailed in section #14 above
19. All patients with moderate or severe allergic reaction or anaphylaxis must be transported to a hospital E.D.:
    a. The incidence of late-phase (biphasic) reaction may be as high as 25% in patients with hypotension or airway obstruction during the initial reaction
    b. Even patients with less severe presentation may require counseling, diagnostic testing, or other treatment(s)
    c. EXCEPTION: patients with mild, skin-only allergic reaction responsive to diphenhydramine
20. For additional assistance and Medical Control physician guidance, contact BioTel

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Figure 1: Visual Representation of Anaphylaxis Criteria

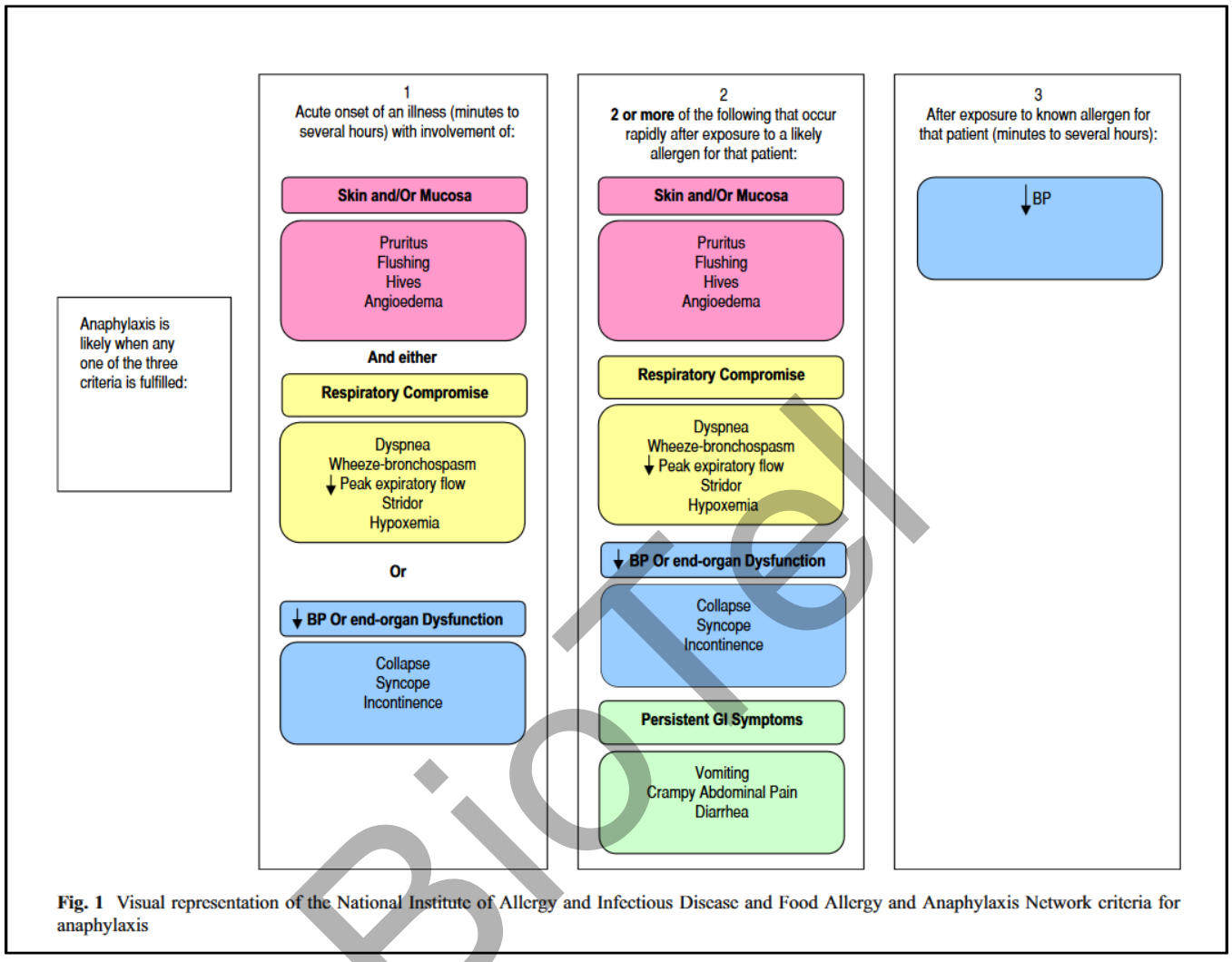

Fig. 1 Visual representation of the National Institute of Allergy and Infectious Disease and Food Allergy and Anaphylaxis Network criteria for anaphylaxis

(Source: Manivannan et al. Int J Emerg Med (2009) 2(1):3–5. https://dx.doi.org/10.1007/s12245-009-0093-z)

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Altered Mental Status (AMS)/CNS Depression

Goals: Identify treatable causes of altered mental status (AMS) and protect the patient from harm
Inclusion Criteria: Patients of all ages altered mental status, especially non-traumatic CNS depression
Exclusion Criteria: Patients with altered mental status due to Head Injury/Traumatic Brain Injury
Refer to: Bradycardia, Cold-Related Emergencies, Diabetic Emergencies, Head Injury, Heat-Related Emergencies, Poisoned Patient and Overdose, Seizure, Stroke, Toxic Chemical Exposure and symptom-specific CPGs; Transcutaneous Pacing Procedure; Custody, Evaluation/Transport, Destination Policies

NOTES:

- Life-threatening medical conditions can present as altered mental status (AMS) and CNS depression. These include: alcohol/drug intoxication, meningitis/encephalitis/sepsis, hypoglycemia, hypoxia, hypercarbic arrest in COPD, hypothermia, heatstroke, hypertension, head injury and intracerebral hemorrhage. *If suspected, refer to the respective, symptom-specific CPG.*
- For altered mental status (AMS) due to hypoglycemia, refer to the Diabetic Emergencies CPG
- **Administration of naloxone shall be restricted ONLY to patients with confirmed/suspected opioid overdose, CNS depression, hypoventilation or hypoxia, AND pinpoint pupils.**
- BLS Providers with documented training and written Medical Director authorization may administer naloxone
- Use of ammonia inhalants is not permitted in the BioTel system.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring) and assist ventilations as needed (avoid over-ventilation)
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG; initiate continuous ECG monitoring as soon as possible
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; assess for possible drug overdose and treat according to the Poisoned Patient/Overdose CPG:
        i. GCS evaluation (all ages): Response to pressure (not "pain") should be assessed by nail bed pressure, axillary skin fold pinch or trapezius muscle pinch; use of sternal rub is discouraged
    e. E (Exposure/Environmental): Assess for evidence of head injury and, if present, treat according to the Head Injury CPG; assess for Cold- or Heat-related Emergency and treat according to the appropriate CPG
        i. For fentanyl/related compounds: do NOT use alcohol-based hand cleansers/sanitizers for patient or EMS Provider decontamination/hand-washing if significant skin exposure:
            1. Soap and water are preferred to minimize risk of fentanyl absorption through skin
2. Positioning:
    a. If trauma is not suspected, position the patient in the position of comfort or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
    b. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
    b. Do not administer oral glucose to a patient who is unresponsive or unable to protect his/her airway – assist Advanced Level Provider with parenteral dextrose or glucagon administration
    c. If POC Glucose analysis is normal, then search for other causes of AMS
4. BLS Providers after documented training and with Medical Director authorization may administer naloxone:
    a. ADULTS at least 14 years of age: 0.4 mg IN or IM, under ALS Provider supervision, if available
    b. OR: 0.4 mg slow IVP or IO under ALS Provider supervision, if vascular access is present

c. PEDIATRIC patient less than 14 years of age:
i. Administer per section 10.b, below, under ALS Provider supervision, if available

5. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

6. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring
    a. Treat cardiac dysrhythmias per the symptom-specific CPG, especially the Bradycardia CPG
    b. Obtain 12-Lead ECG ASAP & transmit STEMI ECG or to request consultation
7. Establish IV/IO access at TKO rate; treat shock according to the Shock CPG
8. Initiate advanced airway management, as appropriate
9. If patient is hypoglycemic and oral glucose cannot be given, treat according to the Diabetic Emergencies CPG
    a. If patient becomes alert/oriented after dextrose/glucagon administration, do not administer naloxone
10. For confirmed or suspected **opioid** overdose (CNS depression, hypoventilation/hypoxia AND pinpoint pupils):
    a. ADULT patient at least 14 years of age:
        i. Administer naloxone 0.4 mg IN, slow IVP, IO or IM
        ii. If respiratory status does not improve or patient cannot maintain SpO_2 at least 94%, may repeat naloxone dose every 5 minutes, up to a maximum, total, cumulative dose of 2 mg

b. PEDIATRIC patient less than 14 years of age:
i. Administer naloxone 0.1 mg/kg IN, slow IVP, IO or IM (maximum single dose: 2 mg)
ii. If respiratory status does not improve or patient cannot maintain SpO2 at least 94%, contact BioTel for repeat dosing authorization

    c. If respiratory status or oxygen saturation does not improve after maximum cumulative naloxone dose, initiate advanced airway placement, continue care and initiate transport:
        i. **NOTE: Higher doses of naloxone may be needed in overdose with certain synthetic opioids, such as fentanyl, carfentanil and methadone**
        ii. Contact BioTel for additional naloxone dosing authorization
    d. Do NOT attempt to restore full consciousness in patients with evidence of chronic narcotic/opioid use:
        i. Titrate naloxone dosing only to adequate ventilatory status and SpO_2 at least 94%
    e. If patient does not respond to dextrose/glucagon and naloxone, consider other causes of AMS
    f. Nausea/vomiting associated with naloxone administration:
        i. ADULT at least 14 years of age: Consider ondansetron 4-8 mg IV/IO/PO (optional medication)

ii. PEDIATRIC patient less than 14 years of age:
A. Contact BioTel for possible ondansetron authorization
B. Dose: 0.1 mg/kg IV/IO/IN/PO (maximum single dose: 4 mg) (optional medication)

11. For confirmed or suspected **beta-blocker (BB) toxicity** (CNS depression, bradycardia, ± hypotension) – refer to Bradycardia CPG and:
    a. ADULT patient at least 14 years of age:
        i. Administer glucagon 1 to 2 mg IVP/IO/IM/IN
        ii. May repeat once after 20 minutes, if incomplete response
        iii. Consider Transcutaneous Pacing

b. PEDIATRIC patient unresponsive to assisted ventilation with 100% oxygen for 1 minute:
i. Begin CPR if heart rate is less than 60 bpm with signs of poor perfusion
ii. **One to 13 years of age:** administer glucagon 1 mg IVP/IO/IM/IN
iii. May repeat once after 20 minutes, if incomplete response
iv. **Less than 1 year of age:** administer glucagon 0.5 mg IVP/IO/IM/IN
v. May repeat once after 20 minutes, if incomplete response

12. For confirmed or suspected **calcium-channel blocker (CCB) toxicity** (CNS depression, bradycardia, ± hypotension) – refer to Bradycardia CPG and:
    a. ADULT patient at least 14 years of age:
        i. Administer 1 g (10 mL) of 10% calcium chloride slow IVP/IO over 10 min. (optional medication)
        ii. Consider Transcutaneous Pacing

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b. PEDIATRIC patient less than 14 years of age:
i. Administer 20 mg/kg (0.2 mL/kg) of 10% calcium chloride (maximum single dose: 1 g) slow IV/IO over 10 min. (optional medication) ii. MANDATORY: Contact BioTel as soon as possible after administration

13. For confirmed or suspected **tricyclic anti-depressant (TCA) toxicity** (CNS depression, bradycardia, ± hypotension) – refer to Bradycardia CPG and:
    a. ADULT and PEDIATRIC patient:
        i. Administer sodium bicarbonate 1 mEq/kg IV/IO with 20 mL/kg NS IV/IO over 10 minutes
        ii. May repeat once after 10-15 minutes, if incomplete response
14. For confirmed or suspected **organophosphate poisoning**, refer to the Bradycardia CPG
15. Initiate transport to an appropriate receiving hospital, according to the Destination Policy
    a. Contact BioTel and/or the receiving hospital while en route, to facilitate care
    b. Rigorous, detailed documentation must be performed, including periodic reassessment findings (e.g. vital signs, cardiac rhythm, SpO_2, $PetCO_2$, and neuro status)
16. For additional assistance and Medical Control physician guidance, especially for treatment of other confirmed or suspected drug toxicities, consult North Texas Poison Control Center through BioTel

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Diabetic Emergencies: Hypo- and Hyperglycemia

Goal: To aid EMS Providers in the recognition and care of symptomatic hypo- and hyperglycemia
Inclusion Criteria: All patients who are symptomatic with weakness, dizziness, confusion, disorientation, syncope or loss of consciousness due to a known or suspected diabetic emergency. These include: symptomatic hypoglycemia and hyperglycemia associated with suspected diabetic ketoacidosis (DKA) (common) or Hyperosmolar Hyperglycemic State (HHS) (less common)
Exclusion Criteria: Do not administer glucose/dextrose to a truly asymptomatic patient with abnormal POC glucose
Refer to: Altered LOC, Neonatal, Seizure, Sepsis, Shock, Stroke and other symptom-specific CPGs

Symptomatic Hypoglycemia

Hypoglycemia Definition (POC Glucose):

Age	Non-Diabetic	Diabetic
Adult (at least 14 years of age)	Less than 80 mg/dL	Less than 110 mg/dL
Pediatric (1 month to 13 years of age)	Less than 70 mg/dL	
Newborn under 1 month of age	Refer to Neonatal CPG	

NOTE: Never administer dextrose or glucose to a patient who is not hypoglycemic. If the POC glucose is normal in a patient with altered level of consciousness, search for alternative causes (refer to the Altered LOC CPG).

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Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. Initiate continuous ECG monitoring
2. Assess and document Glasgow Coma Scale (GCS) and neurologic exam (refer to Stroke CPG)
3. Positioning:
    a. Trauma not suspected:
        i. Position of comfort or left lateral position
        ii. If there is evidence of shock, position the patient supine with the feet elevated
    b. Trauma suspected:
        i. Refer to Spinal Motion Restriction Policy and Trauma CPG
    c. Closely monitor airway status and respiratory effort
4. Administer supplemental oxygen to maintain SpO_2 of at least 94%, with continuous monitoring
5. Perform and document a POC Glucose analysis
    a. Adult hypoglycemic patient who is responsive AND able to protect his/her airway:
        i. Administer 1 tube (15 g) oral glucose buccal or SL
        ii. If symptoms persist after 10 minutes, administer a 2nd tube (15 g) of oral glucose
        iii. Perform and document a repeat POC Glucose analysis and patient's response to treatment

b. **Pediatric (1 month to 13 years of age) oral (buccal) glucose dose:**
i. Patient should be sitting upright or in recovery position
ii. Infant (1 month to 1 yr of age; under 10 kg): 5 mL massaged into cheek pocket mucosa
iii. Child 1 to 3 yr of age; approximately 15 kg: approximately 7.5 mL, as above
iv. Child 3 to 5 yr of age; approximately 20 kg: approximately ¼ tube, as above
v. Child 5 to 7 yr of age; approximately 25 kg: approximately ½ tube, as above
vi. Child at least 7 yr of age; at least 30 kg: 1 tube, as above
vii. If symptoms persist after 10 minutes, repeat dose once
viii. Monitor clinical response and document a repeat POC Glucose analysis

6. Perform and document Secondary Survey and SAMPLE history
7. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

8. Establish IV/IO access if patient is hypotensive, in shock, unresponsive to oral glucose or unable to protect his/her airway
9. If an adult patient at least 14 years of age is hypoglycemic and mental status does not improve after oral glucose, **OR** if oral glucose could not be administered, administer 125 mL of D10W IV/IO over 10 minutes:
    a. Monitor for improved level of consciousness and resolution of symptoms
    b. Treatment options, **only if premixed D10W is unavailable**:
        i. **OPTION 1 (preferred):** Administer 125 mL of 10% Dextrose in NS (D10):
            1. Waste 50 mL from a 250-mL bag of NS and replace with 50 mL of D50
            2. Administer 125 mL (1/2 bag)
        ii. **OPTION 2:** Administer 50 mL of 25% Dextrose (D25) IV/IO:
            1. Waste 25 mL from a 50-mL prefilled syringe of D50 and replace with 25 mL of NS
            2. Administer the resulting 50 mL of D25

c. **Infant and Child (1 month to 13 years of age) dextrose dose:**
i. 2 mL/kg of D10W IV/IO over 10 minutes
ii. Treatment option if D10W is unavailable: Waste 40 mL per amp of D50 and replace with 40 mL of Normal Saline – administer 2 mL/kg
iii. Monitor for improved level of consciousness and resolution of symptoms

10. If level of consciousness and symptoms do not improve, administer one additional dose of 125 mL of D10W IV/IO over 10 minutes:
    a. Monitor for improved level of consciousness and resolution of symptoms
    b. Treatment options, **only if premixed D10W is unavailable**: As above, under Section 9.b

c. **Pediatric repeat dextrose dose:** As above, under Section 9.c

11. Consider glucagon (1 mg IM or IN) as *third-line* treatment for adults at least 14 years of age:
    a. ONLY if BOTH of the following conditions are met:
        i. Oral glucose cannot be administered due to patient's inability to protect his/her airway
        ii. ***AND*** reasonable attempts at both IV and IO access are unsuccessful
    b. Monitor for improved level of consciousness and resolution of symptoms
    c. May repeat once after 20 minutes

d. **Pediatric glucagon dose:**
i. Infants 1 month to 4 years of age: 0.5 mg IM or IN
ii. Children 5 years to 13 years of age: 1 mg IM or IN
iii. Monitor for improved level of consciousness and resolution of symptoms
iv. May repeat once after 20 minutes

12. For all patients treated for symptomatic hypoglycemia, perform and document a repeat POC glucose analysis:
    a. If normal and patient is improved, do not administer additional glucose, dextrose or glucagon
    b. If normal and patient remains symptomatic, search for other causes of altered mental status
    c. If hypoglycemia persists, consult BioTel for authorization for additional dextrose or glucagon dosing, and prepare for transport to an appropriate receiving facility
13. Monitor vital signs and GCS, and initiate transport
    a. *All patients treated for symptomatic hypoglycemia should be strongly encouraged to accept transport, especially elderly patients and those with cardiovascular and other comorbidities*
    b. **NOTE:** The following patients ***shall be*** transported to an appropriate receiving hospital:
        i. Patients treated by EMS for symptomatic hypoglycemia who take sulfonylureas, such as:
            3. Glipizide (Glucotrol®)
            4. Acetohexamide (Dymelor®)
            5. Chlorpropramide (Diabinese®)
            6. Tolbutamide (Orinase®)
            7. Tolazamide (Tolinase®)
        ii. Patients treated by EMS for symptomatic hypoglycemia with glucagon (IM or IN)
        iii. Those who refuse transport should be considered as refusing "Against Medical Advice" (AMA), for which appropriate documentation in the ePCR is required
14. For additional assistance and Medical Control physician guidance, contact BioTel

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Symptomatic Hyperglycemia (e.g. DKA and Hyperosmolar Hyperglycemic State)

Hyperglycemia Definition and Background:

- There is no standardized POC Glucose level to define symptomatic hyperglycemia. Confirmation of Diabetic Ketoacidosis (DKA) or Hyperosmolar Hyperglycemic State (HHS) requires in-hospital diagnostic testing. Definitive care for the underlying or precipitating cause likewise requires hospital evaluation.

- DKA may be the presenting clinical picture for children with previously undiagnosed Type I diabetes. Hyperosmolar Hyperglycemic State (HHS) is a life-threatening emergency in Type II (elderly) diabetics.

This CPG is intended to aid EMS Providers in the recognition and resuscitation of patients who may be suffering from acute, potentially life-threatening illness associated with extremely high POC Glucose levels.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. Initiate continuous ECG monitoring
    b. Assess for signs and symptoms of hypovolemic or septic shock (refer to Shock CPG)
2. Assess and document Glasgow Coma Scale (GCS) and neurologic exam (refer to Stroke CPG)
3. Positioning:
    a. Trauma not suspected:
        i. Position of comfort or left lateral position
        ii. If there is evidence of shock, position the patient supine with the feet elevated
    b. Trauma suspected:
        i. Refer to Spinal Motion Restriction Policy and Trauma CPG
    c. Closely monitor airway status and respiratory effort
4. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
5. Perform and document a POC Glucose analysis
6. Perform and document Secondary Survey and SAMPLE history

Advanced Level

7. Initiate continuous waveform capnography monitoring
8. Obtain and document POC lactate measurement, *if available*
9. Establish IV/IO access and administer Normal Saline 20 mL/kg **(maximum: 1000 mL (1L) per bolus)**
10. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
11. If hypoperfusion persists, administer 1 additional 20 mL/kg bolus **(maximum: 1000 mL (1L) per bolus)**
12. **Pediatric fluid resuscitation if DKA is suspected (even in absence of prior history of diabetes):**
    a. Contact BioTel for authorization **before** administering additional fluid after the initial bolus
13. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
14. If hypoperfusion persists after 2 fluid boluses (***1 bolus for pediatrics if DKA is suspected***), contact BioTel for further guidance
15. If cardiac arrest develops, consider administration of sodium bicarbonate (1 mEq/kg IV/IO)
16. Perform and document a repeat POC Glucose analysis and neurologic exam (including repeat GCS)
17. Treat suspected sepsis per Sepsis CPG and treat shock per Shock CPG
18. Initiate transport as soon as possible
19. For additional assistance and Medical Control physician guidance, contact BioTel

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Pain Management

Goals: Provide prompt, effective and safe pain relief due to a wide variety of acute injuries and medical illnesses commensurate with pain severity and patient's hemodynamic status; minimize risk of adverse reactions to EMS-administered analgesics
Inclusion Criteria: Patients in (acute) pain due to injury and illness, including pain due to sickle cell crisis
Exclusion Criteria: Acute ischemic chest pain (refer to Chest Pain CPG); active labor; care plan prohibiting use of parenteral analgesics by EMS; or allergy to available analgesics. Administration of analgesics to patients with chronic pain lacking a palliative/hospice care plan is discouraged, but not prohibited.
Refer to: Burns, Chest Pain, Hemorrhage Control/Tourniquet Use, OB/Gyn and Trauma CPGs

NOTES:

- Safe and effective acute pain management in the dynamic prehospital environment requires expertise in a range of pharmacologic and non-pharmacologic techniques, as well as sound clinical judgment.
- Recognition, documentation and adequate treatment of acute pain are critical EMS performance measures.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring)
    c. C (Circulation): Assess perfusion, including neurovascular status of injured extremities; initiate continuous ECG monitoring
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    e. E (Exposure/Environmental): Assess for trauma, pregnancy and other etiologies
2. Positioning:
    a. If trauma is not suspected, position the patient in a position of comfort, or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        i. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. **NOTE:** Diabetic Ketoacidosis (DKA) may present with abdominal pain mimicking an acute abdomen
4. Determine the patient's pain score using an age-appropriate standardized pain scale:
    a. Refer to the Standardized Pain Scales Resource at the end of this CPG
    b. ADULT and adolescent at least ***12*** years of age:
        i. Self-report Numeric Rating Scale (NRS)

c. PEDIATRIC patient 4 to 12 years of age:
i. Self-report scale (e.g. Wong-Baker FACES® Scale or Faces Pain Scale-Revised (FPS-R))
d. INFANT or CHILD less than 4 years of age:
i. Observational scale (e.g. FLACC or CHEOPS)

5. Obtain focused history about traumatic and medical causes for acute pain; menstrual history (abdominal pain in women of childbearing age – consider ruptured ectopic pregnancy); cardiovascular disease (consider: dissection or aneurysm); sickle cell disease; medication history; medication allergies; other pertinent history
6. If available, consider use of non-pharmaceutical pain management techniques, such as:
    a. Placement of patient in a position of comfort
    b. Application of cold packs and/or splints for pain secondary to trauma
        i. **NOTE:** Do not use traction splints for patients less than 14 years of age
    c. Dry, clean dressings to provide partial pain relief for minor, partial-thickness burns
    d. Verbal reassurance
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Continue ECG and SpO_2 monitoring until patient care has been transferred to hospital staff
    a. For sickle cell patient with hypoxia, chest pain and fever, consider acute chest syndrome
9. Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock or hypoperfusion

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10. Consider establishing IV/IO access at TKO rate:
    a. Provide fluid resuscitation as needed, according to underlying etiology: refer to Burns, Hemorrhage Control/Tourniquet, OB/Gyn, Shock, Trauma or other symptom-specific CPGs
    b. For adult or pediatric patient with acute, sickle cell, vaso-occlusive crisis ("VOC", aka "pain crisis"), administer 10 mL/kg NS (1 L maximum per bolus) and assess response:
        i. Contact BioTel to authorize additional fluid administration
11. For acute pain unrelieved by non-pharmaceutical methods, consider analgesic medications:
    a. **NOTE:** Elderly patient 65 years and older: administer ½ the usual dose & monitor for adverse effects
    b. **NOTE:** Contact BioTel before administering opioid analgesia if patient:
        i. Is debilitated or severely dehydrated;
        ii. Is hypoxic (SpO_2 less than 90%) or hypercarbic ($PetCO_2$ greater than 45 mmHg)
        iii. Has altered mental status (GCS less than 15); OR
        iv. Has SBP less than 90 mmHg (ADULT) or less than (70 mmHg + (2Xage (years)) (PEDIATRIC)
    c. ADULT at least 14 years of age:
        i. Fentanyl: 1 mcg/kg slow IVP/IO/IM/IN (maximum single dose: 100 mcg)
            1. May repeat once after 10 minutes, if incomplete response
            2. Do not exceed 200 mcg total, cumulative dose without BioTel authorization; **OR**
        ii. Morphine: 2 to 4 mg slow IVP/IO/IM
            1. May repeat every 10 minutes, if incomplete response
            2. Do not exceed 10 mg total, cumulative dose without BioTel authorization

c. PEDIATRIC patient less than 14 years of age (monitor for cardiorespiratory depression):
i. Fentanyl: 1 mcg/kg slow IVP/IO/IM/IN (maximum single dose: 100 mcg)
1. May repeat once after 10 minutes, if incomplete response
2. Do not exceed 200 mcg total, cumulative dose without BioTel authorization; **OR**
ii. Morphine: 0.1 mg/kg slow IVP/IO/IM (maximum single dose: 2 mg)
1. Do not exceed 4 mg total, cumulative dose without BioTel authorization

12. For moderate-severe pain *unrelieved by opioid analgesics*, and for use only by appropriately trained EMS Providers with Medical Director authorization, consider low-dose (LDK) ketamine as an *adjunct* analgesic:
    a. **NOTE:** The 100 mg/mL concentration of ketamine hydrochloride must **NOT** be injected IV or IO:
        i. ADULT: Consult Ketamine Drug Sheet for LDK dose dilution instructions
        ii. PEDIATRIC: Consult BioTel PEDI-Guide© for LDK dose dilution/reduction instructions
    b. **NOTE:** Be prepared for respiratory depression, laryngospasm or apnea; excessive salivation; hallucinations, agitation or emergence reaction; nausea or vomiting; tachycardia or hypertension
    c. ADULT at least 14 years of age:
        i. Low-Dose Ketamine (LDK) IN or IM: 0.4 mg/kg (maximum single dose: 40 mg)
            1. May repeat once after 15 minutes (max. single dose: 40 mg; max. total dose: 80 mg)
        ii. Low-Dose Ketamine (LDK) IV/IO: 20 mg in 100 mL NS over 15 minutes
            1. May repeat once after 15 minutes (max. single dose 20 mg; max. total dose: 40 mg)

d. PEDIATRIC patient less than 14 years of age:
i. Low-Dose Ketamine (LDK) IM/IN: Follow BioTel PEDI-Guide© LDK pediatric dosing guidelines
1. Maximum single dose: 40 mg; May repeat once after 15 minutes, if needed
ii. Low-Dose Ketamine (LDK) IV/IO: Follow BioTel PEDI-Guide© LDK pediatric dosing guidelines
1. Maximum single dose: 20 mg; May repeat once after 15 minutes, if needed

13. LDK may be considered as sole or primary analgesia (at doses above) **ONLY** if opioids are unavailable
14. **Detailed documentation of the patient's response to pain management interventions is a critical EMS performance measure (refer to the Standardized Pain Scales Resource on the next page)**
15. Consider ondansetron or promethazine to treat opioid-induced nausea/vomiting
16. Special circumstances (treat according to the applicable, symptom-specific CPG):
    a. Abdominal pain: Consider acute appendicitis/diverticulitis/pancreatitis or other infectious/inflammatory etiologies; leaking or ruptured abdominal aortic aneurysm; pregnancy-related complications; analgesia administration does not mask physical findings or delay diagnosis
    b. Atypical, non-traumatic chest pain: Consider aortic dissection, pulmonary embolism and other, non-ischemic etiologies
    c. Flank pain: Consider kidney stone, pyelonephritis
    d. Back pain: Consider dissection or aneurysm; herniated intervertebral disk
17. For additional assistance and Medical Control physician guidance, contact BioTel

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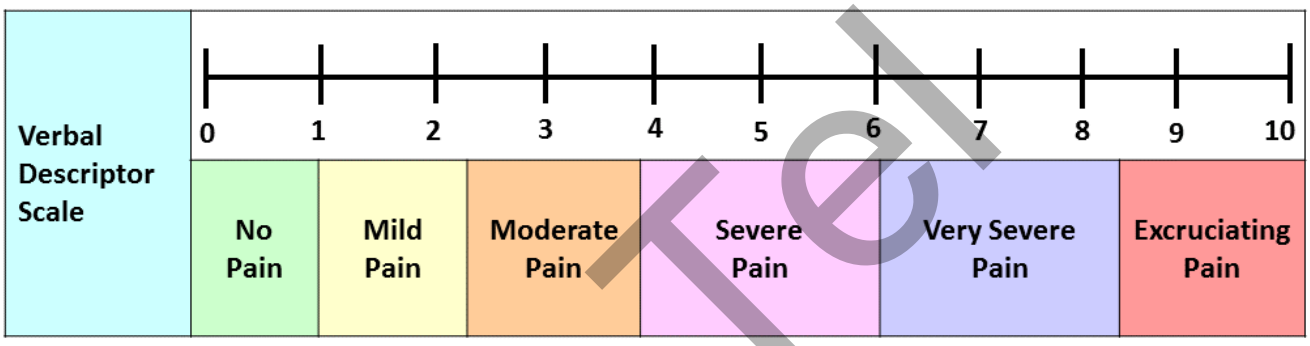
Standardized Pain Scales Resources

ADULT (at least 12 years of age)

Universal Pain Assessment Tools

Self-Report Numerical Rating Scale (NRS)



Descriptive, Observational Scale

Descriptive Scale	Alert, Smiling	No Humor, Serious, Flat	Furrowed Brow, Pursed Lips, Breath Holding	Wrinkled Nose, Raised Upper Lip, Rapid Breathing	Slow Blink, Open Mouth	Eyes Closed, Moaning, Crying

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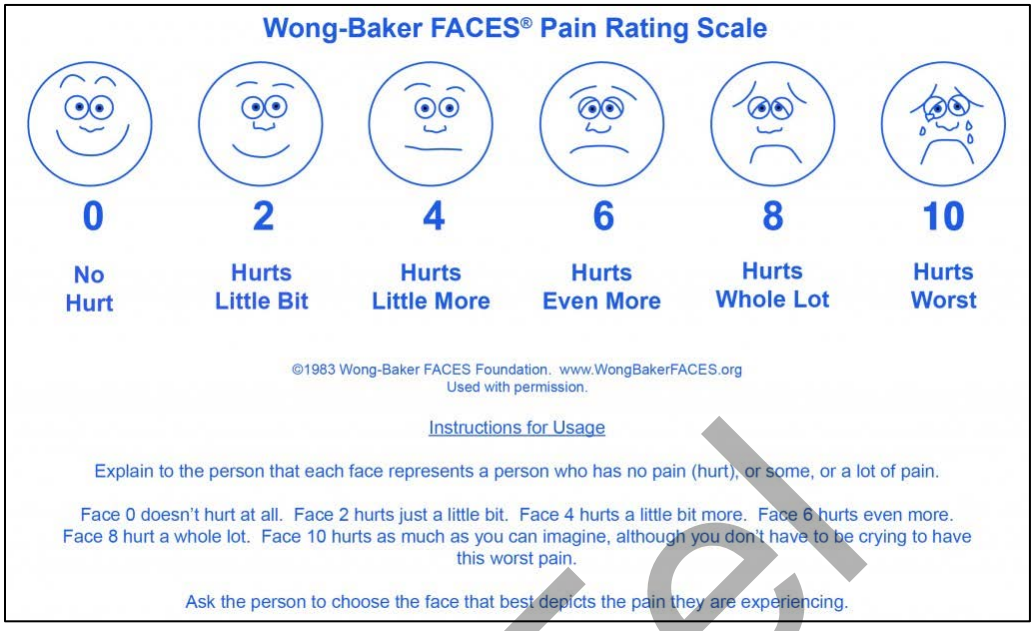
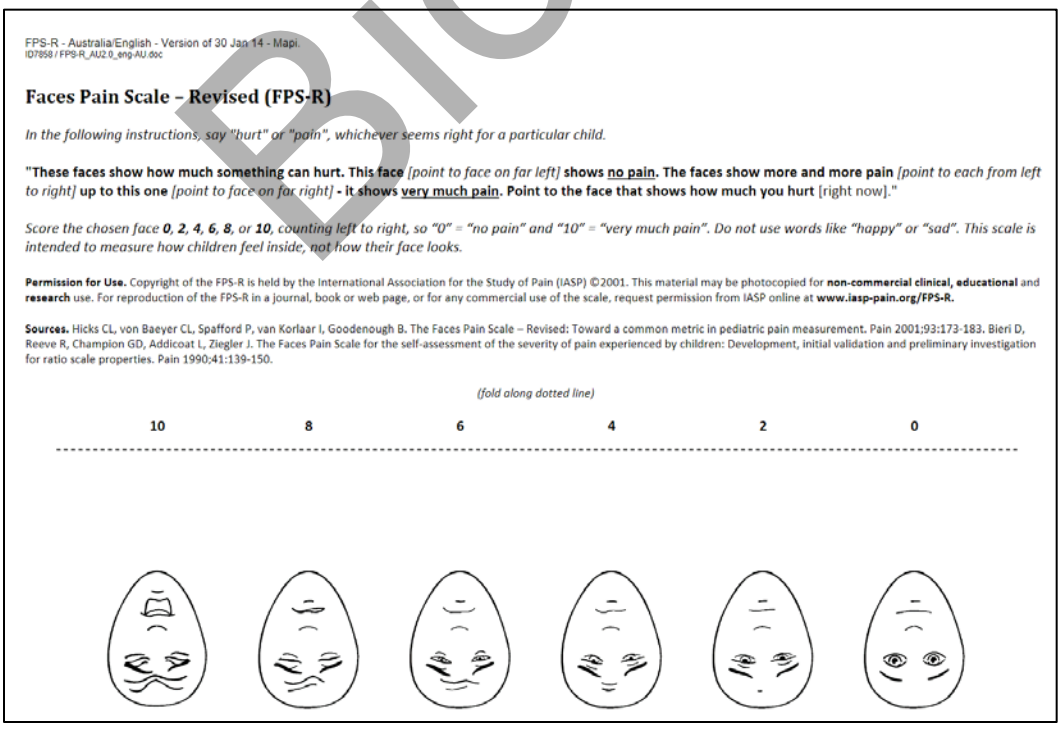
CHILD 4 to 12 years of age



Wong-Baker FACES Pain Rating Scale reproduced with permission from www.wongbakerfaces.org

OR



Faces Pain Scale-Revised (FPS-R) reproduced with permission from www.iasp-pain.org/FPSR

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INFANT and CHILD less than 4 years of age

Face, Legs, Activity, Cry, Consolability (FLACC) Pain Assessment Tool				
Categories	**Scoring**			**Category Score**
	0	**1**	**2**	
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin	
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up	
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking	
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints	
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to, distractible	Difficult to console or comfort	
			Total Score (Range = 0 to 10 points)	

Excerpted from: Merkel SI et al (1997) The FLACC: a behavioral scale for scoring postoperative pain in young children. Pediatr Nursing 23(3):293-297

Whenever feasible, behavioral measurement of pain should be used in conjunction with self-report. When self-report is not possible, interpretation of pain behaviors and decision-making regarding treatment of pain requires careful consideration of the context in which the pain behaviors were observed.

Assessment of behavioral score:

0 = Relaxed and comfortable

1 to 3 = Mild discomfort

4 to 6 = Moderate pain

7 to 10 = Severe discomfort/pain

OR

Children's Hospital of Eastern Ontario Pain Scale (CHEOPS)					
Parameter	**Scoring**				**Category Score**
	0	**1**	**2**	**3**	
Cry		No cry	Moaning or crying	Screaming	
Facial	Smiling	Composed	Grimace		
Child Verbal	Positive	None or complaints other than pain	Pain complaints or both pain and non-pain complaints		
Torso		Neutral	Shifting, tense, shivering, upright or restrained		
Touch		Not touching	Reach or touch or grab or restrained		
Legs		Neutral	Squirming, kicking, drawn up, tensed, standing or restrained		
				Total Score (Range = 4 to 13 points)	

McGrath PJ Johnson G et al (1985). CHEOPS: A behavioral scale for rating postoperative pain in children. Adv Pain Research Therapy. 9:395-402.

Assessment of score: Consider analgesia if score is 5 or more. (Tool available online at MDCalc.com: CHEOPS)

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Seizure

Goals: Prompt cessation of seizures in the prehospital setting; minimizing adverse events in prehospital seizure treatment; minimizing risk of seizure recurrence during transport
Inclusion Criteria: Seizure activity upon EMS arrival, new/recurrent seizure activity lasting > 5 minutes, or patients who are post-ictal upon EMS arrival
Exclusion Criteria: None
Refer to: Behavioral Emergencies/Excited Delirium, Diabetic Emergencies, Head Injury/TBI, Heat-Related Emergencies, Poisoned Patient/Overdose, OB/Gyn, Stroke, Toxic Chemical Exposure and Trauma CPGs

NOTES:

- Seizures are a non-specific manifestation of neurologic injury or disease, as either a primary condition or a secondary condition resulting from a wide range of abnormalities ("AEIOUTIPS").
- These include, among others: Alcohol/substance withdrawal, Epilepsy, Insulin (hypoglycemia), Overdose, "Underdose"/uremia, Trauma/tumor, Infection, Pregnancy, and Structural changes/stroke.
- Fever with seizure in children less than 6 months old or greater than 6 years old is NOT consistent with simple febrile seizure; E.D. evaluation is needed to exclude meningitis, encephalitis or other serious cause.
- Status epilepticus (seizures lasting more than 5 minutes, or 2 or more seizures without lucid interval) may cause a massive release of catecholamines, resulting in hypertension, tachycardia, dysrhythmias, hyperglycemia, hyperthermia, and/or acidosis from muscle rigidity and poor ventilation. The primary goal of EMS care is to stop the seizure.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and to Airway Management – Adult or Airway Management – Pediatric:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring); assist ventilations with BVM, as needed
    c. C (Circulation): Assess perfusion
    d. D (Disability): Assess and document GCS; assess nystagmus, pupillary size and reactivity
    e. E (Exposure/Environmental): Assess for trauma, overdose, sepsis and other etiologies; begin cooling measures, per Heat-Related Emergencies CPG, as needed
2. Positioning:
    a. If trauma is not suspected, position the patient in a position of comfort, or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        i. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer oral glucose to a patient who is unresponsive or unable to protect his/her airway – assist Advanced Level Provider with parenteral dextrose or glucagon administration
4. As soon as possible, obtain focused history about the current seizure; past medical history, such as: seizures/diabetes/trauma/pregnancy/toxin exposure; concurrent symptoms; anticonvulsant medications
5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

6. Initiate continuous ECG and $PetCO_2$ monitoring and continue SpO_2 monitoring until patient care has been transferred to hospital staff
7. Consider Advanced airway placement only if non-invasive measures (positioning, suctioning, OPA/NPA) are unsuccessful or to protect the airway in case of regurgitation/vomiting
8. Treat hypoglycemia according to the Diabetic Emergencies CPG:
    a. For a patient who is unable to tolerate oral glucose, IV/IO dextrose is the preferred treatment
    b. IM/IN glucagon is an alternative, only if reasonable attempts at vascular access are unsuccessful

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   c. Obtain 12-Lead ECG (Adult at least 14 years of age) ASAP & transmit STEMI ECG or to request consultation
9. If the patient is actively seizing upon EMS arrival or seizes again after EMS arrival, administer anticonvulsants as soon as possible:
   a. Generally, IM or IN route of administration is preferred
   b. IV or IO route of administration is not usually necessary for seizure treatment, but may be indicated for other reasons (e.g. fluid resuscitation for trauma/shock/heatstroke)
   c. Before benzodiazepine administration, prepare for assisted ventilation with 100% FiO_2 (especially in the pediatric patient)
   d. ADULT at least 14 years of age:
      iii. Midazolam 2.5 – 5 mg IM or IN (preferred) or IV/IO
      iv. May repeat once after 5-10 minutes, up to a maximum, total, cumulative dose of 10 mg; **OR**
      v. Diazepam 2.5 – 5 mg IV/IO (IM and IN routes are not recommended)
      vi. May repeat once after 5-10 minutes, up to a maximum, total, cumulative dose of 10 mg
      vii. Do not administer more than two doses of either medication without BioTel authorization

e. PEDIATRIC patient less than 14 years of age:
i. Appropriately sized BVM equipment must be available
ii. **IN Midazolam is the drug and route of choice**
iii. Infant 1 to 6 months of age: Midazolam 0.2 mg/kg IN (maximum dose 1 mg)
iv. Infant at least 6 months of age or child: Midazolam 0.2 mg/kg IN (max 5 mg)
v. Divide the IN dose between the two nostrils, if possible
vi. **ONLY if IN route is unavailable**, administer 0.2 mg/kg IV or IO (max 5 mg); no repeat
vii. **3rd-line treatment:** Diazepam 0.5 mg/kg per rectum (maximum dose 10 mg); no repeat
viii. Monitor closely for respiratory depression
ix. Contact BioTel if more than a single anticonvulsant dose is needed

10. Special considerations:
    a. Cyanide Toxicity: Refer to the Cyanide Exposure CPG
    b. Eclampsia:
       i. Consider eclampsia if 3rd-trimester pregnancy, within 48 hours of delivery, or up to 4-6 weeks post-partum (rare)
       ii. Assess for and treat other medical (e.g. hypoglycemia, hypoxia, toxic ingestion) and traumatic (e.g. head injury/traumatic brain injury) causes for seizure
       iii. Treatment of eclampsia consists of anticonvulsants AND magnesium sulfate (refer to OB/Gyn CPG), as well as emergency delivery of the fetus (if it occurs during 3rd-trimester of pregnancy)
    c. Head Injury/TBI: Refer to the Head Injury/TBI CPG
    d. Heatstroke: Refer to the Heat-Related Emergencies CPG
    e. Organophosphate Toxicity: Refer to the Toxic Chemical Exposure CPG
    f. Stimulant Toxicity/Excited Delirium Syndrome: Refer to the Behavioral Emergencies/Excited Delirium Syndrome CPG
    g. Stroke (rare in adults, somewhat more common in children): Refer to the Stroke CPG
11. Transport:
    a. All patients treated in the field for seizure/status epilepticus MUST be offered transport, especially those who received multiple anticonvulsant doses
    b. Hypoglycemic patients treated in the field for seizure should be transported, even if they return to baseline mental status after treatment
    c. All pediatric patients with seizures should be transported, especially those with fever and seizure
    d. All pregnant patients with seizures MUST be transported: contact BioTel and/or receiving hospital as soon as possible en route, to facilitate patient care
    e. If a patient or parent/guardian (pediatric patient) refuses to accept EMS transport, contact BioTel for further guidance and assistance
12. For additional assistance and Medical Control physician guidance, contact BioTel

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Sepsis

Goals: Timely recognition of sepsis, determination of poor prognostic indicators, and pre-hospital triage and care of the patient with possible sepsis to improve survival and minimize end-organ damage
Inclusion Criteria: All patients with a known or suspected infection source (history or clinical presentation) and abnormal vital signs suggestive of sepsis
Exclusion Criteria: None
Refer to: Shock CPG for additional guidance on evaluation and care of patients in septic shock

EMS Sepsis Alert (ADULTS at least 18 years of age)

EMS Providers shall initiate an "**EMS Sepsis Alert**" for the receiving hospital if **BOTH** criteria are met:

1. Known or suspected infection; AND
2. One or more of the following abnormalities (qSOFA score):
   a. New or worsened mentation (GCS less than 15) (e.g. confusion, agitation, lethargy or obtundation)
   b. Respiratory rate 22 breaths per minute or more
   c. SBP 100 mmHg or less

NOTE: Consider EMS Sepsis Alert even for patients who do not meet both criteria above IF: $PetCO_2$ less than 30 mmHg; age greater than 50 yr; HR greater than 100 bpm; nursing home residency; and/or history of fever

EMS Sepsis Alert (PEDIATRIC patients under 18 years of age)

EMS Providers shall initiate an "**EMS Sepsis Alert**" for the receiving hospital if **BOTH** criteria are met:

i. Known or suspected infection; AND
ii. One or more of the following (Pediatric SIRS criteria):
   a. Temperature greater than 38.5°C (101.3°F) or less than 36°C (96.8°F)
   b. Tachycardia or bradycardia* (for infant under 1 year of age)
   c. Tachypnea*

*Refer to age-specific vital signs chart under UNIVERSAL CARE – PEDIATRIC

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Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
   a. Initiate continuous ECG monitoring
   b. Obtain and document POC glucose measurement
2. Place the patient in a position of comfort
   a. If there is evidence of shock, position the patient supine with the feet elevated
   b. Closely monitor airway status and respiratory effort
3. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
4. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

5. Initiate continuous $PetCO_2$ monitoring
6. Obtain and document POC lactate measurement, *if available*
7. Establish IV/IO access and administer Normal Saline 20 mL/kg **(maximum = 1000 mL (1L) per bolus)**
   a. Fluid resuscitation should be initiated for suspected sepsis even if SBP is within normal range for age
8. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
9. If hypotension persists, administer 1 **additional** 20 mL/kg bolus **(maximum = 1000 mL (1L) per bolus)**
10. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
11. If hypotension persists, administer norepinephrine bitartrate infusion IV/IO at 4 to 10 mcg/minute
12. Treat symptomatic hypoglycemia per Diabetic Emergencies CPG
13. Initiate transport as soon as possible
    a. Notify BioTel and/or receiving hospital while *en route,* if patient meets "EMS Sepsis Alert" criteria
14. For additional fluid boluses, other assistance, or Medical Control physician guidance, contact BioTel

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Shock

Goals: Timely recognition of shock and the underlying cause thereof; early fluid resuscitation and/or other appropriate therapy to restore and preserve end-organ function
Inclusion Criteria: Signs/symptoms of poor perfusion and one or more possible shock etiologies
Exclusion Criteria: None – however, shock due to trauma should be managed per Trauma CPG
Refer to: Allergic Reaction, Bradycardia, Chest Pain, Head Injury/TBI, Poisoned Patient/Overdose, Sepsis, OB/Gyn, Tachycardia-Unstable and Trauma CPGs; EZ-IO® Insertion and Needle Thoracostomy Procedures

NOTES:

- The four basic categories of shock are: hypovolemic (hemorrhagic and non-hemorrhagic), cardiogenic, distributive/vasogenic (e.g. anaphylaxis, sepsis, neurogenic shock) and obstructive (e.g. tension pneumothorax, cardiac tamponade, massive pulmonary embolism).
- Patients may exhibit sign/symptoms of more than one type of shock.
- In most cases, the initial EMS treatment consists of IV/IO fluid resuscitation, EXCEPT for tension pneumothorax and certain hemodynamically-significant dysrhythmias.
- Improved level of consciousness and perfusion are more important than a target SBP endpoint alone.
- In all cases, rapid transport to a hospital E.D. with appropriate capabilities is critical for best patient outcome.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and to Airway Management – Adult or Airway Management – Pediatric:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as needed
    b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring); assist ventilations with BVM, as needed
    c. C (Circulation): Initiate continuous ECG monitoring
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    e. E (Exposure/Environmental): Assess for trauma, overdose, sepsis and other etiologies; cover the patient to prevent heat loss or begin cooling measures, per Heat-Related Emergencies CPG
2. Positioning:
    a. If trauma is not suspected, position the patient supine (with legs elevated, if tolerated) or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        i. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
4. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

5. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    a. If STEMI, acute stroke, or TBI is suspected, or during post-cardiac arrest care with ROSC, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
    b. If etiology is unknown, continue high-flow oxygen to maintain SpO_2 at least 94%
6. Treat hemodynamically-significant dysrhythmias according to the relevant CPG
7. Establish at least one large-bore peripheral IV (preferred) or IO
8. Infuse Normal Saline according to the following guidelines:
    a. **Hypovolemic shock (NON-TRAUMA) – All patients:**
        i. Administer 20 mL/kg IV/IO (1 L maximum per bolus)
        ii. Repeat up to two more times, as needed, to maintain radial pulse or SBP 90 mmHg

iii. PEDIATRIC patient less than 14 years of age: Target = radial pulse or SBP 70 mmHg
1. Discontinue fluid administration if signs/symptoms of volume overload develop
2. If DKA is suspected, administer ONLY 1 fluid bolus and contact BioTel

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b. **Hypovolemic shock (TRAUMA) – All patients:**
   i. Refer to the Trauma CPG and Head Injury/TBI CPG for specific guidelines
c. **Cardiogenic shock due to dysrhythmia, myocardial ischemia or other "pump failure":**
   i. Treat Chest Pain and hemodynamically significant dysrhythmias, per the relevant CPG
   ii. ADULT at least 14 years of age:
      1. Administer a single 10 mL/kg NS bolus IV/IO, if no signs of pulmonary edema
      2. Consider repeating once, while preparing vasoactive infusion, if no signs of pulmonary edema
      3. Consider norepinephrine infusion at 4 to 10 mcg/min, if no response to fluid bolus(es)
      4. Consider dopamine infusion at 5 to 20 mcg/kg/min (2nd-line, if norepinephrine unavailable)

iii. PEDIATRIC patient less than 14 years of age:
1. Run IV/IO fluid at TKO rate
2. Contact BioTel for vasopressor dosing and possible fluid bolus (5-10 mL/kg)
3. Refer to BioTel PEDI-Guide© for dilution, dosing and infusion rate instructions

d. **Addisonian Crisis due to adrenal insufficiency – All patients:**
   i. Suspect if medical alert bracelet/device or history provided by family members; chronic steroid use; congenital adrenal hyperplasia; or Addison's disease
   ii. Administer 20 mL/kg IV/IO (1 L maximum per bolus)
   iii. Repeat up to two more times, as needed, to maintain radial pulse or SBP 90 mmHg

iv. PEDIATRIC patient less than 14 years of age: Target = radial pulse or SBP 70 mmHg
1. Discontinue fluid administration if signs/symptoms of volume overload develop

   v. Administer corticosteroid IV/IO/IM (e.g. methylprednisolone or dexamethasone (optional medications)), if available (consult BioTel for dosing assistance)
e. **All other types of shock, EXCEPT tension pneumothorax – All patients:**
   i. Administer 20 mL/kg IV/IO (1 L maximum per bolus)
   ii. Repeat up to two more times, as needed, to maintain radial pulse or SBP 90 mmHg
   iii. Discontinue fluid administration if signs/symptoms of volume overload develop

iv. PEDIATRIC patient less than 14 years of age: Target = radial pulse or SBP 70 mmHg
1. Discontinue fluid administration if signs/symptoms of volume overload develop

   v. Refer to Allergic Reaction, OB/Gyn, Poisoned Patient/Overdose, Sepsis and other symptom-specific CPGs for specific treatment guidelines for those conditions
e. **Tension pneumothorax with obstructive shock – All patients:**
   i. Presentation: respiratory distress, tachypnea, hypoxia, hypotension or PEA, decreased/absent breath sounds and chest wall excursion on affected side, and "hard to bag"
   ii. IV/IO fluid bolus does not treat the underlying cause and is not indicated unless there are other indications (e.g. hemorrhagic shock) present AFTER pleural decompression
   iii. Perform Needle Thoracostomy as soon as possible and monitor for clinical improvement
   iv. Contact BioTel as soon as possible
9. Continuously monitor vital signs, ECG, SpO_2, $PetCO_2$ and neurologic status during transport
10. For additional assistance and Medical Control physician guidance, contact BioTel

Final

Vomiting

Goals: To decrease discomfort due to nausea and vomiting
Inclusion Criteria: Patients of all ages who are currently nauseated and/or vomiting (prolonged vomiting prior to EMS arrival or actively vomiting after EMS arrival)
Exclusion Criteria: No specific exclusions
Refer to: Symptom-specific CPGs and to Ondansetron and Promethazine Drug Sheets

Observe Body Substance Isolation Precautions and employ appropriate PPE

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A and B (Airway and Breathing): Monitor closely for aspiration risk, especially in obtunded patients
    b. C (Circulation): Assess for evidence of shock/hypoperfusion
    c. D (Disability): Assess and document GCS; and assess pupillary size and reactivity
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum
        ii. Reassess and document every 5 to 10 minutes in patients with significant injury or instability
    d. E (Exposure/Environmental): Assess for underlying cause of vomiting, especially gastrointestinal, cardiovascular (e.g. myocardial ischemia) and obstetrical/gynecological conditions
2. Positioning:
    a. Position patient to minimize risk of pulmonary aspiration (consider "recovery" position: lateral decubitus, facing EMS Providers)
    b. If there is evidence of shock, treat the patient according to the Shock CPG
3. Administer supplemental oxygen, as needed, to maintain SpO_2 of at least 94%, with continuous monitoring
4. Obtain SAMPLE history and detailed secondary physical examination, as time permits
5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

6. Initiate continuous ECG and $PetCO_2$ monitoring if respiratory distress or shock is present or develops
7. If signs/symptoms of dehydration or hypoperfusion, establish IV/IO access and administer Normal Saline:
    a. Adult and pediatric patients: 20 mL/kg (up to 1000 mL maximum per bolus)
    b. Monitor for clinical response
    c. May repeat once, if NO history of congestive heart failure, renal failure or age greater than 65 years
8. For persistent vomiting despite fluid resuscitation, consider anti-emetic medication:
    a. EMS agencies are not required to carry both medications and may carry only one or the other
    b. Adults at least 14 years of age:
        i. Ondansetron HCl: 4 to 8 mg SLOW IV or IO over 1 minute (preferred); or IM; **OR**
        ii. Ondansetron (Zofran®) ODT: 4 to 8 mg ODT orally if patient is NOT actively vomiting; **OR**
        iii. Promethazine 12.5-25 mg IM **ONLY** (do **NOT** administer IV)
        iv. Do NOT administer more than one drug OR more than one dose to any patient
        v. Do NOT administer Ondansetron during known or suspected 1st-trimester pregnancy

c. Infants and children under 2 years of age: Do NOT administer anti-emetic medication
d. Children 2 to 4 years of age: Contact BioTel for possible ondansetron authorization if unresolved vomiting despite fluid resuscitation
e. Children 5 to 13 years of age: Consider ondansetron (refer to BioTel PEDI-Guide©)
i. 0.15 mg/kg (maximum dose 4 mg) slow IV or IO over 1 minute **(not IM)**; **OR**
ii. Ondansetron (Zofran® ODT) tablet if patient is NOT actively vomiting:
1. Children 5 to 13 years of age and at least 19 kg: 4 mg ODT
A. One full 4-mg ODT **OR** ½ of an 8-mg ODT
iii. Do NOT administer more than one dose to any patient

9. Monitor patients who have received anti-emetics for dystonic reaction (refer to Allergic Reaction CPG) and for adverse cardiac effects (e.g. prolonged QT interval, bradydysrhythmias)
10. For additional assistance and Medical Control physician guidance, contact BioTel

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Amputated Body Part

Goals: To minimize blood loss, reduce the risk of hemorrhagic shock and enhance the chance of salvage of the amputated body part
Inclusion Criteria: Patients of all ages with traumatic amputation of one or more body parts, including the distal phalanx of fingers or toes
Exclusion Criteria: No specific exclusions
Refer to: Hemorrhage Control/Tourniquet, Pain Management, Shock and Trauma CPGs; Destination Policy

Observe Body Substance Isolation Precautions and employ appropriate PPE

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC and according to the Trauma CPG:
    a. A and B (Airway and Breathing): Assess and support, as needed
    b. C (Circulation): If signs and symptoms of shock, minimize scene time and continue treatment en route
    c. D (Disability): Assess and document GCS; and assess pupillary size and reactivity
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum
        ii. Reassess and document every 5 to 10 minutes in patients with significant injury or instability
    d. E (Exposure/Environmental): Assess for other injuries and take measures to prevent heat loss
2. Positioning:
    a. Initiate Spinal Motion Restriction, if indicated, per Spinal Motion Restriction Policy
    b. If spinal injury is not suspected, place the patient in a position of comfort
    c. If there is evidence of shock, treat the patient according to the Shock CPG
3. Administer supplemental oxygen, as needed, to maintain SpO_2 of at least 94% with continuous monitoring
4. Hemorrhage Control – Extremity (refer to Hemorrhage Control/Tourniquet CPG):
    a. Direct wound pressure is unlikely to fully control stump bleeding above the wrist or ankle
    b. Apply an EMS agency-approved medical tourniquet to the proximal stump, per the CPG
        i. Endpoints: Cessation of hemorrhage and (in the case of partial amputation) loss of distal pulse
        ii. Moist sterile dressings may be applied to the stump, but avoid bulky dressings that may conceal ongoing or renewed bleeding
        iii. IMPORTANT: Document the time of tourniquet application in the ePCR
        iv. Manage improvised tourniquets applied by bystanders/non-medical personnel per the CPG
5. Hemorrhage Control – Other Body Part (refer to Hemorrhage Control/Tourniquet CPG):
    a. Control obvious external hemorrhage with direct pressure and sterile gauze/dressing materials
6. Care of the Amputated Part:
    a. Remove gross contaminants by rinsing with Normal Saline
    b. Wrap in Normal Saline-moistened (but not soaking wet) sterile gauze
    c. Place in a watertight plastic bag or container (if available)
    d. Seal the bag or container tightly and place in a larger container or cooler of ice water, if available
    e. Do NOT allow the amputated part to freeze or to become soaked in water or Normal Saline
    f. Bring all amputated parts to the hospital, regardless of the patient's overall condition
        i. If the amputated part cannot be immediately located, transport the patient and instruct other field providers to search for and transport the part as soon as possible
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Consider establishing IV/IO access at a TKO rate or with a saline lock and treat shock per Shock CPG
9. Initiate continuous ECG and $PetCO_2$ monitoring if shock is present, anticipated or develops
10. Administer parenteral analgesia according to the Pain Management CPG
11. Initiate transport as soon as possible to an appropriate hospital E.D., per the Destination Policy
12. For additional assistance and Medical Control physician guidance, contact BioTel

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Burns: Thermal, Electrical and Chemical

Goals: To minimize tissue damage and patient morbidity due to thermal, electrical and chemical injuries, and due to inhalation injury
Inclusion Criteria: Patients of all ages with thermal, electrical or chemical burns
Exclusion Criteria: No specific exclusions
Refer to: Carbon Monoxide Exposure, Cyanide Toxicity, Eye Injury, Hemorrhage Control/Tourniquet, Pain Management, Shock, Toxic Chemical Exposure and Trauma CPGs; Destination Policy

CRITICAL POINTS:
- Hypotension in the setting of thermal burns suggests other traumatic injuries (e.g. blast, fall, assault).
- Airway management, pain management and heat loss prevention are the key interventions.

Observe Body Substance Isolation Precautions and employ appropriate PPE

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC and according to the Trauma CPG:
    a. A and B (Airway and Breathing): Look closely for evidence of inhalation injury (e.g. hoarseness, stridor, sooty sputum, facial burns, or singed nasal/facial hair) and be prepared for early and aggressive **airway management**, especially if history of closed-space thermal injury
        i. Monitor closely for swelling and other causes of airway/respiratory compromise
    b. C (Circulation): Control obvious external hemorrhage, per Hemorrhage Control/Tourniquet CPG
    c. D (Disability): Assess and document GCS; and assess pupillary size and reactivity
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum
        ii. Reassess and document every 5 to 10 minutes in patients with significant injury or instability
        iii. Remove contact lenses, if possible, especially for facial burns or chemical exposure
    d. E (Exposure/Environmental): Assess for other injuries and remove restricting items/clothing:
        i. Remove and secure any jewelry, belts, shoes and other items from burned areas
        ii. Remove burned or singed clothing that is not stuck to the skin
2. Positioning:
    a. Initiate Spinal Motion Restriction, if indicated, per Spinal Motion Restriction Policy
    b. If spinal injury is not suspected, place the patient in a position of comfort (for facial burns, slight head elevation is preferable)
    c. If there is evidence of shock, treat the patient according to the Shock CPG
3. Administer supplemental oxygen, as needed, to maintain SpO_2 of at least 94% with continuous monitoring
4. Initiate burn care measures and steps to **prevent heat loss**:
    a. Thermal injury: Apply clean, dry sheet and thermal blanket (if available)
    b. Chemical injury: Brush off dry chemical and flush with water to remove residual chemical
5. SAMPLE history and detailed, secondary physical examination, as time permits
6. Initiate transport as soon as possible (refer to Burn Center Transport Criteria in Table 1, below)
7. Once advanced level care arrives on scene, give report and transfer care

Table 1: Patients Requiring Transport to a Burn Center

• Burns greater than 10% TBSA, regardless of depth • Burns of face, eyes, ears, hands, feet, genitalia, perineum or involving major joints • Full-thickness (3rd-degree) burns of any size in any age patient • Electrical burns, including lightning injury • Chemical burns	• Inhalation injury (including smoke inhalation) • Burns associated with other traumatic injuries (e.g. fractures) • Burns in patients with pre-existing medical conditions or comorbidities (e.g. elderly, immunocompromised, diabetic, respiratory conditions, cardiac history, etc.) • Burns in patients needing special social, emotional or rehabilitative intervention

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Advanced Level

8. Initiate continuous ECG and $PetCO_2$ monitoring for all patients meeting Burn Center transport criteria
9. Consider toxicologic exposure (CO, cyanide, other toxic chemicals) and treat per the relevant CPG
10. Establish large-bore IV/IO access, preferably in an uninjured extremity:
    a. Vascular access may be obtained in an extremity with thermal burns, but it may be difficult to secure because standard tape and dressings will not adhere well
    b. Initiate fluid resuscitation to maintain adequate perfusion (Lactated Ringers preferred, if available)
    c. If the thermal burn clearly exceeds 20% TBSA, administer IV/IO fluid at the following initial rates:
        i. Adults at least 14 years of age: 500 mL/hr

i.	Children 6 to 13 years of age: 250 mL/hr
i.	Infants and children up to 5 years of age: 125 mL/hr

    d. Do not exceed 1 liter of total IV/IO fluids unless authorized by BioTel
    e. Contact BioTel for fluid resuscitation orders in patients with congestive heart failure, cardiac disease or age greater than 65 years
    f. Monitor patient's clinical response
11. Monitor SpCO (carbon monoxide) levels, if possible, especially for closed-space or suspected inhalation injury
12. Monitor airway and respiratory status, and anticipate need for advanced airway placement
13. **Treat pain** according to the Pain Management CPG
14. For additional assistance and Medical Control physician guidance, contact BioTel

Special Circumstances

1. **Closed space fires:**
    a. Consider smoke inhalation, with or without associated thermal inhalation injury
    b. Consider carbon monoxide toxicity – treat according to the Carbon Monoxide Exposure CPG
        i. Pulse oximetry (SPO_2) monitoring may not be accurate
    c. Consider cyanide toxicity in a patient with depressed level of consciousness, respiratory distress/failure and cardiovascular collapse – treat according to the Cyanide Toxicity CPG
2. **Illicit drug lab incident:**
    a. Consider the possibility of toxic chemical exposure and need for HAZMAT assistance
    b. Notify BioTel or receiving hospital
3. **Chemical injuries:** (refer to Toxic Chemical Exposure CPG)
    a. Alkali (more severe damage): Perform copious irrigation with water or Normal Saline en route
    b. Acid (generally less severe): Perform copious irrigation with water or Normal Saline en route
    c. Hydrofluoric Acid (HF): Hexafluorine solution is preferred for irrigation, if available (e.g. work site)
    d. Cyanide: Refer to Cyanide Toxicity CPG
4. **Electrical injuries (AC or DC current):**
    a. Verify scene safety, especially disabling of the electrical source prior to patient assessment
    b. Primary assessment: focus on cardiac dysrhythmia and cardiac arrest
        i. Resuscitation with good outcome may be possible even in patients who appear dead, with dilated pupils (refer to the Cardiac Arrest and other symptom-specific CPGs)
        ii. AC current: more likely to cause cardiac dysrhythmias, especially ventricular fibrillation
        iii. DC current: more likely to cause deep tissue damage, but cardiac dysrhythmia (especially asystole) is not uncommon
    c. Assess for all sites of burn injury: if the patient became part of the circuit, there will be an additional site near the contact with the ground
        i. Electrical injuries are often full-thickness, with significant deep tissue damage
        ii. Assess for potential compartment syndrome and rhabomyolysis
    d. Associated mechanical injury may be present, due to falls or violent, involuntary muscle contraction

Additional Resources: Refer to Figure 1 (Estimation of Burn Size by Percentage of Total BSA), next page

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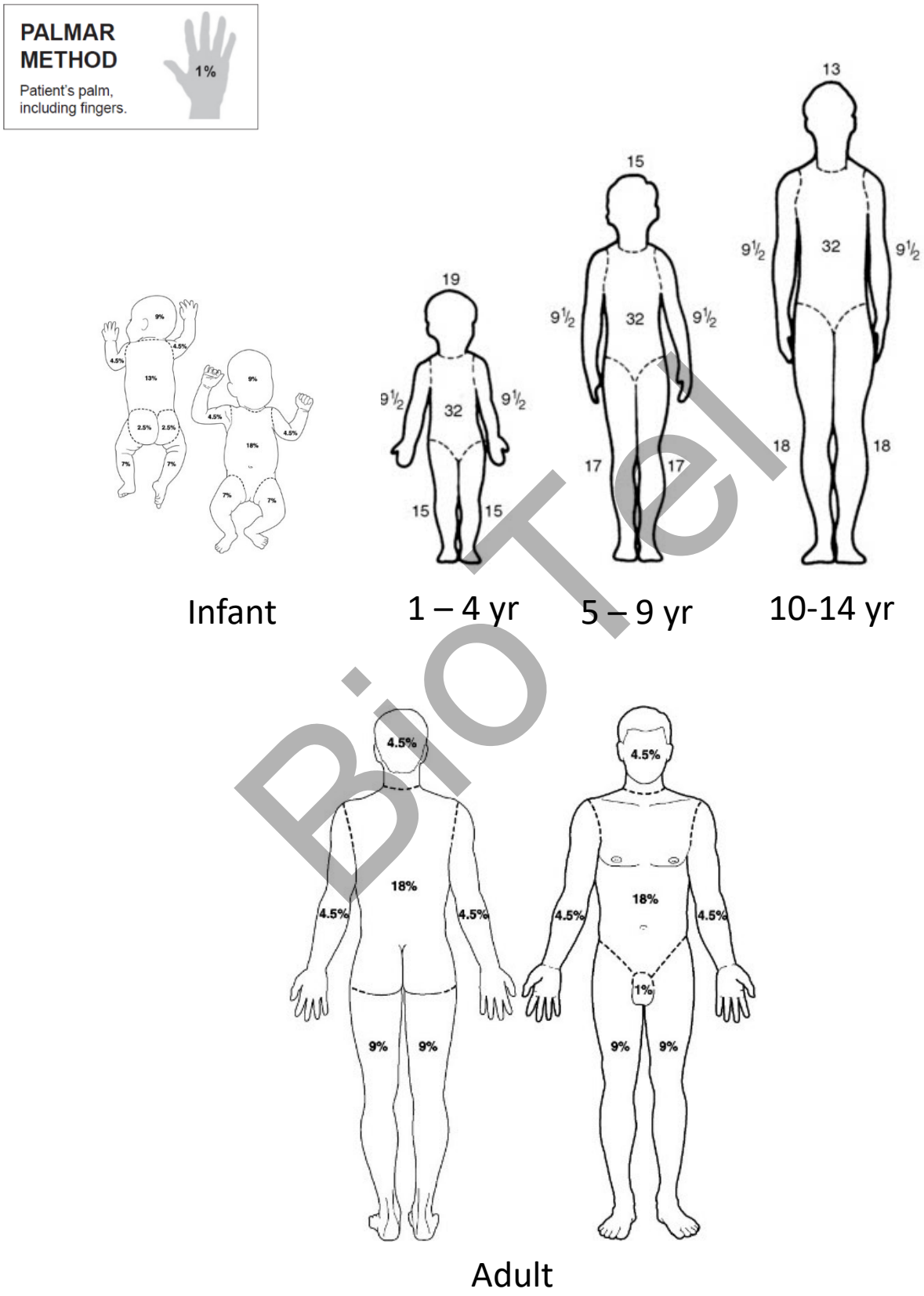
Figure 1: Estimation of Burn Size by Percentage of Total Body Surface Area (BSA)



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Eye Injury

Goal: To minimize ocular injury and preserve vision whenever possible
Inclusion Criteria: Blunt or penetrating eye injury; chemical exposures to the eyes
Exclusion Criteria: Patients without known or suspected traumatic or chemical eye injury
Refer to: Head Injury/TBI, Toxic Chemical Exposure, and Trauma CPGs; Spinal Motion Restriction Policy

Observe Body Substance Isolation Precautions and employ appropriate PPE

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC and according to the Trauma CPG:
    a. A and B (Airway and Breathing): Suction airway secretions as needed after exposure to toxic chemicals or riot control agents
    b. C (Circulation) and Wound Care: Control bleeding from associated injuries with gentle pressure and moist, sterile dressings
        i. Do not apply direct pressure to the eyeball itself, especially if open globe is suspected
    c. D (Disability): Assess and document GCS; and assess pupillary size and reactivity, if possible
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum
            1. Signs of early deterioration: confusion, agitation, drowsiness, vomiting, severe headache
        ii. Reassess and document every 5 to 10 minutes in patients with significant injury or instability
        iii. Assume associated (cervical) spine injury in patients with moderate/severe head injury
    d. E (Exposure/Environmental): Assess for Toxic Chemical Exposure and for other traumatic injuries
2. Positioning:
    a. Initiate Spinal Motion Restriction, if indicated, per Spinal Motion Restriction Policy
    b. If spinal injury is not suspected, place the patient in a position of comfort, preferably with the head slightly elevated
    c. If there is evidence of shock, treat the patient according to the Shock CPG
3. In the absence of known/suspected chemical injury, perform and document gross visual acuity estimate:
    a. If a Snellen reading card is unavailable, ask patient to read a sign in the distance or the instructions on a box, package or IV fluid bag:
        i. Patient should wear his/her glasses when testing, if available
    b. If visual acuity is too limited for the patient to be able to read, assess “count fingers” vision:
        i. Hold up 1, 2 or 5 fingers and ask patient: “How many fingers do you see?”
        ii. Test each eye individually
    c. If patient cannot count fingers, assess for “hand motion” vision:
        i. Move your hand approximately 12” from the patient and ask: “Tell me when my hand moves”
        ii. Test each eye individually
    d. If patient cannot detect hand motion, assess for “light detection” vision:
        i. Ask patient: “Tell me when you see the light” and shine a penlight in the eye being examined, while covering the other eye
        ii. Test each eye individually
4. Specific conditions:
    a. Known or suspected eye avulsion or open globe – “Shield and Ship”:
        i. Discontinue further examination
        ii. Do not place anything, e.g. eye pads or medication, in the affected eye
        iii. Shield the eye with a protective Fox shield or improvised protective device (e.g. bottom portion of Styrofoam cup) (see Figure 1, below):
            1. Place tape from the center of the forehead to the angle of the mandible
            2. IMPORTANT: Do not place any pressure on the eye or allow anything to touch the eye
        iv. Prepare for transport
    b. Impaled object:
        i. Do not attempt to remove the object
        ii. If the object is large and protruding from the eye, attempt to stabilize it
        iii. Follow guidelines for open globe, as above

