Emergency Medical Services
Clinical Practice Guidelines (CPGs)

Effective: November 2018
(Updated Spring 2021)

UTSW/ Parkland BioTel EMS Medical Direction Team

Medical Director – Andrew N. Hogan, MD, NRP

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

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Andrew N. Hogan, MD, NRP **Date: 11/01/2022**
Medical Director

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 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.

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
UTSW/Parkland BioTel EMS System

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Quick Reference Guide

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, prolapsed cord, nuchal cord, preeclampsia, eclampsia, maternal drug abuse, or lack of prenatal care.

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. Specific pediatric assessment and treatment information is notated throughout this document is on the right-hand side of the CPG, which is pink. Pink equals pedi. Medications that are pediatric but different for age ranges are in the below colored boxes.

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.

Return of Spontaneous Circulation (ROSC) refers to the 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

Assess Scent Safety: Evaluate for hazards to EMS providers, patient, or bystanders. Determine if additional resources are needed-see list under PEARLS.
Use appropriate PPE. Consider spinal motion restriction if trauma per policy. Complete primary survey of ABCs. Continuous ECG monitoring. Provide oxygen to keep SpO2 at least 94%, unless otherwise indicated. See list below. Use appropriate corresponding CPG as indicated.

GCS: or AVPU Motor score is the most predictive and important factor. 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)	____

Environment/Exposure: Keep patient modesty when feasible, keep patient warm. Complete secondary survey. Baseline VS for all patients, at least 2 sets, at least 5 minutes apart documented.

Continuous ECG, SpO2, and ETCO2 monitoring. EMS providers MUST acquire a 12-Lead ECG for any patient with cardia or respiratory complaint, or are 20 years old with ANY acute Coronary Syndrome (ACS) sign or symptom. See list below. ***Continuous, 3-lead ECG monitoring is NOT the same as a 12-Lead ECG and does NOT substitute for obtaining and transmitting a 12-Lead ECG.***

IV/IO access: Normal Saline (NS) is the only fluid IV/IO used routinely in the BioTel EMS system. In the event it is not available, the Medical Director may advise of a substitution. See below for list. Antecubital or external jugular veins are preferred. External jugular may be used for giving fluids and certain medications in patients who are 14 years of age and other IV or IO sites are unavailable or unsuccessful. Central lines can be used if training and knowledge and equipment to do so.
Intraosseous (IO) is for critical patients when fluids or medications are needed, but not first line. In adult cardia arrest, IO route may be less effective than IV.

Fluid Administration: Can give TKO rate or saline lock. Selected patients such as cardia arrest may benefit from wide open rate until ROSC is achieved. **NS 20mL/kg, max 1 L per bolus, then reassess.** 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)

Cardiac Arrest Considerations: Immediate, minimally interrupted, high quality CPR is 1st priority. Prompt defibrillation for a shockable rhythm. **"Continuous Chest Compressions"** for adults and adolescents with BVM OR advanced airway. **Chest Compression rate: 100-120 per minute, chest compression depth 2" (5 cm) to 2.5" (6cm). Asynchronous ventilations: 8-10 per minute. Do not pause compressions to provide ventilations. Use metronome.**

AED: Power on AED first. Hands-free pads to bare chest, follow all prompted by AED until paramedics arrive. For manual monitor-defibrillator deployment PADS/PADDLES lead, NOT Lead II immediately upon patient contact and throughout resuscitation.

BVM with oro- or nasopharyngeal airway on scene for at least 6 minutes, 3 rounds of CPR. EXCEPTION: Active regurgitation may require earlier advanced airway placement.

Perform CPR on scene for 10 minutes unless scene is unsafe. There is no survival or recovery benefit to earlier patient movement to the ambulance***. If you transport a patient EITHER with CPR in progress OR after achieving ROSC, there must be at least 2 rescuers in the back of the ambulance.***

PEARLS:

- 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.

- **Assess scene safety:** evaluate for hazards to EMS Providers, patient and bystanders

- Determine number of patients
- Determine mechanism of injury
- Request additional resources, if needed, especially in case of:
  - Multiple victims (especially if adult and pediatric patients at the same scene)
  - Childbirth
  - Cardiac arrest
  - Excited Delirium Syndrome
  - Agitated or violent patient

- **Primary survey** (Airway, Breathing, Circulation sequence, unless otherwise specified):
  - Airway: Refer to Airway Management CPG, as needed
  - Breathing: Provide supplemental oxygen to maintain SpO_2 at least 94%, unless specified otherwise:
    - In most cases of critically ill or injured patients, high-flow supplemental oxygen is acceptable during initial resuscitation
    - Titrate oxygen supplementation to maintain SpO_2 94-99% after initial resuscitation, unless otherwise specified
    - Supplemental oxygen is not beneficial for patients who are not hypoxemic
  - Circulation:
    - If pulseless, refer to Cardiac Arrest CPG
    - If major hemorrhage, refer to Trauma & Hemorrhage Control/Tourniquet Use CPGs
  - Disability: If suspected acute Stroke, refer to Stroke CPG
    - GCS (or AVPU): *Motor score is the most predictive and important factor*
    - Arousability should be assessed by response to nailbed pressure, axillary skin fold pinch or trapezius muscle pinch; use of sternal rub is discouraged

- Breathing: Provide supplemental oxygen to maintain SpO_2 at least 94%, unless specified otherwise:
  - In most cases of critically ill or injured patients, high-flow supplemental oxygen is acceptable during initial resuscitation
  - Titrate oxygen supplementation to maintain SpO_2 94-99% after initial resuscitation, unless otherwise specified
  - Supplemental oxygen is not beneficial for patients who are not hypoxemic

- **Secondary survey** (do not delay transport of critically ill or injured patients; tailor to patient presentation and complaint)
  - Head and face
  - Neck
  - Chest
  - Abdomen/back/flanks/buttocks
  - Extremities
  - Neurologic

- **Baseline vital signs for ALL patients (and at least TWO sets, at least 5 minutes apart and documented, for all transported patients):**
  - Palpated pulse (Heart Rate, HR)
  - Blood pressure (BP)
  - Respiratory rate (RR) and effort
  - Oxygen saturation (SpO_2)
  - Temperature (Temp)
  - POC Glucose (need not be repeated, unless abnormal or unless clinical condition warrants repeat)
  - Neurologic status (GCS) (Refer to Stroke CPG, if acute stroke is suspected)
  - **NOTE:** Unstable patients shall have repeat vital signs documented every 5 to 10 minutes

- **12-Lead ECG Acquisition for all patients with cardiac or respiratory complaints:**
  - EMS Providers MUST acquire a 12-Lead ECG for any patient who meets EITHER of these criteria:
    - Patient 20 years of age or older with ANY Acute Coronary Syndrome (ACS) sign or symptom;
    - Any age patient with ACS signs or symptoms AND a history of:
      - Hypertension
      - Cardiac disease
      - Tobacco use (any form)
      - Diabetes Mellitus
      - Severe obesity
      - High cholesterol
      - Family history of cardiac disease, especially sudden cardiac death
      - Recent recreational drug use
  - When in doubt, obtain 12-Lead ECG & transmit STEMI ECG or to request consultation
  - **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

- **OPQRST History for pain or a similar symptom:**
  - **O**nset of the event or symptom: sudden or gradual? What was patient doing when it started?
  - **P**rovocation or **P**alliation: what makes it worse? What makes it better?
  - **Q**uality: open-ended question, such as “Can you describe it for me?”
  - **R**adiation/Region: does it extend to another part of the body?
  - **S**everity: refer to Pain CPG for numeric and other pain rating scales
  - **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?
- **SAMPLE History for all patients**, when possible:
  - S: Symptoms

- A: Allergies (medications, environmental, food)
- M: Medications (prescription, over-the-counter; BRING CONTAINERS to hospital, if possible)
- NOTE: Aspirin, warfarin and other blood thinners are very important, especially for trauma (even "minor" trauma) and especially for elderly patients
- P: Past Medical/Surgical History
- Look for medical alert tags, portable medical records and advance directives (DNR)
- Look for medical devices and implants (e.g. dialysis shunt, insulin pump, pacemaker or implanted defibrillator, central venous catheter/port, gastric tubes, bladder catheter)
- Consider possibility of pregnancy in any female patient older than 10 years of age
- L: Last oral intake
- E: Events leading up to the 911 call
- For a patient with altered LOC, syncope, seizure or acute stroke:
    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

2. **Specific patient considerations:**
    a. "Geriatric" definition varies according to the specific CPG and receiving hospital
        - 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

3. **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:**
        - Because of lack of efficacy/benefit, endotracheal medication administration is not used in the BioTel EMS system

- **Intranasal medication administration, as device availability permits:**
    - 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

- **Vascular access and fluid administration:**
    - Normal Saline (0.9% Saline) is the only IV/IO fluid routinely used in the BioTel EMS system. 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
    - Administration of the alternate IV fluid product will be identical to the Normal Saline administration for each CPG, unless otherwise specified
    - BioTel agencies are not required to carry more than one type of IV fluid at any given time

- **Vascular access:**
    - Antecubital or external jugular veins are preferred for adults in cardiac arrest
    - 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:
    - Paramedics may use existing central venous lines in critical cases, if the paramedic has the specialized knowledge and equipment to do so
    - 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:
      In adult cardiac arrest, IO administration may be less effective than IV
      Paramedics shall not establish IO access to replace routine IV access that is unsuccessful or difficult to establish
        - 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)

- **Cardiac Arrest considerations** (Refer to the Cardiac Arrest, Asystole/PEA and VF/VT CPGs):
  Survival determinants with good neurologic function after out-of-hospital cardiac arrest (OOH-CA):
    - Immediate, minimally-interrupted, high-quality, "pit-crew" CPR – 1st priority for every OOH-CA
    - Prompt defibrillation for a shockable rhythm

  The BioTel EMS system uses **"Continuous Chest Compressions" for adults and adolescents,** either with BVM-assisted ventilation OR with an advanced airway:
    - Chest compression rate: 100-120 compressions per minute
    - Chest compression depth: 2" (5 cm) to 2.5" (6 cm)
        1. Allow for complete chest recoil, without leaning on the chest
    - 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

- Hand placement: Two hands, midline, lower half of sternum
- Chest recoil: Allow full recoil after each compression; do not lean on chest after compression

c. **Chest compression fraction:**
- Minimal interruptions to effective chest compressions improve survival and recovery
- Chest compression pauses for *rhythm check or shock*: no more than 5-10 seconds
- 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):
- Power on the AED FIRST
- Place hands-free pads on bare chest as soon as possible
- Follow ALL visual and voice prompts by the AED until paramedics arrive

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

g. **Suspected asystole:**
- Quick check for loose/disconnected leads, defibrillator power and signal strength (“gain”)
- Do NOT interrupt effective chest compressions to confirm asystole in multiple leads
- 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:**
- 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
- There is no survival or recovery benefit to earlier advanced airway placement

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

j. **Patient transport during or after cardiac arrest:**
- High-quality resuscitation on-scene correlates with the best chance of favorable outcome
- Very few patients who do not achieve Return of Spontaneous Circulation (ROSC) in the field will be successfully resuscitated in the E.D.
- 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

Refer to Field Termination Policy for details about termination of resuscitation.

Universal Care-Pediatric

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)

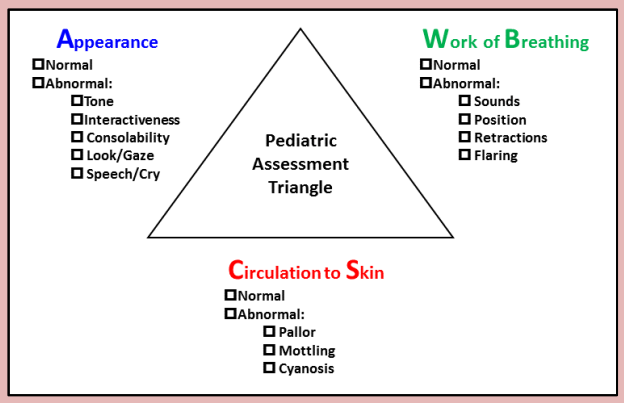
Hypotension definition: SBP *less than* 70 + (2 X age in years) (less than 5th-percentile)

NOTE: Hypotension is a very late, ominous sign of pediatric shock

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

Spinal Motion Restriction (SMR): Torso paddint (top shoulders to buttocks) for young children to achieve neutral spinal alignment. Additional padding may be needed on child's sides to prevent side to side movement.

Primary Survey: Pediatric Assessment Triangle (PAT):



GCS: Pediatric GCS modified for infants and young children less than 5 years of age.

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)	___

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

Specific Treatment Considerations: WEIGHT-/LENGTH- OR AGE-BASED Medication dosing (REFER to the BioTel PEDI-Guide©).

Vascular access: IV preferred for non-critical patients. IO may be preferable for critically ill or severely injured patient. Any age patient, as long as appropriate equipment is available 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

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). Pediatric equipment, especially airway management. No traction splint for femur fracture (stabilize and pad). Currently, there is no Field Termination for pediatric patients in the BioTel EMS system.

Cardiac Arrest Considerations: Survival determinants are same as for adults. Focus on high-quality CPR. 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)

PEARLS:

- 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.**

- **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)

- Scene safety and PPE are the same as for adults.

- Pediatric Assessment Triangle (PAT) PAT Impression:
  - All Components Normal: Stable
  - Breathing Abnormal: Respiratory Distress
  - Breathing + Appearance Abnormal: Respiratory Failure
  - Circulation Abnormal ± Appearance Abnormal: Shock
  - Appearance Abnormal: CNS/Metabolic
  - All Components Abnormal: Cardiopulmonary Failure

- **Secondary Survey:** Same as for adults
  - Do not delay transport of critically ill or injured patients; tailor to patient presentation or complaint

- **Baseline Vital Signs:** Same as for adults (at least two sets, at least 5 minutes apart and documented):
  - NOTE: Do not omit POC Glucose in any sick infant or child
  - NOTE: Hypotension is a late, ominous sign of pediatric shock

- **Acutely ill or injured patients, altered LOC, and any patient with advanced airway:** Same as for adults
  - Continuous ECG monitoring
  - Continuous pulse oximetry (SpO_2) monitoring
  - Continuous waveform capnography ($ETCO_2$) monitoring

- **12-Lead ECG Acquisition:** Refer to Syncope/presyncope, Tachycardia, and Bradycardia CPGs
- **OPQRST History for pain or similar symptom:** Same as for adults
- **SAMPLE History for all patients, when possible:** Same as for adults, plus, as indicated:
  - Pregnancy/birth/neonatal history (neonates and young infants), immunization history, ill contacts
  - Social and environmental history, e.g. consider abuse/neglect, non-accidental trauma
- **Specific patient considerations:**
  - Anatomic, physiologic, emotional and developmental differences
    - Hypothermia/heat loss
    - Multi-system trauma very common
  - Intentional injury (abuse/neglect): Refer to Child/Elderly/Disabled Abuse/Neglect Reporting Policy
  - Children with Special Healthcare Needs
  - Consent Issues: Legal Age of Consent is 18, unless Emancipated
    - Refer to Evaluation and Transport Policy
- **CPR fraction:** Same as for adults – minimize interruptions to chest compressions
- **Chest recoil:** Same as for adults – allow full recoil between compressions and do not lean on chest
- **Metronomes:** Same as for adults – they should be used for ***all*** CPR incidents
- **AED: Focus should be on high-quality CPR – do not delay resuscitation for AED placement**
  - Infants under 1: AED may be used (pediatric equipment preferred, if available)
  - Children 1 to puberty: AED may be used (pediatric equipment preferred, if available)
- **Manual monitor-defibrillator:** Same as adults (for shock doses, refer to VF/pVT CPG)
  - **Refer to the BioTel PEDI-Guide© for defibrillation and cardioversion dosing**
- **Suspected asystole:** Same as adults
- **Advanced Airway:** Unless active regurgitation, do not attempt for at least 3 CPR cycles (6 minutes)
  - **Refer to the BioTel PEDI-Guide© for advanced airway equipment sizes**
- **Patient movement during CPR:** Same as for adults
  - Infant or child must be on a firm surface (e.g. floor or table) for effective CPR
- **Patient transport during CPR or with ROSC:** Same as for adults

Allergic Reaction

ADULT 14 YEARS AND OLDER

***IMMEDIATE IM epinephrine is the #1 treatment priority for anaphylaxis.**

BASIC LEVEL

Assess and support ABCs. Assess for stridor; monitor vomiting patients for potential aspiration.

If wheezing, stridor, or shock present, administer any available epinephrine auto-injector or BioTel approved BLS Epi Kit. **The EA is held firmly against the skin for 3 seconds, massage for 10 seconds, repeat every 5-10 minutes, if needed, max 3 doses, under ALS supervision.**

Patient should be placed in a position of comfort with minimal symptoms. **NOTE: Positioning patient in sitting position or change from supine to upright position is associated with sudden death in anaphylaxis.**

ADVANCED LEVEL

Initiate continuous ECG and PetCO2 monitoring. Consider IV/IO access at TKO rate or saline lock.

If ANY of the below anaphylaxis symptoms/signs, immediately administer IM epinephrine (approximately 0.01 mg/kg).

Epinephrine: More than 50 KG, IM EPI DOSE (mL), 1mg/mL (1:1,000) 0.5 mL OR 0.3 mg (Adult) YELLOW DEVICE. 2nd or 3rd doses may be needed-every 5-10 minutes-in 25-30% of patients.

NS Bolus: 20 mL/kg (up to 1 L per bolus) IV/IO over 15 minutes as needed. Maximum total fluid volume 3 L. Contact BioTel if more needed. Repeat bolus up to 2 more times, max 1 L per bolus as needed.

For cardiovascular collapse despite up to 3 doses of IM epinephrine and 3 fluid boluses, consider IV/IO epinephrine infusion.

Dose of Epinephrine	Epinephrine Strength	Added To	Final Concentration
10 mL (1 mg)	0.1 mg/mL (1:10,000)	1000 mL NS	1 mcg/mL
1 mL (1 mg)	1 mg/mL (1:1,000)	1000 mL NS	1 mcg/mL

ADULTS/TEENS use 10 gtt/mL drip set.

ALTERNATIVE: For persistent cardiovascular collapse despite 3 doses IM epinephrine and 3 fluid boluses, ONLY IN ADULTS 14-55 YEARS, *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 NS	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 1/10 the adult dose of IV epinephrine administered during cardiac arrest.			

PEDIATRIC < 14 YEARS OLD

***IMMEDIATE IM epinephrine is the #1 treatment priority for anaphylaxis.**

BASIC LEVEL

Assess and support ABCs. Assess for stridor; monitor vomiting patients for potential aspiration.

If wheezing, stridor, or shock is present, administer any available epinephrine auto-injector or BioTel approved BLS Epi Kit. **The EA is held firmly against the skin for 3 seconds, massage for 10 seconds, repeat every 5-10 minutes, if needed, max 3 doses, under ALS supervision.**

Patient should be placed in a position of comfort with minimal symptoms. **NOTE: Positioning patient in sitting position or change from supine to upright position is associated with sudden death in anaphylaxis.**

ADVANCED LEVEL

Initiate continuous ECG and PetCO2 monitoring. Consider IV/IO access at TKO rate or saline lock.

If ANY of the below anaphylaxis symptoms/signs, immediately administer IM epinephrine (approximately 0.01 mg/kg). 2nd or 3rd doses may be needed every 5-10 minutes in 25-30% of patients.

AGE	WEIGHT (KG)	IM EPI DOSE (mL) 1 mg/mL (1:1,000)	EPI AUTO-INJECTOR (EA) OR approved Epi Kit
Less than 12 mo.	Less than 10	0.05-0.1 mL	NO-unless infant EA
12-23 mo.	10-11.9	0.1 mL	Consider "JR" if known wt. is at least 10KG
24-35 mo.	12-14.9	0.15 mL	Consider "JR" if known wt. is at least 10KG
3-6 YRS.	15-23.9	0.2 mL	0.15 MG JR GREEN DEVICE
7-9 YRS.	24-29.9	0.25 mL	0.15 MG JR GREEN DEVICE
10-11 YRS.	30-36.9	0.3 mL	0.3 mg (Adult) YELLOW DEVICE
12-13 YRS.	37-50	0.4 mL	0.3 mg (Adult) YELLOW DEVICE

NS Bolus: 20 mL/kg (up to 1 L per bolus) IV/IO over 15 minutes as needed. Maximum total fluid volume 3 L. Contact BioTel if more needed. Repeat bolus up to 2 more times, max 1 L per bolus as needed.

For cardiovascular collapse despite up to 3 doses of IM epinephrine and 3 fluid boluses, consider IV/IO epinephrine infusion. Refer to NioTel PEDI-Guide © for dosing, dilution, reduction instructions.

Dose of Epinephrine	Epinephrine Strength	Added To	Final Concentration
10 mL (1 mg)	0.1 mg/mL (1:10,000)	250 mL NS	4 mcg/mL
1 mL (1 mg)	1 mg/mL (1:1,000)	250 mL NS	4 mcg/mL

Albuterol: for persistent wheezing not responsive to epinephrine, 2.5 mg via nebulizer. Repeat up to 2 times if needed, total number of doses 3.

Diphenhydramine: After IM epi and fluids, consider for symptomatic relief. For localized SKIN reaction ONLY.

Due to risk for adverse cardiac events, this should be used only if infusion cannot be used (IE: 250- or 1000-mL bags of NS are not available, or other limit.) **Albuterol: for persistent wheezing not responsive to epinephrine, 2.5 mg via nebulizer. Repeat up to 2 times if needed, total number of doses 3.** **Diphenhydramine:** After IM epi and fluids, consider for symptomatic relief. **For localized SKIN reaction ONLY, 25 to 50 mg IM, IV, or IO.** **Methylprednisolone:** If transport time permits, may be considered. **60-125 mg IM or slow IV/IO over 2 minutes (optional medication) OR** **Dexamethasone: 10-16 mg IM, IV/IO, or PO (optional medication).**	**Diphenhydramine 1 mg/kg (0.02 mL/kg) of 50 mg/mL formulation** **IV/IM/IO administration do not dilute. Administer 1 mg/kg (0.02 mL/kg).** Consider optional corticosteroids if transport time permits. **Methylprednisolone**: Refer to formulary Drug Sheet or BioTel PEDI-Guide© optional med **OR** **Dexamethasone: 0.6 mg/kg IM, IV/IO, or PO; maximum dose 16 mg** (optional med).

PEARLS:

- The epi auto injector should be injected into the muscle of the anterolateral, mid-thigh, holding the EA firmly against the skin for 3 seconds (or per manufacturer). Massage the injection site for 10 seconds.
- In addition to epinephrine, administer IV/IO fluid bolus to patients with hypoperfusion or hypotension.
- 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
- There is no proven benefit to use corticosteroids in acute management of allergic reaction/anaphylaxis.
- Anaphylactic reaction is acute onset of **ANY** of these signs/symptoms:
- **Minutes to hours after exposure to a KNOWN** allergen for that patient: hypotension/shock, **OR**
  - **Two or more** of the following that occur rapidly after exposure to a **LIKELY** allergen: flushing, itching, hives, angioedema, dyspnea, wheezing/bronchospasm, stridor, hypoxemia, cardiovascular collapse, syncope, incontinence, vomiting, cramping abdominal pain, diarrhea, **OR**
  - **Acute onset (minutes to hours) of an illness with flushing, itching, hives, angioedema AND EITHER dyspnea, wheezing/bronchospasm, stridor, hypoxemia, OR cardiovascular collapse, syncope, incontinence.**

Figure 1: Visual Representation of Anaphylaxis Criteria

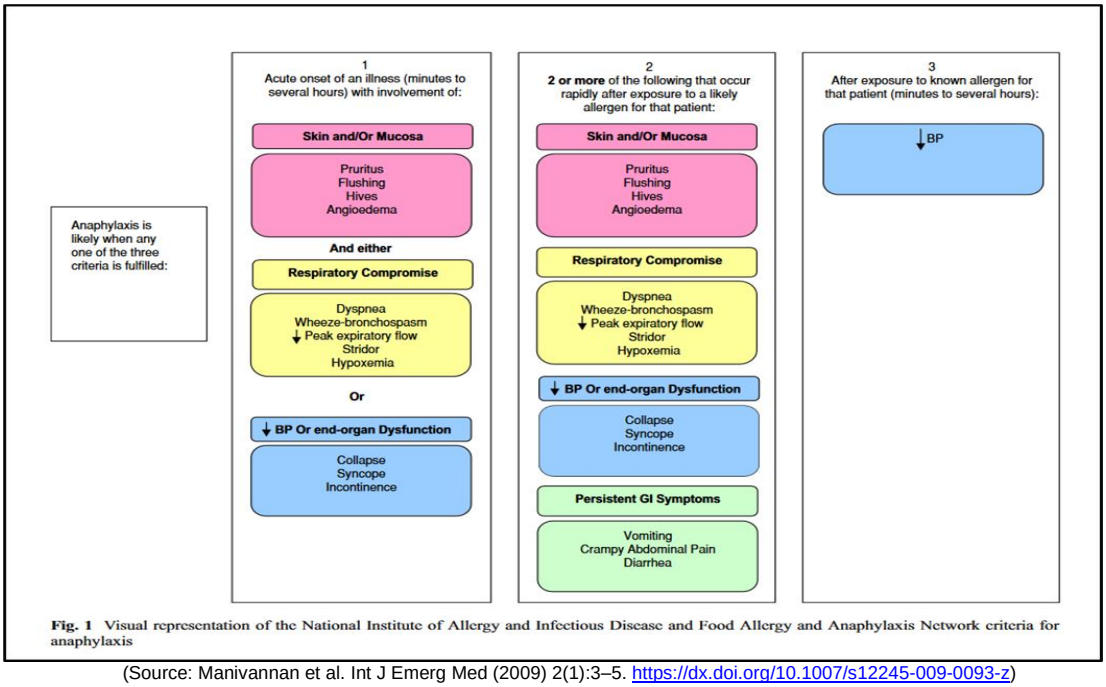


Fig. 1 Visual representation of the National Institute of Allergy and Infectious Disease and Food Allergy and Anaphylaxis Network criteria for anaphylaxis

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

See also Respiratory Distress, Shock, Universal Care-Adult, and Universal Care-Pediatric.