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c. Chemical exposure: **IMMEDIATE, COPIOUS IRRIGATION IS THE MOST CRITICAL STEP**
   i. Remove contact lenses, if possible
   ii. Sterile isotonic Normal Saline or Lactated Ringers, or sterile eye wash solution may be used:
      1. Tap water may be substituted if these are unavailable
      2. Do not delay irrigation waiting for a specific irrigation solution
   iii. Initiate irrigation with at least 1 to 2 liters and continue en route to receiving hospital E.D.:
      1. Use "large drip" (10 gtt/mL) tubing
      2. If a Morgan lens is unavailable, an adult nasal cannula may be connected to the IV tubing and taped to the bridge of the patient's nose to provide continuous irrigation
      3. Gentle use of a sterile 4X4 gauze to keep the lid open may be helpful
   iv. If necessary, administer 1 or 2 drops of proparacaine or other topical ophthalmic anesthetic (if available) to the affected eye(s) to relieve pain and to facilitate irrigation:
      1. May repeat dose once, after 5 minutes, if needed
   v. Instruct patient not to rub the eyes
   vi. If pH paper is available, consider testing pH after at least 1 to 2 liters of irrigation
d. Acid burns:
   i. Damage is usually superficial, but patient must be transported for E.D. evaluation/treatment
   ii. Irrigate on-scene and continue en route, as described above
   iii. Hydrofluoric acid (HF) causes exceptionally severe eye burns
      1. Use hexafluorine solution for irrigation, if available (e.g. on a work site)
      2. Emergent E.D. evaluation/treatment is critical
e. Alkali burns:
   i. Damage is usually deeper and more serious: patient must be transported for E.D. evaluation/treatment
   ii. Irrigate on-scene and continue en route, as described above
f. Riot control agents (including "mace", "pepper spray", "tear gas"):
   i. Treat respiratory signs and symptoms according to the Respiratory Distress CPG
   ii. Ocular signs/symptoms: intense lacrimation (tear production), as well as swelling and redness
   iii. Irrigate on-scene, as described above
   iv. Patients who remain symptomatic despite irrigation or more than 30 minutes after exposure should be transported for E.D. evaluation/treatment, even if this is the patient's only injury
      1. Continue irrigation en route

5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

6. Consider establishing IV/IO access at TKO rate or with a saline lock
7. Treat persistent pain according to the Pain CPG and nausea according to the Vomiting CPG
8. NOTE: All patients with known or suspected traumatic or chemical eye injury should be strongly encouraged to accept transport for E.D. evaluation/treatment:
   a. POSSIBLE exceptions:
      i. Mild/dilute acid burns without symptoms after irrigation
      ii. Riot control agent exposure without symptoms at least 30 minutes after exposure and irrigation
   b. When in doubt, transport
9. For additional assistance and Medical Control physician guidance, contact BioTel

Figure 1: "Shield and Ship" with Fox Eye Shield (right eye) and improvised shield made from Styrofoam cup (left eye)

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Head Injury/Traumatic Brain Injury (TBI)

Goal: To aid EMS Providers in the treatment of patients with known or suspected head injury, particularly traumatic brain injury (TBI), in order to optimize patient outcome
Inclusion Criteria: All adult or pediatric patients with blunt or penetrating head trauma, with or without loss of consciousness or amnesia
Exclusion Criteria: No specific exclusions, although this CPG focuses on moderate-severe TBI
Refer to: Hemorrhage Control/Tourniquet, Shock, Trauma and other relevant CPGs; Spinal Motion Restriction, and Destination policies

CRITICAL POINT:
- EMS care of the patient with moderate-severe TBI must include measures to prevent hypoxia, hypotension, and both elevated and low body temperature, all of which are associated with poor outcome.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC and according to the Trauma CPG:
    a. A and B (Airway and Breathing): Frequent suctioning of blood or secretions is critical:
        i. Place an oro-pharyngeal or nasopharyngeal airway unless contraindicated because of associated injuries
        ii. Avoid over-zealous assisted ventilation (hyperventilation is harmful in TBI)
    b. C (Circulation) and Wound Care: Initiate continuous ECG and SpO_2 monitoring:
        i. Control active bleeding from penetrating head injury with gentle pressure and moist, sterile dressing, if open skull fracture is NOT suspected
        ii. Apply moist, sterile dressing to known or suspected open skull fracture
        iii. Control active extremity and junctional bleeding per Hemorrhage Control/Tourniquet CPG
    c. D (Disability): Assess and document GCS and pupillary size and reactivity:
        i. At least two sets of measurements, 5 to 10 minutes apart, is the absolute minimum:
            1. Signs of early deterioration: confusion, agitation, drowsiness, vomiting, severe headache
        ii. Reassess and document every 5 to 10 minutes in patients with significant injury or instability
        iii. Assume associated (cervical) spine injury in patients with moderate/severe head injury
        iv. Arousability should be assessed by nailbed pressure, axillary skin fold pinch or trapezius muscle pinch; use of sternal rub is discouraged
    d. E (Exposure/Environmental): Assess for other traumatic injuries & obtain patient temperature:
        i. Institute measures to prevent both heat loss/hypothermia and hyperthermia
2. Immobilize patient with cervical collar and long spine board, if indicated, per Spinal Motion Restriction Policy:
    a. If severe TBI and spine injury is not suspected, elevate the head of the stretcher 30 degrees
    b. If severe TBI and other spine injury is suspected, consider reverse Trendelenburg (30 degrees)
    c. Young children on a long spine board must have torso padding for neutral spine alignment:
        i. Pad from top of shoulder to bottom of buttocks
        ii. Neutral alignment is achieved when the sternum is level with the ear canal
3. **Administer supplemental oxygen to maintain SpO_2 of at least 94% (with continuous monitoring):**
    a. NOTE: Even brief periods of hypoxia are extremely damaging to injured brain
    b. When in doubt during initial resuscitation or if SpO_2 measurement is unavailable, provide high-flow, supplemental oxygen
    c. During *prolonged* transport, titration to maintain SpO_2 94-99% may be appropriate
4. Obtain and document a POC Glucose:
    a. Treat hypoglycemia per Diabetic Emergencies-Hypoglycemia CPG
5. Obtain and document SAMPLE History:
    a. Patient or bystander history of "loss of consciousness" and duration thereof may be misleading
6. Perform and document secondary survey, with special attention to HEENT for signs of head/facial injury:
    a. Examples: "DCAPBLSTIC", skull fracture, CSF drainage from ears/nose, and facial bone instability
7. Once advanced level care arrives on scene, give report and transfer care

Continued on the next page…

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Advanced Level

8. Initiate continuous waveform capnography ($PetCO_2$) monitoring: ***avoid hyperventilation!***
    a. With assisted ventilation or after advanced airway placement, maintain $PetCO_2$ 35 to 45 mmHg
        i. Target: 40 mmHg
    b. Avoid even "mild" hyperventilation, even in the setting of "impending cerebral herniation", due to lack of scientific evidence
        i. Risk of harm from over-ventilation outweighs theoretical, unproven benefit
9. Consider advanced airway placement for continually compromised airway:
    a. GCS 8 or less and/or inability to maintain airway with basic airway maneuvers and suctioning
    b. Maintain cervical spine stabilization during advanced airway placement
    c. Nasotracheal intubation is relatively contraindicated in patients with head injury
10. Establish IV/IO access and ***treat hypotension:***
    a. Adults and teens at least 14 years of age with SBP less than 110 mmHg and no other source of uncontrolled hemorrhage: Administer Normal Saline 20 mL/kg **(maximum 1000 mL (1L) per bolus)**
        i. Do not wait for hypotension to develop: begin fluid bolus if SBP is dropping or if patient shows signs of progressive shock, such as increasing HR with decreasing SBP

    b. Pediatric patients: Administer Normal Saline 20 mL/kg **(maximum 1000 mL (1L) per bolus):**
        i. Newborn under 1 month of age: Target SBP at least 60 mmHg
        ii. Infant 1 month to 12 months of age: Target SBP at least 70 mmHg
        iii. Child 1 to 10 years of age: Target SBP at least (70 + 2X(age in years)) mmHg
        iv. Child 11 to 14 years of age: Target SBP at least 90 mmHg

    c. Reassess for and document clinical response
    d. Repeat IV/IO fluid bolus once, to maintain target blood pressure, if needed
    e. Contact BioTel for authorization for additional fluid boluses
    f. NOTE: For patients with TBI AND suspected, uncontrolled, internal hemorrhage due to other, major trauma, follow resuscitation guidelines and target SBP described in the Trauma CPG
11. Treatment of acute hypertension following TBI:
    a. Restrict IV/IO fluids to "keep open" rate if SBP is greater than 140 mmHg (adults) or above normal range for age (pediatric) (refer to UNIVERSAL CARE – PEDIATRIC for age-specific parameters)
12. Consider treatment of pain, agitation and/or combativeness not due to hypoxia according to Pain CPG:
    a. Document GCS, pupillary reaction and neurologic exam before AND after analgesia/sedation administration
    b. First-line treatment: opioids (e.g. fentanyl or morphine)
    c. Second-line/adjunct treatment: IV/IOIM/IN ketamine (**analgesic** dose; Low-Dose Ketamine (LDK))
    d. Contact BioTel Online Medical Control Physician for further analgesia/sedation guidance, if needed
13. Monitor for and treat seizures per Seizure CPG
14. Monitor vital signs and transport patients with moderate to severe head injuries to an appropriate Level I or Level II Trauma Center, per Destination Policy and Hospital Capabilities Matrix:
    a. Consult BioTel, if needed, for additional destination decision-making guidance
    b. Patients with known/suspected mild TBI, no loss of consciousness AND GCS 15 may be transported to the closest, appropriate receiving hospital E.D.
15. For additional assistance and Medical Control physician guidance, contact BioTel

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Helmet and Protective Equipment Removal

Goals: Timely removal of sports, motorcycle and other helmets to facilitate emergency patient care, while minimizing risk of spinal cord or other injury
Inclusion Criteria: Patients of all ages wearing a sports, motorcycle or other helmet who require emergency medical care, especially for traumatic injury
Exclusion Criteria: Patients without a helmet
Refer to: Airway Management – Adult, Airway Management – Pediatric, Head Injury/TBI and Trauma CPGs; Spinal Motion Restriction Policy

NOTES:

- As of 2015, the National Athletic Trainers' Association (NATA) recommends that – when appropriate – rescuers should remove protective equipment (helmet AND shoulder pads) prior to transport:
  - Both helmet and shoulder pads should be removed; OR
  - Both helmet and shoulder pads should be left in place (when medically appropriate);
  - NOTE: Do not remove the helmet while leaving shoulder pads in place, or vice versa.
- Screwdrivers are preferred to cutting tools for facemask removal, in order to minimize neck motion.
- Athletic trainers on-scene may assist with the procedure, under paramedic supervision.
- **Minimum number of Providers/Responders needed:**
  - **At least 2 for helmet removal (3 or 4 Providers preferred);**
  - **At least 4 for helmet and pads/equipment removal, if possible;**
  - **6 Providers/Responders are needed to safely transfer the patient to a long spine board:**
    - **The 6-person lift or "lift and slide" maneuver is preferred to the traditional log-roll.**

Equipment Needed:

• Screwdriver (manual or cordless)	• Long spine board
• Bandage shears	• Cervical collar and stabilization devices
• Tongue blade (for helmets with removable ear/cheek pads)	

Contraindications:

- Increased paresthesias or neck pain during the removal procedure

Summary of Helmet Removal Procedure to Maintain Inline Spinal Immobilization:

1. Inline immobilization initially applied from above (Rescuer 1) while Rescuer 2 removes facemask, etc.
2. Inline immobilization transferred and applied from below (Rescuer 2) while Rescuer 1 removes the helmet
3. Inline immobilization reestablished from above (Rescuer 1)

Procedure*:

1. **Rescuer 1** positions him/herself behind the patient's head and maintains inline spinal stabilization:
   a. Place hands on each side of the helmet, with the fingers on the victim's mandible:

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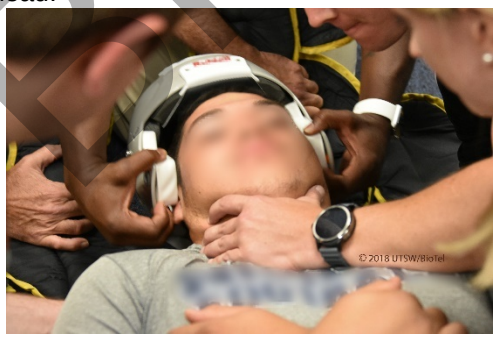
2. **Rescuer 2** removes all screws that secure the facemask to the helmet, and then removes the facemask (where applicable):

   a. If Rescuer 2 cannot remove either the screws or the facemask, and a cutting tool is not available, proceed to Step 3
3. **Rescuer 2** uses a tongue blade to loosen the snaps and remove both ear/cheek pads, if applicable
4. **Rescuer 2** cuts or loosens the chin strap and then, from the patient's side, places one hand on both sides of the mandible (at the angle of the mandible, adjacent to the patient' neck):
   a. Cup the mandible with the thumb on one side and the fingers on the other side of the mandible:

5. **Rescuer 2** then slides the other hand under the patient's neck and applies pressure from the occipital region, holding inline stabilization:
   a. **Rescuer 2** must say to **Rescuer 1** "I have stabilization" before proceeding to the next step, and Rescuer 1 must acknowledge that spinal immobilization has been transferred to **Rescuer 2**
6. **Rescuer 1** expands the helmet laterally by pulling the ear holes away from the patient's ears and then slides the helmet off the patient's head:



   a. For full-face coverage helmets (e.g. motorcycle/motocross helmets), the following may be needed:
      i. **Rescuer 1** may need to tilt the helmet backward and raise it to clear the nose
7. After the helmet has been removed, **Rescuer 1** places his/her hands on either side of the patient's head, with the palms of each hand over the patient's ears, maintaining inline spinal stabilization until a long spine board and cervical stabilization device are in place:
   a. Patients with shoulder pads still in place: slight padding to "pack and fill" under the patient's head may be needed to maintain neutral spinal alignment until shoulder pads have been removed (see below)

b. Young children: torso padding from the top of the shoulders to the bottom of buttocks may be needed in order to maintain neutral spinal alignment and to prevent airway obstruction: the plane of the child's face should be parallel to the spine board, not flexed. The sternum should be level with the ear canal.

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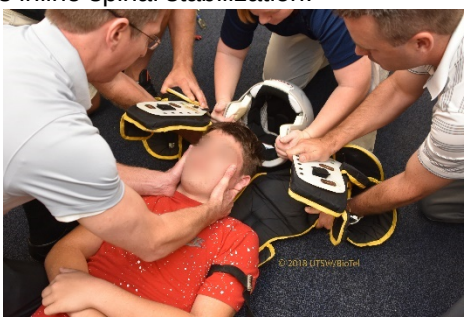
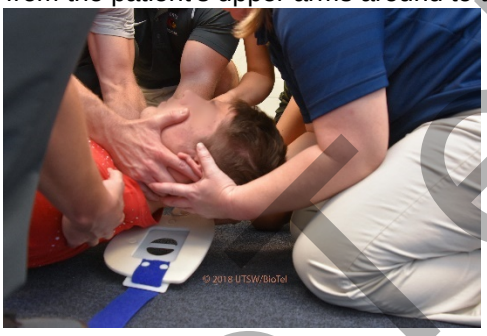
8. **Special Circumstances – Shoulder Pads:** If the patient is wearing shoulder pads, **Rescuer 3** should cut the laces on the front of the pads, while **Rescuer 2** removes the facemask:
    a. **Rescuer 2** and **Rescuer 3** then remove the helmet and shoulder pads simultaneously, while **Rescuer 1** maintains inline spinal stabilization:



9. **Rescuer 4** prevents neck flexion by sliding his/her hands under the patient's shoulders:
    a. S/he first places his/her hands on the patient's upper arms, palms facing toward the patient and then slides his/her hands from the patient's upper arms around to the scapulae:



10. **NOTE:** If, at any time during the helmet removal procedure, the patient complains of paresthesias or neck pain, the removal procedure should be discontinued:
    a. The patient should be immobilized and transported as quickly as possible to a hospital E.D.
    b. Airway patency, vital signs and neurologic status should be closely monitored en route

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*Thanks to the administrators, coaches, trainers, parents and students of Nimitz High School, Irving ISD, the Irving Fire Department and Dr. Shane Miller
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Hemorrhage Control and Tourniquet Use

Goal: To minimize morbidity and mortality due to life-threatening external junctional and extremity hemorrhage, through the use of direct pressure, wound packing/hemostatic agents and medical tourniquets
Inclusion Criteria: All adult or pediatric patients with external hemorrhage due to blunt or penetrating trauma
Exclusion Criteria: No specific exclusions
Refer to: Amputation, Shock, Trauma and other relevant CPGs; and to Spinal Motion Restriction and Destination Policies

NOTE: This CPG does not recommend or endorse any specific brand or style of medical tourniquet or hemostatic agent. EMS Providers shall be familiar with the proper and safe application of their agency-approved device(s).

NOTE: Internal bleeding due to blunt or penetrating torso trauma requires emergent surgical consultation in a Level I or Level II Trauma Center – Refer to Destination Policy or consult BioTel for destination advice.

NOTE: Scene safety is #1 priority. This CPG is not intended to provide specific training for "care under fire".

Overview (Observe Body Substance Isolation Precautions and employ appropriate PPE)

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC and according to the Trauma CPG, as clinically indicated, but following the "MARCH" mnemonic:
   a. M (Massive Hemorrhage): With life-threatening external hemorrhage, hemorrhage control is first priority
   b. A (Airway): Assess and support airway patency, per Airway Management (Adult/Pediatric) CPGs
   a. R (Respirations): Assess and support oxygenation, ventilation and respiratory mechanics
   b. C (Circulation): Assess for other and treat traumatic injuries, signs/symptoms of shock, per Shock CPG
   c. H (Head Injury): Assess for and treat closed and/or open head injuries, per Head Injury/TBI CPG

Basic and Advanced Level

2. **Extremity** hemorrhage control:
   a. Indications for tourniquet application:
      i. Potentially life-threatening hemorrhage **AND**
      ii. Direct pressure fails or cannot be performed (e.g. resource scarcity, unsafe scene)
   b. Contraindications for tourniquet application:
      i. Non-extremity hemorrhage (e.g. head, neck, torso, groin, axilla, buttocks) **OR**
      ii. Hemorrhage controlled by direct pressure
   c. General tourniquet application procedure:
      i. Care under fire/unsafe scene: As "high and tight" as possible, over clothing, may be necessary
      ii. Preferred, "Deliberate" procedure, if scene conditions and resources permit:
         1. Expose wound
         2. Apply tourniquet 2 to 3" above the wound, not over a joint
         3. Tighten until bleeding stops **AND** distal pulse is no longer palpable (important!)
            a. EXCEPTION: In the case of traumatic amputation, tighten until bleeding stops
         4. If bleeding continues, a 2nd tourniquet may be applied proximal to the first (especially on thigh)
   d. **CRITICAL DOCUMENTATION:** Tourniquet application time
      1. Write the application time directly on the tourniquet(s); **AND**
      2. Document the application time in the ePCR
   e. Once placed, the tourniquet should NOT be removed until the patient has been transferred to a higher level of care (see Special Circumstances below), even if patient complains of pain in the extremity
   f. The bleeding site and tourniquet(s) should be left uncovered, or with minimal dressings
   g. Notify BioTel or the receiving hospital en route to a **Level I or Level II Trauma Center** that the patient has had a tourniquet applied, whether or not bleeding is controlled, and the application time
   h. Continue to monitor patient's vital signs and for recurrent bleeding; treat shock per Shock CPG
   i. Treat pain with judicious administration of analgesics, per Pain CPG (advanced level providers only)
3. **Junctional (groin, axilla, neck)** hemorrhage control:
   a. Indications for wound packing with gauze or hemostatic agents:

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i. Potentially life-threatening hemorrhage **AND**
ii. Direct pressure fails or cannot be performed (e.g. resource scarcity, unsafe scene)

b. Contraindications for wound packing with gauze or hemostatic agents:
i. Chest or abdomen wounds (these require surgical intervention), head or eye wounds
ii. Hemorrhage controlled by direct pressure

c. General wound packing procedure – **"4 Ps"**:
i. **Peel:** Peel the (hemostatic) gauze from the roll or folded pile
ii. **Push:** Pack firmly into the depth of the wound and keep packing, until bleeding stops
1. If bleeding continues, pack with additional gauze (tie the gauze ends together!)
2. Keep packing until bleeding stops
3. If bleeding continues, the most likely explanation is insufficient packing
4. Caution: bone fragments from associated fracture can injure EMS providers during packing
i. **Pile:** Pile extra/leftover gauze (if available) on top of the wound
ii. **Pressure:** Apply pressure for AT LEAST 3 minutes* (hemostatic gauze) or 10 minutes* (plain gauze)
1. Do NOT remove pressure dressing or packing to assess bleeding
2. Pressure to groin wounds may be accomplished by the EMS Provider's knee

d. **CRITICAL DOCUMENTATION:** Wound packing time
i. Write the wound packing time directly on the dressing, if feasible; **AND**
ii. Document the would packing time in the ePCR

e. If a commercial hemostatic gauze or other wound packing product was used, bring package to the E.D.
f. Continue to monitor patient's vital signs and for recurrent bleeding; treat shock per Shock CPG
g. Treat pain with judicious administration of analgesics, per Pain CPG (advanced level providers only)

4. Initiate transport as soon as possible
a. *If the wound pressure period has not yet elapsed, initiate transport and maintain pressure en route
5. For additional patient care considerations not covered under standing orders, contact BioTel

Special Circumstances

6. Improvised tourniquets applied by bystanders or non-medical personnel prior to EMS arrival:
a. These are NOT a substitute for a medical tourniquet applied by UTSW/Parkland BioTel EMS Providers
b. Replacement procedure:
i. Apply, but do not yet secure, the BioTel agency-approved device proximal to the improvised device
ii. Remove the improvised device and monitor for bleeding
iii. If bleeding cannot be controlled by direct pressure, apply the EMS tourniquet as described above
7. Patient with tourniquet applied by first-responding law enforcement officer, citizen or other person prior to EMS arrival who declines an EMS offer of hospital transport:
a. Patient refusal of hospital transport shall be strongly discouraged
b. If the patient refuses EMS Provider efforts to agree to transport, the following steps shall be taken:
i. Explain that the tourniquet cannot remain in place if the patient is not being transported by ambulance and that removal may result in uncontrolled bleeding and death
ii. Contact BioTel requesting that the Medical Command Physician speak directly with the patient
iii. If the Medical Command Physician fails to convince the patient to accept ambulance transport, and upon acknowledgement of the warnings, slowly release the tourniquet over 3 to 5 minutes
iv. If bleeding recurs, apply direct pressure/pressure bandaging and observe the patient for **10 minutes**
v. If bleeding remains uncontrolled, reapply the tourniquet and contact BioTel for further assistance
vi. If bleeding is controlled with direct pressure/pressure bandaging, document this, as well as the presence of distal pulses and capillary refill
1. Have the patient sign the refusal and encourage the patient to seek immediate medical care by whatever means he/she chooses
8. Consider prehospital removal of medical tourniquet(s) ***ONLY*** if transport to definitive hospital care is significantly delayed (more than 60 minutes), e.g. during mass casualty incident or other austere conditions:
a. If the tourniquet is replaced with a pressure dressing, the loose tourniquet should be left in place, in case recurrent hemorrhage necessitates reapplication
b. EXCEPTIONS: Do not remove tourniquet(s) if: amputation or near-amputation; the patient is unstable or complex poly-trauma; or the clinical or tactical setting is unstable

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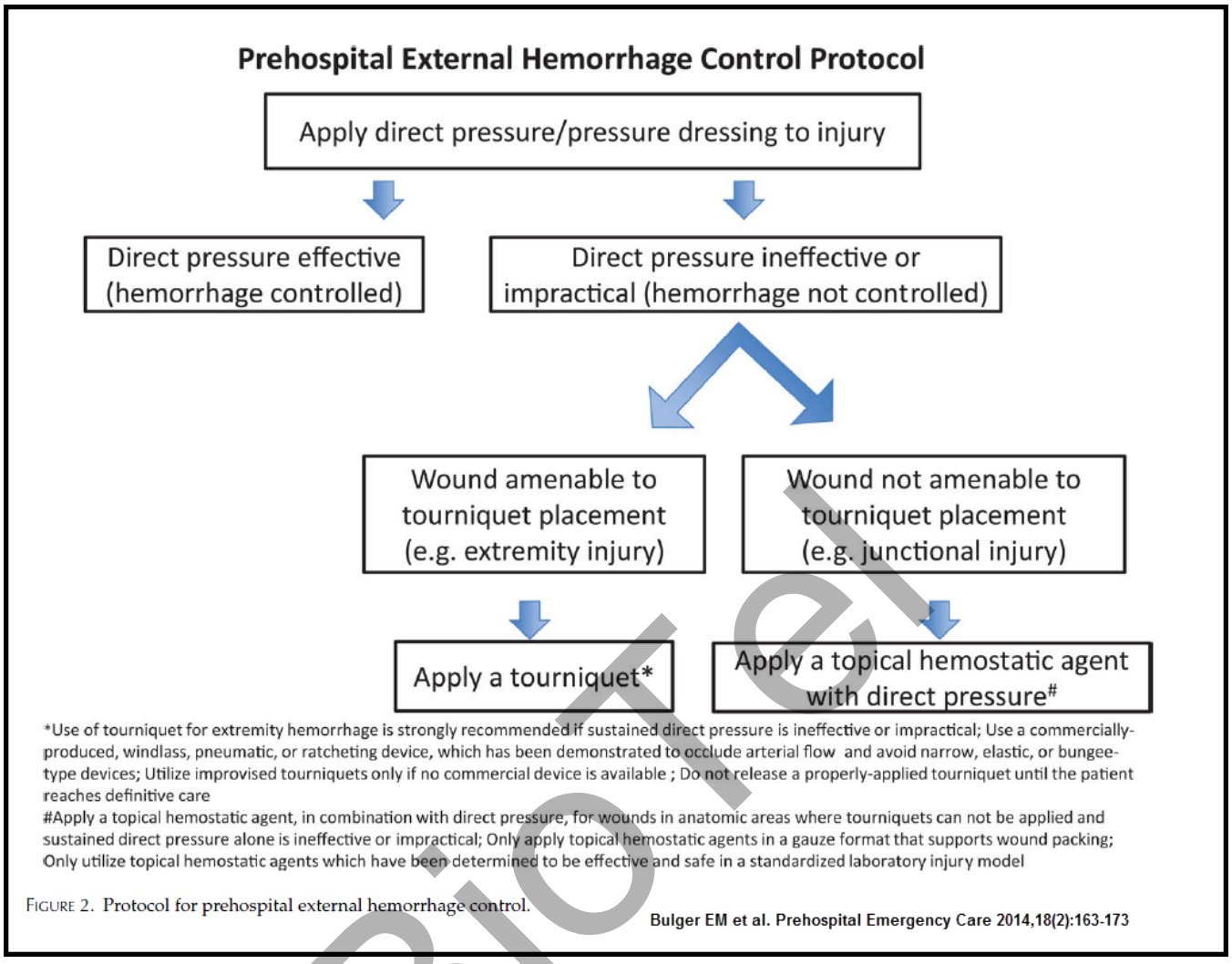

FIGURE 2. Protocol for prehospital external hemorrhage control.

Bulger EM et al. Prehospital Emergency Care 2014,18(2):163-173

http://dx.doi.org/10.3109/10903127.2014.896962

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Spinal Motion Restriction (SMR) and Spinal Care

Purpose: To assist UTSW/Parkland BioTel EMS Providers with appropriate application of spinal motion restriction (SMR) and spinal care measures in the out-of-hospital environment
Inclusion Criteria: All patients for whom the need for SMR and spinal care should be considered
Exclusion Criteria: Patients with non-trauma emergencies for whom the use of SMR is not indicated
Refer to: Head Injury/TBI and Trauma CPGs; and Helmet Removal Procedure for additional guidance

➢ **Refer to the Blunt Trauma SMR Algorithm (Figure 1) on the last page of this CPG.**

I. SMR Evaluation in BLUNT Trauma:

A. **Overarching principle: Evaluation for indications for SMR is MANDATORY for ANY patient sustaining a blunt mechanism of injury (MOI) with potential for causing a spinal injury:**
   1. Note: This includes not only high-risk mechanisms, but also falls from standing height, syncope with fall, seizure with fall, or other "minor" mechanism, especially in elderly patients.

B. **CLINICAL CRITERIA: SMR is MANDATORY** for a patient with ANY of the following**:**
   1. **Age:** Patient younger than **8** years of age or older than **65** years of age;
   2. **High-risk Mechanism, such as:**

• Fall from 3 ft. above ground surface or more than 5 stairs	• Bicycle collision (rider struck or collision with fixed object)
• MVC with: speed greater than 60 mph; rollover; ejection; hit by bus or large truck (excluding simple, low-speed, rear-end MVC); or pushed into traffic	• Axial load injury (e.g. fall with head-first impact, high-impact athletic activity, heavy object falling on head)
• Motorcycle crash at 20 mph or greater	• Pedestrian struck at 20 mph or greater
• Motorized recreational vehicle (ATV) crash	

   3. **Focal Neurological Deficit:** Numbness, tingling, weakness, or paralysis of any extremity.
   4. **Altered Mental Status or Lack of Cooperation:** ANY alteration in the patient's GCS, level of consciousness or mental status at the time of EMS evaluation, including:
      a. Pre-existing conditions: dementia, brain injury, developmental delay or psychosis; AND/OR
      b. Situational factors: acute stress reactions, anxiety or other distracting considerations.
   5. **Drug or alcohol intoxication (known or suspected)**.
   6. **Language or communication barrier** preventing reliable assessment of signs or symptoms.
   7. **Distracting Injury:** Any severe or painful injury that could reasonably be thought to distract the patient from the ability to recognize pain or tenderness in the spine, including, but not limited to: long bone fracture, extremity dislocation, large laceration, crush injury, large burn, significant abdominal or pelvic injury, or significant facial trauma.

C. **STRONGLY CONSIDER SMR** for any patient who meets BioTel Prehospital Trauma Triage Criteria in the Destination Policy.

D. **CONSIDER SMR** if the mechanism of injury or other factors precludes complete spine assessment.

E. **If there is blunt MOI with potential for spine injury, but NONE of the clinical criteria for mandatory SMR listed above, EMS providers SHALL proceed with 3-step spine assessment (Section II).**
   1. If *neither* MOI with potential for spine injury *nor* clinical criteria listed above: SMR is not indicated.

II. 3-Step Spine Assessment Procedure:

A. For patients with blunt MOI with potential for spine injury, but none of the clinical criteria for mandatory SMR listed in Section I.B, **perform and document the full, 3-step spine assessment**, described below.
   1. 2nd rescuer maintains manual stabilization of the head and neck during the assessment.
   2. **IMPORTANT: Discontinue the spine assessment, proceed with SMR, transport the patient and document findings in the ePCR if the patient:**
      a. **Cannot be reliably assessed due to lack of cooperation, age, altered mental status, intoxication, language/communication barrier or significant distracting injury; OR**
      b. **Fails the spine assessment at any step due to neurologic signs or symptoms.**

B. **3 Steps:**
   1. **Step 1: Evaluate for midline spinal pain, tenderness to palpation or bony deformity:**
      a. Ask that patient: "Does your neck or back hurt, or do you have any discomfort in your spine?"

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b. Palpate the posterior cervical spine in the midline, beginning at C7 level to the occiput, while asking the patient: "Does this cause you any pain?"
c. Palpate the patient's entire thoracic and lumbar spine, while asking the patient: "Does this cause you any pain?" (If patient is supine, carefully logroll to palpate thoracic and lumbar spine.)
d. If there is no pain/tenderness and no bony deformity, proceed to Step 2.

2. **Step 2: Perform motor and sensory examination:**
   a. Bilateral Motor Exam:
      i. Grip strength ("squeeze my fingers");
      ii. Wrist extension ("raise the back of your hand at the wrist towards your shoulder");
      iii. Foot plantar flexion ("step on the gas pedal");
      iv. Foot dorsiflexion ("bring toes to your nose").
   b. Bilateral Sensory Exam:
      i. Test gross sensation in all extremities for parasthesias or decreased sensation.
   c. If there is no motor or sensory deficit, proceed to Step 3.
3. **Step 3: Perform Cervical Spine Range of Motion Testing:**
   a. Tell the patient "I am going to ask you to slowly move your head".
   b. Instruct the patient to immediately stop and tell you if moving his/her head causes ANY pain in the neck or abnormal sensation, such as "pins and needles" in their arms or hands.
   c. Ask the patient to slowly move his/her head forward (bending chin toward the chest), then backward, and then side to side.
      i. Movement should be voluntary and self-initiated: do not assist or force head movement.
   d. If the patient reports ANY discomfort or paresthesias, slowly return his/her head to neutral position, apply SMR, transport the patient, document findings in the ePCR.

C. If ALL 3 components of the examination PASS without abnormality, SMR is NOT required:
   a. Clearly DOCUMENT each major step in the ePCR and notate: "Clinical criteria and 3-step spinal assessment passed, spinal motion restriction deferred."
   b. **FAILURE of any step OR inability to cooperate with assessment requires MANDATORY SMR.**

III. SMR with LSB (Long Spine Board):

A. **EMS Providers shall implement SMR with LSB for any patient who meets SMR criteria (Section I) or who fails the 3-step Assessment (Section II), unless *Selective* SMR Procedures have been authorized by the Medical Director (Refer to Section VI, below).**
   1. NOTE: The ultimate goal of SMR is to restrict spinal motion, not simply to apply devices, especially if application creates spinal movement, improper spinal immobilization or improper alignment.

B. Equipment needed:
   1. Rigid LSB or similar extrication/transport device (e.g. vacuum mattress or scoop stretcher);
   2. Semi-rigid, properly-sized cervical collar:
      a. When a properly-sized cervical collar is not available, alternative immobilization methods (e.g. towel rolls, vacuum devices or other splinting materials) may be used, provided that they do not impinge upon the patient's ability to breath;
   3. Lateral neck rolls, head blocks or approved head immobilization device;
   4. Tape and/or securing straps across the patient's forehead and the cervical collar;
   5. Straps (minimum 3) to secure the patient's chest, hips, abdomen and to minimize pivoting movement in any direction;
   6. Padding (e.g. towel, blanket or folded sheet).

C. Procedure (per agency SOPs):
   1. Maintain manual, neutral, in-line stabilization of the head until SMR procedure is complete;
   2. Apply semi-rigid, properly-sized cervical collar;
   3. Pad the space, as needed, between the back of the head and backboard to prevent hyperextension;
   4. Secure the torso before immobilizing the head to the LSB in order to minimize C-spine angulation;
   5. In most cases, the upper extremities should be secured next to the torso on the LSB;
   6. Secure the head to the LSB;
   7. Assess, monitor and document in the ePCR the patient's airway/breathing/circulation status.

D. For patients with apparent motor or sensory deficits or other evidence of spinal cord injury, the LSB ideally should be padded or have a vacuum mattress applied, in order to minimize secondary injury.

E. 3rd-trimester Pregnancy: For trauma (as in Cardiac Arrest), bimanual Left Uterine Displacement (LUD) by an additional rescuer is more effective at relieving vena cava compression and supine hypotension syndrome than tilting the LSB. If unable to perform LUD, tilt the LSB to 30 degrees.

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F. Airway:
   1. Maintain high vigilance for airway compromise for patients in SMR with LSB.
   2. Patients with head injury (susceptible to vomiting), severe nosebleed or facial bleeding, severe facial swelling or other difficulty breathing are especially susceptible to airway compromise.
   3. Maintain spine stabilization as much as possible when turning the patient on an LSB and when performing suctioning and other airway interventions, especially during transport.

G. The LSB should be removed as soon as possible by E.D. personnel at the receiving hospital, in order to minimize risk of secondary spine injury, skin breakdown or other adverse effect.

IV. PENETRATING Trauma:

A. **NO focal signs or symptoms of spinal injury:** SMR is not required.
B. **Focal motor and/or sensory deficits indicative of spinal injury or new anatomic deformity of the spine:** Use SMR Without LSB (as per Section VI.B, below).
C. **Both penetrating AND blunt MOI:** Follow the SMR Algorithm for Blunt Trauma.
D. **Mandatory:** Notify E.D. personnel at receiving hospital ASAP upon arrival for patients with C-collar and penetrating neck injury, to minimize risk of delayed injury identification or risk of airway compromise.

V. Additional Considerations:

A. Use utmost care in ANY patient with potential spine injury.
B. Higher index of suspicion for possible spinal injury should be maintained, and at least a cervical collar should be applied if there is evidence of head trauma in patients with any of these conditions:
   1. Dementia or other chronic neuro-psychiatric condition;
   2. Rheumatoid arthritis, severe osteoarthritis or other skeletal deformity;
   3. Chronic steroid therapy;
   4. Severe osteoporosis;
   5. Chronically bedridden.
C. Be conservative! SMR measures are rapidly reversible. When in doubt, apply SMR.
D. Be conservative when evaluating patients who are "found down" or intoxicated with possible new weakness or paralysis, or with evidence of trauma above the clavicles:
   1. These patients may have suffered a cardiovascular event, hypoglycemia or other acute condition, AND they may have also injured their neck and spinal cord.
E. For patients who cannot tolerate a cervical collar (e.g. agitation, CHF exacerbation, respiratory distress or the need for advanced airway management) or for very small children, manual stabilization of the head and neck shall be maintained to the extent possible, with fixation of the patient to the LSB:
   1. **This and any other deviation from standard SMR procedures SHALL be documented in the ePCR AND reported to receiving hospital E.D. personnel, either directly or through BioTel.**
F. For patients requiring advanced airway management, establishing a patent airway is the first priority.

G. **Pediatric Considerations:**

1. For **young children**, the torso must be padded from the top of the shoulders to the bottom of the buttocks, e.g. with a folded sheet or blanket approximately 1-2" thick, if a specialized pediatric spine board with a head recess is unavailable (in order to accommodate their large head and to maintain neutral spinal alignment). Other considerations:
   a. Torticollis (fixed head rotation) in children after blunt trauma is an indication for SMR.
   b. Additional padding may be needed on the child's sides, to prevent lateral movement;
   c. Many young children will stop struggling, once proper immobilization has been performed;
   d. Immobilization straps should be placed across the chest and pelvis (not the abdomen), if possible, in order to minimize respiratory compromise in young children (who "belly breathe");
   e. Closely monitor airway, breathing and circulation.
2. For **infants**, optimal SMR practices and restraints have not been standardized:
   a. Additional padding (e.g. with blanket or towel rolls) may be used to enhance immobilization for a young infant transported in an *otherwise undamaged* infant restraint ("car seat");
   b. If the infant requires significant care (e.g. airway management) that cannot be accomplished in the restraint system, remove the patient and secure him/her directly to the stretcher.
   c. Closely monitor airway, breathing and circulation.

Refer to the next page for details of color-coded, selective SMR Procedures to be deployed after specialized training and with Medical Director authorization.

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VI. Selective SMR Procedures (These selective SMR procedures may be used ONLY by agencies with written Medical Director authorization after completing approved training):

A. Spinal Precautions:

1. **Criteria: Ambulatory patients** (already self-extricated and already standing) with normal mental status, normal motor and sensory examination, AND no thoracic or lumbar spinal tenderness.
2. Maintain manual, in-line stabilization.
3. Place semi-rigid, properly-sized cervical collar.
4. Bring stretcher as close as possible to the patient:
   a. DO NOT ambulate patient to or into the ambulance.
5. Assist patient with gently pivoting and laying down in position of comfort:
   a. Alternatively, the patient may be allowed to sit and then the head of the stretcher gently lowered, while maintaining neutral spinal alignment;
   b. No "standing take-down" is required.
6. Head of the stretcher may be elevated 30° if there is no thoracic or lumbar tenderness.
7. Instruct patient to minimize head and neck movement as much as possible.
8. Any further transfers from the EMS stretcher should be accomplished while maintaining in-line, manual stabilization and limiting spinal motion:
   a. Use slide boards or sheet lifts, if possible;
   b. Patients **SHALL NOT** be ambulated from the stretcher.

B. SMR Without LSB:

1. **Criteria: All other SMR patients (EXCEPT for limited, special circumstances requiring LSB).**
2. Maintain, manual, in-line stabilization.
3. Apply semi-rigid, properly-sized cervical collar.
4. Use device (KED, scoop stretcher, LSB, commercial transfer sheet, or vacuum mattress) to move patient to stretcher while maintaining manual, in-line stabilization and limiting flexion, extension, rotation, and distraction of the spine.
5. If an LSB or scoop stretcher has been used, DO NOT leave in place for transport:
   a. Carefully REMOVE the rigid device while maintaining spinal alignment:
      i. For LSB: use log-roll or multi-rescuer lift-and-slide techniques (minimum 4 rescuers);
      ii. For scoop stretcher: separate the device and remove each piece.
6. Secure the patient SUPINE and flat on the stretcher using tape, head rolls or blocks, stretcher seatbelts, or other devices as needed to minimize movement:
   a. Once the head is secured, manual in-line stabilization may be released;
   b. Patients with vomiting or 3rd-trimester pregnancy may be placed in a left lateral position while maintaining their head in a neutral position using manual stabilization, padding/pillows or the patient's arm.
7. Instruct patient to minimize head and neck movement as much as possible.
8. Consider elevating head of stretcher 30° if: respiratory distress, moderate/severe head injury, or to promote patient compliance and cooperation.
9. Further transfers from the EMS stretcher: See Section IV.A.8, above.

C. SMR With LSB (as described above, Section III):

1. **Criteria: Patients with confirmed paralysis on exam <u>OR</u> in ANY of these circumstances:**
   a. Patients with sports injuries sustained while wearing helmet and shoulder pads*;
   b. Patient/ Provider safety (e.g. combative patient);
   c. If removal would delay transportation of an unstable patient;
   d. Patient must be moved multiple times (beyond usual transfers);
   e. LSB needed to immobilize multiple extremity injuries;
   f. Aeromedical transport (in consultation with aeromedical crew); or
   g. If CPR is ongoing or anticipated during transport.
2. *For patients sustaining trauma during athletic activities while wearing helmet AND shoulder pads, follow the HELMET REMOVAL Procedure. Patients may receive SMR With LSB, or -- in consultation and cooperation with on-scene athletic training staff -- the LSB may be removed for transport once the patient is placed on the EMS stretcher.

Refer to the next page for Figure 1: Blunt Trauma SMR Algorithm

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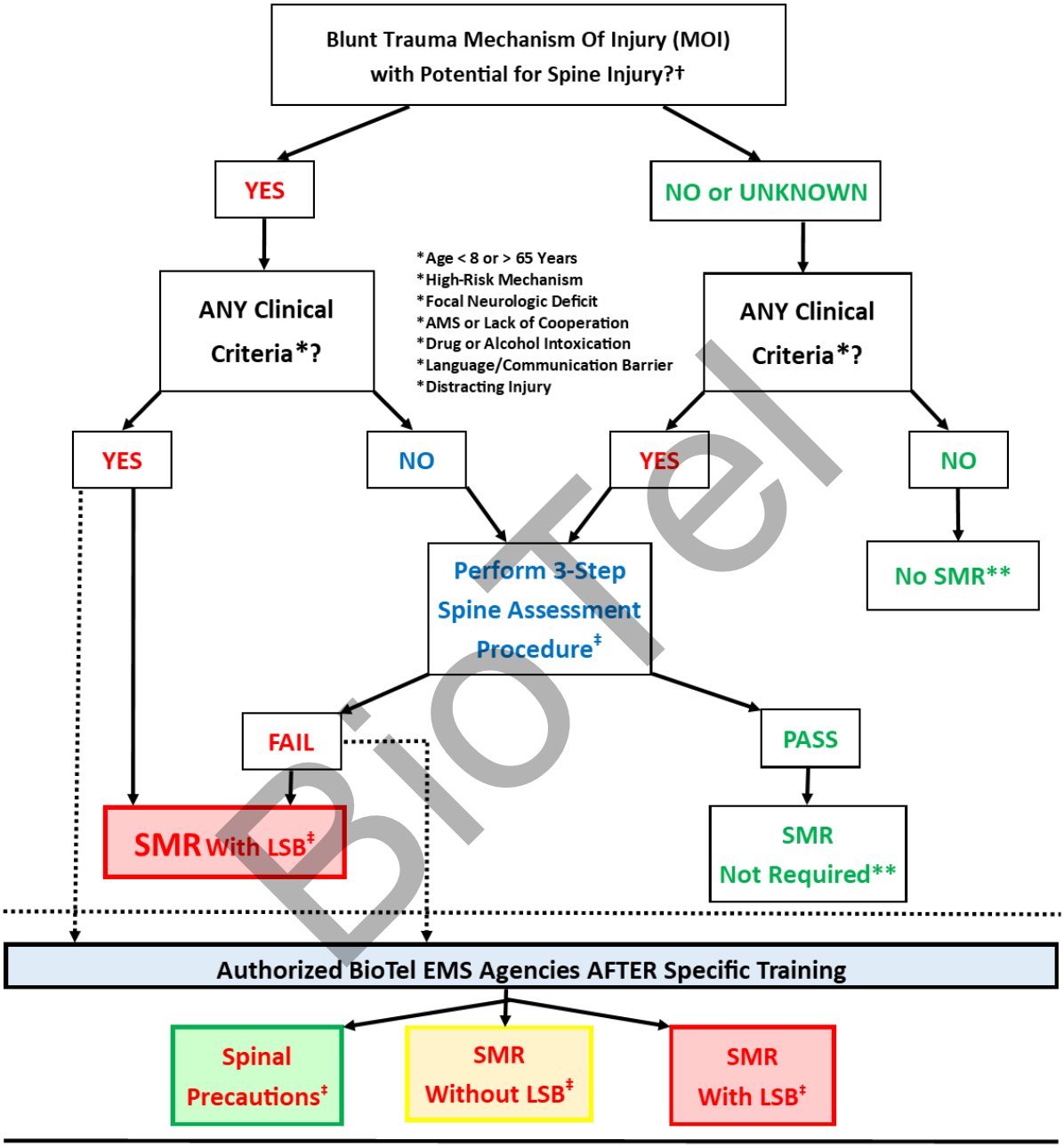
Figure 1: Blunt Trauma SMR Algorithm



†**ANY BLUNT Trauma MOI with potential for causing spine injury:** Refer to the written CPG for details.
(Combined blunt AND penetrating MOI: Follow this algorithm and refer to the written CPG for details.)

***Clinical criteria:** ANY criteria listed in the written CPG (Refer to Sections I.B through I.D for details).

****Consider* SMR** if paramedic judgment deems it appropriate, if Mechanism of Injury (MOI) is unknown, and/or if other factors preclude performing complete spine assessment (e.g. "found down", intoxicated or new weakness/paralysis, with evidence of head/neck/facial trauma).

‡**Criteria for color-coded, selective SMR procedures:** Refer to the written CPG for details.

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Trauma (General)

Goals: Rapid and safe assessment, movement, management, triage and transport of trauma patients
Inclusion Criteria: Patient with blunt and/or penetrating trauma, including blast injury
Exclusion Criteria: No specific exclusions
Refer to: Amputation, Burns, Cardiac Arrest, Eye Injury, Head Injury/TBI, Hemorrhage Control/Tourniquet, Lightning Injury, Pain Management, Toxic Chemical Exposure and Trauma CPGs; Intraosseous Access, Helmet Removal, Needle Cricothyroidotomy and Needle Thoracostomy Procedures; Spinal Motion Restriction, Destination and Determination of Death Policies; Hospital Capabilities Matrix

NOTES:

- *Scene Safety is the #1 priority – this CPG is not intended to provide training for "care under fire".*
- *For major trauma with active hemorrhage, "MARCH" replaces "ABCDE" for the primary assessment.*
- *Adequate pain treatment in trauma patients is a critical EMS performance measure.*
- *Refer to the Destination Policy for detailed destination decision-making guidelines.*
- *Hospital capabilities change: consult BioTel for current Trauma Center and other hospital capabilities.*

Observe Body Substance Isolation Precautions and employ appropriate PPE

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and to Airway Management – Adult or Airway Management – Pediatric, following the MARCH algorithm:
    a. M (Massive Hemorrhage): Control life-threatening hemorrhage according to the Hemorrhage Control/Tourniquet CPG
    b. A (Airway): Assess and support airway patency, per Airway Management (Adult/Pediatric) CPGs
    c. R (Respirations): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring); monitor respiratory effort
    d. C (Circulation): Initiate continuous ECG monitoring; treat shock per Shock CPG
    e. H (Head Injury): Document GCS & pupil size/reaction; refer to Head Injury/TBI CPG; avoid hypoxia
    f. ALSO: Exposure/Environment – Assess for missed injuries; prevent heat loss
2. Positioning:
    a. Refer to the Spinal Motion Restriction Policy and Helmet Removal Procedure
3. Provide basic care, based on anatomical injuries:
    a. Eye: Refer to the Eye Injury CPG
    b. Head/Neck/Spine: Refer to Head Injury/TBI CPG
        i. If TBI is suspected, avoid hypoxia; elevate head 15-30 degrees, if possible
    c. Chest:
        i. Open/sucking chest wound: Cover with occlusive dressing that is taped on only 3 sides
        ii. Flail chest: Closely monitor respiratory status; do not attempt to "stabilize" flail segment
    d. Abdomen/Pelvis:
        i. Open abdominal wound/evisceration: Apply saline-moistened dressing and cover with waterproof material to minimize heat loss
        ii. Unstable pelvic fracture with hemodynamic instability/shock: Apply pelvic binder, if available; minimize manipulation during movement
    e. Extremity: Splint and pad for comfort fractures as they lie, unless manipulation is needed to restore distal pulses
        i. Monitor and document every 5-10 minutes the neurovascular status of injured extremities
        ii. **NOTE:** Do not use traction splints for patients less than 14 years of age
        iii. Open fracture: Apply saline-moistened dressing
        iv. Amputation: Refer to the Amputation CPG
    f. Impaled object: Use bulky dressings to stabilize and secure the object – do not remove the object
4. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
5. Obtain a SAMPLE history, with emphasis on injury mechanisms and patient medications, especially **prescription blood thinners**
6. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

7. Initiate continuous $PetCO_2$ monitoring (if signs/symptoms of shock/hypoperfusion) and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    a. Titrate FiO2 to maintain SpO2 at least 94%:
        i. Hypoxia must be avoided during the acute, pre-hospital care of moderate/severe TBI
8. Initiate advanced airway placement, as needed, according to Airway Management-Adult or -Pediatric:
    a. Indications: failure/impending failure to oxygenate or ventilate; inability to maintain/protect the airway; obstruction; severe respiratory distress unrelieved by less invasive means
9. Establish at least one large-bore peripheral IV (preferred) or IO
10. Infuse Normal Saline, only as needed, according to the following guidelines:
    a. ADULT at least 14 years of age to achieve SBP 80 mmHg or palpable radial pulse:
        i. Administer Normal Saline 500 mL IV/IO
        ii. Repeat up to 2 more times, ONLY as needed, to maintain SBP 80 mmHg or radial pulse
        iii. Consider norepinephrine infusion (4 to 10 mcg/kg/min) for possible neurogenic shock due to high spinal cord injury unresponsive to fluid resuscitation *(not for hemorrhagic shock)*

b. PEDIATRIC patient less than 14 years of age with SBP less than 70 mmHg (60 for infant):
i. Administer Normal Saline 20 mL/kg IV/IO (1000 mL (1 L) maximum per bolus)
ii. Repeat up to two more times, as needed, to maintain palpable brachial (infant) or radial (child) pulse or target SBP for age
iii. Discontinue fluid administration if signs/symptoms of volume overload develop
iv. Contact BioTel for norepinephrine authorization if neurogenic shock is suspected

11. Specific care guidelines, based on anatomical injuries:
    a. Eye: Refer to the Eye Injury CPG
    b. Head/Neck/Spine: Refer to Head Injury/TBI CPG
        i. Avoid hypotension (for isolated TBI, target ADULT SBP 110 mmHg, not 80 mmHg)
        ii. Avoid hypoxia, but titrate FiO_2, if possible (see Section 6.a. above) to minimize hyperoxia
        iii. Avoid both hypoventilation and hyperventilation: target $PetCO_2$ is 35-45 mmHg
    c. Chest: If tension pneumothorax is suspected, perform Needle Thoracostomy as soon as possible
        1. Monitor for clinical improvement and contact BioTel as soon as possible
    d. Wound irrigation: Irrigation of grossly contaminated wounds should be performed using only Normal Saline or tap water (do not use hydrogen peroxide, Betadine® or other antiseptic solution)
    e. Crush injury: The mainstay of treatment is vigorous fluid resuscitation, preferably before extrication, as well as monitoring for and treatment of ECG changes of hyperkalemia and hypocalcemia
        i. Tourniquets are indicated only to control life-threatening hemorrhage
12. Special circumstances – Pregnancy (refer to the OB/Gyn CPG):
    a. Consider any female patient of childbearing age to be pregnant
    b. Normal pregnancy physiology may mask severe maternal or fetal injury:
        i. "Normal" maternal vital signs may indicate shock or impending respiratory failure
        ii. The fetus may be in grave danger after seemingly minimal maternal trauma
        iii. The pregnant trauma patient requires more aggressive fluid resuscitation
    c. Assess for fetal movement, vaginal bleeding, excessive uterine tone and contractions in the visibly pregnant trauma patient
    d. Any pregnant patient with trauma other than isolated, minor extremity injuries should be transported to an appropriate facility for evaluation for the need for Rh-incompatibility treatment (Rhogam®)
    e. A 2nd rescuer must travel in the passenger compartment when transporting a third-trimester, pregnant trauma patient, to in order to take measures to prevent aorto-caval compression syndrome:
        i. Left Uterine Displacement may be more effective and safer than "backboard tilt":

(Images adapted from 2015 American Heart Association Guidelines Update for CPR and ECC doi.org/10.1161/CIR.0000000000000264)

13. Treat pain according to the Pain Management CPG
    a. **NOTE:** Closely monitor cardiorespiratory status when administering parenteral analgesics (especially opioids) to trauma patients with hypovolemia and signs/symptoms of hemorrhagic shock
    b. Cold packs, padding and splinting may provide at least partial analgesia for injured extremities

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14. Initiate transport as soon as possible to an appropriate adult or pediatric facility, following detailed guidance in the Destination Policy and Hospital Capabilities Matrix
    a. Consult BioTel at any time with questions or concerns about destination decision-making
15. For additional assistance and Medical Control physician guidance, contact BioTel

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✦ PEDIATRIC-SPECIFIC

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Airway Management: Pediatric

Goals: Provide effective oxygenation and ventilation; recognize and alleviate respiratory distress or failure; provide necessary interventions quickly and safely to patients who need respiratory support; promptly identify a potentially difficult airway
Inclusion Criteria: Infants and children less than 14 years of age with signs/symptoms of respiratory distress or failure, or with evidence of hypoxemia and/or hypoventilation
Exclusion Criteria: Patients older than 14 years of age; patients with tracheostomies; patients for whom oxygenation and ventilation are adequate with supplemental oxygen alone, via nasal cannula or simple mask
Refer to: Airway Management – Adult Guidelines; CPAP, Cricothyrotomy, Nasotracheal Intubation, PAI and Tracheostomy/Stoma Care Procedures; Neonatal Care, Respiratory Distress – Adult and Respiratory Distress – Pediatric CPGs; and Universal Care – Pediatric Guidelines

- Refer to Airway Management – Adult Guidelines for general guidance about airway management and advanced airway decision-making
- This section will focus on the **pediatric-specific** considerations that differ from adult management

1. **Patient Assessment – As per adult patient assessment, Pediatric Assessment Triangle, AND:**
   a. History – Assess for ***additional*** history:
      i. History of prematurity (infants)
      ii. Associated symptoms, such as poor feeding and fever
   b. Physical Examination – Assess for:
      i. Shortness of breath
      ii. Abnormal skin color (cyanosis, pallor or mottling)
      iii. Age-dependent abnormal respiratory rate and/or effort
      iv. Use of accessory muscles, including retractions, nasal flaring or head bobbing (infants)
      v. Patient positioning, e.g. "tripoding"
      vi. Abnormal mental status
      vii. Quality of air exchange, including depth and equality of breath sounds (all lung fields)
      viii. Abnormal respiratory sounds: wheezing, rhonchi, rales, grunting or stridor
      ix. Cough, including presence and color of sputum
      x. Evidence of hypoxemia (do not assume low SpO_2 is due to equipment malfunction)
      xi. Signs of difficult airway: short jaw or limited jaw thrust; small thyromental space; upper airway obstruction; large tongue; obesity; large tonsils; thick neck; craniofacial abnormalities or injuries

2. **Treatment and Interventions:**

NOTE: These guidelines present an **escalation of EMS care**, **beginning with supplemental oxygen** and possibly ending with endotracheal intubation or needle cricothyrotomy. Most patients would likely follow this sequence. Based on patient's clinical presentation and acuity, however, the EMS provider may need to proceed directly to more advanced airway techniques. **The foundation of all advanced airway management is effective basic airway management (BVM, positioning, suctioning, etc.).** ***Nearly all pediatric patients can be effectively managed, at least temporarily, with supplemental oxygen and/or properly implemented basic airway maneuvers.***

NOTE: The goal of treatment is not *necessarily* "100% SpO_2" and/or 35-45 mmHg $PetCO_2$, but rather adequate oxygenation and ventilation for that particular patient, relief of respiratory distress/failure, and a patent airway (with or without an artificial, advanced airway, as clinically indicated).

a. **Basic Airway Management, including continuous SpO_2 monitoring, to achieve SpO_2 94-98%:**
   i. Apply **supplemental oxygen in the "sniffing" position** (using a small shoulder roll, as needed), as per the Respiratory Distress – Pediatric CPG and other relevant, symptom-specific CPGs, using the following devices, as clinically indicated:
      1. Nasal cannula (NC)
      2. Simple mask

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3. Venti-mask (if available)
4. Non-rebreather mask (NRBM)

ii. If needed, additional respiratory support may be provided by **CPAP** (Continuous Positive Airway Pressure), a form of non-invasive positive pressure ventilation (NIPPV):
   1. **NOTE:** This is an ALS skill in the BioTel EMS System; however, properly trained BLS and ALS Providers may be authorized by the Medical Director to perform *pediatric* CPAP
   2. Refer to the CPAP Procedure for indications, contraindications and procedural details
      a. Minimum age: at least 5 years and **pediatric equipment must be available**
   3. Brief overview of patients possibly suitable for a CPAP trial:
      a. Awake, oriented and able to cooperate (GCS at least 11)
      b. Ability to maintain a patent airway
      c. Respiratory rate at least 25 breaths per minute (or significant tachypnea for age)
      d. Systolic BP at least (70 + 2(age in years) (mmHg))
      e. Use of accessory muscles during spontaneous respirations

iii. If needed, additional respiratory support may be provided for respiratory failure or respiratory arrest by assisted ventilation with a **bag-valve mask (BVM)**:
   1. As per Airway Management – Adult Guidelines, using pediatric equipment

iv. **PEEP Valves, if available,** may be used by appropriately trained personnel, as per Airway Management – Adult Guidelines

b. **Advanced Airway Management:**

v. An **extraglottic airway (EGA) device** may be needed in patients tolerating BVM-assisted ventilation without resistance due to altered mental status (AMS) or unresponsiveness, or who need airway protection (e.g. during cardiac arrest):
   1. General guidelines:
      a. EGA placement is currently an ALS skill in the BioTel EMS System
      b. EGAs are considered an "Advanced Airway" in the BioTel EMS System
      c. EGA placement in pediatric patients may be performed only if pediatric equipment is available
   2. General indications, contraindications and potential complications:
      a. As per Airway Management – Adult Guidelines
   3. Patient preparation:
      a. As per Airway Management – Adult Guidelines
      b. Assist ventilation and preoxygenate with BVM at 12-20 gentle, one-handed breaths per minute (or as appropriate for the age and underlying condition), using only enough volume to achieve chest rise: avoid over-ventilation!
   4. EGA placement – general procedure:
      a. Suggested King EGA sizes: Refer to the BioTel PEDI-Guide©
      b. Other EGA devices: consult manufacturer recommendations
      c. As per Airway Management – Adult Guidelines, using pediatric equipment

ix. **Endotracheal intubation** without use of paralytic agents is rarely indicated for pediatric patients in the out-of-hospital environment:
   1. Indications, contraindications and potential complications:
      a. As per Airway Management – Adult Guidelines
   2. In situations that warrant advanced airway placement, but the patient's level of consciousness precludes ET tube insertion, refer to the Pharmacologically-Assisted Intubation (PAI) Procedure (applies ONLY to agencies authorized by the Medical Director)
   3. Patient/equipment preparation:
      1. Don appropriate PPE and use isolation precautions (contact, droplet or airborne)
      2. Maintain continuous ECG, SpO_2, and $PetCO_2$ monitoring
      c. As per Airway Management – Adult Guidelines, using pediatric equipment
   4. Endotracheal intubation procedure using direct laryngoscopy:
      a. As per Airway Management – Adult Guidelines, using pediatric equipment
      b. A straight ("Miller") laryngoscope blade is preferred

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c. Suggested pediatric ET tube sizes: Refer to the BioTel PEDI-Guide©
d. Inflate the cuff with air to "minimal leak", or use an ET tube cuff manometer and inflate to no more than 20 cm H_2O pressure
e. Continue to provide assisted ventilation at proper rate & volume, avoiding over-ventilation due to excessive ventilation rate, force and/or volume

5. Abandon ET intubation attempt and ventilate with 100% oxygen if ANY of the following events occurs:
   a. Heart rate falls by 10 beats per minute below baseline
   b. SpO_2 falls by 10 points below baseline
   c. $PetCO_2$ rises by more than 5 mmHg above baseline
6. If ET intubation is unsuccessful after ONE attempt (defined as laryngoscope introduction into the patient's mouth), provide BVM ventilation and consider insertion of an approved pediatric EGA device, if available
7. Additional tube placement confirmation guidelines:
   a. As per Airway Management – Adult Guidelines
   b. NOTE: Because of transmission of breath sounds in the pediatric chest, symmetry is best confirmed by auscultation in the bilateral axillae
8. If there is ANY doubt about the proper placement of an ET tube, REMOVE the tube and ventilate the patient with a BVM while preparing for insertion of an EGA rescue device

x. **Nasotracheal intubation** is generally not used in pediatric patients
   1. Refer to the Nasotracheal Intubation Procedure for equipment requirements, procedural details and potential complications

xi. **Needle Cricothyrotomy** may be indicated in certain, extenuating circumstances when risk of death for not escalating airway management may outweigh risk of procedural complications:
   1. Possible indications:
      a. As per Airway Management – Adult Guidelines
   2. NOTE: This procedure provides limited, temporary ability to oxygenate, but little ability to ventilate – hypercarbia will develop eventually
   3. Refer to the Cricothyrotomy (Needle) Procedure for equipment requirements, procedural details and potential complications

xii. **Percutaneous/surgical cricothyrotomy** may be indicated in extremely rare circumstances:
   1. This procedure is restricted in the BioTel EMS System to use only by ALS Providers specifically trained to perform it and authorized by the Medical Director
   2. The online Medical Command Physician at BioTel **must** authorize pediatric use

c. Assisted ventilation rates, $PetCO_2$ values and ECG/SpO_2 monitoring – general guidelines:
   i. Continuous ECG, SpO_2, and waveform capnography/$PetCO_2$ monitoring shall be used for every acutely ill or injured pediatric patient with moderate or severe respiratory distress, shock or hemodynamic instability, critical illness or injury, and/or need for advanced airway management
   ii. $PetCO_2$ monitoring/waveform analysis helps to guide assisted ventilation rate and volume
      1. Avoid excessive positive-pressure ventilation (rate, volume or force) to reduce risk of complications, as per Airway Management – Adult Guidelines
   iii. Assisted ventilation via advanced airway should be performed as follows:
      1. Technique & volume: As per Airway Management – Adult Guidelines
      2. Rate: 10 to 20 breaths per minute, or as needed, *depending on age*, adjusted judiciously to maintain normal $PetCO_2$ values, unless clinically indicated otherwise, such as:
         a. During CPR and ROSC: As per Airway Management – Adult Guidelines
         b. If hypovolemia or severe pulmonary expiratory obstruction (e.g. asthma) is present, consider reducing rate to approximately 6 to 8 breaths per minute

d. **Rapidly transport the patient to the closest appropriate hospital for airway stabilization when respiratory failure cannot be successfully managed in the prehospital setting**

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Advanced Airway Checklist

(For all advanced airway procedures, including Pharmacologically Assisted Intubation (PAI))
(Only paramedics specifically trained and authorized by the Medical Director shall perform PAI.)
(Confidential and Privileged. For quality assurance/improvement purposes only. Pursuant to Section 160.007 of Texas Occupations Code, Texas Health and Safety Code 161.032 and 42 USC Sec. 11101 et seq.)

Date of Procedure: _____ Agency/EMS Run #: _____

At least three rescuers must be present for this procedure:

Rescuer 1 Name (Time Keeper and Monitor): _____

Rescuer 2 Name (Medications ± Laryngeal Manipulation): _____

Rescuer 3 Name (Intubator): _____

Pre-Intubation Evaluation: Complete 3 Minutes Prior to Intubation

Time Completed: _____ Spontaneous Respiratory Rate: _____

Heart Rate: _____ BP: _____/_____ SpO_2: _____ On how much oxygen? _____

$PetCO_2$: _____ mmHg GCS: _____ Head/neck trauma? ☐ Yes ☐ No

Moving all extremities? ☐ Yes ☐ No ☐ No, only the right ☐ No, only the left

Equipment available: ☐ Suction ☐ BVM ☐ Extraglottic device ☐ Bougie

Two Minutes Prior to Intubation

Infant (Less than 1 Year of Age) Pre-Medication	Dose Given	Time
Refer to BioTel PEDI-Guide©		
Atropine 0.02 mg/kg (0.2 mL/kg) IV/IO (If less than 1 year of age and no contraindications exist)		

One Minute Prior to Intubation

ADULT Sedation Medication	Dose Given	Time
Etomidate 0.3 mg/kg slow IV/IO over 30 seconds (adult) (If no contraindications exist) ---------- **OR** Ketamine 2 mg/kg slow IVP/IO, **OR** 4 mg/kg IM (adult) ---------- **OR** Midazolam 2.5 to 5 mg slow IV/IO: maximum 5 mg (adult) AND Fentanyl 1 mcg/kg slow IV/IO: maximum 200 mcg (adult)		

Pediatric (age less than 14 years) medication doses (refer to BioTel PEDI-Guide©) AND additional procedure steps are on the next page

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One Minute Prior to Intubation

PEDIATRIC Sedation Medication	Dose Given	Time
Etomidate 0.3 mg/kg slow IV/IO over 30 seconds (pediatric) (If no contraindications exist) ---------- **OR** Ketamine 2 mg/kg slow IVP/IO, **OR** 4 mg/kg IM (pediatric) ---------- **OR** Midazolam 0.1 mg/kg slow IV/IO: maximum 5 mg (pediatric) AND Fentanyl 1 mcg/kg slow IV/IO: maximum 100 mcg (pediatric)		

Intubation

Abandon intubation attempt and ventilate with a BVM if **ANY** of the following occurs (check all that apply):

_____ Heart rate falls by 10 beats per minute below pre-intubation level

_____ Pulse oximeter falls by 10% below pre-intubation level

_____ $PetCO_2$ rises by 5 mmHg above pre-intubation level

Intubation Successful? ☐ No ☐ Yes, with ETT ☐ Yes, with Extraglottic Airway

Time Completed: _____

Only one attempt allowed. If unsuccessful, insert an extraglottic airway.

Confirmation of ET Tube/Extraglottic Airway Intubation

MANDATORY: 4-phase $PetCO_2$ waveform AND $PetCO_2$ reading at least 5 mmHg? ☐ Yes ☐ No

$PetCO_2$ reading: _____ mmHg

Did medic visualize tube passing between vocal cords? ☐ Yes ☐ No

Is there chest rise and fall with each ventilation? ☐ Yes ☐ No

Are epigastric sounds heard with each ventilation? ☐ Yes ☐ No

Are breath sounds heard in at least 4 places (2 high and 2 lateral)? ☐ Yes ☐ No

30 to 60 Seconds Following Intubation Attempt

Time Completed: _____ Assisted Respiratory Rate: _____

Heart Rate: _____ B/P:_____/_____ SpO_2: _____ on 100% oxygen.

$PetCO_2$: _____ GCS: _____ Tube Depth: _____ mm Tube Size: _____

During Transport

If patient exhibits movement or coughing that might lead to extubation, administer ONE medication:

Medication	Dose(s) Given	Time(s)
Ketamine 2 mg/kg IVP/IO/IM (adult or pediatric) • May repeat once after 10-15 minutes **OR** Midazolam 2 to 5 mg (adult) or 0.1 mg/kg (pediatric) IV/IO/IM/IN • May repeat once after 15 minutes		

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BioTel PEDI-Guide© (**P**ediatric **E**mergency **D**rug & **I**nterventions-Guide)

LINK TO BioTel PEDI-Guide©

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Brief, Resolved, Unexplained Event (BRUE)

(Replaces "Apparent Life-Threatening Event" (ALTE))

Purpose: To facilitate appropriate initial EMS assessment, management and mandatory transport of any infant who experiences an acute event consistent with a possible Brief, Resolved, Unexplained Event (BRUE)
Inclusion Criteria: All infants under 1 year of age for whom history, clinical presentation and/or EMS assessment suggests the possibility of a BRUE
Exclusion Criteria: Children over 1 year of age*
Refer to: UNIVERSAL CARE - PEDIATRIC for details about patient assessment and general EMS care

I. Overview:

ALL INFANTS with a presentation suggestive of a possible BRUE require prompt physician evaluation and **MUST BE TRANSPORTED** to a hospital Emergency Department (E.D.).

If a parent/caregiver refuses transport, EMS Providers must contact BioTel before departing the scene.

II. Definition of a qualifying event consistent with possible BRUE:

1. A Brief, Resolved Unexplained Event (BRUE) is defined[1] as an event occurring in an infant **younger than 1 year of age** when the observer reports a sudden, **brief (less than 1 minute)**, and ***now resolved*** episode of any one or more of the following:
    a. Cyanosis or pallor (**color**)
    b. Absent, decreased or irregular breathing (**breathing**)
    c. Marked change in tone (hyper- or hypotonia) (**tone**)
    d. Altered level of responsiveness (**responsiveness**)
2. The less precise and less accurate term "Apparent Life-Threatening Event" (ALTE) is no longer used:
    a. Terms such as "Near-Miss SIDS" should *never* be used
3. BRUE is a diagnosis of exclusion that can be made only by a physician, not by an EMS Provider

III. Possible Causes (Etiologies) of BRUE:

1. There are many possible causes, ranging from minor to potentially life-threatening, such as:

airway obstruction	seizures
pneumonia or respiratory infection	toxic ingestions
sepsis	metabolic disorders
cardiac abnormality	gastroesophageal reflux/aspiration

IV. Background & Significance:

1. BRUEs account for approximately 1% of all pediatric E.D. visits for infants under 1 year of age
2. The determination that the infant's acute event was a BRUE can only be made after hospital evaluation
3. **By definition, the infant appears well (or back to baseline) by the time EMS arrives**
4. This can lead to a false sense of complacency by both caregivers and EMS Providers, leading to a decision not to transport
5. The risk of death after a BRUE approaches 1%:
    a. Risk of death continues even after discharge from the hospital with a negative evaluation
    b. It is impossible to predict which infants will die
    c. Factors associated with poor outcome:
        i. More than one event in 24 hours
        ii. The need for vigorous stimulation or resuscitation (especially CPR) by EMS providers
6. **EMS Providers lack the diagnostic tools and tests to exclude serious or life-threatening causes**

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V. EMS Assessment, Care and Transport:

1. The patient with an acute, "qualifying" event suggestive of a BRUE should be evaluated and cared for according to the UNIVERSAL CARE – PEDIATRIC Guidelines, as well as any other, specific, applicable CPGs, such as the Cardiac Arrest, Respiratory Distress, Seizure, Sepsis and Trauma CPGs:
    a. Priorities include:
        i. Monitor and manage the ABCs (especially airway), as appropriate
        ii. Identify and treat any obvious life threats
        iii. Obtain and document a detailed history and assessment, including: vital signs (including temperature), POC Glucose analysis, ECG rhythm strip, patient skin color, respiratory effort, tone, eye movements and the duration of the event:
            1. History should include details before, during and after the event, as well as documentation of the social environment (e.g. drug use, neglect, etc.)
            2. Physical exam should include evaluation for sepsis and for possible respiratory, cardiac, neurologic, GI, trauma (including non-accidental trauma), and other causes
2. **Every infant with a suspected BRUE MUST be transported to the closest appropriate E.D.:**
    a. Caregivers of infants with similar, acute events for which details are unavailable and/or that do not fit the strict definition of BRUE qualifying event also should be offered transport for the infant to a pediatric-capable E.D.
    b. *Caregivers of children older than 1 year of age with similar signs/symptoms/history also should be strongly encouraged to accept transport for the child to a pediatric-capable E.D.
3. Destination Decision-Making:
    a. All infants with a presentation consistent with a possible BRUE should transported to a facility with at least **baseline pediatric readiness**
    b. Transport to a destination with pediatric **critical care** capability is preferred for a history of:
        i. Cyanosis
        ii. Past cardiac/respiratory history
        iii. Previous BRUE
        iv. Resuscitation by caregiver
        v. More than one event in 24 hours
4. **If parents/caregivers refuse transport, EMS providers must contact BioTel immediately, before leaving the scene and must document the refusal as "Against Medical Advice"**

VI. Suspected Abuse or Neglect Considerations:

1. Refer to Child/Elderly/Disabled Abuse/Neglect Reporting Policy

V. Reference (excellent resource for details of history and physical exam):

1. Tieder JS et al. Pediatrics (2016). 137(5):e2016059; DOI 10.1542/peds.2016-0590

UTSW/Parkland BioTel EMS Providers may contact BioTel or the EMS Medical Direction Team at any time with questions or concerns about this Policy, especially regarding parent/caregiver transport refusals

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Respiratory Distress - Pediatric

Goals: Timely recognition of respiratory distress; differentiation between upper and lower respiratory tract conditions vs. cardiovascular causes; prompt treatment to prevent deterioration and cardiorespiratory arrest
Inclusion Criteria: Pediatric patients with signs/symptoms of respiratory distress: tachypnea, dyspnea, increased work of breathing, stridor/wheezing, cough and/or signs of volume overload
Exclusion Criteria: Adult patients at least 14 years of age (refer to Respiratory Distress – Adult CPG)
Refer to: Airway Management – Pediatric, Allergic Reaction, Burns, Toxic Chemical Exposure, Trauma and other, relevant CPGs; CPAP, Cricothyroidotomy, Needle Thoracostomy, and Pharmacologically-Assisted Intubation (PAI) Procedures

NOTES:

- EMS care of patients with respiratory distress hinges on timely recognition of the likely cause – upper airway vs. lower airway vs. cardiovascular illness or injury.
- In the setting of confirmed or suspected infectious illness, EMS Provider safety through the use of agency-specific infection control measures and EMS Provider PPE (including a HEPA or N95 respirator) is critical:
  - If fever plus respiratory symptoms are present, or for patients with coughing, sneezing or generation of airborne droplets, consider placing a HEPA or N95 mask (if tolerated) or a 100% NRB mask on the patient to reduce infection transmission.
- Emergency, initial treatment of respiratory distress under special conditions:
  - Suspected tension pneumothorax: ***immediate*** Needle Thoracostomy
  - Severe anaphylaxis with stridor/laryngospasm: ***immediate*** IM epinephrine, per Allergic Reaction CPG
  - Suspected epiglottitis: supportive measures without airway instrumentation, rapid transport
  - Suspected airway trauma with obstruction: consider immediate Needle Cricothyroidotomy
  - Status asthmaticus: ***immediate*** relief of bronchospasm **(see below, Step 13.d)**:
    - Advanced airway placement: reserved for patients who do not respond to other measures.

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – Pediatric and to Airway Management – Pediatric:
   a. A (Airway): Ensure airway patency with positioning, suctioning and OPA or NPA, as needed
      i. If stridor is present, treat for anaphylaxis (Allergic Reaction CPG) or foreign body, as indicated
   b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 at least 94% (continuous monitoring); assist ventilations with BVM, as needed:
      i. During initial evaluation and care, continue high-flow oxygen to maintain SpO_2 at least 94%
      ii. If acute stroke or TBI is suspected, or during post-cardiac arrest care with ROSC, titrate FiO_2 to the minimum concentration necessary to maintain SpO_2 94-99%
      iii. If wheezing is present and there are no signs of volume overload or congestive heart failure, administer albuterol 2.5 mg via nebulizer, every 5 minutes, up to a total of 3 doses
      iv. If stridor ± barking cough is present, do NOT administer albuterol: proceed to "Croup" section of this CPG **(see below, Step 14)**
   c. C (Circulation): Initiate continuous ECG monitoring
   d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
   e. E (Exposure/Environmental): Assess for cardiac or renal disease, overdose, sepsis, toxic chemical exposure and other etiologies; treat chest trauma according to the Trauma CPG
2. Positioning:
   a. If trauma is not suspected, position the patient in a position of comfort
   b. If shock is present, position patient supine (with legs elevated, if tolerated) or in the left lateral decubitus position, facing EMS Providers, if tolerated, in order to monitor and manage the airway
   c. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
3. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
4. Perform a SAMPLE history and focused secondary assessment
5. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

6. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring until patient care has been transferred to hospital staff:
    a. Anticipate the need and prepare for possible CPAP or advanced airway management (PAI, supgraglottic airway/endotracheal intubation, or Needle Cricothyroidotomy)
    b. Consider using PEEP Valve if no contraindications (refer to Airway Management – Pediatric)
7. Treat hemodynamically-significant dysrhythmias according to the relevant CPG
8. Establish IV (preferred) or IO access at TKO rate or with saline lock
    a. IV/IO access should be obtained BEFORE nitroglycerin administration, if possible
9. Assess breath sounds and other physical findings and then proceed to **Step 10, Step 11, Step 12, Step 13, Step 14 OR Step 15,** based on the patient's history and physical examination
10. If **upper airway obstruction** is confirmed or suspected:
    a. Smoke inhalation/thermal airway burns: consider early advanced Airway Management (PAI)
    b. Foreign body obstruction: perform BLS maneuvers to remove foreign body
    c. Anaphylaxis with or without bronchospasm: treat according to the Allergic Reaction CPG
    d. Traumatic injury to upper airway: consider one attempt at oral advanced airway placement before proceeding to emergency Needle Cricothyroidotomy
11. If **tension pneumothorax** is suspected, due to dyspnea, tachypnea, hypoxia, decreased breath sounds and decreased chest wall excursion on the affected side, accompanied by hemodynamic compromise and high airway resistance to assisted ventilation, proceed immediately to Needle Thoracostomy
    a. Tracheal deviation is a late, ominous sign that may be difficult to detect on physical examination
12. If **volume overload** is suspected (e.g. rales, JVD, peripheral edema or hepatomegaly):
    a. Contact BioTel
    b. Acquire and transmit 12-Lead ECG as soon as possible
    c. Consider CPAP at 5 to 10 cm H_2O pressure, if available and if there are no contraindications
13. If **wheezing is present <u>without</u> signs of volume overload or signs/symptoms of anaphylaxis**:
    a. Mild-moderate wheezing (all ages): Administer albuterol: 2.5 mg via nebulizer
    b. *If no significant improvement after one albuterol nebulizer treatment:*

Age Less Than 2 Years AND NO Asthma History	Age At Least 2 Years AND/OR History of Asthma
Supplemental oxygen to maintain SpO_2 at least 94%	Add ipratropium 0.5 mg to next nebulizer doses
Monitor airway patency; suction as needed	Maximum total ipratropium doses: 3
Contact BioTel for additional assistance or Medical Control Physician guidance	Proceed to step 13.c (below) and contact BioTel as soon as possible

    c. If no significant improvement after 3 nebulizer treatments, add the following:

Age Less Than 2 Years AND NO Asthma History	Age At Least 2 Years AND/OR History of Asthma
Consider single dose of epinephrine (1 mg/mL): 3 mg (3 mL) via nebulizer IF respiratory distress or tachypnea without wheezing or bronchospasm	Consider CPAP, if available Obtain IV/IO access
Contact BioTel for additional assistance or Medical Control Physician guidance	Administer methylprednisolone IV/IO, if available (optional medication): • Reconstitute 125 mg in 2 mL (as supplied), then dilute with 8 mL NS to final volume 10 mL (12.5 mg/mL) • Administer IV/IO unit dose, by age: Under 2 yr: **BioTel authorization req'd.** 2 yr to 35 mo: 25 mg (2 mL) 3 to 4 yr: 37.5 mg (3 mL) 5 to 9 yr: 50 mg (4 mL) 10 to 13 yr: 62.5 mg (5 mL) If IM dosing is needed because of lack of IV/IO access, contact BioTel to confirm dose: • Reconstitute in 2 mL, but do NOT dilute • Administer 2 mg/kg (0.032 mL/kg) IM

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	• **ALTERNATIVE:** Dexamethasone, if available (optional medication): • 0.6 mg/kg IV/IO or IM or PO (max 16 mg)

d. If no response to nebulizers, or for status asthmaticus or impending respiratory failure (altered mental status, severe difficulty ventilating, worsening hypoxia or hypercarbia):
   i. Age less than 2 years and NO asthma history:
      5. Prepare for advanced airway management (refer to BioTel PEDI-Guide©)
      6. Contact BioTel for further guidance
      7. Administer Normal Saline 20 mL/kg IV/IO (maximum 1000 mL (1 L) per bolus)
      8. Consider IM epinephrine, as outlined in the table below
   ii. Age at least 2 years AND/OR history of asthma:
      9. Administer IM epinephrine, as outlined in the table below
      10. **AND:** Administer magnesium sulfate IV/IO:
         A. Refer to Magnesium Sulfate drug sheet and BioTel PEDI-Guide© for dosing
      11. Administer Normal Saline 20 mL/kg IV/IO (maximum 1000 mL (1 L) per bolus)
      12. Contact BioTel as soon as possible
      13. Prepare for advanced airway management (equipment sizes: BioTel PEDI-Guide©)

AGE (If weight is unknown)	WEIGHT (kg)	IM EPI DOSE (mL) 1 mg/mL (1:1,000)		EPINEPHRINE AUTO-INJECTOR (EA) Or Approved Epi Kit*
Less than 12 months	Less than 10	0.05 – 0.1 mL		No (Unless infant EA available)
12 to 23 months	10 – 11.9	0.1 mL	OR	Consider "Jr" if known weight is at least 10 kg
24 to 35 months	12 – 14.9	0.15 mL		
3 to 6 years	15 – 23.9	0.2 mL	OR	0.15 mg ("Jr") GREEN DEVICE
7 to 9 years	24 – 29.9	0.25 mL		
10 to 11 years	30 – 36.9	0.3 mL	OR	0.3 mg (Adult) YELLOW DEVICE
12 to 13 years	37 - 50	0.4 mL		
At least 14 years & adult	More than 50	0.5 mL		
NOTE: 2nd or 3rd dose might be needed – every 5-10 minutes – in 25-30% of patients NOTE: Consider adding glucagon for patients on beta-blockers (which may blunt response to epinephrine)				

14. If **respiratory distress with a history of "barking" cough and/or stridor suggestive of CROUP**:
    a. Do not administer albuterol
    b. If stridor is present at rest, administer epinephrine (1 mg/mL) **via nebulizer**:
       i. Age less than 2 years: 3 mg (3 mL)
       ii. Age 2 years and older: 5 mg (5 mL)
    c. Consider dexamethasone (0.6 mg/kg) PO or IM or IV/IO (maximum dose: 16 mg)
    d. Consider IV/IO access at TKO rate, if not already done
    e. Administer Normal Saline 20 mL/kg IV/IO for patient with impending respiratory failure
    f. Contact BioTel as soon as possible for further guidance
15. **If respiratory distress with fever, ill appearance and signs/symptoms of upper airway obstruction (e.g. "hot potato" voice, drooling) suggestive of EPIGLOTTITIS:**
    a. Transport in upright position and minimize interventions that cause agitation, crying or tachypnea
    b. Do not administer albuterol
    c. Establish IV/IO access only if doing so will not aggravate patient's condition
    d. Laryngoscopy and advanced airway: reserved ONLY for patients who fail less invasive measures
    e. Contact BioTel en route to facilitate emergency airway interventions as soon as possible after arrival
16. Initiate transport with close monitoring of ABCs
17. For additional assistance and Medical Control physician guidance, especially patient transport refusal by parents/caregivers, contact BioTel

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✦ OB-GYN and NEONATAL

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Emergency Childbirth: Normal

Purpose: To aid EMS Providers in emergency childbirth
Inclusion Criteria: All pregnant women in active, uncomplicated labor, with impending delivery
Exclusion Criteria: Known or suspected complications or other high-risk conditions requiring additional care
Refer to: Emergency Childbirth (Abnormal) Special Procedure; OB-Gyn and Neonatal Care CPGs

Procedure (observe Body Substance Isolation Precautions and employ appropriate PPE):

1. **Patient Preparation:**
   a. Maternal vital signs, including POC Glucose analysis (if time permits), per UNIVERSAL CARE - ADULT
   b. Continuous ECG and SpO_2 monitoring (no supplemental oxygen *unless* SpO_2 is less than 94%)
   c. SAMPLE and focused obstetrical history, including, if time permits:
      i. Estimated due date
      ii. Contractions: Frequency, duration, intensity
      iii. Amniotic sac rupture: time and color (presence of meconium)
      iv. Prenatal care (especially any identified pregnancy complications)
      v. Previous pregnancies and deliveries (especially multiple births, complications, C-section)
      vi. Medical conditions (especially hypertension, preeclampsia, diabetes, seizures, cardiac conditions)
      vii. Medications taken prior to labor, including over-the-counter
      viii. Vaginal bleeding and/or abdominal pain
   d. Remove clothing and position patient with perineum elevated on a clean, folded blanket, pad or pillow
2. **Equipment needed:**
   a. Obstetrical kit (prepare bulb syringe, cord clamps, scalpel/scissors, towels, newborn blanket)
   b. Biohazard bag (place open bag under mother's buttocks)
3. **Deliver the newborn:**
   a. During contractions, urge patient to push
   b. Deliver and support the emerging fetal head (support the mother's perineum, if possible)
      i. Routine suctioning of mouth/pharynx/nose during delivery is no longer recommended
   c. Check for and manage nuchal cord, if present
      i. Slipping the cord over the infant's head is usually possible and preferable to early cord clamping/cutting
   d. Assess for and document presence of meconium (if present, do not attempt suctioning at this time)
   e. Deliver the shoulders, then the rest of the body
   f. Place newborn on mother's abdomen or level with the mother's uterus
      i. If preterm/term infant is vigorous and mother is stable, delay cord clamping/cutting for 30 to 60 seconds
   g. Note the time of birth (county of birth is also needed for birth certificate documentation)
4. **Maternal care:**
   a. Control, document and treat maternal hemorrhage with volume resuscitation, if needed
   b. Monitor and document maternal vital signs
   c. Refer to OB-Gyn CPG for additional post-partum care guidance
5. **Newborn care (refer to Neonatal Care CPG):**
   a. **Birth to 30 seconds postpartum:**
      i. Warm and dry; clear the airway, if needed (because of apnea or "drowning" in secretions)
      ii. Stimulate the newborn by rubbing the back; wrap in blankets or towels to prevent heat loss/hypothermia
   b. **30 to 60 seconds postpartum:**
      i. Initiate neonatal resuscitation per Neonatal Care CPG, if needed
         1. Ventilation is more important than oxygenation
      ii. Clamp and cut the umbilical cord
      iii. Calculate and document the 1-minute APGAR score
   c. **More than 1 minute postpartum:**
      i. Continue neonatal resuscitation per Neonatal Care CPG, if needed
   d. **5 minutes postpartum:**
      i. Calculate and document the 5-minute APGAR score
6. **Continue to monitor maternal and neonatal vital signs, and prepare for transport**
   a. If possible, a neonate should be transported secured in an infant seat unless resuscitation is needed.
   b. "Skin-to-skin" transport under blankets on the mother's chest may be more feasible.
7. **For additional assistance and Medical Control physician guidance, contact BioTel**

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Emergency Childbirth: Abnormal

Goal: To aid EMS Providers in emergency childbirth procedures during abnormal maternal and fetal conditions that may complicate labor and delivery
Inclusion Criteria: Term and preterm emergency deliveries with known or suspected complications
Exclusion Criteria: Normal, uncomplicated emergency childbirth
Refer to: Neonatal CPG, Emergency Childbirth (Normal) Special Procedures and Hospital Capabilities Matrix

Procedure (observe Body Substance Isolation Precautions and employ appropriate PPE):

1. **Patient Preparation:**
   a. Maternal vital signs, including POC Glucose analysis (if time permits), per UNIVERSAL CARE - ADULT
   b. Continuous ECG and SpO_2 monitoring (administer 100% oxygen via NRBM)
   c. Establish at least one, large-bore peripheral IV, if time permits (two IVs preferred if maternal hemorrhage)
   d. SAMPLE and focused obstetrical history, per Emergency Childbirth (Normal), if time permits
   e. Remove clothing and position patient with perineum elevated on a clean, folded blanket, pad or pillow
   f. Request additional EMS resources, if time permits
2. **Equipment needed:**
   a. Obstetrical kit (prepare bulb syringe, cord clamps, scalpel/scissors, towels, newborn blanket)
   b. Biohazard bag (place open bag under mother's buttocks)
      i. If available, a 1-gallon zip food storage bag or equivalent, placed up to the infant's neck, may be useful for to help minimize neonatal heat loss of an extremely premature infant
   c. IV/IO access for mother (and possibly for infant)
   d. Neonatal/infant resuscitation equipment, especially BVM and pulse oximetry equipment
3. **Deliver the newborn – Refer to specific guidance on the next pages, and/or consult BioTel:**
   a. During contractions, urge patient to push (EXCEPTION: cord prolapse)
   b. Deliver and support the emerging fetal part, if not the head
   c. Recognize abnormal presentation requiring immediate care and **transport for emergency C-section**:
      i. Prolapsed cord, hand/shoulder presentation ("transverse lie"), Cephalopelvic Disproportion ("CPD")
      ii. Breech presentation when the head does not deliver within 3 minutes
      iii. Shoulder dystocia
   d. If breech or other non-vertex presentation, deliver the legs and body, then the head
   e. Two active-labor conditions requiring insertion of a sterile, gloved hand into the vaginal canal:
      i. Breech presentation when the head does not deliver immediately (prevent fetal suffocation)
      ii. Umbilical cord prolapse (lift presenting part off the cord)
         1. Alternative: position mother on hands/knees with buttocks elevated (may be unsafe for transport)
      iii. In both cases, this position must be maintained en route, until emergency C-section delivery
   f. Assess for and document the presence of meconium
   g. Initiate rapid transport to an appropriate Obstetrical/Neonatal Specialty Care Facility, depending on maternal and/or neonatal capabilities, per Destination Policy and Hospital Capabilities Matrix
   h. Deliver the shoulders, if not previously delivered
   i. Deliver the remainder of the body, if not previously delivered
   j. Place newborn on mother's abdomen or level with the mother's uterus
      i. If preterm/term infant is vigorous and mother is stable, delay cord clamping/cutting for 30 to 60 seconds
   k. Note the time of birth (county of birth is also needed for birth certificate documentation)
4. **Maternal care:**
   a. Control, document and treat maternal hemorrhage with volume resuscitation, if needed
   b. Monitor and document maternal vital signs
   c. Refer to OB-Gyn CPG for additional post-partum care guidance
5. **Newborn care (refer to Emergency Childbirth (Normal) on previous page and to Neonatal Care CPG)**
6. **Continue to monitor maternal vital signs and fetal viability/neonatal vital signs en route**
7. For additional assistance and Medical Control physician guidance, especially with destination decision-making, contact BioTel

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Emergency Childbirth – Abnormal

Additional Resources

1. These conditions CANNOT be safely managed in the field and **REQUIRE IMMEDIATE C-SECTION**:
   a. **Cephalopelvic Disproportion ("CPD"):** fetal head is too large or maternal pelvis is too small
      i. Associations: Primigravida with prolonged, excessively strong contractions for a long time
      ii. Risks: Uterine rupture, fetal demise
   b. **Umbilical cord prolapse:** fetal part compresses the cord, causing anoxia (cord prolapse may be hidden)
      i. Associations: breech presentation, PROM, large fetus, multiple gestation, long cord, preterm labor
      ii. Risk: fetal anoxic brain injury
      iii. **EMS treatment different from normal childbirth:**
         1. Position mother: hips elevated (e.g. on pillows), Trendelenburg or knee-chest position (may be useful on-scene, but not practical for transport)
         2. Administer 100% oxygen by NRBM to the mother
         3. Instruct mother to "pant" with each contraction – instruct her NOT to bear-down
         4. Minimize handling of the exposed cord to avoid tearing:
            a. Consider covering it with moist, sterile gauze (but this may increase risk of hypothermia)
         5. Use a sterile, gloved hand GENTLY attempt to push the fetus back into the vagina AND elevate the presenting fetal part off the cord
            a. If the cord spontaneously retracts, allow it to do so without attempting to reposition it
         6. This position **MUST** be maintained en route, until emergency C-section can be performed
         7. Periodically reassess and document fetal viability (palpable pulse in the cord)
   c. **Shoulder presentation ("Transverse Lie"):** fetal arm or shoulder as the presenting part
      i. Associations: Rare, except in second twins
      ii. Risks: uterine rupture, fetal injury

2. These conditions **REQUIRE IMMEDIATE TRANSPORT** for likely C-section delivery:
   a. **Breech presentation:** if the head does not deliver within 3 minutes, the infant cannot be safely delivered in the field
      i. Three types:
         1. Most common: "frank" or "frontal" (hips flexed, legs extended, buttocks presentation)
         2. 2nd most common: "incomplete" (foot presentation)
         3. Least common: "complete" (both hips and legs flexed, buttocks presentation)
      ii. Associations: Multiple gestation, preterm labor
      iii. Risks: Fetal injury, anoxic brain injury or death
      iv. **EMS treatment different from normal childbirth:**
         1. Contact BioTel, while permitting fetus to deliver spontaneously to up the level of the umbilicus:
            a. During delivery, ensure that the fetal face is turned away from the maternal symphysis pubis
            b. Avoid excessive traction or manipulation of the fetal head or spine
         2. If the head does not deliver immediately, take action to prevent suffocation:
            a. Insert a sterile, gloved hand into the vagina, palm towards the fetal face
            b. Form a "V" around the nose with the index and middle fingers
            c. Gently push the vaginal wall away from the fetal face until the head is delivered
            d. This position **MUST** be maintained en route, until emergency C-section can be performed
   b. **Shoulder dystocia:** fetal shoulders blocked by maternal symphysis pubis, causing the head to deliver, but then to pull back tightly against the mother's perineum ("turtle sign")
      i. Associations: increased birth weight (e.g. infant of diabetic mother)
      ii. Risks: brachial plexus injury, fractured clavicle, fetal anoxia from cord compression
      iii. **EMS treatment different from normal childbirth:**
         1. Contact BioTel while positioning mother on her back in knee-chest position ("McRoberts")
         2. Avoid excessive traction on the fetal head or spine
         3. Follow guidance provided by BioTel staff/physician for maneuvers to assist with delivery (e.g. suprapubic pressure or maternal positioning ("Starter position"))

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3. These conditions may complicate delivery – **PREPARE FOR IMMEDIATE TRANSPORT**:
   a. **Preeclampsia:** triad of hypertension, edema and proteinuria that can progress to eclampsia
      i. Associations: 1st pregnancy, teenage pregnancy, cardiovascular disease, multiple gestation, coagulation disorders, genetics
      ii. Risks: Eclampsia (preeclampsia + seizures), causing maternal and fetal morbidity and mortality
         1. The only definitive treatment for eclampsia is delivery of the fetus
      iii. Signs/symptoms: SBP greater than 160 mmHg or DBP greater than 90 mmHg, peripheral edema, headache, visual disturbances, nausea/vomiting, altered LOC, or multi-system organ failure
      iv. **EMS treatment different from normal obstetrical care/normal childbirth:**
         1. Establish two, large-bore peripheral IVs (or IO): one for fluids, the other for magnesium sulfate
         2. Monitor for and treat seizures according to the OB-Gyn and Seizure CPGs
         3. Notify BioTel en route to receiving hospital, to facilitate preparation for emergency delivery
   b. **Multiple gestation:** women with no prenatal care may be unaware of multiple gestation
      i. Risks: prematurity, PROM, placental abruption, postpartum hemorrhage, abnormal presentation
      ii. **EMS treatment different from normal childbirth:**
         1. 1st twin: identical to singleton (single fetus) with the same presentation
         2. Uterine contractions usually resume within 5 to 10 minutes
         3. Delivery of 2nd fetus usually occurs within 30 to 45 minutes
         4. Both twins usually deliver before the placenta(s)
         5. BioTel may advise transport prior to delivery of the 2nd fetus
      iii. Increased newborn risks after delivery: hypothermia, hypoxia, hypoglycemia, sepsis
      iv. Maternal risks: severe postpartum hemorrhage requiring vigorous fluid resuscitation, uterine massage
   c. **Precipitous delivery:** rapid, spontaneous delivery within 3 hours of the onset of labor
      i. Associations: grand multiparity (7 or more prior deliveries)
      ii. Risks: fetal head trauma, fetal hypoxia, hemorrhage due to umbilical cord tear
      iii. **EMS treatment different from normal childbirth:**
         1. Apply GENTLE counter-pressure to the fetal head, but do NOT attempt to prevent fetal descent
         2. Examine the maternal perineum for tears or hemorrhage
            a. Control hemorrhage with firm pressure on gauze pads
   d. **Pulmonary embolism and Amniotic Fluid Embolism ("AFE"):** common causes of maternal morbidity and mortality before, during and after delivery
      i. Associations:
         1. Pulmonary embolism: more common after C-section than after vaginal delivery
         2. AFE: Multiparous women in 1st stage of labor, maternal trauma, placenta previa, placental abruption, intrauterine fetal demise
      ii. Risk: maternal death
      iii. Signs/symptoms: Sudden, severe dyspnea; pleuritic chest pain; tachycardia; tachypnea; hypotension; shock; cyanosis; cardiopulmonary arrest
      iv. **EMS treatment different from normal childbirth:**
         1. Refer to Cardiac Arrest, Shock and the relevant dysrhythmia CPGs
         2. Continuous ECG, SpO_2 and $PetCO_2$ monitoring
         3. IV/IO at TKO rate and fluid resuscitation as needed, per relevant CPGs
         4. 12-lead ECG
   e. **Abnormal maternal hemorrhage:** placenta previa, placental abruption, multiple gestation, precipitous delivery, uterine rupture, uterine inversion, uterine atony, and other causes
      i. "Normal" blood loss with childbirth: 500 mL
      ii. Associations for abnormal *postpartum* hemorrhage: "Four Ts"
         1. Tone (uterine atony – uterus does not contract normally)
         2. Tissue (retained placenta)
         3. Trauma (perineal lacerations, uterine rupture)
         4. CloTting (coagulopathy)
      iii. Risks: maternal and/or fetal death
      iv. **NOTE:** Absence of vaginal bleeding does NOT exclude placental abruption
         1. Mandatory transport to an Obstetrical Special Care facility for any pregnant woman with abdominal pain after MVC or other trauma

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v. **NOTE:** It is always safer to encourage transport for any pregnant, laboring or postpartum woman with history of vaginal bleeding and/or abdominal pain, especially after MVC or trauma

vi. **EMS treatment different from normal childbirth:**

1. Refer to Shock CPG
2. Continuous ECG, SpO_2 and $PetCO_2$ monitoring
3. Two, large-bore IVs (or IO) and fluid resuscitation, as needed, to treat hypovolemic shock
4. For suspected uterine atony:
   a. Allow mother to empty bladder
   b. Allow infant to breastfeed, if feasible
   c. Consider external uterine compression (painful):
      i. Place left hand on abdomen, dipping down as far as possible behind uterus
      ii. Press right hand flat on abdominal wall
      iii. Pull up the uterus into the abdomen and compress between right and left hands

f. **Uterine inversion:** uterus turns "inside out" (may be complete or incomplete)

i. **#1 cause:** personnel exerting traction on the cord or excessive pressure on the uterine fundus
   1. Other causes: forceful uterine contraction; maternal cough or sneeze

ii. Signs/symptoms: postpartum hemorrhage; sudden, severe lower abdominal pain; shock

iii. **EMS treatment different from normal childbirth:**

1. Monitor and resuscitate as for other causes of maternal hemorrhage
2. Do NOT attempt to remove the placenta
3. If the uterus is freshly inverted AND the placenta has already separated, apply pressure with sterile, gloved fingertips and palm to push the uterine fundus upward through the cervical canal
   a. If this is ineffective, cover all protruding tissues with moist, sterile dressings and transport
4. If the uterus has been inverted for a prolonged period, or if the placenta has not already separated, or if in doubt, cover all protruding tissues with moist, sterile dressings and transport

g. **Meconium staining:** Fetal stool in the amniotic fluid, indicative of fetal distress

i. Associations: Post-term delivery, small-for-gestational age (SGA) infants

ii. Risks: perinatal mortality, hypoxemia, pneumonia, pneumothorax, Meconium Aspiration Syndrome

iii. Signs and symptoms: spectrum from minimal symptoms to severe cardiorespiratory depression

iv. ***EMS treatment and resuscitation of the vigorous, newly born infant with meconium-stained fluid is the same as that for infants with clear amniotic fluid***

1. Refer to Emergency Childbirth (Normal) Special Procedures and Neonatal Care CPG
2. Routine suctioning of mouth/pharynx/nose *during* delivery is no longer recommended
3. If infant cannot clear his/her own airway or is drowning in secretions, suction mouth, oropharynx and nose with bulb syringe

v. **IMPORTANT NOTE:** Endotracheal suctioning is RARELY, if ever, needed for the depressed neonate with meconium staining *unless other resuscitative measures*, per the Neonatal Care CPG, have failed

vi. Consider ET suctioning ***only*** if there is no improvement in heart rate and no chest rise *despite "MRSOPA" and other corrective steps*, such as good mask seal and gentle positive pressure ventilation

vii. Endotracheal intubation and suction procedure (advanced level providers only):

1. Perform direct ET suctioning, using the ET tube as a suction catheter
2. Apply suction to the ET tube while withdrawing it
3. Monitor heart rate
4. If heart rate drops below 100 bpm, *gently* ventilate with infant BVM at 40 to 60 ventilations per minute (squeeze bag just enough to produce chest rise)
5. Repeat the *intubation-suction for 3 seconds-extubation* cycle until no further meconium is removed, as long as heart rate remains at least 100 bpm
6. If heart rate remains above 100 bpm, do not ventilate between cycles
7. If the ET tube occludes with meconium, replace it with a fresh tube

viii. Refer to Neonatal Care CPG for additional resuscitation guidelines and other interventions

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Neonatal Care

Goals: To aid EMS Providers in the timely care of term and preterm, newly born infants
Inclusion Criteria: All term and preterm newborns, especially those unresponsive to initial stimulation and who need resuscitation efforts
Exclusion Criteria: None
Refer to: OB-Gyn CPG, Emergency Childbirth Special Procedures and Hospital Capabilities Matrix

SPECIAL NOTE: Maternal estimates of "due date" may be inaccurate. Very premature infants and those of certain other, high-risk pregnancies may be very small. Determination of fetal viability is best made by trained hospital personnel. As such, attempts should be made to resuscitate all infants, unless a BioTel Online Medical Control physician advises otherwise.

Basic Level:

1. Within the first 30 seconds:
   a. Warm and dry the infant – take care to avoid hypothermia (if possible, increase ambient temperature to 70-75°F (21-24°C))
      i. Vigorous, term infant: Dry the infant, place skin-to-skin with the mother and cover with a blanket
      ii. Preterm infant: If available, place the infant in a polyethylene bag (e.g. 1-gallon zip food bag) up to the level of the neck
   b. Position the infant to facilitate drainage of airway secretions
   c. Stimulate by gently rubbing the back
   d. Regardless of whether amniotic fluid is clear or meconium-stained, clear the airway ONLY if needed:
      i. If the infant cannot clear his/her own airway, or if the infant is drowning in secretions
      ii. This can usually be done with a bulb syringe – deep suctioning with a catheter before instituting other resuscitation measures is rarely needed
      iii. Refer to OB-Gyn CPG and Emergency Childbirth Special Procedures for additional guidance
2. Assess respirations:
   a. If respirations are inadequate or gasping OR if heart rate is less than 100 bpm, gently assist ventilations at a rate of 40 to 60 ventilations per minute, using an infant BVM with room air, just enough to produce chest rise
   b. Monitor the infant's SpO_2 on the right hand or wrist
   c. Supplemental oxygen to achieve the Mean Per-Minute Goal Saturations (see next page) is secondary to effective ventilation*
3. Assess heart rate:
   a. If heart rate remains less than 100 bpm after respiratory interventions, take corrective steps to improve ventilation, according to the "MRSOPA" algorithm:
      i. **M**ask: check the seal
      ii. **R**eposition: make sure infant is in sniffing position (do not flex or hyperextend the neck)
      iii. **S**uction: mouth before nose
      iv. **O**pen the mouth
      v. **P**ressure increase (gentle!!!)
      vi. **A**lternative airway (either intubate or place LMA, if available – advanced level providers only)
   b. If the heart rate remains less than 60 bpm despite completing "MRSOPA" steps, increase oxygen concentration to 100% and begin chest compressions:
      i. Use the two-thumb/encircling hands technique (thumbs side-by-side, just below nipple line)
      ii. Compression-to-ventilation ratio for neonates is 3 to 1
      iii. Compression rate is 120 events per minute (90 compressions interspersed with 30 gentle ventilations)
4. Assess skin color (for APGAR score only – see next page):
   a. Score: Blue/pale = 0 points; Body pink/extremities blue = 1 point; Completely pink = 2 points
   b. Provide supplemental oxygen to maintain Mean Per-Minute Goal Saturations* (see next page)
5. Clamp and cut the cord:
   a. *Vigorous preterm or term infant: delay cord clamping for 30 to 60 seconds after delivery*
   b. Depressed infant or neonatal/maternal emergency condition: do not delay cord clamping/cutting
6. Calculate and record the APGAR score at 1 minute AND again at 5 minutes postpartum (see next page)
7. Once advanced level providers arrive on-scene, give report and transfer care

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Advanced Level

8. If the infant does not respond to CPR, obtain IV/IO access with Normal Saline and perform POC Glucose analysis:
   a. For hypoglycemia (POC Glucose less than 45 mg/dL) administer:
      i. 10% Dextrose or D10W: 2 mL/kg IV/IO; OR
      ii. Glucose (40%) Gel: 5 mL/kg (0.2 g/kg) massaged into the cheek pocket buccal mucosa (not SL or swallowed)
         1. Exercise extreme caution administering to a depressed infant without a gag reflex
      iii. Recheck and document repeat POC Glucose analysis results 5-10 minutes after treatment
      iv. May repeat Dextrose or Glucose administration once, if needed
   b. For heart rate less than 60 bpm during CPR, administer:
      i. Epinephrine (0.1 mg/mL) 0.01 mg/kg (0.1 mL/kg) IV/IO, followed by 5 mL Normal Saline flush
      ii. Repeat every 3 to 5 minutes, as needed, until heart rate is at least 60 bpm
   c. For suspected narcotic toxicity, provide positive pressure ventilation with supplemental oxygen, as needed, to maintain Mean Per-Minute Goal Saturations*, until transfer of care to hospital personnel
9. Notify the receiving hospital or contact BioTel as early as possible for destination recommendations and early receiving hospital notification, according to Hospital Capabilities matrix
10. Monitor ECG and SpO_2 continuously on the infant's right hand or wrist until hospital arrival
    a. Provision of supplemental oxygen to achieve Mean Per-Minute Goal Saturations* is secondary to effective ventilation
11. Continue measures to prevent heat loss and hypothermia
12. Allow vigorous infants to breastfeed, if both mother and infant are stable
13. Transport as soon as possible:
    a. If possible, a neonate should be transported secured in an infant seat unless resuscitation is needed.
    b. "Skin-to-skin" transport under blankets on the mother's chest may be more feasible.
14. For additional assistance and Medical Control physician guidance, contact BioTel

APGAR SCORE			
Sign	**0 Points**	**1 Point**	**2 Points**
Appearance (skin color)	Blue, pale	Body pink, extremities blue	Completely pink
Pulse Rate (heart rate)	Absent	Less than 100 per minute	Greater than 100 per minute
Grimace (irritability)	No response	Grimaces	Cough, sneeze or cry
Activity (muscle tone)	Limp	Some flexion	Active motion
Respirations (respiratory effort)	Absent	Slow, irregular	Good, crying

*Oxygen Saturation (SPO_2) Goals per Minute of Life	
Time	**Oxygen Saturation (SpO_2) Goal**
1 minute	60-65%
2 minutes	65-70%
3 minutes	70-75%
4 minutes	75-80%
5 minutes	80-85%
10 minutes	85-95%

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Obstetrical and Gynecological

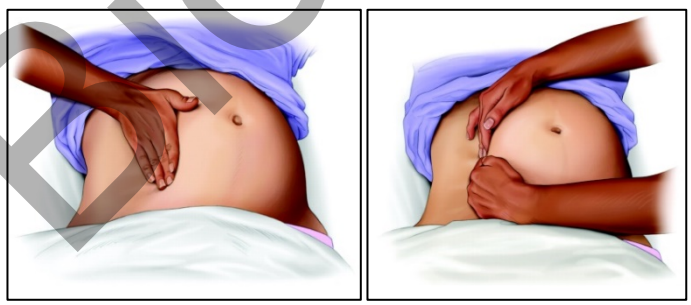
Goal: To aid in the care of patients with gynecological or obstetrical conditions, including active labor
Inclusion Criteria: Female patients of childbearing age with a chief complaint related to pregnancy, impending delivery, the 1st month post-partum, or gynecological conditions
Exclusion Criteria: Female patients who have not yet reached puberty
Refer to: Neonatal, Shock and Trauma CPGs; Emergency Childbirth Special Procedures & Destination Policy

SPECIAL NOTES:

- High-risk pregnancy/delivery includes: preterm labor, breech presentation, multiple births, meconium staining, placenta previa, placental abruption, shoulder dystocia, prolapsed cord, preeclampsia, eclampsia (may occur rarely up to 4 weeks post-partum), maternal drug use, lack of prenatal care and extremes of maternal age.
- Unstable pregnant patients require aggressive resuscitation and stabilization measures first. Maternal resuscitation is the key to survival of both the mother and the fetus.
- Any woman of childbearing age with abdominal pain ± dizziness ± shock ± vaginal spotting who may or may not think she is pregnant may have a ruptured ectopic pregnancy (life-threatening OB-Gyn emergency).

Basic Level

1. Assess and support ABCs per UNIVERSAL CARE – ADULT; monitor for vomiting and pulmonary aspiration
2. Obtain SAMPLE and focused obstetrical/gynecological history, including last menstrual period (LMP)
   a. If chief complaint is abdominal pain, dizziness and/or vaginal bleeding, with or without shock, during known/suspected 1st trimester pregnancy: consider ruptured ectopic pregnancy and treat per Shock CPG
3. Position:
   a. Place the stable, pregnant patient in the position of comfort
   b. Place the unstable patient supine (refer to EMERGENCY CHILDBIRTH – ABNORMAL for exceptions)
   c. During 3rd trimester, relieve aorto-caval compression and hemodynamic compromise (pallor, bradycardia, hypotension, sweating, nausea or vomiting) in an unstable patient:
      i. Implement and maintain Left Uterine Displacement (LUD) – preferred, especially if maternal cardiac arrest:



(Images adapted from 2015 American Heart Association Guidelines Update for CPR and ECC doi.org/10.1161/CIR.0000000000000264)

      ii. Or: immobilize patient supine on long backboard and transport at a 10-15° angle, left side down (this requires elevating the right side of the backboard approximately 10 inches) (useful in trauma setting)
         1. Refer to Spinal Motion Restriction Policy
4. Supplemental oxygen:
   a. Do not administer supplemental oxygen if patient is stable and is not hypoxic (SpO_2 less than 94%)
   b. For hypoxia in otherwise stable patient, administer supplemental oxygen to maintain SpO_2 at least 94%
   c. For high-risk pregnancy/delivery, administer 100% oxygen via non-rebreather mask (NRBM)
5. If delivery is imminent, prepare for immediate childbirth, including requesting additional EMS resources
6. Once advanced level providers arrive on-scene, give report and transfer care

Advanced Level

7. For hemorrhage, seizure, pre-term labor, or other high-risk condition, contact BioTel as soon as possible.
   a. **NOTE:** If pre-eclampsia, SBP greater than 160 mmHg or DBP greater than 110 mmHg: Notify BioTel
8. Initiate transport as soon as possible to a facility capable of handling complicated obstetrical emergencies

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   a. Destination decision-making may depend on hospital maternal capabilities, fetal capabilities or both
9. Continuously monitor ECG, SpO_2 (all patients) and $PetCO_2$ (unstable or high-risk patients)
10. For uncomplicated labor, refer to EMERGENCY CHILDBIRTH – NORMAL
11. For complicated labor, refer to EMERGENCY CHILDBIRTH – ABNORMAL and request additional resources
12. Pain management:
    a. For non-high-risk patient with severe pain, consider IV/IO analgesia, per Pain Management CPG
    b. For high-risk patient with severe pain, consult Pain Management CPG, but exercise extreme caution administering IV/IO analgesia
    c. Monitor all patients receiving IV/IO analgesia (and their infants) for adverse effects, especially cardiorespiratory depression, sedation and aspiration
13. Consider establishing IV/IO access at TKO rate or use a saline lock:
    a. Routine, uncomplicated childbirth may be associated with 500 mL or more blood loss
    b. For shock or hypotension due to hemorrhage, establish two large-bore peripheral IVs and administer 20 mL/kg Normal Saline bolus (up to 1000 mL per bolus), per Shock CPG
    c. Reassess and repeat fluid bolus once, if needed
    d. Contact BioTel for authorization for additional IV/IO fluid administration, if needed
14. For seizures related to eclampsia (which may occur within 48 hours of delivery and (rarely) up to 4 weeks post-partum), refer to Seizures CPG and:
    a. Administer Midazolam 2.5 to 5 mg slow IV/IO/IN/IM – May repeat once; **AND**
    b. Administer Magnesium Sulfate 5 g in 100 mL Normal Saline IV/IO over approximately 15 minutes:
       i. Add 5 g of Magnesium Sulfate to a 100-mL bag of Normal Saline
       ii. Administer IV/IO over 15 minutes (1 gtt/sec with 10 gtt/mL (macro) IV set)
       iii. Monitor ABCs and document clinical response
    c. If vascular access cannot be obtained, Magnesium Sulfate may be administered IM:
       i. Administer 2.5 g in 5 mL IM, split into two separate injections sites (1.25 g (2.5 mL) per injection)
       ii. Repeat ASAP with a 2nd dose (2.5 g in 5 mL, divided into two separate injection sites)
       iii. Total IM dose: 5 g (10 mL) split into four separate injection sites
       iv. This divide-dose, multiple-injection approach is necessary because the standard concentration of magnesium sulfate (1 g in 2 mL) is too dilute for large IM doses
       v. Monitor ABCs and document clinical response
    d. Contact BioTel for seizures refractory to both midazolam and magnesium sulfate, or for magnesium sulfate dosing guidance (especially if available formulation is not 1 g in 2 mL)
15. Post-partum care:
    a. Refer to Neonatal Care CPG and Emergency Childbirth Special Procedures
    b. If mother is stable, place a vigorous infant "skin to skin" on the mother's chest and cover both patients with a blanket during transport in order to minimize heat loss, to reduce neonatal stress, and to help stabilize the newborn's heart rate, respiratory rate and glucose levels
    c. Allow vigorous infant to breastfeed, as tolerated
    d. Monitor maternal ABCs, including post-partum hemorrhage
    e. Document time of placental delivery (place in red bag and transport with patient to hospital)
    f. Treat post-partum hemorrhage according to Shock CPG and:
       i. If due to uterine atony (flabby, soft uterus): Consider external fundal massage, per Emergency Childbirth Special Procedures
       ii. If due to perineal laceration: Apply pressure dressing with sterile gauze (transport saturated dressings to hospital with patient to assist with estimating maternal blood loss)
16. For additional assistance and Medical Control physician guidance, contact BioTel

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✦ BEHAVIORAL HEALTH

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Behavioral Emergencies/Excited Delirium Syndrome

Goals: Provision of emergency medical care to the agitated, violent or uncooperative patient, while maximizing and maintaining safety for the patient, EMS Providers and others
Inclusion Criteria: Patients of all ages exhibiting agitated, violent or uncooperative behavior, or who are a potential danger to self or others
Exclusion Criteria: Patients exhibiting agitated, violent or uncooperative behavior due to medical conditions, including, but not limited to, head injury or metabolic conditions (e.g. hypoxia or hypoglycemia)
Refer to: Head Injury, Heat-Related Emergencies, Poisoned Patient and Overdose, Seizure and other, symptom-specific CPGs; Custody, Evaluation/Transport, Destination, and Restraint of Patient Policies

NOTES:

- For behavioral emergencies in patients in police custody, refer to the Custody Policy
- The safety of the patient, EMS Providers and others is paramount in the decision to use restraint techniques.
- Prone positioning or any restraint that restricts the airway or respiratory efforts shall not be used.
- Sudden "giving up", collapse or quiet compliance of a violent/aggressive patient is an ominous sign of imminent cardiac arrest.
- "Hyperventilation" may be a symptom of a serious medical condition, such as pulmonary embolism.
- Life-threatening medical conditions can present as agitation or delirium. These include: alcohol/drug intoxication, meningitis/encephalitis, hypoglycemia, hypoxia, heatstroke, hypertension, head injury and intracerebral hemorrhage. If suspected, refer to the respective, symptom-specific CPG.

Basic Level

1. Approach the patient calmly and with caution
2. Verbally re-direct and de-escalate, if possible, with coaching and reassurance
3. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, as soon as possible and as clinically indicated (physical restraint or emergency medication administration may be needed):
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA, as tolerated
    b. B (Breathing): Note respiratory effort and provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring); provide verbal coaching/reassurance if patient is hyperventilating
    c. C (Circulation): Evaluate, document and treat signs/symptoms of shock; initiate continuous ECG monitoring as soon as possible
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; assess for possible drug overdose and treat according to the Poisoned Patient/Overdose CPG
    e. E (Exposure/Environmental): Assess for evidence of trauma or head injury and, if present, treat according to the Head Injury CPG; treat hyperthermia according to the Heat Emergencies CPG
4. Record the patient's Behavioral Activity Rating Scale (BARS) score **(*refer to Table 1, next page)**
5. Positioning:
    a. If the patient requires physical restraint, refer to the Restraint of Patient Policy

b. PEDIATRIC patient less than 14 years of age:
i. Contact BioTel before using any level of restraint other than verbal de-escalation

    c. Lateral decubitus (with patient facing EMS Providers) is preferred for patient at risk of aspiration
    d. Prone positioning, hobble ("hog-tie"), "sandwich" and other restrictive positioning is NOT permitted
    e. Supine positioning, with head of stretcher elevated 30°, if possible, is preferred
6. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer glucose unless there is documented, symptomatic hypoglycemia
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

7. Initiate continuous $PetCO_2$ monitoring and maintain continuous ECG and SpO_2 monitoring
8. Initiate advanced airway management, as appropriate

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9. Treatment of Excited Delirium Syndrome centers on reversing the triad of agitation, hyperthermia and acidosis
10. Establish IV/IO access as soon as possible (IV fluid resuscitation is the mainstay of treating acidosis):
    a. Treat dehydration or shock with fluid bolus(es) according to the Shock and Heat Emergencies CPGs
11. Obtain and transmit a 12-Lead ECG, as appropriate, per Chest Pain and specific dysrhythmia CPGs
12. Consider use of emergency medications if and when all other acceptable safety measures have been unsuccessful and/or inadequate for a patient posing an immediate threat to self, EMS Providers or others:
    a. In general, IM or IN route of administration may be preferred for EMS Provider safety:
        i. If necessary due to safety concerns, IM medications may be administered through clothing:
            1. Avoid directing the injection into objects in clothing pockets
            2. Injections through clothing must be specifically documented and communicated to E.D. staff, as prophylactic antibiotics may be necessary to prevent infection
    b. Continuous vital signs, ECG, SpO_2, and $PetCO_2$ monitoring must be used and documented
    c. ADULT at least 14 years of age:
        i. Administer midalozam 5 mg slow IV/IO/IM/IN
            1. May repeat once after 10-15 minutes, if needed
            2. Contact BioTel for authorization of additional doses
            3. IV/IO or IM dosing is preferred to IN, as IN drug absorption in this setting is unknown
        ii. ***OR Alternative*** (for appropriately trained EMS Providers in agencies with Medical Director authorization): Administer ketamine 4 mg/kg IM/IN or 2 mg/kg IV/IO
            1. Maximum single dose: 500 mg
            2. Contact BioTel for authorization of additional doses

d. PEDIATRIC patient less than 14 years of age:
i. Contact BioTel
ii. BioTel may authorize midazolam 0.1 mg/kg to 0.3 mg/kg IV/IO/IM/IN
iii. Repeat dosing requires BioTel authorization
iv. Do not administer ketamine, unless specifically authorized by Medical Control physician

13. For a patient with prolonged violent/aggressive behavior not responding well to physical restraint and emergency medication sedation, or for EMS Provider-witnessed cardiac arrest:
    a. ADULT at least 14 years of age: *Consider* administration of sodium bicarbonate 50 mEq IV/IO

b. PEDIATRIC patient less than 14 years of age:
i. Contact BioTel
ii. BioTel *may* authorize sodium bicarbonate 1-2 mEq/kg IV/IO
iii. Repeat dosing requires BioTel authorization

14. Document patient's response to intervention(s) using BARS score (***Refer to Table 1, below**)
15. Initiate transport to an appropriate receiving hospital, according to the Destination and Custody Policies
    a. Contact BioTel and/or the receiving hospital while en route, to facilitate care
    b. Agitated/combative patients should be transported with a 2nd provider in the patient care compartment
    c. Rigorous, detailed documentation must be performed, including: reasons for and means of restraint; and periodic reassessment findings (e.g. vital signs, cardiac rhythm, SpO_2, $PetCO_2$, and neuro status)
16. For additional assistance and Medical Control physician guidance, contact BioTel

***Table 1: Behavioral Activity Rating Scale (BARS)**	
1	Difficult or unable to rouse
2	Asleep, but responds normally to verbal or physical contact
3	Drowsy, appears sedated
4	Quiet and awake (normal level of activity)
5	Signs of overt (physical or verbal) activity, calms down with instructions
6	Extremely or continuously active, not requiring restraint
7	Violent, requires restraint

Adapted from Swift RH et al (2002). J Psych Res. Volume 36(2): 87–95

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Restraint of Patient

LINK TO POLICY

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TASER® Barb Removal

Purpose: To delineate the patient assessment guidelines, barb removal procedure and disposition for patients following TASER® (or other conducted electrical device) deployment
Inclusion Criteria: Any adult or pediatric patient with a TASER® barb lodged in the skin
Exclusion Criteria: No specific recommendations
Refer to: Behavioral Emergencies/Excited Delirium; Trauma and other CPGs; Restraint of Patient Policy

Special Notes:
- All BioTel EMS Providers may utilize this procedure when responding to a law enforcement (LE) request to remove TASER® barbs lodged in a person's skin
- TASER® deployment may result in falls and secondary trauma, but NOT to altered mental status (AMS)
    - All patients should be evaluated for possible trauma; AMS should be evaluated per AMS CPG

Patient Assessment and Care Following TASER® Deployment:
1. Confirm that the officer deactivated the TASER® and disconnected the barb cartridge from the device
2. Obtain full vital signs as soon as possible:
    a. Violent or combative behavior may be caused by intoxication, psychosis, hypoxia, hypoglycemia, head injury, overdose, CNS infection or other conditions
3. Obtain SpO_2, $PetCO_2$, lead II ECG rhythm strip and POC glucose analysis as soon as possible
4. Treat Altered Mental Status, Excited Delirium Syndrome, Seizures and Trauma according to the relevant CPG(s)
5. Evaluate the anatomical location(s) of the barb puncture zone(s):
    a. Initiate E.D. transport and do **NOT** attempt removal if barbs are lodged in **any of these locations**:
        i. Areas above the clavicles, including eyes, ears, nose, mouth, face, scalp or neck
        ii. Genitals or perineum
        iii. Nipple/areola (male or female) or breast (female)
        iv. Hands, feet or joints
        v. Suspicion barb might be embedded in bone or blood vessel, or any barb that – in the EMS Provider's judgment – might require excessive force for removal

Barb Removal Procedure:
1. Use Standard Precautions and appropriate PPE
2. Remove one barb at a time:
    a. Stabilize the skin surrounding the barb
    b. Firmly grasp the barb and, with one smooth, firm pull, remove the barb from the patient's skin
3. Visually examine the barb to ensure that the tip is intact:
    a. If any part remains embedded in the patient, transport to closest appropriate medical facility
4. Observe precautions to avoid accidental needle stick during barb removal
5. Place the barb in an appropriate container and transfer the container to the LE officer for evidence
6. Cleanse the barb site with antiseptic and apply an adhesive bandage
7. Provide the patient with basic wound care instructions and the advice to seek medical care if signs of infection (redness, swelling, pain, drainage or fever) develop:
    a. The patient will need tetanus immunization, if s/he has not received one in the past 5 years

Disposition:
1. Transport to the closest appropriate hospital ANY patient meeting ANY of the following criteria:
    a. Barb(s) lodged in the sensitive areas listed above
    b. Previous cardiac history
    c. Apparent intoxication
    d. Patient non-compliance with direct instructions
    e. ANY criteria for other BioTel EMS CPGs requiring mandatory transport (e.g. chest pain, AMS or Excited Delirium Syndrome, electrical injury, age greater than 75 years)
2. **Complete medical documentation is required, whether or not EMS transports the patient**

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✦ TOXINS and ENVIRONMENTAL

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Carbon Monoxide Exposure

Goals: Remove patient from toxic environment; assure adequate oxygenation and ventilation; correct hypoperfusion
Inclusion Criteria: Patients and first responders of all ages with confirmed/suspected carbon monoxide (CO) exposure with/without smoke inhalation
Exclusion Criteria: No specific exclusions
Refer to: Burns, Cyanide Exposure, Poisoned Patient/Overdose, Toxic Chemical Exposure and Trauma CPGs

NOTES:

- Signs and symptoms of carbon monoxide (CO) exposure are non-specific and highly variable.
- Patient care centers on history and signs/symptoms*, even if the measured SpCO reading is low.
- Transcutaneous CO monitoring devices (carbon monoxide co-oximetry, "SpCO" monitoring) may be used concurrently with both SpO_2 and $PetCO_2$ monitoring.
- Hyperbaric oxygen (HBO) therapy, if/when indicated, is most effective if delivered as soon as possible.
- **Contact BioTel for updated hospital capabilities and pre-arrival notification**. HBO may be available at: THR Presbyterian Dallas, BSW Baylor University Medical Center or Medical Center of Plano

Indications for Measurement of Carbon Monoxide (CO) Levels:

- Smoke inhalation
- Thermal burns
- Altered Mental Status (AMS) with no clearly identifiable cause
- Assessment of patients and fire ground personnel (e.g. fires, hazardous materials incidents, hydrocarbon-powered equipment in a closed environment (heating systems, stoves, generators, vehicles, etc.))

*Clinical Presentation According to SpCO Level		
SpCO Level	**Signs/Symptoms**	**Fire Rehab Considerations**
Greater than 5%	Mild headache	Refer to your agency SOPs
10%	Mild headache, dyspnea on exertion	
10% - 20%	Moderate headache, shortness of breath, tachypnea	
20% - 30%	Worsening headache, nausea, dizziness, fatigue	
30% - 40%	Severe headache, vomiting, vertigo, impaired judgment	
40% - 50%	Confusion, syncope, tachycardia	
50% - 60%	Seizures, shock, apnea, coma	

Basic Level

1. Remove patient from the toxic environment: Scene safety and PPE for EMS Providers are critical
2. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and Airway Management – Adult or Airway Management – Pediatric:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA
    b. B (Breathing): Provide high-flow, 100% oxygen via non-rebreather or BVM as needed; initiate continuous SpO_2 monitoring and carbon monoxide co-oximetry, if available
        i. **NOTE:** Standard pulse oximetry cannot screen for or exclude CO exposure
        ii. **NOTE:** Always confirm a high SpCO reading on more than one finger of each hand
            4. If the values differ significantly, use an average reading
    c. C (Circulation): Initiate continuous ECG monitoring; assess for/treat shock (refer to the Shock CPG)
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
    e. E (Exposure/Environmental): Treat according to the Burns and/or Trauma CPG, as indicated
3. Positioning:
    a. If trauma is not suspected, position the patient supine or (if aspiration risk) in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        i. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
4. Once advanced level care arrives on scene, give report and transfer care

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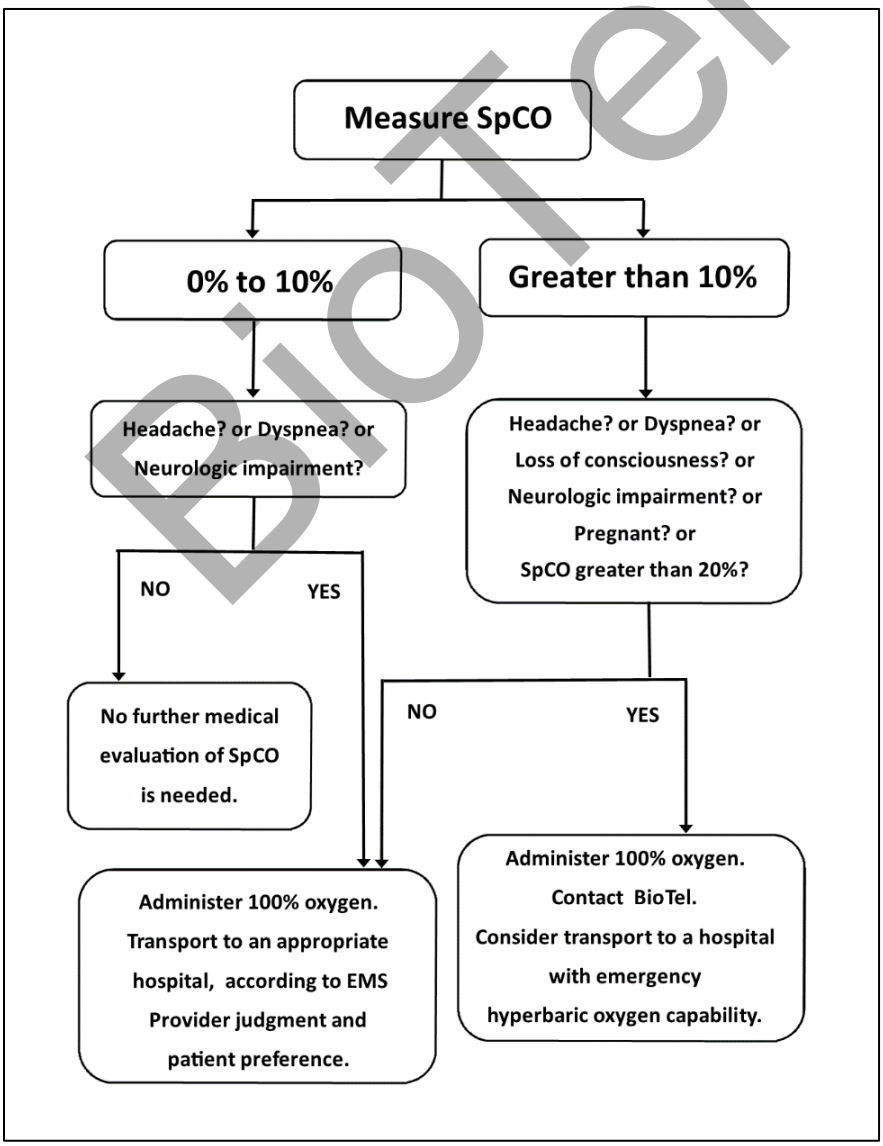
Advanced Level:

5. Maintain continuous ECG, SpO_2, $PetCO_2$ and SpCO monitoring for all patients with suspected CO exposure
6. Place an Advanced Airway as soon as possible if patient is comatose
7. Establish IV/IO access and treat hypotension/hypoperfusion according to the Shock CPG
8. Treat hypoglycemia according to the Diabetic Emergencies CPG, if not already done
9. Obtain 12-Lead ECG ASAP & transmit any STEMI ECG or to request consultation
10. Treat chest pain according to the Chest Pain CPG
11. Consider treatment for Cyanide Toxicity, if indicated by history (e.g. structure fire):
    a. **NOTE:** Hydroxocobalamin administration for treatment of simultaneous cyanide exposure requires a separate, dedicated IV/IO line
    b. Do NOT administer nitrites (components of "Pasadena" or "Lilly" cyanide antidote kit)
12. Initiate transport as soon as possible to an appropriate receiving hospital E.D. (see below):
    a. **NOTE:** Receiving hospital capabilities to care for associated injuries (e.g. burns, smoke inhalation or other trauma) or comorbidities should take priority over HBO capability
    b. Contact BioTel en route, especially for HBO-capable destinations and for pre-arrival preparation
13. For additional assistance and Medical Control physician guidance, contact BioTel

CARBON MONOXIDE EXPOSURE TRIAGE and TREATMENT CONSIDERATIONS



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Cold-Related Emergencies/Accidental Hypothermia

Goal: To aid EMS Providers in: the recognition and treatment of **systemic effects** of accidental hypothermia and cold exposure, including maintenance of hemodynamic stability, vigorous cardiopulmonary resuscitation, and prevention of further heat loss; and in the recognition and treatment of **localized cold injury** to minimize risk of limb loss
Inclusion Criteria: All patients with localized or systemic cold injuries
Exclusion Criteria: Patients without cold exposure, or patients with cold exposure with no symptoms referable either to hypothermia or to localized cold injury (such as frostbite)
Refer to: Altered Mental Status, Cardiac Arrest, Asystole/PEA, VFib/Pulseless Vtach, Pain Management and Trauma CPGs

Definitions:

1. Accidental hypothermia: an involuntary drop in core (internal) body temperature to 35°C (95°F) or less
    a. Primary: excessive cold overcomes heat production in an otherwise healthy person
    b. Secondary: caused by many medical conditions, even in a warm environment (*refer to **Table 2**)
2. Localized cold injury: spectrum of localized tissue damage (usually limbs) associated with cold exposure

Significance:

1. Resuscitation outcomes can be favorable in many cases, even after prolonged "down time"
    a. Key factors for hypothermia: level of consciousness, shivering and cardiac stability (BP and rhythm)
2. Death in secondary hypothermia is often caused by the underlying condition

Diagnosis and Clinical Features:

1. **Diagnostic Criteria:**
    a. History of cold exposure ***OR*** a predisposing disease/risk factor (*refer to **Table 2**) **AND**
    b. Exam: Cold torso ***OR*** core (internal) temperature less than 35°C (95°F)
2. Core temperature cannot be measured by EMS, so **Table 1** should be used for **clinical staging**:

Table 1 – Clinical Staging of Accidental Hypothermia†

Stage	Cold Torso + These Signs and Symptoms	Typical Core Temperature
I	**Conscious, shivering**	35 to 32°C (95 to 90°F)
II	**Impaired consciousness, not shivering**	Less than 32 to 28°C (Less than 90 to 82°F)
III	**Unconscious, not shivering, vital signs present**	Less than 28 to 24°C (Less than 82 to 75°F)
IV	**No vital signs, fixed and dilated pupils**	Less than 24°C (Less than 75°F)

†**Adapted from Brown DJA, et al. 2012. NEJM 367:20; 1930-1938.** doi/full/10.1056/nejmra1114208

3. ECG and cardiac findings – Slow cardiac conduction, with a range of dysrhythmias, such as:
    a. Sinus bradycardia and AV nodal block: these generally resolve with rewarming
    b. Atrial fibrillation: common at core temperature less than 32°C (90°F)
    c. Osborn (J) waves: 80% of patients with core temperature less than 30°C (86°F)
        i. Late, small wave after QRS in leads II, III, aVR, aVF and V3-V6 (**Figure 1**):

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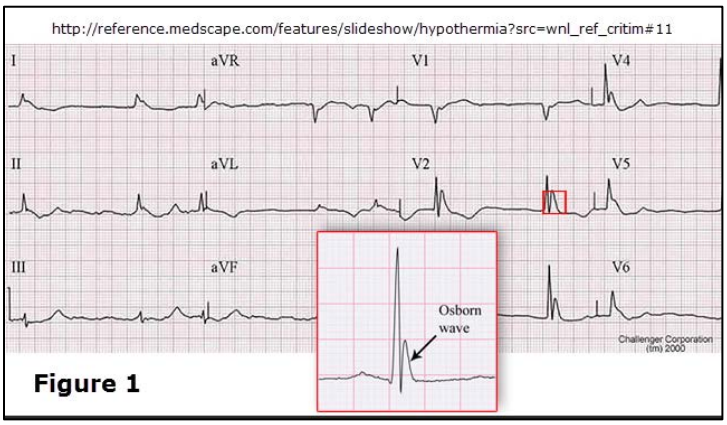

Figure 1

d. Cardiac arrest: greatest risk in Stage III (core temperature less than 28°C (82°F))
    i. "Rescue collapse":
        1. Caused by hypovolemia, patient movement (dysrhythmias) and continued cooling

Basic Level

1. **NOTE:** Handle patients gently – minimize patient movements to reduce risk of cardiovascular collapse
    a. Patients in Stage II or III should not be permitted to stand, ambulate or exercise
2. **NOTE:** Detection of a palpable pulse is difficult – check for signs of life/pulse for at least 60 seconds
3. Assess and support ABCs per UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
    a. Initiate continuous ECG, SpO_2 and $ETCO_2$ monitoring
    b. Obtain and document frequent vital signs, including GCS and POC Glucose analysis
        i. Treat hypoglycemia according to Diabetic Emergencies CPG
    c. Document the patient's initial temperature and ambient temperature (if known)
        i. Do not interrupt or delay treatment/transport for repeat measurements
        ii. Core cooling may continue even after rescue, once peripheral, external rewarming of cold extremities has begun – this is called "afterdrop"
    d. Apply supplemental oxygen (warmed, if possible), to maintain SpO_2 at least 94%
    e. Follow general patient care and transport guidelines in **Figure 2** (next page)
    f. Once advanced level care arrives on scene, give report and transfer care
4. Initiate passive rewarming, e.g. remove wet clothing; shelter patient from wind and wet conditions; insulate patient from ground; remove patient to warm environment; cover patient with dry blankets or clothing; provide warm, sweet drinks or oral glucose 40% gel to fully conscious patient with normal airway

Advanced Level:

1. Treat only hemodynamically-significant dysrhythmias (e.g. VFib and pulseless VTach) and cardiac arrest
    a. Sinus bradycardia: consider transcutaneous pacing (TCP) ONLY if hemodynamic compromise persists after rewarming
    b. VF/pulseless VT: One immediate defibrillation attempt on-scene at maximal settings, then:
        i. CPR and up to two additional defibrillation attempts should be performed *en route*
            1. This differs from standard treatment of normothermic VF/pulseless VTach arrest
        ii. Consider one dose of IV/IO epinephrine 0.1 mg/mL (repeat doses unlikely to be helpful):
            1. Adults: 1 mg (10 mL) for adults

> 2. **Pediatric (Infants and children under 14 years of age) - Epinephrine (0.1 mg/mL)**
> Administer 0.01 mg/kg (0.1 mL/kg) IV/IO

        iii. No proven benefit for amiodarone, lidocaine or other anti-arrhythmics
2. Establish IV/IO access, but avoid excessive infusion of cold fluids
3. Continue general patient care and transport guidelines in **Figure 2** (next page)
4. Assess for and treat associated/underlying conditions according to symptom-specific CPG (*refer to **Table 2**)

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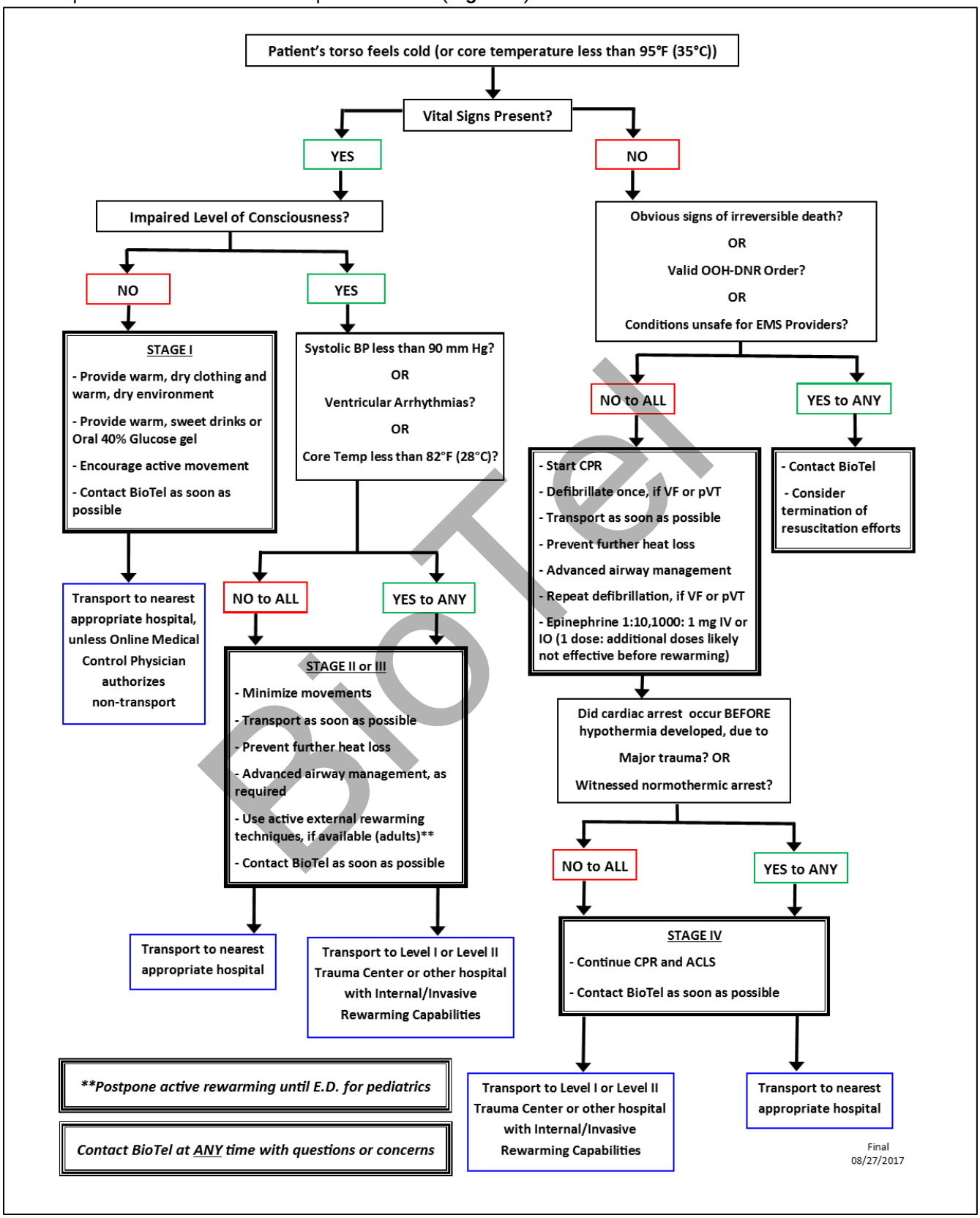
5. Pre-Hospital Patient Care and Transport Overview (**Figure 2**)



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†**Adapted from Brown DJA, et al. 2012. NEJM 367:20; 1930-1938.** doi/full/10.1056/nejmra1114208

6. Special Considerations:
    a. Patient with Stage IV hypothermia should **NOT** be considered dead until rewarming has been performed at an appropriate receiving hospital
        i. Consider withholding or terminating pre-hospital CPR and resuscitation ***ONLY*** if the following contraindications are present (refer to Section 6.b, below)
    b. Contraindications for initiating resuscitation in the hypothermic patient:
        i. Documented submersion greater than 1 hour (if in doubt, resuscitate)
        ii. CORE temperature less than 10°C (50°F)
        iii. Obviously fatal injuries incompatible with life, such as decapitation
        iv. Ice formation in the airway and other signs of total body tissue freezing
        v. Chest wall rigidity that renders chest compressions impossible
        vi. Valid Out-Of-Hospital DNR Order
        vii. Dangers to EMS Providers or other rescuers
    c. Trauma, shock and C-spine injury:
        i. These conditions increased risk of hypothermia
        ii. Refer to Trauma (General) and symptom-specific CPGs/policies (e.g. Spinal Motion Restriction)
    d. Submersion/drowning:
        i. Initiate and continue resuscitation – especially if *cold water* submersion – if submersion time is less than 1 hour or unknown AND there are no resuscitation contraindications (Section 6.a, above)
7. Associated Local Cold Injury (e.g. Frostbite):
    a. Remove clothing, footwear, jewelry and other constricting items
    b. Initiate rewarming, if feasible, ONLY if refreezing of the affected body part is absolutely preventable:
        i. Do NOT allow tissue to refreeze!
    c. Cover injured body parts with loose, dry, sterile dressing:
        i. Do NOT open or drain intact blisters
        ii. Do NOT rub the injured body part to stimulate circulation
    d. Maintain the injured body part at heart level:
        i. Do NOT elevate or dangle an injured limb
    e. Refer to Pain Management CPG
8. Destination Decision-Making:
    a. Stage I (Conscious, shivering and no other signs/symptoms): Nearest appropriate hospital, unless online Medical Control Physician advises otherwise
    b. Stages II, III or IV: refer to the flow chart in **Figure 2 (previous page)**
    c. Consult the current Hospital Capabilities Matrix and/or BioTel for additional destination assistance
9. Critical Documentation Items:
    a. Duration of cold exposure; ambient temperature at time of EMS contact; rewarming attempts or other therapies applied prior to EMS arrival
    b. Cardiac dysrhythmias (and their treatment); associated trauma (if present)

***Table 2: Examples of Conditions Associated with Secondary Hypothermia**	
Impaired Thermoregulation	**Increased Heat Loss**
CNS disease, such as Stroke	Multi-system Trauma
CNS Trauma (e.g. Head or C-spine Injury)	Shock
Extremes of Age (newborn or elderly)	Burns
Alcoholic or Diabetic Ketoacidosis	Cardiopulmonary Disease
Lactic Acidosis	Major Infection or Sepsis
Hypoglycemia	Emergency Childbirth
Extreme Physical Exertion	Cold IV or IO Fluid Infusion
Malnutrition	Heat-Stroke Treatment
Hypothyroidism or Other Endocrine Disorder	Disseminated Cancer
Impaired Shivering	Medication- and Toxin-Induced Skin Diseases

[†]**Adapted from Brown DJA, et al. 2012. NEJM 367:20; 1930-1938.** doi/full/10.1056/nejmra1114208

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Cyanide Exposure

Goals: Remove patient from the toxic environment; assure adequate oxygenation and ventilation; correct hypoperfusion
Inclusion Criteria: Patients and first responders of all ages with confirmed/suspected cyanide (CN) exposure with/without smoke inhalation
Exclusion Criteria: No specific exclusions
Refer to: Burns, Carbon Monoxide Exposure, Poisoned Patient/Overdose, Toxic Chemical Exposure and Trauma CPGs; Hydroxocobalamin Drug Sheet

NOTES:

- Cyanide (CN) is a potent cellular toxin that prevents oxygen utilization, leading to cellular hypoxia.
- CN may enter the body through inhalation, ingestion, or skin absorption.
- Settings in which to suspect CN toxicity include: occupational or other smoke exposure (e.g. firefighting), industrial accidents, natural catastrophes, suicide/homicide attempts, and chemical warfare/terrorism (especially in the setting of multiple casualties of unclear etiology).
- Detection of a "bitter almond smell" is unreliable (at least 50% of population lack capability to detect the odor).
- The CN clinical presentation ("toxidrome") is rapid and dose-dependent, leading to severe metabolic acidosis, cardiorespiratory collapse, seizures/loss of consciousness and, ultimately, death.
    - Mild: Headache, sinus tachycardia, tachypnea/dyspnea, flushing, vertigo, anxiety, weakness, nausea
    - Moderate: Altered mental status, hypertension, respiratory depression
    - Severe: Marked and rapid loss of consciousness, including rapid collapse; seizures; respiratory depression/arrest; cardiac dysrhythmias, hemodynamic collapse or cardiac arrest.