Altered Mental Status (AMS)/CNS Depression

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**BASIC LEVEL**
ABC support with suction and OPA or NPA if needed. Provide oxygen to keep SPO2 at 94% or higher. Assess GCS and treat and possible overdose according to appropriate CPG.	ABC support with suction and OPA or NPA if needed. Provide oxygen to keep SPO2 at 94% or higher. Assess GCS and treat and possible overdose according to appropriate CPG.
Position in lateral decubitus facing EMS. For trauma refer to spinal motion restriction policy. Perform a glucose and treat if needed.	Position in lateral decubitus facing EMS. For trauma refer to spinal motion restriction policy. Perform a glucose and treat if needed.
Naloxone: 0.4 mg IN or IM, under ALS provider supervision if available. If respiratory status does not improve or SPO2 is not at least 94%, may repeat every 5 minutes, up to a max total cumulative dose of 2mg.	**Naloxone: 0.1 mg/kg IN, slow IVP, IO or IM, max single dose 2mg. If respiratory status does not improve or SPO2 is not at least 94%, contact BioTel for repeat dose authorization.**
Ondansetron: (nausea with naloxone, optional) 4-8 mg IV/IO/PO	**Ondansetron: (nausea with naloxone, optional) Contact BioTel if needed to be given. 0.1 mg/kg IV/IO/IN/PO (max single dose 4 mg).**
ADVANCED LEVEL	**ADVANCED LEVEL**
Initiate PetCO2 monitoring with continuous ECG and SPO2 monitoring. Treat cardiac dysrhythmias per CPG. Obtain 12 lead ECG ASAP and transmit STEMI ECG or for consult.	Initiate PetCO2 monitoring with continuous ECG and SPO2 monitoring. Treat cardiac dysrhythmias per CPG. Obtain 12 lead ECG ASAP and transmit STEMI ECG or for consult.
Establish IV/IO access at TKO rate, treat shock with CPG. Initiate advanced airway if needed. For hypoglycemia and oral glucose cannot be given, consider dextrose/glucagon administration.	Establish IV/IO access at TKO rate, treat shock with CPG. Initiate advanced airway if needed. For hypoglycemia and oral glucose cannot be given, consider dextrose/glucagon administration.
Beta-Blocker Toxicity: Glucagon 1-2mg IVP/IO/IM/IN, may repeat once after 20 minutes, consider transcutaneous pacing.	**Beta-Blocker Toxicity: CPR for heart rate <60 bpm and poor perfusion.** **LESS THAN 1 YEAR OF AGE: Glucagon 0.5 mg IVP/IO/IM/IN, may repeat once after 20 minutes if needed.** **1-13 YEARS OF AGE: Glucagon 1 mg IVP/IO/IM/IN, may repeat once after 20 minutes if needed.**
Calcium-Channel Blocker Toxicity: (CNS depression, bradycardia, and possible hypotension). **1G (10 mL) of 10% calcium chloride show IVP/IO over 10 minutes.** Consider transcutaneous pacing.	**Calcium-Channel Blocker Toxicity:** (CNS depression, bradycardia, and possible hypotension). **20 mg/kg (0.2 ml/kg) of 10% calcium chloride, max single dose 1G, slow IV/IO over 10 minutes. MANDATORY: CONTACT BIOTEL ASAP AFTER ADMINISTRATION.**
Tricyclic anti-depressant (TCA) Toxicity: Sodium bicarbonate 1 mEq/kg IV/IO with 20 mL/kg NS IV/IO over 10 minutes, may repeat once after 10-15 minutes if needed.	**Tricyclic anti-depressant (TCA) Toxicity: Sodium bicarbonate 1 mEq/kg IV/IO with 20 mL/kg NS IV/IO over 10 minutes, may repeat once after 10-15 minutes if needed.**
Organophosphate Poisoning: refer to bradycardia CPG. Go to appropriate receiving hospital.	**Organophosphate Poisoning: refer to bradycardia CPG. Go to appropriate receiving hospital.**

PEARLS:

- Administration of naloxone shall be restricted ONLY to patients with confirmed/suspected opioid overdose, CNS depression, hypoventilation or hypoxia, AND pinpoint pupils.
- Use of ammonia inhalants is not permitted in the BioTel system.
- GCS pressure not pain should be assessed by nail bed pressure, axillary skin fold pinch, or trapezium muscle pinch, sternal rub is discouraged.

- Do not administer glucose unless symptomatic hypoglycemia. Do not administer oral glucose to an unresponsive patient or if they cannot protect airway.

- For treatment of confirmed or suspected drug toxicities, contact North Texas Poison Control Center through BioTel.

- For fentanyl/related compounds: do NOT use alcohol-based hand cleansers/sanitizers for patient or EMS Provider decontamination/handwashing if significant skin exposure:
  - Soap and water are preferred to minimize risk of fentanyl absorption through skin

- **NOTE: Higher doses of naloxone may be needed in overdose with certain synthetic opioids, such as fentanyl, carfentanil and methadone.** Contact BioTel for additional naloxone dosing authorization

- Contact BioTel for additional Medical Control physician guidance, especially for treatment of other confirmed/suspected drug toxicities.

See also Bradycardia, Cold-Related Emergencies, Diabetic Emergencies, Head Injury, Heat-Related Emergencies, Poisoned Patient and Overdose, Seizure, Stroke, Toxic Chemical Exposure CPGs and Transcutaneous Pacing Procedure, Custody, Evaluation/Transport, and Destination Policies.

Amputated Body Part

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs. For neuro checks and pupil size/symmetry at least 2 sets should be done, 5-10 minutes apart Initiate spinal motion restriction if indicated, otherwise place patient in position of comfort. Treat shock with related CPG. Administer oxygen to keep pulse ox at least 94% and monitor continuously. Hemorrhage Control: 1. Apply an EMS agency approved medical tourniquet to the proximal stump. Endpoints is cessation of hemorrhage and loss of distal pulse. 2. Moist sterile dressings may be applied to stump, avoid bulky dressings that may conceal new bleeding 3. IMPORTANT: Document then time of tourniquet application in the ePCR. 4. Manage improvised tourniquets applied by bystanders/non-medical personnel. Amputated Part Care: 1. Remove glass contaminants by rinsing with NS 2. Wrap in NS-moistened but not soaking wet sterile gauze 3. Place in a watertight plastic bag or container if available. 4. Do NOT allow the amputated part to freeze/become soaked in water or NS. 5. Bring all amputated parts to the hospital, regardless of patient overall condtion. If it cannot be located, transport the patient and advise others to search. **ADVANCED CARE** Consider IV/IO access at TKO rate with saline lock, use CPG for shock. Initiate ECG and PetCO2 monitoring if shock present, anticipates, or develops. Administer parental analgesia with related CPG.	**BASIC LEVEL** Assess and support ABCs. For neuro checks and pupil size/symmetry at least 2 sets should be done, 5-10 minutes apart Initiate spinal motion restriction if indicated, otherwise place patient in position of comfort. Treat shock with related CPG. Administer oxygen to keep pulse ox at least 94% and monitor continuously. Hemorrhage Control: 5. Apply an EMS agency approved medical tourniquet to the proximal stump. Endpoints is cessation of hemorrhage and loss of distal pulse. 6. Moist sterile dressings may be applied to stump, avoid bulky dressings that may conceal new bleeding 7. IMPORTANT: Document then time of tourniquet application in the ePCR. 8. Manage improvised tourniquets applied by bystanders/non-medical personnel. Amputated Part Care: 6. Remove glass contaminants by rinsing with NS 7. Wrap in NS-moistened but not soaking wet sterile gauze 8. Place in a watertight plastic bag or container if available. 9. Do NOT allow the amputated part to freeze/become soaked in water or NS. 10. Bring all amputated parts to the hospital, regardless of patient overall condtion. If it cannot be located, transport the patient and advise others to search. **ADVANCED CARE** Consider IV/IO access at TKO rate with saline lock, use CPG for shock. Initiate ECG and PetCO2 monitoring if shock present, anticipates, or develops. Administer parental analgesia with related CPG.

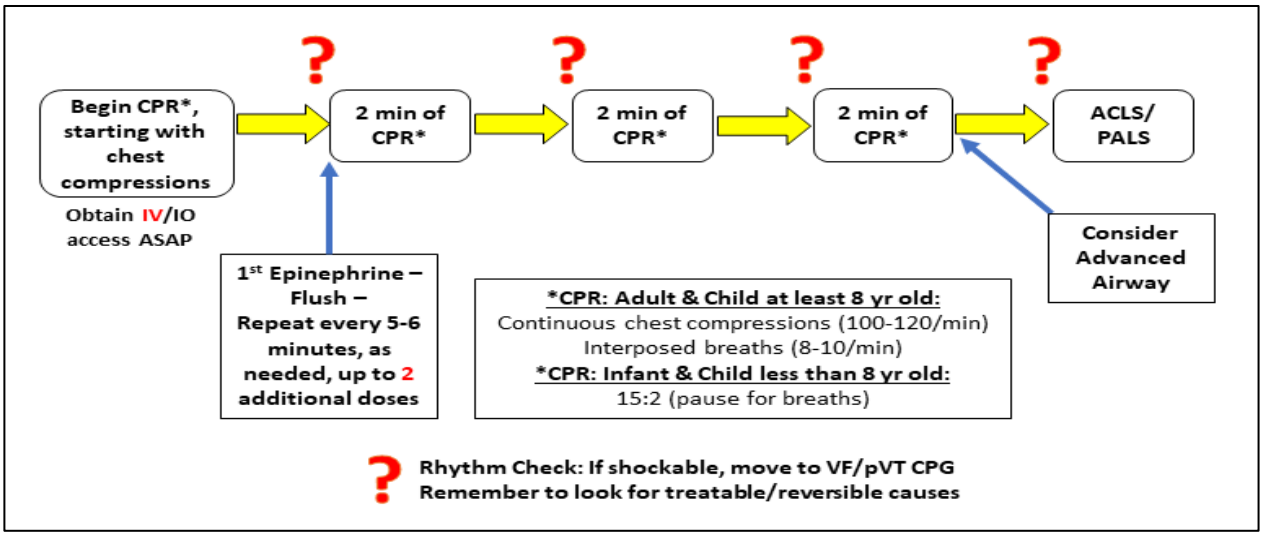
PEARLS:

- Direct wound pressure is unlikely to fully control stump bleeding above wrist or ankle
- For additional assistance and Medical Control physician guidance, contact BioTel.

See also Body Substance Isolation Precautions, appropriate PPE, Universal Care-Adult, Universal Care-Pediatric, Spinal Motion Restriction Policy, Shock CPG, Hemorrhage Control/Tourniquet CPG, Trauma CPG, Pain Management CPG, Destination Policy

Asystole/PEA

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Support CAB-circulation first, immediate high-quality CPR, start with chest compressions. Support airway use OPA and/or NPA with suctioning. Jaw thrust is preferred if trauma suspected. Assist ventilations with 100% FiO2 and 8-10 gentle, one-handed BVM breaths per minute, enough to cause chest rise. **ADVANCED LEVEL** Initiate PetCO2 monitoring, normal or high value may indicate ROSC, even before a pulse is palpable. Ensure that manual monitor/defibrillator is in MANUAL mode and in PADS/PADDLES lead. Exception: Manual device in "AED mode" for ADULTS only depending on agency. Confirm asystole-check lines, lead connections, signal. Do not attempt advanced airway placement for at least 6 minutes (CPR cycles) unless needed due to regurgitation. Minimize chest compressions during placement. **Epinephrine (0.1 mg/mL): 1mg (10mL) IVP or IO, with NS flush. May repeat up to two more doses every 5-6 minutes as needed. Max doses: 3.** Contact BioTel for additional doses. **Opioid Overdose:** Naloxone after starting CPR. **0.4 mg IV/IO/IM or 2 mg IN; repeat once after 4 minutes if needed.** **Beta-Blocker Overdose**: **Glucagon 1-2 mg IV/IO/IM/IN, may repeat once after 20 minutes if needed.** **Calcium-Channel Blocker Overdose: 10% calcium chloride: 1g (10 mL) IVP or IO.** Optional medication.	**BASIC LEVEL** Support CAB-circulation first, immediate high-quality CPR, start with chest compressions. Support airway use OPA and/or NPA with suctioning. Jaw thrust is preferred if trauma suspected. Assist ventilations with 100% FiO2 and 8-10 gentle, one-handed BVM breaths per minute, enough to cause chest rise. **ADVANCED LEVEL** Initiate PetCO2 monitoring, normal or high value may indicate ROSC, even before a pulse is palpable. Ensure that manual monitor/defibrillator is in MANUAL mode and in PADS/PADDLES lead. Exception: Manual device in "AED mode" for ADULTS only depending on agency. Confirm asystole-check lines, lead connections, signal. Do not attempt advanced airway placement for at least 6 minutes (CPR cycles) unless needed due to regurgitation. Minimize chest compressions during placement. **Epinephrine (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg) IVP or IO with NS. May repeat 2 doses every 5-6 minutes, max 3 doses.** Contact BioTel for additional doses. **Opioid Overdose:0.1 mg/kg IV/IO/IM, max single dose 2 mg.** Contact BioTel for additional doses or if no improvement. **Beta-Blocker Overdose**: **LESS THAN 1 YEAR OF AGE: Glucagon 0.5 mg IV/IO/IM/IN** **1-13 YEARS OF AGE: Glucagon 1 mg IV/IO/IM/IN, may repeat once after 20 minutes if needed.** **Calcium-Channel Blocker Overdose: Administer 20 mg/kg (0.2 mL/kg) of 10% calcium chloride, max single dose: 1g. (0ml).** Optional medication.



PEARLS:

- Perform a focused secondary survey and SAMPLE history as conditions permit.

- Look for signs of traumatic injury (including drowning), drug overdose and other special conditions
- Search for and treat potentially reversible causes and special circumstances:
  - **Hypoxia:** Assist ventilations with 100% FiO_2; confirm airway patency and/or proper advanced airway placement with continuous $PetCO_2$ monitoring
  - **Hypothermia:** Protect from further heat loss; refer to Cold Emergencies CPG
  - **Overzealous ventilation:** Provide only 8 to 10 gentle breaths over 1-1.5 seconds each during CPR
  - **Hypovolemia:** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO
    - May repeat twice, as needed, if no signs of volume overload (rales, JVD, frothy sputum)
  - **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
  - **Opioid overdose (known or suspected):** Administer naloxone after starting CPR

- **Tension pneumothorax (known or suspected):** Perform needle thoracostomy on affected side and contact BioTel as soon as possible (Refer to Needle Thoracostomy Procedure)
- **Cardiac tamponade (suspected, based on history/mechanism):** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO
- **Prolonged resuscitation (greater than 15 minutes):**
  - Consider sodium bicarbonate 1 mEq/kg IVP or IO
  - Consider calcium chloride (as above)
- In the event of return of spontaneous circulation (ROSC), refer to Post-Cardiac Arrest Care CPG
- 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
- For additional assistance and Medical Control physician guidance, contact BioTel

See also Cold Emergencies CPG, Cardiac Arrest, VFib/pulseless VTach, Post-Cardiac Arrest CPGs, determination of death policy, Universal Care-Adult, Universal Care-Pediatric, Spinal Motion Restriction Policy, Diabetic Emergencies CPG, and Needle Thoracostomy Procedure

Behavioral Emergencies/Excited Delirium

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Approach the patient calmly using caution. Verbally redirect and de-escalate with coaching and reassurance if you can. Use the BARS score, table 1 Behavioral Activity Rating Scale. Perform and document a POC glucose and document and treat if necessary. The decision to use restraints are based on the safety of the EMS patient, and EMS providers. • Do NOT place the patient in the prone position or use any restraint that restricts the airway or respiratory effort. • Sudden "giving up", collapse or quiet compliance of a violent/aggressive patient is an ominous sign of imminent cardiac arrest. **ADVANCED LEVEL** Initiate continuous PetCO2 monitoring and maintain continuous ECG and SpO2 monitoring. Advanced airway management as appropriate. Establish IV/IO access to treat dehydration or which with boluses see shock and heat emergency CPGs. Obtain a 12 lead ECG and transmit. **Consider use of emergency medications if and when all other safety measures have been unsuccessful/inadequate, and the patient is an immediate threat to self, EMS, or others.** IM or IN routes may be preferred by EMS, however IM medications may be given through clothing if necessary due to safety concerns. **Midazolam: 5 MG slow IV/IO/IM/IN** may repat once after 10-15 minutes of needed. **Contact BioTel for authorization of additional doses!** **OR ALTERNATIVE (For EMS with Medical Director authorization): Ketamine: 4mg/kg IM or 2mg/kg IV/IO/IN, max single dose 500MG. Contact BioTel for additional doses.** Consider administration of sodium bicarbonate 50mEq IV/IO for prolonged violent/aggressive behavior not responding well to physical restraint and emergency medication sedation, or for EMS witnessed cardiac arrest.	**BASIC LEVEL** Approach the patient calmly using caution. Verbally redirect and de-escalate with coaching and reassurance if you can. Use the BARS score, table 1 Behavioral Activity Rating Scale. Perform and document a POC glucose and document and treat if necessary. **Contact BioTel before using any level of restraint other than verbal de-escalation.** **ADVANCED LEVEL** Initiate continuous PetCO2 monitoring and maintain continuous ECG and SpO2 monitoring. Advanced airway management as appropriate. Establish IV/IO access to treat dehydration or which with boluses see shock and heat emergency CPGs. Obtain a 12 lead ECG and transmit. Consider use of emergency medications if and when all other safety measures have been unsuccessful/inadequate, and the patient is an immediate threat to self, EMS, or others. **Contact BioTel for medication authorization**. BioTel may authorize **midazolam 0.1 mg/kg to 0.3 mg/kg IV/IO/IM/IN. Repeat** doses require BioTel authorization. **DO NOT ADMINISTER KETAMINE, UNLESS SPEICICIALLY AUTHORISZED BY MEDICAL CONTROL PHYSICIAN.** For a patient with prolonged violent/aggressive behavior not responding well to physical restraint and emergency medical sedation, or for EMS witnessed cardiac arrest: Contact BioTel. BioTel ***may*** **authorize sodium bicarbonate 1-2 mEq/kg IV/IO.** Repeat doses require BioTel authorization.

PEARLS:

- "Hyperventilation" may be a symptom of a serious medical condition, such as pulmonary embolism.
- The lateral decubitus is preferred to prevent aspiration or supine positioning with the head of the stretcher elevated 30 degrees.
- 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.
- Treatment of Excited Delirium Syndrome centers on reversing the triad of agitation, hyperthermia, and acidosis.
- If IM medications are given, notify E.D. staff as prophylactic antibiotics may be needed. IV/IO or IM dosing is preferred to IN, as IN in this setting is not clear.
- Document patient's response to intervention(s) using BARS score and initiate transport to an appropriate receiving hospital-see Destination and Custody Policies. Contact BioTel and/or receiving hospital while en route to facilitate care.

- Agitated/combative patients should be transported with a 2nd provider in the patient care compartment.
- 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).

***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

Bradycardia

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
Adult with 3rd degree/complete heart block: Immediately begin transcutaneous pacing. Do NOT initiate TCP if 1st or 2nd degree heart block, unless there are signs of shock. Do NOT initiate TCP is asymptomatic bradycardia, PEA, or asystole. Consider one dose of atropine (0.5 mg IV/IO) if TCP is ineffective or unavailable **REQUIRES BIOTEL AUTHORIZATION** **Beta-Blocker overdose (confirmed or suspected):** **Administer Glucagon 1 to 2 mg IV/IO/IM/IN. May repeat once after 10 minutes, if no response and if available.** **Calcium-Channel Blocker overdose (confirmed or suspected):** **Calcium chloride, 1 G (10 ML of 10% solution) IV/IO over 10 minutes (1mL/minute).** This is an optional medication. **Organophosphate toxicity (confirmed or suspected)** PPE/SCENE SAFETY **Administer nerve agent antidote IM via auto-injector OR administer atropine 1-2 mg IV/IO. May repeat twice, every 5 minutes, if incomplete response.** **TCP Procedural Sedation Guidelines for the Conscious Patient:** **Midazolam: 2.5-5 mg slow IV/IO/IM/IN. May repeat once after 5-10 minutes, if needed**. OR **Diazepam: 2/5-5 mg slow IV/IO (optional med). May repeat once after 5-10 minutes, if needed.** OR **Ketamine: 2mg/kg IV/IO or 4 mg/kg IM** (optional med). **BIOTEL AUTHORIZATION REQUIRED**	**Heart rate less than 60 bpm:** -Assist ventilation with 100% oxygen for one full minute at 12 to 20 breaths/minute. If heart rate is still less than 60 begin CPR. **Epinephrine (0.1mg/mL): 0.01 mg/kg (0.1 mL/KG) IV/IO. Repeat every 3 to 5 minutes as needed, maximum 3 doses.** **CONTACT BIOTEL FOR ADDITIONAL DOSES** **Atropine if increased vagal tome or primary AV block: 0.02mg/kg (0.2mL/kg) IV/IO. Maximum single dose 0.5mg (5mL). Maximum total dose: 1mg (child), 3mg (adolescent).** **CONTACT BIOTEL FOR TRANSCUTANEIOUS PACING SETTINGS AND INSTUCTIONS** **Beta-Blocker overdose (confirmed or suspected):** **Glucagon: 0.5mg (less than 1 year of age) or 1 mg (at least 1 year of age) IV/IO/IM/IN. May repeat once after 10 minutes, if no response.** **Calcium-Channel Blocker overdose (confirmed or suspected):** **Administer 20mg/kg (0.2mL/kg) of 10% calcium chloride IV/IO (maximum dose: 1G) over 10 minutes** (optional medication) **CONTACT BIOTEL AS SOON AS POSSIBLE AFTER ADMINISTRATION!** **Organophosphate Toxicity (confirmed or suspected):** PPE/SCENE SAFETY **Administer nerve agent antidote IM via auto-injector OR administer atropine 0.02 mg/kg (0.2 mL/kg) IV/IO, may repeat twice every 5 minutes if incomplete response.** **TCP Procedural Sedation Guidelines for the Conscious Patient:** **Midazolam 0.1mg/kg IV/IO/IM/IN**, **BIOTEL AUTHORIZATION REQUIRED,** may repeat once **BIOTEL AUTHORIZATION REQUIRED.**

PEARLS:

HYPOXIA is a common cause of bradycardia and must be treated or excluded from the differential diagnosis before using these guidelines.

Consider shock, chest pain, stroke or head injury CPG. Consider a glucose level as well.

Initiate continuous ECG monitoring and obtain a 12-Lead ECG, but do not delay care or transport of an unstable patient to obtain the 12-lead ECG.

See also Chest Pain, Head Injury, Poisoned Patient and Overdose, Shock, Stroke, Toxic Chemical Exposure CPGs and Transcutaneous Pacing (TCP) Procedure.

Brief, Resolved, Unexplained Event (BRUE)

ADULT	PEDIATRIC
N/A	**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 must contact BIOTEL BEFORE departing the scene.** A BRUE is an event 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 cyanosis, pallor, absent/decreased/irregular breathing, changes in tole, altered level of responsiveness. EMS Care and Transport: i. Monitor and manage ABCs, obtain a history before during and after the event and documentation of the social environment observed. ii. Every infant with a suspected BRUE must be transported to the closest appropriate E.D. *See PEARLS. iii. Destination Decision-Making: iv. ALL infants presenting with a possible BRUE should be transported to a facility with at least baseline pediatric readiness. v. Transport to a destination with a pediatric critical care capability is preferred for a history of cyanosis, past cardiac/respiratory history, previous BRUE, resuscitation by caregiver, or more than one event in 24 hours. **If parents/caregivers refuse transport, EMS providers must contact BioTel immediately, before leaving the scene and must document the refusal as "Against Medical Advice"**

PEARLS:

- History should include details before, during and after the event, as well as documentation of the social environment (e.g. drug use, neglect, etc.)
- Physical exam should include evaluation for sepsis and for possible respiratory, cardiac, neurologic, GI, trauma (including non-accidental trauma), and other cause
- *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. Infants with similar, acute events for which details are unavailable and/or that do not fit the strict definition of BRUE also should be offered transport to a pediatric-capable E.D.
- BRUEs account for 1% of all pediatric E.D. visits for infants less than 1 year. By definition, the infant appears well or back to baseline by the time EMS arrives. This can lead to a false sense of complacency by both caregivers and EMS providers-leading to a decision not to transport. The risk of death continues even after discharge from the hospital with a negative evaluation. It is impossible to predict which infants will die. Factors that are associated with poor outcomes include more than one event in 24 hours, or the need for vigorous stimulation or resuscitation (especially CPR) by EMS providers.
- Suspected abuse or neglect considerations: Refer to Child/Elderly/Disabled Abuse/Neglect Reporting Policy.

Possible causes of BRUE: 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

Reference (excellent resource for details of history and physical exam): Tieder JS et al. Pediatrics (2016). 137(5):e2016059; DOI 10.1542/peds.2016-0590

See also Universal Care-Pediatric, Cardiac Arrest, Respiratory Distress, Seizure, Sepsis, Trauma, and Child/Elderly/Disabled Abuse/Neglect Reporting Policy.

Burns (Thermal, Electrical and Chemical)

ADULT	PEDIATRIC
BASIC LEVEL Assess and support ABCs, look closely for evidence of inhalation injury and be prepared for early aggressive airway management. Control obvious external hemorrhage. Assess/document GCS and pupil size. Remove contacts if able to. Remove and secure jewelry, belts, shoes, and other items from burned areas. Remove burned/singed clothing NOT stuck to skin. Position with spinal motion restriction if applicable. Otherwise, position of comfort. For facial burns, slightly elevated head is preferred. Oxygen as needed for SpO2 < 94%. Burn care measures to prevent heat loss: Thermal Injury: clean, dry sheet and thermal blanket Chemical Injury: Brush off dry chemical and flush with water to remove residual chemical. Initiate transport as soon as possible-Burn Transport Criteria in Table 1, below. **ADVANCED LEVEL** Initiate continuous ECG and PetCO2 monitoring. Consider toxicologic exposure and treat per CPG. Establish large-bore OV/IO, in uninjured extremity if possible. Start fluid resuscitation, **LR is preferred.** **If thermal burn clearly exceeds 20% TBSA, fluid rate at 500 mL/hr. Max 1 L unless BioTel authorized. Contact BioTel for patients with CHF, cardiac disease, or older than 65.** Monitor SpCO levels, airway, treat pain per CPG. **SPECIAL CIRCUMSTANCES** **Closed space fire:** Consider smoke inhalation, consider CO toxicity, SpO2 may not be accurate. Consider cyanide toxicity with decreased LOC, respiratory distress, or cardiovascular collapse. See related CPGs. **Illicit Drug Lab Incident:** Consider toxic chemical exposure, contact HAZMAT, notify BioTel **Chemical Injuries:** Alkali are more severe. Copious irrigation with water or NS. Acid, generally less severe, copious irrigation with water or NS. Hydrofluoric Acid, hexafluorine solution is preferred for irrigation if available. **Electrical Injuries (AC or DC):** focus on cardiac dysrhythmia or cardiac arrest. Assess for injuries, if patient part of circuit, there will be additional site near the contact with ground. These are often full thickness, with deep tissue damage. Assess for compartment syndrome or rhabdomyolysis. See Figure 1 below for estimation of burn size.	**BASIC LEVEL** Assess and support ABCs, look closely for evidence of inhalation injury and be prepared for early aggressive airway management. Control obvious external hemorrhage. Assess/document GCS and pupil size. Remove contacts if able to. Remove and secure jewelry, belts, shoes, and other items from burned areas. Remove burned/singed clothing NOT stuck to skin. Position with spinal motion restriction if applicable. Otherwise, position of comfort. For facial burns, slightly elevated head is preferred. Oxygen as needed for SpO2 < 94%. Burn care measures to prevent heat loss: Thermal Injury: clean, dry sheet and thermal blanket Chemical Injury: Brush off dry chemical and flush with water to remove residual chemical. Initiate transport as soon as possible-Burn Transport Criteria in Table 1, below. **ADVANCED LEVEL** Initiate continuous ECG and PetCO2 monitoring. Consider toxicologic exposure and treat per CPG. Establish large-bore OV/IO, in uninjured extremity if possible. Start fluid resuscitation, **LR is preferred. Max 1 L unless BioTel authorized.** **Infants up to age 5: 125 mL/hr** **Children 6-13 years: 250 mL/hr.** Monitor SpCO levels, airway, treat pain per CPG. **SPECIAL CIRCUMSTANCES** **Closed space fire:** Consider smoke inhalation, consider CO toxicity, SpO2 may not be accurate. Consider cyanide toxicity with decreased LOC, respiratory distress, or cardiovascular collapse. See related CPGs. **Illicit Drug Lab Incident:** Consider toxic chemical exposure, contact HAZMAT, notify BioTel **Chemical Injuries:** Alkali are more severe. Copious irrigation with water or NS. Acid, generally less severe, copious irrigation with water or NS. Hydrofluoric Acid, hexafluorine solution is preferred for irrigation if available. **Electrical Injuries (AC or DC):** focus on cardiac dysrhythmia or cardiac arrest. Assess for injuries, if patient part of circuit, there will be additional site near the contact with ground. These are often full thickness, with deep tissue damage. Assess for compartment syndrome or rhabdomyolysis. See Figure 1 below for estimation of burn size.

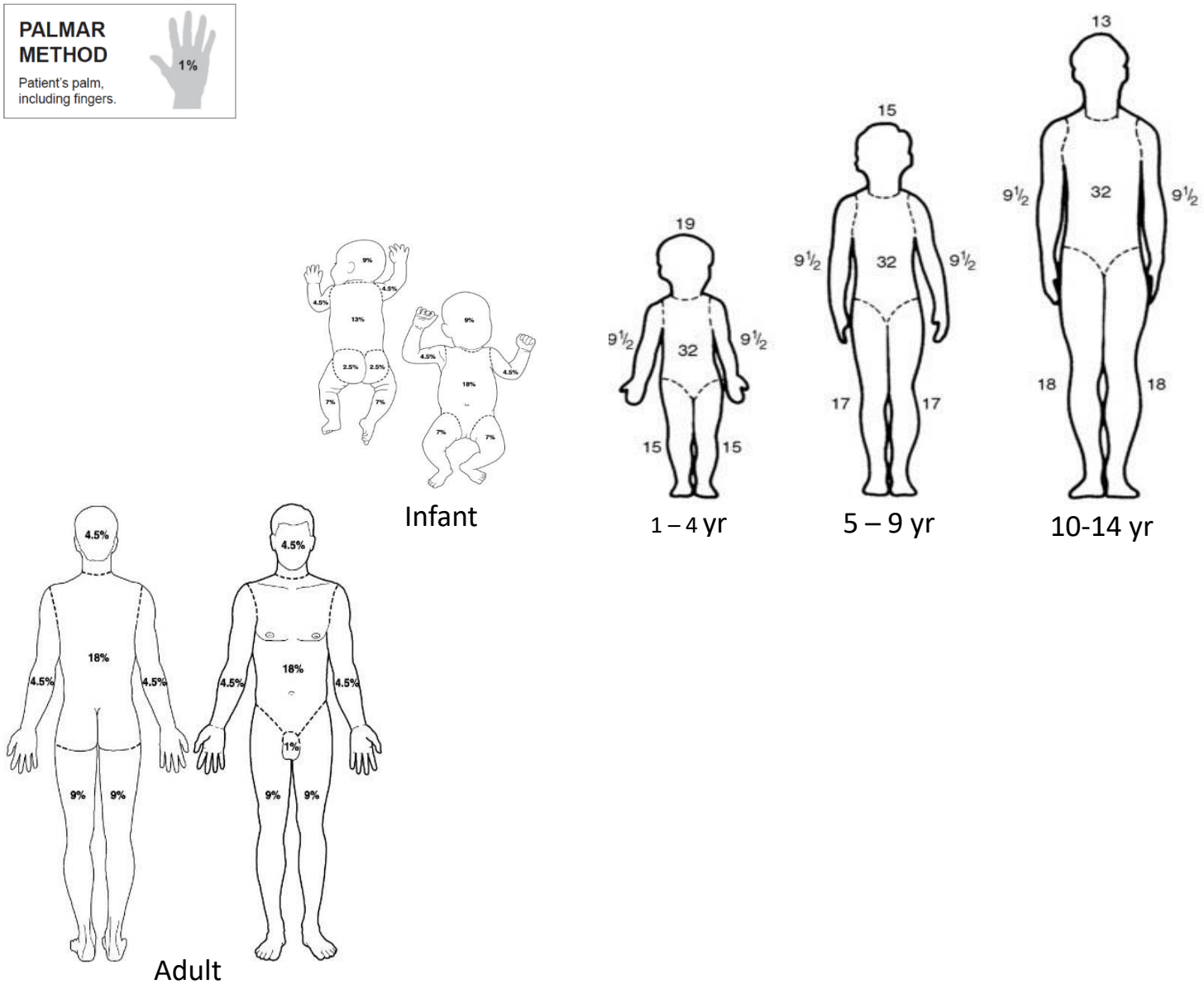
PEARLS:

- 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.
- Signs of inhalation injury include hoarseness, stridor, sooty sputum, facial burns, or singed nasal/facial hair.

- When assessing GCS and pupils, you need two sets of measurements at least 5 minutes apart.
- Document response to therapies given.
- Resuscitation with good outcome may be possible even in patients who appear dead, with dilated pupils with electrical injuries. AC current is more likely to cause cardiac dysrhythmias, especially V FIB. DC current more likely to cause deep tissue damage, but cardiac dysrhythmias (especially asystole) is not uncommon.

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

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



See also Burns, Cyanide Exposure, Poisoned Patient/Overdose, Toxic Chemical Exposure and Trauma CPGs.

Carbon Monoxide Exposure

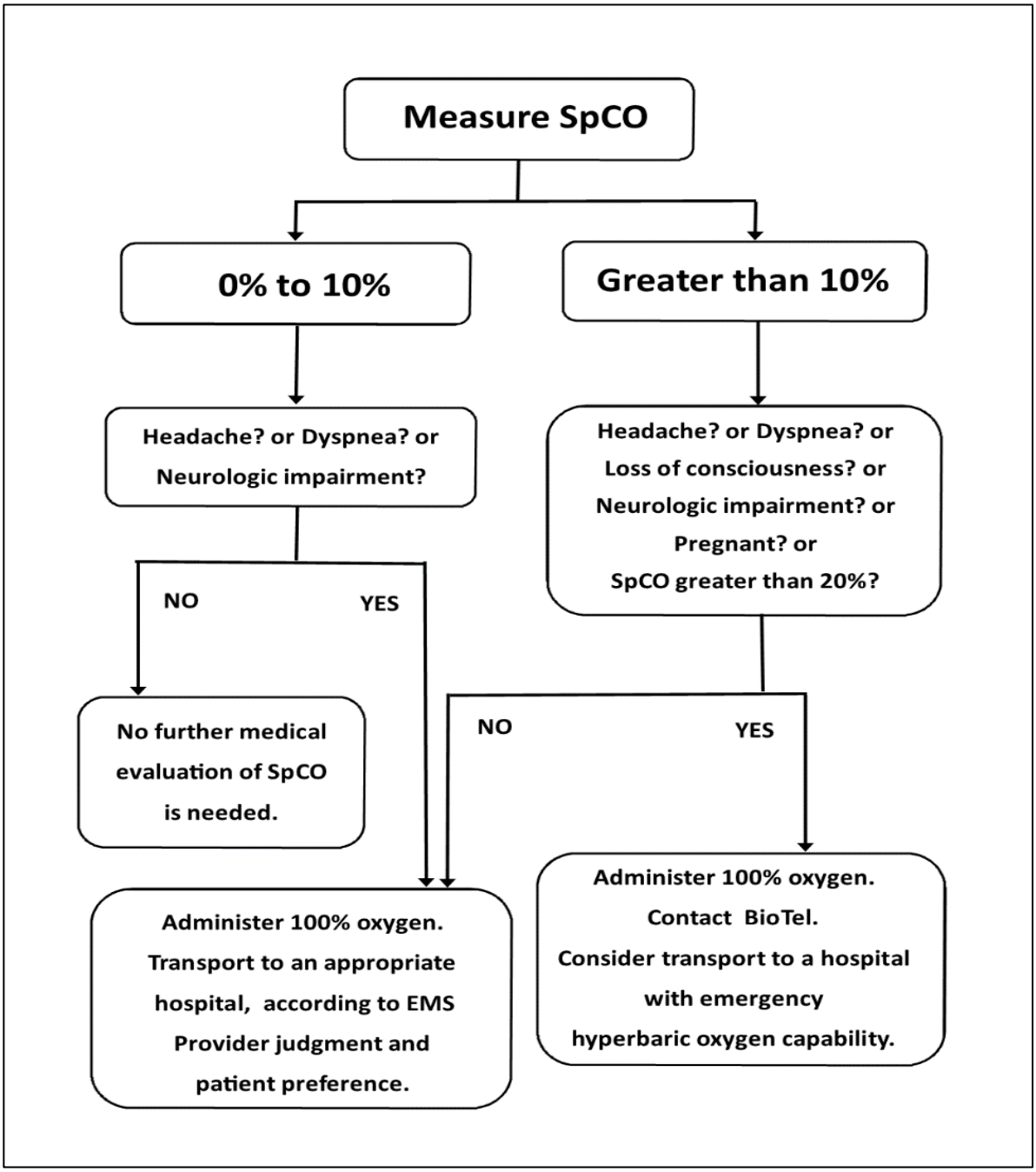
ADULT	PEDIATRIC
BASIC LEVEL Remove patient from toxic environment. Support ABCs and suction airway for patency if indicated. Provide high-flow O2, 100% oxygen, via non-rebreather or BVM as needed. Initiate continuous SpO2 monitoring and CO co-oximetry if available. Initiate continuous ECG, assess for/treat shock. Position the patient supine or if aspiration risk in the left lateral decubitus, facing EMS personnel. **ADVANCED LEVEL** Maintain continuous ECG, PetCO2, and SpCO monitoring for all patients with suspected CO exposure. Advanced airway as soon as possible if patient comatose. Establish IV/IO access and treat hypotension/hypoperfusion. Check blood glucose if indicated. Obtain 12-lead ECG ASAP and transmit any STEMI ECG or to request consultation. Treat chest pain and consider treatment for Cyanide Toxicity if indicated by history. (IE: structure fire). **NOTE: Hydroxocobalamin administration for treatment of simultaneous cyanide exposure requires a separate, dedicated IV/IO line.** **Do NOT administer nitrites (components of "Pasadena" or "Lilly" cyanide antidote kit).** **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. Contact BioTel en route, especially for HBO-capable destinations and for pre-arrival preparation. ***SEE CO EXPOSURE TRIAGE AND TREATMENT CONSDIERATIONS BELOW. ***	**BASIC LEVEL** Remove patient from toxic environment. Support ABCs and suction airway for patency if indicated. Provide high-flow O2, 100% oxygen, via non-rebreather or BVM as needed. Initiate continuous SpO2 monitoring and CO co-oximetry if available. Initiate continuous ECG, assess for/treat shock. Position the patient supine or if aspiration risk in the left lateral decubitus, facing EMS personnel. **ADVANCED LEVEL** Maintain continuous ECG, PetCO2, and SpCO monitoring for all patients with suspected CO exposure. Advanced airway as soon as possible if patient comatose. Establish IV/IO access and treat hypotension/hypoperfusion. Check blood glucose if indicated. Obtain 12-lead ECG ASAP and transmit any STEMI ECG or to request consultation. Treat chest pain and consider treatment for Cyanide Toxicity if indicated by history. (IE: structure fire). **NOTE: Hydroxocobalamin administration for treatment of simultaneous cyanide exposure requires a separate, dedicated IV/IO line.** **Do NOT administer nitrites (components of "Pasadena" or "Lilly" cyanide antidote kit).** **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. Contact BioTel en route, especially for HBO-capable destinations and for pre-arrival preparation. ***SEE CO EXPOSURE TRIAGE AND TREATMENT CONSDIERATIONS BELOW. ***

PEARLS:

- 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 measure SpCO reading is low.
- Transcutaneous CO monitoring devices may be used concurrently with both SpO2 and PetCO2 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.
- NOTE: Standard pulse oximetry cannot screen for or exclude CO exposure. Always confirm a high SpCO reading on more than one finger of each hand. If the values differ significantly, use an average reading.
- Indications for measurement of CO Levels include smoke inhalations, thermal burns, altered mental status with no identifiable cause, assessment of patients and fire ground personnel.

***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	

Carbon Monoxide Exposure Triage and Treatment Considerations



See also Burns, Cyanide Exposure, Poisoned Patient/Overdose, Toxic Chemical Exposure and Trauma CPGs.

Cardiac Arrest

ADULT

BASIC LEVEL

Support ABCs using the "CAB" sequence for cardiac arrest. Immediately begin high-quality, minimally interrupted CPR, starting with chest compressions. Place the patient supine on a firm surface with adequate space for team-based CPR.

Power on AED/defibrillator and apply hands-free defibrillation pads to patient's bare chest. A metronome shall be used for all CPR incidents. Ensure airway patency, jaw thrust for trauma patients preferred. Assist ventilations with 100% FiO2 and 8-10 gentle, one handed BVM breaths per minute over 1-1.5 seconds each. Just enough to cause chest rise.

AGE	COMPRESSION DEPTH	CPR RATIO	VENTILATIONS
Adolescent and Adult-at least 8 years old	**2-2.5 inches**	**Continuous Chest Compressions (CCC)**	**8 to 10 per minute, without pausing compressions**

AED GUIDELINES

Follow all visual and voice prompts. After each 2-minute CPR cycle, briefly pause chest compressions to check rhythm. If the rhythm is organized, check for palpable pulse. If palpable pulse-post-cardiac arrest care. If no pulse, resume CPR. If patient remains in a shockable rhythm, resume CPR and follow CPG for VFib/pulseless VTach.

Consider pre-charging manual defibrillator to the next energy level during CPR, before next shock. Chest compressions done while charging. Immediately after rhythm check/shock, resume CPR for 2 full minutes. Do NOT administer "stacked" shocks. No more than 5 seconds of compressions should be missed before/after shock.

ADVANCED LEVEL

Initiate PetCO2 as soon as possible. Ensure monitor/defibrillator is in MANUAL mode and PADS/PADDLES lead.

*Do not attempt advanced airway placement for at least 6 minutes unless regurgitation is a concern. Do not over ventilate. **Medical etiology: 10 ventilations per minute (once every 6 seconds). Trauma etiology: 6-8 ventilations per minute (once every 10 seconds).**

Establish IV/IO access as soon as possible, but not before CPR or AED application. **Medical etiology: TKO unless hypovolemia. Trauma etiology: Wide open until ROSC achieved, then TKO.**

***See special circumstances below: tension pneumothorax, cardiac tamponade, pregnancy. ***

PEDIATRIC

BASIC LEVEL

Support ABCs using the "CAB" sequence for cardiac arrest. Immediately begin high-quality, minimally interrupted CPR, starting with chest compressions. Place the patient supine on a firm surface with adequate space for team-based CPR.

Power on AED/defibrillator and apply hands-free defibrillation pads to patient's bare chest. A metronome shall be used for all CPR incidents. Ensure airway patency, jaw thrust for trauma patients preferred.

AGE	COMPRESSION DEPTH	CPR RATIO	VENTILATIONS
INFANT-LESS THAN 1 YR.	**Approx. 1.5 inches**	**15:2**	**Pause compressions to give breaths**
CHILD 1-8 YRS.	**Approx. 2 inches**	**15.2**	**Pause compressions to give breaths**
Adolescent and Adult-at least 8 years old	**2-2.5 inches**	**Continuous Chest Compressions (CCC)**	**8 to 10 per minute, without pausing compressions.**

AED GUIDELINES

Follow all visual and voice prompts. After each 2-minute CPR cycle, briefly pause chest compressions to check rhythm. If the rhythm is organized, check for palpable pulse. If palpable pulse-post-cardiac arrest care. If no pulse, resume CPR. If patient remains in a shockable rhythm, resume CPR and follow CPG for VFib/pulseless VTach.

Consider pre-charging manual defibrillator to the next energy level during CPR, before next shock. Chest compressions done while charging. Immediately after rhythm check/shock, resume CPR for 2 full minutes. Do NOT administer "stacked" shocks. No more than 5 seconds of compressions should be missed before/after shock.

ADVANCED LEVEL

Initiate PetCO2 as soon as possible. Ensure monitor/defibrillator is in MANUAL mode and PADS/PADDLES lead.

*Do not attempt advanced airway placement for at least 6 minutes unless regurgitation is a concern. Do not over ventilate. **Medical etiology: 10 ventilations per minute (once every 6 seconds). Trauma etiology: 6-8 ventilations per minute (once every 10 seconds).**

Establish IV/IO access as soon as possible, but not before CPR or AED application. **Medical etiology: TKO unless hypovolemia. Trauma etiology: Wide open until ROSC achieved, then TKO.**

Refer to age-based Summary Cardiac Arrest Resuscitation on the next page (Table 1).

***See special circumstances below: tension pneumothorax, cardiac tamponade, pregnancy. ***

Table 1: Summary of BLS Cardiac Arrest Resuscitation (Adapted from American Heart Association 2015)			
Therapy	**Adolescent and Adult (8^{th} 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	**1^{st} choice:** Manual defibrillator with pediatric pads Dose: 2 J/kg, 4 J/kg, 4-10 J/kg **2^{nd} choice:** AED with device-specific pediatric AED pads or pediatric setting **3^{rd} choice:** AED with adult pads (place front and back on left chest, if necessary)	
ompression 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 ovide one ventilation every 6 seconds (10 per minute)

PEARLS:

- **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.
- Chest compressions should not be paused for more than 10 seconds for any reason.
- 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. Minimize scene time and continue treatment en route. Contact BioTel as soon as possible, in order to expedite Trauma Center notification and preparation.
- As soon as an AED arrives, **POWER ON** the device first, and then apply hands-free pads. Minimize chest compression interruptions during placement.
- Low $PetCO_2$ value may indicate overly aggressive ventilation or inadequate chest compressions. Normal or high $PetCO_2$ value may indicate ROSC, even before a pulse is palpable.
- 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.
- Check a glucose if time allows.

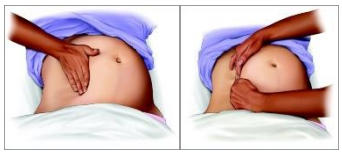
Special Circumstances

1. **Tension pneumothorax (known or suspected):** Perform needle thoracostomy on affected side and contact BioTel as soon as possible (Refer to Needle Thoracostomy Procedure)

2. **Cardiac tamponade (suspected, based on history/mechanism):** Infuse 20 mL/kg (up to 1000 mL maximum per bolus) Normal Saline IV/IO

3. **Pregnancy:**
   Request additional EMS resources AND notify BioTel as soon as possible
   If definite pulse, but no breathing or abnormal breathing: Provide 1 ventilation every 5-6 seconds
   If no pulse: Begin CPR immediately with same hand placement as non-pregnant patient
   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)

Chest Pain/Discomfort

ADULT	PEDIATRIC
Aspirin 324 mg OR 325 mg (Chewed) Immediately obtain **12-lead ECG** This must be done before giving Nitroglycerin and repeated after 5-10 minutes even if the first one appears normal. Establish vascular access. Transmit any ECG showing STEMI and immediately initiate transport to an appropriate hospital E.D. with 24-hour cath lab capability. **INFERIOR wall MI AND SBP <100mmHg:** **Do not administer nitroglycerin** **Administer 20ml/kg bolus BS IV/IO 1 L maximum. If SBP remains <100mmHg and no pulmonary edema, repeat fluid bolus once.** **Contact BIOTEL for morphine or fentanyl authorization** **INFERIOR wall MI AND SBP at least 100mmHg and HR 50-110:** **Administer nitroglycerin 0.4 mg SL** **May repeat up to two times, every 5 minutes** **3 doses maximum.** **OTHER STEMI/NSTEMI pattern and SBP at least 100 mmHg AND HR 50-110:** **Do not delay nitroglycerin administration for IV/IO attempts. Administer nitroglycerin 0.4mg SL. May repeat two times, every five minutes, 3 dose maximum.** For pain unrelieved by three doses of nitroglycerin, consider opioid analgesia: 1. Fentanyl: 1mcg/kg IN or SLOW IVP/IO with maximum single dose 100mcg; repeat once after 15 minutes if needed, maximum cumulative dose 200mcg. 2. Morphine: 2 to 4 mg SLOW IVP/IO; repeat once after 15 minutes, if needed, as long as SBP at least 100mmHg	FOR THE TREATMENT OF SUSPECTED ACS IN THE PEDIATRIC PATIENT, CONTACT BIOTEL Acute myocardial ischemia and infarction is rare in children and if present, usually occurs secondary to congenital defects, acute inflammation, or abnormal location of the coronary arteries Because of the complex nature and relative rarity of an acute coronary syndrome in a child, **BIOTEL** MUST be consulted before administration of any medications

PEARLS:

- Attention should be directed at:
  1. **Early recognition of STEMI** through 12-lead ECG analysis
  2. **Early notification of receiving hospital** via 12-lead ECG transmission when available
  3. **Early initiation of transport** to appropriate STEMI Receiving Center with ALS interventions started enroute to ED
- Aspirin should be given even if the patient reports having taken aspirin prior to EMS arrival
- Do not administer oxygen unless room air SpO2 is less than 94%
- If confirmed or suspected history of diabetes perform a POC glucose and treat hypoglycemia according to Diabetic Emergencies CPG.
- **For NORMAL or inconclusive 12-lead ECG, or ST-elevation in V1, or ST-depression in V1-V3 strongly consider a Right Sided V4R ECG and Posterior 15 lead ECG**
- If chest pain is suspected to be **stimulant-induced** follow the guidelines to exclude or treatment STEMI/NSTEMI AND:
  1. Administer sedation and monitor for respiratory depression:
     - Midazolam: 2.5 to 5 mg IV/IO/IN/IM, repeat every 5-10 minutes, if needed max dose 10 mg.
     - Diazepam: 2.5 to 5 mg IV/IO/IN/IM; repeat every 5-10 minutes, if needed max dose 10 mg.

See also Bradycardia, Pain, Shock, Tachycardia-Stable and Tachycardia-Unstable CPGs, Right-Sided and Posterior ECG Procedure and Transcutaneous Pacing Procedure and Destination Policy.