Basic Level

1. Remove patient from the toxic environment: Scene safety and PPE for EMS Providers are critical
    a. Ingested CN liquid or crystals may cause belching or vomiting of highly toxic hydrogen cyanide gas
        i. Ensure maximal air circulation in ambulance patient compartment during transport
    b. Patient may need to be decontaminated before EMS Providers can safely deliver care or transport
2. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and Airway Management – Adult or Airway Management – Pediatric, as clinically indicated:
    a. A (Airway): Ensure airway patency with suctioning and OPA or NPA; assess for airway soot
    b. B (Breathing): Provide high-flow, 100% oxygen via tight-fitting non-rebreather face mask or BVM as needed; initiate continuous SpO_2 monitoring
        ii. Sudden respiratory depression/arrest can occur despite a "normal" SpO_2 reading
    c. C (Circulation): Initiate continuous ECG monitoring; assess for/treat shock (refer to the Shock CPG)
    d. D (Disability): Assess and document GCS; assess pupillary size and reactivity; refer to Seizures CPG
    e. E (Exposure/Environmental): Treat according to the Burns and/or Trauma CPG, as indicated; prevent heat loss
3. Positioning:
    a. If trauma is not suspected, position the patient supine or (if aspiration risk) in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway:
        iii. If trauma is suspected, refer to the Spinal Motion Restriction Policy and Trauma CPG
9. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
    a. Do not administer oral glucose to a patient who is unresponsive or unable to protect his/her airway – assist Advanced Level Provider with parenteral dextrose or glucagon administration
4. If possible, obtain history of: specific agent of exposure, time and quantity of ingestion/inhalation
5. Once advanced level care arrives on scene, give report and transfer care

Advanced Level:

6. Initiate/continue continuous ECG, SpO_2, and $PetCO_2$ monitoring for all patients with possible CN toxicity
    a. Continuous SpCO monitoring should be used, if available, although it does not directly impact the decision to administer cyanide antidote
7. Place an Advanced Airway as soon as possible if patient is comatose
8. Establish IV/IO access and treat hypotension/hypoperfusion according to the Shock CPG

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   a. **NOTE: Hydroxocobalamin administration should be given IV, if possible, and requires a separate, dedicated IV/IO line**
9. Treat hypoglycemia according to the Diabetic Emergencies CPG, if not already done
10. Obtain 12-Lead ECG ASAP and transmit any STEMI ECG or to request consultation
11. Consider treatment for Cyanide Toxicity with cyanide antidote:
   a. Preferred CN antidote is hydroxocobalamin (optional medication):
      i. Hydroxocobalamin may be carried by Battalion/EMS Chiefs, EMS Supervisors, EMS Medical Directors or HazMat units
   b. Criteria for hydroxocobalamin administration, if available, for any patient with history and signs/symptoms suggestive of CN exposure:
      i. Immediate administration per standing orders:
         1. Any patient with smoke inhalation or suspected CN ingestion/inhalation/skin exposure AND confirmed presence of CN on-scene; **OR**
         2. Any patient with smoke inhalation OR suspected CN ingestion/inhalation/skin exposure AND severe signs/symptoms
      ii. Administration after consultation with online medical control (BioTel):
         1. Any patient with smoke inhalation OR suspected CN ingestion/inhalation/skin exposure and moderate signs/symptoms
   c. Notification:
      i. Immediately notify agency EMS Supervisor as soon as possible
      ii. EMS Supervisor will notify EMS Administration according to agency policies/procedures
12. Hydroxocobalamin administration and dosing:
   a. **NOTE: Hydroxocobalamin administration should be given IV, if possible, and requires a separate, dedicated IV/IO line**
   b. **NOTE:** Diluent is NOT included in the kit – Normal Saline (NS) is the preferred diluent
   c. **NOTE:** After hydroxocobalamin administration, pulse oximetry (SpO_2) levels are no longer accurate
   d. **NOTE:** Hydroxocobalamin will change the color of sweat, tears and urine to red – this is normal
   e. **NOTE:** Do not delay CPR and other resuscitation measures for hydroxocobalamin administration
   f. ADULT at least 14 years of age:
      i. Initial dose: reconstitute 1 vial (5 g) in 200 mL NS
         1. Repeatedly invert or rock (but do NOT shake) the vial for at least 60 seconds
         2. Administer 5 g in 200 mL IV over 15 minutes (15 mL/min)
         3. NOTE: Lactated Ringers (LR) or D5W may be used, if Normal Saline is unavailable
      ii. Repeat dose: one additional 5 g dose may be administered, if needed, over 15 minutes to 2 hours, *with BioTel authorization*

g. PEDIATRIC patient less than 14 years of age:
i. Initial dose: Reconstitute 1 vial (5 g) in 200 mL NS, as above
ii. Infuse for 15 minutes: Refer to BioTel PEDI-Guide© for dosing instructions
iii. Contact BioTel as soon as possible during/after administration or if a 2nd dose is needed
iv. Repeat dose, if authorized, will likely be half the starting dose

13. Alternative cyanide antidote, if hydroxocobalamin is unavailable:
   a. Sodium thiosulfate (component of “Pasadena” or “Lilly” kit) (optional medication):
      i. ADULT at least 14 years of age: 12.5 g IV/IO (50 mL of 25% solution)

b. PEDIATRIC patient less than 14 years of age: 0.5 g/kg (2 mL/kg of 25% solution)
i. Contact BioTel as soon as possible during/after administration

   c. Do NOT administer nitrites (e.g. amyl nitrite and sodium nitrite), especially if there is confirmed/suspected carbon monoxide exposure (refer to Carbon Monoxide Exposure CPG)
      i. These medications are no longer available in commercial cyanide antidote kits
   d. Do NOT administer sodium thiosulfate to a pregnant patient with cyanide toxicity
14. Treat seizures according to the Seizures CPG
15. For persistent hypotension, especially after antidote administration, contact BioTel for vasopressor authorization and dosing guidance
16. Initiate transport as soon as possible to an appropriate receiving hospital E.D. (see below):
   a. Contact BioTel and/or receiving hospital directly en route, especially HBO-capable facilities, for pre-arrival preparation
17. For additional assistance and Medical Control physician guidance, contact BioTel

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Heat-Related Emergencies

Goal: Prompt recognition and treatment of heat-related emergencies, with focus on immediate cooling and rehydration, and on mitigating risk for cardiovascular/neurologic decompensation and agitation
Inclusion Criteria: All patients with signs and symptoms of illness related to exposure to high environmental temperature/humidity
Exclusion Criteria: Fever from infectious or inflammatory conditions; Adverse Drug Events (such as malignant hyperthermia and neuroleptic malignant syndrome); thyroid storm; delirium tremens (DTs)
Refer to: Excited Delirium, Poisoned Patient, Shock and Trauma CPGs

Definitions:

1. **Heat cramps:** Minor muscle cramps, usually in the legs/abdominal wall; Begin after exertion; Temp normal
    a. Not life-threatening
2. **Heat syncope:** Dizziness, fainting or presyncope resulting from blood pooling in the lower extremities
    a. Not life-threatening
3. **Heat exhaustion:** Salt and water depletion; Usually gradual onset; Abnormal vital signs; Temp elevated
    a. May progress to heatstroke
4. **Heatstroke:** Body cooling mechanisms fail; **ALTERED LOC**; Temp *usually* over 104°F (40°C)
    a. True life-threatening emergency with two different clinical presentations:

CLASSIC	EXERTIONAL
External heat source (e.g. heat wave)	Exercise or work
Elderly, debilitated	Previously healthy
NO exertion	No acclimatization
Slower onset (hours to days)	Fast onset (hours)
No sweating	May be sweating
Hypoglycemia uncommon	Hypoglycemia common

Emergency Care of Heatstroke
Adapted from Belval LN et al (2018). Prehosp Emerg Care 22(4):392-397

Basic Level

1. Move victim to a cool, shaded area, away from sun or external heat source
    a. If there is evidence of shock, position the patient supine with the feet elevated; monitor airway
2. Remove as much clothing as practical and loosen restrictive garments
3. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
    a. Monitor airway status for emesis, seizure
    b. Initiate continuous ECG monitoring
    c. Obtain and document POC glucose measurement
        i. If hypoglycemic and patient can tolerate oral intake, provide small sips of cool liquids
    d. Document temperature (and route of measurement):
        i. **Core (rectal) temperature is most accurate and preferred, if available**
        ii. **Non-core** temperature within normal range does NOT exclude serious heat illness/heatstroke
        iii. **Elevated non-core** temperature suggests an even higher core temperature
        iv. **Duration of high core temperature** is more important than the temperature level, *per se*
    e. Assess neurologic status: Confusion? Coma? Agitation?
        i. Altered Mental Status (AMS) is the hallmark of heatstroke, regardless of patient's temperature, especially if core (rectal) temperature measurement is unavailable
    f. Assess skin:
        i. Hot and flushed?
        ii. Dry or sweaty?

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1. NOTE: Sweating does NOT exclude the diagnosis of heatstroke!

g. Assess for other signs of shock

4. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
5. If temperature is at least 104°F (40°C) ***OR*** if there is altered mental status, begin rapid cooling **on-scene**:
   a. Principle: "Wet and Windy" BEFORE leaving the scene
      i. Mist exposed skin with tepid water, while fanning the skin: continue cooling en route
   b. Ice packs to groins and axillae (adjunct only – NOT primary method)
   c. Ice bath immersion (most rapid and effective cooling method):
      i. This is generally unavailable for EMS, but may have been started before EMS arrival
      ii. If ice-bath cooling was started before arrival, e.g. for student athlete, continue cooling on scene to complete 20-minute treatment, before getting en route
6. SAMPLE History focus:
   a. **S**igns/symptoms: Cramps, headache, altered mental status, orthostatic symptoms, weakness, nausea
   b. **A**llergies
   c. **M**edications (including over-the-counter, supplements); Alcohol ingestion; Illicit drugs (overdose?)
   d. **P**ast Medical History, especially cardiovascular, neurologic
   e. **L**ast oral intake
   f. **E**vents:
      i. Environmental: Ambient temperature and humidity
      ii. Exertion: level of activity and other circumstances (young child left in vehicle?)
      iii. Length of time at risk
      iv. Attire worn
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Initiate continuous waveform capnography ($PetCO_2$) monitoring
9. Continue cooling measures:
   a. Consider discontinuing cooling measures at (core) temperature of 103.1-104°F (39.5-40.0°C)
   b. Do not administer acetaminophen or other antipyretics, even if available on-scene
10. Monitor for shivering and seizures (see below)
11. Consider differential diagnosis, especially for adults and workplace/occupational settings, e.g. acute coronary syndrome (ACS), stroke, hypoglycemia, drug/alcohol intoxication, head injury
12. Treat hypoglycemia per Diabetic Emergencies CPG
13. Continue hydration:
    a. Heat cramps, syncope, or exhaustion: oral fluids (sports drinks, or table salt ¼-½ tsp/qt. water), as tolerated*
    b. Heatstroke: establish IV/IO access and:
       i. Administer Normal Saline 20 mL/kg **(maximum 1000 mL (1L) per bolus)**
       ii. Reassess vital signs and perfusion status (BP, HR, RR, mental status, skin color, capillary refill)
       iii. Repeat once, if needed, with Normal Saline 20 mL/kg **(maximum 1000 mL (1L) per bolus)**
       iv. Reassess vital signs and perfusion status (BP, HR, RR, mental status, skin color, capillary refill)
14. *Consider small fluid bolus IV/IO for dehydration, even if vital signs are normal:
    a. 10 mL/kg (up to 500 mL total per bolus) for adults 14 years of age and older

    b. **Pediatric (Infants and children under 14 years of age):**
       Administer 10-20 mL/kg (up to 500 mL total per bolus)

    c. Assess and document clinical response & repeat bolus if signs of hypoperfusion persist
15. Treat seizures or uncontrolled shivering during cooling according to the Seizures CPG:
    a. Risk of treating shivering (respiratory depression, etc.) must be weighed against potential benefit
    b. *In pediatric patients, prepare for assisted ventilation/advanced airway management prior to treatment*
16. Monitor vital signs and transport:
    a. Strongly consider transport of suspected heatstroke patients to a Level I or Level II Trauma Center
17. For additional assistance and Medical Control physician guidance, contact BioTel

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Lightning/Lightning Strike

Goal: To aid EMS Providers in the recognition and safe treatment of lightning strike victims, including high priority resuscitation for cardiac arrest victims, within limits of mass casualty care
Inclusion Criteria: All patients who have been victims of lightning strike injury
Exclusion Criteria: No specific exclusions
Refer to: Asystole/PEA, Burns, Cardiac Arrest, Trauma and VFib/Pulseless VTach CPGs

Background and Significance

1. Lightning strikes typically kill more people in the U.S. each year than any other natural disaster, except floods
2. Texas typically ranks in the top 5 states for lightning strike injury
    a. Most common: Spring/summer, afternoon/evening, outdoors (⅓ occur indoors), open areas, male
3. Without bystander observations or history, it may not be apparent that a patient has been struck by lightning*
4. Mortality 10-30%: 65% die in 1st hour, most often due to cardiac dysrhythmia/cardiac arrest
    a. Cardiac arrest resuscitation carries higher rate of success than general cardiac arrest statistics
5. Patient/Rescuer Safety:
    a. Repeat strike poses risk to victims and rescuers
    b. Lightning strike victims do NOT carry or discharge current – it is safe to touch and treat

Basic Level

6. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
    a. A and B (Airway and Breathing): Isolated *respiratory* arrest or full cardiopulmonary arrest is possible
    b. C (Circulation): Initiate continuous ECG and SpO_2 monitoring
        i. ***Cyanotic, cool, mottled extremities are suggestive of lightning strike**
    c. D (Disability): Fixed and dilated pupils may be a sign of neurologic insult, not death/impending death
        i. Altered mental status and stroke-like findings are common
    d. E (Exposure): ***Fern-like, superficial skin burns ("Lichtenberg Figures") may be a clue**
7. Treat respiratory/cardiorespiratory arrest according to Cardiac Arrest CPG
    a. NOTE: If multiple victims (common), cardiac arrest victims whose injury was witnessed or is likely recent should be treated first and aggressively ("reverse triage")
        i. Prolonged CPR may be justified because of generally favorable outcomes
8. Place the patient in a position of comfort
    a. If there is evidence of shock, position the patient supine with the feet elevated
    b. Closely monitor airway status and respiratory effort
9. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
10. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

11. Establish IV/IO access, preferably through unburned skin
    a. Lightning strike patients typically require less volume than patients with thermal burns
12. Monitor for and treat cardiac dysrhythmias
    a. Obtain 12-Lead ECG, if possible
13. Secondary Survey to exclude and treat other injuries or illness:
    a. Common: Blast, Brain, Skull, Spine, Eye, Extremities Trauma (extensive thermal burns uncommon)
    b. Consider other diagnoses: Acute Myocardial Infarction, Stroke, Seizure, other causes of altered LOC
14. Treat pain of burns or traumatic injuries according to the Pain Management CPG
15. Transport to a Level I or Level II Trauma Center
16. For additional assistance and Medical Control physician guidance, contact BioTel

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Poisoned Patient and Overdose

Goals: Remove patient from toxic environment; identify intoxicating agent; identify antidote or mitigating agent; treat signs/symptoms in order to preserve vital functions and minimize end-organ damage
Inclusion Criteria: Patients of all ages with confirmed or suspected poisoning, intoxication or overdose of pharmaceutical, illicit or other drugs/substances
Exclusion Criteria: No specific recommendations
Refer to: Altered Mental Status, Behavioral Emergencies-Excited Delirium, Cardiac Arrest, Shock, Toxic Chemical Exposure and other, symptom-specific CPGs, e.g. Carbon Monoxide and Cyanide Exposure CPGs

NOTES:

- This CPG outlines the general approach to the patient with possible acute poisoning or overdose:
  - It cannot account for all possible poisonings, overdoses or exposures.
- Toxidrome definition: Constellation of signs and symptoms associated with exposure to a specific class of medications, drugs or toxins:
  - Toxidrome recognition may facilitate patient care, especially if an antidote/mitigating agent is available.
  - NOTE: A toxidrome may be masked or obscured in cases of multi-substance poisoning.
- **Consult BioTel and the North Texas Poison Control Center early to coordinate patient care, especially in the following circumstances:**
  - **Confirmed or suspected multi-substance poisoning or overdose; OR**
  - **Drug(s) or substance(s) not covered by this or other BioTel CPGs; OR**
  - **Drug(s) or substances are unknown.**
- **BioTel/Poison Control Center contact is mandatory for the symptomatic and *asymptomatic* pediatric patient with confirmed or suspected poisoning or overdose.**
- **Scene safety and use of appropriate PPE assume critical importance, especially if the presence of fentanyl-related substances and/or other hazardous materials is confirmed or suspected:**
  - **Refer to the Toxic Chemical Exposure CPG**

Basic Level

1. Following scene safety principles and agency HazMat SOPs, remove patient from toxic environment
2. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
   a. A (Airway): Ensure airway patency, with positioning, suctioning and OPA or NPA, as needed
   b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
   c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG; initiate continuous ECG monitoring
   d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
   e. E (Exposure/Environmental): Treat traumatic injuries according to the Trauma CPG and heat-related illness according to the Heat-Related Emergencies CPG
3. Positioning:
   a. If trauma is not suspected, position the patient supine or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway
4. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
5. Assess for general and toxidrome-specific sign and symptoms suggestive of drug overdose/poisoning:
   a. Signs/symptoms may vary according to route, concentration, dose, and duration of exposure:
      i. Routes include: ingestion, inhalation, injection or absorption (skin or mucous membranes)
   b. Check for needle marks, paraphernalia, bites, bottles or other items, and for possible trauma
6. Obtain SAMPLE history from patient/bystanders, focusing on prescription and OTC meds and illicit drugs:
   a. For prescription/OTC meds, identify drug name, time of ingestion, dose and quantity, if possible
   b. Collect and transport with patient all pill bottles or other containers present on-scene:
      i. Use extreme caution & PPE handling these items if opioid-related poisoning is suspected
7. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

8. Maintain continuous SpO_2 and ECG monitoring until patient care has been transferred to hospital staff

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9. Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion or respiratory distress
10. Obtain 12-Lead ECG, preferably before transport, if cardiac dysrhythmias are present & transmit STEMI ECG:
    a. Treat hemodynamically significant dysrhythmias according to the relevant CPG
11. Consider establishing IV/IO access at TKO rate or with a saline lock
    a. Treat shock/hypotension with fluid resuscitation according to the Shock CPG
12. Initiate transport, with continuous monitoring and frequent reassessment
13. Follow agency SOPs for patient decontamination prior to E.D. transport
    a. Follow agency SOPs for personnel, equipment and apparatus decontamination
14. For patient care considerations not covered under standing orders, especially for poisoning/overdose due to drug(s) not covered under this CPG, consult BioTel and the North Texas Poison Control Center

Specific Considerations for Representative Drug Classes (confirmed or suspected):

- **Scene safety & use of appropriate PPE assume critical importance to prevent EMS Provider exposure**
- **Consult BioTel and the North Texas Poison Control Center early to coordinate patient care**

1. Benzodiazepine:
    a. Support ABCs with supplemental oxygen and assisted ventilation/advanced airway
    b. Consider IV/IO fluid challenge (Normal Saline 20 mL/kg, up to 1 L maximum per bolus)
2. Beta-Blocker (BB) or Calcium Channel Blocker (CCB):
    a. Treat according to the Bradycardia CPG and Shock CPG
3. Carbon monoxide (CO):
    a. Toxidrome recognition and treatment according to the Carbon Monoxide Exposure CPG
4. Caustic (acid or alkali) oral ingestion:
    a. Evaluate for and treat airway compromise according to Airway Management (Adult/Pediatric) CPG
    b. Consider dilution with water or milk ONLY in the first few minutes immediately after ingestion:
        i. Up to 240 mL (adults) or 120 mL (pediatric patient less than 14 years of age)
        ii. Do NOT force fluids if: patient refuses to drink, or cannot swallow or protect his/her airway
        iii. Do NOT administer if: respiratory distress, AMS, abdominal pain, or nausea/vomiting
5. Cyanide (CN):
    a. Toxidrome recognition and treatment according to the Cyanide Exposure CPG
6. Narcotic/opioid (including fentanyl, carfentanil, and related substances):
    a. Exercise extreme caution and use PPE to avoid accidental exposure even to minute quantities of confirmed or suspected fentanyl-related substances (e.g. white powders, pills or unknown liquids)
    b. Toxidrome recognition and treatment according to the Altered Mental Status CPG
7. Organophosphate or carbamate pesticide, nerve agent:
    a. Toxidrome recognition and treatment according to the Toxic Chemical Exposure CPG
        i. If atropine/2-PAM Duodote® autoinjectors are unavailable, administer atropine IV/IO
8. Psychiatric and other medications causing symptomatic dystonia or extrapyramidal symptoms:
    a. Administer diphenhydramine according to the Allergic Reaction CPG
9. Selective Serotonin Reuptake Inhibitor Antidepressant (SSRI):
    a. Consider early advanced airway management
    b. Treat dysrhythmias according to the relevant CPG
    c. Treat hyperthermia according to the Heat-Related Emergencies CPG
    d. Treat hypotension according to the Shock CPG
    e. Treat seizures according to the Seizure CPG
10. Stimulant:
    a. Request additional EMS and Law Enforcement resources, as needed
    b. Toxidrome recognition and treatment according to the Behavioral Emergencies/Excited Delirium Syndrome CPG
11. Tricyclic Antidepressant (TCA):
    a. Treat according to the Bradycardia CPG and Shock CPG; and
    b. Administer sodium bicarbonate 1 mEq/kg IV/IO; and
    c. Administer 20 mL/kg Normal Saline IV/IO (1 L maximum per bolus)
    d. Treat seizures according to the Seizure CPG

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Snakebite (Venomous)

Goals: To aid EMS Providers in the recognition and treatment of patients with a bite by a venomous snake, in order to minimize spread of venom into the central and lymphatic circulation, and to identify and treat potentially limb- and life-threatening symptoms of envenomation
Inclusion Criteria: Any person with a proven or suspected venomous snake bite
Exclusion Criteria: Bites by snakes confirmed to be non-venomous. When in doubt, transport!
Refer to: Allergic Reaction, Shock and Pain Management CPGs for additional guidance

Clinical Presentation

- Bites typically occur while walking in an area known to be inhabited by venomous snakes
- Signs of envenomation from the majority of native venomous snakes include:
  - Sudden onset of pain
  - Swelling
  - Ecchymosis
- NOTE: Fang marks and local swelling may be absent
- NOTE: Victims may present with cranial nerve deficits or other paralysis, due to venom neurotoxicity
- NOTE: Very young and elderly patients are likely to have more severe envenomation
- **CAUTION:** NEVER ATTEMPT TO PICK UP A PRESUMED DEAD ANIMAL WITH BARE HANDS!
  - PRIMITIVE BITE REFLEX MAY PERSIST FOR HOURS AFTER ANIMAL DEATH

Basic Level

1. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC:
   a. A and B (Airway and Breathing): Assess for and treat airway/breathing compromise due to anaphylaxis and cardiovascular collapse (rare, but life-threatening):
      i. Administer epinephrine via auto-injector per Allergic Reaction CPG
   b. C (Circulation): Initiate continuous ECG and SpO_2 monitoring; monitor for signs of hemorrhage
   c. D (Disability): Document GCS and neurologic deficits
   d. E (Exposure and Environmental): Immediately remove jewelry/restrictive clothing from the extremity
   e. Obtain POC Glucose and treat according to Diabetic Emergencies CPG
2. Place the patient in a position of comfort:
   a. If there is evidence of shock, position the patient supine with the feet elevated
   b. Closely monitor airway status and respiratory effort
3. Immobilize the extremity with a splint or other immobilization device and maintain the extremity parallel to the ground at the level of the heart or slightly elevated (no more than 15° of elevation):
   a. Do NOT constrict circulation with a tourniquet, Ace bandage, cravat or other device
   b. Do NOT apply ice or heat to the affected extremity
   c. Do NOT incise the wound or apply suction
4. Administer supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
5. Secondary Survey
   a. With pen/marker, outline the area of swelling on the patient's skin and NOTE the TIME
   b. Assess for pulses, capillary refill and sensation in the affected extremity
   c. Assess for persistent oozing from the bite site
6. Obtain SAMPLE and other pertinent history:
   a. Did patient see the snake?
      i. If so, document: colors, scale pattern, patient's location when bitten (near water, on dry land, etc.), and TIME BITTEN and TIME TO ONSET of SYMPTOMS
   b. If snake can be located, attempt to obtain photos (from a safe distance), using smartphone or camera
   c. If photography is unavailable and snake has been killed, consider transporting dead animal in a secure container for expert identification
7. Once advanced level care arrives on scene, give report and transfer care

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Advanced Level

8. Continue assessment and management of airway compromise due to anaphylaxis or cardiovascular collapse
    a. For suspected anaphylaxis with upper and/or lower airway compromise and hypotension/shock:
        i. **Epinephrine (1 mg/mL):** Adults – Administer 0.3-0.5 mg (0.3-0.5 mL) IM

        ii. **Pediatric (Infants and children under 14 years of age) - Epinephrine (1 mg/mL)**
        Administer 0.01 mg/kg (0.01 mL/kg) IM (maximum dose = 0.3 mg (0.3 mL))

        iii. Additional management of anaphylaxis: Refer to Allergic Reaction CPG
9. Establish IV/IO access in an unaffected extremity:
    a. For shock/hypotension, administer Normal Saline 20 mL/kg (maximum of 1000 mL (1L) per bolus)
    b. Reassess and document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.)
    c. Repeat fluid bolus once, if no response
    d. For additional fluid administration, consult BioTel
10. For refractory shock or hypotension after fluid administration, consider vasoactive medication infusion:
    a. Norepinephrine bitartrate infusion IV/IO, starting a 2 mcg/min (maximum: 10 mcg/min)
    b. Consult BioTel for dosage calculations and administration details
11. Monitor for and treat respiratory compromise, and initiate continuous waveform capnography ($ETCO_2$) monitoring according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC
12. Monitor for and treat cardiac dysrhythmias
    a. Obtain 12-Lead ECG, if possible
13. Secondary Survey:
    a. Frequent reassessment and documentation of response to interventions
    b. Frequent reassessment and documentation of progression of swelling (with time noted)
14. Treat pain according to the Pain Management CPG
15. Transport to a Level I or Level II Trauma Center:
    a. Contact BioTel for destination decision-making guidance and assistance

Additional Patient and Rescuer Safety Considerations

1. If the live animal is in the vicinity, do NOT attempt to capture it!
    a. If it can be done safely, consider taking a smartphone photograph of the animal
2. If the animal is dead, lift the body with a long stick or other long object and place it into a sturdy, sealable container:
    a. Transport the dead animal with patient for expert identification
3. Collection of NON-NATIVE venomous snakes is a popular hobby among reptile enthusiasts:
    a. If dispatched to the scene of a bite by a NON-NATIVE venomous snake:
        i. Attempt to establish the location of the offending snake
        ii. Use GREAT CAUTION retrieving the patient if the snake's whereabouts are unknown
        iii. Once the patient and rescuers are in a safe location, attempt to obtain information from the patient or persons on-scene about:
            1. The scientific name and/or common name of the non-native snake
            2. The toxicities associated with this type of non-native snake (collectors usually know this)

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Toxic Chemical Exposure

Goals: Remove patient from toxic environment; decontaminate patient, if clinically indicated; identify intoxicating agent; administer antidote or mitigating agent, if available; treat signs/symptoms in order to preserve vital functions and minimize end-organ damage
Inclusion Criteria: Patients and responders with confirmed or suspected exposure to toxic pharmaceutical, industrial, illicit or other drugs/substances, such as chemical weapons of mass effect
Exclusion Criteria: No specific recommendations
Refer to: Altered Mental Status (AMS), Bradycardia, Burns, Cardiac Arrest, Cyanide Exposure, Eye Injury, Poisoned Patient/Overdose, Respiratory Distress, Seizure, and other, symptom-specific CPGs

NOTES:
- This CPG outlines the general approach to the patient (or responder) with a toxic chemical exposure:
  - It is not intended to serve as a replacement for agency SOPs or formal HazMat guidelines.
  - It cannot account for all possible poisonings or toxic chemical exposures.
  - Early consultation with Hazardous Materials (HazMat) experts is strongly encouraged.
- Toxidrome definition: Constellation of signs and symptoms associated with exposure to a specific class of medications, drugs or toxins:
  - Toxidrome recognition may facilitate patient care, especially if an antidote is available.
  - NOTE: A toxidrome may be masked or obscured in cases of multi-substance poisoning.
- **Consult BioTel and the North Texas Poison Control Center early to coordinate patient care, especially in the following circumstances:**
  - **Confirmed or suspected exposure to chemical weapons of mass effect (WME); OR**
  - **Confirmed or suspected multi-substance poisoning or overdose; OR**
  - **Drug(s) or substance(s) not covered by this or other BioTel CPGs; OR**
  - **Drug(s) or substances are unknown.**
- **BioTel/Poison Control Center contact is mandatory for the symptomatic and *asymptomatic* pediatric patient with confirmed or suspected toxic chemical exposure.**
- **Scene safety and use of appropriate PPE – especially respiratory protection – are critical!**
  - **Refer to the Poisoned Patient/Overdose CPG**

Basic Level

1. Observe for scene clues suggesting the possibility of toxic chemical exposure:
   a. Timing: sudden onset within minutes, especially among multiple victims
   b. Unusual fogs or smokes or odors:
      i. Do NOT rely on odors (e.g. musty, bleach, newly cut hay, or rotten eggs) to consider the possibility of toxic vapor exposure: many toxic chemicals are odorless at toxic concentrations
   c. Common clinical findings in multiple patients, especially in those downwind from release site
   d. Failure to respond to usual therapy
   e. Unexplained human, animal, fish or plant deaths
2. Following scene safety principles and agency HazMat SOPs, remove patient from toxic environment:
   a. EMS Provider safety is the first priority
   b. Depending on the agent, dose and route of exposure, triage, treatment and decontamination may need to proceed essentially simultaneously
   c. Initiate agency SOPs for patient dry and/or wet decontamination, as indicated
   d. In most cases of vapor exposure, dry decontamination will suffice
      i. If possible, remove patient contact lenses, and treat according to the Eye Injury CPG
   e. When wet decontamination is indicated, use measures to avoid accidental hypothermia
   f. Patient vomitus and other body fluids may be contaminated, even after external decontamination
3. Assess and support ABCs according to UNIVERSAL CARE – ADULT or UNIVERSAL CARE – PEDIATRIC, and Airway Management – Adult or Airway Management – Pediatric:
   a. A (Airway): Ensure airway patency, with positioning, suctioning and OPA or NPA, as needed
   b. B (Breathing): Provide supplemental oxygen to maintain SpO_2 of at least 94% (continuous monitoring)
   c. C (Circulation): Evaluate, document and treat signs/symptoms of shock according to the Shock CPG; initiate continuous ECG monitoring
   d. D (Disability): Assess and document GCS; assess pupillary size and reactivity
   e. E (Exposure/Environmental): Treat traumatic injuries according to the Trauma CPG

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4. Positioning:
    a. If trauma is not suspected, position the patient supine or in the left lateral decubitus position, facing EMS Providers, in order to monitor and manage the airway
5. Perform and document a POC Glucose analysis and treat according to the Diabetic Emergencies CPG
6. Assess for general and toxidrome-specific sign and symptoms suggestive of toxin exposure:
    a. Signs/symptoms may vary according to route, concentration, dose, and duration of exposure:
        i. Routes include: inhalation, injection, ingestion, or absorption (skin or mucous membranes)
    b. Check for needle marks, paraphernalia, bites, bottles or other items, and for possible trauma
7. Obtain SAMPLE history from patient/bystanders, focusing on toxic:
    a. For prescription/OTC meds, identify drug name, time of ingestion, dose and quantity, if possible
    b. Collect and transport with patient all pill bottles or other containers present on-scene:
        i. Use extreme caution & PPE handling these items if opioid-related poisoning is suspected
8. Once advanced level care arrives on scene, give report and transfer care

Advanced Level

9. Maintain continuous SpO_2 and ECG monitoring until patient care has been transferred to hospital staff
10. Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion or respiratory distress
11. Treat specific toxidromes according to the considerations outlined below*, including use of antidotes, when available
12. Obtain 12-Lead ECG, preferably before transport, if cardiac dysrhythmias are present & transmit STEMI ECG:
    a. Treat hemodynamically significant dysrhythmias according to the relevant CPG
13. Consider establishing IV/IO access at TKO rate or with a saline lock
    a. Treat shock/hypotension with fluid resuscitation according to the Shock CPG
14. Initiate transport, with continuous monitoring and frequent reassessment
15. Follow agency SOPs for patient decontamination prior to E.D. transport
    a. Follow agency SOPs for personnel, equipment and apparatus decontamination
16. For patient care considerations not covered under standing orders, especially for toxic exposure to chemicals not covered under this CPG, consult BioTel and the North Texas Poison Control Center

***Specific Considerations for Representative Toxin Classes (confirmed or suspected):**

- **Scene safety & use of appropriate PPE – especially respiratory protection – are critical!**
- **Consult BioTel and the North Texas Poison Control Center early to coordinate patient care**

12. ASPHYXIANTS
    a. Carbon monoxide (CO):
        i. Toxidrome recognition and treatment according to the Carbon Monoxide Exposure CPG
    b. Cyanide (CN):
        i. Toxidrome recognition and treatment according to the Cyanide Exposure CPG
    c. Hydrogen Sulfide (H_2S):
        i. Treat with supportive care, supplemental oxygen, bronchodilators; consider sodium nitrite, if available
13. INCAPACITATING AGENTS
    a. Narcotics/opioids (including fentanyl, carfentanil, and related substances):
        i. Toxidrome recognition and treatment according to the Altered Mental Status CPG
    b. Stimulants (e.g. methamphetamine, PCP, Ecstasy, etc.):
        i. Request additional EMS and Law Enforcement resources, as needed
        ii. Treat according to the Behavioral Emergencies/Excited Delirium Syndrome CPG
    c. Riot control agents (e.g. “tear gas”, mace, pepper spray):
        i. Toxidrome recognition and treatment according to the Eye Injury CPG
        ii. Patients with persistent symptoms 30 minutes after exposure should be transported to an E.D. for ophthalmologic evaluation
14. RESPIRATORY IRRITANTS
    a. UPPER AIRWAY TOXIDROME (e.g. ammonia, bleach+ammonia mixture, sulfur dioxide, formaldehyde): Upper airway (and other mucous membrane) irritation and swelling, stridor, cough, laryngospasm, respiratory distress, respiratory arrest
    b. UPPER AND LOWER AIRWAY TOXIDROME (e.g. chlorine): Upper airway toxidrome, PLUS bronchospasm, non-cardiogenic pulmonary edema

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c. LOWER AIRWAY TOXIDROME (e.g. phosgene, nitrogen dioxide): Bronchorrhea, bronchospasm, non-cardiogenic pulmonary edema, cyanosis, chest pain, headache
d. Treatment:
   i. General treatment according to Airway Management – Adult or Airway Management – Pediatric
   ii. Mainstays: 100% supplemental oxygen, suction, inhaled bronchodilators
   iii. For laryngospasm causing upper airway obstruction: consider emergency Cricothyroidotomy
   iv. Symptom onset after phosgene exposure may be delayed: E.D. transport is mandatory
      1. Lack of early symptoms or mucous membrane irritation does not exclude exposure

15. NERVE AGENTS, organophosphate or carbamate pesticides
   a. TOXIDROME: "DUMBBELS" (cholinergic – muscarinic)
      i. Diarrhea, Urination, Miosis (pinpoint pupils), BRONCHORRHEA and BRONCHOSPASM, Bradycardia, Emesis, Lacrimation (watery eyes), Salivation: "wet patients who cannot breathe"
   b. TOXIDROME: "Days of the Week" (cholinergic – nicotinic)
      i. Mydriasis (dilated pupils), Tachycardia, Weakness, Hypertension, Fasciculations
   c. Patients may present with either toxidrome, or a combination of both toxidromes
   d. Treatment:
      i. Immediate treatment with IM atropine/2-PAM via (Duodote®) autoinjector, if available:
         1. Mid-lateral thigh injection preferred (avoid femur, zippers, and foreign objects in pockets)

2. Pediatric patients less than 14 years (if no **pediatric** autoinjector):
a. Severe symptoms: consider administering 1 adult auto-injector
b. For moderate symptoms, administer weight-based atropine, as described below, in section 15.ii.2

      ii. If atropine/2-PAM Duodote® autoinjectors are unavailable, administer atropine IV/IO:
         1. ADULT at least 14 years of age: 2 mg IV/IO

2. Pediatric patients less than 14 years: atropine 0.05 mg/kg (0.5 mL/kg)
a. Maximum single dose: 2 mg

      iii. Repeat dosing every 3 to 5 minutes may be needed, up to 3, total, cumulative doses
      iv. BioTel may authorize additional doses, if needed
      v. Treatment endpoint: improved respiratory status
         1. Observe for atropine side effects: tachycardia, decreased sweating, confusion
         2. Observe for 2-PAM side effects: laryngospasm, tachycardia, hypertension
      vi. NOTE: Patients with mild (e.g. runny nose) or no symptoms 60 minutes after vapor exposure do not need antidote treatment
      vii. Additional treatment considerations: refer to the Respiratory Distress – Adult or Respiratory Distress – Pediatric CPG
      viii. Treat seizures according to the Seizure CPG

16. BLISTER AGENTS (Vesicants) (e.g. Mustard, Lewisite):
   a. TOXIDROME:
      i. Vapor: Eye and mucous membrane irritation, hoarseness, sore throat (early); pneumonia, respiratory failure, sepsis (late)
      ii. Liquid:
         1. Skin itching, burning, stinging (early); redness, swelling, blisters, pain (late)
         2. Symptom onset may be delayed (except for Lewisite): EMS Providers may be inadvertently exposed if patient decontamination is not performed before patient care
   b. Treatment:
      i. Immediate wet decontamination, if possible, according to agency SOPs
         1. Avoid hot water and excessive scrubbing
      ii. Treat respiratory distress according to the Respiratory Distress (Adult or Pediatric) CPG
      iii. Treat eye signs/symptoms according to the Eye Injury CPG
      iv. Treat skin burns according to the Burns CPG
      v. Treat pain according to the Pain Management CPG

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✦ POLICIES: CLINICAL OPERATIONS – PATIENT CARE & TRANSPORT

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BioTel Social Work Program Referral

Purpose: To provide UTSW/Parkland BioTel EMS Providers with a mechanism for meeting the social service needs of our patients
Inclusion Criteria: Patients whom EMS leadership feels might benefit from social services
Exclusion Criteria: Patients who EMS leadership feels will not benefit from social services
Refer to: Child/Elderly/Disabled Abuse/Neglect/Exploitation Reporting and ELAP Policies

I. Policy Overview – Representative Scenarios for Which BioTel Social Work Contact Is Recommended:

A. Resource Deficit: Patient, patient's family or EMS Provider identifies a resource deficit that limits the patient's ability to reach his/her full physical or mental potential.
   1. Examples include (but are not limited to) need for: alternate home placement; additional supports in the home (e.g. home health or durable medical equipment); connection to a medical home; or coordination of community resources.

B. Frequent and Excessive Use of 911 System: Patients meeting their basic needs through frequent and/or excessive 911 use.

II. BioTel Social Work Program Features:

A. Referrals are flexible, and the decision to refer is left to EMS agency leadership discretion.
B. The BioTel Social Worker can attempt intervention to provide services, as well as education, guidance and feedback on certain challenging patient populations.
C. BioTel Social Work referral is based not on number of EMS runs or patient call volume, but upon need:
   1. The BioTel Social Worker will collaborate with EMS agency Providers to assess candidates and to identify and address their needs.
D. Crisis intervention:
   1. The BioTel Social Worker may not be able to respond in real time to crisis situations.
   2. A patient's immediate physical and mental health needs take priority over social needs.
   3. EMS Providers should follow agency policies for assuring the safety of any patient they determine to be in immediate danger or in an unsafe situation.
   4. EMS Providers should adhere to the BioTel CPGs and to their EMS agency policies.
   5. A BioTel Social Work referral can be made following immediate safety/clinical management.
E. Abuse/Neglect: Refer to the Child/Elderly/Disabled Abuse/Neglect/Exploitation Reporting Policy
   1. A BioTel Social Work referral is NOT a substitute for mandatory reporting, but can be made after the report, in order to follow-up and coordinate efforts with responding community agencies.

III. Referral Process:

A. EMS Providers should follow their agency process and procedure for initiating a referral.
B. The BioTel Social Worker will follow-up with the designated contact person at the referring agency re:
   1. Assessment findings, patient assistance efforts, barriers, challenges, successes and outcomes.
C. As part of the treatment plan, the BioTel Social Worker may complete patient home visits when requested by the referring agency, or as needed (with approval of EMS agency leadership):
   1. The BioTel Social Worker shall be accompanied by an agency representative or a BioTel staff member, per the discretion of the EMS agency's leadership and BioTel leadership.
D. Patients refusing to participate in the BioTel Social Work Program or a decision to terminate services for a currently enrolled patient will be discussed by EMS agency leadership and BioTel leadership.

IV. Other Support Areas:

A. The BioTel Social Worker is available to provide support and education to EMS agencies and Providers.

V. Contacting the BioTel Social Work Program:

A. Under normal circumstances, the referral process outlined in Section III should be followed.
B. For immediate assistance, concerns or questions, EMS Providers should contact BioTel staff to determine the need to contact the BioTel Social Worker, and/or to activate the BioTel Emergency Legal Assistance Program.

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Custody

Purpose: To assist UTSW/Parkland BioTel ("BioTel") EMS Providers in the evaluation and care of patients in law enforcement custody
Inclusion Criteria: As above
Exclusion Criteria: EMS incidents that do not involve patients in law enforcement custody
Refer to: Destination, ELAP, Evaluation and Transport, and Restraint Policies; Behavioral Health Emergency and Excited Delirium CPGs; UNIVERSAL CARE – ADULT and UNIVERSAL CARE -PEDIATRIC

I. Definitions:

A. **Court Order:** An order issued by a judge whereby a person is ordered by the Court to do or not to do something. In EMS application, the only Court of record is a District Court (a State judicial office). The judge may have criminal, civil or both criminal and civil jurisdiction.
B. **Custody:** The status of a person who has been arrested or detained by a law enforcement officer (LEO).
C. **Detained:** The status of a person for whom freedom of movement has been restricted by a LEO for a limited time and under limited circumstances. A detained person is NOT formally under arrest. This sometimes includes asking a person to wait while a LEO checks for outstanding warrants, for wanted status, or to verify a specific account given by the person.
D. **Emergency Detention (Formerly known as "Apprehension by a Peace Officer Without a Warrant" or "APOWW"):** An action taken by a LEO who has probable cause to believe that the subject being detained is an immediate threat to him/herself or to others and requires a mental health evaluation.
E. **Mental Health Hold:** A non-legal term sometimes used by physicians or other healthcare professionals to indicate that a person in the hospital has been cleared for medical purposes, but nonetheless requires psychiatric evaluation prior to release.
F. **Under Arrest:** The status of a person after action by a LEO either on scene or pursuant to a warrant issued by a judge, whereby the person is taken into physical restraint with the intent to transport to jail or to some other confinement area authorized by law.

II. EMS Implications of "Custody":

A. In EMS, "Custody" most frequently involves persons who are "Under Arrest" or under "Emergency Detention".
B. Questions regarding "Custody" not covered in this policy should be directed to BioTel for assistance.

III. Evaluation of Patients who are "Under Arrest", "Detained" or in "Emergency Detention":

A. If a public safety or LEO requests that a BioTel EMS Provider evaluate a person who is under arrest or who has been placed in Emergency Detention, then, by definition, that person is a PATIENT.
B. The evaluation of patients who are under arrest or Emergency Detention is no different from the evaluation of any other patient, assuming that the patient consents to evaluation and that it is safe to evaluate the patient.
   1. Refer to the Evaluation and Transport Policy for the minimum assessment and documentation requirements for patients.
C. Patients in custody RETAIN the right to self-determination with regard to **assessment and treatment**.
   1. EMS Providers shall not initiate treatment against a patient's will, UNLESS failure to do so would likely result in imminent death or permanent disability.
   2. If there is ANY question whether to assess or treat a patient against his/her will, EMS Providers shall contact BioTel immediately.
D. Persons who are simply detained have the right to refuse BOTH evaluation AND transport.
E. Patients under arrest or Emergency Detention DO NOT have the right to refuse **ambulance transport**.
   1. If a LEO requests that such a patient be transported by ambulance, EMS Providers SHALL transport the patient to a receiving hospital emergency department (E.D.).
   2. If there is a disagreement about the need for the patient's ambulance transport, EMS Providers shall contact BioTel immediately.
F. When transporting an incompletely assessed patient due to the patient's refusal of assessment or because it was unsafe to assess the person, then EMS Providers shall notify BioTel as soon as possible, so that appropriate resources can be prepared at the receiving hospital.

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IV. Transport and Decision-Making:

A. EMS Providers shall follow their respective City and EMS agency policies regarding transport destination decision-making for patients who are under arrest or Emergency Detention.
B. Emergency Detention patients may be transported to the closest appropriate receiving hospital E.D. for medical clearance.
C. If there is any question about the appropriate destination for a patient under arrest or Emergency Detention patient, or for a patient originating from a jail, EMS Providers shall contact BioTel immediately.

V. Medical Clearance:

A. **ONLY** a physician in a hospital E.D. or jail medical staff can "medically clear" a patient in custody.
B. **UTSW/Parkland BioTel EMS Providers CANNOT "medically clear" a patient.**
C. EMS Providers may, after complete assessment, report that a patient's vital signs are within normal limits and stable, and that – in the EMS Provider's judgment – the patient's condition does not warrant ambulance transport to a receiving hospital E.D..
   1. If LEOs are comfortable transporting the patient either to jail for medical clearance or to a hospital E.D. for medical clearance, then the ePCR shall be completed and the reasons for allowing LEOs to transport the patient shall be clearly documented.
D. Any patient in custody meeting ANY of the criteria for "Mandatory Offer of Transport" in the Evaluation and Transport Policy MUST be transported by ambulance to a hospital E.D., unless otherwise approved by BioTel:
   1. If a person in law enforcement custody refuses EMS evaluation, then that person MUST be transported by EMS ambulance (with an accompanying Law Enforcement office in the patient compartment) to the closest appropriate hospital E.D., unless the EMS Providers' City/agency policy requires a specific, different hospital destination.
   2. Should EMS Providers believe a patient who: 1) is under arrest or under emergency detention, and 2) has not consented to evaluation does NOT warrant ambulance transport, then BioTel shall be contacted. The decision to permit such an individual to be released to law enforcement custody (and THEREFORE NOT TRANSPORTED BY AMBULANCE) shall be made ONLY by a Medical Control Physician.
E. If a LEO requests that EMS Providers transport a patient by ambulance, then EMS Providers shall honor this request, OR shall immediately contact BioTel for assistance.

VI. Patient Restraints and Handcuffs (Refer to the Restraint of Patient Policy):

A. A patient assessed to be a potential harm to him/herself or others shall be restrained in the safest, least restrictive manner possible, as per Restraint of Patient Policy.
B. At NO time shall BioTel EMS Providers utilize handcuffs.
C. At NO time shall a patient who is handcuffed be transported in a BioTel agency ambulance without the presence in the back of the ambulance of a LEO with the key to release the handcuffs:
   1. If local city policy dictates, a restraint system may be used that allows immediate release of the patient, in lieu of handcuffs.
D. When transporting a patient in law enforcement custody, a LEO shall accompany the patient in the patient compartment of the ambulance.
E. Patients shall NEVER be transported or allowed to roll over into a prone position.
F. Patients shall NEVER be "hogtied".
G. The cardiorespiratory and neurologic status of all restrained patients shall be continuously monitored and documented.

VII. Excited Delirium/Excited Delirium Syndrome (ExDS) (Refer to the Excited Delirium Syndrome CPG):

A. Persons in custody may exhibit wild or combative behavior and/or altered mental status. This condition is referred to "Excited Delirium" or "Excited Delirium Syndrome". It is often associated with stimulant drug ingestions, such as cocaine, PCP and/or amphetamines. The triad of agitation, hyperthermia and metabolic acidosis is accompanied by tachycardia, tachypnea and "superhuman" strength.
B. Many medical conditions, including brain injury, hypoglycemia and other metabolic disorders may mimic drug-related ExDS. Definitive diagnosis of the patient's underlying condition CANNOT be established in the field.
C. ExDS is a true, life-threatening medical emergency with a high-risk of sudden death, especially with restraint.
D. ExDS patients MUST be transported to a hospital E.D. by ambulance.

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E. If it is unsafe to assess a combative patient, that patient shall be placed in an ambulance, along with as many LEOs as needed to safely control the patient during transport to an appropriate hospital E.D..
   1. Continuous monitoring of airway, breathing and circulation is CRITICAL (refer to UNIVERSAL CARE)
   2. "Giving up" or abrupt cessation of struggling may be an ominous sign of impending cardiac arrest.

F. If it is safe to do so, EMS Providers shall obtain vital signs and a POC Glucose analysis, initiate ECG monitoring, administer supplemental oxygen and perform any other, symptom-specific assessment or treatment, as indicated. Pharmacologic sedation may be performed by advanced level providers.

G. BioTel shall be notified as early as possible during transport with notification that an incompletely assessed, combative patient is en route.

VIII. Mace/Pepper Spray:

A. Refer to the Eye Injury CPG

IX. Taser Barb Removal:

A. Refer to the Taser Barb Removal Procedure

X. Juveniles in Custody:

A. Juveniles under 18 years of age in custody shall be managed just as any other patients in custody:
   1. They RETAIN the right to refuse assessment and treatment.
   2. They do NOT have the right to refuse transport.
   3. They shall be transported according to the Destination Policy.
   4. If there is any question about the evaluation, treatment, transport or destination for a juvenile in custody, EMS Providers shall contact BioTel immediately.

XI. Transporting Prisoners from Jail:

A. EMS Providers may be required to provide transportation for prisoners when requested by medical personnel at a penal facility. EMS Providers shall follow their respective City/agency policies for this prisoner transport.

B. A LEO MUST ride in the back of the ambulance with any prisoner.

C. Patients from the Lew Sterrett Justice Center (jail) shall ALWAYS be transported to Parkland Hospital.

D. In general, jail patients in cardiac arrest should be transported to the closest appropriate hospital E.D., unless they meet criteria for determination of death in the field (refer to Determination of Death in the Field Policy).
   1. BioTel MUST be contacted regarding CPR in the field for ANY jail patient.

E. If there is any question or concern about the evaluation, treatment or transport of a jail patient, EMS Providers shall contact BioTel immediately.

XII. Overdose Patients:

A. A person who may have "overdosed" on street drugs or alcohol, who is awake, alert, oriented and acting appropriately, who has a normal or baseline unassisted gait, AND who does NOT meet ANY mandatory transport criteria MAY refuse further evaluation and transport.

B. A person who may have "overdosed" on street drugs or alcohol who is awake, alert, oriented and acting appropriately BUT who DOES meet any mandatory transport criteria SHALL be transported by ambulance to a hospital Emergency Department (E.D.):
   1. For any such patient who refuses transport, BioTel shall be contacted, as for any other high-risk patient who refuses transport.
   2. If a patient verbalizes thoughts of harming him/herself or anyone else, the local law enforcement agency should be contacted to determine if the patient should be placed under Emergency Detention.

C. A person reported by a third-party to have verbalized thoughts of harming him/herself or others, or who may have ingested street drugs, alcohol or prescription or OTC medications *in a self-harm attempt* shall be presented to BioTel for PHYSICIAN consultation regarding the possible need for Emergency Detention and transport:
   1. This applies even if the patient is not yet in law enforcement custody (under arrest) or under Emergency Detention.
   2. The local law enforcement agency should be contacted to determine if the patient should be placed under Emergency Detention.

D. In all cases, appropriate, detailed documentation shall be performed.

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E. In any case for which additional guidance or assistance may be needed, including possible activation of the Emergency Legal Assistance Program (ELAP), BioTel should be contacted.

XIII. Acute Adult Psychiatric Patients:

A. Nearly all patients for whom 911 has been called for evaluation of a behavioral health emergency require "medical clearance" before they can be evaluated by behavioral health professionals.
B. They shall, therefore, be transported to an appropriate hospital E.D. for "medical clearance".
C. EMS Providers CANNOT "medically clear" these patients in the field.
D. EMS Providers shall perform a standard patient evaluation (refer to UNIVERSAL CARE – ADULT) unless the patient refuses to consent to such evaluation, OR unless the patient's combative or violent behavior makes it unsafe to do so. In such cases, BioTel shall be contacted immediately.
E. EMS Providers may not transport patients directly to Green Oaks, Timberlawn Hospital or any other primary psychiatric facility (refer to Destination Policy).
F. Patients under arrest or Emergency Detention may be transported to any appropriate hospital E.D. for "medical clearance".
G. As outlined above in Section III, patients with a behavioral health emergency retain the right to determine treatment and may, therefore, refuse **evaluation and treatment**.
H. As outlined above in Section III, patients with a behavioral health emergency CANNOT refuse **transport** without BioTel Medical Command Physician authorization.
I. Patients under arrest or Emergency Detention likewise may refuse **evaluation and treatment**, but they CANNOT refuse **transport**.
J. Patients with signs or symptoms of Excited Delirium Syndrome: refer to Section VII above and to the Excited Delirium Syndrome CPG.

XIV. Pediatric and Adolescent Psychiatric Patients:

A. Refer to UNIVERSAL CARE – PEDIATRIC and to the Destination Policy.

XV. Primary Psychiatric Facilities (Green Oaks and Timberlawn Hospital):

A. BioTel EMS Providers shall NOT transport patients directly either to Green Oaks or to Timberlawn Hospital.
B. EMS Providers shall refer to their agency Standard Operating Procedures (SOPs) for guidance on EMS response to these facilities.

XVI. Parkland Hospital Psychiatric Emergency Service:

A. Parkland Hospital's Psychiatric Emergency Service does not accept patients directly from the field.
B. When a BioTel EMS agency unit transports a patient for urgent behavioral health evaluation to Parkland Hospital, EMS Providers enter the main E.D. EMS triage entrance.

XVII. Dallas City Detention Center (CDC):

A. The Dallas CDC is located in and overseen by the Dallas Marshal's Office (DMO).
B. The facility can accept persons who are assessed to be simply intoxicated by drugs or alcohol and who are transported to the CDC by LEOs, NOT by EMS Providers.
C. BioTel EMS units may NOT transport directly to the CDC.
D. If asked by LEOs to evaluate a person for possible transport by law enforcement to the CDC, EMS Providers shall follow the instructions in Section XVIII below (and to Section XVII in the Destination Policy).
E. IF THERE IS ANY DOUBT WHETHER THE PATIENT IS APPROPRIATE FOR LAW ENFORCEMENT TRANSPORT TO THE CDC, THEN THE PATIENT SHOULD BE TRANSPORTED TO A RECEIVING HOSPITAL E.D..

XVIII. Persons Detained for Simple Public Intoxication:

A. Refer to the Destination Policy and to the Evaluation and Transport Policy.
B. Patients with conditions such as epilepsy, diabetes, brain injury (among others) may appear to be intoxicated.

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C. EMS Providers shall perform a complete assessment of ANY patient for whom a LEO requests EMS evaluation OR of any patient with altered mental status (AMS), in order to assess for causes other than simple intoxication.
D. If EMS Providers are not reasonably confident that a patient's AMS is due ONLY to alcohol or drug intoxication, then that patient shall be transported by ambulance to a hospital E.D. for further evaluation.
E. Refer to the complete list of criteria for which ambulance transport to a hospital E.D. is **MANDATORY** in Section XVII of the Destination Policy and in Section VII of the Evaluation and Transport Policy.
F. Patients may be transported by LEOs either to jail or to the CDC **ONLY** if **ALL** criteria are met:
    1. Complete EMS evaluation AND documentation demonstrating no obvious, acute medical condition, traumatic injury or co-existing medical complaint; **AND**
    2. NO mandatory transport criteria (see Section E above); **AND**
    3. Must have a GCS of 15.
G. If, following EMS evaluation, LEOs are not comfortable transporting a patient to jail or to the CDC, then EMS Providers shall transport the patient by ambulance to a hospital E.D..
H. If a patient with AMS thought to be due to alcohol or drug intoxication refuses transport and cannot be convinced by LEOs to accept ambulance transport to a hospital E.D., then EMS Providers shall immediately contact BioTel for further assistance and direction.

XIX. BioTel Emergency Legal Assistance Program ("ELAP"):

A. Refer to the ELAP Policy.
B. The ELAP is available to EMS Providers THROUGH BIOTEL, 24 hours a day, 7 days a week for emergency legal consultation.
C. EMS Providers shall contact BioTel for possible ELAP activation. Providers shall NOT directly contact the ELAP attorneys.

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Destination Decision-Making

Purpose: To aid UTSW/Parkland BioTel ("BioTel") EMS Providers in the selection of an appropriate destination facility for their patients
Inclusion Criteria: All patients evaluated and treated in the BioTel EMS system
Exclusion Criteria: None, unless approved by an online Medical Command Physician
Refer to: Hospital Capabilities Matrix and consult BioTel online medical control for the most up-to-date hospital/Trauma Center capabilities, AND whenever questions arise regarding the appropriate destination for any patient

I. Policy Overview:

BioTel EMS Providers shall transport patients ONLY to approved facilities and shall utilize the guidelines enumerated within this policy to assist in their selection of the appropriate receiving facility.

II. General Destination Decision-Making Considerations:

A. Facility destination decisions for EMS patients shall be prioritized based on the following:
   1. Patient medical need;
   2. Patient preference;
   3. Family or on-site physician preference (if the patient is unable to provide input).
B. If a patient requests transport to a receiving hospital that is not the closest appropriate facility, EMS Providers shall follow their respective City/EMS agency guidelines in determining where to transport the patient, so as to accommodate patient preference while minimizing negative impact on day-to-day EMS operations.

III. Adult Patients Who Appear to Have a Minor, Non-Emergent Medical Condition: ("Adult – Minor")

A. A patient who does NOT meet specialty hospital criteria (e.g. Trauma, Stroke, Obstetrics, Pediatrics or STEMI), *AN*D who does NOT meet any of the EXCEPTIONS listed below, MAY be offered transport to the closest appropriate facility. However, the following patients should be transported to the hospital where they normally receive care, assuming that is within the customary BioTel transport radius:
   1. Pregnant patients who report receiving prenatal care should be transported to the E.D. that is associated with their prenatal care.
   2. Patients who are within 90 days of being post-op/post-procedure and who have a chief complaint that could be related to their surgery/procedure should be transported to the E.D. of the hospital that performed their surgery/procedure.
   3. Patients undergoing chemotherapy or radiation treatment should be transported to the E.D. that is associated with their cancer treatment center.
   4. Patients with "complex care" (HIV, CHF, transplant, etc.) who report ongoing care at a specific hospital or hospital system should be transported to that hospital (or a closer "sister hospital").

IV. Adult Patients with a Life-threatening Emergency Medical Condition: ("Adult – Life-Threatening")

A. Patients with any of the following conditions should be transported to the closest hospital emergency department:
   1. Airway obstruction or respiratory insufficiency with inadequate oxygenation and/or ventilation;
   2. Status epilepticus;
   3. NON-TRAUMATIC cardiac arrest or post-cardiac arrest.
B. Patients with TRAUMATIC Cardiac Arrest shall be transported to the closest TRAUMA CENTER.

V. Pediatric Patients – MEDICAL (including overdose patients): ("Pedi – Medical")

A. Age 0 to 18 years (prior to the 19th birthday): Critically ill or unstable pediatric patients should be transported to Children's Medical Center Dallas, Children's Medical Center Plano, or Medical City Children's Hospital
B. **EXCEPTION:** Any pediatric patient with an unstable airway requiring immediate intervention should be transported to the closest hospital emergency department.

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VI. Adult Prehospital TRAUMA CENTER Triage Criteria: ("Trauma – Adult & Special Considerations")

A. Adult patients meeting ANY of the Prehospital Trauma Criteria listed below (refer to section C, below) SHALL be transported to the CLOSEST (by travel time) Level I or Level II ADULT Trauma Center. At the time of publication of these CPGs, the Level I and Level II centers include:

1. Baylor University Medical Center (Level I)
   i. EXCEPTION: Burns
2. Medical Center of Plano (Level I)
   i. EXCEPTIONS: Burns and patients who might require reimplantation surgery
3. Methodist Dallas Medical Center (Level I)
   i. EXCEPTION: Burns
4. Parkland Hospital (Level I) (NO EXCEPTIONS)
   i. Patients meeting ABA Burn Center criteria shall be transported to Parkland Hospital (see Burns CPG)
5. BSW Baylor Grapevine (Level II)
   i. EXCEPTIONS: Burns and patients who might require reimplantation surgery
6. THR Presbyterian Dallas Hospital (Level II)
   i. EXCEPTIONS: Burns and patients who might require reimplantation surgery
7. THR Presbyterian Plano Hospital (Level II)
   i. EXCEPTIONS: Burns and patients who might require reimplantation surgery

B. **EMS Providers should consult BioTel (or the current hospital capabilities matrix) for destination decision-making guidance, as capabilities and Trauma Center designations may change over time.**

C. **Four Sets of Criteria:**

1. **Patient Physiology**
   i. **Airway:**
      a. Endotracheal intubation/advanced airway placement **or** attempted placement prior to arrival
   ii. **Breathing:**
      a. Respiratory distress (obstruction, accessory muscle use, respiratory distress or inhalation injury)
      b. Respiratory rate less than 10 or greater than 29 breaths per minute
   iii. **Circulation:**
      a. Post-traumatic cardiac arrest
      b. Heart rate less than 50 or greater than 140 bpm
      c. Systolic BP less than 90 mmHg (adult)
         1. **NOTE:** SBP less than 110 mmHg in patients 65 years of age or older may indicate shock
   iv. **Disability:**
      a. GCS 13 or less secondary to trauma
      b. Decreasing level of consciousness

2. **Specific Injuries:**
   i. Penetrating wound to head, neck or torso, or proximal to the elbow or knee
   ii. Chest wall instability or deformity (e.g. flail chest)
   iii. Multiple (2 or more) long-bone fractures
   iv. Mangled, crushed, degloved, or pulseless extremity (including suspected compartment syndrome)
   v. Amputation proximal to the wrist or ankle
      a. For other amputation/devascularization injuries, refer to Section XI below
   vi. Pelvic fracture
   vii. Open or depressed skull fracture
   viii. Paralysis (including new weakness or paralysis), or suspected spinal cord injury or spinal fracture
   ix. Evisceration

3. **High-Energy Mechanism/Vehicular Damage Within 72 Hours of Presentation:**
   i. Fall of 20 feet (2 stories) or more
   ii. Drowning
   iii. Hanging
   iv. Pedestrian hit by automobile WITH ANY identified injury
   v. Bicyclist hit by automobile WITH ANY identified injury
   vi. Motorcycle crash WITH ANY identified injury

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vii. High-risk Motor Vehicle Crash (MVC), such as: significant intrusion, including roof (at least 12 inches at occupant site or at least 18 inches at any site), steering wheel collapse, ejection (partial or complete), or death in the same passenger compartment

4. **Special Patient or System Considerations:**
   I. Age at least 65 years WITH ANY identified injury and/or criteria (including ground-level fall)
      a. SBP less than 110 mmHg may indicate shock in patients 65 years of age or older
      b. Low-impact mechanisms, such as ground-level fall, may result in severe injury
   II. History of prescription blood thinners, EXCEPT the following anti-platelet agents:
      a. Aspirin
      b. Dipyridamidole (Persantine®)
      c. Aspirin/dipyridamidole (Aggrenox®)
      d. Cilostazol (Pletal®)
      e. Zontivity (Vorapaxar®)
   III. Pregnancy at least 20 weeks estimated gestational age
   IV. Burns greater than 20% TBSA:
      a. Burns 10% or greater should be transported directly to a verified burn center, if possible
      b. Patients with any of the following criteria should be transported directly to a verified burn center, if possible (refer to the Burns CPG):
         1. Burns of face, eyes, ears, hands, feet, genitalia, perineum, or major joints
         2. Full-thickness (3rd-degree) burns of any size in any age patient
         3. Electrical burns (including lightning)
         4. Chemical burns
         5. Inhalation injury (including smoke inhalation), with or without other Trauma Triage Criteria
         6. Burns with traumatic injuries (e.g. fractures)
         7. Burns in patients with pre-existing medical conditions or comorbidities
         8. Burns in patients needing special social, emotional, or rehabilitative intervention
         9. Pediatric burn patients who do not meet Pediatric Trauma Triage Criteria must be transported to Parkland Hospital
   V. EMS Provider or Medical Command Physician discretion
      a. When in doubt, transport to a Trauma Center
   VI. **NOTE: Transport of any patient with any of the above criteria to a destination other than an Accredited Trauma Center or Verified Burn Center (e.g. because of patient preference) requires prior authorization by an Online Medical Command Physician. If a patient wishes to refuse transport to a Trauma Center but will accept transport to a non-Trauma Center hospital, this is preferable to non-transport. Contact BioTel: a physician MAY be able to convince the patient to accept transport to a Trauma Center. If not, BioTel can explain to the receiving hospital why a patient meeting Prehospital Trauma Center Criteria is en route to their facility.**

VII. Pediatric and Adolescent Patients – TRAUMA: ("Pedi-Trauma")

1. Unless there are extenuating circumstances, such as a Mass Casualty Incident, adult and pediatric trauma patients should be transported separately to appropriate Trauma Centers:
   1. Routine transport of both an adult and a pediatric patient in the same ambulance is discouraged:
      a. An EMS unit transporting both an adult and a pediatric patient to any Trauma Center MUST off-load BOTH patients at that hospital for evaluation
   2. Under NO circumstances shall EMS Providers off-load ONLY one of two patients at the first hospital
2. Pediatric and adolescent patients meeting Trauma Center Activation Criteria (see below, Section VIII) should be transported to the appropriate Trauma Center, according to the following age criteria:

Age	Children's Dallas	Medical Center of Plano; Parkland; BSW Grapevine	Baylor University Medical Center; Methodist Dallas; Presbyterian Dallas
0 to 14th birthday	✓		
14th birthday – 15th birthday	✓	✓	
15th birthday or older		✓	✓

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VIII. Pediatric and Adolescent Prehospital TRAUMA Center Activation Criteria:

Children's Medical Center Trauma Activation Criteria

Trauma Stat Activation Criteria	
Criteria	**Further Information**
Traumatic cardiopulmonary arrest from penetrating trauma	
Traumatic injury with signs of shock*	*See table below for definition of shock
Penetrating injuries (includes gunshot wounds) to the neck, chest, abdomen or pelvis and extremities proximal to the elbow/knee	Excludes lacerations in the stable patient
Respiratory distress secondary to trauma, respiratory compromise/obstruction and/or intubation on scene	
Neurological injury with a GCS equal to or less than 8 without sedation or GCS deteriorating by 2 or more	
Suspected spinal cord injury	Associated with flaccidity, areflexia or unexplained hypotension
Crush or Amputation proximal to the wrist or ankle with signs of shock*	
Any trauma transfer with respiratory and/or hemodynamic instability and/or GCS equal to or less than 8 without sedation or paralytics and/or patients receiving blood products to maintain vital signs	
The above criteria applies to any trauma burn patient	
Emergency physician's discretion	Such as deterioration of previously stable patient
Trauma Alert Criteria	
Criteria	**Further Information**
Traumatic cardiopulmonary arrest from blunt trauma	
Motor Vehicle Crashes (includes ATV's) with reported history of:	Ejection of the patient from the vehicle
	Prolonged extrication (> 20 minutes)
	A rollover collision
	Death of an occupant in same vehicle
Neurological injuries with a GCS of 9 to 14	
Hanging or strangulation mechanisms	
Auto-Pedestrian or Auto-Bike Crashes involving speeds equal to or greater than 20 mph	
Falls greater than 2nd story or 20 feet	
Bilateral femur fractures or 3 or more long bone fractures	
Crush injuries to chest or abdomen	
Crush or Amputation injuries proximal to the wrist or ankle in the stable patient	With fracture or significant tissue loss
Significant lacerations to head or neck in the stable patient	Lacerations that are deep or with significant tissue loss
Any intubated transfer with a isolated/single system head injury with hemodynamic stability	
Any transfer with grade IV solid organ injury or two or more solid organ injuries	
Burns over 30% TBSA, burns to face & neck that has potential for airway compromise, and circumferential extremity burns	

Definition of Shock

Age Group	Heart Rate (beats/min)	Pulse Character	Blood Pressure (mm Hg)	Respiratory Rate (breaths/min)	CNS
Birth to 6 months	> 190	Weak thready central pulses Absence of peripheral pulses	< 60	>70	Change in level of consciousness, dulled response to pain, or comatose
Infant	>176	Same	<75	>50	Same
Preschool	>132	Same	<85	>40	Same
Adolescent	>120	Same	<95	>30	Same

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IX. Acute Stroke: ("STROKE")

A. Adult patients **at least 18** years of age with signs and symptoms of acute stroke shall be transported according to the following criteria, according to the time that the patient was "last known normal":
   1. **Onset of symptoms less than 24 hours and a negative C-STAT score* (suggesting no large vessel occlusion (LVO)):** Transport to the closest designated stroke center.
      i. If the EMS provider is uncertain if the desired destination hospital is a designated stroke center, contact BioTel for consultation.
   2. **Onset of symptoms less than 24 hours and positive C-STAT score* suggesting possible large vessel occlusion (LVO):** Unless immediate intervention (e.g. ABCs, cardiac arrest, etc.) is required, these stroke patients should be preferentially transported to a Comprehensive Stroke Center (CSC), if such a facility is available with less than 15 minutes of additional transport time.
      i. If the EMS provider is uncertain if the desired destination hospital is a Comprehensive Stroke Center (CSC), contact BioTel for consultation.
   3. **Onset of symptoms at least 24 hours, or unknown Last Known Normal (LKN) time:** Transport to the closest designated stroke center.