Cold-Related Emergencies

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**BASIC LEVEL**
NOTE: Handle patients gently-minimize patient movements to reduce risk of cardiovascular collapse. Patients in Stage II or III should not be permitted to stand, ambulate, or exercise.	**NOTE:** Handle patients gently-minimize patient movements to reduce risk of cardiovascular collapse. Patients in Stage II or III should not be permitted to stand, ambulate, or exercise.
NOTE: Detection of a palpable pulse is difficult. Check for signs of life/pulse for at least 60 seconds.	**NOTE:** Detection of a palpable pulse is difficult. Check for signs of life/pulse for at least 60 seconds.
Support ABCs, initiate continuous ECG, SpO2 and ETCO2 monitoring. Obtain frequent vital signs. Document the patient's initial temperature and ambient temperature if known. Do not interrupt or delay treatment/transport for repeat measurements. Core colling may continue even after rescue, once peripheral, external rewarding of clod extremities has begun-this is called "afterdrop." Supplemental oxygen as needed, warm if possible. Follow transport guidelines on Figure 2 below.	Support ABCs, initiate continuous ECG, SpO2 and ETCO2 monitoring. Obtain frequent vital signs. Document the patient's initial temperature and ambient temperature if known. Do not interrupt or delay treatment/transport for repeat measurements. Core colling may continue even after rescue, once peripheral, external rewarding of clod extremities has begun-this is called "afterdrop." Supplemental oxygen as needed, warm if possible. Follow transport guidelines on Figure 2 below.
Initiate passive rewarming such as removing wet clothing, shelter patient from wind and wet conditions, insulate patient from ground, move patient to warm environment, cover patient with dry blankets or clothing.	Initiate passive rewarming such as removing wet clothing, shelter patient from wind and wet conditions, insulate patient from ground, move patient to warm environment, cover patient with dry blankets or clothing.
ADVANCED LEVEL	**ADVANCED LEVEL**
Treat only hemodynamically significant dysrhythmias and cardiac arrest.	Treat only hemodynamically significant dysrhythmias and cardiac arrest.
Sinus Bradycardia: Consider transcutaneous pacing **ONLY** if hemodynamic compromise persists after rewarming.	**Sinus Bradycardia**: Consider transcutaneous pacing **ONLY** if hemodynamic compromise persists after rewarming.
VF/pulseless VT: One immediate defibrillation attempt on-scent at max settings, then CPR and up to 2 additional defibrillation attempts should be done *en route.* This differs from standard treatment of normothermic VF/pulseless VTach arrest. **Consider one dose of IV/IO epinephrine 0.1 mg/mL (repeat dose unlikely helpful). 1 mg (10 mL) for adults.**	**VF/pulseless VT**: One immediate defibrillation attempt on-scent at max settings, then CPR and up to 2 additional defibrillation attempts should be done *en route.* This differs from standard treatment of normothermic VF/pulseless VTach arrest. **Consider one dose of IV/IO epinephrine.** **Epinephrine (0.1 mg/mL) Administer 0.01 mg/kg (0.1 mL/kg) IV/IO**
Establish IV/IO access, but avoid excessive infusion of cold fluids.	Establish IV/IO access, but avoid excessive infusion of cold fluids.
Continue general patient care and transport guidelines in Figure 2 below.	**Continue general patient care and transport guidelines in Figure 2 below.**

PEARLS:

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

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

Diagnostic Criteria:

1. History of cold exposure ***OR*** a predisposing disease/risk factor (*refer to **Table 2**) **AND**
2. Exam: Cold torso ***OR*** core (internal) temperature less than 35°C (95°F)
3. 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**):

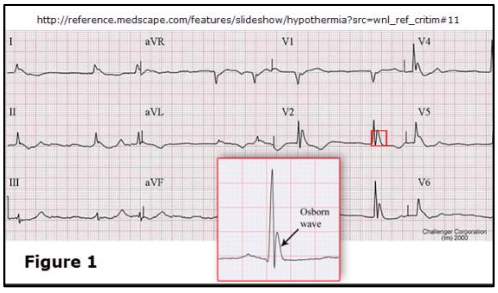


Figure 1

    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

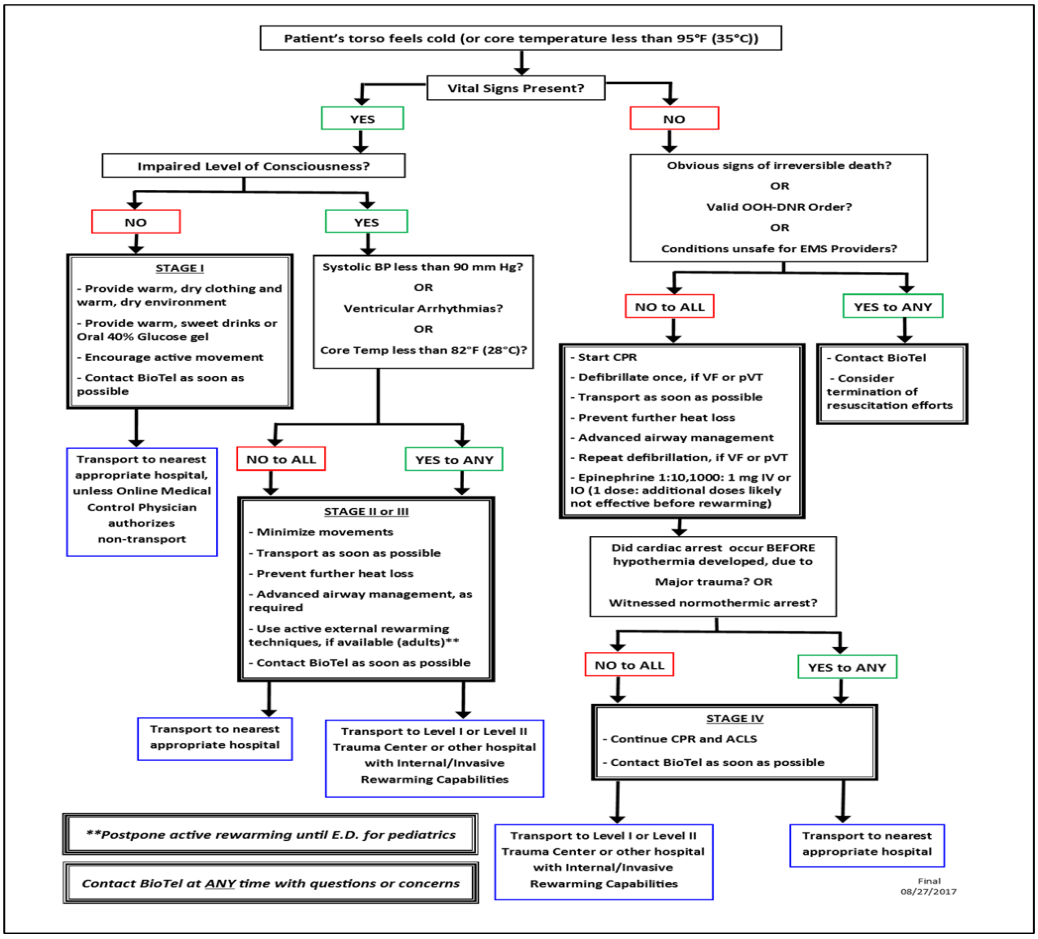
- Special Considerations:
- Patient with Stage IV hypothermia should **NOT** be considered dead until rewarming has been performed at an appropriate receiving hospital
- Consider withholding or terminating pre-hospital CPR and resuscitation ***ONLY*** if the following contraindications are present (refer to Section 6.b, below)
    - Contraindications for initiating resuscitation in the hypothermic patient:
- Documented submersion greater than 1 hour (if in doubt, resuscitate)
- CORE temperature less than 10°C (50°F)
- Obviously fatal injuries incompatible with life, such as decapitation
- Ice formation in the airway and other signs of total body tissue freezing
- Chest wall rigidity that renders chest compressions impossible
- Valid Out-Of-Hospital DNR Order
- Dangers to EMS Providers or other rescuers
    - Trauma, shock and C-spine injury:
- These conditions increased risk of hypothermia
- Refer to Trauma (General) and symptom-specific CPGs/policies (e.g. Spinal Motion Restriction)
    - Submersion/drowning:
- 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)
- Associated Local Cold Injury (e.g. Frostbite):
    - Remove clothing, footwear, jewelry and other constricting items
    - Initiate rewarming, if feasible, ONLY if refreezing of the affected body part is absolutely preventable:
- Do NOT allow tissue to refreeze!
    - Cover injured body parts with loose, dry, sterile dressing:
- Do NOT open or drain intact blisters
- Do NOT rub the injured body part to stimulate circulation
    - Maintain the injured body part at heart level:
- Do NOT elevate or dangle an injured limb
    - Refer to Pain Management CPG
- Destination Decision-Making:

- Stage I (Conscious, shivering and no other signs/symptoms): Nearest appropriate hospital, unless online Medical Control Physician advises otherwise
- Stages II, III or IV: refer to the flow chart in **Figure 2 (previous page)**
- Consult the current Hospital Capabilities Matrix and/or BioTel for additional destination assistance

- Critical Documentation Items:
  - Duration of cold exposure; ambient temperature at time of EMS contact; rewarming attempts or other therapies applied prior to EMS arrival
  - 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

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



See also Altered Mental Status, Cardiac Arrest, Asystole/PEA, VFib/Pulseless Vtach, Pain Management, Trauma CPGs.

CYANIDE EXPOSURE

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Support ABCs, assess for airway soot. Provide high flow 100% oxygen via NRB mask or BVM as needed, initiate continuous SpO2 monitoring. **Sudden respiratory depression/arrest can occur despite a "normal" SpO_2 reading.** Initiate continuous ECG monitorring, prevent heat loss from skin if burns present. Position patient supine or if aspiration risk in the left lateral decubitus position facing EMS staff. If trauma suspected refer to the Spinal Motion Restriction Policy. Perform a POC glucose and treat if needed. **ADVANCED LEVEL** Initiate continuous ECG, Sp02, and PetCO2, and PetCO2 monitoring for all patients. Place an advanced airway as soon as possible if comatose. Establish IV/IO access and treat hypotension/hypoperfusion accordingly. Obtain 12-Lead ECG ASAP and transmit any STEMI ECG or to request consult. Consider treatment with cyanide antidote. **NOTE: Hydroxocobalamin administration should be given IV, if possible, and requires a separate, dedicated IV/IO line. *See criteria, etc. for administration below. Contact BioTel for questions. *** **Hydroxocobalamin:** NS will be needed to dilute. After giving, SpO2 levels are no longer accurate. It will change the color of sweat, tears, and urine to red-all normal. Do not delay CPR and other resuscitation measures for administration. **Initial dose: reconstitute 1 vial (5 g) in 200 mL NS. Repeatedly invert or rock (but do NOT shake) the vial for at least 60 seconds. Administer 5 g in 200 mL IV over 15 minutes (15 mL/min). NOTE: Lactated Ringers (LR) or D5W may be used if Normal Saline is unavailable. Repeat dose: one additional 5 g dose may be administered, if needed, over 15 minutes to 2 hours, *with BioTel authorization*** **Sodium Thiosulfate:** If hydroxocobalamin is not available. "Pasadena" or "Lilly" kit. Optional medication. **12.5 g IV/IO (50 mL of 25% solution). *DO NOT ADMINISTER TO PREGNANT PATIENT! *** **Contact BioTel for persistent hypotension for vasopressor authorization and dosing guidance.**	**BASIC LEVEL** Support ABCs, assess for airway soot. Provide high flow 100% oxygen via NRB mask or BVM as needed, initiate continuous SpO2 monitoring. **Sudden respiratory depression/arrest can occur despite a "normal" SpO_2 reading.** Initiate continuous ECG monitorring, prevent heat loss from skin if burns present. Position patient supine or if aspiration risk in the left lateral decubitus position facing EMS staff. If trauma suspected refer to the Spinal Motion Restriction Policy. Perform a POC glucose and treat if needed. **ADVANCED LEVEL** Initiate continuous ECG, Sp02, and PetCO2, and PetCO2 monitoring for all patients. Place an advanced airway as soon as possible if comatose. Establish IV/IO access and treat hypotension/hypoperfusion accordingly. Obtain 12-Lead ECG ASAP and transmit any STEMI ECG or to request consult. Consider treatment with cyanide antidote. **NOTE: Hydroxocobalamin administration should be given IV, if possible, and requires a separate, dedicated IV/IO line. *See criteria, etc. for administration below. Contact BioTel for questions. *** **Hydroxocobalamin:** NS will be needed to dilute. After giving, SpO2 levels are no longer accurate. It will change the color of sweat, tears, and urine to red-all normal. Do not delay CPR and other resuscitation measures for administration. **Initial dose: Reconstitute 1 vial (5 g) in 200 mL NS. Repeatedly invert or rock (but do NOT shake) for at least 60 seconds. Infuse for 15 minutes: Refer to BioTel PEDI-Guide© for dose** **Contact BioTel ASAP during/after administration or if a 2nd dose is needed. Repeat dose, if authorized, will likely be half the starting dose.** **Sodium Thiosulfate:** If hydroxocobalamin is not available. "Pasadena" or "Lilly" kit. Optional medication. **0.5g/kg (2mL/kg of 25% solution). Contact BioTel ASAP during/after administration.** ***DO NOT ADMINISTER TO PREGNANT PATIENT! *** **Contact BioTel for persistent hypotension for vasopressor authorization and dosing guidance.**

PEARLS:

- Cyanide (CN) is a potent cellular toxin that prevents oxygen utilization, leading to cellular hypoxia. It can 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.
- Ingested CN liquid or crystals may cause belching or vomiting of highly toxic hydrogen cyanide gas. Ensure maximal air circulation in ambulance patient compartment during transport.

- Do not administer oral glucose to a patient who is unresponsive or unable to protect his/her airway.
- Continuous SpCO monitoring should be used, if available, although it does not directly impact the decision to administer cyanide antidote
- Do not administer nitrites especially if there is confirmed/suspected carbon monoxide exposure.
- For additional assistance and Medical Control physician guidance, contact BioTel

1. Consider treatment for Cyanide Toxicity with cyanide antidote:
    a. Preferred CN antidote is hydroxocobalamin (optional medication):
        1. 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

See also Burns, Carbon Monoxide Exposure, Poisoned Patient/Overdose, Toxic Chemical Exposure, Trauma CPGs and Hydroxocobalamin Drug Sheet.

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.

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
   - 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		✓	✓

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.

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.

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):

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.

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.

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:

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 confirming asystole required);
   2. Dependent Lividity (cardiac rhythm strip 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:

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.
   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..
    ii.

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.

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 original, 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.
   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".

Diabetic Emergencies (Hypoglycemia)

ADULT 14 YEARS AND OLDER

Symptomatic Hypoglycemia

Hypoglycemia Definition:

Non-Diabetic	Diabetic
LESS THAN 80 mg/dL	LESS THAN 110 mg/dL

BASIC LEVEL

Assess and support ABCs. Continuous ECG monitoring. GCS and neuro exam. Position of comfort or left lateral, if shock, position supine with feet elevated. IF trauma, refer to spinal immobilization. Monitor airway, O2 to keep SpO2 94%. Perform glucose test.

Hypoglycemic patient who is responsive AND able to protect his/her airway: Administer 1 tube (15 g) oral glucose buccal or SL. If symptoms persist after 10 minutes, administer a 2nd tube (15 g) of oral glucose. Perform repeat glucose and patient response.

ADVANCED LEVEL

IV/IO access.

D10W: IV/IO over 10 minutes. Hypoglycemia and mental status does not improve after oral glucose OR if oral could not be given. **One additional dose of 125 mL of D10W over 10 minutes IV/IO can be given. If D10W unavailable, follow below.**

If premixed D10W is unavailable:

OPTION 1 (preferred): Administer 125 mL of 10% Dextrose in NS (D10). Waste 50 mL from a 250-mL bag of NS and replace with 50 mL of D50. Administer 125 mL (1/2 bag).

OPTION 2: Administer 50 mL of 25% Dextrose (D25) IV/IO. Waste 25 mL from a 50-mL prefilled syringe of D50 and replace with 25 mL of NS. Administer the resulting 50 mL of D25.

Glucagon: 1 mg IM/IN as third-line option. ONLY IF oral glucose can't be given, **AND** no IV/IO line can be established. May repeat once after 20 minutes.

PEDIATRIC < 14 YEARS OLD

Symptomatic Hypoglycemia

Hypoglycemia Definition:

Age	Non-Diabetic	Diabetic
NEWBORN < 1 MO. OF AGE	REFER TO NEONATAL CPG	
1 MO. TO 13 YRS.	Less than 70 mg/dL	

BASIC LEVEL

Assess and support ABCs. Continuous ECG monitoring. GCS and neuro exam. Position of comfort or left lateral, if shock, position supine with feet elevated. IF trauma, refer to spinal immobilization. Monitor airway, O2 to keep SpO2 94%. Perform glucose test.

Hypoglycemic pediatric patient: Sitting upright or recovery position. Document response and repeat glucose.

1 MONTH to 1 YEAR, under 10 KG: 5 mL massaged into cheek mucosa
1 YEAR-3 YEAR, approx. 15 kg: 7.5 mL, as above
3 YEAR to 5 YEAR, approx. 20 kg: ¼ tube, as above
5 YEAR to 7 YEAR, approx. 25 kg: ½ tube, as above
7 YEAR and AT LEAST 30 kg: 1 tube, as above

ADVANCED LEVEL

IV/IO access.

2 mL/kg of D10W over 10 minutes.
If D10W unavailable: Waste 40 mL per amp of D50 and replace with HS-administer 2 mL/kg.

Monitor and improve level of consciousness and symptoms to resolve. If no improvement, administer one additional dose as above.

Glucagon: IM/IN, may repeat once after 20 minutes. ONLY IF oral glucose cannot be given, AND no IV/IO access can be established. May repeat once after 20 minutes.

1 MONTH-4 YEARS: 0.5 MG IM/IN
5 YEARS-13 YEARS: 1 MG IM/IN

PEARLS:

- **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). Always monitor patient response to treatment and document.

- 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

- Monitor vital signs and GCS, and initiate transport. *All patients treated for symptomatic hypoglycemia should be strongly encouraged to accept transport, especially elderly patients and those with cardiovascular and other comorbidities*

- **NOTE:** The following patients ***shall be*** transported to an appropriate receiving hospital.Patients treated by EMS for symptomatic hypoglycemia who take sulfonylureas, such as:
  1. Glipizide (Glucotrol®)
  2. Acetohexamide (Dymelor®)
  3. Chlorpropramide (Diabinese®)
  4. Tolbutamide (Orinase®)
  5. Tolazamide (Tolinase®)

  i. Patients treated by EMS for symptomatic hypoglycemia with glucagon (IM or IN)

- Those who refuse transport should be considered as refusing "Against Medical Advice" (AMA), for which appropriate documentation in the ePCR is required. For additional assistance and Medical Control physician guidance, contact BioTel

See also Altered LOC, Neonatal, Seizure, Shock, Sepsis, Stroke and other non-specific CPGs.

M. Diabetic Emergencies (Hyperglycemia)

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Support ABCs. Put patient on ECG continuous monitoring, assess for signs/symptoms of hypovolemic or septic shock. Assess neuro status and CGS. Position of comfort or left lateral position. If shock position supine with feet elevated. If trauma suspected, spinal immobilization per policy. Give O2 to keep SpO2 94% or higher. Perform glucose test and SAMPLE history. **ADVANCED LEVEL** Start continuous waveform capnography monitoring. POC lactate if available. IV/IO access and administer bolus. **Normal Saline (NS): 20 mL/kg, max 1 L per bolus.** Reassess perfusion. **If hypoperfusion persists, give 1 additional 20 mL/kg bolus, max 1 L.** If hypoperfusion persists after 2 fluid boluses, contact BioTel for further guidance. For cardiac arrest, consider sodium bicarbonate (1mEq/kg IV/IO) Perform and document POC glucose. Monitor neuro status. Treat suspected sepsis per CGP. Initiate transfer ASAP.	**BASIC LEVEL** Support ABCs. Put patient on ECG continuous monitoring, assess for signs/symptoms of hypovolemic or septic shock. Assess neuro status and CGS. Position of comfort or left lateral position. If shock position supine with feet elevated. If trauma suspected, spinal immobilization per policy. Give O2 to keep SpO2 94% or higher. Perform glucose test and SAMPLE history. **ADVANCED LEVEL** Start continuous waveform capnography monitoring. POC lactate if available. IV/IO access and administer bolus. **Normal Saline (NS): 20 mL/kg, max 1 L per bolus. Reassess perfusion.** **Pediatric fluid resuscitation if DKA is suspected (even in absence of prior history of diabetes:** **Contact BioTel for authorization BEFORE administering additional fluid after the initial bolus.** If hypoperfusion persists after 1 bolus for pediatrics if DKA suspected, contact BioTel for further guidance. For cardiac arrest, consider sodium bicarbonate (1mEq/kg IV/IO) Perform and document POC glucose. Monitor neuro status. Treat suspected sepsis per CGP. Initiate transfer ASAP.

PEARLS:

- 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.

See also Shock, Altered LOC, Neonatal, Seizure, Sepsis, Stroke, and other relevant CPGs.

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.
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)
   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.

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%;
        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.

XI. Consultation for Questions or Concerns:

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

Eye Injury

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs. Suction airway PRN after exposure to toxic chemicals or riot control agents. Control bleeding from injuries with gentle pressure and moist/sterile dressings. No direct pressure to eyeball itself, especially if open globe suspected. Assess for toxic chemical exposure for other trauma. Initiate spinal motion restriction if indicated. Otherwise, position of comfort, with head slightly elevated. Treat shock if needed. In absence of known/suspected chemical injury, perform gross visual acuity estimate. See below for tests. **Eye Avulsion or open globe:** "Shield and Ship" with Fox shield and improvised protective device. Tape from center of forehead to angle of mandible. **Impaled object:** Do not attempt to remove object, if too large and protruding from eye, attempt stabilization. Follow open globe as above. **Chemical Exposure: IMMEDIATE COPIOUS IRRIGATION.** Remove contact lenses. Sterile isotonic NS or LR, or sterile eye wash. Tap water only if nothing else available. 1-2 L irrigation and continue en route. See below for additional considerations. 1-2 drops Proparacaine or other agent for pain and irrigation, repeat dose every 5 minutes if needed. Instruct patient not to rub eyes. If pH paper available, consider testing at least 1-2 L of irrigation. **Acid Burns:** Must transport to E.D. for evaluation. Irrigate on-scene and continue en route. HF acid causes exceptional eye burns. Use hexalfuorine solution for irrigation, if available. **Alkali Burns:** Damage usually more serios. Must transport to E.D. Irrigate on scene and en route. **Riot Control Agents:** Treat respiratory symptoms. Intense lacrimation with redness and swelling. Irrigate on-scene as above. Patients who remain symptomatic despite irrigation or more than 30 minutes after exposure should go to E.D., even if only injury. Continue irrigation. **ADVANCED LEVEL** Consider IV/IO at TKO rate or saline lock. Treat pain or nausea with appropriate CPG. NOTE: All patients with known or suspected traumatic or chemical eye injury should be strongly encouraged to accept transport for E.D. evaluation/treatment. Exceptions below.	**BASIC LEVEL** Assess and support ABCs. Suction airway PRN after exposure to toxic chemicals or riot control agents. Control bleeding from injuries with gentle pressure and moist/sterile dressings. No direct pressure to eyeball itself, especially if open globe suspected. Assess for toxic chemical exposure for other trauma. Initiate spinal motion restriction if indicated. Otherwise, position of comfort, with head slightly elevated. Treat shock if needed. In absence of known/suspected chemical injury, perform gross visual acuity estimate. See below for tests. **Eye Avulsion or open globe:** "Shield and Ship" with Fox shield and improvised protective device. Tape from center of forehead to angle of mandible. **Impaled object:** Do not attempt to remove object, if too large and protruding from eye, attempt stabilization. Follow open globe as above. **Chemical Exposure: IMMEDIATE COPIOUS IRRIGATION.** Remove contact lenses. Sterile isotonic NS or LR, or sterile eye wash. Tap water only if nothing else available. 1-2 L irrigation and continue en route. See below for additional considerations. 1-2 drops Proparacaine or other agent for pain and irrigation, repeat dose every 5 minutes if needed. Instruct patient not to rub eyes. If pH paper available, consider testing at least 1-2 L of irrigation. **Acid Burns:** Must transport to E.D. for evaluation. Irrigate on-scene and continue en route. HF acid causes exceptional eye burns. Use hexalfuorine solution for irrigation, if available. **Alkali Burns:** Damage usually more serios. Must transport to E.D. Irrigate on scene and en route. **Riot Control Agents:** Treat respiratory symptoms. Intense lacrimation with redness and swelling. Irrigate on-scene as above. Patients who remain symptomatic despite irrigation or more than 30 minutes after exposure should go to E.D., even if only injury. Continue irrigation. **ADVANCED LEVEL** Consider IV/IO at TKO rate or saline lock. Treat pain or nausea with appropriate CPG. NOTE: All patients with known or suspected traumatic or chemical eye injury should be strongly encouraged to accept transport for E.D. evaluation/treatment. Exceptions below.

PEARLS:

- GCS should be checked twice and documented at least 5-10 minutes apart, the absolute minimum. Signs of early deterioration include confusion, agitation, drowsiness, vomiting, severe headache.
- Assume associated cervical spine injury in patients with moderate/severe head injury.

- When assessing vision, if the patient wears glasses, have them wear for testing.

- In the absence of known/suspected chemical injury, perform and document gross visual acuity estimate:
  - 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:
    - Patient should wear his/her glasses when testing, if available
  - If visual acuity is too limited for the patient to be able to read, assess "count fingers" vision:
    - Hold up 1, 2 or 5 fingers and ask patient: "How many fingers do you see?"
    - Test each eye individually
  - If patient cannot count fingers, assess for "hand motion" vision:
    - Move your hand approximately 12" from the patient and ask: "Tell me when my hand moves"
    - Test each eye individually
  - If patient cannot detect hand motion, assess for "light detection" vision:
    - Ask patient: "Tell me when you see the light" and shine a penlight in the eye being examined, while covering the other eye
    - Test each eye individual

- IMPORTANT: Do not place any pressure on the eye or allow anything to touch the eye

- Sterile isotonic Normal Saline or Lactated Ringers, or sterile eye wash solution may be used:
    - Tap water may be substituted if these are unavailable
    - Do not delay irrigation waiting for a specific irrigation solution
  - Initiate irrigation with at least 1 to 2 liters and continue en route to receiving hospital E.D.:
    - Use "large drip" (10 gtt/mL) tubing
    - 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
    - Gentle use of a sterile 4X4 gauze to keep the lid open may be helpful
- Acid burns:

  Damage is usually superficial, but patient must be transported for E.D. evaluation/treatment
  - Irrigate on-scene and continue en route, as described above
  - Hydrofluoric acid (HF) causes exceptionally severe eye burns
    - Use hexafluorine solution for irrigation, if available (e.g. on a work site)
    - Emergent E.D. evaluation/treatment is critica

- Alkali burns:
  - Damage is usually deeper and more serious: patient must be transported for E.D. evaluation/treatment
  - Irrigate on-scene and continue en route, as described above

- Riot control agents (including "mace", "pepper spray", "tear gas"):
  - Treat respiratory signs and symptoms according to the Respiratory Distress CPG
  - Ocular signs/symptoms: intense lacrimation (tear production), as well as swelling and redness
  - Irrigate on-scene, as described above
  - 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
    - Continue irrigation en route

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

- NOTE: All patients with known or suspected traumatic or chemical eye injury should be strongly encouraged to accept transport for E.D. evaluation/treatment:
  - POSSIBLE exceptions:
    - Mild/dilute acid burns without symptoms after irrigation
    - Riot control agent exposure without symptoms at least 30 minutes after exposure and irrigation
  - When in doubt, transport

- 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)

Head Injury/Traumatic Brain Injury (TBI)

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**BASIC LEVEL**
Support ABCs. Frequent suctioning if blood/secretions. Place oropharyngeal or nasopharyngeal airway unless injuries contraindicate. Continuous ECG and SpO2 monitoring. Control active bleeding from head injury with gentle pressure and moist sterile dressing, if open skull fracture is **NOT** suspected.	Support ABCs. Frequent suctioning if blood/secretions. Place oropharyngeal or nasopharyngeal airway unless injuries contraindicate. Continuous ECG and SpO2 monitoring. Control active bleeding from head injury with gentle pressure and moist sterile dressing, if open skull fracture is **NOT** suspected.
Assess neuro status with pupils and GCS at least twice, 5 minutes apart. Assess C spine injury in patient with head injury. Immobilize patient with cervical collar and long spine board, if indicated, per policy. **Is severe TBI and spine injury NOT suspected, elevate head of stretcher 30 degrees. If severe TBI and other spine injury suspected, consider reverse Trendelenburg (30 degrees).** Keep oxygen at 94% or above with supplemental oxygen and continuous monitoring. When in doubt if Spo2 not available, provide oxygen. Obtain a glucose. SAMPLE history.	Assess neuro status with pupils and GCS at least twice, 5 minutes apart. Assess C spine injury in patient with head injury. Immobilize patient with cervical collar and long spine board, if indicated, per policy. **Is severe TBI and spine injury NOT suspected, elevate head of stretcher 30 degrees. If severe TBI and other spine injury suspected, consider reverse Trendelenburg (30 degrees).** Young children on a long spine board must have torso padding for neutral spine alignment. Pad from top of shoulder to bottom of buttocks. Neutral alignment achieved when the sternum is level with ear canal. Keep oxygen at 94% or above with supplemental oxygen and continuous monitoring. When in doubt if Spo2 not available, provide oxygen. Obtain a glucose. SAMPLE history.
ADVANCED LEVEL	**ADVANCED LEVEL**
Continuous waveform capnography (PetCO2) and ***avoid hyperventilation.*** With assisted ventilation/advanced airway, maintain 35-45 mmHg. Target: 40 mmHg. Consider advanced airway for compromised airway, or GCS 8 or less or inability to maintain airway. Maintain C spine stabilization during placement of airway. Establish IV/IO access, treat hypotension. **SBP < 110 mmHg and no other source of uncontrolled hemorrhage: NS 20 mL/kg, max 1 L.** Repeat bolus once. Contact BioTel for authorization for more boluses. For hypertension following TBI, restrict IV/IO fluids to TKO if SBP is greater than 140 mmHg. For pain, agitation and/or combativeness not due to hypoxia according to PAIN CPG. First line: opioids (fentanyl or morphine). Second line: IV/IO/IM/IN ketamine, analgesic dose, LDK). Contact BioTel for further guidance. Monitor/treat seizures. Monitor VS and transport patients with moderate to severe head injuries to a Level I or Level 2 Trauma Center per Destination Policy. Contact BioTel for additional assistance. Patients with known/suspected mild TBI, no LOC, AND GCS 15 may be transported to closest/appropriate receiving hospital E.D.	Continuous waveform capnography (PetCO2) and ***avoid hyperventilation.*** With assisted ventilation/advanced airway, maintain 35-45 mmHg. Target: 40 mmHg. Consider advanced airway for compromised airway, or GCS 8 or less or inability to maintain airway. Maintain C spine stabilization during placement of airway. Establish IV/IO access, treat hypotension. Repeat bolus once. Contact BioTel for authorization for more boluses. For hypertension following TBI, restrict IV/IO fluids to TKO if SBP is above normal range for age. **NS 20 mL/kg, max 1 L per bolus.** **<1-month age: Target SBP at least 60 mmHg.** **1 month-12 months: Target SBP at least 70 mmHg** **1 YR. – 10 YR.: Target SBP at least (70 + 2X (age in years) mmHg** **11 YR. – 14 YR.: Target SBP at least 90 mmHg** For pain, agitation and/or combativeness not due to hypoxia according to PAIN CPG. First line: opioids (fentanyl or morphine). Second line: IV/IO/IM/IN ketamine, analgesic dose, LDK). Contact BioTel for further guidance. Monitor/treat seizures. Monitor VS and transport patients with moderate to severe head injuries to a Level I or Level 2 Trauma Center per Destination Policy. Contact BioTel for additional assistance. Patients with known/suspected mild TBI, no LOC, AND GCS 15 may be transported to closest/appropriate receiving hospital E.D.

PEARLS:

- **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.
- Avoid overzealous assisted ventilation as hyperventilation is harmful to TBI.

- Control active extremity and junctional bleeding per hemorrhage control/tourniquet CPG.
- Signs of early deterioration: confusion, agitation, drowsiness, vomiting, severe headache.
- Arousability should be assessed by nailbed pressure, axillary skin fold pinch or trapezius muscle pinch; use of sternal rub is discouraged.
- With SAMPLE history, patient or bystander history of “loss of consciousness” and duration thereof may be misleading.
- During prolonged transport, titration to maintain SpO2 94-99% may be appropriate. **NOTE: Even brief periods of hypoxia are extremely damaging to injured brain.** When in doubt during initial resuscitation or if SpO_2 measurement is unavailable, provide high-flow, supplemental oxygen.
- Perform and document a secondary survey, with special attention to HEENT for signs of head/facial injury. Examples “DCAPBLSTICS”, skull fracture, CSF drainage from ears/nose, and facial bone instability.
- Avoid even “mild” hyperventilation, even in the setting of “impending cerebral herniation”, due to lack of scientific evidence. Risk of harm from over-ventilation outweighs theoretical, unproven benefit.
- Nasotracheal intubation is relatively contraindicated in patients with head injury.
- 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.
- 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.

See also Hemorrhage Control/Tourniquet, Shock, Trauma and other relevant CPGs, and Spinal Motrin Restriction and Destination policies.

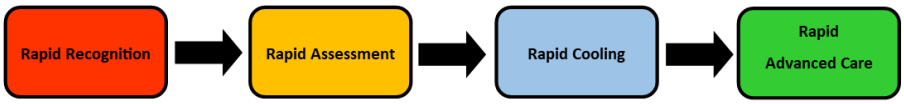
Heat-Related Emergencies

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Move victim to a cool, shaded area, away from sun or external heat sources. If evidence of shock, position supine with feet elevated. Assess and support ABCs see Universal Care-Adult Initiate continuous ECG monitoring and glucose level. Give sips of cool liquids if PO tolerated. Document temperature and rote. **Core (RECTAL) temperature is most accurate and preferred.** Assess neuro status-**AMS is hallmark of heatstroke, regardless of temperature.** Give oxygen to keep SpO2 at 94%, continuous monitoring. ***If temp is at least 104 F (40 C) OR if there is AMS, begin rapid cooling on-scene. * Wet and windy before leaving scene, see below for details.** SAMPLE history as below. **ADVANCED LEVEL** Initiate continuous waveform capnography (PetCO2) monitoring. Continue cooling measures. Continue d/c cooling measures at core temperature of 103.1-104 F (39.5-40 C). Monitor for shivering/seizures. Consider differential diagnosis below. Treat hypoglycemia. Continue hydration: **Heat cramps/syncope/exhaustion:** (sports drinks or table salt ¼-1/2 tsp./qt water). **Heatstroke:** Establish IV/IO access. **NS 20 mL/kg, max 1 L per bolus. Repeat once if needed with NS 20 mL/kg, max 1 L.** Consider small fluid bolus for dehydration despite normal VS. **NS 10 mL/kg, up to 500 mL bolus.** Reassess vitals and perfusion. Treat seizures or uncontrolled shivering during cooling according to seizure CPG. Monitor VS and transport, strongly consider suspected heatstroke to Level 1 or 2 Trauma Center. Contact BioTel for additional assistance or Medical Control physician guidance.	**BASIC LEVEL** Move victim to a cool, shaded area, away from sun or external heat sources. If evidence of shock, position supine with feet elevated. Assess and support ABCs see Universal Care-Pediatric Initiate continuous ECG monitoring and glucose level. Give sips of cool liquids if PO tolerated. **Core (RECTAL) temperature is most accurate and preferred.** Assess neuro status-**AMS is hallmark of heatstroke, regardless of temperature.** Give oxygen to keep SpO2 at 94%, continuous monitoring. ***If temp is at least 104 F (40 C) OR if there is AMS, begin rapid cooling on-scene. * Wet and windy before leaving scene, see below for details.** SAMPLE history as below. **ADVANCED LEVEL** Initiate continuous waveform capnography (PetCO2) monitoring. Continue cooling measures. Continue d/c cooling measures at core temperature of 103.1-104 F (39.5-40 C). Monitor for shivering/seizures. Consider differential diagnosis below. Treat hypoglycemia. Continue hydration: **Heat cramps/syncope/exhaustion:** (sports drinks or table salt ¼-1/2 tsp./qt water). **Heatstroke:** **10-20 mL/kg NS up to 500 mL total bolus** Reassess vitals and perfusion. Treat seizures or uncontrolled shivering during cooling according to seizure CPG. **Pediatric patients-Prepare for assisted ventilation/advanced airway management prior to treatment.** Monitor VS and transport, strongly consider suspected heatstroke to Level 1 or 2 Trauma Center. Contact BioTel for additional assistance or Medical Control physician guidance.

PEARLS:

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

- Non-core temperature within normal range does NOT exclude serious heat illness/heatstroke.
- Elevated non-core temperature suggests an even higher core temperature.
- Sweating does **not** exclude the diagnosis of heatstroke.
- Principle: "Wet and Windy" BEFORE leaving the scene
  - Mist exposed skin with tepid water, while fanning the skin: continue cooling en route
    - Ice packs to groins and axillae (adjunct only – NOT primary method)
    - Ice bath immersion (most rapid and effective cooling method):
      - This is generally unavailable for EMS, but may have been started before EMS arrival
      - 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
- SAMPLE History focus:
  - **S**igns/symptoms: Cramps, headache, altered mental status, orthostatic symptoms, weakness, nausea
  - **A**llergies
  - **M**edications (including over-the-counter, supplements); Alcohol ingestion; Illicit drugs (overdose?)
  - **P**ast Medical History, especially cardiovascular, neurologic
  - **L**ast oral intake
  - **E**vents:
    - Environmental: Ambient temperature and humidity
    - Exertion: level of activity and other circumstances (young child left in vehicle?)
    - Length of time at risk
    - Attire worn
- The risk of treating shivering must be weighted against potential benefit.

See also Seizures, Universal Care-Adult, Universal Care-Pediatric, Excited Delirium, Poisoned Patient, and Trauma CPGs.

HELMET REMOVAL

ADULT 14 YEARS AND OLDER

PROCEDURE:

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

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

If Rescuer 2 cannot remove either the screws and a cutting tool is not available, proceed to Step 3.

Rescuer 2 uses a tongue blade to loosen the snaps and remove both ear/cheek pads. Cut or loosen the chin strap and then, from patient's side, places one hand on both sides of the mandible (at the angle of the mandible, adjacent to the patient' neck): Cup the mandible with the thumb on one side and the fingers on the other side of the mandible:

Rescuer 2 then slides the other hand under the patient's neck and applies pressure from the occipital region, holding inline stabilization. **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.**

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:

For full-face coverage helmets (e.g. motorcycle/motocross helmets), the following may be needed:

Rescuer 1 may need to tilt the helmet backward and raise it to clear the nose.

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

PEDIATRIC < 14 YEARS OLD

PROCEDURE:

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

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

If Rescuer 2 cannot remove either the screws and a cutting tool is not available, proceed to Step 3.

Rescuer 2 uses a tongue blade to loosen the snaps and remove both ear/cheek pads. Cut or loosen the chin strap and then, from patient's side, places one hand on both sides of the mandible (at the angle of the mandible, adjacent to the patient' neck): Cup the mandible with the thumb on one side and the fingers on the other side of the mandible:

Rescuer 2 then slides the other hand under the patient's neck and applies pressure from the occipital region, holding inline stabilization. **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.**

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:

For full-face coverage helmets (e.g. motorcycle/motocross helmets), the following may be needed:

Rescuer 1 may need to tilt the helmet backward and raise it to clear the nose.

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:

stabilization until a long spine board and cervical stabilization device are in place:
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.

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:
Rescuer 2 and **Rescuer 3** then remove the helmet and shoulder pads simultaneously, while **Rescuer 1** maintains inline spinal stabilization:

Rescuer 4 prevents neck flexion by sliding his/her hands under the patient's shoulders:
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:

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.

<u>YOUNG CHILDREN</u>: Torso padding from the top of shoulders to bottom of buttocks may be needed 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.

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:
Rescuer 2 and **Rescuer 3** then remove the helmet and shoulder pads simultaneously, while **Rescuer 1** maintains inline spinal stabilization:

Rescuer 4 prevents neck flexion by sliding his/her hands under the patient's shoulders:
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:

PEARLS:

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

- **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

See also airway management Adult, Airway Management, Pediatric, Head Injury/TBI, Trauma CPGs and Spinal Motion Restriction Policy.

Hemorrhage Control and Tourniquet Use

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC AND ADVANCED LEVEL	**BASIC AND ADVANCED LEVEL**
Assess and support ABCs according to UNIVERSAL CARE – ADULT. Follow appropriate CPGs but following the "MARCH" mnemonic: **M (Massive Hemorrhage):** With life-threatening external hemorrhage, hemorrhage control is first priority **A (Airway):** Assess and support airway patency **R (Respirations):** Assess and support oxygenation, ventilation and respiratory mechanics **C (Circulation):** Assess for other and treat traumatic injuries, signs/symptoms of shock **H (Head Injury):** Assess for and treat closed and/or open head injuries Tourniquets for extremity hemorrhage control are potentially life-threatening hemorrhage AND direct pressure fails/cannot be performed. General tourniquet application includes as "high and tight" as possible, over clothing if needed. Preferred procedure includes expose wound, apply tourniquet 2-3 inches above wound, not over a joint. Tighten until bleeding stops **AND** distal pulse is no longer palpable **(IMPORTANT). EXCEPTION:** In the case of traumatic amputation, tighten until bleeding stops. If bleeding continues, a 2nd tourniquet may be applied proximal to the first (especially on thigh). **Junctional (groin, axilla, neck) hemorrhage:** **Peel:** Peel the (hemostatic) gauze from the roll or folded pile **Push:** Pack firmly into the depth of the wound and keep packing, until bleeding stops If bleeding continues, pack with additional gauze (tie the gauze ends together!) Keep packing until bleeding stops If bleeding continues, the most likely explanation is insufficient packing Caution: bone fragments from associated fracture can injure EMS providers during packing **Pile:** Pile extra/leftover gauze (if available) on top of the wound **Pressure:** Apply pressure for AT LEAST 3 minutes* (hemostatic gauze) or 10 minutes* (plain gauze) Do NOT remove pressure dressing or packing to assess bleeding Pressure to groin wounds may be accomplished by the EMS Provider's knee If a commercial hemostatic gauze or other product was used, bring package to E.D. Continue to monitor patient's vital signs and for recurrent bleeding; treat shock as indicated. Treat pain with judicious administration of analgesics (advanced level providers). If the wound pressure period has not yet elapsed, initiate transport and maintain pressure en route. Contact BioTel for additional patient care considerations or orders.	Assess and support ABCs according to UNIVERSAL CARE – PEDIATRIC. Follow appropriate CPGs but following the "MARCH" mnemonic: **M (Massive Hemorrhage):** With life-threatening external hemorrhage, hemorrhage control is first priority **A (Airway):** Assess and support airway patency **R (Respirations):** Assess and support oxygenation, ventilation and respiratory mechanics **C (Circulation):** Assess for other and treat traumatic injuries, signs/symptoms of shock **H (Head Injury):** Assess for and treat closed and/or open head injuries Tourniquets for extremity hemorrhage control are potentially life-threatening hemorrhage AND direct pressure fails/cannot be performed. General tourniquet application includes as "high and tight" as possible, over clothing if needed. Preferred procedure includes expose wound, apply tourniquet 2-3 inches above wound, not over a joint. Tighten until bleeding stops **AND** distal pulse is no longer palpable **(IMPORTANT). EXCEPTION:** In the case of traumatic amputation, tighten until bleeding stops. If bleeding continues, a 2nd tourniquet may be applied proximal to the first (especially on thigh). **Junctional (groin, axilla, neck) hemorrhage:** **Peel:** Peel the (hemostatic) gauze from the roll or folded pile **Push:** Pack firmly into the depth of the wound and keep packing, until bleeding stops If bleeding continues, pack with additional gauze (tie the gauze ends together!) Keep packing until bleeding stops If bleeding continues, the most likely explanation is insufficient packing Caution: bone fragments from associated fracture can injure EMS providers during packing **Pile:** Pile extra/leftover gauze (if available) on top of the wound **Pressure:** Apply pressure for AT LEAST 3 minutes* (hemostatic gauze) or 10 minutes* (plain gauze) Do NOT remove pressure dressing or packing to assess bleeding Pressure to groin wounds may be accomplished by the EMS Provider's knee Continue to monitor patient's vital signs and for recurrent bleeding; treat shock as indicated. Treat pain with judicious administration of analgesics (advanced level providers). If the wound pressure period has not yet elapsed, initiate transport and maintain pressure en route. Contact BioTel for additional patient care considerations or orders.

PEARLS:

- **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".
- Contraindications for extremity hemorrhage tourniquet include non-extremity hemorrhage OR hemorrhage is controlled by direct pressure.

- Once a tourniquet is placed, it should NOT be removed until the patient has been transferred to a higher level of care, even if the patient complains of pain in the extremity. The bleeding site and tourniquets should be left uncovered, or with minimal dressings.

- **CRITICAL DOCUMENTATION:** Tourniquet application time
  - Write the application time directly on the tourniquet(s); **AND**
  - Document the application time in the ePCR

- 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.

- **Junctional (groin, axilla, neck)** hemorrhage control:
  a. Indications for wound packing with gauze or hemostatic agents:
     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

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

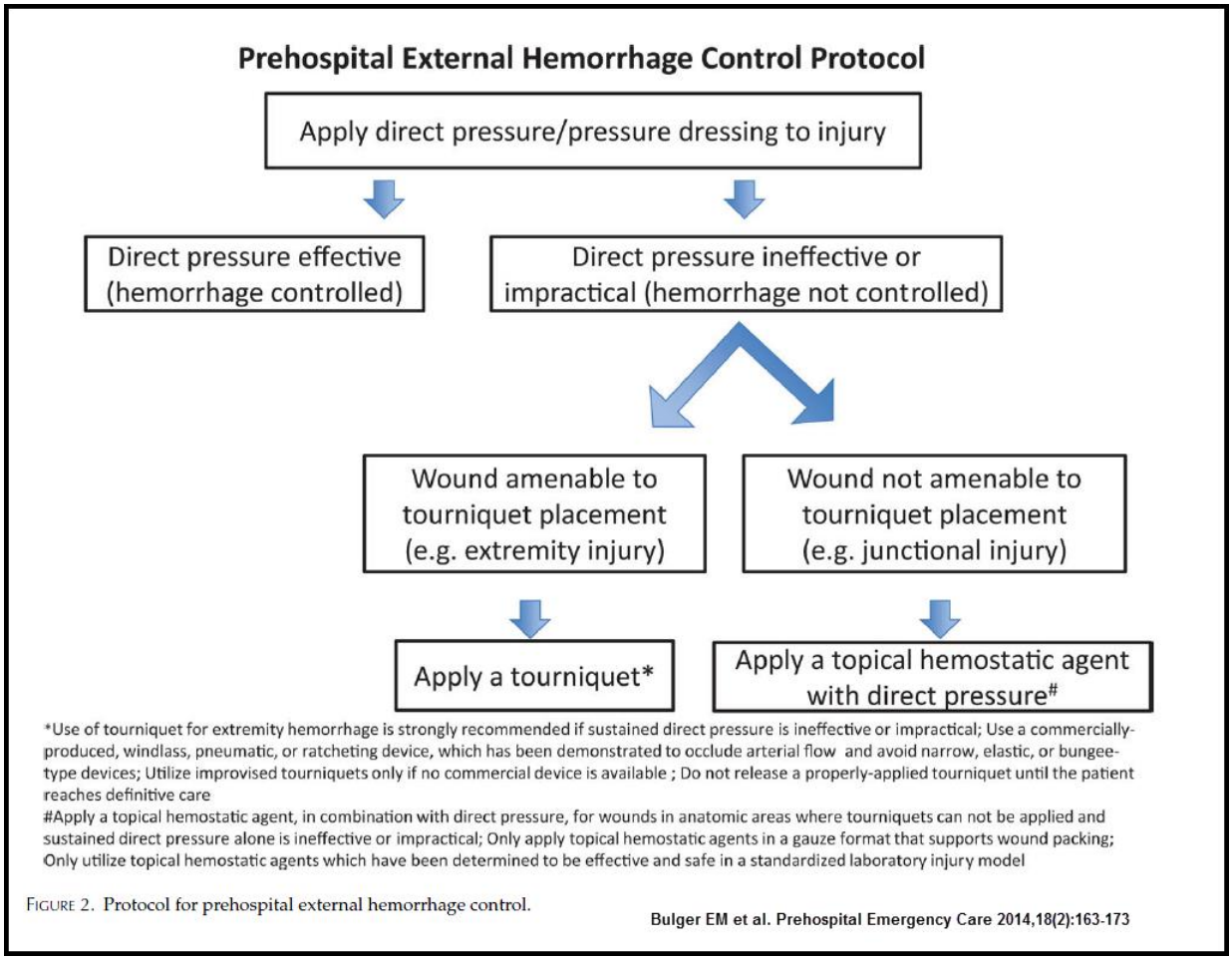


FIGURE 2. Protocol for prehospital external hemorrhage control.

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

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

Special Circumstances

2. 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

3. 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
4. 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

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

See also Amputation, Shock, Trauma and other relevant CPGs, Spinal Motion Restriction and Destination Policies.

LIGHTNING/LIGHTNING STRIKE

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs according to UNIVERSAL CARE – ADULT. If Isolated respiratory arrest or full cardiopulmonary arrest, initiate continuous ECG and SpO_2 monitoring. Evaluate for neurological findings. (altered mental status, stroke-like findings) Fixed/dilated pupils may be a sign of neurologic insult, not death/impending death. Treat respiratory/cardiorespiratory arrest according to CARDIAC ARREST CPG. Place patient in a comfortable position. If evidence of shock, position patient supine with feet elevated. Administer supplemental oxygen, maintain SpO_2 of at least 94% Transfer care once advanced level care arrives. **ADVANCED LEVEL** Establish IV/IO access, preferably through unburned skin. Monitor for and treat cardiac dysrhythmias. Secondary Survey to exclude/treat other injuries. Treat burns or traumatic injuries according to PAIN MANAGEMENT CPG. Transport to a Level I or Level II Trauma Center. For additional assistance contact BioTel.	**BASIC LEVEL** Assess and support ABCs according to UNIVERSAL CARE – PEDIATRIC. If isolated respiratory arrest or full cardiopulmonary arrest, initiate continuous ECG and SpO_2 monitoring. Evaluate for neurological findings (altered mental status, stroke-like findings) Fixed/dilated pupils may be a sign of neurologic insult, not death/impending death. Treat respiratory/cardiorespiratory arrest according to CARDIAC ARREST CPG. Place patient in a comfortable position. If evidence of shock, position patient supine with feet elevated. Administer supplemental oxygen and maintain SpO_2 of at least 94%. Transfer care once advanced level care arrives. **ADVANCED LEVEL** Establish IV/IO access, preferably through unburned skin. Monitor for and treat cardiac dysrhythmias. Secondary Survey to exclude/treat other injuries. Treat burns or traumatic injuries according to PAIN MANAGEMENT CPG. Transport to a Level I or Level II Trauma Center. For additional assistance contact BioTel.

PEARLS:

- NOTE: Lightening strike victims do NOT carry or discharge current – it is safe to touch and treat
- NOTE: Multiple victims: cardiac arrest victims whose injury was witnessed or is likely recent should be treated first and aggressively **("reverse triage")**
- NOTE: Cyanotic, cool mottled extremities are suggestive of lightning strike
- NOTE: Fern-like, superficial skin burns **("Lichtenberg Figures")** may be a clue

See also Asystole/PEA, Burns, Cardiac Arrest, Trauma and VFib/Pulseless VTach CPGs

NEONATAL CARE

BASIC LEVEL

1) Within first 30 seconds:
   a) Warm and dry the infant
      i) TERM: skin to skin with mother, cover with blanket
      ii) PRETERM: polyethylene bag (1-gallon zip food bag) up to level of neck
   b) Position to facilitate drainage of airway secretions, gently rub back
      i) Clear airway ONLY if infant cannot on own or if drowning in secretions. Use bulb syringe – deep suctioning with a catheter. Refer other relevant CPGs as indicated.

2) Assess respirations:
   a) Gently assist ventilation at rate of 40-60 per minute if breathing inadequate/gasping OR if heart rate is less than 100 bpm
   b) Monitor SpO_2 on the right hand or wrist. Supplemental oxygen to achieve Mean Per-Minute Goal Saturations s

*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%

3) Assess heart rate.
   a) Follow **"MRSOPA" algorithm** if heart rate remains under 100 bpm
      i) **M**ask: check the seal
      ii) **R**eposition: infant in sniffing position (do not flex/hyperextend the neck)
      iii) **S**uction: mouth before nose
      iv) **O**pen the mouth
      v) **P**ressure increase (gentle)
      vi) **A**lternative airway: intubate or place LMA (ADVANCED LEVEL PROVIDERS ONLY)
   b) Increase oxygen concentration to 100% and begin chest compressions if still under 60 bpm despite "MRSOPA"
      i) Use the two-thumb/encircling hands technique (thumbs side-by-side just below nipple line)
      ii) 3:1 Compression to ventilation ratio
      iii) 120 events per minute (90 compressions interspersed with 30 gentle ventilations)

4) Assess skin color

5) Clam and cut the cord
   a) Do not delay if depressed infant or neonatal/maternal emergency. Otherwise delay cord clamping for 30-60 seconds after delivery.

6) Calculate and record APGAR score at 1 and 5 minutes postpartum

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

ADVANCED LEVEL

7) IV/IO access if no response to CPR. Normal Saline, Evaluate Blood Glucose.
   a) Treat hypoglycemia if POC glucose <45mg/dl – D10W: 2ml/kg IV/IO OR 40% Glucose gel 5mg/kg (0.2g/kg) massaged into cheek pocket (NOT SL OR SWALLOWED). Extreme caution if no gag reflex.
   b) Epinephrine (0.1 mg/mL) 0.01 mg/kg (0.1 mL/kg) IV/IO followed by 5 mL Normal Saline flush for heart rate <60 bpm during CPR. Repeat every 3-5 minutes until heart rate at least 60 bpm
   c) Positive pressure ventilation with supplemental oxygen, as needed until transfer of care for suspected narcotic toxicity

8) Notify receiving hospital or contact BioTel for destination recommendations according to Hospital Capabilities matrix. Monitor ECG and SpO_2 continuously on the infant's right hand or wrist until hospital arrival. Allow breastfeeding if both mother and infant are stable and transport as soon as possible

PEARLS:

- NOTE: "Due date" may be inaccurate. Very premature infants and other high-risk pregnancies may be very small.
- NOTE: Attempt to resuscitate all infants unless a BioTel Online Medical Control physician advises otherwise.