B. Pediatric patients less than 18 years of age with signs and symptoms of acute stroke should be transported to a Pediatric Stroke Center, either Children's Medical Center Dallas (NOT Children's Medical Center Plano) or Medical City Children's Hospital.
   1. Contact BioTel for destination decision-making guidance and other instructions.

C. *Refer to the Stroke CPG for guidance on stroke screening and the use of secondary stroke triage scores

X. Acute ST-Elevation MI: ("STEMI")

A. Patients with signs and symptoms of and/or an EKG suggesting acute STEMI shall be transported to the closest hospital with 24/7 cardiac catheterization lab ("cath-lab") capabilities, according to the following hierarchy:
   1. Patients who are unstable shall be transported to the closest hospital with 24/7 cath-lab capabilities;
   2. Patient preference for transport to a specific receiving hospital that has cath-lab capabilities;
   3. Family or physician preference (if patient is unable to provide input) for transport to a specific receiving hospital that has cath-lab capabilities;
   4. Patients without a preference shall be transported to the closest receiving hospital that has cath-lab capabilities.

XI. Isolated Distal Amputation and Devascularization Injuries: ("REPLANT")

A. Patients with the following injuries who do NOT meet any Prehospital Trauma Triage Criteria may be transported to the Microsurgical Specialty Care Facility of their choice or to the closest microsurgical center, if the patient has no preference:
   1. Isolated amputation or partial amputation distal to the ankle or wrist;
   2. Extensive facial, lip, or ear avulsion;
   3. Penile amputation.

B. Patients with simple avulsion lacerations of the distal phalanx (finger or toe) may be transported to patient's preferred receiving hospital if within the customary transport radius of the EMS Agency, or to the closest receiving hospital, if the patient has no preference.

XII. Obstetrics: ("OB")

A. Pregnant patients with any of the following conditions should be transported to the closest hospital with a Labor and Delivery facility (the hospital may arrange transfer to a higher-level facility after delivery, if needed):
   1. Breech presentation;
   2. Limb presentation;
   3. Vaginal hemorrhage with shock;
   4. Umbilical cord prolapse;
   5. Actively seizing or status-post seizure;
   6. No prenatal care during pregnancy.

B. All other pregnant patients with a pregnancy-related medical problem shall be transported to the Labor and Delivery Facility of their choice, or to the closest Labor and Delivery facility, if the patient has no preference.

C. Contact BioTel or refer to the current Hospital Capabilities Matrix for further guidance and assistance.

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XIII. VA Patients: ("VA")

A. Patients who report that they are Veterans, who do not meet specialty care criteria (e.g. STEMI, Stroke, Trauma), AND who express a preference to be transported to the VA Hospital **may** be transported there.
B. However, it may not be necessary to transport Veterans directly to a Veteran's hospital:
   1. Veterans may call 911 for emergency transport to the closest non-VA hospital:
      i. If hospitalization is required, the hospital may contact the nearest VA hospital within 24 hours to arrange transfer.
   2. The VA may be able to arrange and pay the health care of eligible Veterans outside of VA medical facilities, but only in certain, limited circumstances:
      i. When the Veteran meets eligibility criteria; and
      ii. When there is a medical need; and
      iii. When VA medical facilities (or "sharing agreement" facilities) are unavailable.
C. Patients who are not Veterans and any patients who meet specialty care criteria (e.g. Trauma, STEMI or acute Stroke) shall **NOT** be transported to the VA Hospital, ***unless*** they have an unstable airway, are in medical cardiac arrest or post-arrest, and the VA hospital is the closest appropriate facility.

XIV. Psychiatric Patients: ("PSYCH")

A. Nearly all patients for whom 911 is called for evaluation of a behavioral health emergency will require "medical clearance" before they can be evaluated by psychiatric providers. Therefore, such patients may be transported to ***any*** receiving hospital emergency department for medical clearance.
B. EMS Providers cannot "medically clear" these patients in the field. Thus, these patients shall be transported by ambulance unless a BioTel physician approves alternative transport or refusal of transport.
C. EMS Providers shall perform a standard patient evaluation unless the patient refuses consent for such an evaluation, or unless the patient is combative and that evaluation may be unsafe to the providers.
D. EMS Providers may not transport patients directly to Green Oaks Hospital or to any other primary psychiatric facility.
E. Patients who are under Emergency Detention (previously known as "APOWW") may be transported to ***any*** hospital emergency department for medical clearance:
   1. EMS Providers shall follow their respective City/EMS agency policies regarding hospital destination for patients in custody of law enforcement officers, first ensuring that the intended receiving hospital is not "closed" to psychiatric patients needing medical clearance.
F. Psychiatric patients maintain the right to determine their treatment, and therefore they may refuse evaluation and treatment if they demonstrate capacity to understand their condition. They CANNOT refuse transport without PRIOR BioTel MD consultation.
G. Any patient exhibiting signs and symptoms of Excited Delirium Syndrome MUST be transported by ambulance to a hospital emergency department, and BioTel contact shall be made as early as possible to assist in the destination decision-making and early notification of receiving hospital staff for such patients.

XV. Pediatric & Adolescent Psychiatric Patients: ("PEDI PSYCH")

A. Age 0 to 12 years (up to 13th birthday): Patients should be transported to Children's Medical Center Dallas or Children's Medical Center Plano.
B. Age 13 to 18 years:
   1. NOT violent or in custody: Children's Medical Center Dallas or Texas Health Resources Plano.
   2. Violent or in custody: Contact BioTel for destination decision-making guidance.
C. Age at least 18 years: Patients should be transported to closest appropriate facility (see Section XIV above).
D. Contact BioTel for additional destination decision-making guidance.

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XVI. Alleged Sexual Assault Patients: ("Sexual Assault")

A. All Texas hospitals must have the ability either to conduct a forensic exam on an alleged Sexual Assault patient**, OR** to make arrangements to transfer the patient to the nearest designated treatment facility with 24/7 Sexual Assault Nurse Examiner (SANE) availability or to a "Center of Excellence". **Consult the current Hospital Capabilities Matrix or contact BioTel for up-to-date hospital capabilities.**

1. **Dallas County Available Resources**
   - i. **Females 0 to 13 years of age** (up to 14th birthday): Patients may be transported to CMC Dallas.
   - ii. **Females 14 years of age and older**: Patients may be transported to any adult hospital with 24/7 SANE Nurse availability.
   - iii. **Males 0 to 16 years of age** (up to 17th birthday): Patients may be transported to CMC Dallas.
   - iv. **Males 17 years of age and older**: Patients may be transported to any adult hospital with 24/7 SANE Nurse availability (some Dallas County hospitals accept male patients as young as 14 years of age).

2. **Collin County Available Resources**
   - i. **Females 0 to 13 years of age** (up to 14th birthday): Patients may be transported to CMC Plano.
   - v. **Females 14 years of age and older**: Patients may be transported to any adult hospital with 24/7 SANE Nurse availability.
   - ii. **Males 0 to 16 years of age** (up to 17th birthday): Patients may be transported to CMC Plano.
   - vi. **Males 17 years of age and older**: Patients may be transported to any adult hospital with 24/7 SANE Nurse availability.

XVII. Intoxicated Patients: ("Intoxicated")

A. Critical considerations in the care of patients who appear to be intoxicated by alcohol or other substances:
1. EMS Providers CANNOT "medically clear" patients for transport by law enforcement officers to jail or to the Dallas Marshall's City Detention Center (CDC).
2. EMS Providers may, however, perform a complete evaluation, and document that, in their judgment, a patient does not appear to require transport by ambulance.
3. EMS Providers MUST transport by ambulance to a receiving hospital emergency department any intoxicated patient with ***AN***Y of the following criteria:
   - i. Glasgow Coma Score less than 15;
   - ii. Pulse rate less than 50 or greater than 120 beats per minute;
   - iii. Systolic blood pressure greater than 200 or less than 90 mmHg;
   - iv. Diastolic blood pressure greater than 110 mmHg;
   - v. Respiratory rate less than 12 or greater than 24 breaths per minute;
   - vi. Room air oxygen saturation (SpO_2) less than 95%;
   - vii. POC blood glucose level less than 60 or greater than 300 mg/dL;
   - viii. Active hemorrhage;
   - ix. Bruising or hematoma above the clavicles, indicating the need for spinal stabilization;
   - x. Witnessed seizure within the last hour;
   - xi. ANY signs or symptoms of Excited Delirium Syndrome;
   - xii. Inability to ambulate without assistance (if patient's baseline mobility status is ambulatory);
   - xiii. A law enforcement officer reports that he/she is NOT comfortable transporting the patient by means other than ambulance.

XVIII. Freestanding Emergency Centers (FEC):

Freestanding Emergency Centers (FEC): Contact BioTel to determine if the FEC is an approved destination for BioTel patients. Refer to the Freestanding Emergency Centers (FEC) Policy.

XIX. Multi-Casualty Incident (MCI):

A. In the event of a Multi-Casualty Incident (MCI), the Incident Transport Officer, in consultation with BioTel and the Medical Director or his/her designee (when possible), will be responsible for hospital and Trauma Center destination decisions.
B. Such decisions shall be made in the best interests of the maximal number of patients and the continued operations and functions of the EMS agencies and the receiving hospitals.

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Determination of Death, Resuscitation Termination and Do Not Resuscitate (DNR)

Purpose: To provide guidance for determining when out-of-hospital resuscitation attempts are not indicated, when EMS Providers may terminate resuscitation efforts in the field, and how to apply Do Not Resuscitate (DNR) orders. Sound clinical judgment and common sense shall be used in the implementation of this policy
Inclusion Criteria: As above
Exclusion Criteria: Mass Casualty Incident (MCI) patients
Refer to: Mandatory Contact and Physician Coordination Policies

I. Policy Overview:

A. In situations where any possibility of life exists, EMS Providers shall make every effort to resuscitate the patient.
   1. Very often, the reported "down time" inaccurately predicts resuscitation potential. The patient may have been in bradycardia or simply unconscious for a period of time, yet with cerebral perfusion. Additionally, time information received from bystanders is often inaccurate.
   2. Pupil size and response to light can be inaccurate predictors of death, as the eyes can be affected by oral and topically applied medications. Pupils can become "fixed" after only one or two minutes of cerebral anoxia. Additionally, children and hypothermic patients may have fixed and dilated pupils from anoxia and, yet, can be resuscitated without long-term neurologic deficit.

B. EMS Providers do not PRONOUNCE death. Rather, they DETERMINE death, based on predetermined criteria. Only BioTel Medical Command Physicians can PRONOUNCE death.

II. Criteria to Determine Death in the Field (Adult and Pediatric):

A. EMS Providers are not required to ***initiate*** resuscitation measures for the following 6 conditions, IF the patient is apneic and pulseless, AND a cardiac rhythm strip shows asystole (***except as specified below***):
   1. Rigor Mortis (cardiac rhythm strip by paramedic confirming asystole required);
   2. Dependent Lividity (cardiac rhythm strip by paramedic confirming asystole required); or
   3. Presence of a VALID Do Not Resuscitate order or bracelet/medallion (refer to Section IV, below);
   4. Decapitation (no cardiac rhythm strip required);
   5. Incineration (no cardiac rhythm strip required);
   6. Obvious decomposition (no cardiac rhythm strip required).

B. For patients in ***blunt or penetrating*** traumatic cardiac arrest, including visually apparent MASSIVE brain or heart trauma that is CLEARLY incompatible with life:
   1. Resuscitation efforts may be ***discontinued*** IF:
      i. A cardiac rhythm strip demonstrating asystole has been OBTAINED AND DOCUMENTED; **AND**
      ii. There are no EMS-witnessed signs of life, no pulse and no respiratory effort
   2. If the patient is NOT in asystole, resuscitation shall be initiated and the patient shall be transported to the closest designated TRAUMA CENTER.
      i. Consult BioTel for additional guidance, if needed.

C. EMS Providers are not required to continue resuscitation efforts initiated by other persons on the scene, if the patient meets any of the above criteria.
   1. This includes telephone CPR initiated by the direction of Emergency Medical Dispatchers.

D. **Procedure After Death Has Been Determined:**
   1. Immediately notify the appropriate law enforcement agency and remain on-scene until officers arrive
   2. To the degree possible, set up visual barriers, so that the public cannot view the body
   3. Do not remove any property from the body or from the scene for any purpose
   4. Leave the body at the scene, in the care of the appropriate law enforcement agency

III. Termination of Resuscitation Efforts in the Field (Adult Only):

A. Every effort shall be made to resuscitate all patients who do not meet criteria outlined above in Section II.
   1. Studies show, however, that rapid transport of MEDICAL CARDIAC ARREST patients for in-hospital resuscitation after unsuccessful prehospital Advanced Cardiac Life Support (ACLS) efforts rarely, if ever results in survival to hospital discharge.

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2. Additionally, the risks associated with high-speed transport outweigh the extremely small likelihood of benefit.
3. Therefore, in the absence of a compelling reason, EMS Providers shall work these cardiac arrest patients in the field and transport ONLY if ROSC has been achieved, or if BioTel staff/physician advises continuation of resuscitation efforts en route to an appropriate E.D..

B. Field deaths not covered by this policy require assessment by a paramedic and consultation with a BioTel Medical Command Physician for death pronouncement.

C. During the initial resuscitation effort, EMS Providers or appropriate fire/rescue personnel will inform the family of the progress of the resuscitative efforts and possible implementation of this policy. If any family member or responsible person objects to the termination of resuscitation efforts in the field, OR if paramedics determine that pronouncement in the field is either inappropriate or potentially unsafe, continue the resuscitation and transport the patient to the closest appropriate receiving hospital E.D. Notify BioTel immediately of the circumstances.

D. BioTel paramedics MAY terminate resuscitation efforts of a presumed primary (medical) cardiac arrest WITHOUT BIOTEL CONSULTATION ONLY if ***ALL*** of the following criteria are met:
1. Patient is over 70 years of age;
2. Patient is in a nursing home or other long-term care facility;
3. Effective ventilation with a BVM, extraglottic airway or endotracheal tube is being provided (chest rise and fall, auscultation of breath sounds in four fields and absence of gastric breath sounds);
4. IV or IO access has been established;
5. Initial patient assessment showed asystole, the patient remained in asystole, and the patient failed to respond to care consistent with Advanced Cardiac Life Support (ACLS) guidelines:
   i. For a minimum of 20 minutes, regardless of previous CPR time and the arrest interval:
      1. Time begins with paramedic initiation of ALS care (IV/IO, advanced airway).
   ii. For a minimum of 30 minutes, if the arrest was witnessed by EMS Providers; AND
6. The $PetCO_2$ reading is less than 20 mmHg while performing high-quality chest compressions.

UNLESS ALL OF THESE CRITERIA HAVE BEEN MET, PARAMEDICS MUST CONSULT BIOTEL FOR CONSIDERATION OF FIELD PRONOUNCEMENT

E. BioTel paramedics SHALL NOT terminate resuscitation efforts if ***ANY*** of these criteria are met:
1. Patient is less than 18 years of age;
2. Patient is visibly pregnant;
3. Cardiac arrest may be due to trauma and EMS Providers note any signs of life, OR the cardiac rhythm is anything other than asystole;
4. Cardiac arrest MAY BE associated with hypothermia, drug overdose, toxicological exposure, airway obstruction or electrocution;
5. Cardiac arrest has occurred in a crowded public setting, except a nursing home or long-term care facility;
6. The scene situation may place EMS Providers in jeopardy;
7. The family will not accept the termination of resuscitation efforts in the field;
8. Inability to communicate with the family present on-scene due to language or cultural barriers:
   i. This does not imply that paramedics must contact absent family members before making the decision;
   ii. It only applies if contact with family members has already been established.
9. The cardiac rhythm is persistent/recurrent ventricular fibrillation, pulseless ventricular tachycardia, or any narrow-complex rhythm at a rate greater than 40 beats per minute;
10. The patient has any neurological signs of life;
11. The patient has return of spontaneous circulation (ROSC), even briefly:
    i. ROSC – even for a brief interval – during resuscitation is a positive prognostic sign and warrants consideration of transport to a receiving hospital E.D..

F. **Procedure After Death Has Been Determined:**
1. Immediately notify the appropriate law enforcement agency and remain on-scene until officers arrive;
2. To the degree possible, set up visual barriers, so that the public cannot view the body;
3. Do not remove any property from the body or from the scene for any purpose;
4. Leave all medical devices (e.g. endotracheal tube, IV, ECG pads, etc.) in place;
5. Leave the body at the scene, in the care of the appropriate law enforcement agency.

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IV. Do Not Resuscitate (DNR) Orders:

A. Critical Points:
   1. The wishes of the patient supersede any out-of-hospital DNR order;
   2. If there is any question about whether to initiate or continue resuscitation efforts, EMS Providers shall initiate or continue those efforts until BioTel consultation can be performed.

B. Revocation of a valid DNR order (and refer to Section F.2, below):
   1. Various individuals may revoke a DNR order at any time;
   2. These include:
      i. The patient (including a competent minor);
      ii. A person who identifies himself/herself as the patient's legal guardian;
      iii. A qualified relative, as defined in the following priority list:
         1. Spouse;
         2. Reasonably available adult children;
         3. Parents;
         4. Nearest living relative.
      iv. A person with medical Power of Attorney (POA).
   3. Revocation may consist of either verbal communication to responding EMS Providers, destruction of the DNR form, or removal of the DNR device (e.g. bracelet or medallion).

C. Identification DNR Devices:
   1. EMS Providers shall accept any one of the following devices as proof of a valid DNR order:
      i. DNR Order Form (including out of state DNR Order Form, under circumstances explained below);
      ii. DNR Bracelet; or
      iii. DNR Necklace.

D. Validation of DNR Devices:
   1. EMS Providers are not required to accept or interpret an out-of-hospital DNR Order that does not meet the requirements of this policy.
   2. If doubt exists about the validity of any DNR order, EMS Providers shall initiate resuscitation until a valid DNR Order is made available, or until the patient has been transferred to a higher level of care.
   3. DNR requests that do not meet the approved criteria outlined in this policy, including requests by a Medical Power of Attorney or a physician on-scene, require authorization by a BioTel Medical Command Physician.

E. Specific Criteria to Validate DNR Devices:
   1. DNR Order Form:
      i. The official Texas Department of State Health Services Out-of-Hospital (OOH) DNR Form is an official, single-page form with the Texas DNR logo in the upper-left corner:
         1. The OOH-DNR form is considered to be valid if ALL of the following conditions are met:
            i. The patient's identity matches that of the patient named on the form;
            ii. The form is the original TX DSHS form with the DNR logo, or a duplicate copy;
            iii. All required sections have been completed; and
            iv. All required signatures are present.
   2. DNR Bracelet:
      i. There are two acceptable DNR bracelets:
         1. A white, plastic, hospital-type bracelet with the word "TEXAS" (or a representation of the geographical shape of Texas with the word "STOP" imposed over the shape) and the words "DO NOT RESUSCITATE". This bracelet contains no other identifying information; or
         2. A stainless-steel bracelet similar to a "medic alert" bracelet and inscribed with the words "TEXAS DO NOT RESUSCITATE-OOH".
      ii. EMS Providers shall honor either bracelet around the patient's wrist as if it were a valid DNR Order Form:
         1. The bracelet shall NOT be removed from the patient's wrist, even if s/he is deceased.
      iii. EMS Providers shall NOT honor a DNR bracelet that is NOT worn on the patient's wrist.
   3. DNR Necklace:
      i. The DNR necklace is made of stainless-steel chain, 16 to 18 inches long, with a one-inch diameter disk attached:
         1. The disk is inscribed with the same information as on a metal bracelet (see above).
      ii. EMS Providers shall honor a necklace worn around the patient's neck as it if were a valid DNR Order Form:
         1. The necklace shall NOT be removed from the patient's neck, even if s/he is deceased.

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iii. EMS Providers shall NOT honor a DNR necklace that is NOT worn on the patient's neck.

4. Out-of-State DNR Order:
   i. EMS Providers may accept a paper Out-of-Hospital DNR Order Form that the patient executed in another state, as long as it appears valid and there is no reason to question the Order's authority.
   ii. **EMS Providers shall NOT accept any bracelets, necklaces or similar devices as proof of out-of-state DNR Orders.**

F. Conditions Under Which a DNR Order Form Shall NOT Be Honored:
1. Alteration in the meaning of the form, e.g. some of the listed treatments are marked through, as if to reject them;
2. The patient communicates a desire to revoke the order;
3. The order is revoked by the attending physician, legal guardian, a close relative (e.g. spouse, adult child, parent or nearest living relative), or by a person with a proxy or Durable Power of Attorney for Health Care;
4. The patient is pregnant;
5. EMS Providers cannot conclusively match the name on the form to the identity of the patient; or
6. Unnatural or suspicious circumstances.

G. **Procedure to Comply with Out-of-Hospital DNR Order:**
1. EMS Providers must match the name on the DNR Order Form to the patient's identity;
2. EMS Providers must agree that the TX DSHS OOH DNR Order Form appears to be valid;
3. If the patient is encountered in or develops cardiac and/or respiratory arrest:
   i. EMS Providers will honor the DNR order by withholding: placement of the AED/manual defibrillator; CPR, transcutaneous pacing, advanced airway placement, and assisted ventilation.
   ii. If assessment or treatment begins BEFORE a valid DNR order is presented, EMS Providers shall immediately stop the assessment and/or treatment, even if the patient has responded to treatment.
4. If the patient has a valid DNR order and the patient is not in cardiac and/or respiratory arrest:
   i. EMS Providers will provide care, such as opening and suctioning the patient's airway, providing oxygen, IV fluids or medications (other than resuscitation medications), or any other treatment directed towards making the patient comfortable. This includes hemorrhage control and splinting.
   ii. The DNR Order Form must accompany the patient during transport to a receiving hospital E.D.

H. **Documentation:**
1. Following field declaration of death, EMS Providers should contact BioTel to relay statistical information required by TX Department of State Health Services.
2. When the response team encounters a DNR Order Form, bracelet or necklace, the EMS Provider should document the following items in the ePCR:
   i. Assessment of the patient's condition;
   ii. The type of DNR device used to confirm DNR status;
   iii. Any problems encountered during implementation of the DNR Order;
   iv. The name of the patient's attending physician; and
   v. The full name, address, telephone number, and relationship to the patient of any witness used to identify the patient.

V. Interacting with Family/Loved Ones:

A. Once resuscitation efforts stop, EMS Providers acquire a new set of patients: family and loved ones.
B. Briefly describe the circumstances leading to the death and review with them the sequence of events.
C. Avoid euphemisms, such as "he's passed on", "she is no longer with us", or "he's left us". Instead, use the words death, dying or dead.
D. Allow time for family members to process the events and the information.
E. Make eye contact.
F. Consider appropriate physical contact to convey empathy and compassion.
G. Convey feelings with phrases, such as "you have my sincere sympathy", rather than "I am sorry".
H. Allow as much time necessary for questions and discussion.
I. Review the events several times, as needed.
J. Allow family members to view their relative (inform them in advance if medical devices are in place).
K. Know in advance what happens next and who will sign the death certificate.
L. Be prepared to answer "What do we do next?" with a proper answer, such as "You will need to contact a funeral home".

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Durable Medical Equipment (DME) Transport

Purpose: To guide EMS Providers in the transport of patient Durable Medical Equipment (DME)
Inclusion Criteria: Patients with DME
Exclusion Criteria: Patients without DME
Refer to: Destination Decision-Making, Evaluation and Transport and Social Work Program Referral Policies

I. Policy Overview:

A. This policy outlines the rationale for transport of patient DME, as well as recommendations for special situations

II. Definition:

A. Durable Medical Equipment (DME): Mobility equipment including – but not limited to – canes, walkers and wheelchairs

III. Rationale for DME Transport:

A. Safe discharge from the hospital for a patient using DME will necessitate availability of that equipment:
   1. For example, if a wheelchair-bound patient's wheelchair is not transported with him/her to the hospital, then the hospital will need to expend time and resources to reunite the patient with his/her device, or to obtain another device for the patient.
   2. Most insurance payors (including Medicare and Medicaid) will only replace a patient's DME after a certain time interval (e.g. 5-10 years), or if a police report documents that the device was stolen.
   3. If the patient is uninsured, then the hospital must solicit donations or absorb the cost for a new device in order to facilitate the patient's discharge.
   4. These factors lead: to higher cost for taxpayers; discharge delays; and longer E.D. dwell times for a patient with no acute or emergent medical need, pending arrangements to locate or order DME.

IV. Special Considerations:

A. DME in poor condition:
   1. If at all possible, attempt to transport the DME with the patient;
   2. It is more cost-effective to repair or clean DME than it is to replace it with new devices;
   3. Insurance payors will pay for repairs and the company who provided the DME to the patient is required to repair it during a defined post-purchase period;
   4. Sometimes, repairs must be attempted before insurance will authorize a new equipment purchase.

B. If EMS transport of DME is not possible:
   1. Obtain – if at all possible – the contact information for a family member or friend who is willing to keep the DME safe:
      a. The hospital will contact that person to coordinate retrieval of the DME when the patient is ready for discharge.
   2. Leave the DME in a safe place where it can be located by hospital staff:
      a. For example, for a homeless shelter resident, ask the shelter staff to keep the DME or ask the patient where you can leave it where the patient feels it will be safe and easily located.
   3. Upon arrival at the E.D., notify hospital staff during report that the patient uses DME and that the DME was not transported:
      a. Provide hospital staff with the contact information for the person/facility holding the DME, or with the location of the equipment.

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Emergency Legal Assistance Program (ELAP)

Purpose: To guide UTSW/Parkland BioTel EMS Providers in the resolution of actual or potential medical-legal issues arising in the field
Inclusion Criteria: As above
Exclusion Criteria: No specific exclusions
Refer to: Abuse Reporting, Destination, Determination of Death, EMTALA and Evaluation and Transport Policies

I. Policy Background:

A. EMS Providers often encounter situations in which medical-legal advice should be sought, prior to decision-making about the patient treatment or transport in the field. Examples include:
   1. Determination of whether a patient has decision-making capacity to refuse evaluation, treatment or transport
   2. Questions about the management of patients in custody
   3. The evaluation, treatment and transport of patients less than 18 years of age
   4. EMTALA issues
   5. Situations where an EMS Provider is presented with a legal document (e.g. a court order or Power of Attorney), or with a legal situation governing medical outcome (e.g. an Out-of-Hospital DNR device or order)
   6. Other incidents where an EMS Provider is unsure whether there may be a patient-care legal issue

II. Emergency Legal Assistance Program (ELAP) Definition:

A. Parkland/BioTel has had a long-standing relationship with two attorneys with EMS training and with significant experience and expertise managing EMS medical-legal issues that arise in the field.
B. At least one attorney is always available through for consultation through BioTel.
C. Both attorneys are capable of responding to the scene, as needed, and can seek court orders for treatment and/or transport, as needed.

III. ELAP Activation Procedure:

A. When EMS Providers need assistance with potential medical-legal issues, BioTel shall be contacted.
B. Once a report has been given to the BioTel staff, one of three actions will be taken:
   1. BioTel staff will provide direction to the EMS Providers
   2. BioTel staff will consult with the BioTel Online Medical Control Physician, who may request to speak directly with the EMS Providers and/or the patient
   3. BioTel staff will seek input from the BioTel legal counsel through the ELAP
C. Once BioTel has been consulted for medical-legal advice, the responsibility for the incident rests with BioTel.
D. BioTel staff shall advise EMS Providers in need of legal advice if the ELAP has been activated.
E. If there is disagreement between BioTel advice/guidance and the EMS Providers' judgment about appropriate management of an incident, then EMS Providers shall immediately contact BioTel and request that the BioTel EMS Medical Director or his designee be paged.
F. EMS Providers shall follow their agency-specific guidelines regarding notification of their chain-of-command.

IV. Specific Considerations – "Consent" Issues:

A. General points:
   1. If an EMS Provider reasonably believes that a person needs emergency medical evaluation and treatment, then the EMS Provider has the right and duty to approach the patient and to attempt to obtain consent for the evaluation and treatment.
   2. EMS Providers shall make every effort to persuade or convince a patient to voluntarily consent to evaluation, treatment and transport, as indicated.
      i. This shall include contacting BioTel for support, when needed, bearing in mind that additional assistance for consent issues may take time.
      ii. If feasible, delays regarding consent issues should be avoided.

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B. **Conscious adult, NOT intoxicated and NOT in custody:**
   1. The EMS Provider does NOT have the legal right to treat the patient against his/her wishes.
   2. In this case, if the patient does not appear to have a serious, limb- or life-threatening chief complaint or injury, AND EMS Providers believe that patient's refusal to be reasonable and appropriate, EMS Providers shall explain to the patient the potential risks of refusing evaluation, treatment and transport.
      i. Both the explanation and the patient's refusal shall be documented in the ePCR.
      ii. A witnessed, signed refusal shall be obtained, including all possible witness contact information:
         a. Law enforcement officers make excellent witnesses, if present on-scene
   3. If EMS Providers believe that a patient's decision to refuse evaluation, treatment or transport puts the patient at significant or grave risk, then BioTel shall be contacted for assistance.

C. **Patient in law enforcement custody or a possible risk of self-harm, or considering harming himself/herself or others:**
   1. A patient meeting any of these conditions MAY refuse treatment.
   2. Such a patient may NOT, however, refuse transport.
   3. If EITHER the EMS Providers or law enforcement officers believe that it is in the best interest of that patient to be transported by ambulance, then the patient shall be transported by ambulance (refer to Evaluation and Transport Policy).
   4. If questions or concerns arise, or if EMS Providers believe immediate treatment is necessary and recommended, but the patient refuses, then BioTel shall be contacted for assistance.

D. **Unconscious patient:**
   1. Any age patient who is unconscious may be evaluated, treated and transported under the doctrine of "implied consent".

E. **Clinically intoxicated or possibly impaired patient:**
   1. A patient who is clinically intoxicated or whose medical condition appears to significantly impair his/her decision-making capacity may be "alert and oriented times three", but he/she may lack sufficient decision-making capacity and/or the ability to effectively communicate his/her understanding of voluntary consent for medical treatment and/or transport.
      i. If questions or concerns arise about the patient's decision-making capacity, EMS Providers shall immediately contact BioTel.
      ii. EMS Providers should follow their agency-specific policies for notifying their chain-of-command.

F. **Minor:**
   1. For medical-legal purposes, a minor is defined as a person less than 18 years of age.
   2. In general, minors cannot consent for their own treatment or transport, UNLESS:
      i. The child is legally married and produces for inspection a certificate of marriage
      ii. The child in unmarried and pregnant, and consents to treatment related to the pregnancy (except for abortion)
      iii. The illness involved drug or chemical addiction, dependency or abuse by the child
      iv. The child is on active duty in the U.S. armed forces
      v. The child is 16 years of age or older, lives separate or apart from the parent(s) or guardian(s), and is not dependent on the parent(s) or guardian(s) for support or maintenance
      vi. The child suffers from an infectious, contagious or communicable disease
      vii. The child is at least 16 years of age and consents to treatment in a mental health facility
      viii. The child consents to counseling related to suicide, or to sexual, physical or emotional abuse, in the absence of a court order prohibiting such counseling

G. **Emancipated minor – A child who has had the "disabilities of minority" removed by court order:**
   1. An emancipated minor may consent to or refuse treatment, just as an adult may do so, UNLESS s/he is in law enforcement custody.
   2. If a minor states that s/he is emancipated, s/he MUST be able to produce a copy of the court order confirming that statement.
   3. In any such case, EMS Providers shall immediately contact BioTel for consultation and assistance.

H. **Minor with parent/guardian refusal or parent/guardian absence:**
   1. Absent special circumstances enabling a minor to consent to his/her own treatment or transport (e.g. those outlined in sections F and G, above), consent MUST be obtained from the minor patient's parent or legal guardian.
   2. If the parent/legal guardian REFUSES consent for treatment or transportation, and EMS Providers believe that the life of the child may be in immediate danger, then BioTel shall be contacted immediately for further consultation and assistance.
   3. If the parent/legal guardian is NOT PRESENT on the scene, an adult relative (e.g. aunt, uncle, grandparent or sibling) or an appropriate surrogate with *written documentation* allowing them to make

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medical decisions in the absence of the parent/legal guardian (e.g. a school official) may provide consent for treatment and transport.

V. Special Considerations – EMTALA Issues:

A. Refer to the EMTALA Policy

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EMS Wait Times at Hospitals

Purpose: To minimize EMS unit "Wait Times" at receiving facilities
Inclusion Criteria: Any EMS incident with involving patient transport
Exclusion Criteria: EMS incidents without patient transport
Refer to: Destination, EMTALA and Evaluation and Transport Policies

I. Policy Background and Overview:

A. Due to emergency department (E.D.) overcrowding and staffing issues, EMS Providers are occasionally asked to wait before transferring their patient to the care of E.D. personnel.
B. This policy is intended to provide guidance to UTSW/Parkland BioTel EMS Providers in this situation.

II. Policy Specifics:

A. All UTSW/Parkland BioTel EMS Providers shall comply with the following guidelines:
   1. When a member of the hospital E.D. or freestanding emergency center (FEC) staff indicates that the wait time for the transfer of care will exceed **twenty (20) minutes**, then the EMS Providers will ask to speak with the E.D. Charge Nurse, asking that s/he verify that the EMS unit will be out-of-service at the hospital for at least 20 minutes, while waiting for E.D. staff to assume full responsibility for the patient.
      i. EMS Providers shall then communicate to the Charge Nurse that the UTSW/Parkland BioTel EMS procedure does not permit ambulances to remain at a hospital or other receiving facility for an extended time, and shall respectfully request that the patient transfer be expedited.
   2. When a member of the hospital E.D. or freestanding emergency center (FEC) staff indicates that the wait time will exceed **thirty (30) minutes**, or if the actual wait time passes 30 minutes, then the EMS Providers shall follow their agency procedure for resolution.
   3. BioTel shall be notified as soon as possible when an EMS unit has been waiting more than 30 minutes to offload a patient.
   4. EMS Providers are reminded that, once they arrive on hospital property (by crossing the threshold of the hospital property), they MUST deliver their patient to the E.D. staff.
   5. EMS Providers may leave that hospital with their patient ONLY with authorization of a BioTel Medical Command Physician.
      i. Departing the hospital with the patient and without BioTel physician authorization may constitute an EMTALA violation (refer to EMTALA Policy).
   6. UTSW/Parkland BioTel EMS Providers will at all times conduct themselves professionally and respectfully when communicating with E.D. staff, and shall defer to their EMS Field Supervisor or the BioTel Medical Director to resolve these issues, if needed.

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EMTALA

Purpose: To ensure that all UTSW/Parkland BioTel EMS Providers adhere to Federal EMTALA Guidelines
Inclusion Criteria: All persons evaluated, treated and transported by BioTel agency EMS Providers
Exclusion Criteria: None
Refer to: Destination and Evaluation and Transport Policies

I. Policy Overview:

Once an ambulance transporting a patient has crossed the threshold of a hospital's property, that ambulance shall not leave the hospital with that patient without first seeking authorization from BioTel.

II. What is EMTALA?

A. "EMTALA" is the Emergency Medical Treatment and Labor Act enacted by Congress in 1986. EMTALA is a federal law requiring that anyone who comes to an emergency department (E.D.) requesting emergency medical evaluation be stabilized and treated, regardless of their insurance status or ability to pay. It is commonly referred to as the "anti-dumping" law. It was designed to prevent hospitals from transferring uninsured or Medicaid patients to public hospitals without, at a minimum, providing a documented medical screening examination or "MSE" and stabilizing treatment within the capability of the hospital. This statute is vigorously enforced by the Centers for Medicare and Medicaid Services (CMS) and by the U.S. Department of Health & Human Services Office of the Inspector General (OIG).

III. Hospital Obligations under EMTALA:

A. The CMS defines a dedicated hospital emergency department as an area of the hospital that meets one of three tests: it is licensed by the state as an emergency department, it holds itself out to the public as providing emergency care, or, in a calendar year, it treats at least one-third of its outpatient visits for an emergency medical condition. Hospitals have three obligations under EMTALA:
   1. Any individual who comes to the hospital and requests examination or treatment must receive an appropriate medical screening examination within the capability of the hospital to determine whether an emergency medical condition exists. Examination and treatment cannot be delayed to inquire about methods of payment or insurance coverage. Emergency departments must also post signs notifying patients and visitors of their rights under the statute.
   2. If it is determined that a medical emergency condition exists, the hospital must provide stabilizing treatment within its capability until the emergency medical condition is resolved or stabilized. If a hospital does not have the capability to stabilize the emergency medical condition, it must arrange an "appropriate" transfer of the patient to another hospital, in accordance with the EMTALA statute and the regulations promulgated by CMS. Hospitals with specialized capabilities are obligated to accept transfers from hospitals that lack the capability to treat an unstable medical condition. This last requirement applies even to hospitals that do not have an emergency department.
   3. Hospitals must report to CMS or to the state survey agency any time they have reason to believe that they may have received from another hospital in violation of EMTALA an individual in an unstable emergency medical condition.

IV. EMTALA's Direct Impact on EMS Providers:

A. Under EMTALA, a patient "comes to" a hospital when an ambulance that contains the patient crosses the threshold of the hospital's property. Once an ambulance "comes to" the receiving hospital, the patient may not be removed from that hospital by EMS Providers until the receiving hospital has complied with EMTALA and has, *at a minimum*, provided a Medical Screening Examination (MSE) for that patient, even if the patient requests that the EMS Providers take him/her elsewhere. Once an ambulance transporting a patient has crossed the threshold of a hospital's property, that ambulance shall not leave the hospital with that patient without first seeking authorization from BioTel.

B. Patients encountered at hospital-based outpatient clinics on the hospital property that are not equipped to handle the patient's medical emergency must be transported to the E.D. of the hospital with which

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they are affiliated, UNLESS the clinic treating physician has made arrangements for acceptance at another E.D.. In such cases, the clinic staff shall provide EMS Providers with a "Memorandum of Transfer" indicating that the patient has been accepted at the alternative hospital E.D.. EMS Providers must deliver this document to the receiving E.D. staff upon arrival. EMS Providers shall NOT deviate from these transfer arrangements without first consulting BioTel.

i. Special Circumstances for Parkland's Amelia Court Clinic and Ambulatory Surgery Center: Patients encountered at these facilities MUST be transported to Parkland Hospital, unless the clinic treating physician has made arrangements for acceptance at another hospital E.D.. If so, the "Memorandum of Transfer" requirement shall apply.

C. Trauma Considerations: Patients meeting BioTel Prehospital Trauma Center Triage Criteria who are encountered on the grounds of a hospital that is not a designated Trauma Center may be transported directly to a designated Trauma Center, rather than to original hospital's E.D..

D. Offsite Clinic Considerations: If an outpatient clinic is not on the grounds of a particular hospital AND no arrangements have been made in advance by clinic staff for patient acceptance at a particular hospital's E.D., EMS Providers shall utilize the BioTel Destination Policy to determine the transport destination.

V. Special Circumstances Related to Parkland Hospital and Children's Medical Center Dallas:

A. Unless extenuating circumstances, such as a Mass Casualty Incident, mandate otherwise, adult and pediatric patients should be transported separately. This is normally in the best interest of both patients. Therefore, it should not be routinely necessary or advisable to simultaneously transport BOTH an adult patient and a pediatric patient in the same ambulance. This is recommended even when transporting to Parkland Hospital and Children's Medical Center Dallas (CMC Dallas), despite the proximity of these facilities.

B. Any ambulance transporting both an adult and a pediatric patient to Parkland Hospital **MUST** off-load **BOTH** patients at Parkland for evaluation. If Parkland E.D. physicians determine that a pediatric patient requires a higher level of care, Parkland staff will arrange transport of the pediatric patient to CMC Dallas.

C. Similarly, any ambulance transporting both an adult and a pediatric patient to CMC Dallas **MUST** off-load **BOTH** patients at CMC Dallas for evaluation. CMC Dallas staff will arrange transport of the adult patient to Parkland Hospital or to another appropriate facility.

D. Under NO circumstances shall EMS Providers off-load ONLY one of two patients at the first hospital and then continue to the other hospital with the second patient.

E. **BioTel Notification:** EMS Providers shall **ALWAYS** notify BioTel when en route either to Parkland Hospital or to CMC Dallas with BOTH an adult patient AND a pediatric patient in the same ambulance.

VI. Special Circumstances Related to Hospital Helipads:

A. Hospital helipads are exempt from EMTALA requirements. If an EMS agency meets a helicopter at a hospital helipad, the patient need NOT go that hospital's E.D., if the sending hospital has made arrangements for patient transfer to another nearby hospital, OR if – coming from a "scene" – the ultimate destination is a different hospital appropriate for that patient. The helipad is a "load/unload waypoint" and nothing more.

VII. Reporting Procedure for Possible EMTALA Issues:

A. EMS Providers should immediately report possible EMTALA issues directly to BioTel staff and to their EMS Supervisor, for further assistance and guidance. EMS Providers shall not engage in discussions or arguments with hospital or clinic personnel regarding any EMTALA issues, unless specifically advised to do so by BioTel staff. In such cases, EMS Providers shall notify their EMS Supervisor of such occurrences.

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Evaluation and Transport

Purpose: To set forth the definition of a patient and the requirements for evaluation, documentation and transport decision-making in the UTSW/Parkland BioTel ("BioTel") EMS System
Inclusion Criteria: As above
Exclusion Criteria: No specific exclusion criteria
Refer to: UNIVERSAL CARE – ADULT, UNIVERSAL CARE- PEDIATRIC and to Custody, Destination, ELAP, EMTALA, Freestanding Emergency Center, Mandatory Contact and Trauma Policies

I. Policy Scope and Overview:

A. This policy is intended to guide UTSW/Parkland BioTel EMS Providers in determining which of the many persons they encounter shall be considered to be a **PATIENT** and therefore require emergency evaluation.
B. This policy also sets forth the **minimum** elements of history-taking and physical assessment that shall be performed, as well as the required data elements for appropriate documentation.
C. This policy also sets forth criteria for the:
   1. decision-making process regarding which patients require transportation to a hospital emergency department (E.D.);
   2. determination of medical direction authorization for refusal of transport; and
   3. required, minimum documentation for patients who are not transported; and
   4. required, minimum documentation for encounters with a person determined not to qualify as a patient.

II. PATIENT Definition:

A. BioTel EMS Providers shall consider a **PATIENT** to be anyone who meets ***ANY*** of these criteria:
   1. A person who has contacted 911 requesting emergency medical assistance for himself/herself;
   2. A person on whose behalf another legally responsible person has contacted 911 (e.g. a parent or legal guardian);
   3. A person for whom 911 has been contacted because a third party states a belief in and rationale for medical concern;
   4. A person for whom a Law Enforcement Officer requests evaluation (see below*, Section III.D);
   5. A person for whom 911 has been called due to a concern that the patient may have intentionally ingested drugs in an attempt to harm himself/herself or who expresses suicidal or homicidal thoughts; or
   6. A person for whom an EMS Provider physical assessment (beyond visual inspection) has been initiated or completed.
   7. A person subjected to a traumatic event that meets BioTel Prehospital Trauma Center Criteria.

III. EXCEPTIONS to the Definition of a Patient:

A. In order NOT to be considered a patient, an individual must meet ***ALL*** of the following criteria:
   1. He/she did not call 911 to request medical care;
   2. He/she is awake, alert, oriented and cooperative;
   3. He/she calmly, clearly and lucidly states that he/she has no injuries or medical complaints AND does not wish to be evaluated by EMS Providers;
   4. He/she is ambulatory without assistance or is at his/her baseline level of ambulation/mobility;
   5. He/she exhibits NO external signs of recent trauma (e.g. lacerations, abrasions or contusions);
   6. He/he exhibits NO signs of alcohol or drug intoxication (e.g. slurred speech, odor of alcohol on breath or ataxic gait);
   7. He/she has not been involved in a traumatic event that meets BioTel Prehospital Trauma Center Criteria;
   8. He/she has not been alleged to have taken an overdose of medications or to have communicated suicidal or homicidal thoughts or feelings.
B. If ALL of the above criteria are true, the person's full name shall be documented in the ePCR or another, readily retrievable format, along with documentation that he/she does not meet the definition of a patient:
   1. Two EMS Providers or a Provider and an Officer will sign the ePCR, attesting that the person does not meet the definition of a patient.

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C. If ANY of the above exceptions are NOT met, then the person shall be considered to be a PATIENT and must be fully evaluated by EMS Providers, with appropriate, complete documentation.

D. ***Law Enforcement Request for Evaluation:**
   1. EMS Providers shall inform law enforcement officers that EMS Providers CANNOT medically clear patients in the field, and that medical clearance requires evaluation in an emergency department (E.D.).
   2. If a person in law enforcement custody refuses EMS evaluation, then that person MUST be transported by EMS ambulance (with an accompanying Law Enforcement office in the patient compartment) to the closest appropriate hospital E.D., unless the EMS Providers' City/agency policy requires a specific, different hospital destination.
   3. Should EMS Providers believe a patient who: 1) is under arrest or under emergency detention, and 2) has not consented to evaluation does NOT warrant ambulance transport, then BioTel shall be contacted. The decision to permit such an individual to be released to law enforcement custody (and THEREFORE NOT TRANSPORTED BY AMBULANCE) shall be made ONLY by a Medical Control Physician.
   4. BioTel shall be notified as soon as possible that an incompletely assessed patient is en route to a receiving hospital (refer to Custody and Mandatory Contact Policies).
   5. Destination: If City/EMS agency policies permit it, a patient in law enforcement custody meeting ALL of the following criteria may decline EMS ambulance transport and may be transported by law enforcement officers, either to jail medical services or to a hospital E.D.:
      i. Complete assessment documented by EMS Providers; and
      ii. Determined to have a minor medical condition; and
      iii. Meets no "Mandatory Offer of Transport" Criteria (see below, Section VII); and
      iv. The law enforcement officer is comfortable transporting the patient to jail medical services or to a hospital E.D..

IV. Patient Assessment and Documentation Requirements:

A. All persons meeting the PATIENT definition shall be assessed in a manner consistent with standard practice.
B. The ***ONLY*** exception shall be if it is determined to be unsafe to perform such an assessment.
C. If the physical location of the patient is felt to be potentially unsafe, the EMS Provider shall either:
   1. Move the prospective patient to a place where it is no longer unsafe to assess the patient while maintaining a basic airway, ventilation and **SPINAL MOTION RESTRICTION**, as necessary; **OR**
   2. Perform whatever aspects of the assessment that may be safely performed and then expedite transport to a hospital E.D., as indicated.
D. If the patient's presentation makes it unsafe to perform a routine physical assessment (e.g. Excited Delirium Syndrome, combative patient, etc.), EMS Providers shall perform only the portions of the assessment that may be safely completed, and then shall continuously monitor the patient's airway, breathing and pulse as best as possible, while transporting the patient to the closest appropriate facility.
   1. BioTel shall be notified as soon as possible that an incompletely assessed patient is en route to a receiving hospital; AND
   2. EMS Providers will document in the ePCR the reasons for incomplete assessment.
E. Assuming it is safe to do so, every PATIENT shall have at least two full sets of vital signs (BP, HR, RR, SpO_2, Temperature), at least one POC Glucose analysis, and the documentation of at least one GCS score.
   1. All of these data elements shall be recorded in the ePCR; OR
   2. EMS Providers will document in the ePCR the reasons for incomplete assessment.
F. The following data elements MUST be documented in the ePCR for EVERY PATIENT, unless EMS Providers record in the ePCR the reasons for incomplete documentation:
   1. Name, age, date of birth, home address, phone number, and social security number
   2. Chief Complaint (CC)
   3. History of Present illness (HPI)
   4. Past Medical History (PMH)
   5. Medications
   6. Allergies to medications
   7. Vital signs (*at least two sets*, at least 5 minutes apart) INCLUDING:
      i. Palpated pulse rate (HR)
      ii. Blood pressure (BP)
      iii. Respiratory rate (RR)
      iv. Oxygen saturation (SpO_2)
      v. Temperature (Temp)

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vi. POC Glucose, if clinically warranted (POC Glucose – need not be repeated, if initial value is normal)
vii. Glasgow Coma Score (GCS)
viii. End-tidal CO2 ($PetCO_2$), as per the symptom-specific CPG and/or as warranted by the patient's clinical condition
ix. **NOTE:** Unstable patients shall have repeat vital signs documented every 5 to 10 minutes

8. Physical Examination, which shall include assessment of the head, neck, chest/lungs, abdomen/pelvis, extremities, and a basic neurological exam
9. All interventions performed and the response to those interventions
10. All medications given, including dose, route and clinical response to those medications
11. Patient disposition
12. Patient signature
13. Signatures of two EMS Providers or one EMS Provider and an Officer

V. Transport Decision-Making:

A. Following patient assessment, BioTel EMS Providers shall follow their EMS Agency policies regarding offering the patient ambulance transport to a hospital E.D..
B. EMS Providers shall NOT initiate a discussion of the cost of ambulance transport and shall NOT provide an estimate of E.D. waiting times:
   1. For example, if asked, EMS Providers may NOT state: "Transport generally costs about one thousand dollars, but what is most important is that we get you to the hospital." OR
   2. "We don't know how long the wait is at any given ER at any time."
C. If one EMS Provider on-scene believes that a patient should be transported by ambulance to a hospital E.D., then the patient shall be offered transport.
D. If EMS Providers disagree about the need for transport, then BioTel shall be contacted for assistance.
E. ANY person for whom 911 has been called due to a concern that the patient may have intentionally ingested drugs in an attempt to harm himself/herself or who expresses suicidal or homicidal thoughts shall be considered a patient and must be transported by ambulance, unless a BioTel Medical Control Physician approves the non-transport prior to EMS providers leaving the scene.

VI. Patients Declining Transport:

A. Following assessment and an offer of hospital transport, some patients may decline further assessment, treatment or transport, choosing instead to find their own way to the doctor or hospital, or they may seek some alternative means of evaluation or treatment.
B. Patients who – in the judgment of EMS Providers – possess the capacity to make an informed decision to refuse transport and who are not in custody of law enforcement ("under arrest" or under Emergency Detention) maintain the right of self-determination and shall be allowed to refuse transportation to a hospital emergency department ONLY if *ALL* of the following criteria are met:
   1. An EMS Provider has determined that the patient has decision-making capacity to refuse transport;
   2. An EMS Provider has discussed the potential risks of non-transport with the patient and the patient's family, when present;
   3. The patient has verbalized to the EMS Provider in his/her own words his/her understanding of the risks associated with non-transport; and
   4. An EMS Provider has determined that the patient understands and accepts the risks of not accepting transport (including worsening of his/her condition and death, as indicated), and that the decision has been made after receiving accurate and unbiased information.
C. If a paramedic believes that the patient's decision to refuse transport is reasonable and does not put the patient at risk of loss of life or limb, AND if the patient does not meet "Mandatory Offer of Transport" Criteria (see below, Section VII), then the patient shall sign the ePCR, indicating that he/she has declined transport:
   1. EMS Providers shall complete all City/EMS Agency documentation required for Patients Declining Transport.
D. If a patient does NOT meet ALL criteria listed in Section B (above), EMS Providers should contact BioTel or follow the City/EMS agency-specific policy regarding patients who decline transport.

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VII. "Mandatory Offer of Transport" Criteria:

A. Patient refusal of transport under **ANY** of the following conditions outlined in Section C (below) shall be considered to be "Against Medical Advice" ("AMA"), in which case BioTel MUST be contacted.
B. Contacting BioTel ensures that there is an additional record of the offer of transport, the patient's decision-making capacity to refuse and the acceptance of risks, up to and including death, thereby decreasing liability for the EMS Providers, the EMS Agency/City and the EMS System as a whole.
C. If BioTel staff believe that the refusal is "low risk", they shall document the refusal after speaking with the patient.
D. If BioTel staff believe that the refusal is "high risk", they shall attempt to persuade the patient to accept hospital transport and may seek additional assistance from an online Medical Control physician.
E. A patient with ANY of the following SHALL be offered transport:
    1. Sustained abnormal adult vital signs:
        i. Glasgow Coma Score less than 15;
        ii. Pulse rate less than 50 or greater than 110 beats per minute;
        iii. Systolic blood pressure less than 90 mmHg or greater than 200 mmHg;
        iv. Diastolic blood pressure greater than 110 mmHg;
        v. Respiratory rate less than 12 or greater than 24 breaths per minute;
        vi. Room air oxygen saturation less than 95% (if not consistent with patient's baseline SpO_2);
        vii. POC blood glucose level less than 70 or greater than 300 mg/dL;
    2. The patient has been administered a medication by EMS Providers;
    3. The patient meets Prehospital Trauma Center triage or Burn Center criteria;
    4. The patient has a history and/or signs or symptoms consistent with acute MI or acute stroke;
    5. The patient has non-traumatic chest pain/discomfort;
    6. The patient reports shortness of breath or difficulty breathing;
    7. The patient reports having abdominal pain;
    8. The patient is less than 18 years of age and is not "emancipated";
    9. The patient is age 75 years or older (unless specifically permitted by the EMS Provider's EMS Agency policy);
    10. The patient reports being pregnant or is visibly pregnant; or
    11. The patient called 911 or someone has called 911 on the patient's behalf, due to a concern that the he/she may have intentionally ingested drugs in an attempt to harm himself/herself or has expressed suicidal or homicidal thoughts.

VIII. Requirements for Patients Declining Transport "Against Medical Advice" ("AMA"):

A. EMS Providers shall follow their City/agency-specific policies regarding Mandatory Offer of Transport and patient refusals of transport that are "Against Medical Advice" ("AMA").
B. EMS Providers shall utilize the UTSW/Parkland BioTel CPGs, sound judgment and common sense in determining which patient refusals that are not covered by VII above and are to be considered "AMA".
C. EMS Providers who encounter a patient who meets Mandatory Offer of Transport Criteria who refuses transport shall contact BioTel on a tape-recorded line (214-590-8848).
D. Patients under Emergency Detention may NOT refuse transport. However, should a patient under emergency detention not meet any Mandatory Offer of Transport Criteria, the patient may be transported by law enforcement vehicle, if the Law Enforcement Officer is comfortable transporting that patient.
E. Patients who refuse transport "AMA" shall always be advised that they should contact 911 at ANY time in the future if their condition worsens, or if they change their mind about ambulance transport.

IX. Paramedic-Initiated Refusal of Transport:

A. EMS Providers shall follow their City/agency-specific policies regarding EMS Provider-Initiated refusal of transport.

X. EMS Incident Disposition Codes:

A. EMS Providers shall adhere to their City/agency guidelines regarding disposition codes.

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XI. Consultation for Questions or Concerns:

A. EMS Providers may contact BioTel by phone or may email the EMS Medical Direction Team at any time with questions or concerns about this policy, especially regarding non-transport decisions.

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Freestanding Emergency Centers (FECs) Transport

Purpose: To provide guidance to UTSW/Parkland BioTel EMS Providers about patient transport to a Freestanding Emergency Center (FEC)
Inclusion Criteria: Clinically-stable adult and pediatric patients EXCEPT those delineated below, either by patient request or at EMS Provider discretion, for whom FEC transport may be considered but is not required
Exclusion Criteria: Patient and facility exclusion criteria are delineated below
Refer to: Custody, Destination, EMTALA, and Evaluation and Transport Policies

I. Background:

A. In 2009, the 81st Texas Legislature passed legislation enabling Freestanding Emergency Medical Care Facilities, with rules and regulations listed in Texas Health and Safety Code Chapter 254 and Texas Administrative Code 25 TAC Ch.131. These rules and regulations direct the Department of State Health Services (DSHS) to oversee the licensing and regulation of Freestanding Emergency Medical Care Facilities (commonly referred to as Freestanding Emergency Centers or FECs) in Texas.
B. At the time of the adoption of this BioTel policy, the Texas Department of State Health Services (DSHS), the Governor's Emergency Trauma Advisory Council (GETAC) and the North Central Texas Trauma Regional Advisory Committee (NCTTRAC) have not promulgated rules, regulations or guidelines regarding the transport of 911 Emergency Medical Services patients to FECs.

II. Policy Scope and Overview:

A. **This policy is PERMISSIVE:**
   1. It does NOT require any EMS Provider or EMS agency to transport any patient to any FEC.
   2. The senior EMS Provider caring for the patient shall make the decision whether or not to transport the patient to an approved FEC.
   3. If there is any question about the suitability of an FEC destination for any patient, EMS Providers shall consult prior to transport with their EMS Field Supervisor/Chief Officer and/or with BioTel online medical control.
B. This policy sets forth the requirements for FECs seeking approval to accept patients transported by BioTel EMS agencies (see below, Section>>>>)
C. Patients for whom transport to a BioTel-approved FEC may be considered include:
   1. Pediatric and adult patients with non-critical illness and vital signs.

III. EXCEPTIONS to FEC Transport:

A. **Any patient with <u>ANY</u> of the known or suspected conditions or criteria listed below shall <u>NOT</u> be transported to an FEC**:
   1. Acute STEMI, NSTEMI, or Acute Coronary Syndrome (ACS);
   2. Stroke or Transient Ischemic Attack (TIA);
   3. Adult or Pediatric Trauma Center Criteria (refer to Trauma CPG and to Destination Policy);
   4. Pediatric patient under **18** years of age with critical illness or unstable vital signs;
   5. Excited Delirium Syndrome (refer to Excited Delirium Syndrome CPG);
   6. Law Enforcement custody or Emergency Detention (refer to Custody Policy);
   7. Sepsis (refer to Sepsis CPG);
   8. Behavioral health emergency, including intentional or unintentional drug overdose;
   9. ANY patient for whom the EMS Providers' judgment determines that transport to an FEC is not in the patient's best interest.

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IV. EMS Provider Consultation with FEC Personnel:

A. Under NO circumstances shall EMS Providers consult with FEC personnel or staff about ANY of the following:
   1. Medical direction or patient care;
   2. Patient's insurance;
   3. Patient's ability to pay for medical care.

V. BioTel FEC Approval Procedure and Criteria:

A. Only BioTel-approved FECs may accept patients from BioTel EMS agencies.
B. An FEC seeking such approval within the BioTel system must submit to the BioTel Council's FEC Evaluation Committee a "BioTel FEC Approval Application" *(under development)*.
C. At the next regularly scheduled BioTel Council meeting, the BioTel FEC Evaluation Committee shall either recommend that the Medical Director approve or deny the application, or request revision to the BioTel FEC Approval Application.
D. The following criteria will be evaluated for FEC approval in the BioTel EMS System:
   1. 24/7 Board-Certified/Eligible Emergency Medicine physicians
   2. Published, on-call physician surge capacity
   3. 24/7 Two RNs with ACLS, PALS, and TNCC or ATCN
   4. Published, on-call RN surge capacity
   5. Commitment to adhere to EMTALA regulations
   6. 24/7 Radiology/CT capability and technician on-site
   7. Lab capability
   8. Ultrasound capability
   9. Medical Director Board-Certified/Eligible in Emergency Medicine
   10. Sedation capability
   11. Emergency transfer agreements, including ambulance availability
   12. Active participation in BioTel Council and NCTTRAC
   13. Quality Management Plan
   14. Special Procedures (Ventilator, emergency airway, 12-lead ECG, thrombolytics, video laryngoscopy)
   15. Communication Plan (EMS Agency/BioTel/NCTTRAC)
E. The final decision to approve an FEC rests with the BioTel Medical Director.
F. An updated list of approved FECs will be provided to BioTel EMS agencies on a monthly basis.

VI. Quality Management Procedure:

A. The BioTel EMS agency and its respective EMS Medical Director, in collaboration with the FEC leadership, will review any quality issues related to patient transport to an FEC.
B. This review and any resulting recommendations shall be provided to the BioTel Medical Director for possible review and action on the FEC's approval status.

Reference (Accessed December 2, 2017): TX DSHS Freestanding Emergency Medical Care Facilities

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Physician Coordination in the Out-of-Hospital Setting

Purpose: To guide UTSW/Parkland BioTel EMS Providers when encountering a physician at the scene of a medical emergency
Inclusion Criteria: Any EMS incident with a physician on-scene
Exclusion Criteria: None
Refer to: Destination, Determination of Death and Evaluation and Transport Policies

I. General Guidelines:

A. In general, EMS Providers shall not accept direction on emergency calls from any physician or member of the public. Only BioTel staff and BioTel Medical Command Physicians are authorized to provide medical direction to EMS Providers. In certain circumstances, however, a field physician may be authorized to provide medical direction to EMS Providers, if ALL of the following conditions are met:
1. The physician is licensed in the State of Texas, is present on-scene, wishes to direct patient care AND agrees to accompany the patient to the hospital; AND
2. The direction being offered by the physician is within the EMS Scope of Practice; AND
3. A BioTel Medical Command Physician has been contacted, agrees that such direction is appropriate AND approves the on-scene physician to direct patient care.

II. Procedure for Interacting with Physicians On-Scene at an Emergency Medical Call (but NOT in a medical office, clinic or other healthcare facility):

A. *Prior to* accepting direction from an on-scene physician, EMS Providers shall:
1. Verify the identity and credentials of the on-scene physician. The physician must produce a current, valid Texas medical license, and must show it to the EMS Providers, along with a valid, government-issued photo ID demonstrating that s/he is the person whose name is on the medical license.
2. Advise the physician that s/he will be required to ride to the hospital in the ambulance with the patient and to sign the ePCR or Prehospital Care Record.
3. Contact BioTel and request authorization from the Medical Command Physician to allow the on-scene physician to direct patient care.

III. On-Scene Physician Patient Care Options:

A. Once the on-scene physician has provided his/her medical license and official governmental ID, EMS Providers shall contact BioTel and inform staff that a physician on scene is requesting to provide medical direction. BioTel staff shall inform the on-duty Medical Command Physician, who will discuss the on-scene physician's offer to direct patient care with the EMS Providers and then with the on-scene physician. Following this consultation, and with the authorization of the BioTel Medical Command Physician:
1. EITHER the physician on-scene may assist the EMS Providers, offering patient care advice, but allowing the EMS Providers to remain in control of the scene and to treat/transport the patient according to the BioTel Clinical Practice Guidelines;
2. OR the on-scene physician may be granted authorization by the BioTel Medical Command Physician to direct patient care, within the EMS Providers' scope of practice. The on-scene physician MUST accompany the patient in the ambulance to the hospital AND must assume TOTAL responsibility for the patient's care until the Emergency Department (E.D.) staff assumes this responsibility.
   i. EMS Providers will assist the physician, as requested, provided that they operate within the standard of care and the EMS Scope of Practice.
   ii. All orders given by the on-scene physician shall be documented in the ePCR.
   iii. The physician shall sign the ePCR.
   iv. Additional, mandatory ePCR documentation: physician's full name, medical license number and expiration date, complete contact information.

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IV. Special Circumstances:

A. Physicians in a healthcare setting (hospital, clinic, physician office, freestanding emergency clinic, etc.):
   1. Physicians already caring for a patient in a hospital or clinic setting have established a physician-patient relationship and therefore do not fall under the requirements of this policy. That being said, should a physician already caring for a patient direct the paramedics to administer a medication or perform a procedure, paramedics shall inform the physician that they operate under the direction and Clinical Practice Guidelines of the UTSW/ Parkland BioTel system and can only provide care consistent with the BioTel CPGs. Should the physician still wish to direct the care of the patient, BioTel shall be contacted so that the on-scene physician may speak directly with the BioTel Medical Command Physician.
   2. In general, decisions made by such physicians regarding whether to transport a patient by ambulance, as well as the destination hospital for a patient, shall be respected, assuming that the hospital is a BioTel receiving hospital and EMS Providers believe that the destination hospital can appropriately care for that patient. Of course, the patient must consent to the transfer. If there is a discrepancy between the physician's direction to transport the patient by ambulance OR the physician's direction regarding the appropriate destination hospital, BioTel shall be immediately consulted.
   3. EMS Providers shall always maintain a professional and respectful demeanor, as they do with any member of the public, when interacting with a physician or other healthcare providers at the scene of a medical emergency.

B. Do Not Resuscitate (DNR) Orders:
   1. An on-scene physician who has been identified as the patient's personal physician may issue a DNR Order, which EMS Providers may follow, if the physician has been properly identified and states that he or she is accepting full medical-legal accountability. Family members, if present, must agree. This order shall be documented in the ePCR and must be approved by the BioTel Medical Command Physician. In this circumstance, the Medical Command Physician may waive the requirement for the physician to accompany the patient during ambulance transport, should transport to a receiving hospital ensue.
   2. If there is ANY question or concern about the appropriateness of the on-scene physician's DNR order, EMS Providers shall begin resuscitation according to the BioTel Clinical Practice Guidelines, as indicated, while contacting BioTel for further direction and assistance.

C. EMS Physicians:
   1. On occasion, EMS Providers will encounter a physician who is trained and experienced in working with prehospital providers. Such "EMS Physicians" may or may not be known to the EMS Providers.
   2. If a physician identifies him/herself as an "EMS Physician" and is known to the paramedics, they may follow the direction of the "EMS Physician", provided such direction is consistent with BioTel Clinical Practice Guidelines and the EMS Providers agree that such direction is appropriate for the care of the patient. If the EMS Providers disagree with the care suggested by the "EMS Physician", BioTel shall be immediately contacted and an EMS supervisor shall be requested to respond to the scene. Known "EMS Physicians" are not required to accompany the patient to the hospital in the ambulance, although doing so is acceptable if the EMS Provider and the "EMS Physician" believe it would be of benefit to the patient. Any direction provided to the EMS Providers by the "EMS Physician" shall be documented in the ePCR.
   3. If the "EMS Physician" is NOT known to the EMS Providers, they shall ask the physician to provide some form of credentials, such as an EMS agency ID card, badge or other appropriate evidence that they function as an EMS Physician. In such cases, EMS Providers may utilize judgment as to whether to accept advice or direction from such a physician. If there is any question as to the validity of the physician's credentials or the medical direction he/she offers, EMS Providers will inform the physician of the requirements of this policy and act accordingly.
   4. This procedure shall be followed whether the EMS Providers are evaluating a patient at a single scene or at a public venue, such as a concert, marathon race, church service or any other "mass gathering" event.
   5. Any questions or concerns regarding interactions with "EMS Physicians" on-scene shall be referred to BioTel.

Continued on the next page…

V. Information Card for Physicians Seeking to Assist BioTel EMS Providers in the Field:

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NOTE: This card is NOT to be used or given to a physician already caring for a patient in a healthcare setting

Information for Physicians Seeking to Assist EMS Providers at the Scene of a Medical Emergency:

Thank you for your offer to assist EMS Providers in caring for a person in need of emergency medical evaluation and treatment in the field.

PLEASE READ THE FOLLOWING INFORMATION CAREFULLY:

In the State of Texas, EMS Providers operate under the authority and direction of a designated, accountable EMS Medical Director and are only authorized to provide emergency medical treatment utilizing the protocols and guidelines for therapy approved by the Medical Director. The EMS Providers on-scene are experienced professionals who are experts in providing out-of-hospital emergency medical evaluation and treatment. They operate for the University of Texas Southwestern Medical Center (UTSW)/Parkland BioTel EMS System, led by Medical Director Dr. Marshal Isaacs.

Any physician wishing to assist the EMS Providers in the care of a patient MUST:

Produce for EMS Provider inspection a copy of his/her current Texas medical license AND ALSO an official, government-issued photo ID.

Once EMS Providers have verified that information, the on-scene physician may:

1) EITHER consult with the on-duty BioTel Medical Command Physician and offer advice on the care of the patient, but allow the Medical Command Physician to direct patient care;

2) OR, with the authorization of the BioTel Medical Command Physician, direct the EMS Providers within the Texas EMS Scope of Practice and then accompany the patient to the hospital and assume total responsibility for patient care until this responsibility is assumed by emergency department staff. In this case, the EMS Providers will assist the physician as requested, provided they operate within their Scope of Practice. All orders given by the on-scene physician shall be documented on the electronic care record and signed by the physician. The physician's name, medical license number and contact information will be documented on the electronic care record.

If you do not have a copy of your medical license and a photo ID, or if you are not willing to consult with the BioTel Medical Command Physician, accept in writing full medical-legal accountability for the care rendered AND accompany the EMS Providers and the patient in the ambulance to the hospital, PLEASE stand back and allow the EMS Providers to do their job.

Thank you.

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Restraint of Patient

Purpose: To provide guidance to UTSW/Parkland BioTel EMS Providers for the use of physical restraint and emergency medications in the care and transport of patients who are violent, potentially violent and/or at risk of harming himself/herself or others
Inclusion Criteria: Any EMS incident involving care and transport of a violent or potentially violent patient
Exclusion Criteria: For pediatric patients less than 14 years of age, consult BioTel for sedation guidance
Refer to: Behavioral Emergencies/Excited Delirium, Overdose/Poisoned Patient CPGs, and Spinal Motion Restriction CPGs; and to Evaluation and Transport and Destination Policies

I. Policy Overview:

A. **Safety of the patient, community, EMS Providers and other first responders is the primary concern.**
B. EMS Providers MUST consider the possibility that aggressive, violent behavior may be a symptom of medical conditions, such as: head trauma; alcohol- or drug-related problems; or a metabolic or psychiatric disorder.
   1. Refer to Behavioral Emergencies/Excited Delirium Syndrome and Overdose/Poisoned Patient CPGs, and to the Evaluation and Transport Policy
C. Physical restraint of the violent or potentially violent patient should be used only when the patient presents a potential risk to himself/herself or others.
D. The minimal level of physical restraint necessary shall be used and restraints shall be applied in a humane and professional manner.
E. The restraint method shall ALWAYS permit adequate monitoring of vital signs. It shall not restrict the ability of the patient to protect his/her airway or compromise neurologic, respiratory or cardiovascular status.