See also OB-Gyn CPG, Emergency Childbirth Special Procedures and Hospital Capabilities Matrix.

Obstetrical and Gynecological

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**N/A**

Assess and support ABCs per UNIVERSAL CARE – ADULT
Monitor for vomiting, pulmonary aspiration
Obtain SAMPLE and focused OB/GYN history (include last menstrual period)

Consider ruptured ectopic pregnancy if chief complaint is abdominal pain, dizziness, and/or vaginal bleeding with/without shock in 1st trimester. Treat per Shock CPG

Position unstable pregnant patient supine (refer to EMERGENCY CHILDBIRTH – ABNORMAL for exceptions)

If unstable 3rd trimester with aorto-caval compression and hemodynamic compromise (pallor, bradycardia, hypotension, sweating, nausea/vomiting) implement **Left Uterine Displacement (preferred, especially if maternal cardiac arrest)** OR immobilize supine on long backboard at 10-15° angle, left side down (useful in trauma setting). Refer to Spinal Motion Restriction Policy

Supplemental oxygen to maintain SpO_2 at least 94%
100% oxygen via non-rebreather mask (NRBM) for high-risk pregnancy/delivery

Prepare for childbirth if delivery imminent

Give report/transfer care once advanced level providers arrive

ADVANCED LEVEL

Contact BioTel ASAP for hemorrhage, seizure, pre-term labor, or other high-risk conditions

Transport ASAP to facility capable of handling complicated obstetrical emergencies

Continuous ECG, SpO_2 (all patients) and $PetCO_2$ (unstable/high-risk patients)
Refer to EMERGENCY CHILDBRITH – NORMAL/ABNORMAL

Establish IV/IO access at TKO rate/saline lock

For shock/hypotension due to hemorrhage: **two large-bore peripheral IVs and administer 20 mL/kg Normal Saline bolus (up to 1000 mL per bolus** per Shock CPG
Reassess and **repeat fluid bolus once, if needed**
Contact BioTel for authorization for additional IV/IO administration if needed

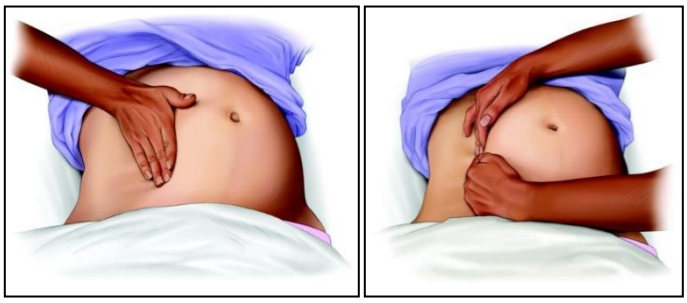
IV/IO analgesia per Pain Management CPG (extreme caution in high-risk patient), monitor for adverse effects

For seizures refer to Seizures CPG
Midazolam 2.5 – 5 mg slow IV/IO/IN/IM – may repeat once; AND **Magnesium Sulfate 5 g in 100mL Normal Saline IV/IO over 15 minutes**. *IM Magnesium Sulfate* 2 g in 4 mL split into two separate injections if vascular access cannot be obtained.
Monitor ABCs, document clinical response.
Contact BioTel for refractory seizures

Post-partum care: refer to Neonatal Care CPG and Emergency Childbirth Special Procedures
Allow infant to breastfeed
Monitor maternal ABCs and for post-partum hemorrhage
Document time of placental delivery (place in red bag, transport to hospital)
Treat post-partum hemorrhage according to Shock CPG

- If uterine atony (flabby, soft uterus): external fundal massage (Emergency Childbirth Special Procedures)
- If perineal laceration: pressure dressing with sterile gauze (transport saturated dressings to hospital to assist with estimating blood loss)

Contact BioTel for additional assistance and Medical Control physician guidance



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

PEARLS:

- High-risk pregnancy/delivery include preterm labor, breech presentation, multiple births, meconium staining, placenta previa, placental abruption, shoulder dystocia, prolapsed cord, preeclampsia (SBP > 160 mmHg or DBP > 110 mmHg), eclampsia (may occur up to 4 weeks post-partum), maternal drug use, lack of prenatal care and extremes of maternal age.

- NOTIFY BIOTEL OF ANY HIGH-RISK CONDITIONS

- Unstable pregnant patients require aggressive resuscitation and stabilization measures first. **Maternal resuscitation is key to survival of both mother and fetus.**

- Consider ruptured ectopy pregnancy (life threatening emergency) for any woman of childbearing age with abdominal pain ± dizziness ± shock ± vaginal spotting who may or may not think she is pregnant

Pain Management

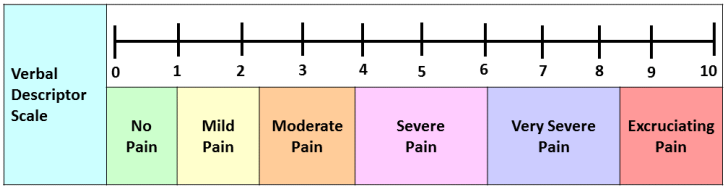
ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs per UNIVERSAL CARE – ADULT Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at 94% or higher. Assess GCS and treat. Assess for trauma, pregnancy, other etiologies. Position in lateral decubitus facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG. POC glucose and treat if needed according to Diabetic Emergencies CPG. (NOTE: Diabetic Ketoacidosis (DKA) may present with abdominal pain mimicking acute abdomen) Determine pain score using age-appropriate pain scale. Refer to SELF-REPORT NUMERIC RATING SCALE (NRS) below Obtain focused history of traumatic and medical causes for acute pain Consider non-pharmaceutical pain management (position of comfort, cold packs, splints, dressings, verbal reassurance) Give report and transfer to advance level care **ADVANCED LEVEL** ECG and SpO_2 monitoring until hospital transfer Continuous $PetCO_2$ if shock or hypoperfusion. IV/IO access at TKO rate Provide fluids as needed (Refer to Burns, Hemorrhage Control/Tourniquet, OB/Gyn, Shock, or other specific CPGs) For adult with acute, sickle cell, vaso-occlusive crisis: administer 10 mL/kg NS (1 L max per bolus) and assess response. Contact BioTel for additional administration Consider analgesic medication for acute pain not relieved by non-pharmaceutical methods. **Detailed documentation of response to interventions is a critical EMS performance measure.** NOTE: 65 years and older → administer ½ the usual dose & monitor NOTE: Contact BioTel before administering opioid analgesia if: patient is debilitated/dehydrated, hypoxic (SpO_2 < 90%), hypercarbic ($PetCO_2$ > 45 mmHg), altered mental status (GSC <15), OR SBP less than 90 mmHg • **Fentanyl**: 1 mcg/kg slow IVP/IO/IM/IN (max single dose: 100 mcg). May repeat once after 10 minutes. Don't exceed 200 mcg total cumulative dose without BioTel authorization: OR • **Morphine**: 2 to 4 mg slow IVP/IO/IM. May repeat every 10 minutes, don't exceed 10 mg without BioTel authorization. Consider ondansetron/promethazine for opioid-induced nausea/vomiting For moderate-severe pain unrelieved by opioid analgesics, and for use only by appropriately trained EMS with Medical Director authorization, consider low-dose ketamine (LDK) as an adjunct analgesic: NOTE: 100 mg/mL must **NOT** be injected IV or IO,	**BASIC LEVEL** Assess and support ABCs per UNIVERSAL CARE – PEDIATRIC Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at 94% or higher. Assess GCS and treat. Assess for trauma and other etiologies Position in lateral decubitus facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG. POC glucose and treat if needed according to Diabetic Emergencies CPG. (NOTE: Diabetic Ketoacidosis (DKA) may present with abdominal pain mimicking acute abdomen) Determine pain score using age-appropriate pain scale. Refer to: • 12 years and above → SELF-REPORT NUMERIC RATING SCALCE (NRS) • 4 – 12 years of age → SELF REPORTING SCALE (WONG-BAKER FACES Scale or FACES PAIN SCALE - REVISITED (FPS-R) • Less than 4 years → OBSERVATIONAL SCALE (FLACC or CHEOPS) Obtain focused history of traumatic and medical causes for acute pain Consider non-pharmaceutical pain management (position of comfort, cold packs, dressings, verbal reassurance) NOTE: DO NOT USE TRACTION SPLINTS IN PATIENTS LESS THAN 14 YEARS. Give report and transfer to advance level care **ADVANCED LEVEL** ECG and SpO_2 monitoring until hospital transfer Continuous $PetCO_2$ if shock or hypoperfusion. IV/IO access at TKO rate Provide fluids as needed (Refer to Burns, Hemorrhage Control/Tourniquet, OB/Gyn, Shock, or other specific CPGs) For child with acute, sickle cell, vaso-occlusive crisis: administer 10 mL/kg NS (1 L max per bolus) and assess response. Contact BioTel for additional administration Consider analgesic medication for acute pain not relieved by non-pharmaceutical methods. **Detailed documentation of response to interventions is a critical EMS performance measure.** NOTE: Contact BioTel before administering opioid analgesia if: patient is debilitated/dehydrated, hypoxic (SpO_2 < 90%), hypercarbic ($PetCO_2$ > 45 mmHg), altered mental status (GSC <15), OR SBP less than (70 mmHg + (2 x age (years)) • **Fentanyl**: 1 mcg/kg slow IVP/IO/IM/IN (max single dose: 100 mcg). May repeat once after 10 minutes. Don't exceed 200 mcg total cumulative dose without BioTel authorization: OR • **Morphine**: 0.1 mg/kg slow IVP/IO/IM (maximum single dose: 2 mg). Don't exceed 4 mg total cumulative dose without BioTel authorization Consider ondansetron/promethazine for opioid-induced nausea/vomiting

consult Ketamine Drug Sheet. NOTE: monitor for respiratory depression, laryngospasm/apnea, etc. **Low dose Ketamine (LDK)** dosing: • IN or IM: 0.4 mg/kg (max single dose: 40 mg) May repeat once after 15 minutes • IV/IO: 20 mg in 100 mL NS over 15 minutes. May repeat once after 15 mins LDK may be considered as sole/primary analgesia **ONLY** if opioids are unavailable. Treat special circumstances according to symptom-specific CPG Contact BioTel for additional assistance and Medical Control physician guidance	For moderate-severe pain unrelieved by opioid analgesics, and for use only by appropriately trained EMS with Medical Director authorization, consider low-dose ketamine (LDK) as an adjunct analgesic: NOTE: 100 mg/mL must **NOT** be injected IV or IO, consult BioTel PEDI-Guide for further instructions. NOTE: monitor for respiratory depression, laryngospasm/apnea, etc. **Low dose Ketamine (LDK)** dosing: • IN or IM: Follow BioTel PEDI-Guide (max single dose: 40 mg, may repeat once after 15 minutes) • IV/IO: Follow BioTel PEDI-Guide (max single dose: 20 mg, may repeat once after 15 mins) LDK may be considered as sole/primary analgesia **ONLY** if opioids are unavailable. Treat special circumstances according to symptom-specific CPG Contact BioTel for additional assistance and Medical Control physician guidance

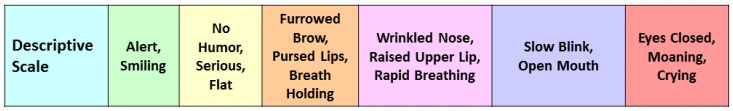
Universal Pain Assessment Tools

ADULT (at least 12 years of age)

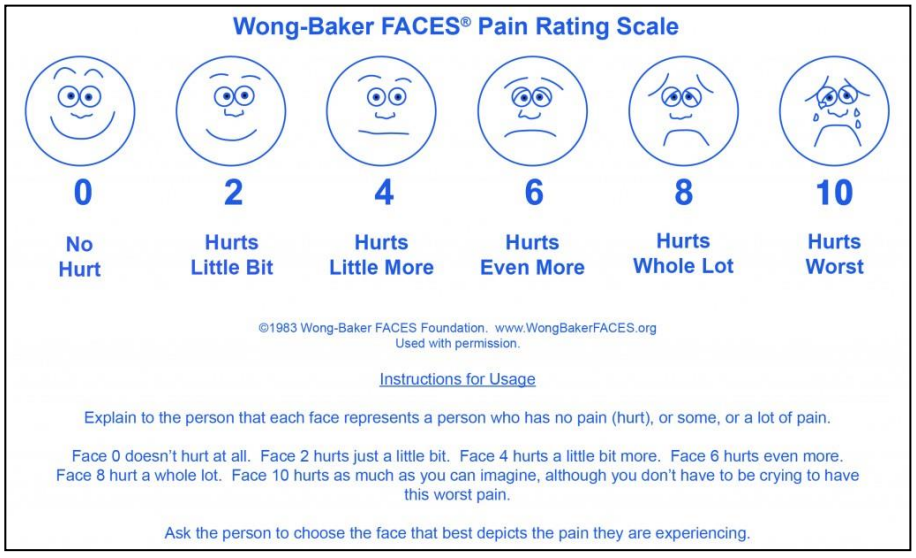
Self-Report Numerical Rating Scale (NRS)



Descriptive, Observational Scale

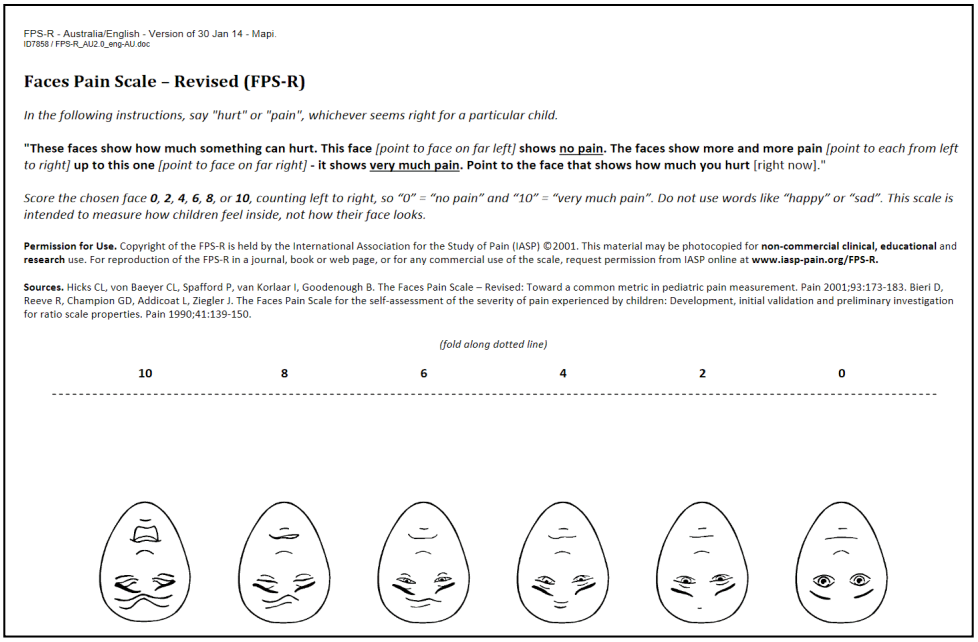


CHILD 4 to 12 years of age



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

OR



FPS-R - Australia/English - Version of 30 Jan 14 - Mapi.
ID7858 / FPS-R_AU2.0_eng-AU.doc

Faces Pain Scale – Revised (FPS-R)

In the following instructions, say "hurt" or "pain", whichever seems right for a particular child.

"These faces show how much something can hurt. This face *[point to face on far left]* **shows no pain. The faces show more and more pain** *[point to each from left to right]* **up to this one** *[point to face on far right]* **- it shows very much pain. Point to the face that shows how much you hurt** [right now]."

*Score the chosen face **0**, **2**, **4**, **6**, **8**, or **10**, counting left to right, so "0" = "no pain" and "10" = "very much pain". Do not use words like "happy" or "sad". This scale is intended to measure how children feel inside, not how their face looks.*

Sources. Hicks CL, von Baeyer CL, Spafford P, van Korlaar I, Goodenough B. The Faces Pain Scale – Revised: Toward a common metric in pediatric pain measurement. Pain 2001;93:173-183. Bieri D, Reeve R, Champion GD, Addicoat L, Ziegler J. The Faces Pain Scale for the self-assessment of the severity of pain experienced by children: Development, initial validation and preliminary investigation for ratio scale properties. Pain 1990;41:139-150.

(fold along dotted line)

10 8 6 4 2 0

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

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)

See also Burns, Chest Pain, Hemorrhage Control/Tourniquet Use, OB/Gyn and Trauma CPG

Poisoned Patient and Overdose

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**BASIC LEVEL**
Assess and support ABCs per UNIVERSAL CARE – ADULT Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at 94% or higher. Evaluate for signs/symptoms of shock and treat. Continuous ECG monitoring. Assess GCS. Treat trauma and heat-related illness according to specific CPGs.	Assess and support ABCs per UNIVERSAL CARE – PEDIATRIC Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at 94% or higher. Evaluate for signs/symptoms of shock and treat. Continuous ECG monitoring. Assess GCS. Treat trauma and heat-related illness according to specific CPGs.
If no trauma, position supine or in lateral decubitus facing EMS to monitor and manage airway.	If no trauma, position supine or in lateral decubitus facing EMS to monitor and manage airway.
POC glucose and treat if needed according to Diabetic Emergencies CPG.	POC glucose and treat if needed according to Diabetic Emergencies CPG.
Assess for general and toxidrome-specific signs/symptoms suggestive of drug overdose/poisoning. Symptoms may vary depending on route, concentration, or duration of exposure. Check for needle marks, paraphernalia, bites, bottles, etc.	Assess for general and toxidrome-specific signs/symptoms suggestive of drug overdose/poisoning. Symptoms may vary depending on route, concentration, or duration of exposure. Check for needle marks, paraphernalia, bites, bottles, etc.
Obtain SAMPLE history from patient/bystanders. Focus on prescriptions, OTC meds, and illicit drugs. Identify drug name, dose/quantity, and time of ingestion. Collect and transport all pill bottles and other containers with patient. **Use extreme caution & PPE if opioid-related poisoning is suspected to prevent EMS Provider exposure.** Refer to Toxic Chemical Exposure CPG.	Obtain SAMPLE history from patient/bystanders. Focus on prescriptions, OTC meds, and illicit drugs. Identify drug name, dose/quantity, and time of ingestion. Collect and transport all pill bottles and other containers with patient. **Use extreme caution & PPE if opioid-related poisoning is suspected.** Refer to Toxic Chemical Exposure CPG.
Give report and transfer care once advanced level care arrives.	Give report and transfer care once advanced level care arrives.
ADVANCED LEVEL	**ADVANCED LEVEL**
Maintain continuous SpO_2 and ECG until transferred to hospital staff	Maintain continuous SpO_2 and ECG until transferred to hospital staff
Initiate continuous $PetCO_2$ if signs/symptoms of shock, hypoperfusion, or respiratory distress Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation.	Initiate continuous $PetCO_2$ if signs/symptoms of shock, hypoperfusion, or respiratory distress Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation.
For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG.	For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG.
Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG.	Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG.
Follow agency SOPs for patient decontamination prior to E.D. transport. (SOPs for personnel/equipment and apparatus decontamination)	Follow agency SOPs for patient decontamination prior to E.D. transport. (SOPs for personnel/equipment and apparatus decontamination)
Consult BioTel and North Texas Poison Control Center for care considerations not covered under standing orders.	Consult BioTel and North Texas Poison Control Center for care considerations not covered under standing orders.

PEARLS:

- **Consult BioTel and the North Texas Poison Control Center** early if: confirmed or suspected multi-substance poisoning or overdose, 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.

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

Benzodiazepine:

- Support ABCs with supplemental oxygen and assisted ventilation/advanced airway
- Consider IV/IO fluid challenge (Normal Saline 20 mL/kg, up to 1 L maximum per bolus)

Beta-Blocker (BB) or **Calcium Channel Blocker (CCB)**:

- Treat according to the Bradycardia CPG and Shock CPG

Carbon monoxide (CO):

- Toxidrome recognition and treatment according to the Carbon Monoxide Exposure CPG

Caustic (acid or alkali) oral ingestion:

- Evaluate for and treat airway compromise according to Airway Management (Adult/Pediatric) CPG
- 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

Cyanide (CN):

- Toxidrome recognition and treatment according to the Cyanide Exposure CPG

Narcotic/opioid (including fentanyl, carfentanil, and related substances):

- 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)
- Toxidrome recognition and treatment according to the Altered Mental Status CPG

Organophosphate or **carbamate pesticide**, **nerve agent**:

- Toxidrome recognition and treatment according to the Toxic Chemical Exposure CPG
  i. If atropine/2-PAM Duodote® autoinjectors are unavailable, administer atropine IV/IO

Psychiatric and other medications causing **symptomatic dystonia** or **extrapyramidal symptoms**:

- Administer diphenhydramine according to the Allergic Reaction CPG

Selective Serotonin Reuptake Inhibitor Antidepressant (SSRI):

- Consider early advanced airway management
- Treat dysrhythmias, hyperthermia, hypotension, and seizures according to the relevant CPG

Stimulant:

- Request additional EMS and Law Enforcement resources, as needed
- Toxidrome recognition and treatment according to the Behavioral Emergencies/Excited Delirium Syndrome CPG

Tricyclic Antidepressant (TCA):

- Treat according to the Bradycardia CPG, Shock CPG, and Seizure CPG
- Administer sodium bicarbonate 1 mEq/kg IV/IO; and
- Administer 20 mL/kg Normal Saline IV/IO (1 L maximum per bolus)

See also Altered Mental Status, Behavioral Emergencies-Excited Delirium, Cardiac Arrest, Toxic Chemical Exposure, and other, symptom-specific CPGs

Post-Cardiac Arrest Care

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs per UNIVERSAL CARE – ADULT Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 94 – 99%. Assist in ventilations as needed (avoid over-ventilation). Continuous ECG monitoring. Assess GCS (pupillary size and reactivity). Avoid measures that may contribute to hyperthermia. Position supine OR lateral decubitus (if aspiration risk) facing EMS. For trauma refer to spinal motion restriction policy. Perform a glucose and treat if needed. **ADVANCED LEVEL** Initiate $PetCO_2$ monitoring with continuous ECG and SpO_2 monitoring. Titrate FiO_2 to minimum concentration necessary to maintain SpO_2 94 – 99%. AVOID HYPERVENTILATION: - Medical etiology: no more than 10 – 12 breaths/minute - Trauma etiology: 6 – 8 breaths/minute Administration of ROUTINE ANTI-ARRHYTHMICS (especially infusions) NOT RECOMMENDED AFTER ROSC. Advanced Airway (ET Tube or extraglottic device) if no regain of consciousness or if SpO_2 remains less than 90% Treat Hypotension (SBP < 90 mmHg) with fluid bolus (20 mL/kg NS IV/IO – 1 L max per bolus), may repeat once if needed (unless volume overload). May consider norepinephrine infusion (4 – 10 mcg/min IV/IO) only if medical etiology. Obtain 12-Lead ECG ASAP and transmit STEMI. Transport ASAP to facility with 24-hour cath lab capability for patients with STEMI, suspicion of acute myocardial infarction, or ROSC after cardiac arrest (according to Hospital Capabilities and Destination Policy). Treat hypoglycemia (D10W preferred) and seizures according to relevant CPGs. Assess and treat common causes of post-resuscitation hypotension (hyperventilation, hypovolemia, tension pneumothorax – refer to Needle Thoracostomy Procedure). Remove extraglottic airway or follow sedation guidelines for intubated patients awaken (coughing, gagging/movement with advanced airway in place. - Midazolam 2.5 – 5 mg IV/IO/IN/IM; may repeat once after 10-15 minutes OR - Diazepam 2.5 – 5 mg IV/IO/IN/IM; maybe repeat once after 10-15 minutes. - BioTel contact for additional sedation doses	**BASIC LEVEL** Assess and support ABCs per UNIVERSAL CARE – PEDIATRIC Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 94 – 99%. Assist in ventilations as needed (avoid over-ventilation). Continuous ECG monitoring. Assess GCS (pupillary size and reactivity). Avoid measures that may contribute to hyperthermia. Position supine OR lateral decubitus (if aspiration risk) facing EMS. For trauma refer to spinal motion restriction policy. Perform a glucose and treat if needed. **ADVANCED LEVEL** Initiate $PetCO_2$ monitoring with continuous ECG and SpO_2 monitoring. Titrate FiO_2 to minimum concentration necessary to maintain SpO_2 94 – 99%. AVOID HYPERVENTILATION: - Medical etiology: no more than 10 – 12 breaths/minute - Trauma etiology: 6 – 8 breaths/minute Administration of ROUTINE ANTI-ARRHYTHMICS (especially infusions) NOT RECOMMENDED AFTER ROSC. Advanced Airway (ET Tube or extraglottic device) if no regain of consciousness or if SpO_2 remains less than 90% Treat Hypotension (SBP < 5th percentile for age) with fluid bolus (20 mL/kg NS IV/IO – 1 L max per bolus; 5 –10 mL/kg if respiratory etiology or heart failure), BioTel authorization for additional fluid boluses or vasopressor infusion. Obtain 12-Lead ECG ASAP and transmit STEMI. Transport ASAP to facility with 24-hour cath lab capability for patients with STEMI, suspicion of acute myocardial infarction, or ROSC after cardiac arrest (according to Hospital Capabilities and Destination Policy). Treat hypoglycemia (D10W preferred) and seizures according to relevant CPGs. Assess and treat common causes of post-resuscitation hypotension (hyperventilation, hypovolemia, tension pneumothorax – refer to Needle Thoracostomy Procedure). Remove extraglottic airway or follow sedation guidelines for intubated patients awaken (coughing, gagging/movement with advanced airway in place. - Midazolam 0.2 mg/kg IV/IO/IN/IM (maximum single dose: 5mg), may repeat once after 10-15 minutes - BioTel contact for additional sedation doses Contact BioTel for additional assistance and Medical Control physician guidance.

PEARLS:

- ROSC: return of an organized cardiac rhythm with a palpable pulse (carotid, femoral, or radial)
- Avoid excessive ventilation (rate, depth)
- Prehospital cooling with cold IV fluids is no longer routinely recommended
- Two rescuers should be present (if possible) in patient compartment of the ambulance

See also Asystole/PEA, Cardiac Arrest, and Vfib/pulseless VTach CPGs and Determination of Death Policy

Respiratory Distress: Adult and Pediatric

ADULT 14 YEARS AND OLDER

BASIC LEVEL

Assess and support ABCs per UNIVERSAL CARE – ADULT and Airway Management - Adult
Suction and OPA or NPA if needed. If stridor is present, treat for anaphylaxis (Allergic Reaction CPG) or foreign body. Provide oxygen to keep SpO_2 at least 94%. Assist in ventilations as needed:

- STEMI, acute stoke, TBI, or post-cardiac arrest care with ROSC: titrate FiO_2 to minimum concentration needed for SpO_2 94 – 99%
- Hypercarbic arrest (COPD) or if $PetCO_2$ rises or decreased level of consciousness following supplemental oxygen: titrate FiO_2 to minimum concentration needed for SpO_2 88 – 92%
- Wheezing with no signs of volume overload or congestive heart failure: albuterol 2.5 mg via nebulizer, every 5 minutes (max 3 doses)

Continuous ECG monitoring. Assess GCS (pupillary size and reactivity). Assess for cardiac/renal disease, overdose, sepsis, toxic chemical exposure, and other etiologies and treat as per specific CPG.

Position in position of comfort (if no trauma). If in shock: supine (with legs elevated), OR lateral decubitus (if tolerated) facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG.

Perform a glucose and treat if needed.
Obtain SAMPLE history and focused secondary assessment

ADVANCED LEVEL

Initiate $PetCO_2$ monitoring with continuous ECG and SpO_2 monitoring. Prepare for possible CPAP or advanced airway management. Consider using PEEP Valve if no contraindications (refer to Airway Management – Adult)

Treat hemodynamically-significant dysrhythmias according to relevant CPG.

IV (preferred) or IO access at TKO rake/saline lock (obtain access before nitroglycerin administration if possible).

Upper Airway Obstruction

- Smoke inhalation/thermal airway burns: consider early advanced Airway Management (PAI or awake Nasal Intubation)
- Foreign body obstruction: BLS maneuvers
- Anaphylaxis: treat per Allergic Reaction CPG
- Traumatic injury to upper airway: one attempt at oral advanced airway placement before emergency Cricothyroidotomy

Tension Pneumothorax (dyspnea, tachypnea, hypoxia, decreased breath sounds and decreased chest wall excursion on affected side, hemodynamic compromise, high resistance to assisted ventilation, tracheal deviation: late ominous sign)

- Immediate Needle Thoracostomy

PEDIATRIC < 14 YEARS OLD

BASIC LEVEL

Assess and support ABCs per UNIVERSAL CARE – PEDIATRIC and Airway Management - Pediatric
Suction and OPA or NPA if needed. If stridor is present, treat for anaphylaxis (Allergic Reaction CPG) or foreign body. Provide oxygen to keep SpO_2 at least 94%. Assist in ventilations as needed:

- Acute stoke, TBI, or post-cardiac arrest care with ROSC: titrate FiO_2 to minimum concentration needed for SpO_2 94 – 99%
- Wheezing with no signs of volume overload or congestive heart failure: albuterol 2.5 mg via nebulizer, every 5 minutes (max 3 doses). **DON'T GIVE ALBUETEROL FOR CROUP (stridor ± barking cough)**

Continuous ECG monitoring. Assess GCS (pupillary size and reactivity). Assess for cardiac/renal disease, overdose, sepsis, toxic chemical exposure, and other etiologies and treat as per specific CPG.

Position in position of comfort (if no trauma). If in shock: supine (with legs elevated), OR lateral decubitus (if tolerated) facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG.

Perform a glucose and treat if needed.
Obtain SAMPLE history and focused secondary assessment

ADVANCED LEVEL

Initiate $PetCO_2$ monitoring with continuous ECG and SpO_2 monitoring. Prepare for possible CPAP or advanced airway management. Consider using PEEP Valve if no contraindications (refer to Airway Management – Pediatric)

Treat hemodynamically-significant dysrhythmias according to relevant CPG.

IV (preferred) or IO access at TKO rake/saline lock (obtain access before nitroglycerin administration if possible).

Upper Airway Obstruction

- Smoke inhalation/thermal airway burns: consider early advanced Airway Management (PAI or awake Nasal Intubation)
- Foreign body obstruction: BLS maneuvers
- Anaphylaxis: treat per Allergic Reaction CPG
- Traumatic injury to upper airway: one attempt at oral advanced airway placement before emergency Needle Cricothyroidotomy

Tension Pneumothorax (dyspnea, tachypnea, hypoxia, decreased breath sounds and decreased chest wall excursion on affected side, hemodynamic compromise, high resistance to assisted ventilation, tracheal deviation: late ominous sign) requires

- Immediate Needle Thoracostomy

Volume Overload (rales, JVD/peripheral edema, missed dialysis)

- CONTACT BIOTEL, acquire and transmit 12-Lead ECG ASAP.
- Consider CPAP at 5 – 10 cm H_2O pressure if no contraindications.

Volume Overload (rales, JVD/peripheral edema, missed dialysis)

- Nitroglycerin 0.4 mg SL (as long as SBP at least 100 mmHg). May repeat twice. NOTE: 12-Lead ECG before NTG if possible. IV/IO fluid bolus (10 mL/kg, up to 500 mL) for hypotension
- If no response to NTG: CPAP at 5 cm H_2O pressure if no contraindications. If no response, increase pressure to 10 cm H_2O. NOTE: CPAP may be applied with initial NTG for severe dyspnea.
- If wheezing: contact BioTel (Epinephrine and albuterol may worsen pulmonary edema)
- Transmit any 12-Lead ECG showing STEMI

Wheezing without signs of volume overload:

- Mild – Moderate: albuterol 2.5 mg via nebulizer (may repeat every 5 minutes for 3 total doses). Add ipratropium 0.5 mg to 2nd and 3 doses.
- Severe distress/no response to bronchodilators: CPAP at 5 mg H_2O pressure if no contraindications.
- If no response, magnesium sulfate: 2 g in 100mL. Normal Saline IVPB over 15 minutes (BioTel authorization for kidney dialysis or COPD patients) AND methylprednisolone: 60 – 125 mg IV/IO/IM or dexamethasone: 10 – 16 mg IV/IO/IM/PO
- If no response with impending respiratory arrest: Epinephrine (1 mg/mL): 0.5 – 0.5 mg IM every 5 minutes (up to 3 total doses)

Status Asthmaticus or impending respiratory failure, simultaneously administer:

- Albuterol 2.5 mg with ipratropium 0.5 mg every 5 minutes (up to 3 total doses)
- Epinephrine (1 mg/mL): 0.3 –0.5 mg IM if not already done
- CPAP at 5 cm H_2O, increase to 19 cm if needed
- Magnesium sulfate 2 g in 100 mL Normal Saline IVPB over 15 minutes
- Methylprednisolone 60 – 125 mg IV/IO/IM
- Advance airway placement if other measures fail

Transport with close monitoring unless specific non-transport criteria are met.

Contact BioTel for additional assistance and Medical Control physician guidance (especially for patient refusals of transport)

Wheezing without signs of volume overload:

- Mild – Moderate (all ages): *albuterol* 2.5 mg via nebulizer
- **If no significant improvement after one treatment**:
  Age < 2 years AND NO asthma history → Supplemental oxygen to maintain SpO_2 at least 94%, suction airway as needed, Contact BioTel.
  At least 2 years AND/OR history of asthma → Add *ipratropium* 0.5 mg to next nebulizer doses (max 3 doses). Contact BioTel ASAP
- **If no significant improvement after 3 nebulizer treatments**, add:
  Age < 2 years AND NO asthma history → *Epinephrine* (1 mg/mL): 3mg via nebulizer IF respiratory distress/tachypnea without wheezing/bronchospasm.
  At least 2 years AND/OR history of asthma → Consider *CPAP*.
  Methylprednisolone IV/IO: Reconstitute 125 mg in 2 mL (as supplied) diluted with 8 mL NS. Administer unit dose by age.

METHYLPREDNISOLONE IV/IO	
Years of Age	**Dosage**
Less than 2 years	BioTel authorization
2 years	25 mg (2 mL)
3 – 4 years	37.5 mg (3 mL)
5 –8 years	50 mg (4 mL)
10 – 13 years	62.5 mg (5 mL)

  Contact BioTel for IM route: reconstitute in 2 mL, NO dilution, 2 mg/kg (0.032 mL/kg) IM.
  ALTERNATIVE: *Dexamethasone*: 0.6 mg/kg IV/IO or IM/PO (max: 16 mg)
- **If no response to nebulizers, Status asthmaticus, or impending respiratory failure** (altered mental status, worsening hypoxia, etc.) → Contact BioTel.
  Age < 2 years AND NO asthma history → Prepare for advanced airway management (BioTel PEDI-Guide)
  Normal Saline 20 mL/kg IV/IO (max 1000 ml per bolus)
  Consider *IM epinephrine* (table below)
  At least 2 years AND/OR history of asthma → *IM epinephrine* (table below) AND *magnesium sulfate* IV/IO (BioTel PEDI-Guide)
  Normal Saline 20 mL/kg IV/IO (max 1000 mL per bolus)
  Prepare for advanced airway management.

CROUP (respiratory distress with "barking" cough and/or stridor)

- DO NOT GIVE ALBUTEROL
- *Epinephrine* (1 mg/mL) via **nebulizer:** 3 mg (if less than 2 years) or 5 mg (if above 2 years) if stridor at rest.
- Consider *dexamethasone* (0.6 mg/kg) PO/IM or IV/IO (max dose
- Normal Saline 20 mL/kg IV/IO if impending respiratory failure
- Contact BioTel ASAP

EPIGLOTTITIS (respiratory distress with fever, ill appearance, and suspicion of upper airway obstruction e.g. "hot potato" voice, drooling)

- KEEP IN UPRIGHT POSITION and minimize interventions that cause agitation, crying, etc.
- DO NOT GIVE ALBUTEROL
- IV/IO access only if it will not aggravate patient's condition
- Laryngoscopy and advanced airway ONLY for patients who fail less invasive measures
- Contact BioTel

Contact BioTel for additional assistance and Medical Control physician guidance (especially for patient transport refusal by parents/caregivers)

Epinephrine Dosing Chart

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)				

PEARLS:

- Timely recognition of likely cause and immediate treatment is crucial
- Use of agency-specific infection control measures and EMS Provider PPE is critical in setting of infectious illness. Consider placing a HEPA or N95 mask (if tolerated) or 100% NRB mask on patient to reduce infection transmission in patients with fever, cough, generation of airborne content, etc.

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.
      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

Refer to Behavioral Emergencies/Excited Delirium Syndrome CPG for additional guidance and contact BioTel for additional assistance or Medical Control Physician guidance

Seizure

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at least 94%. Assess GCS and for etiologies, treat accordingly. Cooling measures (Heat-Related Emergency CPG) as needed Position in position of comfort (if no trauma) or lateral decubitus facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG. POC glucose and treat if needed according to Diabetic Emergencies CPG. DON'T administer oral glucose if unresponsive/ unable to protect airway – assist with parenteral dextrose or glucagon. Obtain focused history of current seizure, past medical history, concurrent symptoms, anticonvulsant medications. **ADVANCED LEVEL** ECG, $PetCO_2$, and SpO_2 monitoring until hospital transfer Consider advanced airway placement only if non-invasive measures fail or to protect airway in case of regurgitation/vomiting. 12-Lead ECG ASAP & transmit STEMI Use Diabetic Emergencies CPG for hypoglycemia: IV/IO dextrose preferred if unable to tolerate oral glucose IM/IN glucagon only if vascular access is unsuccessful Anticonvulsants for any patient actively seizing: IM/IN route preferred, IV/IO not necessary unless for other reasons (fluid resuscitation for trauma/shock/heatstroke) Benzodiazepine administration (prepare for assisted ventilation with 100% FiO_2): **Midazolam** 2.5 – 5 mg IM/IN (preferred) or IV/IO, may repeat once after 5 – 10 minutes, up to max dose of 10mg. **Diazepam** 2.5 – 5 mg IV/IO only, may repeat once after 5 – 10 minutes, up to max dose of 10 mg. No more than two doses of either without BioTel authorization. Special considerations (refer to specific CPG): Cyanide, Eclampsia (OB/Gyn CPG), Head Injury/TBI, Heatstroke, Organophosphate Toxicity Stimulant Toxicity/Excited Delirium Syndrome, Stroke All patents treated for seizure/status epilepticus MUST be offered transport. Transport all who are hypoglycemic (even if treated, return to baseline), pregnant, or received multiple anticonvulsant doses. Contact BioTel for additional assistance and Medical Control physician guidance.	**BASIC LEVEL** Assess and support ABCs Suction and OPA or NPA if needed. Provide oxygen to keep SpO_2 at least 94%. Assess GCS and for etiologies, treat accordingly. Cooling measures (Heat-Related Emergency CPG) as needed Position in position of comfort (if no trauma) or lateral decubitus facing EMS. For trauma refer to Spinal Motion Restriction Policy and Trauma CPG. POC glucose and treat if needed according to Diabetic Emergencies CPG. DON'T administer oral glucose if unresponsive/ unable to protect airway – assist with parenteral dextrose or glucagon. Obtain focused history of current seizure, past medical history, concurrent symptoms, anticonvulsant medications. **ADVANCED LEVEL** ECG, $PetCO_2$, and SpO_2 monitoring until hospital transfer Consider advanced airway placement only if non-invasive measures fail or to protect airway in case of regurgitation/vomiting. 12-Lead ECG ASAP & transmit STEMI Use Diabetic Emergencies CPG for hypoglycemia: IV/IO dextrose preferred if unable to tolerate oral glucose IM/IN glucagon only if vascular access is unsuccessful Anticonvulsants for any patient actively seizing: IM/IN route preferred, IV/IO not necessary unless for other reasons (fluid resuscitation for trauma/shock/heatstroke) Benzodiazepine administration (prepare for assisted ventilation with 100% FiO_2, appropriate sized BVM is a must, monitor for respiratory depression): **Midazolam IN (drug and route of choice)** divide between 2 nostrils if possible: Infant 1 – 6 months of age: 0.2 mg/kg IN (max dose 1 mg) 6 months –13 years: 0.2 mg/kg IN (max dose 5 mg) If IN route unavailable: 0.2 mg/kg IV/IO (max 5 mg, no repeat) **Diazepam (3rd line treatment)**: 0.5 mg/kg per rectum (max 10 mg) no repeat. Special considerations (refer to specific CPG): Cyanide, Head Injury/TBI, Heatstroke, Organophosphate Toxicity, Stimulant Toxicity/Excited Delirium Syndrome, Stroke All children should be transported, contact BIoTel if parent/guardian refuses or for additional assistance and Medical Control physician guidance.

PEARLS:

- Common causes of seizures ("AEIOUTIPS") Alcohol/substance withdrawal, Epilepsy, Insulin (hypoglycemia), Overdose, Underdose/Uremia, Trauma/Tumor, Infection, Pregnancy, Structural changes/Stroke
- Fever with seizure in children aged less than 6 months or greater than 6 years is NOT consistent with simple febrile seizures. ED evaluation needed for further workup.
- 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. Primary goal is to stop the seizure.

See also Behavioral Emergencies/Excited Delirium, Diabetic Emergencies, Head Injury/TBI, Heat-Related Emergencies, Poisoned Patient/Overdose, OB/Gyn, Stroke, Toxic Chemical Exposure and Trauma CPGs

Sepsis

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs per UNIVERSAL CARE – ADULT. Continuous ECG monitoring. Monitor airway status/respiratory effort. Provide oxygen to keep SpO_2 at 94% or higher. Obtain POC glucose. Keep in position of comfort. If evidence of shock, position supine with feet elevated. **ADVANCED LEVEL** $PetCO_2$ monitoring. Obtain POC lactate (if available). IV/IO access and **administer Normal Saline 20 mL/kg (max = 1000mL per bolus)** regardless of SBP. Document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.). Additional 20 mL/kg bolus (max = 1000 mL per bolus) if hypotension persists and recheck perfusion status. If still hypotensive, norepinephrine bitartrate infusion IV/IO at 4 – 10 mcg/minute. Treat symptomatic hypoglycemia per Diabetic Emergencies CPG. Transport ASAP. Notify BioTel and/or receiving hospital while en route if patient meets "EMS Sepsis Alert Criteria" (below) and for additional fluid boluses, other assistance, or Medical Control physician guidance.	**BASIC LEVEL** Assess and support ABCs per UNIVERSAL CARE – PEDIATRIC. Continuous ECG monitoring. Monitor airway status/respiratory effort. Provide oxygen to keep SpO_2 at 94% or higher. Obtain POC glucose. Keep in position of comfort. If evidence of shock, position supine with feet elevated. **ADVANCED LEVEL** $PetCO_2$ monitoring. Obtain POC lactate (if available). IV/IO access and **administer Normal Saline 20 mL/kg (max = 1000mL per bolus)** regardless of SBP. Document perfusion status (BP, HR, RR, mental status, skin color, capillary refill, etc.). Additional 20 mL/kg bolus (max = 1000 mL per bolus) if hypotension persists and recheck perfusion status. If still hypotensive, norepinephrine bitartrate infusion IV/IO at 4 – 10 mcg/minute. Treat symptomatic hypoglycemia per Diabetic Emergencies CPG. Transport ASAP. Notify BioTel and/or receiving hospital while en route if patient meets "EMS Sepsis Alert Criteria" (below) and for additional fluid boluses, other assistance, or Medical Control physician guidance.

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

See also Behavioral Emergencies/Excited Delirium, Diabetic Emergencies, Head Injury/TBI, Heat-Related Emergencies, Poisoned Patient/Overdose, OB/Gyn, Stroke, Toxic Chemical Exposure and Trauma CPGs

SHOCK

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs see Universal Care-Adult and Airway Management-Adult Cover the patient to prevent heat loss or begin cooling measures per Heat-Related Emergencies CPG Position in the supine or left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG Check blood glucose-follow Diabetic Emergencies CPG if needed **ADVANCED LEVEL** Initiate continuous $PetCO_2$ monitoring and maintain continuous pulse ox and ECG until transferred to hospital staff If STEMI, acute stroke, or TBI is suspected, or during post-cardiac arrest care with ROSC, titrate FiO_2 to maintain SpO_2 94-99% If etiology is unknown, continue high-flow oxygen For chest pain and hemodynamically significant dysrhythmias treat according to the relevant CPG. Establish IV (preferred) or IO access and infuse NS according to the following guidelines: **Hypovolemic shock (NON-TRAUMA)** Give 20 mL/kg IV/IO (max 1 L per bolus) Repeat up to 2 more times as needed to maintain radial pulse or SBP 90 mmHg **Hypovolemic shock (TRAUMA)** Refer to the Trauma CPG and Head Injury/TBI CPG **Cardiogenic shock from dysrhythmia, myocardial ischemia, or other "pump failure"** If no signs of pulmonary edema, give 10 mL/kg NS bolus IV/IO, and consider repeating once while preparing vasoactive infusion If no response, consider norepinephrine 4-10 mcg/min Consider dopamine 5-20 mcg/kg/min if norepinephrine unavailable **Addisonian Crisis due to adrenal insufficiency** Suspect if medical alert bracelet/device or history provided by family members; chronic steroid use; congenital adrenal hyperplasia; or Addison's disease Give 20 mL/kg IV/IO (1 L max per bolus) Repeat up to two more times as needed to maintain radial pulse or SBP 90 mmHg Give corticosteroid IV/IO/IM (e.g. methylprednisolone or dexamethasone). Consult BioTel for dosing **Tension pneumothorax with obstructive shock** Presentation: respiratory distress, tachypnea, hypoxia, hypotension or PEA, decreased/absent breath sounds and chest wall excursion on affected side, and "hard to bag" **Fluid bolus is NOT indicated unless there are other indications (e.g. hemorrhagic shock) AFTER pleural decompression**	**BASIC LEVEL** Assess and support ABCs see Universal Care-Pediatric and Airway Management-Pediatric Cover the patient to prevent heat loss or begin cooling measures per Heat-Related Emergencies CPG Position in the supine or left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG Check blood glucose-follow Diabetic Emergencies CPG if needed **ADVANCED LEVEL** Initiate continuous $PetCO_2$ monitoring and maintain continuous pulse ox and ECG until transferred to hospital staff If STEMI, acute stroke, or TBI is suspected, or during post-cardiac arrest care with ROSC, titrate FiO_2 to maintain SpO_2 94-99% If etiology is unknown, continue high-flow oxygen For chest pain and hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG. Establish IV (preferred) or IO access and infuse NS according to the following guidelines: **Hypovolemic shock (NON-TRAUMA)** Administer 20 mL/kg IV/IO (max 1 L per bolus) Repeat up to 2 more times as needed to maintain radial pulse or SBP 70 mmHg **DC fluids prn symptoms of volume overload** If DKA is suspected, administer ONLY 1 fluid bolus and contact BioTel **Hypovolemic shock (TRAUMA)** Refer to the Trauma CPG and Head Injury/TBI CPG **Cardiogenic shock from dysrhythmia, myocardial ischemia, or other "pump failure"** If no signs of pulmonary edema, run IV/IO fluid at TKO Contact BioTel for vasopressor dosing and possible fluid bolus (5-10 mL/kg) Refer to BioTel PEDI-Guide for dilution, dosing, and infusion rate instructions **Addisonian Crisis due to adrenal insufficiency** Suspect if medical alert bracelet/device or history provided by family members; chronic steroid use; congenital adrenal hyperplasia; or Addison's disease Give 20 mL/kg IV/IO (1 L max per bolus) Repeat up to two more times as needed to maintain radial pulse or SBP 70 mmHg **DC fluids prn symptoms of volume overload** Give corticosteroid IV/IO/IM (e.g. methylprednisolone or dexamethasone). Consult BioTel for dosing **Tension pneumothorax with obstructive shock** Presentation: respiratory distress, tachypnea, hypoxia, hypotension or PEA, decreased/absent breath sounds and chest wall excursion on affected side, and "hard to bag" **Fluid bolus is NOT indicated unless there are other indications**

Perform Needle Thoracostomy as soon as possible and monitor for clinical improvement Contact BioTel as soon as possible **All other types of shock** Give 20 mL/kg IV/IO (1 L max per bolus) Repeat up to two more times as needed to maintain radial pulse or SBP 90 mmHg **DC fluids prn symptoms of volume overload** Refer to Allergic Reaction CPG, OB/Gyn CPG, Poisoned Patient/Overdose CPG, Sepsis CPG, and other specific CPGs for specific treatment guidelines for those conditions	**(e.g. hemorrhagic shock) AFTER pleural decompression** Perform Needle Thoracostomy as soon as possible and monitor for clinical improvement Contact BioTel as soon as possible **All other types of shock** Give 20 mL/kg IV/IO (1 L max per bolus) Repeat up to two more times as needed to maintain radial pulse or SBP 70 mmHg **DC fluids prn symptoms of volume overload** Refer to Allergic Reaction CPG, OB/Gyn CPG, Poisoned Patient/Overdose CPG, Sepsis CPG, and other specific CPGs for specific treatment guidelines for those conditions

PEARLS:

- 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 signs/symptoms of more than one type of shock.
- 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.

See also Airway Management CPG, Heat-Related Emergencies CPG, Head Injury/TBI CPG, Chest Pain CPG, Allergic Reaction CPG, OB-GYN CPG, Poisoned Patient/Overdose CPG, Sepsis CPG, Stroke CPG, Diabetic Emergencies CPG, Spinal Motion Restriction Policy and Trauma CPG.