II. Patients in Custody of Law Enforcement:

A. This policy does not negate the need for law enforcement personnel to use appropriate restraint equipment approved by their respective agency for arrest and control, such as the use of Conducted Electrical Devices.
B. The responsibility for the patient's clinical care rests with the highest medical authority on the scene.
C. A patient who is capable of understanding the consequences of his/her decisions does not lose the right to participate in the decision-making process about his/her medical care, regardless of the arrest status.
D. In situations where law enforcement officers apply handcuffs:
   1. The patient shall NOT be handcuffed to the stretcher; AND
   2. The law enforcement officer MUST accompany the patient in the ambulance, if the handcuffs are to remain on the patient.
      i. If handcuffs are NOT used and EMS Providers restrain the patient according to the procedures outlined in this policy, then the law enforcement officer may elect to follow the ambulance to the hospital in a patrol vehicle.

III. Policy Details:

A. Restraint devices applied by EMS Providers must be either padded leather or soft restraints (e.g. Posey vest, Velcro® or seat-belt-type).
B. Suggested restraint technique consists of a six-point system, preferably connecting the patient to a backboard for ease of transfer at the receiving facility.
   1. Use a snug-fitting device at the ankles and wrists to secure both legs and arms, respectively.
      i. Extend the legs and arms and draw the restraint straps taut.
      ii. Alternatively, restrain the legs in the extended position, but restrain one arm "up" (at the level of the patient's head) and one arm "down" (by the patient's side)
   2. Prevent the patient from sitting up by applying appropriate restraints across the chest and knees.
      i. Draw the restraint straps taut, but do NOT restrict chest wall excursion or interfere with respiration.
   3. The head of the stretcher should be elevated approximately 30°, if possible, to decrease aspiration risk.
   4. If using a backboard, restrain the patient supine:
      i. Elevate the head of the stretcher approximately 30°, if possible, to decrease aspiration risk.
      ii. If a lateral position becomes necessary, tilt the backboard to 10-15° and provide support.

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iii. In the lateral position, the patient MUST face EMS Providers, not the wall of the ambulance, so that airway and breathing can be monitored.

C. Do NOT apply restraints in such a way as to hinder or prevent evaluation of the patient's medical status (e.g. airway, breathing, circulation, neurologic status), to hinder or prevent patient care activities, or to in any way jeopardize the patient.
D. EMS personnel MUST have readily available a means of immediately releasing all restraints.
E. Minimum documentation for physical restraint application includes:
   1. Reason for restraint use
   2. Device and technique used
   3. Assessment of the neurovascular status of the patient's extremities, with periodic reevaluation
   4. The patient's neurologic, respiratory and cardiovascular status, with periodic reevaluation

F. For pediatric patients less than 14 years of age, contact BioTel ASAP, preferably BEFORE using any level of physical restraint (especially for children less than 8 years of age)

IV. Patient Positions and Restraint Methods PROHIBITED in the UTSW/Parkland BioTel EMS System:

A. Patients SHALL NOT be transported in or allowed to roll over to the PRONE position
B. EMS Providers in the BioTel system may NOT use ANY of these forms of restraint:
   1. Sandwich Technique: patient placed between two objects, such as a backboard and a scoop stretcher
   2. Hobble (hogtie) Restraint: wrists and ankles bound behind the patient's back
   3. ANY restraint procedure that restricts abdominal or chest wall movement, either directly or indirectly (e.g. by hyper-extension of the chest wall)
   4. Hard, plastic ties
   5. Any restraints device requiring a key for removal

V. Emergency Medications (Advanced Level Providers ONLY):

A. For adult patients who continue to demonstrate symptoms of agitation/aggression after all other safety measures have been undertaken, including patients who may have ingested a stimulant or hallucinogen, paramedics may treat ongoing agitation by administering:
   1. Midazolam 5 mg IM/IV/IO/IN; OR
   2. Diazepam 5 mg IM/IV/IO/IN; OR
   3. Ketamine 4 mg/kg IM or 2 mg IV/IO (Maximum single dose: 500 mg)
C. BioTel may authorize additional sedation, if required

C. For pediatric patients less than 14 years of age, contact BioTel for authorization and dosing of benzodiazepine sedation.
   1. Do not administer ketamine unless specifically authorized by a Medical Command Physician

D. Refer to Behavioral Emergencies/Excited Delirium Syndrome CPG for additional guidance and contact BioTel for additional assistance or Medical Control Physician guidance

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State Disaster Deployment Outside Normal Jurisdiction

Purpose: To set forth the practice guidelines for UTSW/Parkland BioTel ("BioTel") EMS Providers who have been deployed outside of their normal jurisdiction as part of a State response team during a disaster or potential disaster
Inclusion Criteria: As above
Exclusion Criteria: EMS incidents to which BioTel EMS Providers respond within their normal jurisdiction

I. Policy Overview:

A. Extenuating circumstances, such as a disaster or impending disaster, may necessitate deployment of UTSW/Parkland BioTel ("BioTel") EMS Providers as part of a State response.
B. This policy sets forth the guidelines for EMS Providers to operate under those circumstances.

II. Policy Guidelines:

A. BioTel EMS Providers deployed by their respective EMS agency as a State disaster asset shall operate under the authority of the UTSW/Parkland BioTel Medical Director when:
   1. The Texas Department of State Health Services (TX DSHS) has called for state resources to deploy in response to a large-scale, multi-jurisdictional, and/or potential large-scale incident; **AND**
   2. The EMS Provider is on duty for his/her agency.
B. BioTel EMS Providers operating during State-requested deployment shall utilize the UTSW/Parkland BioTel EMS Clinical Practice Guidelines (CPGs) and shall contact BioTel for consultation, when required by those Guidelines, and when possible.
C. **Exceptions to this requirement are explained below, in Sections D and E.**
D. Under certain circumstances, the Texas Disaster Medical System (TDMS) may deploy a **Medical Control Physician** into the local designated Medical Operations Center (MOC).
   1. BioTel EMS Providers are authorized to practice under that physician's direction.
   2. When practicing under a Non-UTSW/Parkland BioTel Physician's medical direction, the following information must be documented in the Patient Care Record (PCR) or electronic Patient Care Record (ePCR):
      i. Physician's full name; ***AND***
      ii. Physician's credentials (e.g. M.D. or D.O., and TX license number); ***AND***
      iii. Details of the treatment ordered by that physician.
E. When **no Medical Control Physician has been designated** by the State to provide on-line or on-scene medical direction, ***AND* when BioTel contact cannot be established** because of communications failure (e.g. absent cellphone service in a disaster area), UTSW/Parkland BioTel EMS Providers shall use their best clinical judgment to provide patient care within their scope of practice:
   1. Under these exceptional circumstances, treatment modalities that would normally require prior BioTel authorization within the standard UTSW/Parkland BioTel CPGs may be used without BioTel consultation.
   2. EMS Providers shall fully document on the PCR or ePCR all deviations from the standard UTSW/Parkland BioTel EMS CPGs that were necessary during the disaster response.

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✦ POLICIES: CLINICAL OPERATIONS – COMMS AND REPORTING

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Adverse Incident Self-Reporting

Purpose: To provide UTSW/Parkland BioTel EMS Providers with a procedure for mandatory reporting of adverse incidents involving patients or bystanders, in order to improve overall care and decrease risk
Inclusion Criteria: Any incident involving patients or bystanders with known or suspected adverse consequences, errors or accidents
Exclusion Criteria: No specific exclusions

I. Policy Overview:

A. This policy provides a mechanism through which BioTel EMS Providers shall report to their agency leadership any incident with known or suspected, actual or potential adverse consequence(s) for the patient and/or bystanders:
   1. In some cases, such as a gurney tipping over or collapsing, reporting should be made even though there is no apparent, documented injury or immediate adverse outcome.

B. Reporting can serve as a learning opportunity in order to implement safer practices and procedures, not as a punitive undertaking for the EMS Providers:
   1. The self-reporting of medical errors will be regarded favorably as part of any resulting investigation and action plan.
   2. EMS agency leadership will review each EMS Provider self-report to better understand the factors involved in the incident.
   3. Agency leadership, in conjunction with BioTel Medical Direction Team leadership, where indicated, will determine if the incident warrants an action plan related to education, training, policy or procedural changes aimed at diminishing the likelihood of a future, similar event.

II. Adverse Incident Self-Reporting Procedure:

A. When an EMS Provider recognizes that they have committed a medical error OR when there has been an accidental injury or "near injury" to a patient or bystander, the EMS Provider shall do the following:
   1. **Immediately report the incident to his/her EMS Supervisor or other, designated agency representative once it is safe and appropriate to do so:**
      a. If the incident involves a CURRENT patient already under EMS care, then a detailed physical examination shall be performed, including notation in the ePCR of any interim changes that may be related to the adverse incident in question;
         i. The ePCR documentation should include a brief description of the adverse incident itself, the results of the new patient examination, and any steps taken for resolution/care.
      b. If the incident involves a BYSTANDER, then a new ePCR record should be created for this person, including all of the documentation noted above.

B. The EMS Field Supervisor or other designated agency representative receiving the report shall do the following:
   1. Provide positive support to the member for reporting the adverse incident;
   2. Document any additional actions or resolution taken after notification;
   3. Forward all related information to the agency's EMS Chief Officer or designee
   4. Determine if the adverse incident should be reported by phone to the agency's assigned Medical Director or to the UTSW/Parkland BioTel EMS System Medical Director:
      a. When in doubt, the adverse incident should be reported.

C. The EMS Chief Officer will take appropriate action to follow up the report.
   1. If indicated, an investigation may be undertaken, to include (among others): interviews with the EMS Providers involved and/or other witnesses; examination of supplies and equipment; or other actions deemed necessary to determine the nature, severity and agency- or system-wide implications.

III. Errors or Other Incidents Reported by Persons Other Than BioTel EMS Providers:

A. Medical errors or injuries to patients or bystanders that have been alleged by the public, patients, patients' family members, medical staff or other EMS agency personnel shall be forwarded IMMEDIATELY to the EMS Supervisor or other designated agency representative.

B. Thereafter, the procedure outlined in Sections IIB and IIC shall be followed.

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Child, Elderly and Disabled Abuse/Neglect/Exploitation Reporting

Purpose: To set forth for UTSW/Parkland BioTel EMS Providers the policy and reporting procedure for suspected abuse, neglect or exploitation of children, the elderly or the disabled
Inclusion Criteria: As above
Exclusion Criteria: EMS incidents without known or suspected abuse, neglect or exploitation of vulnerable patient groups
Refer to: Destination, ELAP, EMTALA and Evaluation and Transport Policies

I. Policy Background:

A. Texas ranks among the top 3 states with the highest number of reported child abuse cases.
B. Similar to reporting requirements for physicians, Texas Family Code defines **the duty and obligation** of non-physician "professionals" to report to a state-designated authority **ANY** suspected child abuse or neglect:
   1. "Professional" is defined as a person "licensed or certified by the state…who, in the normal course of official duties or duties for which a license or certification is required, has direct contact with children".
   2. This clearly encompasses EMS Providers in the field.
   3. The duty **CANNOT** be delegated to others or waived based on legal "privilege".
C. These reporting requirements also apply to suspected cases of abuse, neglect or exploitation of the elderly and the mentally or physically disabled (see below).
D. A person who reports abuse/neglect/exploitation in good faith is immune from civil or criminal liability.
E. Reporting suspected abuse/neglect/exploitation makes it possible for the patient and family to get help.
F. Failure to report could mean the difference between life and death for the patient.

II. UTSW/Parkland BioTel EMS System Reporting Procedure for Suspected Abuse/Neglect/Exploitation:

A. UTSW/Parkland BioTel EMS Providers shall evaluate and transport to an appropriate receiving hospital E.D. ANY patient for whom abuse/neglect/exploitation is suspected:
   1. Details of the patient's history, physical examination, environmental factors at the scene, and other relevant observations and evidence shall be clearly and objectively documented in the ePCR.
   2. EMS Providers shall convey directly to the hospital E.D. personnel their concern about possible abuse, neglect or exploitation.
   3. EMS Providers **ALSO** shall directly report as soon as possible ANY suspected child/elderly/disabled abuse, neglect or exploitation to any of the following state-designated authorities:
      i. Texas Department of Family and Protective Services (DFPS), 24 hours a day, 7 days a week via:
         a. **Telephone (faster lead time): 1-800-252-5400** or **1-800-877-5300; OR**
         b. **Secure website www.txabusehotline.org**
      ii. Local law enforcement agency
      iii. The agency with regulatory oversight over a facility suspected of abuse* (see below, Section III C)
      iv. Any agency designated by a court to handle abuse
   4. The TX state report must include **ALL** of the following **MINIMUM** information:
      i. Patient name and address; AND
      ii. Name, address and phone number of the person(s) responsible for the patient's care, custody or welfare; AND
      iii. Any other information regarding the possible abuse, neglect or exploitation, especially all available medical or other evidence; AND
      iv. The names and phone numbers of all EMS Providers participating in the EMS incident.

III. Other Persons Protected by These Reporting Requirements:

A. Elderly persons at least 65 years of age
B. Physically disabled persons
C. *Mentally ill and mentally disabled persons, including adults and children living in state facilities or who are being helped by programs for people with mental illness or intellectual disabilities

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IV. Resources (Accessed November 9, 2018, but subject to change):

EMS Providers Can Identify Child Abuse – Adapted from JEMS October 2011
What Is Child Abuse and Neglect? Recognizing the Signs and Symptoms
Guide to Reporting Suspected Abuse, Neglect or Financial Exploitation of Adults
Texas Family Code, Section 261
www.txabusehotline.org

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Mandatory Contact

Purpose: To ensure that UTSW/Parkland BioTel EMS Providers contact BioTel or the receiving hospital directly under appropriate circumstances
Inclusion Criteria: Any EMS incident meeting the mandatory reporting criteria listed below
Exclusion Criteria: EMS incidents not meeting the mandatory reporting criteria listed below
Refer to: Abuse Reporting, Determination of Death, Destination, ELAP, EMTALA, Radio-Verbal Reporting, and Evaluation and Transport Policies; and to relevant CPGs

I. Policy Overview – Mandatory Reporting Criteria:

A. Receipt by the receiving hospital emergency department (E.D.) of essential information about critical patients and those meeting "specialty care" criteria is mandatory. UTSW/Parkland BioTel EMS Providers SHALL ALWAYS contact BioTel or the receiving hospital directly under any of the following circumstances:
1. When transporting a patient "Code 3"
2. When transporting a patient who:
   i. Is undergoing CPR
   ii. Is post-cardiac arrest and has achieved Return of Spontaneous Circulation (ROSC)
   iii. Has an unstable airway or has in place an extraglottic airway (EGA) or endotracheal tube
   iv. Meets BioTel Trauma Center Triage Criteria (refer to Destination Policy and Trauma CPG)
   v. May be experiencing an acute, ST-elevation myocardial infarction (STEMI)
   vi. May be experiencing an acute stroke
   vii. May be experiencing Excited Delirium Syndrome
   viii. May have been exposed in the field to a toxic/hazardous substance, whether or not the patient has been decontaminated in the field
   ix. Has been incompletely assessed, or who is combative, en route to the receiving hospital E.D.
   x. Refuses ambulance transport when EMS Providers believe such refusal may result in serious complications or death
3. When EMS Providers encounter a physician on-scene of a medical emergency incident who wishes to direct patient care (refer to Physician Coordination in the Out-of-Hospital Setting Policy)
4. When transporting both an adult and pediatric patient in the same ambulance

II. Special Considerations – BioTel Contact Strongly Recommended:

A. EMS Providers MAY contact BioTel at ANY time, either by radio or by mobile phone by calling 214-590-8848. EMS Providers SHOULD contact BioTel when they believe that consultation with BioTel staff or a Medical Command Physician serves the patient's best interests. Representative examples include, but are not limited to the need for:
1. Clinical advice or direction in the care of complex or unstable patients
2. Physician consultation regarding clinical care or the decision to transport
3. Destination decision-making assistance
4. Medication orders or dosage assistance
5. Assistance with the determination of death or the termination of resuscitation efforts
6. Possible activation of the Emergency Legal Assistance Program (refer to the ELAP Policy)
7. Consultation with the North Texas Poison Control Center
8. Specialty team activation (e.g. Parkland Hospital Trauma Activation Team)
9. Response to a Mass Casualty Incident (MCI)

III. Special Considerations – Clinical, Operational or Logistical Circumstances Preventing Contact:

A. If clinical, operational or logistical conditions prevent EMS Providers from directly contacting either BioTel or the receiving hospital to provide a full patient report, then the EMS Provider's agency communication center SHALL be contacted. Communications center personnel may relay basic information to BioTel regarding the patient's condition, destination hospital and estimated time of arrival (ETA).

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Radio and Verbal Reporting

Purpose: To set forth the minimum standards for the communication of vital patient information when providing a radio/telephone report to BioTel or to the receiving hospital, and when providing in-person verbal report to receiving hospital E.D. or freestanding emergency center (FEC) personnel
Inclusion Criteria: Any EMS incident in which a radio or verbal report is provided to BioTel or a receiving hospital, or in which in-person report is provided to receiving facility personnel
Exclusion Criteria: Extremely rare EMS incidents in which neither radio/verbal reporting nor patient transport are indicated
Refer to: Abuse Reporting, Destination, Determination of Death, ELAP, EMTALA, Evaluation and Transport, and Mandatory Contact Policies; and to relevant CPGs

I. Policy Overview:

A. EMS Providers shall provide a succinct, well-organized patient report by radio or telephone to BioTel or to the receiving hospital, as well as in-person at a receiving facility, in accordance with the standards listed below.

II. Field Communication – Reporting Format:

A. EMS Providers shall ALWAYS document the name of the staff member receiving report
B. When contacting BioTel, EMS Providers shall communicate whether contact is for routine hospital notification, or for another reason, such as:
   1. Specialty Care notification (e.g. Burns, Trauma, STEMI, Stroke, OB, etc.)
   2. BioTel staff consultation
   3. BioTel Medical Command Physician consultation
   4. Termination of Resuscitation (Field Termination pronouncement)
   5. Destination decision-making
   6. Patient refusal/AMA (including possible activation of the Emergency Legal Assistance Program (ELAP))
   7. Other
C. The field report by EMS Providers either to BioTel or to the receiving hospital shall include, at a MINIMUM:
   1. EMS agency and unit number
   2. Patient age and gender
   3. Chief complaint or mechanism of injury
   4. Vital signs
   5. Level of consciousness
   6. Transport code and Estimated Time of Arrival (ETA)
   7. Whether the patient has or had in place an extraglottic airway (EGA) or endotracheal tube
   8. Any other, pertinent information

III. Receiving Facility Communication – Reporting Format:

A. EMS Providers shall ALWAYS document the name of the staff member receiving report
B. For critical or “Specialty Care” patients, upon entering a room with multiple staff members present, ask “Who will be taking report today?” and then give report to that staff member.
C. The in-hospital verbal report shall include, at a MINIMUM:
   1. Patient age and gender
   2. Chief complaint or mechanism of injury
   3. Vital signs
   4. Level of consciousness
   5. Pertinent positive and negative physical findings
   6. All interventions performed, and the patient’s response to those interventions
   7. All medications given, and the patient’s response to the medication(s)
   8. Any additional information that may assist the treatment team in effectively caring for the patient

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IV. Verbal Report for Critical, Pediatric Patients Arriving to Children's Medical Center (Dallas or Plano):

A. Upon arrival at CMC Dallas or Plano with a critical pediatric patient, CMC personnel will FIRST perform a primary survey of the patient before receiving in-person verbal report
B. Once CMC personnel have completed the primary survey AND any necessary, critical interventions, EMS Providers will be asked to provide report
C. With this procedure in mind, providing a complete, verbal radio or telephone report to BioTel regarding the transport of a critical, pediatric patient to CMC Dallas or Plano is both MANDATORY and important to facilitate appropriate care upon E.D. arrival

V. Special Circumstances – Radio/Telephone Communication Failure or Inability to Provide Report:

A. In the event of radio or telephone communication failure in the field, or if EMS Providers are too busy attending to a critically ill/injured patient to provide timely report, they shall request that their agency dispatch center personnel relay as much patient information as possible to BioTel as early in the transport as possible.

VI. Quality Improvement:

A. BioTel will work with our EMS agency and receiving facility partners to monitor, report and improve the quality of field-to-hospital and in-hospital patient verbal reporting.

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✦ POLICIES: ADMINISTRATIVE

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Credentialing

Purpose: To ensure consistent credentialing of EMS Providers caring for patients in the UTSW/Parkland BioTel ("BioTel") EMS System.
Inclusion Criteria: Any EMS Provider beginning service for a BioTel EMS agency
Exclusion Criteria: None, unless specifically authorized in writing by the Medical Director
Refer to: Return to Duty and Re-credentialing Policies

I. Policy Overview:

A. Credentialing is the process whereby EMS Providers obtain **local system authorization from the Medical Director** to work within the UT Southwestern/Parkland BioTel ("BioTel") EMS System.
B. All EMTs and Paramedics must comply with Texas Department of State Health Services (DSHS) EMS certification or licensure rules, including National Registry of EMTs (NREMT) certification requirements, as well as agency-specific policies, in order to be eligible to care for patients in the BioTel EMS System.
   1. Only Texas State certified or licensed EMTs and Paramedics shall be considered for credentialing to care for patients in the BioTel EMS System.
C. A credential to work as a BioTel EMS Provider shall be issued as a letter from the Medical Director; this list may include a list of credentialed Providers.
   1. The EMS Provider's BioTel EMS Agency may also issue a department ID or credential.

II. Policy Specifics, Effective Immediately Upon Implementation of This Policy:

A. Existing Providers: All EMS Providers employed by and in good standing with a BioTel EMS System agency at the time of the adoption of this policy shall be considered to be credentialed.
B. Newly Hired Providers: A newly hired EMS Provider shall be issued a credential upon receipt by the Medical Director's office of all three of the following documents:
   1. Written confirmation from the EMS Agency Chief or his/her designee that the newly hired Provider is certified or licensed by the State of Texas; and
   2. Written confirmation from the EMS Agency Chief or his/her designee that the newly hired Provider has been trained, educated and evaluated by a Medical-Director-approved, written BioTel EMS System examination on all UTSW/Parkland BioTel EMS System Clinical Practice Guidelines (CPGs)/Protocols, Policies and Procedures (refer to Section VIII below); and
   3. The EMS Provider's signed Attestation of Understanding of the Medical Director's Philosophy of Patient Care (under development).

III. Policy Specifics, Beginning in 2020 and Every Two Years Thereafter:

A. Beginning in 2020 and every two years thereafter, all credentialed BioTel EMS Providers shall be required to undergo biennial re-credentialing, as funding permits.
B. BioTel EMS Providers shall be re-credentialed if they meet ALL of the following criteria:
   1. Continued employment in good standing by a BioTel EMS Agency;
   2. Recommendation by the BioTel EMS Agency for re-credentialing;
   3. Successful passage of a Medical-Director-approved, written BioTel EMS System examination on all UTSW/Parkland BioTel EMS System Clinical Practice Guidelines (CPGs)/Protocols, Policies and Procedures (refer to Section VIII below);
   4. Demonstrated competency for a set of Medical-Director-specified clinical patient care skills;
   5. Provision of documentation confirming successful completion of any refresher training and/or continuing education required by the Medical Director since the previous credentialing approval; and
   6. Submission of a signed Attestation Understanding of the Medical Director's Philosophy of Patient Care.

Continued on the next page

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IV. Credential Probation:

A. The Medical Director may issue a probationary credential or place an existing credential on probationary status should a clinical performance issue be identified. The Provider and his/her employer shall be notified of the probationary status of the credential, along with the time period of the probationary status and any performance improvement actions that must be completed in order to end the probationary period. An EMS Provider may request a review by the Credential Review Board of the decision to place a credential on probation.

V. Credential Suspension:

A. The Medical Director may suspend the credential of a BioTel EMS Provider at any time should there be a concern that the Provider is not able to care for patients safely and effectively. The Provider and his/her employer shall be notified of the suspension of the credential, as well as of the means to reinstate the credential, on either probationary or unrestricted status. Following a fact-finding Quality Management process, the suspension will be lifted, maintained or revoked. EMS Providers may request a review by the Credential Review Board of a credential suspension.

VI. Credential Revocation:

A. The Medical Director may revoke the credential of any BioTel EMS Provider at any time should he/she believe that the Provider is no longer qualified to safely and effectively care for patients in the BioTel EMS System. The Provider and his/her employer shall be notified of the revocation of the credential, the reason(s) for the revocation, as well as of the process under which the credential may be reinstated. The Credential Review Board shall review ALL revocations of an EMS Provider's credential.

VII. Credential Review Board:

A. The Medical Director will establish a voluntary board of 3 Texas EMS physicians not employed or substantively related to the BioTel EMS system. The Board shall review all credential revocations. The Board shall also review any credentialing issue requested either by an EMS Provider or by the Medical Director. Following review, the board will recommend in writing to the BioTel Medical Director whether to uphold or change the status of the Provider's credential.

VIII. Written Credentialing Examination:

A. Beginning in October 2018, a written examination, approved by the Medical Director shall be administered to all newly hired EMS Providers (refer to Section II.B.2) and to those seeking biennial re-credentialing (refer to Section III.B.3). The examination will cover all aspects of patient care in the current BioTel EMS System Clinical Practices Guidelines, including specific clinical practices guidelines (CPGs), as well as system policies and procedures.
B. Successful passage of this examination will be required for the initial credentialing of newly hired EMS Providers and for the biennial re-credentialing of existing EMS Providers in the BioTel EMS System.

IX. Ultimate Credentialing Decision-Making Authority:

A. The ultimate authority regarding credentialing of an EMS Provider to care for patients in the BioTel EMS System rests with the Medical Director.

X. Credentialing Issues Not Specifically Covered Under This Policy:

A. Any credentialing issues not specifically covered under this policy shall be addressed on a case-by-case basis.

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Return to Duty (Recredentialing)

Purpose: To establish a protocol for the recredentialing of former active duty UTSW/ Parkland BioTel credentialed EMS Providers returning to clinical activity after a prolonged period of clinical inactivity
Inclusion Criteria: Any EMS Provider returning to service for a BioTel EMS agency after a prolonged absence, e.g. military service, family/medical leave or other circumstance
Exclusion Criteria: Newly hired EMS Providers
Refer to: Credentialing Policy

I. Policy Overview and Objectives:

A. Identify candidates for EMT or paramedic re-credentialing.
B. Establish a competency-based program that facilitates reintegration of previously credentialed EMTs and paramedics to the knowledge, skills, and responsibilities of an active BioTel EMS Provider.
C. Provide a process of competency verification by EMS Supervisors, Chief Officers and the BioTel Medical Directors.

II. Definitions:

A. **Clinical Activity:** The provision of emergency medical evaluation and treatment as a component of the EMS Provider's routine job description, i.e. providing clinical care on a regular basis on a fire apparatus or ambulance.
B. **Within-System EMS Provider:** A previously-credentialed EMS Provider who has remained within the BioTel system in a role other than providing primary patient evaluation and treatment.
C. **Reinstatement EMS Provider:** A previously-credentialed EMS Provider who meets the following criteria:
    1. Held valid credentialing at the time of leave; AND
    2. Has been clinically inactive for less than 6 months; AND
    3. Is not currently undergoing any remediation program implemented by the UTSW/Parkland BioTel EMS Medical Direction Team.
D. **Re-entry EMS Provider:** A previously-credentialed EMS Provider who meets the following criteria:
    1. Held valid credentialing at the time of leave; AND
    2. Has been clinically inactive for more than 6 and fewer than 24 months; AND
    3. Is not currently undergoing any remediation program implemented by the UTSW/Parkland BioTel EMS Medical Direction Team.
E. **Late Re-entry EMS Provider:** A previously-credentialed EMS Provider who meets the following criteria:
    1. Held valid credentialing at the time of leave; AND
    2. Has been clinically inactive for more than 24 months; AND
    3. Is not currently undergoing any remediation program implemented by the UTSW/Parkland BioTel EMS Medical Direction Team.
F. **Provider Re-entry Program (PREP):** A program to deliver to Re-entry EMS Providers training and evaluation of clinical and procedural skills before reinstatement of credentials and return to active duty.
G. **PREP Review Committee:** A committee tasked with recommending candidates for the PREP and with continually monitoring the performance progress of both candidates and preceptors.
    1. For Re-entry EMS Providers, the committee shall comprise:
        a. EMS Chiefs or their designees
    2. For Late Re-entry EMS Providers, the committee shall comprise:
        a. EMS Chiefs or their designees; AND
        b. Designated BioTel EMS Medical Directors.

III. Identification of Recredentialing Candidates:

A. Candidates for the PREP include, but are not limited to, EMS Providers who have been out of clinical practice for any of the following reasons:
    1. Military service
    2. Injury or illness
    3. Maternity leave or FMLA
    4. Administrative reassignment

IV. Selection Process:

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A. A State of Texas licensed or certified EMS Provider meeting the above criteria may submit in writing to the Chief of EMS a written application for entry into the PREP.
B. For a Reinstatement EMS Provider (less than 6 months of clinical inactivity), no further action is needed unless the EMS Chief feels that additional interventions are needed.
C. Screening for the PREP: For PREP entry, members of the PREP Review Committee will review the candidate's eligibility based on, but not limited to, the following criteria:
    1. Verification of State certification
    2. Verification of previous credentials within a UTSW/Parkland BioTel EMS agency;
    3. Prior counseling or disciplinary actions;
    4. Other work history or supporting documents provided by the EMS agency;
    5. Review of activities performed during the leave from clinical duty.
D. Recommendation: After review of the candidate's eligibility, the PREP Review Committee will recommend the candidate's acceptance into and placement in the PREP.
E. Removal from the PREP: A PREP participant may be evaluated for removal from the program under the following circumstances:
    1. Field Preceptors, EMS Chiefs or Medical Directors express concerns regarding the candidate's ability to successfully complete the PREP:
        a. A letter requesting the candidate's removal may be brought to the PREP Review Committee;
        b. The letter and supporting documentation will be reviewed by the PREP Review Committee;
        c. A determination will be made about the candidate's further participation in the PREP or about corrective action, as determined by the Committee.

V. PREP Components:

A. Continuing Education (CE): All CE activities occurring during the candidate's clinical inactivity period;
B. BioTel Clinical Practice Guidelines (CPGs) Refresher Course: A refresher course based on the UTSW/Parkland BioTel EMS System CPGs at the time of the candidate's acceptance into the PREP;
C. BioTel CPGs Exam: A written examination based on the UTSW/Parkland BioTel EMS System CPGs at the time of the candidate's acceptance into the PREP;
D. Skills Refresher: A refresher course and evaluation of clinically important psychomotor skills, as determined by the BioTel EMS Medical Direction Team
E. Field Evaluation: EMS Provider shifts supervised and evaluated by senior EMS Field Supervisors;
F. PREP Review Committee Evaluation: A final review by the PREP Review Committee following completion of the items listed above, with a final recommendation to the agency EMS Chiefs.

VI. Recredentialing Requirements:

A. Clinical inactivity less than 6 months:
    1. CE: Satisfactory completion of 50% of missed CE and operational drills and updates within 30 days of reinstatement and completion of all CE/drills/updates within 45 days of reinstatement;
    2. BioTel CPGs: Candidate may elect to complete an *optional* CPGs Refresher Course;
    3. Skills: No requirement;
    4. Field evaluation: No requirement;
    5. The candidate will not be restricted from patient care during this time period.
B. Clinical inactivity between 6 and 11 months:
    1. CE: Satisfactory completion of all missed CE and operational drills and updates prior to reinstatement;
    2. BioTel CPGs: Successfully pass the BioTel CPGs Exam
        a. The candidate may elect to complete an optional CPGs Refresher Course before the exam;
        b. If the candidate fails the exam, s/he will be placed into a CPGs Refresher Course.
    3. Field evaluation: No requirement;
    4. The candidate will be restricted from assignment until all requirements have been met.
C. Clinical inactivity between 12 and 23 months:
    1. CE: Satisfactory completion of all missed CE and operational drills and updates within 30 days of reinstatement;
    2. BioTel CPGs: Successfully complete the BioTel CPGs Refresher Course and pass the BioTel CPGs Exam;
    3. Skills: Successfully complete skills review and evaluation;
    4. Field evaluation: 3 to 5 preceptor-evaluated ride outs;

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5. The candidate will be restricted from assignment until all requirements have been met.

D. Clinical inactivity between 24 and 35 months:
   1. CE: Satisfactory completion of all missed CE and operational drills and updates within 30 days of reinstatement;
   2. BioTel CPGs: Successfully complete the BioTel CPGs Refresher Course and pass the BioTel CPGs Exam;
   3. Skills: Successfully complete skills review and evaluation;
   4. Field evaluation: 10 preceptor-evaluated ride outs;
   5. The candidate will be restricted from assignment until all requirements have been met.

E. Clinical activity 36 months or longer – Out-of-System:
   1. This EMS Provider must return to EMT/Paramedic school in order to return to clinical duty

F. Clinical inactivity 36 months to 7 years – Within System:
   1. Return to clinical duty will be at the discretion of the Medical Direction Team.

G. Clinical activity longer than 7 years – Within System:
   1. This EMS Provider must return to EMT/Paramedic school in order to return to clinical duty.

VII. Summary Table:

	Re-Entry Paramedics			**Late Re-Entry Paramedics**		
	0 to 6 mo.	**6 to 11 mo.**	**12 to 23 mo.**	**24 to 35 mo.**	**36 mo. to 7 years** (Within system)	**More than 36 mo.** (Out of system) **More than 7 years** (Within system)
Continuing Education	50% in 30 days; 45 days to complete	Complete prior to return to duty	Complete prior to return to duty	Complete prior to return to duty		
CPGs Exam		Complete prior to return to duty	Complete prior to return to duty	Complete prior to return to duty		
CPGs Refresher		Complete if failure to pass protocol exam	Complete prior to return to duty	Complete prior to return to duty		
Skills Exam			Complete prior to return to duty	Complete prior to return to duty	Discretion of UTSW Medical Direction Team	Return to EMT/ paramedic school
Preceptor Ride-Outs (shifts)			3 to 5	10		

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- ***Unless otherwise specified,*** adult and pediatric doses may be given under "standing orders"
- ***Unless otherwise specified,*** additional dosing beyond standing orders requires BioTel authorization
- ***Unless otherwise specified,*** "BioTel Authorization required" refers to BioTel staff authorization
- ***Unless otherwise specified,*** pediatric dosing refers to patients less than 14 years of age
- Confirmed or suspected hypersensitivity to any medication is a contraindication to its administration
- **"Optional" (O) medications are not required for every BioTel EMS agency**
- **However, agencies must carry at least ONE of these "Alternative" medications (A): a parenteral analgesic (e.g. fentanyl and/or morphine); a benzodiazepine (e.g. diazepam and/or midazolam); and a parenteral dextrose formulation (D50 must be carried if D10W is unavailable)**
- Etomidate and ketamine require documented education/training and written Medical Director authorization
- Refer to BioTel Pedi-Guide© and BioTel MACC for dosing, dilution, reduction & cross-check guidance

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Medication Administration Cross-Check (MACC)	221		Glucagon	244
BioTel PEDI-Guide©	270		Glucose (40% Oral Gel) (Glutose®)	245
Adenosine (Adenocard®)	223		Hydroxocobalamin (Cyanokit®) (O)	246
Albuterol (Proventil®, Ventolin®)	224		Ipratropium Bromide (Atrovent®)	247
Amiodarone HCl (Cordarone®, Nexterone®)	225		Ketamine (Ketalar®) (O)	248
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Dexamethasone (Decadron®) (O)	229		Midazolam (Versed®) (A)	257
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Epinephrine 0.1 mg/mL ("1:10,000")	237		Ondansetron (Zofran®) (O)	264
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Fentanyl (Sublimaze®) (A)	243		Sodium Bicarbonate	268

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With sincere appreciation from the Medical Direction Team:
Formulary review provided by Yong J. Lee, PharmD
Emergency Medicine/Critical Care Clinical Pharmacy Specialist, Parkland Health and Hospitals System

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✦ BioTel MEDICATION ADMINISTRATION CROSS-CHECK (MACC)

Purpose: To facilitate timely delivery of the correct dose of the correct medication (dose, volume, route and rate) for the correct indication to the correct patient
Inclusion Criteria: All patients, especially for pediatric patients, IV/IO administration and when medication dilution must be performed to achieve the proper concentrations
Exclusion Criteria: Extenuating circumstances preventing MACC use should be documented in ePCR
Refer to: Universal Care – Adult; Universal Care – Pediatric; BioTel PEDI-Guide© FAQ; symptom-specific CPGs and relevant Formulary Drug Sheets

Background:

A. Safe, out-of-hospital medication administration depends on the "5 Rights":
   1. Right Patient – typically not a significant problem for EMS Providers treating only 1 patient
   2. Right Drug
   3. Right Dose – this relates closely to the "Right Concentration" and "Right Volume"
   4. Right Route
   5. Right Time – most EMS medications are administered urgently or emergently, while others should be administered within a certain time frame (e.g. aspirin within 10 minutes for chest pain)
B. Other "Rights":
   1. Right Reason/Indication
   2. Right Formulation (e.g. IM given IV, or IV given PO, etc.)
   3. Right Response – documentation of patient response is paramount, especially in the elderly, infants and children, critically-ill or injured patients, or those with underlying comorbid conditions
C. The large number of EMS pharmaceuticals, as well as supply-chain and other issues, creates complexity:
   1. EMS supplies are subject to availability of different medications, different concentrations and different size formulations
D. Many medications may be administered to different age patients (pediatric vs. adult), via different routes (IV/IO, IM, IN and/or PO), in different concentrations, and in different volumes (sometimes after dilution):
   1. "One size does NOT fit all" when it comes to EMS medications
   2. EMS Providers must exercise situational awareness and procedures designed to ensure accurate medication administration

Overview:

- The BioTel MACC is a tool designed to reduce the risk of unjustifiable harm during medication administration
- The BioTel MACC should be used for out-of-hospital medication administration EVERY time, unless extenuating circumstances prohibit doing so (ePCR justification/documentation required):
  - For example, the procedure may need to be modified when only one paramedic is present in the ambulance passenger compartment
- NEVER administer the contents of a syringe that is not labeled
- You must ALWAYS be able to visualize the vial, bottle or ampule from which the contents were immediately drawn
- Two Providers are required to perform a proper Medication Administration Cross-Check:
  - The 1st Provider will be the paramedic administering the medication
  - The 2nd Provider need not be a paramedic; s/he may be a BLS Provider (ECA/EMR or EMT)
- For PEDIATRIC patients, refer to the BioTel PEDI-Guide© for medication DILUTION and/or dose REDUCTION guidance to ensure correct medication concentration, dose, route and volume

Refer to the BioTel MACC on the next page

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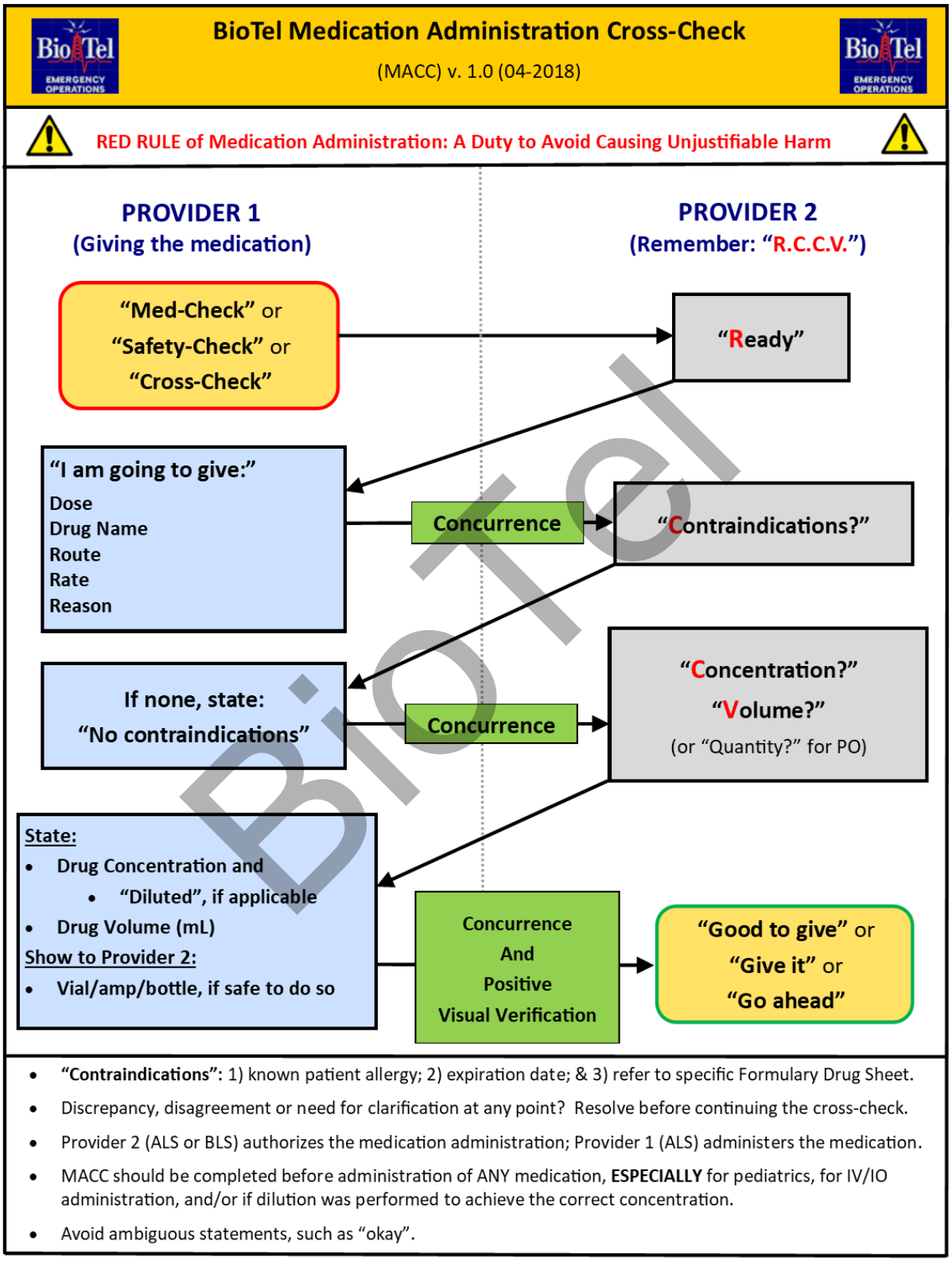

(Adapted from Wichita-Sedgwick County EMSS 2012, with permission)

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Adenosine (Adenocard®)

CLASS: Anti-arrhythmic (naturally-occurring nucleoside)

ACTIONS: Slows AV node conduction, thereby terminating reentrant supraventricular tachycardia (SVT)

INDICATIONS:

- Paroxysmal and non-paroxysmal SVT, including Wolff-Parkinson-White (WPW)

CONTRAINDICATIONS:

- Hypersensitivity
- 2nd- or 3rd-degree heart block
- Atrial fibrillation or flutter
- Irregular, polymorphic wide-complex tachycardia
- Sick sinus syndrome or symptomatic bradycardia
- Poisoning- or drug-induced tachycardia

PRECAUTIONS:

- Consult BioTel before administration if: asthma, COPD, CHF, coronary artery disease
- Consult BioTel before administration if: recent caffeine, theophylline or calcium-channel blocker intake
- Consult BioTel before administration if: carbamazepine (Tegretol®) or dipyridamole (Persantine®)

SIDE EFFECTS:

- Facial flushing
- Headache
- Dizziness and lightheadedness
- Bronchospasm and shortness of breath
- Nausea/vomiting
- Chest pain
- Transient asystole
- Transient dysrhythmias

ADMINISTRATION NOTES:

- Large-bore, antecubital IV preferred
- Rapid IV/IO push in less than 5 seconds
- Follow each dose with rapid, 10-20 mL NS flush
- Run continuous ECG strip before, during and after dose
- **If patient becomes unstable, proceed to immediate synchronized cardioversion**

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Probable SVT, stable	12 mg rapid IV/IO push via proximal IV, with flush: • Use IV port closest to the patient • 2-syringe technique preferred for IO route • May repeat once after 1-2 minutes, if needed	Consult BioTel if no response to 2 doses
Probable SVT, unstable	Consider dose as above before cardioversion, ONLY if narrow-complex tachycardia, HR at least (220-age) AND antecubital IV is already in place	Synchronized cardioversion generally preferred over adenosine
PEDIATRIC LESS THAN 14 YEARS OF AGE		
Probable SVT, stable: • Infant HR > 220 bpm • Child HR > 180 bpm	0.1 mg/kg rapid IV/IO push via closest port • Follow immediately with 10-20 mL NS flush • Maximum single dose: 6 mg • 2-syringe technique preferred for IV & IO route • May repeat once at 0.2 mg/kg (maximum 12 mg) after 1-2 minutes, with flush, if no response	**BioTel authorization required**
Probable SVT, unstable:	BioTel may authorize at same dose as above	

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Albuterol (Proventil®, Ventolin®)

CLASS: Sympathomimetic ($beta_2$ and $beta_1$ agonist) bronchodilator

ACTIONS: Bronchodilation ($beta_2$); cardiac stimulation ($beta_1$); intracellular shift of potassium (K^+) ($beta_2$)

INDICATIONS:

- Acute bronchospasm due to asthma, bronchiolitis (pediatrics), COPD (adults), and allergic reaction
- Acute bronchospasm due to chemical toxin exposure (e.g. respiratory irritants, organophosphates, cyanide or blister agents)
- Emergency treatment of acute hyperkalemia with ECG changes (tall, peaked T waves and wide QRS), e.g. due to crush syndrome or diabetic ketoacidosis

CONTRAINDICATIONS:

- Hypersensitivity
- Pregnancy (relative, not absolute)
- Pediatric patient with barking cough and/or stridor (possible croup)
- Severe tachycardia (relative, not absolute)

PRECAUTIONS:

- Paradoxical bronchospasm with excessive dosing
- Use with caution in patients with known heart disease (e.g. CHF, coronary artery disease)
- Continuous ECG monitoring should be used in order to detect cardiac dysrhythmias
- Potential benefits may warrant use for acute, short-term care during pregnancy, despite potential risks

SIDE EFFECTS:

- Restlessness and headache
- Tachycardia and palpitations
- Hypertension
- Muscle tremors
- Nausea and vomiting
- Hypokalemia

ONSET AND DURATION OF CLINICAL EFFECTS: Onset within 2-5 minutes; duration: approximately 3-4 hours

ADMINISTRATION NOTES: May be administered during use of CPAP

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute bronchospasm or acute hyperkalemia with ECG changes	2.5 mg in 3 mL NS via nebulizer: • May repeat twice every 5-10 min, up to total 3 doses • May mix 2nd and 3rd doses with ipratropium* (ALS)	Contact BioTel for additional dosing
Status asthmaticus	2.5 mg with 0.5 mg ipratropium in 3 mL NS via nebulizer: • May repeat twice every 5-10 min, up to total 3 doses	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Acute bronchospasm or acute hyperkalemia with ECG changes	2.5 mg in 3 mL NS via nebulizer: • May repeat twice every 5-10 min, up to total 3 doses • May mix 2nd and 3rd doses with ipratropium* (ALS) in children at least two years of age	Contact BioTel for additional dosing
Status asthmaticus in children **at least one year of age**	2.5 mg with 0.5 mg ipratropium in 3 mL NS via nebulizer: • May repeat twice every 5-10 min, up to total 3 doses	

* Refer to Ipratropium Drug Sheet for contraindications prior to administration

BioTel

Amiodarone HCl (Cordarone®, Nexterone®)

CLASS: Class III Antiarrhythmic

ACTIONS: Depresses SA node automaticity; increases atrial, ventricular and AV node refractoriness; slows conduction; and prolongs QT interval via potassium channel blockade

INDICATIONS:

- Ventricular fibrillation (VF) and pulseless ventricular tachycardia (pVT) unresponsive to defibrillation
- Sustained, wide-complex tachycardia (WCT) in hemodynamically stable, adult patient with pulse (infusion)

CONTRAINDICATIONS:

- Hypersensitivity
- 2nd- or 3rd-degree heart block
- Sick sinus syndrome or sinus bradycardia
- Narrow-complex tachycardia (QRS less than 0.12 sec)
- Trauma
- Hypotension or cardiogenic shock
- Torsades de Pointes
- Procainamide or other QT-prolonging meds

PRECAUTIONS:

- Administer with caution to renal failure patients
- Continuous ECG and vital sign monitoring must be used during administration (especially infusion)

SIDE EFFECTS:

- Hypotension (especially Cordarone®)
- Bradycardia and heart block
- Heart failure
- Nausea and vomiting

ADMINISTRATION NOTES:

- Do not shake (especially Cordarone®)
- Draw up with 18g or larger needle
- Administer at IV/IO port closest to patient
- Do not administer in same IV/IO line with sodium bicarbonate

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
VF or pVT unresponsive to defibrillation	300 mg IV/IO rapid push, with 10-20 mL NS flush: • May repeat once: 150 mg before next shock	Lidocaine is at least as effective and may be preferred
Sustained WCT in stable, adult patient with pulse	**BioTel authorization required:** Dilute 300 mg in 250 mL NS, then: • Infuse ONLY 150 mg (125 mL = ½ of the bag) @ 12.5 mL/minute for 10 minutes • Discard remaining contents of the infusion • Discontinue if hypotension (SBP less than 100) or bradycardia (HR less than 60) develops	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
VF or pVT unresponsive to defibrillation	5 mg/kg IV/IO rapid push, with 10-20 mL NS flush: • Maximum single dose: 300 mg • May repeat once: 5 mg/kg before next shock	Lidocaine is at least as effective and may be preferred
Sustained WCT in unstable patient with pulse	Synchronized cardioversion is preferred treatment	

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Aspirin (Acetylsalicyclic Acid; ASA)

CLASS: Platelet aggregation inhibitor; analgesic; anti-inflammatory; anti-pyretic

ACTIONS: Inhibits prostaglandin and Thromboxane A_2 synthesis; inhibits platelet aggregation

INDICATIONS:

- Suspected acute coronary syndrome, including ischemic chest pain and acute myocardial infarction

CONTRAINDICATIONS:

- Hypersensitivity to ASA or other NSAIDs
- Active bleeding disorder (e.g. hemophilia)
- Current peptic ulcer or GI bleeding condition
- Known or suspected aortic dissection

PRECAUTIONS:

- Anaphylactic reaction is possible in sensitive patients

SIDE EFFECTS:

- Tinnitus (ringing in the ears) (high doses
- Heartburn and gastroesophageal reflux
- Nausea and vomiting
- GI bleeding

ADMINISTRATION NOTES:

- May be administered to patients on warfarin (Coumadin®) or clopidogrel (Plavix®)
- May be administered to those on heparin/low molecular weight heparin (LMWH) or Direct Oral Anticoagulants (DOACs), such as dabigatran (Pradaxa®), apixaban (Eliquis®), rivaroxaban (Xarelto®), edoxaban (Savaysa®), betrixaban, fondaparinux (Arixtra®), ticagrelor (Brilinta®), prasugrel (Effient®) or vorapaxar (Zontivity®)
- Combination of aspirin and anticoagulants may increase bleeding risk

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute Coronary Syndrome (ACS)	One adult (325 mg) or four baby (81mg X 4 = 324 mg) tablet PO (chewed before swallowing), as soon as possible	Administer even if patient has taken a dose within previous 24 hours
PEDIATRIC LESS THAN 14 YEARS OF AGE		
Not normally administered by EMS to pediatric patients		**Contact BioTel**

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Atropine Sulfate

CLASS: Anticholinergic/parasympatholytic

ACTIONS: Reverses vagal tone and increases heart rate in some types of symptomatic bradycardia; blocks acetylcholine in organophosphate/chemical nerve agent poisoning

INDICATIONS:

- Symptomatic bradycardia due to vagally mediated etiology or pacemaker failure
- Organophosphate/carbamate pesticide or chemical nerve agent poisoning
- Premedication for Pharmacologically Assisted Intubation (PAI) in pediatric patients u

CONTRAINDICATIONS:

- Hypersensitivity
- Bradycardia due to systemic hypothermia
- Atrial fibrillation or atrial flutter
- Glaucoma

PRECAUTIONS:

- Paradoxical bradycardia, especially if administered too slowly or in insufficient dose
- Use caution when administering to elderly patients with symptomatic bradycardia: resulting tachycardia and tachydysrhythmias may cause increased myocardial ischemia and myocardial infarction
- Continuous vital signs and ECG monitoring should be used before, during and after administration

SIDE EFFECTS:

- Tachycardia
- Mydriasis (dilated pupils) and blurred vision
- Dry mouth
- Urinary retention
- Skin flushing, decreased sweating and hyperthermia
- Confusion

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Symptomatic bradycardia	0.5 to 1 mg IV/IO single dose: • Do not administer or repeat dosing without BioTel authorization	**BioTel authorization required** (Transcutaneous pacing (TCP) preferred over atropine in most cases for first-line treatment)
Organophosphate pesticide or nerve agent poisoning	2 mg deep IM via autoinjector or IV/IO push: • May repeat up to two times, every 3-5 minutes, as needed • Endpoint: improved respiratory status	**MANDATORY:** **Contact BioTel as soon as possible**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Symptomatic bradycardia with poor perfusion unresponsive to oxygenation and ventilation	CONSIDER 0.02 mg/kg (0.2 mL/kg) IVP/IO: • May repeat once • Maximum single dose: 0.5 mg • Maximum, total, cumulative dose: o Child: 1 mg; adolescent: 3 mg	**Ensure adequate oxygenation and ventilation first;** **Age 8 or less: Perform CPR if HR less than 60 bpm**
Organophosphate/nerve agent poisoning	0.05 mg/kg (0.5 mL/kg) IV/IO push: • May repeat up to two times, every 3-5 minutes, as needed • Maximum single dose: 2 mg	**MANDATORY:** **Contact BioTel as soon as possible**
PAI premedication: infants less than 1 year of age	0.02 mg/kg (0.2 mL/kg) IV/IO push, two minutes prior to intubation: • Maximum dose: 1 mg	

BioTel

Calcium Chloride

CLASS: Electrolyte – cellular membrane stabilizer and antidote

ACTIONS: Stabilizes myocardium in hyperkalemia and hypocalcemia dysrhythmias; increases calcium levels to reverse toxicity from calcium channel blocker, magnesium sulfate and other toxicity

INDICATIONS:

- Confirmed or suspected hyperkalemic cardiac arrest/ECG changes (tall, peaked T waves; wide QRS), e.g. renal failure, diabetic ketoacidosis (DKA), or crush syndrome
- Confirmed or suspected hypocalcemia or calcium channel blocker (CCB) toxicity (bradycardia and/or hypotension)
- Confirmed or suspected magnesium sulfate toxicity (e.g. after eclampsia or Torsades de Pointes treatment)

CONTRAINDICATIONS:

- Known hypercalcemia
- Confirmed or suspected digoxin toxicity

PRECAUTIONS:

- Use with extreme caution in patients taking digitalis preparations

SIDE EFFECTS:

- Local pain and burning
- Tissue necrosis if extravasation occurs
- Hypotension
- Bradycardia
- Cardiac arrest (asystole or VFib)
- Digitalis toxicity in patients on digitalis preparations

ADMINISTRATION NOTES:

- Large-bore, antecubital IV preferred: monitor closely for IV patency and signs of extravasation
- Rapid infusion or overdose associated with bradycardia, vasodilation, hypotension and syncope
- Do not administer in the same IV/IO line with sodium bicarbonate
- Continuous vital signs and ECG monitoring should be used before, during and after administration

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Hyperkalemic cardiac arrest	1 g (10 mL) of 10% solution, IV/IO push	Monitor vital signs and ECG
CCB overdose, hypocalcemia or ECG changes consistent with hyperkalemia following crush injury	1 g (10 mL) of 10% solution, slow IV/IO: • Administer 1 mL/minute over 10 min. • May repeat up to 2 times, every 10 min.	
Magnesium toxicity	Discontinue magnesium sulfate infusion, then proceed as above	**BioTel authorization required, especially in pregnant patient**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Hyperkalemic cardiac arrest	20 mg/kg (0.2 mL/kg) of 10% solution, IV/IO push • Maximum single dose: 1 g (10 mL)	**MANDATORY:** **Contact BioTel as soon as possible after administration**
CCB overdose or ECG changes consistent with hyperkalemia following crush injury	20 mg/kg (0.2 mL/kg) of 10% solution, slow IV/IO, over 10 minutes • Maximum single dose: 1 g (10 mL)	

BioTel

Dexamethasone (Decadron®)

OPTIONAL (Not required for every agency)

CLASS: Synthetic glucocorticoid (corticosteroid)

ACTIONS: Anti-inflammatory; may alter immune response; potentiates bronchial smooth muscle relaxation; reverses cardiovascular collapse patients with adrenal insufficiency (acute Addisonian crisis)

INDICATIONS:

- Adjunct treatment of acute, bronchospasm (asthma or COPD) or croup with stridor (pediatrics)
- Adjunct treatment of moderate-severe allergic reaction (NOT primary treatment of anaphylaxis)
- Cardiovascular collapse/shock due to confirmed/suspected Addisonian crisis (check for medical alert device)

CONTRAINDICATIONS:

- Hypersensitivity
- Advanced glaucoma
- Systemic fungal infection
- Confirmed or suspected acute GI bleeding

PRECAUTIONS:

- May cause transient hyperglycemia

SIDE EFFECTS:

- Few associated with short-term EMS use
- Nausea/vomiting (less than methylprednisolone)
- Possible CHF or hypertension exacerbation
- Possible glaucoma exacerbation

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Severe bronchospasm or status asthmaticus unresponsive to nebulized bronchodilators	10 to 16 mg IVP/IO push or IM	Administer in conjunction with magnesium sulfate and non-invasive ventilatory support (CPAP)
Moderate-severe allergic reaction AFTER IM epinephrine and IV/IO fluids	10 to 16 mg IV/IO or IM or PO	NOT 1st-line treatment of anaphylaxis
Adrenal crisis	10 to 16 mg IVP/IO push or IM	
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Bronchospasm unresponsive to nebulized bronchodilators in child at least 2 years of age OR history of asthma; or croup with stridor	0.6 mg/kg IV/IO or IM or PO • Maximum dose: 16 mg	Administer in conjunction with magnesium sulfate and non-invasive ventilatory support (e.g. CPAP)
Moderate-severe allergic reaction AFTER IM epinephrine and IV/IO fluids		NOT 1st-line treatment of anaphylaxis
Adrenal crisis	0.6 mg/kg IVP/IO or IM **with BioTel authorization** • Maximum dose: 16 mg	

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Dextrose 10% in Water (D10W)

CLASS: Carbohydrate

ACTIONS: Increases blood glucose level

INDICATIONS:

- Altered mental status (AMS) or other symptoms of hypoglycemia defined as POC glucose less than:
  - 80 mg/dL (non-diabetic adult), 110 mg/dL (diabetic adult), 70 mg/dL (pediatric), 45 mg/dL (newly born)
  - **AND patient unable to tolerate PO/SL glucose** (e.g. impaired gag or swallow reflex and/or AMS)

CONTRAINDICATIONS:

- Normoglycemia or hyperglycemia, especially in STEMI, stroke, or Traumatic Brain Injury (TBI)

SPECIAL NOTE:

- Premixed D10W is the 1st-line treatment for symptomatic hypoglycemia in patients unable to tolerate PO
  - It is supplied in 250-mL and 100-mL bags
- If premixed D10W is not available, D50 from a prefilled syringe and can be diluted with NS to make D10*

SIDE EFFECTS:

- Few, if administered according to instructions below

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
AMS, seizure or other symptoms of hypoglycemia **AND** pt. cannot take PO	12.5 grams (125 mL) (½ of a 250-mL bag) IV or IO: • Administer over 10 minutes • Treatment endpoints: improved mental status and clinical response (entire dose may not be needed) • May repeat once, if incomplete response	Monitor clinical response and perform repeat POC glucose after treatment
	***ALTERNATIVE** IF premixed D10W is unavailable: • Waste 50 mL from a 250-mL bag of NS • Replace with 50 mL of D50 (1 amp) • Administer 125 mL (½ bag) over 10 minutes • May repeat once, if incomplete response	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
AMS, seizure or other symptoms of hypoglycemia **AND** pt. cannot take PO	0.2 g/kg (2 mL/kg) IV or IO: • Administer over 5 to 10 minutes • Treatment endpoints: improved mental status and clinical response (entire dose may not be needed) • May repeat once, if incomplete response	Monitor clinical response and perform repeat POC glucose after treatment
	***ALTERNATIVE** IF premixed D10W is unavailable: • Waste 40 mL from a 50-mL D50 prefill syringe • Replace with 40 mL of NS • Administer 2 mL/kg over 5-10 minutes • May repeat once, if incomplete response	

*Alternative: Waste 20 mL of a 100-mL bag of NS and replace with 20 mL of D50 to make 100 mL of D10

BioTel

Dextrose 50% (D50)

Alternative (Not required for every agency, but must be carried if premixed D10W is unavailable)

CLASS: Carbohydrate

ACTIONS: Increases blood glucose level

INDICATIONS:

- Altered mental status (AMS) or other symptoms of hypoglycemia defined as POC glucose less than:
  - 80 mg/dL (non-diabetic adult), 110 mg/dL (diabetic adult), 70 mg/dL (pediatric), 45 mg/dL (newly born)
  - **AND patient unable to tolerate PO/SL glucose** (e.g. impaired gag or swallow reflex and/or AMS)
  - **AND D10W is unavailable (D10W is first-line treatment for all ages, if available)**

SPECIAL NOTE:

- **D50 MUST be diluted to D10 (adults or pediatrics) or D25** (adults only) before administration, except in austere conditions (e.g. cardiac arrest) – document reasons for the exception in ePCR**

CONTRAINDICATIONS:

- Normoglycemia or hyperglycemia, especially in STEMI, stroke, or Traumatic Brain Injury (TBI)

PRECAUTIONS:

- D50 (or D25) extravasation may cause severe tissue injury: report to E.D. personnel and document in ePCR

SIDE EFFECTS:

• Local:	• Systemic:
• Severe tissue necrosis	• Hyperosmolar syndrome, brain swelling (especially pediatrics)
• Vein irritation, phlebitis	• Overshoot hyperglycemia & rebound hypoglycemia

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
AMS, seizure or other symptoms of hypoglycemia **AND** pt. cannot take PO **AND** D10W is unavailable	12.5 grams (125 mL) of D10 in NS IV or IO: • Waste 50 mL from a 250-mL bag of NS • Replace with 50 mL of D50 (1 amp) • Administer 125 mL (½ bag) over 10 minutes • May repeat once, if incomplete response	Monitor clinical response and perform repeat POC glucose after treatment
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
AMS, seizure or other symptoms of hypoglycemia **AND** pt. cannot take PO **AND** D10W is unavailable	0.2 g/kg (2 mL/kg) of D10 in NS IV or IO: • Waste 50 mL from a 250-mL bag of NS • Replace with 50 mL of D50 (1 amp) • Administer 2 mL/kg over 5-10 minutes • May repeat once, if incomplete response	Monitor clinical response and perform repeat POC glucose after treatment

Refer to the next page for dosing alternatives, to be used under extenuating circumstances (e.g. drug shortage)

BioTel

SUPPLEMENTAL RESOURCES

Instructions for preparing D10 in NS if premixed D10W is unavailable:				
Desired volume of D10:	Initial Solution:	Waste from Initial Solution:	Replace with:	Final Solution:
50 mL	50 mL of D50	40 mL of D50	40 mL of NS	50 mL of D10
100 mL	100 mL of NS	20 mL of NS	20 mL of D50	100 mL of D10
250 mL	250 mL of NS	50 mL of NS	50 mL of D50	250 mL of D10
INITIAL DOSE (Adults at least 14 years of age): 100 mL (10 g) or 125 mL (12.5 g)				
INITIAL DOSE (Pediatrics): 2 mL/kg (0.2 g/kg) **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**				

**Instructions for preparing D25 in NS if premixed D10W is unavailable: ONLY for ADULTS at least 14 years of age and ONLY if D10 in NS cannot be prepared				
Desired volume of D25:	Initial Solution:	Waste from Initial Solution:	Replace with:	Final Solution:
50 mL	50 mL of D50	25 mL of D50	25 mL of NS	50 mL of D25
INITIAL DOSE (Adults at least 14 years of age): 50 mL (12.5 g)				
INITIAL DOSE (Pediatrics): 1 mL/kg - **Contact BioTel for authorization** **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**				

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Diazepam (Valium®)

Alternative (Not required for every agency, but must be carried if midazolam is unavailable)

CLASS: Benzodiazepine

ACTIONS: Short-acting CNS Depressant, anti-convulsant, sedative/hypnotic, amnestic; muscle relaxant

INDICATIONS:

- Seizures (status epilepticus)
- Procedural sedation (e.g. cardioversion, Transcutaneous Pacing (TCP))
- Sedation maintenance in ROSC after cardiac arrest with advanced airway
- Agitated patient who may be a danger to self or others (Excited Delirium Syndrome)
  - 2nd-line medication: Midazolam or ketamine is preferred for this indication, if available
  - Includes: adjunct administration after ketamine to prevent emergence reaction
- Shivering in patients with accidental hypothermia or during emergency cooling for heatstroke

CONTRAINDICATIONS:

- Hypersensitivity
- Pregnancy (except eclamptic seizure) (relative)
- Narrow-angle glaucoma
- Shock
- CNS or respiratory depression
- Alcoholic coma

PRECAUTIONS:

- Use with caution in patients who have taken other depressant drugs (e.g. alcohol, opioids, barbiturates)
- ALWAYS prepare for assisted ventilation/advanced airway, *especially in pediatric patients*
- Continuous monitoring of vital signs, SpO_2 and $PetCO_2$ is mandatory before and after administration

SIDE EFFECTS:

- Respiratory depression and arrest
- Hypotension
- Drowsiness and confusion
- Paradoxical reaction (excitement, agitation, delusions)
- Dizziness and ataxia
- Fatigue
- Nausea and vomiting
- Bradycardia and other dysrhythmias

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Seizures; or procedural sedation, e.g. for cardioversion or other painful procedure; or ROSC sedation maintenance	2.5 to 5 mg slow IV or IO or IM: • May repeat once after 5 to 10 minutes, if SBP remains at least 100 mmHg • Maximum, total, cumulative dose: 10 mg	IN route not favored
Combative patient/Excited Delirium Syndrome	5 mg IM or slow IV or IO: • May repeat once after 5 to 10 minutes, if SBP remains at least 100 mmHg • Maximum, total, cumulative dose: 10 mg	Ketamine and/or midazolam preferred
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Seizures	0.2 mg/kg IV/IO (maximum dose: 5 mg; no repeat) **OR** 0.5 mg/kg per rectum (PR) IF available on-scene: • Maximum single dose: 10 mg • Do not repeat	3rd-line treatment only if IN or IV midazolam unavailable
All other indications	**BioTel Authorization required** 0.2 mg/kg IV/IO (maximum dose: 5 mg; no repeat)	BioTel may authorize repeat

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Diphenhydramine HCl (Benadryl®)

CLASS: Antihistamine (histamine$_1$ blocker)

ACTIONS: Blocks histamine$_1$ receptor sites in allergic reaction; anticholinergic and anti-Parkinsonian effect reverses acute dystonic reaction due to certain medications (but is not a true antidote)

INDICATIONS:

- Symptomatic relief of hives and itching in mild allergic reaction
- Secondary, symptomatic relief in severe allergic reaction/anaphylaxis, AFTER epinephrine administration
- Treatment of dystonic reaction secondary to phenothiazines and other medications, such as Haldol®, Thorazine® and Compazine® (e.g. acute nystagmus (oculogyric crisis), torticollis and/or facial grimacing)

CONTRAINDICATIONS:

- Hypersensitivity
- Pregnancy (relative contraindication)

PRECAUTIONS:

- NOT **first-line** treatment for severe allergic reaction or anaphylaxis
- Additive effects in combination with alcohol and other CNS depressants
- Use with caution: asthma (thickening of bronchial secretions), COPD, cardiovascular disease or glaucoma

SIDE EFFECTS:

- CNS depression and drowsiness
- Disturbed coordination (ataxia)
- Hypotension (especially after IV/IO administration)
- Palpitations and tachycardia
- Bradycardia
- Dry mouth
- Thickening of bronchial secretions
- Paradoxical excitement (especially pediatric)

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Mild allergic reaction or acute dystonic reaction	25 – 50 mg IM, IV or IO: • Monitor for hypotension with IV/IO administration	Epinephrine IM is the 1st-line treatment of severe allergic reaction or anaphylaxis
Secondary treatment AFTER epinephrine for severe allergic reaction	As above	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Mild allergic reaction or acute dystonic reaction	1 mg/kg IM, IV or IO: • IM, IV or IO (using 50 mg/mL formulation): o Dilution is not necessary o Administer 1 mg/kg (0.02 mL/kg) o Monitor for hypotension after IV/IO administration	Epinephrine IM is the 1st-line treatment of severe allergic reaction or anaphylaxis
Secondary treatment AFTER epinephrine for severe allergic reaction	As above	

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Dopamine HCl (Intropin®)

OPTIONAL (Not required for every agency; 2nd-line alternative if norepinephrine is unavailable)

CLASS: Sympathomimetic (dopaminergic and adrenergic agonist); inotrope and chronotrope

ACTIONS: Dose-dependent stimulation of dopaminergic (low dose), beta$_1$-adrenergic (medium dose) and alpha-adrenergic (high dose) receptors

INDICATIONS:

- Second-line treatment of symptomatic bradycardia unresponsive to transcutaneous pacing and atropine
- Shock with systemic hypotension (SBP less than 90 mmHg), including cardiogenic shock

CONTRAINDICATIONS:

- Hypovolemic shock
- Tachydysrhythmias

PRECAUTIONS:

- Use with caution in cardiogenic shock with accompanying CHF
- In most cases, norepinephrine or epinephrine infusion will be first-choice, rather than dopamine infusion

SIDE EFFECTS:

- Tachyarrhythmias
- Hypertension
- Myocardial ischemia and chest pain
- Excessive vasoconstriction with peripheral ischemia
- Tissue necrosis if extravasation occurs

ADMINISTRATION NOTES:

- **Large-bore, antecubital IV preferred:** monitor closely for IV patency and signs of extravasation
- Do not administer in the same IV/IO line with sodium bicarbonate
- Continuous vital signs and ECG monitoring should be used before, during and after administration
- Dosage ranges:
  - 2 to 5 mcg/kg/min (dopaminergic): renal and mesenteric vasodilation (rarely indicated)
  - 5 to 10 mcg/kg/min (beta$_1$-adrenergic): increased cardiac contractility and heart rate
  - Greater than 10 mcg/kg/min (alpha-adrenergic): peripheral vasoconstriction and increased BP
  - Greater than 20 mcg/kg/min: strongly consider using a different vasoactive infusion

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Refractory, symptomatic bradycardia or shock	5 to 20 mcg/kg/minute IV/IO piggyback infusion: • Mix 400 mg in 250 mL NS (**1600 mcg/mL**) **OR** • Mix 800 mg in 500 mL NS (**1600 mcg/mL**); **OR** • Use premixed solution (**1600 mcg/mL**) • Titrate every 5 minutes to patient response (SBP at least 90 mmHg & improved perfusion)	**Infusion Rate:** **Refer to chart (next page)** **MANDATORY:** **Contact BioTel ASAP after starting infusion**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions**		
Refractory, symptomatic bradycardia or shock	**Dilute a dopamine solution from 1600 mcg/mL:** • Waste 50 mL from a 250-mL bag of NS • Replace with 50 mL (80 mg) of dopamine drawn from a 500-mL or 250-mL bag of dopamine **(final concentration: 320 mcg/mL)**	**Infusion Rate:** **See BioTel PEDI-Guide©** **MANDATORY:** **Contact BioTel ASAP after starting infusion**

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ADULT AT LEAST 14 YEARS OF AGE

DOPAMINE INFUSION (DRIP) GUIDE

Premixed solution or prepared from vial to 1600 mcg/mL final concentration

**** IMPORTANT: Use 60 gtt/mL drip set ****

MANDATORY: Contact BioTel ASAP after starting infusion

kg	5 mcg/kg/min	7.5 mcg/kg/min	10 mcg/kg/min	12.5 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min	lb
45	8 gtt/min	13 gtt/min	17 gtt/min	21 gtt/min	25 gtt/min	34 gtt/min	**99**
50	9 gtt/min	14 gtt/min	19 gtt/min	23 gtt/min	28 gtt/min	38 gtt/min	**110**
55	10 gtt/min	15 gtt/min	21 gtt/min	26 gtt/min	31 gtt/min	41 gtt/min	**121**
60	11 gtt/min	17 gtt/min	23 gtt/min	28 gtt/min	34 gtt/min	45 gtt/min	**132**
65	12 gtt/min	18 gtt/min	24 gtt/min	30 gtt/min	37 gtt/min	49 gtt/min	**143**
70	13 gtt/min	20 gtt/min	26 gtt/min	33 gtt/min	39 gtt/min	53 gtt/min	**154**
75	14 gtt/min	21 gtt/min	28 gtt/min	35 gtt/min	42 gtt/min	56 gtt/min	**165**
80	15 gtt/min	23 gtt/min	30 gtt/min	38 gtt/min	45 gtt/min	60 gtt/min	**176**
85	16 gtt/min	24 gtt/min	32 gtt/min	40 gtt/min	48 gtt/min	64 gtt/min	**187**
90	17 gtt/min	25 gtt/min	34 gtt/min	42 gtt/min	51 gtt/min	68 gtt/min	**198**
95	18 gtt/min	27 gtt/min	36 gtt/min	45 gtt/min	53 gtt/min	71 gtt/min	**209**
100	19 gtt/min	28 gtt/min	38 gtt/min	47 gtt/min	56 gtt/min	75 gtt/min	**220**
110	21 gtt/min	31 gtt/min	41 gtt/min	52 gtt/min	62 gtt/min	83 gtt/min	**242**
120	23 gtt/min	34 gtt/min	45 gtt/min	56 gtt/min	68 gtt/min	90 gtt/min	**264**
130	24 gtt/min	37 gtt/min	49 gtt/min	61 gtt/min	73 gtt/min	98 gtt/min	**286**
140	26 gtt/min	39 gtt/min	53 gtt/min	66 gtt/min	79 gtt/min	105 gtt/min	**308**
150	28 gtt/min	42 gtt/min	56 gtt/min	70 gtt/min	84 gtt/min	113 gtt/min	**330**

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PEDIATRIC LESS THAN 14 YEARS OF AGE

DOPAMINE INFUSION (DRIP) GUIDE

Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions

**** IMPORTANT: 1600 mcg/mL concentration must be diluted to 320 mcg/mL final concentration****

**** IMPORTANT: Use 60 gtt/mL drip set ****

Dosing: Start at 5 mcg/kg/min and increase every 5 minutes, as needed, to patient response and improved perfusion

MANDATORY: Contact BioTel ASAP after starting infusion

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Epinephrine 0.1 mg/mL ("1:10,000")

SPECIAL NOTE: FDA change in 2016 eliminated use of "1:10,000" labeling

CLASS: Sympathomimetic with alpha- and beta-adrenergic agonist properties

ACTIONS: Cardiovascular: ↑ HR & force of contraction; ↑ systemic vascular resistance and BP; ↑ myocardial oxygen consumption and automaticity; Respiratory: potent bronchodilator

INDICATIONS:

- Cardiac arrest
- Anaphylaxis unresponsive to other treatment
- Bradycardia with signs of poor perfusion unresponsive to oxygenation/ventilation and CPR (pediatrics)

CONTRAINDICATIONS:

- None

PRECAUTIONS:

- Patients on beta-blockers may need higher doses and/or adjunct glucagon
- Incompatible with sodium bicarbonate: flush IV/IO line well between drugs

SIDE EFFECTS:

- Tachycardia, palpitations and dysrhythmias
- Hypertension
- Chest pain
- Tremors
- Nausea/vomiting
- Headache

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Cardiac arrest	1 mg (10 mL) IVP/IOP: • May repeat up to 2 more times, every 5 to 6 minutes, if needed • Maximum number of standing order doses: 3	Follow relevant CPG
Severe anaphylaxis/shock with cardiovascular collapse unresponsive to other measures or impending cardiorespiratory arrest	• Add 1 mg (10 mL) to 1 L of NS (1 mcg/mL) • **Use 10 gtt/mL drip set** • Infuse @ 2 to 10 **mcg/min** (20 to 100 **mL/minute**) • Titrate every 5 min by 2 mcg/min to SBP at least 90 mmHg and improved perfusion o Maximum rate: 10 mcg/min (100 mL/min) **OR** • See next page for alternative IV slow bolus dose in select, non-elderly patients if infusion is unavailable	**Infusion Rate: Refer to chart (next page)** **MANDATORY: Contact BioTel ASAP after starting infusion**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Cardiac arrest; or unstable bradycardia with signs of poor perfusion unresponsive to oxygenation/ventilation and CPR	0.01 mg/kg (0.1 mL/kg) IVP/IOP: • May repeat up to 2 more times, every 5 to 6 minutes, if needed • Maximum number of standing order doses: 3	Follow relevant CPG
Severe anaphylaxis/shock, with cardiovascular collapse unresponsive to other measures or impending cardiorespiratory arrest	• Add 1 mg (10 mL) to 250 mL of NS (4 mcg/mL) • See dosing chart next page & BioTel PEDI-Guide© • Titrate to SBP at least (70 + (2 x age)) mmHg and improved perfusion o Maximum rate: 1 mcg/kg/min	**MANDATORY: Contact BioTel ASAP after starting infusion**

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ADULT AT LEAST 14 YEARS OF AGE

EPINEPHRINE INFUSION (DRIP) GUIDE

Add 1 mg (10 mL) "cardiac" epinephrine prefilled syringe (0.1 mg/mL) to 1 L NS*

Final concentration: 1 mcg/mL

- **IMPORTANT: Use 10 gtt/mL drip set**

Start at 2 mcg/min and increase by 2 mcg/min every 5 minutes, as needed, to achieve SBP at least 90 mmHg and improved perfusion

Maximum infusion rate: 10 mcg/min (100 gtt/min)

MANDATORY: Contact BioTel ASAP after starting infusion

Dose (mcg/min)	Rate (gtt/min with 10 gtt/mL drip set)
2	20
4	40
6	60
8	80
10	100

ALTERNATE EPINEPHRINE IV BOLUS DOSING FOR *REFRACTORY ANAPHYLAXIS/SHOCK*

ONLY ADULTS 14 TO 55 YEARS OF AGE

AND

ONLY IF DILUTE EPINEPHRINE INFUSION (DRIP) CANNOT BE USED

Dose of Epinephrine	Epinephrine Strength	Added To	Final Concentration
1 mL (0.1 mg)	**0.1 mg/mL** (1:10,000)	**9 mL Normal Saline**	**10 *mcg*/mL**

Dosing: Administer 10 mL (0.1 mg) IV VERY SLOW PUSH OVER **5-10 MINUTES** (10-20 mcg/min)
NOTE: This is ~1/10th the adult dose of IV epinephrine administered during cardiac arrest

PEDIATRIC LESS THAN 14 YEARS OF AGE

EPINEPHRINE INFUSION (DRIP) GUIDE

Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions

Add 1 mg (10 mL) "cardiac" epinephrine prefilled syringe (0.1 mg/mL) to 250 mL NS

Final concentration: 4 mcg/mL

- **IMPORTANT: Use 60 gtt/mL drip set**

Infants less than 1 year of age: Start at 0.1 mcg/kg/min

Increase by 0.1 mcg/kg/min every 5 minutes, to achieve target SBP & improved perfusion

MANDATORY: Contact BioTel ASAP after starting infusion

Children at least 1 year of age: Start at 2 mcg/min

Increase by 2 mcg/min every 5 minutes, to achieve target SBP & improved perfusion

MANDATORY: Contact BioTel ASAP after starting infusion

***If 1-L NS is unavailable, to prepare infusion at 1 mcg/mL:**

EITHER add 0.5 mg (5 mL) of "cardiac" epinephrine **(0.1 mg/mL)** to 500 mL NS;
OR add 0.25 mg (2.5 mL) of "cardiac" epinephrine **(0.1 mg/mL)** to 250 mL NS.

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Epinephrine 1 mg/mL ("1:1000")

SPECIAL NOTE: FDA change in 2016 eliminated use of "1:1000" labeling

CLASS: Sympathomimetic with alpha- and beta-adrenergic agonist properties

ACTIONS: Cardiovascular: ↑ HR & force of contraction; ↑ systemic vascular resistance and BP; ↑ myocardial oxygen consumption and automaticity; Respiratory: potent bronchodilator

INDICATIONS:

- **IM** administration: moderate-severe allergic reaction/anaphylaxis or severe bronchospasm (asthma, COPD)
- **Nebulized** administration: croup (pediatrics) or (rarely) children under 2 with respiratory distress
- [IV use (e.g. cardiac arrest, bradycardia): ***ONLY*** if epinephrine 0.1 mg/mL is unavailable ***AND ONLY*** if diluted]

CONTRAINDICATIONS:

• Allergic reaction/anaphylaxis: • NONE	• Refractory bronchospasm: • Heart disease, acute MI, age at least 45 years, arrhythmia, or labor

PRECAUTIONS:

- Patients on beta-blockers may need higher doses and/or adjunct glucagon
- Wheezing in elderly patient should be treated as pulmonary edema (not asthma) until proved otherwise

SIDE EFFECTS:

• Tachycardia, palpitations and dysrhythmias • Hypertension • Chest pain	• Tremors • Nausea/vomiting • Headache

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Systemic allergic reaction; or severe bronchospasm unresponsive to inhaled bronchodilators, CPAP and magnesium sulfate	**0.3 to 0.5 mg IM:** • May repeat up to 2 more times, every 10 minutes, if needed • Maximum number of standing order doses: 3 • Maximum, total, cumulative dose: 1 mg	1st-line treatment for systemic allergic reaction or anaphylaxis
Cardiac arrest: asystole/PEA or refractory/recurrent VFib or pulseless VTach	**Dilute 1 mg (1 mL) with 9 mL NS:** • Administer 1 mg (10 mL) IVP/IO per CPG • Maximum number of standing order doses: 3 • BioTel may authorize additional doses	**Do NOT administer IV or IO without dilution**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Systemic allergic reaction; or severe bronchospasm unresponsive to inhaled bronchodilators, CPAP and magnesium sulfate	0.01 mg/kg (0.01 mL/kg) IM: • May repeat up to 2 more times, every 10 minutes, if needed • Maximum number of standing order doses: 3 • Maximum, total, cumulative dose: 1 mg	1st-line treatment for systemic allergic reaction/anaphylaxis; Maximum single dose: 0.4 mg (0.4 mL)
Respiratory distress/tachypnea in children under 2 years of age without wheezing	Consider: 3 mg (3 mL) via nebulizer, single dose	
Cardiac arrest (as above) or unstable bradycardia	**Dilute as above for adult, BUT:** • Administer 0.01 mg/kg (0.1 mL/kg) IVP/IO	**Do NOT administer IV or IO without dilution**
Croup with stridor at rest	• Less than 2 yr: 3 mg (3 mL) via nebulizer • 2 yr and older: 5 mg (5 mL) via nebulizer	Do not use albuterol

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ADULT AT LEAST 14 YEARS OF AGE EPINEPHRINE INFUSION (DRIP) GUIDE
If "cardiac" epinephrine is unavailable, add 1 mg (1 mL) of epi 1 mg/mL to 1 L NS*
Final concentration: 1 mcg/mL
➢ IMPORTANT: Use 10 gtt/mL drip set
Start at 2 mcg/min and increase by 2 mcg/min every 5 minutes, as needed, to achieve SBP at least 90 mmHg and improved perfusion
Maximum infusion rate: 10 mcg/min (100 gtt/min)
MANDATORY: Contact BioTel ASAP after starting infusion

Dose (mcg/min)	Rate (gtt/min with 10 gtt/mL drip set)
2	20
4	40
6	60
8	80
10	100

ALTERNATE, ADULT EPINEPHRINE IV/IO PUSH DOSING FOR *CARDIAC ARREST* ONLY IF STANDARD "CARDIAC" EPINEPHRINE (0.1 mg/mL) IS UNVAILABLE			
Dose of Epinephrine	**Epinephrine Strength**	**Added To**	**Final Concentration**
1 mL (1 mg)	**1 mg/mL** (1:1,000)	**9 mL Normal Saline**	**100 *mcg*/mL**
Dosing: Administer 10 mL (1 mg) IV/IO Push **NOTE:** This is the full adult, cardiac arrest dose of IV epinephrine			

ALTERNATE EPINEPHRINE IV INFUSION (DRIP) FOR *REFRACTORY ANAPHYLAXIS/SHOCK* ONLY IF STANDARD "CARDIAC" EPINEPHRINE (0.1 mg/mL) IS UNVAILABLE			
Dose of Epinephrine	**Epinephrine Strength**	**Added To**	**Final Concentration**
1 mL (1 mg)	**1 mg/mL** (1:1,000)	**1000 mL Normal Saline***	**1 *mcg*/mL**
Dosing: Administer 10 mL (0.1 mg) IV VERY SLOW PUSH OVER **5-10 MINUTES** (10-20 mcg/min) **NOTE:** This is ~1/10th the adult dose of IV epinephrine administered during cardiac arrest			

PEDIATRIC LESS THAN 14 YEARS OF AGE
EPINEPHRINE INFUSION (DRIP) GUIDE
Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions
If "cardiac" epinephrine is unavailable, add 1 mg (1 mL) of epi 1 mg/mL to 250 mL NS
Final concentration: 4 mcg/mL
➢ IMPORTANT: Use 60 gtt/mL drip set
MANDATORY: Contact BioTel ASAP after starting infusion

***If 1-L NS is unavailable, to prepare infusion at 1 mcg/mL:**
EITHER add 0.5 mg (0.5 mL) of epinephrine **(1 mg/mL)** to 500 mL NS;
OR add 0.25 mg (0.25 mL) of epinephrine **(1 mg/mL)** to 250 mL NS.

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Epinephrine Auto-Injector (EpiPen®, EpiPen-Jr®, Auvi-Q®)

OPTIONAL (Not required for every agency)

CLASS: Sympathomimetic with alpha- and beta-adrenergic agonist properties

ACTIONS: Cardiovascular: ↑ HR & force of contraction; ↑ systemic vascular resistance and BP; ↑ myocardial oxygen consumption and automaticity; Respiratory: potent bronchodilator

INDICATIONS:

- Moderate/severe allergic reaction or anaphylaxis with systemic signs and symptoms (1st-line treatment):
  - To expedite treatment, BLS and ALS Providers may assist patient with administration of any (unexpired) epinephrine auto-injector (EA) available on-scene:
    - Patient's own or carried by EMS agency apparatus
  - A BioTel-approved "BLS Epi kit" may be used by ALS and by appropriately-trained BLS Providers:
    - Written agency authorization by the Medical Director for BLS use is required

CONTRAINDICATIONS:

- No absolute contraindication
- Mild allergic reaction (relative contraindication)

PRECAUTIONS:

- IM epinephrine administration delay in patients with history of anaphylaxis is associated with risk of death
- Patients on beta-blockers may need higher doses and/or adjunct glucagon

SIDE EFFECTS:

- Tachycardia, palpitations and dysrhythmias
- Hypertension
- Chest pain
- Tremors
- Nausea/vomiting
- Headache

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Moderate/severe allergic reaction: wheezing, stridor, or shock	One adult EA injection (0.3 mg) IM: • Anterolateral, mid-thigh • Hold firmly against skin for at least 3 seconds, or per device manufacturer recommendation • May repeat every 10 minutes, if available & if needed • Maximum total number of doses: 3, if available	Proceed ASAP to ALS treatment per Allergic Reaction CPG
PEDIATRIC 1 TO 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Moderate/severe allergic reaction: wheezing, stridor, or shock AND weight between 15 and 30 kg	One pediatric EA injection (0.15 mg) IM: • Anterolateral, mid-thigh • Hold firmly against skin for at least 3 seconds, *or per device manufacturer recommendation* o Hold leg firmly in place during injection • May repeat every 10 minutes, if available & if needed • Maximum total number of doses: 3, if available • Consider syringe-dose epi for infant under 15 kg	Proceed ASAP to ALS treatment per Allergic Reaction CPG **BioTel authorization required for EA administration in infant under 1 year of age**
Moderate/severe allergic reaction: wheezing, stridor, or shock AND weight at least 30 kg	One adult EA injection (0.3 mg) IM: • Instructions as above	

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Etomidate (Amidate®)

OPTIONAL (Not required for every agency; training & Medical Director authorization required for use)

CLASS: Short-acting general anesthetic (sedative/hypnotic)

ACTIONS: Suppresses CNS activity to cause rapid unconsciousness; no analgesic activity

INDICATIONS:

- Sedation premedication for Pharmacologically Assisted Intubation (PAI):
  - Provider training and Written Medical Director authorization required

CONTRAINDICATIONS:

- Hypersensitivity
- No other absolute contraindications for EMS
- Known adrenal insufficiency (e.g.
- Pregnancy/lactation (relative)

PRECAUTIONS:

- Risk of adrenal suppression in sepsis and pediatric neurotoxicity not significant with short-term EMS use
- However, use of other sedative agents (e.g. ketamine or benzodiazepines) should be considered

SIDE EFFECTS (SHORT-TERM):

- Myoclonus and transient skeletal muscle movement
- Hypotension (especially with rapid injection)
- Nausea/vomiting with emergence
- Apnea and hypoventilation
- Hiccups, coughing
- Injection site pain
- Hypertension
- Laryngospasm

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
PAI premedication	0.3 mg/kg slow IV/IO one minute prior to intubation: • Inject over 10 seconds • Repeat after 3 minutes with one additional dose at 0.1 mg/kg, if needed • Maximum, total, cumulative dose: 40 mg	
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
PAI premedication	0.3 mg/kg slow IV/IO one minute prior to intubation: • Inject over 30 to 60 seconds • Maximum, total, cumulative dose: 40 mg • Contact BioTel if additional doses are needed	**Contact BioTel ASAP, preferably before procedure**

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Fentanyl (Sublimaze®)

Alternative (Not required for every agency; if unavailable, may substitute morphine sulfate per CPG)

CLASS: Narcotic (opioid) analgesic, synthetic

ACTIONS: Potent analgesia and sedation, approximately 50-100 times more potent than morphine

INDICATIONS:

- Ischemic chest pain unresponsive to nitroglycerin (preferred over morphine sulfate)
- Moderate-severe acute, pain due to fractures, burns, amputations, head injury, sickle cell or other causes
- Treatment endpoint: patient comfort and reduced pain, not total pain elimination
- Sedation premedication – with midazolam – for Pharmacologically Assisted Intubation (PAI)

CONTRAINDICATIONS:

- Hypersensitivity
- SBP less than 90 mmHg (or age-specific equivalent)
- Co-administration with benzodiazepines (relative), except for PAI
- Respiratory depression
- Hypovolemia or shock
- OB patients in active labor (relative)

PRECAUTIONS:

- Do not administer unless naloxone and advanced airway control measures are readily available
- Continuously monitor ECG, vital signs (including SpO_2 and $PetCO_2$), and level of consciousness
- Synergistic respiratory depression with other CNS depressants, e.g. alcohol, benzodiazepines

SIDE EFFECTS:

- **Respiratory depression or arrest**
- Hypotension (less common than morphine)
- Weakness
- Chest wall rigidity (especially with rapid IV dosing)
- Confusion, dizziness or sedation
- Nausea/vomiting

SPECIAL NOTE – BioTel authorization required if:

- SBP less than 90 mmHg (or age-specific equivalent)
- Hypoxia (SpO_2 less than 90%)
- Debilitated patient
- Hypercarbia ($PetCO_2$ greater than 45 mmHg)
- Altered mental status (AMS)

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute ischemic chest pain unrelieved by NTG or acute traumatic or sickle cell pain; AND no contraindications	1 mcg/kg slow IV/IO or IM or IN: • Maximum single dose: 100 mcg • May repeat once after 10-15 minutes • Total, maximum, cumulative dose: 200 mcg	Administer **0.5 mcg/kg** if patient 65 years or older & monitor for adverse effects
PAI premed with midazolam	1 mcg/kg IV/IO one minute before intubation	
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Acute traumatic pain AND no contraindications	As above	**Contact BioTel ASAP for infant less than 1 yr**
PAI premed with midazolam	1 mcg/kg IV/IO one minute before intubation: • Maximum single dose: 100 mcg	**Contact BioTel ASAP**
Acute ischemic chest pain	**Contact BioTel for authorization and dosing**	Rare in pediatrics

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Glucagon

CLASS: Pancreatic peptide hormone; insulin antagonist

ACTIONS: Mobilizes glucose from body glycogen stores to raise blood glucose levels

INDICATIONS:

- Third-line treatment of symptomatic hypoglycemia when oral treatment is not indicated or available AND when reasonable attempts at IV/IO access are unsuccessful or parenteral dextrose is unavailable
- Beta-blocker (BB) toxicity (symptomatic bradycardia or cardiac arrest) (higher pediatric dose required)

CONTRAINDICATIONS:

- Hypersensitivity
- Hyperglycemia
- Insulinoma

PRECAUTIONS:

- PO/buccal glucose or IV/IO dextrose is the treatment of choice for symptomatic hypoglycemia.
- Glucagon is reserved for patients who are seizing, comatose, or combative without IV/IO access, OR for circumstances when parenteral dextrose is unavailable.
- Reduced efficacy in patients with depleted glycogen stores e.g. chronic alcoholism, malnutrition, or young children.
- Supplemental carbohydrates should be given to prevent rebound hypoglycemia as soon as patient is conscious enough to tolerate oral intake.
- Patients sick enough to need glucagon should be transported to an E.D. for evaluation and treatment.

SIDE EFFECTS:

- Nausea and vomiting
- Hypotension
- Tachycardia
- Rebound hypoglycemia

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Symptomatic hypoglycemia: unable to take PO and no IV/IO	1 mg IM or IN: • May repeat once after 20 minutes, if needed • If pt has IV/IO access, treat with dextrose instead	Monitor clinical response and perform repeat POC glucose after treatment; transport
Symptomatic bradycardia or cardiac arrest due to BB toxicity	1 mg IV/IO (preferred) or IM or IN: • May repeat once after 10 minutes, if needed	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Symptomatic hypoglycemia: unable to take PO and no IV/IO	Neonate less than 1 month of age: **Contact BioTel** Infant 1 month to 4 years of age: 0.5 mg IM or IN Child 5 years to 13 years of age: 1 mg IM or IN • May repeat once after 20 minutes, if needed • If pt has IV/IO access, treat with dextrose instead	Monitor clinical response and perform repeat POC glucose after treatment; transport
Symptomatic bradycardia or cardiac arrest due BB toxicity	Neonate less than 1 month of age: **Contact BioTel** Infant 1 month to 1 year of age: 0.5 mg IV/IO or IM/IN Child 1 year to 13 years of age: 1 mg IV/IO or IM/IN • May repeat once after 10 minutes, if needed	

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Glucose (40% Oral Gel) (Glutose®)

CLASS: Carbohydrate

ACTIONS: Increases blood glucose level

INDICATIONS:

- Altered mental status (AMS) or other symptoms of hypoglycemia defined as POC glucose less than:
  - 80 mg/dL (non-diabetic adult), 110 mg/dL (diabetic adult), 70 mg/dL (pediatric), 45 mg/dL (newly born)

CONTRAINDICATIONS:

- Absent gag reflex or inability to protect airway
- Inability to swallow
- Normoglycemia or hyperglycemia

PRECAUTIONS:

- Clinical response may be delayed in elderly and those with poor circulation
- Young infants/children should be sitting upright or in the recovery position (massage into cheek mucosa)
- Neonates: administer into cheek pocket and massage into mucosa

SIDE EFFECTS:

- Hyperglycemia
- Aspiration
- Potential worsening: STEMI, stroke, TBI

HOW SUPPLIED:

- 40% Gel (15 grams in 1.3 oz. **(approximately 37.5 mL) per tube)**
- Agencies carrying a different size unit dose will need to adjust dosing, especially for pediatric patients

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Symptomatic hypoglycemia with intact gag and swallow reflexes	1 tube (15 g) buccal or SL: • May repeat once after 10 minutes, if needed	Monitor clinical response and perform repeat POC glucose after treatment
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing instructions**		
Tube contents may be transferred to a syringe to facilitate more accurate dosing		
Symptomatic hypoglycemia **with intact gag and swallow reflexes**	0.5 g/kg gently massaged into cheek pocket (buccal) mucosa, based on 15-gram unit dose tube: • Infant (1 mo. to 1 yr; less than 10 kg): 5 mL • 1 yr to 3 yr (approximately 15 kg): 7.5 mL • 3 yr to 5 yr (approximately 20 kg): ¼ tube • 5 yr to 7 yr (approximately 25 kg): ½ tube • At least 7 yr (at least 30 kg): 1 tube • May repeat once after 10 minutes, if needed • Monitor closely for pulmonary aspiration	Monitor clinical response and perform repeat POC glucose after treatment
Newly born infant under 1 month of age with symptomatic hypoglycemia and intact gag and swallow reflexes	0.2 g/kg (5 mL/kg) gently massaged into cheek pocket (buccal) mucosa (not SL or swallowed): • Use with extreme caution in depressed infant, monitoring closely for pulmonary aspiration	Monitor clinical response and perform repeat POC glucose after treatment

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Hydroxocobalamin (Cyanokit®)

OPTIONAL (Not required for every agency)

CLASS: Cyanide antidote

ACTIONS: Vitamin B_{12a} molecule complexed to cobalt: cyanide displaces the cobalt, binding to the molecule and creating cyanocobalamin, which is then excreted in the urine

INDICATIONS:

- Confirmed or suspected cyanide poisoning
- Smoke inhalation with suspected cyanide poisoning (coma, persistent hypotension or cardiorespiratory arrest)

CONTRAINDICATIONS:

- No absolute contraindications
- Hypersensitivity (relative)

PRECAUTIONS:

- Pregnancy or lactation
- **IV administration strongly preferred over IO route (glass vial prevents use of pressure bag)**
- Dedicated, second IV/IO line should be used for administration, if possible
- Do not administer in the same IV/IO line with other cyanide antidotes, e.g. "Pasadena kit" or "Lilly kit"
- Do not administer in same IV/IO line with dopamine, fentanyl, diazepam or nitroglycerin

SIDE EFFECTS:

- Erythema (skin redness)
- Transient elevated BP
- Nausea and headache
- Chest tightness and dyspnea
- Urticaria
- Anaphylaxis
- Infusion-site local reactions
- Chromaturia (red urine), red tears, red sweat

SPECIAL NOTES:

- May interfere with SpO_2 and carbon monoxide oximetry measurements: if CO poisoning is suspected, obtain SpCO measurement ***before*** hydroxocobalamin administration, if available and if possible

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Cyanide toxicity	Reconstitute 5 grams in 200 mL NS (or LR): • Invert/rock vial for 30 seconds: do NOT shake • Administer 5 grams IV over 15 min. (~15 mL/min) • May repeat once after 30 min, if patient still symptomatic • Total, maximum, cumulative dose: 10 g	Normal Saline diluent is NOT included in the kit **Use 20 gtt/mL drip set included in kit**
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions**		
Cyanide toxicity	Reconstitute 5 grams in 200 mL NS (or LR) and administer IV • Invert/rock vial for 30 seconds: do NOT shake • Under 3 mo: Administer 15 gtt/min for 15 minutes (1/16 vial) • 3 to 23 mo: Administer 30 gtt/min for 15 minutes (1/8 vial) • 2 to 6 yr: Administer 60 gtt/min for 15 minutes (1/4 vial) • 7 to 13 yr: Administer 120 gtt/min for 15 minutes (1/2 vial) • **Set timer to stop infusion after 15 minutes** • Contact BioTel for dosing or other assistance, if needed	Normal Saline diluent is NOT included in the kit **Use 20 gtt/mL drip set included in kit**

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Ipratropium Bromide (Atrovent®)

CLASS: Anticholinergic/parasympatholytic

ACTIONS: Local, site-specific bronchodilation, via inhibition of vagally-mediated reflexes

INDICATIONS:

- **ONLY** as a supplement to nebulized beta-agonist bronchodilators in the following circumstances:
- Acute bronchospasm due to asthma, bronchiolitis (pediatrics), COPD (adults), and allergic reaction
- Acute bronchospasm due to chemical toxin exposure (e.g. respiratory irritants, organophosphates, cyanide or blister agents)

CONTRAINDICATIONS:

- Hypersensitivity to ipratropium, to atropine or to its derivatives, BUT:
- Peanut or soy allergy is NOT a contraindication to use of NEBULIZED ipratropium
- Peanut or soy allergy is NOT a contraindication to current formulations of ipratropium metered dose inhalers (MDI) or auto-halers (e.g. patient self-medications)
- Pediatric patients less than 2 years of age, unless authorized by online Medical Control physician

PRECAUTIONS:

- Use with caution in patients with known heart disease (e.g. CHF, coronary artery disease), prostatic hypertrophy (enlarged prostate) or glaucoma
- Continuous ECG monitoring should be used in order to detect cardiac dysrhythmia

SIDE EFFECTS:

- Tachycardia and palpitations
- Restlessness/nervousness
- Blurred vision
- Dry mouth
- Cough and worsening respiratory symptoms
- Urinary retention

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute bronchospasm unresponsive to initial beta-agonist dose (asthma, COPD, allergic reaction, or chemical toxin)	0.5 mg Nebulized, *with albuterol 2.5 mg* in 3 mL NS, for 2nd and 3rd nebulizer doses, repeated every 5-10 minutes, as needed	Maximum total: 2 doses
Status asthmaticus	0.5 mg Nebulized, *with albuterol 2.5 mg* in 3 mL NS: • May repeat twice every 5-10 min, up to total 3 doses	Maximum total: 3 doses
PEDIATRIC AT LEAST 2 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Acute bronchospasm unresponsive to initial beta-agonist dose (asthma, COPD, allergic reaction, or chemical toxin)	As above	Maximum total: 2 doses
Status asthmaticus	As above	Maximum total: 3 doses

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Ketamine HCl (Ketalar®)

OPTIONAL (Not required for every agency; training & Medical Director authorization required for use)

CLASS: Dissociative anesthetic with amnestic and analgesic properties

ACTIONS: Anesthesia with preserved airway reflexes, spontaneous respirations and cardiovascular stability; bronchial smooth muscle relaxation; release of endogenous catecholamines

INDICATIONS (PROVIDER TRAINING AND WRITTEN MEDICAL DIRECTOR AUTHORIZATION REQUIRED):

- Treatment of Excited Delirium Syndrome (ExDS) **(ADULTS ONLY)**
- Premedication adjunct for Pharmacologically Assisted Intubation (PAI) or procedural sedation (e.g. pacing)
- Analgesia adjunct for moderate-severe acute pain unrelieved by opioids, including head injury/TBI
- Sole or primary analgesia for moderate-severe acute pain ONLY if opioids are unavailable or contraindicated

CONTRAINDICATIONS:

- Hypersensitivity
- Coronary artery disease
- Pregnancy
- Infants less than 6 months of age
- Any patient for whom significantly elevated BP might pose a serious hazard
- Known or suspected alcohol abuse (relative)

PRECAUTIONS:

- Administration in conjunction with a benzodiazepine in adults may reduce the incidence of emergence reaction, but may result in synergistic respiratory depression or apnea
- Use with caution in elderly patients, especially with history of cardiovascular disease, or in any patient for whom hypertension or tachycardia may be undesirable

SIDE EFFECTS:

- Tachycardia and hypertension
- Respiratory depression and apnea
- Laryngospasm (especially pediatrics)
- Salivary hypersecretion
- Hallucinations, confusion, agitation, delirium
- Emergence reaction

ADMINISTRATION NOTES:

- The 100 mg/mL and 50 mg/mL strengths used for sedation dosing must **NOT** be used for pain management
- **Analgesic dose ("Low-Dose Ketamine" (LDK)) is approximately 1/10th the sedative dose**
- **For circumstances where the 100 mg/mL OR 50 mg/mL formulation must be diluted and/or reduced for adult or pediatric administration, the BioTel MACC MUST be used to reduce risk of dosing error**

	LDK (Pain)		Sedation/ExDS	
	IV/IO	IM/IN	IV/IO	IM/IN
Adult	**Diluted**	**Diluted**	**From vial**	**From vial**
Pediatric	**Diluted**	**Diluted**	**Diluted**	**From vial**

- Resuscitation equipment should be ready before administration, especially for patients given benzodiazepines Slow intravenous administration - especially for sedation doses - over 1 to 2 minutes may reduce the risk of respiratory depression, apnea or enhanced pressor response
- Do not mix ketamine and diazepam in the same syringe

ADULT AND PEDIATRIC DOSAGE:

- **Refer to dosing charts on the next four pages**

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ADULT KETAMINE		
100 mg/mL STARTING CONCENTRATION		
Use BioTel MACC to ensure correct dose		
ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Excited Delirium Syndrome (ExDS) or combative patient	One dose @ 2 mg/kg IV/IO **(from 100 mg/mL vial)** ***OR*** 4 mg/kg IM/IN (**from 100 mg/mL vial**): • Maximum dose 500 mg • If possible, split large IM/IN dose greater than 300 mg (3 mL) into 2 IM injections or divide IN dose between both nares • Contact BioTel for additional dosing	IM or IV/IO dosing preferred over IN route
PAI Premedication or procedural sedation, e.g. Transcutaneous Pacing (TCP)	2 mg/kg IV/IO **(from 100 mg/mL vial)** or 4 mg/kg IM **(from 100 mg/mL vial)** one minute prior to intubation or procedure: • Contact BioTel for additional dosing	May repeat once at 2 mg/kg IV/IO/IM after 10 minutes, to maintain post-intubation sedation
LDK Analgesia ADJUNCT for *acute pain unrelieved by opioids* (or if opioids are unavailable)	20 mg in 100 mL Normal Saline IV/IO **(diluted)**: • Add 20 mg (0.2 mL of **100 mg/mL** strength) to 100 mL NS • Administer IV/IO over 15 minutes (approximately 1 gtt/sec with 10 gtt/mL IV set) • Maximum single dose: 20 mg • May repeat once after 15 minutes, if needed • Total, maximum, cumulative dose: 40 mg **OR**	Discontinue infusion if adverse side effects develop (e.g. apnea, laryngospasm, decreased SpO_2, vomiting, hallucinations, or delirium)
	0.4 mg/kg **IM or IN (diluted)**: • Dilute 100 mg/mL strength to 10 mg/mL before administration for pain management • Maximum single dose: 40 mg • May repeat once after 15 minutes, if needed • Total, maximum, cumulative dose: 80 mg	**100 mg/mL formulation MUST be diluted for IM/IN LDK pain management:** • Waste 1 mL from a 10-mL NS flush • Replace with 1 mL (100 mg) of ketamine • Final concentration: **10** mg/mL If IM/IN volume is greater than 3 mL, split dose into 2 IM injections or divide IN dose between both nares

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Pediatric ketamine dosing guidelines for 100 mg/mL formulation on the next page

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<table>
<tr><th colspan="3">PEDIATRIC KETAMINE</th></tr>
<tr><th colspan="3">100 mg/mL STARTING CONCENTRATION</th></tr>
<tr><th colspan="3">Use BioTel MACC and BioTel PEDI-Guide© to ensure correct dose</th></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="3">PEDIATRIC AT LEAST 6 MONTHS AND LESS THAN 14 YEARS OF AGE
Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions</td></tr>
<tr><td>Excited Delirium Syndrome (ExDS) or combative patient</td><td colspan="2">Contraindicated unless specifically authorized by an online Medical Control Physician</td></tr>
<tr><td>PAI Premedication
OR
Procedural sedation, e.g. Transcutaneous Pacing (TCP) – contact BioTel BEFORE administering ketamine in this setting</td><td>2 mg/kg IV/IO (0.02 mL/kg; diluted) or 4 mg/kg IM (0.04 mL/kg direct from 100 mg/mL vial) one minute prior to intubation or procedure:
• Max. single dose: 100 mg IV/IO; 200 mg IM
• Divide IM dose if volume 3 mL or greater
• May repeat once, if needed, at 2 mg/kg IV/IO/IM after 10 minutes, to maintain post-intubation sedation
• Contact BioTel for additional dosing</td><td rowspan="3">IMPORTANT:
100 mg/mL formulation MUST be DILUTED for pediatric ALL pediatric administration EXCEPT IM/IN sedation.

Dilution recipe for IV/IO LDK pain, IM/IN LDK Pain, and IV/IO sedation:
• Waste 1 mL from a 10-mL NS flush
• Replace with 1 mL (100 mg) of ketamine
• Final concentration: 10 mg/mL</td></tr>
<tr><td rowspan="2">LDK Analgesia ADJUNCT for acute pain unrelieved by opioids (or if opioids are unavailable)</td><td>0.2 mg/kg (0.02 mL/kg; diluted) SLOW IV/IO over 1 to 2 minutes:
• Maximum single dose: 20 mg (2 mL)
• May repeat once after 15 minutes, if needed
• Maximum, cumulative dose: 40 mg (4 mL)
• Contact BioTel for additional dosing

OR</td></tr>
<tr><td>0.4 mg/kg (0.04 mL/kg; diluted) IM or IN:
• Maximum single dose: 40 mg (4 mL)
o Divide IN dose between both nostrils
o Divide IM dose if volume 3 mL or more
• May repeat once after 15 minutes, if needed
• Maximum, cumulative dose: 80 mg (8 mL)
• Contact BioTel for additional dosing</td></tr>
</table>

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ADULT KETAMINE		
ALTERNATE: 50 mg/mL STARTING CONCENTRATION		
Use BioTel MACC to ensure correct dose		
ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Excited Delirium Syndrome (ExDS) or combative patient	One dose @ 2 mg/kg IV/IO **(from 50 mg/mL vial)** ***OR*** 4 mg/kg IM/IN **(from 50 mg/mL vial)**: • Maximum dose 500 mg • If possible, split large IM/IN dose greater than 150 mg (3 mL) into 2 IM injections or divide IN dose between both nares • Contact BioTel for additional dosing	IM or IV/IO dosing preferred over IN route
PAI Premedication or procedural sedation, e.g. Transcutaneous Pacing (TCP)	2 mg/kg IV/IO **(from 50 mg/mL vial)** or 4 mg/kg IM **(from 50 mg/mL vial)** one minute prior to intubation or procedure: • Contact BioTel for additional dosing	May repeat once at 2 mg/kg IV/IO/IM after 10 minutes, to maintain post-intubation sedation
LDK Analgesia ADJUNCT for *acute pain unrelieved by opioids* (or if opioids are unavailable)	20 mg in 100 mL Normal Saline IV/IO **(diluted)**: • Add 20 mg (0.4 mL of **50 mg/mL** strength) to 100 mL NS • Administer IV/IO over 15 minutes (approximately 1 gtt/sec with 10 gtt/mL IV set) • Maximum single dose: 20 mg • May repeat once after 15 minutes, if needed • Total, maximum, cumulative dose: 40 mg **OR**	Discontinue infusion if adverse side effects develop (e.g. apnea, laryngospasm, decreased SpO_2, vomiting, hallucinations, or delirium)
	0.4 mg/kg **IM or IN (diluted)**: • Dilute 50 mg/mL strength to 10 mg/mL before administration for pain management • Maximum single dose: 40 mg • May repeat once after 15 minutes, if needed • Total, maximum, cumulative dose: 80 mg	**50 mg/mL formulation MUST be diluted for IM/IN LDK pain management:** • Waste 2 mL from a 10-mL NS flush • Replace with 2 mL (100 mg) of ketamine • Final concentration: **10** mg/mL If IM/IN volume is greater than 3 mL, split dose into 2 IM injections or divide IN dose between both nares

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Pediatric ketamine dosing guidelines for 50 mg/mL formulation on the next page

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PEDIATRIC KETAMINE

ALTERNATE: 50 mg/mL STARTING CONCENTRATION

Use these instructions ONLY if 100 mg/mL strength is unavailable

Use BioTel MACC to ensure correct dose

(NOTE: BioTel PEDI-Guide© dosing is based on 100mg/mL strength)

PEDIATRIC AT LEAST 6 MONTHS AND LESS THAN 14 YEARS OF AGE

Refer to BioTel PEDI-Guide© for general guidance

NOTE: BioTel PEDI-Guide© dilution/reduction steps are based on 100 mg/mL ketamine concentration

THEREFORE: Follow instructions below and/or contact BioTel for dosing assistance

Excited Delirium Syndrome (ExDS) or combative patient	**Contraindicated unless specifically authorized by an online Medical Control Physician**	
PAI Premedication **OR** Procedural sedation, e.g. Transcutaneous Pacing (TCP) – contact BioTel BEFORE administering ketamine in this setting	2 mg/kg IV/IO (0.02 mL/kg; **diluted**) or 4 mg/kg IM (0.08 mL/kg **direct from 50 mg/mL vial**) one minute **prior to** intubation or procedure: • Max. single dose: 100 mg IV/IO; 200 mg IM • Divide IM dose if volume 3 mL or greater • May repeat once, if needed, at **2 mg/kg** IV/IO/IM after 10 minutes, to maintain **post-intubation** sedation • Contact BioTel for additional dosing	**IMPORTANT:** **50 mg/mL formulation MUST be DILUTED for pediatric ALL pediatric administration EXCEPT IM/IN sedation.** Dilution recipe for IV/IO LDK pain, IM/IN LDK Pain, and IV/IO sedation: • Waste 2 mL from a 10-mL NS flush • Replace with 2 mL (100 mg) of ketamine • Final concentration: **10** mg/mL
LDK Analgesia ADJUNCT for *acute pain unrelieved by opioids* (or if opioids are unavailable)	0.2 mg/kg (0.02 mL/kg; **diluted**) **SLOW IV/IO** over 1 to 2 minutes: • Maximum single dose: 20 mg (2 mL) • May repeat once after 15 minutes, if needed • Maximum, cumulative dose: 40 mg (4 mL) • Contact BioTel for additional dosing **OR** 0.4 mg/kg (0.04 mL/kg; **diluted**) **IM or IN**: • Maximum single dose: 40 mg (4 mL) o Divide IN dose between both nostrils o Divide IM dose if volume 3 mL or more • May repeat once after 15 minutes, if needed • Maximum, cumulative dose: 80 mg (8 mL) • Contact BioTel for additional dosing	

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Lidocaine HCl (Xylocaine®)

CLASS: Class-1B ventricular antiarrhythmic

ACTIONS: Suppresses ventricular ectopy; decreases rate and force of myocardial contraction (high doses); CNS stimulation (tremor, seizures) or CNS depression, and respiratory failure (at toxic doses)

INDICATIONS:

- Ventricular fibrillation (VF) and pulseless ventricular tachycardia (pVT), recurrent or refractory to defibrillation
- Stable wide complex tachycardia (WCT) with pulse (consider infusion, if patient's condition not deteriorating)
- Local anesthesia after IO device insertion (injection at least wait 15 seconds, then proceed with IO flush)

CONTRAINDICATIONS:

- Hypersensitivity to any "caine" anesthetic
- Bradycardia and 2nd- or 3rd-degree heart block
- Supraventricular dysrhythmias, including SVT, atrial fibrillation and atrial flutter

PRECAUTIONS:

- Use with caution: elderly patients over 65 years of age, liver disease or history of CHF
- Because of short half-life, repeat bolus dose may be needed during prolonged transport
- Continuous ECG, BP and level of consciousness monitoring during and after administration

SIDE EFFECTS:

Therapeutic Dosing:	Toxic Levels:
• Sedation, lightheadedness, anticonvulsant effects • Anesthetic effects (local)	• Drowsiness, tinnitus, slurred speech, visual disturbances, paresthesias, muscle twitching, seizures • Hypotension, bradycardia, cardiovascular collapse

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Ventricular Fibrillation (VF) or pulseless Ventricular Tachycardia (pVT) unresponsive to defibrillation	1 to 1.5 mg/kg IV or IO push, in conjunction with epinephrine, immediately after shock, with flush: • Maximum single dose: 100 mg • May repeat once • Maximum, total, cumulative dose: 3 mg/kg	Preferred over amiodarone in most cases
Stable, monomorphic WCT	1 to 4 mg/minute infusion (30-50 mcg/kg/minute): • Avoid IV/IO bolus dosing • Discontinue immediately if toxicity signs develop	**BioTel authorization required**
Intraosseous Anesthetic	40 mg (2 mL) IO in conscious patient before flush	Refer to IO procedure
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Ventricular Fibrillation (VF) or pulseless Ventricular Tachycardia (pVT) unresponsive to defibrillation	1 mg/kg IV or IO push, in conjunction with epinephrine, immediately after shock, with flush: • Maximum single dose: 100 mg • May repeat once • Maximum, total, cumulative dose: 3 mg/kg	Preferred over amiodarone in most cases
Stable, monomorphic WCT	**Contact BioTel for authorization and dosing**	
Intraosseous Anesthetic	**Contact BioTel for dosing guidance**	Refer to IO procedure

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Magnesium Sulfate

CLASS: Electrolyte with anti-arrhythmic, anti-convulsant and smooth muscle relaxant properties

ACTIONS: Blocks cellular calcium channels; smooth muscle relaxation; CNS depression and anti-convulsant; reverses magnesium deficiency

INDICATIONS:

- Torsades de Pointes (polymorphic wide-complex tachycardia (WCT)) or digitalis toxicity (ADULTS only)
- Adjunct treatment of refractory bronchospasm (asthma, COPD) in patients at least 2 years of age
- Seizures due to eclampsia (3rd trimester, within 48 hours of delivery or (rarely) up to 6 weeks post-partum)
- Confirmed or suspected magnesium deficiency (hypomagnesemia)

CONTRAINDICATIONS:

- Pediatric patients less than 2 years of age
- Heart block
- Shock or hypotension
- Renal insufficiency, including dialysis patient
- Respiratory depression

PRECAUTIONS:

- Contact BioTel BEFORE dosing: suspected digitalis toxicity or hypomagnesemia; or severe bronchospasm in pediatric patients less than 2 years of age
- Contact BioTel ASAP, preferably before dosing, for pediatric patients older than 2 years of age with severe bronchospasm or Torsades de Pointes (perfusing or pulseless)
- Documentation note: do NOT abbreviate as "$MgSO_4$" or "MSO_4" or "MS" (confusion with morphine sulfate)

SPECIAL NOTE:

- Vial (5 mg/10mL) formulation preferred over pre-filled syringe (5 mg/10mL) to facilitate dilution for IV dosing

SIDE EFFECTS:

- Hypotension and circulatory collapse
- Bradycardia
- Respiratory depression
- CNS depression
- Muscle weakness and depressed reflexes
- Facial flushing

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
PULSELESS Torsades de Pointes	Mix 2 grams (4 mL) in 6 mL NS and administer IV slow push over **2 minutes**	
PERFUSING Torsades de Pointes, after successful cardioversion	Mix 2 grams (4 mL) in 100 mL NS and administer IV over approximately 15 min (1 gtt/sec with macro **(10 gtt/mL)** IV set)	**Infuse over Approximately 15 minutes**
Refractory bronchospasm	As above	**As above**
Eclampsia seizure	5 grams in 100 mL NS IVPB over 15 minutes: • Add 5 grams to 100-mL bag of NS • Administer IVPB over 15 minutes (1 gtt/sec with macro **(10 gtt/mL)** IV set) • **OR** 2.5 grams (5 mL) IM, **only** if no IV/IO access: • Divide into 2 separate injection sites • Repeat once ASAP (**total dose 5 grams**)	Monitor for hypotension and respiratory depression Contact BioTel for additional doses

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PEDIATRIC LESS THAN 14 YEARS OF AGE Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions		
Age at least 2 years with: severe bronchospasm unresponsive to inhaled bronchodilators; status asthmaticus; or impending respiratory failure (altered mental status, inability to oxygenate, or inability to ventilate)	40 mg/kg IVPB over 15 minutes: • **Less than 30 kg:** o Mix 1 g (2 mL) in 100 mL NS: o Final concentration: 10 mg/mL o Less than 10 kg: Use **60 gtt/mL** drip set o At least 10 kg: Use **10 gtt/mL** drip set o Administer **4 mL/kg** over 15 min. o Set drip rate per BioTel PEDI-Guide© o **Set timer to stop infusion after 15 minutes** • **30 kg or more:** o Mix 2 g (4 mL) in 100 mL NS: o Final concentration: 20 mg/mL o Use **10 gtt/mL** drip set o Administer **2 mL/kg** over 15 min. o Set drip rate per BioTel PEDI-Guide© o **Set timer to stop infusion after 15 minutes** • Maximum dose: 2 g	**Administer simultaneously with IM epinephrine AND Prepare for advanced airway AND Contact BioTel ASAP**
Age less than 2 years with severe bronchospasm	**Dosing as above, but BioTel authorization required**	**As above**
Any age pediatric patient with perfusing Torsades de Pointes (WITH PULSE)	40 mg/kg IVPB over 15 minutes: • **Less than 30 kg:** o Mix 1 g (2mL) in 100 mL NS: o Final concentration: 10 mg/mL o Less than 10 kg: Use **60 gtt/mL** drip set o At least 10 kg: Use **10 gtt/mL** drip set o Administer **4 mL/kg** for 15 min. o Set drip rate per BioTel PEDI-Guide© o **Set timer to stop infusion after 15 minutes** • **30 kg or more:** o Mix 2 g (4 mL) in 100 mL NS: o Final concentration: 20 mg/mL o Use **10 gtt/mL** drip set o Administer **2 mL/kg** for 15 min. o Set drip rate per BioTel PEDI-Guide© o **Set timer to stop infusion after 15 minutes** Maximum dose: 2 g	**Contact BioTel ASAP, preferably BEFORE administration**
Any age pediatric patient with PULSELESS Torsades de Pointes	40 mg/kg IVP/IO over **2 minutes**: • **Less than 15 kg:** o Waste 1 mL from a 10-mL NS flush o Replace with 0.5 g (1 mL) mag sulfate* o Final concentration: 50 mg/mL o Administer dose per BioTel PEDI-Guide© • **15 kg or more:** o Waste 4 mL from a 10-mL NS flush o Replace with 2 g (4 mL) mag sulfate* o Final concentration: 200 mg/mL o Administer dose per BioTel PEDI-Guide© • Maximum dose: 2 g • *If drawing mag sulfate from pre-filled syringe, use stopcock reduction method to draw up correct volume	**Contact BioTel ASAP, preferably BEFORE administration**

BioTel

Methylprednisolone (Solu-Medrol®)

OPTIONAL (Not required for every agency)

CLASS: Synthetic glucocorticoid (corticosteroid)

ACTIONS: Anti-inflammatory; may alter immune response; potentiates bronchial smooth muscle relaxation; reverses cardiovascular collapse patients with adrenal insufficiency (acute Addisonian crisis)

INDICATIONS:

- Adjunct treatment of acute bronchospasm (asthma or COPD)
- Adjunct treatment of moderate-severe allergic reaction (NOT primary treatment of anaphylaxis)
- Cardiovascular collapse/shock due to confirmed/suspected adrenal crisis (check for medical alert device)

CONTRAINDICATIONS:

- Hypersensitivity
- Confirmed or suspected active GI bleeding

PRECAUTIONS:

- Safety in pregnancy and nursing mothers is not established

SIDE EFFECTS:

- Few associated with short-term EMS administration
- Anaphylaxis (rare)
- Possible exacerbation of CHF or hypertension
- Nausea/vomiting

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Severe bronchospasm or status asthmaticus	60 to 125 mg IM or IV/IO (slow, over 2 minutes)	Administer in conjunction with magnesium sulfate and non-invasive ventilatory support (CPAP)
Moderate-severe allergic reaction AFTER IM epinephrine and IV/IO fluid	60 to 125 mg IM or IV/IO (slow, over 2 minutes)	NOT 1st-line initial treatment of anaphylaxis
Adrenal crisis	125 mg IVP/IO push	
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Severe bronchospasm or status asthmaticus; OR Moderate-severe allergic reaction AFTER IM epinephrine and IV/IO fluid	Reconstitute 125 mg in 2 mL, then dilute with 8 mL NS to a final volume of 10 mL (12.5 mg/mL): • Administer IV/IO, per unit dose, by age: o Under 2 mo**: 6.25 mg (0.5 mL) o 2 mo to 11 mo**: 12.5 mg (1 mL) o 1 yr to 35 mo: 25 mg (2 mL) o 3 to 4 yr: 37.5 mg (3 mL) o 5 to 9 yr: 50 mg (4 mL) o 10 to 13 yr: 62.5 mg (5 mL) If IM dosing is required because of no IV/IO access: • Reconstitute 125 mg in 2 mL, but do NOT dilute • Administer 2 mg/kg (0.032 mL/kg) IM**	Administer in conjunction with magnesium sulfate and non-invasive ventilatory support (CPAP) **Do not administer for **respiratory distress** to children under age 2, unless history of asthma Maximum dose: 62.5 mg
Adrenal crisis	2 mg/kg IVP/IO or IM **with BioTel authorization** • Follow dosing guidance above for IV/IO or IM	Maximum dose: 62.5 mg

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Midazolam (Versed®)

Alternative (Not required for every agency; may substitute diazepam per CPG)

CLASS: Benzodiazepine

ACTIONS: Short-acting CNS Depressant, anti-convulsant, sedative/hypnotic, amnestic; no effect on pain

INDICATIONS:

- Seizures (status epilepticus)
- Procedural sedation (e.g. cardioversion, Pharmacologically Assisted Intubation, Transcutaneous Pacing)
- Sedation maintenance in ROSC after cardiac arrest with advanced airway
- Agitated patient who may be a danger to self or others (Excited Delirium Syndrome)
  - Includes: adjunct administration after ketamine administration, to prevent emergence reaction
- Shivering in patients with accidental hypothermia or during emergency cooling for heatstroke

CONTRAINDICATIONS:

- Hypersensitivity
- Pregnancy (except eclamptic seizure) (relative)
- Narrow-angle glaucoma
- Shock
- CNS or respiratory depression
- Alcoholic coma

PRECAUTIONS:

- **Exercise caution in patients using or given other depressant drugs (e.g. alcohol or opioids)**
- ALWAYS prepare for assisted ventilation/advanced airway, ***especially in pediatric patients***
- Continuous monitoring of vital signs, SpO_2 and $PetCO_2$ is mandatory before and after administration

SIDE EFFECTS:

- Respiratory depression and arrest
- Hypotension
- Drowsiness and confusion
- Laryngospasm and bronchospasm
- Dizziness and ataxia
- Fatigue
- Nausea and vomiting
- Bradycardia and other dysrhythmias

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Seizures	2.5 – 5 mg IV/IO, OR 5 mg IM/IN: • May repeat once after 5 minutes	Maximum cumulative, total IV/IO/IM dose: 5 mg Maximum cumulative, total IN dose: 10 mg
Procedural sedation, shivering or ROSC sedation maintenance	2.5 – 5 mg IV/IO, OR 5 mg IM/IN: • May repeat once after 5 minutes	
PAI pre-medication (with fentanyl)	0.1 mg/kg IV/IO push (maximum 5 mg)	With agency Med. Dir. authorization
Combative patient/Excited Delirium	5 mg IM or slow IV/IO; consider IN: • May repeat once after 5 minutes	IM/IV/IO dosing preferred
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Seizures	**INTRANASAL:**	
	1 to 6 months of age: 0.2 mg/kg	Maximum single dose: 1 mg
	Over 6 months of age: 0.2 mg/kg	Maximum single dose: 5 mg • Divide dose between nostrils
	IV or IO or IM:	
	0.2 mg/kg	Maximum single dose: 5 mg
ROSC sedation maintenance	0.2 mg/kg IV/IO/IM/IN	Maximum single dose: 5 mg
PAI pre-medication (with fentanyl)	**0.1 mg/kg IV/IO**	With agency Med. Dir. authorization
Combative patient /Excited Delirium	0.2 mg/kg IV/IO/IM/IN	**BioTel authorization required**

BioTel

Morphine Sulfate

Alternative (Not required for every agency; if unavailable, may substitute fentanyl per CPG)

CLASS: Narcotic (opioid) analgesic

ACTIONS: Alleviates pain; decreases peripheral vascular resistance; decreases myocardial workload

INDICATIONS:

- Ischemic chest pain unresponsive to nitroglycerin (2nd-line treatment due to possible platelet aggregation)
- Moderate-severe acute, pain due to fractures, burns, amputations, head injury, sickle cell or other causes
- Treatment endpoint: patient comfort and reduced pain, not total pain elimination

CONTRAINDICATIONS:

- Hypersensitivity
- SBP less than 90 mmHg (or age-specific equivalent)
- Co-administration with benzodiazepines (relative)
- Respiratory depression
- Hypovolemia or shock
- OB patients in active labor (relative)

PRECAUTIONS:

- Do not administer unless naloxone and advanced airway control measures are readily available
- Continuously monitor ECG, vital signs (including SpO_2 and $PetCO_2$), and level of consciousness
- Documentation note: do NOT abbreviate as "MSO_4" or "MS" (confusion with magnesium sulfate)

SIDE EFFECTS:

- Hypotension
- Respiratory depression or arrest
- Bradycardia
- Bronchospasm
- Allergic reaction
- Euphoria, confusion and dizziness
- Facial flushing and urticaria (hives)
- Nausea/vomiting (especially with rapid IV dosing)

SPECIAL NOTE – BioTel authorization required if:

- Age less than 1 year
- SBP less than 90 mmHg (or age-specific equivalent)
- Hypoxia (SpO_2 less than 90%)
- Debilitated patient
- Hypercarbia ($PetCO_2$ greater than 45 mmHg)
- Altered mental status (AMS)

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute ischemic chest pain unrelieved by NTG or acute traumatic or sickle cell pain; AND no contraindications	2 to 4 mg slow IV/IO or IM: • May repeat every 10 minutes, as needed • Maximum, total, cumulative dose: 10 mg • Contact BioTel for additional dosing	2nd-line choice if fentanyl is unavailable; If patient 65 years or older, start with 1 to 2 mg & monitor for adverse effects
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Acute traumatic pain AND no contraindications	0.1 mg/kg slow IV/IO or IM: • May repeat once after 10 minutes, as needed • Maximum, total, cumulative dose: 4 mg • Contact BioTel for additional dosing	2nd-line choice if fentanyl is unavailable; Contact BioTel for infant less than 1 year of age
Acute ischemic chest pain	**Contact BioTel for authorization and dosing**	Rare in pediatrics

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Naloxone HCl (Narcan®, Evzio®)

CLASS: Narcotic (opioid) antagonist

ACTIONS: Competitive inhibition at opioid receptors to reverse CNS and respiratory depression

INDICATIONS:

- Altered Mental Status (AMS) due to confirmed or suspected opioid overdose ONLY if all 3 conditions met:
  - CNS depression; hypoxia/hypoventilation; and pinpoint pupils
- Opioid-associated cardiac arrest or impending arrest (after initiating CPR and BLS)
- Coma of unknown origin (relative indication: exclude hypoglycemia, hypoxia, trauma, other poisoning, etc.)
- **NOTE:** May be given by BLS Providers after documented training and with Medical Director authorization

CONTRAINDICATIONS:

- Hypersensitivity
- Neonate of opioid-addicted mother

PRECAUTIONS:

- Use with caution in narcotic-dependent patients
- Treatment endpoint (non-arrest): improved respiratory status and SpO_2 at least 94%, NOT total reversal
- **Synthetic opioids (e.g. fentanyl, carfentanil, other fentanyl derivatives, methadone, propoxyphene) may require much higher cumulative doses up to 10 mg, *if available***
- Repeat naloxone doses (every 20-60 minutes) may be needed for opioids with long half-life
- **Patients receiving naloxone should be transported for evaluation, treatment and counseling**
- **Written Medical Director authorization required for use of commercial intranasal devices**

SIDE EFFECTS:

- Tachycardia
- Hypertension
- Seizures
- Ventricular fibrillation and other dysrhythmias
- Nausea/vomiting **(especially with rapid dosing)**
- Acute withdrawal syndrome (violent behavior, pulmonary edema)

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Opioid overdose with AMS, respiratory depression and pinpoint pupils; OR opioid-associated cardiac arrest; or coma of unknown origin	**0.4 mg** IV (preferred), IO or IM: • May repeat every 5 minutes, as needed • Maximum, total, cumulative dose: 2 mg • Contact BioTel for additional doses (if available), if patient does not improve or cannot maintain SpO_2 at least 94% **OR** 2 mg IN via mucosal atomization device, if available: • May repeat twice, every 5 minutes, if needed	IV/IO/IM preferred for cardiac arrest Monitor for recurrent CNS and respiratory depression
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Opioid overdose with AMS, respiratory depression and pinpoint pupils; or opioid-associated cardiac arrest/impending arrest	0.1 mg/kg IV (preferred), IO or IM or IN: • Maximum single dose: **2 mg** • Contact BioTel for additional doses (if available), if patient does not improve or cannot maintain SpO_2 at least 94%	IV/IO/IM preferred for cardiac arrest Monitor for recurrent CNS and respiratory depression
Coma of unknown origin	**BioTel authorization required**	

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Nitroglycerin (Nitrostat®, GoNitro®)

CLASS: Short-acting antianginal nitrate

ACTIONS: Peripheral and coronary vasodilation; venodilation; decreases cardiac preload/afterload to decrease cardiac workload and oxygen demand

INDICATIONS:

- Acute angina and ischemic chest pain, acute coronary syndrome (ACS): perform 12-Lead ECG first
- Acute congestive heart failure (CHF) and cardiogenic pulmonary edema: perform 12-Lead ECG first

CONTRAINDICATIONS:

- Hypersensitivity
- Hypotension (SBP less than 100 mmHg or 30 mmHg below patient's baseline)
- Suspected Right Ventricular MI
- Bradycardia (HR less than 50 bpm)
- Hypovolemia
- Intracranial hemorrhage or TBI
- Recent erectile dysfunction meds (male or female):
- Sildenafil (Viagra®) or vardenafil (Levitra®): 24 hours
- Tadalafil (Cialis®): 48 hours

PRECAUTIONS:

- IV/IO access must be established BEFORE dosing if ECG suggests acute inferior MI (II, III, aVF elevation)
- If SBP falls below 100 mmHg after administration of 1st dose, do not administer additional doses
- Patient must be sitting or recumbent before administration

SIDE EFFECTS:

- Hypotension or rebound hypertension
- Headache
- Syncope
- Reflex tachycardia or bradycardia
- Sublingual burning
- Skin flushing
- Headache
- Nausea/vomiting

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute ischemic chest pain, after 12-Lead ECG AND no contraindications	0.4 mg SL as spray, tablet or powder: • May repeat twice, every 5 minutes, if needed and IF SBP remains at least 100 mmHg • Maximum number of doses: 3 • Contact BioTel if no response to three doses	Hypotension after administration may worsen myocardial ischemia/infarct
Acute pulmonary edema or CHF exacerbation AND no contraindications	As above	Acquire 12-Lead ECG before administration; transmit STEMI ECG or to request consultation
PEDIATRIC LESS THAN 14 YEARS OF AGE		
Ischemic chest pain or acute cardiogenic pulmonary edema	**BioTel Physician Authorization Required**	

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Nitrous Oxide (Nitronox®)

OPTIONAL (Not required for every agency)

CLASS: Gaseous analgesic/anesthetic 50:50 mixture of nitrous oxide and oxygen

ACTIONS: Weak inhalational anesthetic/analgesic

INDICATIONS:

- Self-administered adjunct or 2nd-line analgesic in limited clinical circumstances, such as isolated extremity fractures or active labor

CONTRAINDICATIONS:

- Altered level of consciousness or head injury
- COPD
- Confirmed or suspected pneumothorax
- Chest trauma
- Abdominal trauma
- Major facial trauma
- Pregnancy, other than active labor
- Decompression sickness
- Acute psychosis or uncooperative patient
- Any patient unable to self-administer

PRECAUTIONS:

- Use with caution in elderly and patients with history of stroke, hypotension or cardiac conditions
- Equipment must be checked daily for proper nitrous oxide and oxygen concentrations

SIDE EFFECTS:

- Hypotension
- Dizziness
- CNS depression
- Headache
- Nausea and vomiting
- Hypoxia

ADMINISTRATION NOTES:

- Must be self-administered
- Monitor vital signs (especially BP) and SpO_2 during and after administration

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Acute pain, if no contraindications are present	Instruct patient to inhale deeply through the patient-held mask or mouthpiece – titrate to pain relief	
PEDIATRIC AT LEAST 5 YEARS OR AGE AND LESS THAN 14 YEARS OF AGE		
Acute pain, if no contraindications are present	As above	

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Norepinephrine Bitartrate (Levophed®)

CLASS: Sympathomimetic; vasopressor

ACTIONS: Stimulates alpha-adrenergic receptors (vasoconstriction) and (to a lesser extent) beta$_1$-adrenergic receptors (increased cardiac contractility and heart rate)

INDICATIONS:

- Vasoactive infusion of choice in most types of shock, e.g. "warm" septic shock (preferred over dopamine)
  - Epinephrine is preferred for anaphylactic shock/laryngospasm and possibly in "cold" septic shock
- Post-cardiac arrest hypotension unresponsive to fluid resuscitation

CONTRAINDICATIONS:

- Hypovolemia

PRECAUTIONS:

- Administer via **large-bore, antecubital** IV, if possible, to minimize tissue necrosis risk with extravasation
- Incompatible with sodium bicarbonate
- Continuous ECG and vital signs monitoring must be used during infusion

SIDE EFFECTS:

- Hypertension
- Tachyarrhythmias, palpitations and ectopy
- Reflex bradycardia
- Chest pain
- Intense peripheral vasoconstriction
- Tissue necrosis with extravasation
- Nausea/vomiting
- Headache

MIXING INSTRUCTIONS:

- Always check dose and concentration of vial/ampule before mixing and before patient administration
- Contact BioTel for assistance with mixing and dosing, and/or if a different mixing procedure is needed

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Septic, neurogenic or obstructive shock unresponsive to fluid resuscitation; Post-cardiac arrest hypotension unresponsive to IV fluids; certain other cardiogenic shock cases	Large-bore, antecubital IV (preferred) or IO infusion: • **Add 2 mg (2 mL) to 250 mL of Normal Saline (NS):** o **Final concentration: 8 mcg/mL** • Begin IV infusion at 4 mcg/min IVPB • Increase every 5 minutes in 2 mcg/min increments, as needed, to maintain SBP at least 90 mmHg and improved perfusion • **Maximum rate: 10 mcg/min**	**Infusion Rate: Refer to chart (next page)** **MANDATORY: Contact BioTel ASAP after starting infusion**
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions**		

As above	Large-bore, antecubital IV (preferred) or IO infusion:
	See chart on next page & BioTel PEDI-Guide© for dosing
	• **Up to 4 years of age: Add 1 mg (1 mL) to 250 mL NS:**
	  o **Final concentration: 4 mcg/mL**
	  o Maximum rate: 1 mcg/kg/min
	• **5 years and older: Add 2 mg (2 mL) to 250 mL NS:**
	  o **Final concentration: 8 mcg/mL**
	  o Maximum rate: 10 mcg/min
		Infusion Rate: Refer to chart (next page)
		
		MANDATORY: Contact BioTel ASAP after starting infusion

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ADULT AT LEAST 14 YEARS OF AGE

NOREPINEPHRINE INFUSION (DRIP) GUIDE

Add 2 mg (2 mL) to 250 mL NS
Final concentration: 8 mcg/mL
** IMPORTANT: Use 60 gtt/mL drip set **
MANDATORY: Contact BioTel ASAP after starting infusion

Dose (mcg/min)	Rate (gtt/min)
1	8
2	15
3	23
4	30
5	38
6	45
7	53
8	60
9	68
10	75

PEDIATRIC LESS THAN 14 YEARS OF AGE

NOREPINEPHRINE INFUSION (DRIP) GUIDE

Refer to BioTel PEDI-Guide© for age-based dosing, dilution and drip rate instructions

** IMPORTANT: Use 60 gtt/mL drip set **

Infants and children up to 4 years of age: Add 1 mg (1 mL) to 250 mL NS
Final concentration: 4 mcg/mL
Start at 0.1 mcg/kg/min
Increase by 0.1 mcg/kg/min every 5 min, to achieve target SBP & improved perfusion
Maximum infusion rate: 1 mcg/kg/min
MANDATORY: Contact BioTel ASAP after starting infusion

Children 5 to 13 years of age: Add 2 mg (2 mL) to 250 mL NS
Final concentration: 8 mcg/mL
Start at 2 mcg/min (as per Adult Drip Guide, above)
Increase by 2 mcg/min every 5 min, to achieve target SBP & improved perfusion
Maximum infusion rate: 10 mcg/min
MANDATORY: Contact BioTel ASAP after starting infusion

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Ondansetron (Zofran®)

OPTIONAL (Not required for every agency)

CLASS: Anti-emetic

ACTIONS: Selective blockade of serotonergic receptors responsible for nausea and vomiting

INDICATIONS:

- Treatment of moderate-severe nausea and vomiting

CONTRAINDICATIONS:

- Hypersensitivity
- Pediatric patients less than 2 years of age
- Breastfeeding women (relative)
- 1st-trimester pregnancy (confirmed or reported)

PRECAUTIONS:

- Not effective in every patient:
  - Those who fail to respond to a single dose are unlikely to respond to additional doses
- Nausea and vomiting associated with dehydration may respond to fluid resuscitation, making medication treatment unnecessary, especially in pediatric patients
- Use with caution and monitor for QT prolongation, especially in patients on anti-arrhythmics or meds associated with QT prolongation; or with cardiovascular disease; heart failure; bradydysrhythmias; or known/suspected electrolyte abnormalities (hypokalemia or hypomagnesemia)
- Monitor for mental status changes, tachycardia, hyper- or hypotension, sweating, dizziness, flushing, hyperthermia, tremor, rigidity, seizure or gastrointestinal symptoms (nausea/vomiting)*

SIDE EFFECTS:

- Headache
- Dizziness
- Chest pain
- Tachycardia (including Torsades de Pointes)
- Prolonged QT interval on ECG
- Burning/pain at injection site
- Seizures
- Extrapyramidal symptoms (EPS) (rare)
- Drowsiness and sedation (uncommon)
- *Serotonin syndrome (rare) (e.g. patients on anti-depressants, fentanyl or lithium)

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Nausea or vomiting	4 to 8 mg slow IV/IO (over 1 minute) or IM: • Do not administer repeat doses **OR (if available):** 4 to 8 mg Zofran® ODT: • Maximum dose 8 mg (two 4-mg or one 8-mg tablet) • Do not administer if patient is actively vomiting • Do not administer repeat doses	ODT: Place tablet on tongue and allow to dissolve
PEDIATRIC 5 TO 13 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Nausea or vomiting, in conjunction with IV/IO fluid resuscitation, as indicated	Children at least 5 yr: 0.15 mg/kg IV/IO (over 1 minute): • Do NOT administer IM • Maximum dose: 4 mg **OR (if available):** Zofran® ODT tablet: • At least 5 years of age and 19 kg: 1 full 4-mg ODT **OR** ½ of an 8-mg ODT • Do not administer if patient is actively vomiting • Maximum dose: 4 mg	**Children 2 to 4 yr: Contact BioTel for authorization** **ODT: See above** **Do not administer repeat dose**

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Pralidoxime Chloride (2-PAM®)

OPTIONAL (Not required for every agency)

CLASS: Cholinesterase reactivator

ACTIONS: Reactivates acetylcholinesterase enzyme

INDICATIONS:

- Poisoning due to organophosphate or carbamate pesticide, or chemical nerve agent:
  - **Usually carried in auto-injectors (DuoDote®) combined with atropine sulfate, the primary antidote:**
    - **DuoDote auto-injector contains 2.1 mg atropine and 600 mg pralidoxime chloride**
  - May be administered separately, via syringe, if available, primarily for muscle weakness and fasciculations and/or respiratory depression
  - Refer to TOXIC CHEMICAL EXPOSURE CPG for signs/symptoms of organophosphate toxidromes

CONTRAINDICATIONS:

- No absolute contraindication

PRECAUTIONS:

- Antidote administration does not provide complete protection against chemical nerve agents:
  - Situational awareness, scene safety procedures and proper use of PPE are required
- Elderly and pediatric patients more susceptible to anticholinergic side effects of co-administered atropine

SIDE EFFECTS:

- Tachycardia
- Elevated BP (SBP and DP)
- Blurred or double vision
- Decreased sweating and heat intolerance
- Headache
- Dry mouth
- Nausea/vomiting
- Muscle pain and tightness at injection site
- DuoDote® or other atropine co-administration may lead to atropine side effects, as well

ADULT AT LEAST 14 YEARS OF AGE, IF AVAILABLE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Mild symptoms of organophosphate or nerve agent poisoning	Administration of a single auto-injector deep IM in the mid-lateral thigh may be sufficient: • If symptoms resolve after 10 to 15 minutes, no further antidote is needed • If severe symptoms develop at any time after 1st dose, immediately administer 2 more doses • EMS Providers may self- or buddy-administer	All patients treated with pralidoxime should be transported for ED evaluation
Severe symptoms of organophosphate or nerve agent poisoning	Immediately administer 3 IM doses in rapid succession and then: • Transport as soon as possible • Treat seizures according to Seizure CPG	Altered behavior, AMS, severe respiratory distress or copious respiratory secretions, seizures, severe weakness, or involuntary urination or defecation
PEDIATRIC LESS THAN 14 YEARS OF AGE, IF AVAILABLE		
BioTel may authorize use in pediatric patients under austere conditions		

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Promethazine HCl (Phenergan®)

OPTIONAL (Not required for every agency)

CLASS: Phenothiazine with antiemetic, antihistamine (histamine$_1$) and sedative properties

ACTIONS: Potent antiemetic, possibly due to anticholinergic and sedative effects

INDICATIONS:

- Second-line treatment of persistent vomiting of known gastrointestinal cause (other agents preferred)

CONTRAINDICATIONS:

- Hypersensitivity
- Pediatric patients less than 14 years of age
- Geriatric patients older than 65 years of age
- Debilitation with signs of dehydration or weakness
- Altered Mental Status (AMS)
- Pregnancy

PRECAUTIONS:

- Nausea and vomiting associated with dehydration may respond to fluid resuscitation, making medication treatment unnecessary, especially in pediatric patients
- Monitor for excessive CNS depression and dystonic reaction (e.g. nystagmus, torticollis, facial grimacing)
- Treat dystonic reaction with diphenhydramine

SIDE EFFECTS:

- Excessive sedation
- Respiratory depression (especially pediatrics)
- Dystonic reaction
- Seizure
- Paradoxical hyperexcitability
- Cardiac dysrhythmia (QT prolongation)

ADMINISTRATION NOTES:

- Do NOT administer IV, IO or SQ

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Persistent nausea and vomiting of known cause in adults less than 65 years of age	12.5 to 25 mg deep IM: • Maximum total cumulative dose: 25 mg	
PEDIATRIC LESS THAN 14 YEARS OF AGE		
Do not administer to pediatric patients		

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Proparacaine HCl (Alcaine®)

OPTIONAL (Not required for every agency)

CLASS: Topical ophthalmic anesthetic

ACTIONS: Rapid, brief, superficial anesthesia

INDICATIONS:

- Short-term relief from pain of corneal burns or corneal abrasions
- Patient comfort to facilitate ocular irrigation associated with chemical exposure, pepper spray or "mace"

CONTRAINDICATIONS:

- Hypersensitivity to "caine" anesthetics
- Ocular foreign body
- Ocular avulsion
- Globe rupture (confirmed or suspected)

PRECAUTIONS:

- Caution patient not to rub his/her eye(s)

SIDE EFFECTS:

- Burning or stinging
- Irritation

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Corneal burn/abrasion, without contraindications	1 or 2 drops in the affected eye(s): • Repeat every 5 minutes, as needed • Maximum total number of doses: 3	Contact BioTel if substitution with a different topical ophthalmic anesthetic is needed
PEDIATRIC LESS THAN 14 YEARS OF AGE		
Corneal burn/abrasion, without contraindications	1 or 2 drops in the affected eye(s): • Repeat every 5 minutes, as needed • Maximum total number of doses: 3	Contact BioTel if substitution with a different topical ophthalmic anesthetic is needed

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Sodium Bicarbonate

CLASS: Electrolyte

ACTIONS: Alkalinizing agent; electrolyte supplement

INDICATIONS:

- Cardiac arrest associated with hyperkalemia (renal failure/dialysis), and/or metabolic acidosis (DKA; tricyclic antidepressant (TCA), diphenhydramine or aspirin overdose; or cocaine or other stimulant overdose)
- Crush injury with ECG changes suggestive of hyperkalemia (wide, slurred QRS; peaked T waves)
- Prolonged violent behavior unresponsive to emergency sedation or EMS-witnessed cardiac arrest associated with Excited Delirium Syndrome (ExDS) (relative indication)
- Prolonged (greater than 15 minutes) resuscitation with adequate ventilation (relative indication)

CONTRAINDICATIONS:

- Routine use in cardiac arrest
- Hypokalemia
- Hypernatremia
- Hypocalcemia
- Confirmed or suspected alkalosis

PRECAUTIONS:

- Incompatible with multiple drugs, e.g. amiodarone, calcium, epinephrine, dopamine, norepinephrine
- IV/IO must be flushed well before and after sodium bicarbonate administration

SIDE EFFECTS:

- Alkalosis
- Paradoxical acidosis (especially if inadequate ventilation)
- Hypokalemia
- Hypocalcemia and tetany
- Hypernatremia and hyperosmolarity
- Intravascular volume overload
- Cerebral acidosis (especially DKA)
- Tissue necrosis if extravasation

ADULT AT LEAST 14 YEARS OF AGE		
INDICATION	**DOSE and ROUTE(S)**	**SPECIAL NOTES**
Hyperkalemic cardiac arrest or conditions associated with metabolic acidosis AND no contraindications	1 mEq/kg IV/IO slow push: • Ensure adequate ventilation • Monitor IV site for infiltration/extravasation • Flush well after every dose	Routine use during cardiac arrest is not advised
Excited Delirium Syndrome (ExDS) with EMS-witnessed cardiac arrest	As above, as adjunct to emergency sedation, fluid resuscitation and cooling measures	
Crush injury with ECG changes of hyperkalemia	As above, as adjunct to aggressive fluid resuscitation	
PEDIATRIC LESS THAN 14 YEARS OF AGE **Refer to BioTel PEDI-Guide© for age-based dosing, dilution and reduction instructions**		
Hyperkalemic cardiac arrest or conditions associated with metabolic acidosis AND no contraindications	1 mEq/kg IV/IO slow push: • Ensure adequate ventilation • Monitor IV site for infiltration/extravasation • Flush well after every dose	Routine use during cardiac arrest is not advised
Crush injury with ECG changes of hyperkalemia	As above, as adjunct to aggressive fluid resuscitation	

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✦ APPENDICES AND OTHER RESOURCES

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✦ BioTel PEDI-Guide© (Pediatric Emergency Drug & Interventions-Guide©)

Version 1.1

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✦ BioTel PEDI-Guide© (Pediatric Emergency Drug & Interventions-Guide©)

Purpose: To facilitate timely, safe administration of pediatric emergency medications using pre-calculated doses based on patient weight, length or age in order to minimize incidence of medication dosing errors
Inclusion Criteria: Pediatric patients less than 14 years of age
Exclusion Criteria: Adult patients
Refer to: BioTel Medication Administration Cross-Check (MACC); symptom-specific CPGs; Universal Care – Adult; Universal Care – Pediatric; and BioTel Formulary Drug Sheets

Background:

A. The BioTel PEDI-Guide© adapts elements of the Broselow™, color-coded Pediatric Emergency Reference Tape ("Broselow Tape") to the UTSW/Parkland BioTel EMS System formulary, AND it adds reference to patient **age** zones for circumstances when a critically-ill infant or child cannot be measured.
B. The goal is to reduce the number of calculations needed for dosing pediatric emergency medications.
C. **CRITICAL NOTE: As with any pre-calculated dosing system, accurate use of the BioTel PEDI-Guide© depends on knowing and rechecking the MEDICATION CONCENTRATION – *this information MUST be verified prior to EVERY medication administration*.**

Overview:

A. The BioTel PEDI-Guide© supplements the full BioTel CPGs, the Formulary Drug Sheets, and the BioTel MACC – it does not replace these documents.
B. Medication volumes in the BioTel PEDI-Guide© have been rounded in most cases to the nearest 1/10th of a milliliter (mL) for ease of administration, consistent with accuracy allowable by standard syringes:
    1. As such, PEDI-Guide© doses may vary slightly from precise, "mg/kg", manually-calculated doses.
C. The *current edition* Broselow Tape (or other approved, length-based, pediatric resuscitation tape) should be available on all BioTel EMS units to assist with measurement of pediatric patient length, as needed.
D. Always maintain situational awareness and take time to "Stop and Verify" every medication administration:
    1. Many medications are available in different **concentrations** and different **size** vials/ampules.
    2. Many medications are administered at different **doses** for different **clinical indications** and/or different **routes of administration**, especially for pediatric patients.
E. In addition to the BioTel MACC, pediatric medication preparation entails three steps:
    1. Step 1: SELECT the proper color chart based on weight (preferred), length (2nd choice) or age.
    2. Step 2: DILUTE (if indicated), using the dilution instructions on the back of each chart.
    3. Step 3: REDUCE the volume of drug administered (if indicated), using the Stopcock Method.

Step 1: SELECT the Color-Coded BioTel PEDI-Guide© Chart:

1. Select the appropriate BioTel PEDI-Guide© chart for infants/children **up to approximately 13 years of age (approximately 3 to 50 kg)**, using the following priorities:
    A. Use the patient's **weight** – *if known* – to select the PEDI-Guide© chart that matches the child's weight.
    B. If weight is unknown, use the Broselow Tape, when possible, to identify the color-coded **length** zone:
        i. Measure from the correct end of the tape top of head to child's heels (not to toes).
        ii. If the child appears overweight, consider using 1 zone higher for dosing only (*not equipment*).
    C. If weight is unknown and the length cannot be measured (e.g. respiratory distress or seizure and unable to lay flat on the tape), select the chart that matches the child's approximate **age**.
        i. In extremely time-sensitive circumstances, select the appropriate AGE chart for immediate care; switch to weight- or length-based chart when/if that information becomes available.
2. For **newly born infants less than 3 kg**, refer to the Neonatal CPG and consult BioTel for guidance.
3. For **older children approximately 12-13 years of age and weighing more than 37 kg**, use the patient's actual weight, if known, or refer to the BLACK chart in the BioTel PEDI-Guide©, if the weight is unknown.
4. For adolescents older than 14 years of age, use adult dosing per BioTel CPGs (unless specified otherwise).

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BioTel PEDI-Guide© Color Zones Table

Zone	WEIGHT	AGE	HR (per min)	RR (per min)	SBP** (mmHg)	Handtevy Weight	Age
GRAY	3, 4 and 5 kg	Less than 3 mo	100-180	30-60	At least 60		
PINK	6-7 kg	3-5 mo	100-180	30-45	At least 70		
RED	8-9 kg	6-11 mo	100-180	30-45	At least 70		
PURPLE	10-11 kg	12-23 mo	80-150	25-40	At least 75	10 kg	1 yr
YELLOW	12-14 kg	24-35 mo	80-150	25-40	At least 75		
WHITE	15-18 kg	3-4 yr	80-140	22-35	At least 75	15 kg	3 yr
BLUE	19-23 kg	5-6 yr	70-120	18-30	At least 80	20 kg	5 yr
ORANGE	24-29 kg	7-9 yr	70-120	18-30	At least 85	25 kg	7 yr
GREEN	30-36 kg	10-11 yr	60-100	12-20	At least 90	30 kg	9 yr
BLACK	37-50 kg	12-13 yr	60-100	12-20	At least 100		

Adapted from Broselow®-Luten Zones, with permission of Armstrong Medical Industries, Inc.

Vital sign ranges are approximate

Step 2: DILUTE Medication (When Indicated) To Achieve the Correct Concentration:

1. **The medication VOLUME to be administered (mL) is listed in the far-right, blue-shaded column.**
2. **Certain medications listed in bold, green font and "(D)" must be DILUTED before administration.**
3. **Dilution instructions are on the back side of each BioTel PEDI-Guide© Chart.**
4. The ***CONCENTRATION OF ALL MEDICATIONS MUST BE VERIFIED before administration***.
5. **Whenever possible, every syringe should be labeled with the drug name and concentration.**
6. The BioTel MACC should be followed for every medication dose, every time.
7. Several emergency interventions and equipment sizes are also included on each PEDI-Guide© chart.
8. For vasoactive drips, use the dilution listed on the chart and contact BioTel for specific dosing guidance.

Step 3: REDUCE the Volume of Medication (When Indicated), Using Stopcock Method:

1. For infants and smaller children, safe and accurate measurement of small drug volumes from a larger volume drug volume necessitates reduction using a 3-way stopcock and a small (1-mL or 3-mL) syringe.
2. **The medication VOLUME to be administered (mL) is listed in the far-right, blue-shaded column.**
3. **Certain medications listed in bold, green font and "(R)" must be REDUCED before administration.**
   A. If **not** listed in bold, green font with "(R)", medications may be drawn directly from the vial, without the stopcock reduction procedure, using a 1-mL, 3-mL or 5-mL syringe, as needed
4. The ***DOSE and VOLUME OF ALL MEDICATIONS MUST BE VERIFIED*** before administration.
5. Attach a 3-way stopcock to the labeled medication syringe (if dilution was performed) or pre-filled syringe:

6. ***Flush the stopcock with the drug syringe, to fill dead space and eliminate air bubbles.***

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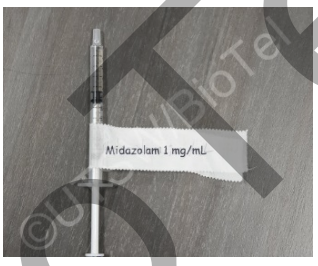
7. Attach a 1-mL (or rarely, if indicated, a 3-mL) syringe to another stopcock port:

8. Use the stopcock to draw up the correct drug volume into the 1-mL syringe:

9. Detach the 1-mL (or 3-mL) syringe from the stopcock/10-mL syringe assembly and LABEL it:



10. The ***DOSE (and volume and concentration) MUST BE VERIFIED before administration***.

11. **Administer the drug to the patient ONLY from the 1-mL (or 3-mL) syringe:**

12. For IV administration, flush the IV line with up to 5-10 mL of Normal Saline.

13. **NOTE:** ONLY the (labeled) 1-mL (or 3-mL) syringe should be used to administer medication!

14. **NOTE:** The large syringe or stopcock should NEVER be used directly to administer medication:

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Weight (kg): 3.0 – 3.9		Weight (lb): 6.6 – 8.5	
Age: Less than 1 month		**Length: 47 – 52 cm**	
Normal Vital Signs:	**HR 100 - 180**	**RR 30 - 60**	**SBP At least 60**
DEFIBRILLATION: 6 → 12 → 12 - 30 Joules		CARDIOVERSION: 3 → 6 → 12 Joules	
Newly-born infant CPR: 3:1 Ratio (Chest Compressions: Ventilations) **120 events per minute (90 compressions & 30 gentle ventilations)**			
OPA: 50 mm; NPA: 14 Fr	Laryngoscope: 1 Straight	Fluid bolus (20 mL/kg): 60 mL IV push	
ETT: 3.5 Uncuffed/ 3.0 Cuffed; Depth: 9 – 9.5 cm		King: Size 0; I-Gel: Size 1 Pink	
Avoid overventilation Refer to Neonatal CPG for detailed resuscitation guidelines Refer to Universal Care - Pediatric and Cardiac Arrest CPG for additional guidance			

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st Dose	3 mg/mL	0.3 mg	IV/IO	0.1 mL
Adenosine 2nd Dose	3 mg/mL	0.6 mg	IV/IO	0.2 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	15 mg	IV/IO	0.3 mL
Atropine - Bradycardia/PAI	0.1 mg/mL	0.05 mg	IV/IO	0.5 mL
Calcium Chloride	100 mg/mL	50 mg	IV/IO	0.5 mL
Dextrose 10%	0.1 g/mL	0.6 g	IV/IO	6 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	2 mg	IV/IO/IM/PO	0.5 mL
Diazepam	5 mg/mL	0.5 mg	IV/IO	0.1 mL
Diphenhydramine	50 mg/mL	5 mg	IV/IO/IM	0.1 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.05 mg	**IM**	0.05 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.05 mg	**IV/IO**	0.5 mL
Epi Auto-Injector Junior	Not applicable unless syringe-dose epi is unavailable			
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	1 mg	IV/IO	0.5 mL
Fentanyl	50 mcg/mL	5 mcg	IV/IO/IM/IN	0.1 mL
Glucagon	Contact BioTel for authorization			
Glucose Gel	15 g/37.5 mL tube	0.6 g	BUCCAL	1.5 mL
Hydroxocobalamin	5 g/200 mL	312.5 mg	IV	**See back**
Lidocaine 2% - Cardiac	20 mg/mL	4 mg	IV/IO	0.2 mL
Magnesium Sulfate	**See Dilution Chart**	120 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	6.25 mg	**IV/IO**	**0.5 mL (D/R)**
Methylprednisolone	125 mg/2 mL	6.25 mg	**IM**	0.1 mL
Midazolam	**1 mg/mL**	0.6 mg	IV/IO/IM/IN	**0.6 mL (D/R)**
Morphine	**1 mg/mL**	0.3 mg	IV/IO/IM	**0.3 mL (D/R)**
Naloxone	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Sodium Bicarbonate 8.4%	1 mEq/mL	3 mEq	IV/IO	3 mL

Less than 1 month (6.6 – 8.5 lb) 3.0 – 3.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medications not indicated: Ipratropium, Ketamine, Ondansetron

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 15 gtt/min **for 15 min** (1/16 vial or 12.5 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 48 gtt/min (12 mL) **for 15 min** **Use 60 gtt/mL set. Set Timer!**
**For Respiratory Distress - Contact BioTel for authorization			
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 2.4 mL, push slowly over 2 min
Methylprednisolone (D/R) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Reduce & administer 0.5 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 0.6 mL
**PAI IV/IO only			**For PAI use half dose: Give 0.3 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 0.3 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): 5: 3 gtt/min | **7.5:** 4 gtt/min | **10:** 6 gtt/min | **12.5:** 7 gtt/min | **15:** 8 gtt/min | **20:** 11 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): 0.1: 5 gtt/min | **0.2:** 9 gtt/min | **0.3:** 14 gtt/min | **0.4:** 18 gtt/min | **0.5:** 23 gtt/min **0.6:** 27 gtt/min | **0.7:** 32 gtt/min | **0.8:** 36 gtt/min | **0.9:** 41 gtt/min | **1:** 45 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): 0.1: 5 gtt/min | **0.2:** 9 gtt/min | **0.3:** 14 gtt/min | **0.4:** 18 gtt/min | **0.5:** 23 gtt/min **0.6:** 27 gtt/min | **0.7:** 32 gtt/min | **0.8:** 36 gtt/min | **0.9:** 41 gtt/min | **1:** 45 gtt/min			

Less than 1 month (6.6 – 8.5 lb) 3.0 – 3.9 kg

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Weight (kg): 4.0 – 4. 9		Weight (lb): 8.6 – 10.8	
Age: Less than 2 months		**Length: 52 – 55 cm**	
Normal Vital Signs:	**HR 100 - 180**	**RR 30 - 60**	**SBP at least 60**
DEFIBRILLATION: 8 → 16 → 16 - 40 Joules		CARDIOVERSION: 4 → 8 → 16 Joules	
Newly-born infant CPR: 3:1 Ratio (Chest Compressions: Ventilations) **120 events per minute (90 compressions & 30 gentle ventilations)**			
OPA: 50 mm; NPA: 14 Fr	Laryngoscope: 1 Straight	Fluid bolus (20 mL/kg): 80 mL IV push	
ETT: 3.5 Uncuffed/ 3.0 Cuffed; Depth: 9.5 – 10 cm		King: Size 0; I-Gel: Size 1 Pink	
Avoid overventilation Refer to Neonatal CPG for detailed resuscitation guidelines Refer to Universal Care - Pediatric and Cardiac Arrest CPG for additional guidance			

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st Dose	3 mg/mL	0.3 mg	IV/IO	0.1 mL
Adenosine 2nd Dose	3 mg/mL	0.6 mg	IV/IO	0.2 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	20 mg	IV/IO	0.4 mL
Atropine - Bradycardia/PAI	0.1 mg/mL	0.1 mg	IV/IO	1 mL
Calcium Chloride	100 mg/mL	100 mg	IV/IO	1 mL
Dextrose 10%	0.1 g/mL	0.8 g	IV/IO	8 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	2.4 mg	IV/IO/IM/PO	0.6 mL
Diazepam	5 mg/mL	1 mg	IV/IO	0.2 mL
Diphenhydramine	50 mg/mL	5 mg	IV/IO/IM	0.1 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.05 mg	**IM**	0.05 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.05 mg	**IV/IO**	0.5 mL
Epi Auto-Injector Junior	Not applicable unless syringe-dose epi is unavailable			
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	1.2 mg	IV/IO	0.6 mL
Fentanyl	50 mcg/mL	5 mcg	IV/IO/IM/IN	0.1 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	2 g	BUCCAL	5 mL
Hydroxocobalamin	5 g/200 mL	312.5 mg	IV	**See back**
Lidocaine 2% - Cardiac	20 mg/mL	4 mg	IV/IO	0.2 mL
Magnesium Sulfate	**See Dilution Chart**	160 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	6.25 mg	**IV/IO**	**0.5 mL (D/R)**
Methylprednisolone	125 mg/2 mL	6.25 mg	**IM**	0.1 mL
Midazolam	**1 mg/mL**	0.8 mg	IV/IO/IM/IN	**0.8 mL (D/R)**
Morphine	**1 mg/mL**	0.4 mg	IV/IO/IM	**0.4 mL (D/R)**
Naloxone	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Sodium Bicarbonate 8.4%	1 mEq/mL	4 mEq	IV/IO	4 mL

Less than 2 months (8.6 – 10.8 lb) 4.0 – 4.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

Medications not indicated: Ipratropium, Ketamine, Ondansetron

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 15 gtt/min **for 15 min** (1/16 vial or 12.5 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 64 gtt/min (16 mL) **for 15 min** **Use 60 gtt/mL set. Set Timer!**
**For Respiratory Distress - Contact BioTel for authorization			
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 3.2 mL, push slowly over 2 min
Methylprednisolone (D/R) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Reduce & administer 0.5 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 0.8 mL
**PAI IV/IO only			**For PAI use half dose: Give 0.4 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 0.4 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 4 gtt/min | **7.5:** 6 gtt/min | **10:** 8 gtt/min | **12.5:** 9 gtt/min | **15:** 11 gtt/min | **20:** 15 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 6 gtt/min | **0.2:** 12 gtt/min | **0.3:** 18 gtt/min | **0.4:** 24 gtt/min | **0.5:** 30 gtt/min **0.6:** 36 gtt/min | **0.7:** 42 gtt/min | **0.8:** 48 gtt/min | **0.9:** 54 gtt/min | **1:** 60 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 6 gtt/min | **0.2:** 12 gtt/min | **0.3:** 18 gtt/min | **0.4:** 24 gtt/min | **0.5:** 30 gtt/min **0.6:** 36 gtt/min | **0.7:** 42 gtt/min | **0.8:** 48 gtt/min | **0.9:** 54 gtt/min | **1:** 60 gtt/min			

Less than 2 months (8.6 – 10.8 lb) 4.0 – 4.9 kg

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Weight (kg): 5.0 – 5. 9		Weight (lb): 11 – 13	
Age: Less than 3 months		**Length: 55 – 58 cm**	
Normal Vital Signs:	**HR 100 - 180**	**RR 30 - 60**	**SBP At least 60**
DEFIBRILLATION: 10 → 20 → 20 - 50 Joules		CARDIOVERSION: 5 → 10 → 20 Joules	
2-Rescuer Infant CPR: 15:2 Ratio (Chest Compressions: Ventilations) **Compression Rate: 100 – 120/minute; Pause for breaths**			
OPA: 50 mm; NPA: 14 Fr	Laryngoscope: 1 Straight	Fluid bolus (20 mL/kg): 100 mL	
ETT: 3.5 Uncuffed/ 3.0 Cuffed; Depth: 10 – 10.5 cm		King: Size 1 White; I-Gel: Size 1.5 Blue	
Avoid overventilation Refer to Universal Care - Pediatric and Cardiac Arrest CPG for additional guidance			

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st Dose	3 mg/mL	0.6 mg	IV/IO	0.2 mL
Adenosine 2nd Dose	3 mg/mL	1.2 mg	IV/IO	0.4 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	25 mg	IV/IO	0.5 mL
Atropine - Bradycardia/PAI	0.1 mg/mL	0.1 mg	IV/IO	1 mL
Calcium Chloride	100 mg/mL	100 mg	IV/IO	1 mL
Dextrose 10%	0.1 g/mL	1 g	IV/IO	10 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	3.2 mg	IV/IO/IM/PO	0.8 mL
Diazepam	5 mg/mL	1 mg	IV/IO	0.2 mL
Diphenhydramine	50 mg/mL	5 mg	IV/IO/IM	0.1 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.05 mg	**IM**	0.05 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.05 mg	**IV/IO**	0.5 mL
Epi Auto-Injector Junior	Not applicable unless syringe-dose epi is unavailable			
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	1.6 mg	IV/IO	0.8 mL
Fentanyl	50 mcg/mL	5 mcg	IV/IO/IM/IN	0.1 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	2 g	BUCCAL	5 mL
Hydroxocobalamin	5 g/200 mL	312.5 mg	IV	**See back**
Lidocaine 2% - Cardiac	20 mg/mL	4 mg	IV/IO	0.2 mL
Magnesium Sulfate	**See Dilution Chart**	200 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	12.5 mg	**IV/IO**	**1 mL (D)**
Methylprednisolone	125 mg/2 mL	12.5 mg	**IM**	0.2 mL
Midazolam	**1 mg/mL**	1 mg	IV/IO/IM/IN	**1 mL (D/R)**
Morphine	**1 mg/mL**	0.5 mg	IV/IO/IM	**0.5 mL (D/R)**
Naloxone	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Sodium Bicarbonate 8.4%	1 mEq/mL	5 mEq	IV/IO	5 mL

Less than 3 months (11 – 13 lb) 5.0 – 5.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

Medications not indicated: Ipratropium, Ketamine, Ondansetron

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 15 gtt/min **for 15 min** (1/16 vial or 12.5 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 80 gtt/min (20 mL) **for 15 min** **Use 60 gtt/mL set. Set Timer!**
**For Respiratory Distress - Contact BioTel for authorization			
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 4 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 1 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 1 mL
**PAI IV/IO only			**For PAI use half dose: Give 0.5 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 0.5 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 5 gtt/min | **7.5:** 7 gtt/min | **10:** 9 gtt/min | **12.5:** 12 gtt/min | **15:** 14 gtt/min | **20:** 19 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 8 gtt/min | **0.2:** 15 gtt/min | **0.3:** 23 gtt/min | **0.4:** 30 gtt/min | **0.5:** 38 gtt/min **0.6:** 45 gtt/min | **0.7:** 53 gtt/min | **0.8:** 60 gtt/min | **0.9:** 68 gtt/min | **1:** 75 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 8 gtt/min | **0.2:** 15 gtt/min | **0.3:** 23 gtt/min | **0.4:** 30 gtt/min | **0.5:** 38 gtt/min **0.6:** 45 gtt/min | **0.7:** 53 gtt/min | **0.8:** 60 gtt/min | **0.9:** 68 gtt/min | **1:** 75 gtt/min			

Less than 3 months (11 – 13 lb) 5.0 – 5.9 kg

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Weight (kg): 6.0 – 7.9		**Weight (lb): 13.2 – 15.4**	
Age: 3 – 5 months		**Length: 59 – 67 cm**	
Normal Vital Signs:	**HR 100 - 180**	**RR 30 - 45**	**SBP At least 70**
DEFIBRILLATION: 13 → 26 → 26 - 60 Joules		CARDIOVERSION: 7 → 13 → 26 Joules	
OPA: 50 mm; NPA: 14 Fr	Laryngoscope: 1 Straight	Fluid Bolus (20 mL/kg): 150 mL	
ETT: 3.5 Uncuffed/ 3.0 Cuffed; Depth: 10 – 10.5 cm		King: Size 1 White; I-Gel: Size 1.5 Blue	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	0.6 mg	IV/IO	0.2 mL
Adenosine 2nd dose	3 mg/mL	1.2 mg	IV/IO	0.4 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	35 mg	IV/IO	0.7 mL
Atropine - Bradycardia/PAI	0.1 mg/mL	0.15 mg	IV/IO	1.5 mL
Calcium Chloride	100 mg/mL	150 mg	IV/IO	1.5 mL
Dextrose 10%	0.1 g/mL	1.5 g	IV/IO	15 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	4 mg	IV/IO/IM/PO	1 mL
Diazepam	5 mg/mL	1.5 mg	IV/IO	0.3 mL
Diphenhydramine	50 mg/mL	5 mg	IV/IO/IM	0.1 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.1 mg	**IM**	0.1 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.1 mg	**IV/IO**	1 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	2 mg	IV/IO	1 mL
Fentanyl	50 mcg/mL	10 mcg	IV/IO/IM/IN	0.2 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	2 g	BUCCAL	5 mL
Hydroxocobalamin	5 g/200 mL	625 mg	IV	**See back**
Lidocaine 2% - Cardiac	20 mg/mL	8 mg	IV/IO	0.4 mL
Magnesium Sulfate	**See Dilution Chart**	280 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	12.5 mg	**IV/IO**	**1 mL (D)**
Methylprednisolone	125 mg/2 mL	12.5 mg	**IM**	0.2 mL
Midazolam	**1 mg/mL**	1 mg	IV/IO/IM/IN	**1 mL (D/R)**
Morphine	**1 mg/mL**	0.7 mg	IV/IO/IM	**0.7 mL (D/R)**
Naloxone	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Sodium Bicarbonate 8.4%	1 mEq/mL	7 mEq	IV/IO	7 mL

3 – 5 months (13.2 – 15.4 lb) 6 – 7.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medications not indicated: Ipratropium, Ketamine, Ondansetron

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 30 gtt/min **for 15 min** (1/8 vial or 25 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 112 gtt/min (28 mL) **for 15 min** **Use 60 gtt/mL set. Set Timer!**
**For Respiratory Distress - Contact BioTel for authorization			
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 5.6 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 1 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 1 mL
**PAI IV/IO only			**For PAI use half dose: Give 0.5 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 0.7 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 7 gtt/min | **7.5:** 10 gtt/min | **10:** 13 gtt/min | **12.5:** 16 gtt/min | **15:** 20 gtt/min | **20:** 26 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 11 gtt/min | **0.2:** 21 gtt/min | **0.3:** 32 gtt/min | **0.4:** 42 gtt/min | **0.5:** 53 gtt/min **0.6:** 63 gtt/min | **0.7:** 74 gtt/min | **0.8:** 84 gtt/min | **0.9:** 95 gtt/min | **1:** 105 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 11 gtt/min | **0.2:** 21 gtt/min | **0.3:** 32 gtt/min | **0.4:** 42 gtt/min | **0.5:** 53 gtt/min **0.6:** 63 gtt/min | **0.7:** 74 gtt/min | **0.8:** 84 gtt/min | **0.9:** 95 gtt/min | **1:** 105 gtt/min			

3 – 5 months (13.2 – 15.4 lb) 6 – 7.9 kg

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Weight (kg): 8 – 9.9		**Weight (lb): 17.6 – 21.8**	
Age: 6 – 11 months		**Length: 67.7 – 74.5 cm**	
Normal Vital Signs:	**HR 100 - 180**	**RR 30 - 45**	**SBP At least 70**
DEFIBRILLATION: 15 → 30 → 30 - 80 Joules		CARDIOVERSION: 8 → 16 → 30 Joules	
OPA: 50 mm; NPA: 14 Fr	Laryngoscope: 1 Straight	Fluid Bolus (20 mL/kg): 200 mL	
ETT: 3.5 Uncuffed/ 3.0 Cuffed; Depth: 10.5 – 11 cm		King: Size 1 White; I-Gel: Size 1.5 Blue	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	0.9 mg	IV/IO	0.3 mL
Adenosine 2nd dose	3 mg/mL	1.8 mg	IV/IO	0.6 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	45 mg	IV/IO	0.9 mL
Atropine - Bradycardia/PAI	0.1 mg/mL	0.2 mg	IV/IO	2 mL
Calcium Chloride	100 mg/mL	200 mg	IV/IO	2 mL
Dextrose 10%	0.1 g/mL	2 g	IV/IO	20 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	5.6 mg	IV/IO/IM/PO	1.4 mL
Diazepam	5 mg/mL	2 mg	IV/IO	0.4 mL
Diphenhydramine	50 mg/mL	10 mg	IV/IO/IM	0.2 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.1 mg	**IM**	0.1 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.1 mg	**IV/IO**	1 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	2.8 mg	IV/IO	1.4 mL
Fentanyl	50 mcg/mL	10 mcg	IV/IO/IM/IN	0.2 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	2 g	BUCCAL	5 mL
Hydroxocobalamin	5 g/200 mL	625 mg	IV	**See back**
Ketamine SEDATE 1st dose	**10 mg/mL**	18 mg	**IV/IO**	**1.8 mL (D/R)**
Ketamine SEDATE 2nd dose		18 mg	**IV/IO**	**1.8 mL (D/R)**
Ketamine SEDATE 1st dose	100 mg/mL	40 mg	**IM**	0.4 mL
Ketamine SEDATE 2nd dose		20 mg	**IM**	0.2 mL
Ketamine PAIN 1st dose	**10 mg/mL**	2 mg	**IV/IO**	**0.2 mL (D/R)**
Ketamine PAIN 2nd dose		1 mg	**IV/IO**	**0.1 mL (D/R)**
Ketamine PAIN 1st dose		4 mg	**IM/IN**	**0.4 mL (D/R)**
Ketamine PAIN 2nd dose		2 mg	**IM/IN**	**0.2 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	12 mg	IV/IO	0.6 mL
Magnesium Sulfate	**See Dilution Chart**	360 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	12.5 mg	**IV/IO**	**1 mL (D)**
Methylprednisolone	125 mg/2 mL	12.5 mg	**IM**	0.2 mL
Midazolam	**1 mg/mL**	1.8 mg	IV/IO/IM/IN	**1.8 mL (D/R)**
Morphine	**1 mg/mL**	0.9 mg	IV/IO/IM	**0.9 mL (D/R)**
Naloxone	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Sodium Bicarbonate 8.4%	1 mEq/mL	10 mEq	IV/IO	10 mL

6 – 11 months (17.6 – 21.8 lb) 8 – 9.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

Medications not indicated: Ipratropium, Ondansetron

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

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Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

RED

6 – 11 months (17.6 – 21.8 lb)

8 – 9.9 kg

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 30 gtt/min **for 15 min** (1/8 vial or 25 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 1.8 mL 2nd dose: Reduce & give 1.8 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.2 mL 2nd dose: Reduce & give 0.1 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.4 mL 2nd dose: Reduce & give 0.2 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 144 gtt/min (36 mL) **for 15 min** **Use 60 gtt/mL set. Set Timer!**
	**For Respiratory Distress - Contact BioTel for authorization		
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 7.2 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 1 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 1.8 mL **For PAI use half dose: Give 0.9 mL
		**PAI IV/IO only	
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 0.9 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 8 gtt/min | **7.5:** 13 gtt/min | **10:** 17 gtt/min | **12.5:** 21 gtt/min | **15:** 25 gtt/min | **20:** 34 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 14 gtt/min | **0.2:** 27 gtt/min | **0.3:** 41 gtt/min | **0.4:** 54 gtt/min | **0.5:** 68 gtt/min **0.6:** 81 gtt/min | **0.7:** 95 gtt/min | **0.8:** 108 gtt/min | **0.9:** 122 gtt/min | **1:** 135 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 14 gtt/min | **0.2:** 27 gtt/min | **0.3:** 41 gtt/min | **0.4:** 54 gtt/min | **0.5:** 68 gtt/min **0.6:** 81 gtt/min | **0.7:** 95 gtt/min | **0.8:** 108 gtt/min | **0.9:** 122 gtt/min | **1:** 135 gtt/min			

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Weight (kg): 10 – 11.9		Weight (lb): 22 – 26	
Age: 12 – 23 months		Length: 74.5 – 84 cm	
Normal Vital Signs:	**HR 80 - 150**	**RR 25- 40**	**SBP At least 75**
DEFIBRILLATION: 20 → 40 → 40 - 100 Joules		CARDIOVERSION: 10 → 20 → 40 Joules	
OPA: 60 mm; NPA: 18 Fr	Laryngoscope: 1 Straight	Fluid Bolus (20 mL/kg): 200 mL	
ETT: 4.0 Uncuffed/ 3.5 Cuffed; Depth: 11 – 12 cm		King: Size 1 White; I-Gel: Size 2 Gray	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	1.2 mg	IV/IO	0.4 mL
Adenosine 2nd dose	3 mg/mL	2.4 mg	IV/IO	0.8 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	50 mg	IV/IO	1 mL
Atropine - Bradycardia	0.1 mg/mL	0.2 mg	IV/IO	2 mL
Calcium Chloride	100 mg/mL	200 mg	IV/IO	2 mL
Dextrose 10%	0.1 g/mL	2.5 g	IV/IO	25 mL slow IVP
Dexamethasone - Allergic	4 mg/mL	6.4 mg	IV/IO/IM/PO	1.6 mL
Diazepam	5 mg/mL	2 mg	IV/IO	0.4 mL
Diphenhydramine	50 mg/mL	10 mg	IV/IO/IM	0.2 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.1 mg	**IM**	0.1 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.1 mg	**IV/IO**	1 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB	1 mg/mL	3 mg	NEB	3 mL
Etomidate	2 mg/mL	3.2 mg	IV/IO	1.6 mL
Fentanyl	50 mcg/mL	10 mcg	IV/IO/IM/IN	0.2 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	3 g	BUCCAL	7.5 mL
Hydroxocobalamin	5 g/200 mL	625 mg	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	22 mg	**IV/IO**	**2.2 mL (D/R)**
Ketamine SEDATE 2nd dose		22 mg	**IV/IO**	**2.2 mL (D/R)**
Ketamine SEDATE 1st dose	100 mg/mL	40 mg	**IM**	0.4 mL
Ketamine SEDATE 2nd dose		20 mg	**IM**	0.2 mL
Ketamine PAIN 1st dose	**10 mg/mL**	2 mg	**IV/IO**	**0.2 mL (D/R)**
Ketamine PAIN 2nd dose		1 mg	**IV/IO**	**0.1 mL (D/R)**
Ketamine PAIN 1st dose		4 mg	**IM/IN**	**0.4 mL (D/R)**
Ketamine PAIN 2nd dose		2 mg	**IM/IN**	**0.2 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	12 mg	IV/IO	0.6 mL
Magnesium Sulfate	**See Dilution Chart**	440 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	25 mg	**IV/IO**	**2 mL (D)**
Methylprednisolone	125 mg/2 mL	25 mg	**IM**	0.4 mL
Midazolam	**1 mg/mL**	2.2 mg	IV/IO/IM/IN	**2.2 mL (D/R)**
Morphine	**1 mg/mL**	1 mg	IV/IO/IM	**1 mL (D/R)**
Naloxone	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Ondansetron IV or ODT	Not applicable			
Sodium Bicarbonate 8.4%	1 mEq/mL	10 mEq	IV/IO	10 mL

12 – 23 months (22 – 26 lb) 10 – 11.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 30 gtt/min **for 15 min** (1/8 vial or 25 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 2.2 mL 2nd dose: Reduce & give 2.2 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.2 mL 2nd dose: Reduce & give 0.1 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.4 mL 2nd dose: Reduce & give 0.2 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Torsades de pointes WITH Pulse or **Respiratory Distress			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 29 gtt/min (44 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
	**For Respiratory Distress - Contact BioTel for authorization		
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 8.8 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 2 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 2.2 mL
		**PAI IV/IO only	**For PAI use half dose: Give 1 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 1 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 10 gtt/min | **7.5:** 15 gtt/min | **10:** 21 gtt/min | **12.5:** 26 gtt/min | **15:** 31 gtt/min | **20:** 41 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 17 gtt/min | **0.2:** 33 gtt/min | **0.3:** 50 gtt/min | **0.4:** 66 gtt/min | **0.5:** 83 gtt/min **0.6:** 99 gtt/min | **0.7:** 116 gtt/min | **0.8:** 132 gtt/min | **0.9:** 150 gtt/min (max dose reached)			

10 – 11.9 kg (22 – 26 lb) 12 – 23 months

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Weight (kg): 12 – 14.9		**Weight (lb): 26.4 – 32.8**	
Age: 24 – 35 months		**Length: 74.5 – 84 cm**	
Normal Vital Signs:	**HR 80 - 150**	**RR 25 - 40**	**SBP At least 75**
DEFIBRILLATION: 25 → 50 → 50 - 130 Joules		CARDIOVERSION: 13 → 26 → 50 Joules	
OPA: 60 mm; NPA: 20 Fr	Laryngoscope: 2 Straight	Fluid Bolus (20 mL/kg): 250 mL	
ETT: 4.5 Uncuffed/ 4.0 Cuffed; Depth: 12.5 - 13.5 cm		King: Size 2 Green; I-Gel: Size 2 Gray	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	1.2 mg	IV/IO	0.4 mL
Adenosine 2nd dose	3 mg/mL	2.4 mg	IV/IO	0.8 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	70 mg	IV/IO	1.4 mL
Atropine - Bradycardia	0.1 mg/mL	0.25 mg	IV/IO	2.5 mL
Calcium Chloride	100 mg/mL	250 mg	IV/IO	2.5 mL
Dextrose 10%	0.1 g/mL	3 g	IV/IO	30 mL slow IVP
Dexamethasone	4 mg/mL	8 mg	IV/IO/IM/PO	2 mL
Diazepam	5 mg/mL	2.5 mg	IV/IO	0.5 mL
Diphenhydramine	50 mg/mL	10 mg	IV/IO/IM	0.2 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.15 mg	**IM**	0.15 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.15 mg	**IV/IO**	1.5 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	4 mg	IV/IO	2 mL
Fentanyl	50 mcg/mL	15 mcg	IV/IO/IM/IN	0.3 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	3 g	BUCCAL	7.5 mL
Hydroxocobalamin	5 g/200 mL	1.25 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	28 mg	**IV/IO**	**2.8 mL (D/R)**
Ketamine SEDATE 2nd dose		28 mg	**IV/IO**	**2.8 mL (D/R)**
Ketamine SEDATE 1st dose	100 mg/mL	60 mg	**IM**	0.6 mL
Ketamine SEDATE 2nd dose		30 mg	**IM**	0.3 mL
Ketamine PAIN 1st dose	**10 mg/mL**	3 mg	**IV/IO**	**0.3 mL (D/R)**
Ketamine PAIN 2nd dose		1 mg	**IV/IO**	**0.1 mL (D/R)**
Ketamine PAIN 1st dose		6 mg	**IM/IN**	**0.6 mL (D/R)**
Ketamine PAIN 2nd dose		3 mg	**IM/IN**	**0.3 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	12 mg	IV/IO	0.6 mL
Magnesium Sulfate	**See Dilution Chart**	520 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	25 mg	**IV/IO**	**2 mL (D)**
Methylprednisolone	125 mg/2 mL	25 mg	**IM**	0.4 mL
Midazolam	**1 mg/mL**	2.6 mg	IV/IO/IM/IN	**2.6 mL (D/R)**
Morphine	**1 mg/mL**	1.4 mg	IV/IO/IM	**1.4 mL (D/R)**
Naloxone	1 mg/mL	1.5 mg	IV/IO/IM/IN	1.5 mL
Ondansetron IV or ODT	Contact BioTel for authorization			
Sodium Bicarbonate 8.4%	1 mEq/mL	15 mEq	IV/IO	15 mL

(D) = Must be DILUTED (R) = Must be volume-REDUCED

24 – 35 months (26.4 – 32.8 lb) 12 – 14.9 kg

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Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 60 gtt/min **for 15 min** (1/4 vial or 50 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 2.8 mL 2nd dose: Reduce & give 2.8 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.3 mL 2nd dose: Reduce & give 0.1 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.6 mL 2nd dose: Reduce & give 0.3 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 35 gtt/min (52 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**50 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL (0.5g) mag sulfate Give 10 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 2 mL
Midazolam (D/R) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Reduce & administer 2.6 mL **PAI IV/IO only **For PAI use half dose: Give 1.2 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 1.4 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 12 gtt/min | **7.5:** 18 gtt/min | **10:** 24 gtt/min | **12.5:** 30 gtt/min | **15:** 37 gtt/min | **20:** 49 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 20 gtt/min | **0.2:** 39 gtt/min | **0.3:** 59 gtt/min | **0.4:** 78 gtt/min | **0.5:** 98 gtt/min **0.6:** 117 gtt/min | **0.7:** 137 gtt/min | **0.8:** 150 gtt/min (max dose reached)			

12 – 14.9 kg (26.4 – 32.8 lb) 24 – 35 months

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Weight (kg): 15 – 18.9		**Weight (lb): 33 – 41.6**	
Age: 3 – 4 years		**Length: 95 – 108 cm**	
Normal Vital Signs:	**HR 80 - 140**	**RR 22 - 35**	**SBP At least 75**
DEFIBRILLATION: 33 → 65 → 65 - 150 Joules		CARDIOVERSION: 17 → 33 → 65 Joules	
OPA: 60 mm; NPA: 22 Fr	Laryngoscope: 2 Straight	Fluid Bolus (20 mL/kg): 300 mL	
ETT: 5.0 Uncuffed/ 4.5 Cuffed; Depth: 14 – 15 cm		King: Size 2 Green; I-Gel: Size 2 Gray	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	1.8 mg	IV/IO	0.6 mL
Adenosine 2nd dose	3 mg/mL	3.6 mg	IV/IO	1.2 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	90 mg	IV/IO	1.8 mL
Atropine - Bradycardia	0.1 mg/mL	0.35 mg	IV/IO	3.5 mL
Calcium Chloride	100 mg/mL	350 mg	IV/IO	3.5 mL
Dextrose 10%	0.1 g/mL	5 g	IV/IO	50 mL
Dexamethasone	4 mg/mL	10.4 mg	IV/IO/IM/PO	2.6 mL
Diazepam	5 mg/mL	3.5 mg	IV/IO	0.7 mL
Diphenhydramine	50 mg/mL	15 mg	IV/IO/IM	0.3 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.2 mg	**IM**	0.2 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.2 mg	**IV/IO**	2 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	5.2 mg	IV/IO	2.6 mL
Fentanyl	50 mcg/mL	20 mcg	IV/IO/IM/IN	0.4 mL
Glucagon	1 mg/mL	0.5 mg	IV/IO/IM/IN	0.5 mL
Glucose Gel	15 g/37.5 mL tube	3.75 g	BUCCAL	1/4 tube
Hydroxocobalamin	5 g/200 mL	1.25 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	34 mg	**IV/IO**	**3.4 mL (D)**
Ketamine SEDATE 2nd dose		34 mg	**IV/IO**	**3.4 mL (D)**
Ketamine SEDATE 1st dose	100 mg/mL	70 mg	**IM**	0.7 mL
Ketamine SEDATE 2nd dose		40 mg	**IM**	0.4 mL
Ketamine PAIN 1st dose	**10 mg/mL**	3 mg	**IV/IO**	**0.3 mL (D/R)**
Ketamine PAIN 2nd dose		2 mg	**IV/IO**	**0.2 mL (D/R)**
Ketamine PAIN 1st dose		7 mg	**IM/IN**	**0.7 mL (D/R)**
Ketamine PAIN 2nd dose		4 mg	**IM/IN**	**0.4 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	20 mg	IV/IO	1 mL
Magnesium Sulfate	**See Dilution Chart**	680 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	37.5 mg	**IV/IO**	**3 mL (D)**
Methylprednisolone	125 mg/2 mL	37.5 mg	**IM**	0.6 mL
Midazolam	**1 mg/mL**	3.4 mg	IV/IO/IM/IN	**3.4 mL (D)**
Morphine	**1 mg/mL**	1.8 mg	IV/IO/IM	**1.8 mL (D/R)**
Naloxone	1 mg/mL	2 mg	IV/IO/IM/IN	2 mL
Ondansetron IV or ODT	Contact BioTel for authorization			
Sodium Bicarbonate 8.4%	1 mEq/mL	20 mEq	IV/IO	20 mL

3 – 4 years (33 – 41.6 lb) 15 – 18.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 60 gtt/min **for 15 min** (1/4 vial or 50 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Administer 3.4 mL 2nd dose: Administer 3.4 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.3 mL 2nd dose: Reduce & give 0.2 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.7 mL 2nd dose: Reduce & give 0.4 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 45 gtt/min (68 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**200 mg/mL**	Waste 4 mL from 10-mL NS flush Replace with 4 mL (2 g) mag sulfate Give 3.4 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 3 mL
Midazolam (D) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Administer 3.4 mL **PAI IV/IO only **For PAI use half dose: Give 1.6 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 1.8 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 16 gtt/min | **7.5:** 24 gtt/min | **10:** 32 gtt/min | **12.5:** 40 gtt/min | **15:** 48 gtt/min | **20:** 64 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **1 mL (1 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **0.1:** 26 gtt/min | **0.2:** 51 gtt/min | **0.3:** 77 gtt/min | **0.4:** 102 gtt/min | **0.5:** 128 gtt/min | **0.6:** 150 gtt/min Max dose reached at 0.6 mcg/kg/min			

3 – 4 years (33 – 41.6 lb)

15 – 18.9 kg

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Weight (kg): 19 – 23.9		Weight (lb): 41.8 – 52.6	
Age: 5 – 6 years		Length: 109 – 122.5 cm	
Normal Vital Signs:	**HR 70 - 120**	**RR 18 - 30**	**SBP At least 80**
DEFIBRILLATION: 40 → 80 → 80 - 200 Joules		CARDIOVERSION: 20 → 40 → 80 Joules	
OPA: 70 mm; NPA: 24 Fr	Laryngoscope: 2 Straight	Fluid Bolus (20 mL/kg): 400 mL	
ETT: 5.5 Uncuffed/ 5.0 Cuffed; Depth: 15.5 – 16.5 cm		King: Size 2 Green; I-Gel: Size 2 Gray	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	2.1 mg	IV/IO	0.7 mL
Adenosine 2nd dose	3 mg/mL	4.2 mg	IV/IO	1.4 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	100 mg	IV/IO	2 mL
Atropine - Bradycardia	0.1 mg/mL	0.4 mg	IV/IO	4 mL
Calcium Chloride	100 mg/mL	400 mg	IV/IO	4 mL
Dextrose 10%	0.1 g/mL	5 g	IV/IO	50 mL
Dexamethasone	4 mg/mL	12 mg	IV/IO/IM/PO	3 mL
Diazepam	5 mg/mL	4 mg	IV/IO	0.8 mL
Diphenhydramine	50 mg/mL	20 mg	IV/IO/IM	0.4 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.2 mg	**IM**	0.2 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.2 mg	**IV/IO**	2 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	6 mg	IV/IO	3 mL
Fentanyl	50 mcg/mL	20 mcg	IV/IO/IM/IN	0.4 mL
Glucagon	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Glucose Gel	15 g/37.5 mL tube	7.5 g	BUCCAL	1/2 tube
Hydroxocobalamin	5 g/200 mL	1.25 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	42 mg	**IV/IO**	**4.2 mL (D)**
Ketamine SEDATE 2nd dose		42 mg	**IV/IO**	**4.2 mL (D)**
Ketamine SEDATE 1st dose	100 mg/mL	80 mg	**IM**	0.8 mL
Ketamine SEDATE 2nd dose		40 mg	**IM**	0.4 mL
Ketamine PAIN 1st dose	**10 mg/mL**	4 mg	**IV/IO**	**0.4 mL (D/R)**
Ketamine PAIN 2nd dose		2 mg	**IV/IO**	**0.2 mL (D/R)**
Ketamine PAIN 1st dose		8 mg	**IM/IN**	**0.8 mL (D/R)**
Ketamine PAIN 2nd dose		4 mg	**IM/IN**	**0.4 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	20 mg	IV/IO	1 mL
Magnesium Sulfate	**See Dilution Chart**	840 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	50 mg	**IV/IO**	**4 mL (D)**
Methylprednisolone	125 mg/2 mL	50 mg	**IM**	0.8 mL
Midazolam	**1 mg/mL**	4.2 mg	IV/IO/IM/IN	**4.2 mL (D)**
Morphine	**1 mg/mL**	2 mg	IV/IO/IM	**2 mL (D/R)**
Naloxone	1 mg/mL	2 mg	IV/IO/IM/IN	2 mL
Ondansetron	2 mg/mL	4 mg	**IV/IO**	2 mL
Ondansetron	Formulation dependent	1 full 4-mg **ODT** **OR** ½ of 8-mg **ODT**		
Sodium Bicarbonate 8.4%	1 mEq/mL	20 mEq	IV/IO	20 mL

5 – 6 years (41.8 – 52.6 lb) 19 – 23.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 60 gtt/min **for 15 min** (1/4 vial or 50 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Administer 4.2 mL 2nd dose: Administer 4.2 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.4 mL 2nd dose: Reduce & give 0.2 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.8 mL 2nd dose: Reduce & give 0.4 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 56 gtt/min (84 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**200 mg/mL**	Waste 4 mL from 10-mL NS flush Replace with 4 mL (2 g) mag sulfate Give 4.2 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 4 mL
Midazolam (D) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Administer 4.2 mL **PAI IV/IO only **For PAI use half dose: Give 2 mL
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 2 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 20 gtt/min | **7.5:** 30 gtt/min | **10:** 39 gtt/min | **12.5:** 49 gtt/min | **15:** 59 gtt/min | **20:** 79 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **2 mL (2 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 15 gtt/min | **4:** 30 gtt/min | **6:** 45 gtt/min | **8:** 60 gtt/min | **10:** 75 gtt/min			

19 – 23.9 kg (41.8 – 52.6 lb) 5 – 6 years

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Weight (kg): 24 – 29		Weight (lb): 53 – 64	
Age: 7 – 9 years		**Length: 123 – 131 cm**	
Normal Vital Signs:	**HR 70 - 120**	**RR 18 - 30**	**SBP At least 85**
DEFIBRILLATION: 55 → 110 → 110 - 260 Joules		CARDIOVERSION: 27 → 52 → 100 Joules	
OPA: 80 mm; NPA: 26 Fr	Laryngoscope: 2 Straight	Fluid Bolus (20 mL/kg): 500 mL	
ETT: 6.0 Cuffed; Depth: 17 – 18 cm		King: Size 2.5 Orange; I-Gel: Size 2.5 White	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	2.7 mg	IV/IO	0.9 mL
Adenosine 2nd dose	3 mg/mL	5.4 mg	IV/IO	1.8 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	140 mg	IV/IO	2.8 mL
Atropine - Bradycardia	0.1 mg/mL	0.5 mg	IV/IO	5 mL
Calcium Chloride	100 mg/mL	550 mg	IV/IO	5.5 mL
Dextrose 10%	0.1 g/mL	10 g	IV/IO	100 mL
Dexamethasone	4 mg/mL	16 mg	IV/IO/IM/PO	4 mL
Diazepam	5 mg/mL	5 mg	IV/IO	1 mL
Diphenhydramine	50 mg/mL	25 mg	IV/IO/IM	0.5 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.25 mg	**IM**	0.25 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.25 mg	**IV/IO**	2.5 mL
Epi Auto-Injector Junior	Brand dependent	0.15 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	8 mg	IV/IO	4 mL
Fentanyl	50 mcg/mL	25 mcg	IV/IO/IM/IN	0.5 mL
Glucagon	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Glucose Gel	15 g/37.5 mL tube	15 g	BUCCAL	1 tube
Hydroxocobalamin	5 g/200 mL	2.5 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	54 mg	**IV/IO**	**5.4 mL (D)**
Ketamine SEDATE 2nd dose		54 mg	**IV/IO**	**5.4 mL (D)**
Ketamine SEDATE 1st dose	100 mg/mL	100 mg	**IM**	1 mL
Ketamine SEDATE 2nd dose		50 mg	**IM**	0.5 mL
Ketamine PAIN 1st dose	**10 mg/mL**	5 mg	**IV/IO**	**0.5 mL (D/R)**
Ketamine PAIN 2nd dose		3 mg	**IV/IO**	**0.3 mL (D/R)**
Ketamine PAIN 1st dose		10 mg	**IM/IN**	**1 mL (D/R)**
Ketamine PAIN 2nd dose		5 mg	**IM/IN**	**0.5 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	28 mg	IV/IO	1.4 mL
Magnesium Sulfate	**See Dilution Chart**	1000 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	50 mg	**IV/IO**	**4 mL (D)**
Methylprednisolone	125 mg/2 mL	50 mg	**IM**	0.8 mL
Midazolam	**1 mg/mL**	5 mg	IV/IO/IM/IN	**5 mL (D)**
Morphine	**1 mg/mL**	2.8 mg	IV/IO/IM	**2.8 mL (D/R)**
Naloxone	1 mg/mL	2 mg	IV/IO/IM/IN	2 mL
Ondansetron	2 mg/mL	4 mg	**IV/IO**	2 mL
Ondansetron	Formulation dependent	1 full 4-mg **ODT** **OR** ½ of 8-mg **ODT**		
Sodium Bicarbonate 8.4%	1 mEq/mL	30 mEq	IV/IO	30 mL

7 – 9 years (53 – 64 lb) 24 – 29 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 120 gtt/min **for 15 min** (1/2 vial or 100 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Administer 5.4 mL 2nd dose: Administer 5.4 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.5 mL 2nd dose: Reduce & give 0.3 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 1 mL 2nd dose: Reduce & give 0.5 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**10 mg/mL**	Add 2 mL (1 g) to 100 mL NS Run 67 gtt/min (100 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**200 mg/mL**	Waste 4 mL from 10-mL NS flush Replace with 4 mL (2 g) mag sulfate Give 5.2 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 4 mL
Midazolam (D) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Administer 5 mL **For PAI use half dose: Give 2.5 mL
		**PAI IV/IO only	
Morphine (D/R) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Reduce & administer 2.8 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 25 gtt/min | **7.5:** 38 gtt/min | **10:** 51 gtt/min | **12.5:** 63 gtt/min | **15:** 76 gtt/min | **20:** 101 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **2 mL (2 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 15 gtt/min | **4:** 30 gtt/min | **6:** 45 gtt/min | **8:** 60 gtt/min | **10:** 75 gtt/min			

7 – 9 years (53 – 64 lb) 24 – 29 kg

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Weight (kg): 30 – 36.9		Weight (lb): 66 – 81	
Age: 10 – 11 years		Length: 131 – 144 cm	
Normal Vital Signs:	**HR 60 - 100**	**RR 12 - 20**	**SBP At least 90**
DEFIBRILLATION: 55 → 110 → 110 - 260 Joules		CARDIOVERSION: 27 → 52 → 100 Joules	
OPA: 80 mm; NPA: 26 Fr	Laryngoscope: 3 Straight	Fluid Bolus (20 mL/kg): 700 mL	
ETT: 6.5 Cuffed; Depth: 18.5 – 19.5 cm		King: Size 3 Yellow; I-Gel: Size 3 Yellow	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st dose	3 mg/mL	3 mg	IV/IO	1 mL
Adenosine 2nd dose	3 mg/mL	6.6 mg	IV/IO	2.2 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	160 mg	IV/IO	3.2 mL
Atropine - Bradycardia	0.1 mg/mL	0.5 mg	IV/IO	5 mL
Calcium Chloride	100 mg/mL	650 mg	IV/IO	6.5 mL
Dextrose 10%	0.1 g/mL	10 g	IV/IO	100 mL
Dexamethasone	4 mg/mL	16 mg	IV/IO/IM/PO	4 mL
Diazepam	5 mg/mL	5 mg	IV/IO	1 mL
Diphenhydramine	50 mg/mL	35 mg	IV/IO/IM	0.7 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.3 mg	**IM**	0.3 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.3 mg	**IV/IO**	3 mL
Epi Auto-Injector ADULT	1 mg/mL	0.3 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	10 mg	IV/IO	5 mL
Fentanyl	50 mcg/mL	35 mcg	IV/IO/IM/IN	0.7 mL
Glucagon	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Glucose Gel	15 g/37.5 mL tube	15 g	BUCCAL	1 tube
Hydroxocobalamin	5 g/200 mL	2.5 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	66 mg	**IV/IO**	**6.6 mL (D)**
Ketamine SEDATE 2nd dose		66 mg	**IV/IO**	**6.6 mL (D)**
Ketamine SEDATE 1st dose	100 mg/mL	140 mg	**IM**	1.4 mL
Ketamine SEDATE 2nd dose		70 mg	**IM**	0.7 mL
Ketamine PAIN 1st dose	**10 mg/mL**	7 mg	**IV/IO**	**0.7 mL (D/R)**
Ketamine PAIN 2nd dose		3 mg	**IV/IO**	**0.3 mL (D/R)**
Ketamine PAIN 1st dose		14 mg	**IM/IN**	**1.4 mL (D/R)**
Ketamine PAIN 2nd dose		7 mg	**IM/IN**	**0.7 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	32 mg	IV/IO	1.6 mL
Magnesium Sulfate	**See Dilution Chart**	1320 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	62.5 mg	**IV/IO**	**5 mL (D)**
Methylprednisolone	125 mg/2 mL	62.5 mg	**IM**	1 mL
Midazolam	**1 mg/mL**	5 mg	IV/IO/IM/IN	**5 mL (D)**
Morphine	**1 mg/mL**	3.4 mg	IV/IO/IM	**3.4 mL (D)**
Naloxone	**1 mg/mL**	2 mg	IV/IO/IM/IN	2 mL
Ondansetron	2 mg/mL	4 mg	**IV/IO**	2 mL
Ondansetron	Formulation dependent	1 full 4-mg **ODT** **OR** ½ of 8-mg **ODT**		
Sodium Bicarbonate 8.4%	1 mEq/mL	35 mEq	IV/IO	35 mL

10 – 11 years (66 – 81 lb) 30 – 36.9 kg

(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 120 gtt/min **for 15 min** (1/2 vial or 100 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Administer 6.6 mL 2nd dose: Administer 6.6 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.7 mL 2nd dose: Reduce & give 0.3 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine **1st dose: Reduce & give 1.4 mL 2nd dose: Reduce & give 0.7 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**20 mg/mL**	Add 4 mL (2 g) to 100 mL NS Run 44 gtt/min (66 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**200 mg/mL**	Waste 4 mL from 10-mL NS flush Replace with 4 mL (2 g) mag sulfate Give 6.6 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 5 mL
Midazolam (D) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Administer 5 mL **For PAI use half dose: Give 2.5 mL
		**PAI IV/IO only	
Morphine (D) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Administer 3.4 mL
Dopamine Drip	Waste 50 mL from 250 mL NS bag; Replace with 50 mL (80 mg) of dopamine drawn from a 1,600 mcg/mL premixed dopamine bag; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 31 gtt/min | **7.5:** 46 gtt/min | **10:** 62 gtt/min | **12.5:** 77 gtt/min | **15:** 93 gtt/min | **20:** 124 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **2 mL (2 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 15 gtt/min | **4:** 30 gtt/min | **6:** 45 gtt/min | **8:** 60 gtt/min | **10:** 75 gtt/min			

30 – 36.9 kg (66 – 81 lb) 10 – 11 years

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Weight (kg): 37 – 50		Weight (lb): 81.4 – 110	
Age: 12 – 13 years		**Length: 131 – 144 cm**	
Normal Vital Signs:	**HR 60 - 100**	**RR 12 - 20**	**SBP At least 100**
DEFIBRILLATION: 75 → 150 → 150 - 360 Joules		CARDIOVERSION: 40 → 80 → 160 Joules	
OPA: 80 mm; NPA: 28 Fr	Laryngoscope: 4 or 5	Fluid Bolus (20 mL/kg): 800 mL	
ETT: 7.0 Cuffed; Depth: 21 – 22.5 cm		King: Size 3 Yellow; I-Gel: Size 3 Yellow	

Medication Administration

NAME	CONCENTRATION	DOSE	ROUTE	VOLUME
Adenosine 1st	3 mg/mL	4.2 mg	IV/IO	1.4 mL
Adenosine 2nd	3 mg/mL	8.4 mg	IV/IO	2.8 mL
Albuterol NEB	2.5 mg/3mL	2.5 mg	NEB	3 mL
Amiodarone	50 mg/mL	200 mg	IV/IO	4 mL
Atropine - Bradycardia	0.1 mg/mL	0.5 mg	IV/IO	5 mL
Calcium Chloride	100 mg/mL	800 mg	IV/IO	8 mL
Dextrose 10%	0.1 g/mL	10 g	IV/IO	100 mL
Dexamethasone	4 mg/mL	16 mg	IV/IO/IM/PO	4 mL
Diazepam	5 mg/mL	5 mg	IV/IO	1 mL
Diphenhydramine	50 mg/mL	40 mg	IV/IO/IM	0.8 mL
Drips (Dopa/Epi/Norepi)	Refer to Dilution Chart on back and contact BioTel			
Epi 1:1000 IM	**1 mg/mL**	0.4 mg	**IM**	0.4 mL
Epi 1:10,000 IV	**0.1 mg/mL**	0.4 mg	**IV/IO**	4 mL
Epi Auto-Injector ADULT	1 mg/mL	0.3 mg	IM	Up to 3 units
Epi 1:1000 NEB - Croup	1 mg/mL	5 mg	NEB	5 mL
Etomidate	2 mg/mL	12 mg	IV/IO	6 mL
Fentanyl	50 mcg/mL	40 mcg	IV/IO/IM/IN	0.8 mL
Glucagon	1 mg/mL	1 mg	IV/IO/IM/IN	1 mL
Glucose Gel	15 g/37.5 mL tube	15 g	BUCCAL	1 tube
Hydroxocobalamin	5 g/200 mL	2.5 g	IV	**See back**
Ipratropium	0.5 mg/2.5 mL	0.5 mg	NEB	2.5 mL
Ketamine SEDATE 1st dose	**10 mg/mL**	80 mg	**IV/IO**	**8 mL (D)**
Ketamine SEDATE 2nd dose		80 mg	**IV/IO**	**8 mL (D)**
Ketamine SEDATE 1st dose	100 mg/mL	160 mg	**IM**	1.6 mL
Ketamine SEDATE 2nd dose		80 mg	**IM**	0.8 mL
Ketamine PAIN 1st dose	**10 mg/mL**	8 mg	**IV/IO**	**0.8 mL (D/R)**
Ketamine PAIN 2nd dose		4 mg	**IV/IO**	**0.4 mL (D/R)**
Ketamine PAIN 1st dose		16 mg	**IM/IN**	**1.6 mL (D/R)**
Ketamine PAIN 2nd dose		8 mg	**IM/IN**	**0.8 mL (D/R)**
Lidocaine 2% - Cardiac	20 mg/mL	40 mg	IV/IO	2 mL
Magnesium Sulfate	**See Dilution Chart**	1600 mg	IV/IO	**See back**
Methylprednisolone	**125 mg/10 mL**	62.5 mg	**IV/IO**	**5 mL (D)**
Methylprednisolone	125 mg/2 mL	62.5 mg	**IM**	1 mL
Midazolam	**1 mg/mL**	5 mg	IV/IO/IM/IN	**5 mL (D)**
Morphine	**1 mg/mL**	4 mg	IV/IO/IM	**4 mL (D)**
Naloxone	1 mg/mL	2 mg	IV/IO/IM/IN	2 mL
Ondansetron	2 mg/mL	4 mg	**IV/IO**	2 mL
Ondansetron	Formulation dependent	1 full 4-mg **ODT** **OR** ½ of 8-mg **ODT**		
Sodium Bicarbonate 8.4%	1 mEq/mL	40 mEq	IV/IO	40 mL

12 – 13 years (81.4 – 110 lb) 37 – 50 kg

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(D) = Must be DILUTED (R) = Must be volume-REDUCED

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Medication Dilution Instructions - These depend on proper concentration

ANY variance to the starting medication concentration will change the dilution recipe!

Some medications must be DILUTED before administration; some must be volume-REDUCED

Some medications must be BOTH DILUTED *AND* volume-REDUCED

(D) = DILUTION (R) = Volume REDUCTION

BLACK — 37 – 50 kg (81.4 – 110 lb) — 12 – 13 years

NAME ROUTE & INDICATION	STARTING CONCENTRATION	DESIRED CONCENTRATION	DILUTION RECIPE
Hydroxocobalamin - IV	Run 120 gtt/min **for 15 min** (1/2 vial or 100 mL). **Use 20 gtt/mL set in kit. Set timer!**		
Ketamine SEDATION (D) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 8 mL 2nd dose: Reduce & give 8 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IV/IO	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine 1st dose: Reduce & give 0.8 mL 2nd dose: Reduce & give 0.4 mL
	If 100 mg/mL unavailable, see CPGs		
Ketamine PAIN (D/R) - IM/IN	100 mg/mL	**10 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL ketamine **1st dose: Reduce & give 1.6 mL 2nd dose: Reduce & give 0.8 mL
	If 100 mg/mL unavailable, see CPGs		
Magnesium Sulfate (D) - IV/IO: Respiratory Distress or Torsades de pointes WITH Pulse			
	5 g/10 mL	**20 mg/mL**	Add 4 mL (2 g) to 100 mL NS Run 53 gtt/min (80 mL) **for 15 min** **Use 10 gtt/mL set. Set Timer!**
Magnesium Sulfate (D) - IV/IO: PULSELESS Torsades de pointes			
	5 g/10 mL	**200 mg/mL**	Waste 4 mL from 10-mL NS flush Replace with 4 mL (2 g) mag sulfate Give 8 mL, push slowly over 2 min
Methylprednisolone (D) - IV/IO	125 mg/2 mL	**125 mg/10 mL**	Reconstitute 125 mg in 2 mL NS Waste 2 mL from 10-mL NS flush Replace with 2 mL of drug Administer 5 mL
Midazolam (D) - IV/IO/IM/IN	5 mg/mL	**1 mg/mL**	Waste 6 mL from 10-mL NS flush Replace with 1 mL of midazolam Administer 5 mL **For PAI use half dose: Give 2.5 mL
		**PAI IV/IO only	
Morphine (D) - IV/IO/IM	10 mg/mL	**1 mg/mL**	Waste 1 mL from 10-mL NS flush Replace with 1 mL of morphine Administer 4 mL
Dopamine Drip	Use **1600 mcg/mL Premix** OR Add **400 mg** to 250ml NS Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/kg/min): **5**: 8 gtt/min | **7.5:** 11 gtt/min | **10:** 15 gtt/min | **12.5:** 19 gtt/min | **15:** 23 gtt/min | **20:** 30 gtt/min			
Epinephrine Drip	Add **10 mL (1 mg) of epi 0.1 mg/mL** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 30 gtt/min | **4:** 60 gtt/min | **6:** 90 gtt/min | **8:** 120 gtt/min | **10:** 150 gtt/min			
Norepinephrine Drip	Add **2 mL (2 mg)** to 250 mL NS; Use 60 gtt/mL set; Contact BioTel		
Dose (mcg/min): **2:** 15 gtt/min | **4:** 30 gtt/min | **6:** 45 gtt/min | **8:** 60 gtt/min | **10:** 75 gtt/min			

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