SNAKEBITE (VENOMOUS)

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL	**BASIC LEVEL**
Assess and support ABCs see Universal Care-Adult	Assess and support ABCs see Universal Care-Pediatric
Assess for airway and breathing compromise due to anaphylaxis and cardiovascular collapse (rare) , and if present, give epinephrine via auto-injector pen per Allergic Reaction CPG	Assess for airway and breathing compromise due to anaphylaxis and cardiovascular collapse (rare), and if present, give epinephrine via auto-injector pen per Allergic Reaction CPG
Monitor for signs of hemorrhage	Monitor for sings of hemorrhage
Immediately remove jewelry/restrictive clothing from the extremity	Immediately remove jewelry/restrictive clothing from the extremity
Place the patient in a comfortable position; if shock is suspected, position the patient supine with feet elevated	Place the patient in a comfortable position; if shock is suspected, position the patient supine with feet elevated
Check blood glucose-follow Diabetic Emergencies CPG if needed	Check blood glucose-follow Diabetic Emergencies CPG if needed
Immobilize the extremity with a splint or other device and keep the extremity parallel to the ground at heart level	Immobilize the extremity with a splint or other device and keep the extremity parallel to the ground at heart level
Do NOT constrict circulation with a tourniquet, Ace bandage, cravat, or other device	Do NOT constrict circulation with a tourniquet, Ace bandage, cravat, or other device
Do NOT apply ice or heat to the affected extremity	Do NOT apply ice or heat to the affected extremity
Do NOT incise the wound or apply suction	Do NOT incise the wound or apply suction
Give oxygen to maintain SpO_2 of 94% or higher	Give oxygen to maintain SpO_2 of 94% or higher
Outline the area of swelling on the patient's skin with a pen/marker and NOTE the TIME	Outline the area of swelling on the patient's skin with a pen/marker and NOTE the TIME
Assess for pulses, capillary refill, and sensation in the extremity	Assess for pulses, capillary refill, and sensation in the extremity
Assess for persistent oozing from the bite site	Assess for persistent oozing from the bite site
Obtain a SAMPLE and other pertinent history: Did the patient see the snake? 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	Obtain a SAMPLE and other pertinent history: Did the patient see the snake? 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
If snake can be located, attempt to obtain photos from a safe distance	If snake can be located, attempt to obtain photos from a safe distance
If the snake has been killed, consider transporting dead animal in a secure container for expert identification	If the snake has been killed, consider transporting dead animal in a secure container for expert identification
ADVANCED LEVEL	**ADVANCED LEVEL**
Continue assessment and management of airway compromise due to anaphylaxis or cardiovascular collapse	Continue assessment and management of airway compromise due to anaphylaxis or cardiovascular collapse
For suspected anaphylaxis with airway compromise and hypotension/shock:	For suspected anaphylaxis with airway compromise and hypotension/shock:
Give **Epinephrine (1 mg/mL)** 0.3-0.5 mg IM	Give **Epinephrine (1 mg/mL)** 0.1 mg/kg IM (max dose 0.3 mg)
Refer to Allergic Reaction CPG	Refer to Allergic Reaction CPG
Establish IV/IO access in unaffected extremity	Establish IV/IO access in unaffected extremity
For shock/hypotension, give NS 20 mL/kg (max 1 L per bolus)	For shock/hypotension, give NS 20 mL/kg (max 1 L per bolus)
Reassess and document perfusion status	Reassess and document perfusion status
If no response, repeat fluid bolus once	If no response, repeat fluid bolus once
Contact BioTel for additional fluid administration	Contact BioTel for additional fluid administration
For refractory shock or hypotension, consider giving **Norepinephrine** infusion IV/IO, starting at 2 mcg/min (max 10 mcg/min)	For refractory shock or hypotension, consider giving **Norepinephrine** infusion IV/IO, starting at 2 mcg/min (max 10 mcg/min)
Consult BioTel for dosage calculations and administration details	Consult BioTel for dosage calculations and administration details
Start continuous waveform capnography ($ETCO_2$)	Start continuous waveform capnography ($ETCO_2$)
Obtain 12-Lead ECG	Obtain 12-Lead ECG
Frequently reassess and document response to interventions and progression of swelling with time noted	Frequently reassess and document response to interventions and progression of swelling with time noted
Treat pain according to the Pain Management CPG	Treat pain according to the Pain Management CPG
Transport to a Level I or Level II Trauma Center	Transport to a Level I or Level II Trauma Center
Contact BioTel for destination decision-making assistance	Contact BioTel for destination decision-making assistance

PEARLS:

- Do NOT attempt to capture the live animal. If the animal is dead, lift the body with a long stick or other long object and place it into a sturdy, sealable container
    - **CAUTION:** NEVER ATTEMPT TO PICK UP A PRESUMED DEAD ANIMAL WITH BARE HANDS!
        - PRIMITIVE BITE REFLEX MAY PERSIST FOR HOURS AFTER ANIMAL DEATH

- If dispatched to the scene of a bite from a NON-NATIVE venomous snake:
    - Attempt to establish the location of the snake
    - Use GREAT CAUTION retrieving the patient if the snake's whereabouts are unknown
    - Once the patient and rescuers are in a safe location, attempt to obtain information from the patient or persons on scene about:
        - The scientific or common name of the snake
        - The toxicities associated with this type of snake (collectors usually know this)

- Signs of envenomation from the majority of native venomous snakes include sudden onset of pain, swelling, ecchymosis
    - Fang marks and local swelling may be absent

- Victims may present with cranial nerve deficits or other paralysis, due to venom neurotoxicity

- Very young and elderly patients are likely to have more severe envenomation

See also Allergic Reaction CPG, Pain Management CPG, Shock CPG, Diabetic Emergencies CPG.

SPINAL MOTION RESTRICTION (SMR) AND SPINAL CARE

ADULT 14 YEARS AND OLDER

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult
Position in the supine on left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED
If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG
Check blood glucose-follow Diabetic Emergencies CPG if needed
Obtain a SAMPLE history from patient/bystanders.

ADVANCED LEVEL

Maintain continuous pulse ox and ECG until transferred to hospital staff
Initiate continuous PetCO2 if signs/symptoms of shock, hypoperfusion, or respiratory distress
Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation.

For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG.

Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG.

All patients with syncope shall be encouraged to accept ambulance transport to E.D. for further evaluation.

For further assistance and Medical Control physician guidance, contact BioTel

PEDIATRIC < 14 YEARS OLD

BASIC LEVEL

Assess and support ABCs see Universal Care-Pediatric
Position in the supine on left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED
If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG
Check blood glucose-follow Diabetic Emergencies CPG if needed
Obtain a SAMPLE history from patient/bystanders.

ADVANCED LEVEL

Maintain continuous pulse ox and ECG until transferred to hospital staff
Initiate continuous PetCO2 if signs/symptoms of shock, hypoperfusion, or respiratory distress
Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation.

For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG.

Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG.

All patients with syncope shall be encouraged to accept ambulance transport to E.D. for further evaluation. For further assistance and Medical Control physician guidance, contact BioTel.

Young children:

Very small children may not tolerate a cervical collar; manual stabilization of the head and neck shall be maintained to the extent possible, with fixation of the patient to the LSB

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.

Torticollis (fixed head rotation) in children after blunt trauma is an indication for SMR

Additional padding may be needed on the child's sides to prevent lateral movement

Many young children will stop struggling, once proper immobilization has been performed

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"

Closely monitor ABCs

Infants:

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")

If the infant requires significant care (e.g. airway management) that cannot be accomplished in the restraint system, remove the patient and secure them directly to the stretcher

Closely monitor ABCs

PEARLS:

- NOTE: Consider ruptured ectopic pregnancy in any woman of childbearing age with syncope, lightheadedness or fainting (refer to the OB-Gyn CPG)

- NOTE: Obtain a complete medication/drug history and signs/symptoms leading up to the event:
    - Example: Syncope that occurs during exercise suggests an ominous cardiac cause
    - Example: Obtain history of fluid losses (vomiting, diarrhea, blood loss) and fluid intake

- **SMR Evaluation in BLUNT Trauma**
    - Evaluation for indications for SMR is MANDATORY for ANY patient sustaining a blunt mechanism of injury (MOI) with potential for causing a spinal injury
        - This includes high-risk mechanisms, falls from standing height, syncope with fall, seizure with fall or other "minor" mechanisms, especially in elderly patients.
    - SMR is MANDATORY for a patient with any of the following:
        - Patients younger than 8 years of age or older than 65 years of age
        - High-risk mechanisms, such as:
            - Fall from 3 ft. above ground surface or more than 5 stairs
            - 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
            - Motorcycle crash at 20 mph or greater
            - Motorized recreational vehicle (ATV) crash
            - Bicycle collision (rider struck or collision with fixed object)
            - Axial load injury (e.g. fall with head-fist impact, high-impact athletic activity, heavy object falling on head)
            - Pedestrian struck at 20 mph or greater
        - Focal neurological deficit, such as numbness, tingling, weakness, or paralysis of any extremity
        - 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:
            - Pre-existing conditions: dementia, brain injury, developmental delay or psychosis
            - Situational factors: acute stress reactions, anxiety or other distracting considerations
        - Drug or alcohol intoxication (known or suspected)
        - Language or communication barrier preventing reliable assessment of signs or symptoms
        - Distracting injury: Any severe or painful injury that could reasonable be thought to distract the patient from the ability to recognize pain or tenderness in the spine, including:
            - Long bone fracture
            - Extremity dislocation
            - Large laceration
            - Crush injury
            - Large burn
            - Significant abdominal or pelvic injury
            - Significant facial trauma
    - Strongly consider SMR for any patient who meets BioTel Prehospital Trauma Triage Criteria in the Destination Policy
    - Consider SMR if the MOI or other factors preclude complete spine assessment
    - If there is blunt MOI with potential for spine injury, but NONE of the clinical criteria for mandatory SMR are present, proceed with 3-step spine assessment.
- **3-Step Spine Assessment Procedure**
    - Perform and document the following:
        - 2nd rescuer maintains manual stabilization of the head and neck during the assessment
        - **Step 1:** Evaluate for midline spinal pain, tenderness to palpation, or bony deformity
            - Ask the patient, "Does your neck or back hurt, or do you have any discomfort in your spine?"
            - Palpate the posterior cervical spine in the midline, beginning at C7 to the occiput, while asking the patient, "Does this cause you any pain?"
            - Palpate the patient's entire thoracic and lumbar spine, while asking the patient, "Does this cause you any pain?"
                - If the patient is supine, carefully logroll to palpate thoracic and lumbar spine
            - If there is no pain/tenderness and no bony deformity, proceed to Step 2
        - **Step 2:** Perform motor and sensory examination:
            - Bilateral Motor Exam:
                - Grip strength ("squeeze my fingers")
                - Wrist extension ("raise the back of your hand at the wrist towards your shoulder")
                - Foot plantar flexion ("Step on the gas pedal")
                - Foot dorsiflexion ("Bring your toes to your nose")
            - Bilateral Sensory Exam:
                - Test gross sensation in all extremities for paresthesias or decreased sensation
            - If there is no motor or sensory deficit, proceed to Step 3

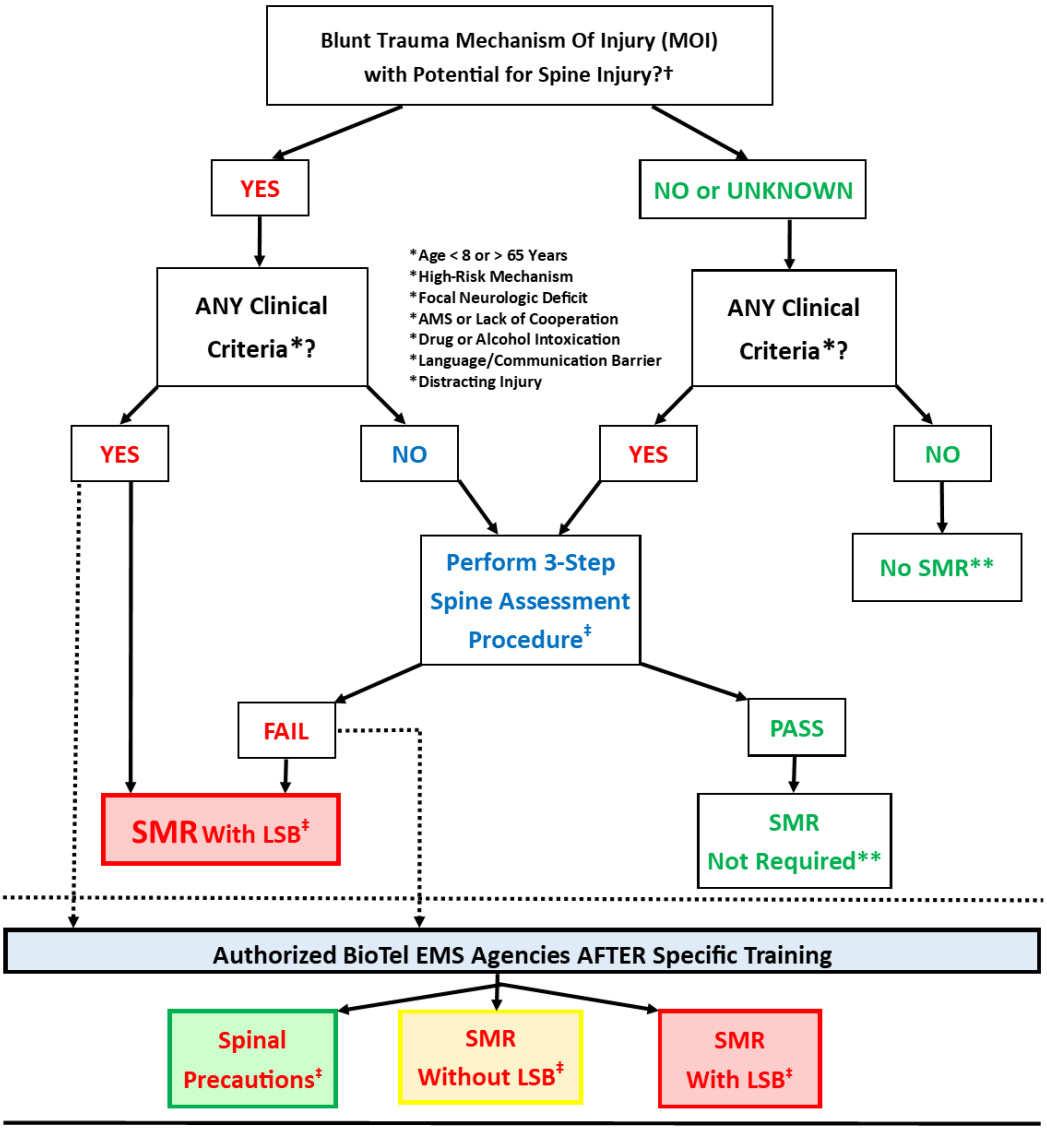
        - **Step 3:** Perform cervical spine range of motion testing:
            - Tell the patient, "I am going to ask you to slowly move your head."
            - Instruct the patient to immediately stop and tell you if moving their head causes ANY pain in the neck or abnormal sensation, such as "pins and needles" in their arms or hands
            - Ask the patient to slowly move their head forward (bending chin toward the chest), then backward, and then side to side
                - Movement should be voluntary and self-initiated: do not assist or force head movement
            - If the patient reports ANY discomfort or paresthesias, slowly return their head to neutral position, apply SMR, transport the patient, and document findings in the ePCR
    - If ALL 3 components of the examination pass without abnormality, SMR is NOT required
        - Clearly document each major step in the ePCR and notate: "Clinical criteria and 3-step spinal assessment passed, spinal motion restriction deferred."
        - FAILURE of any step OR inability to cooperate with assessment requires MANDATORY SMR
- **SMR with LSB (Long Spine Board)**
    - EMS providers shall implement SMR with LSB for any patient who meets SMR criteria or who fails the 3-step Assessment, unless *Selecive* SMR procedures have been authorized by the Medical Director
        - 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
    - Equipment needed:
        - Rigid LSB or similar extrication/transport device (e.g. vacuum mattress or scoop stretcher)
        - Semi-rigid, properly sized cervical collar:
            - 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 breathe
        - Lateral neck rolls, head blocks, or approved head immobilization device
        - Tape and/or securing straps across the patient's forehead and the cervical collar
        - Straps (minimum 3) to secure the patient's chest, hips, and abdomen, and to minimize pivoting movement in any direction
        - Padding (e.g. towel, blanket, or folded sheet)
    - Procedure (per agency SOPs):
        - Maintain manual, neutral, in-line stabilization of the head until SMR procedure is complete
        - Apply semi-rigid, properly-sized cervical collar
        - Pad the space, as needed, between the back of the head and backboard to prevent hyperextension
        - Secure the torso before immobilizing the head to the LSB in order to minimize C-spine angulation
        - In most cases, the upper extremities should be secured next to the torso on the LSB
        - Secure the head to the LSB
        - Assess, monitor, and document in the ePCR the patient's ABC status
    - 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
    - 3rd Trimester Pregnancy: For trauma (such as 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
    - Airway:
        - Maintain high vigilance for airway compromise for patients in SMR with LSB
        - 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
        - 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
    - The LSB should be removed as soon as possible by E.D. personnel at the receiving hospital, in order to minimize the risk of secondary spine injury, skin breakdown, or other adverse effects.
- **Penetrating Trauma**
    - SMR is not required if the patient has NO focal signs or symptoms of spinal injury
    - Use SMR *without* LSB for focal motor and/or sensory deficits indicative of spinal injury or new anatomic deformity of the spine
    - Follow the algorithm for Blunt Trauma if **both** penetrating **AND** blunt MOI
    - **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
- **Additional Considerations:**
    - Use utmost care in ANY patient with potential spine injury
    - For patients requiring advanced airway management, establishing a patent airway is the first priority
    - Higher index of suspicion for possible 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:
        - Dementia or other chronic neuro-psychiatric condition
        - Rheumatoid arthritis, severe osteoarthritis, or other skeletal deformity
        - Chronic steroid therapy
        - Severe osteoporosis

        - Chronically bedridden
    - Be conservative! SMR measures are rapidly reversible. When in doubt, apply SMR.
    - Be conservative with evaluating patients who are "found down" or intoxicated with possible new weakness or paralysis, or with evidence of trauma above the clavicles:
        - These patients may have suffered a cardiovascular event, hypoglycemia, or other acute condition, AND they may have also injured their neck and spinal cord
    - 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:
        - Document and report this and any other deviation from standard SMR procedures to receiving hospital E.D. personnel directly or through BioTel

- **Selective SMR Procedures** – Color-coded procedures to be deployed after specialized training and with Medical Director authorization
    - Spinal Precautions:
        - 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
        - Maintain manual, in-line stabilization
        - Place semi-rigid, properly-sized cervical collar
        - Bring stretcher as close as possible to the patient:
            - DO NOT ambulate patient to or into the ambulance
        - Assist patient with gently pivoting and laying down in position of comfort:
            - Alternatively, the patient may be allowed to sit and then the head of the stretcher gently lowered while maintaining neutral spinal alignment
            - No "standing take-down" is required
        - Head of the stretcher may be elevated 30° if there is no thoracic or lumbar tenderness
        - Instruct patient to minimize head and neck movement as much as possible
        - Any further transfers from the EMS stretcher should be accomplished while maintaining in-line, manual stabilization and limiting spinal motion:
            - Use slide boards or sheet lifts, if possible
            - Patients SHALL NOT be ambulated from the stretcher
    - SMR Without LSB:
        - Criteria: All other SMR patients (EXCEPT for limited, special circumstances requiring LSB)
        - Maintain manual, in-line stabilization
        - Apply semi-rigid, properly-sized cervical collar
        - 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
        - If an LSB or scoop stretcher has been used, DO NOT leave in place for transport:
            - Carefully REMOVE the rigid device while maintaining spinal alignment
                - For LSB: use log-roll or multi-rescuer lift-and-slide techniques (minimum 4 rescuers)
                - For scoop stretcher: separate the device and remove each piece
        - 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
            - Once the head is secured, manual in-line stabilization may be released
            - 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
        - Instruct patient to minimize head and neck movement as much as possible
        - Consider elevating head of stretcher 30° if:
            - Respiratory distress
            - Moderate/severe head injury
            - Or to promote patient compliance and cooperation
    - SMR With LSB
        - Criteria: Patients with confirmed paralysis on exam OR in ANY of these circumstances:
            - Patients with sports injuries sustained while wearing helmet and shoulder pads*
            - Patient/Provider safety (e.g. combative patient)
            - If removal would delay transportation of an unstable patient
            - Patient must be moved multiple times (beyond usual transfers)
            - LSB needed to immobilize multiple extremity injuries
            - Aeromedical transport (in consultation with aeromedical crew)
            - If CPR is ongoing or anticipated during transport
        - *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

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.

See also Bradycardia CPG, Tachycardia-Stable CPG, Tachycardia-Unstable CPG, Chest Pain CPG, Shock CPG, OB-GYN CPG, Stroke CPG, Diabetic Emergencies CPG, Spinal Motion Restriction Policy and Trauma CPG.

STROKE (ACUTE) AND TRANSIENT ISCHEMIC ATTACK (TIA)

ADULT 18 YEARS AND OLDER

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult
Assess and document GCS and pupillary size and reactivity
Assess for evidence of traumatic injury, especially head injury

Place the patient in a comfortable position, preferably with the head of the bed elevated 30°
If there is evidence of shock, treat according to the Shock CPG

Check POC blood glucose-follow Diabetic Emergencies CPG if needed
Do not administer glucose unless there is documented, symptomatic hypoglycemia

ASCERTAIN THE SPECIFIC TIME THE PATIENT WAS "LAST KNOWN NORMAL" (or at baseline):
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
NOTE: If the patient was last known normal going to bed the night before, this is the time to document, not the "wake up" time

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)
○ NORMAL: Both sides of face move equally
○ 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
○ NORMAL: Both arms move the same, *or* both arms do not move at all
○ 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")
○ NORMAL: Patient uses correct words with no slurring
○ ABNORMAL: Patient slurs words, uses wrong words, *or* is unable to speak

Obtain a SAMPLE history and detailed secondary physical examination, as time permits
NOTE: **Sudden** onset of **any** of the following suggests the possibility of acute stroke:

a. Numbness or weakness of face, arm, or leg (especially on one side of the body)
b. Confusion
c. Trouble speaking or understanding language
d. Trouble seeing in one or both eyes, or double vision
e. Trouble walking
f. Dizziness
g. Loss of balance or coordination
h. Sudden onset of severe headache with no known cause (suggests hemorrhagic stroke)

PEDIATRIC < 18 YEARS OLD

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult
Assess and document GCS and pupillary size and reactivity
Assess for evidence of traumatic injury, especially head injury

Place the patient in a comfortable position, preferably with the head of the bed flat
If there is evidence of shock, treat according to the Shock CPG

Check POC blood glucose

ASCERTAIN THE SPECIFIC TIME THE PATIENT WAS "LAST KNOWN NORMAL" (or at baseline):
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
NOTE: If the patient was last known normal going to bed the night before, this is the time to document, not the "wake up" time

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Obtain a SAMPLE history and detailed secondary physical examination, as time permits
NOTE: **Sudden** onset of **any** of the following suggests the possibility of acute stroke:

a. Numbness or weakness of face, arm, or leg (especially on one side of the body)
b. Confusion
c. Trouble speaking or understanding language
d. Trouble seeing in one or both eyes, or double vision
e. Trouble walking
f. Dizziness
g. Loss of balance or coordination
h. Sudden onset of severe headache with no known cause (suggests hemorrhagic stroke)
i. Any asymmetry of the neurologic exam
j. Altered LOC may also be a presenting sign

i. Any asymmetry of the neurologic exam

ADVANCED LEVEL

Minimize on-scene time whenever possible

If Primary Stroke Screen is positive, and if Last Known Normal (LNK) 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: ○ Provides correct age and current moth? **AND** ○ 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

Initiate continuous ECG monitoring and maintain until transfer of care to hospital staff
Treat hemodynamically significant dysrhythmias according to the symptom-specific CPG

Initiate continuous $PetCO_2$ monitoring if respiratory distress, shock, or hemodynamic instability is present

Establish IV/IO access at TKO rate or use a saline lock, if possible
RIGHT Antecubital site, at least 18g or 20g, is preferred

REGARDLESS OF SYMPTOM DURATION, EMS PROVIDERS MUST CONTACT EITHER BIOTEL OR THE STROKE CENTER DESTINATION FOR PRE-NOTIFICATION ("Activiation") AS SOON AS POSSIBLE
Report **must** include pertinent past medical history, current vital signs and GSC, and LKN time

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

For additional assistance, destination guidance, or other Medical Control physician advice, contact BioTel

Stroke Patient Destination Decision-Making

A. Onset of symptoms less than 24 hours and a C-STAT score less than 2 (suggesting no large vessel occlusion (LVO)):

i. Transport to the closest designated stroke center
ii. **EXCEPTION:** For a patient with isolated aphasia (inability to speak or understand language) on primary stroke screen (CPSS) for less than 24 hours, but NO facial droop or arm drift AND with a

ADVANCED LEVEL

Minimize on-scene time whenever possible

Treat hypoglycemia (POC glucose less than 70) per Diabetic Emergencies CPG
Treat dehydration per Shock CPG
Treat seizures per Seizure CPG

If Primary Stroke Screen is positive, and if Last Known Normal (LNK) 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: ○ Provides correct age and current moth? **AND** ○ 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

Initiate continuous ECG monitoring and maintain until transfer of care to hospital staff
Treat hemodynamically significant dysrhythmias according to the symptom-specific CPG

Initiate continuous $PetCO_2$ monitoring if respiratory distress, shock, or hemodynamic instability is present

Establish IV/IO access at TKO rate or use a saline lock, if possible
RIGHT Antecubital site, at least 18g or 20g, is preferred

REGARDLESS OF SYMPTOM DURATION, EMS PROVIDERS MUST CONTACT BIOTEL AS SOON AS POSSIBLE
Report **must** include pertinent past medical history, current vital signs and GSC, and LKN time

Initiate rapid transport according to the destination decision-making guidelines below:

c. Limit scene time to 10 minutes or less, if possible
d. Additional guidance: refer to the Destination Policy and current Hospital Capabilities Matrix

For additional assistance, destination guidance, or other Medical Control physician advice, contact BioTel

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

a. Congenital heart conditions/surgery
b. Sickle Cell Disease and other hematologic conditions, such as those causing abnormal blood clotting
c. Infectious/inflammatory (vasculitis) and non-inflammatory blood vessel conditions
d. Metabolic conditions

C-STAT score less than 2, consider transport to a Comprehensive Stroke Center (CSC)
iii. Contact BioTel for consultation regarding hospital capabilities

B. Onset of symptoms less than 24 hours and C-STAT score 2 or more (suggesting possible large vessel occlusion (LVO)):
i. 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
ii. Contact BioTel for consultation regarding hospital capabilities

C. Onset of symptoms 24 hours or longer, or unknown LKN time:
i. If C-STAT is less than 2 points, transport to the closest designated stroke center
ii. If C-STAT is 2 or more points, consider transport to a Comprehensive Stroke Center

D. Blood Thinners
i. Patients with sudden, severe headache who are on blood thinners (other than aspirin), with no history of trauma and a **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 (other than aspirin) with no history of trauma and a **C-STAT score of 2 or more** should be transported to a Comprehensive Stroke Center

e. Cocaine or methamphetamine ingestion

Presentation may differ from adults:
Infants: focal weakness; altered level of consciousness, and seizures are common
Children: focal neurologic deficit; headache; altered level of consciousness, and seizures are also common

Pediatric Stroke Patient Destination Decision-Making

A. 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
B. Contact BioTel as soon as possible en route for pre-notification and for further guidance

PEARLS:

- 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
- A thorough medical history, especially the use of any **blood thinners** (including antiplatelet agents), is critical

See also Shock CPG, Diabetic Emergencies CPG, Destination Policy, Seizure CPG.

SYNCOPE/PRESYNCOPE

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs see Universal Care-Adult Position in the supine on left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG Check blood glucose-follow Diabetic Emergencies CPG if needed Obtain a SAMPLE history from patient/bystanders. **ADVANCED LEVEL** Maintain continuous pulse ox and ECG until transferred to hospital staff Initiate continuous PetCO2 if signs/symptoms of shock, hypoperfusion, or respiratory distress Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation. For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG. Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG. All patients with syncope shall be encouraged to accept ambulance transport to E.D. for further evaluation. For further assistance and Medical Control physician guidance, contact BioTel	**BASIC LEVEL** Assess and support ABCs see Universal Care-Pediatric Position in the supine on left lateral decubitus position, facing EMS staff if NO TRAUMA SUSPECTED If trauma expected, refer to the Spinal Motion Restriction Policy and Trauma CPG Check blood glucose-follow Diabetic Emergencies CPG if needed Obtain a SAMPLE history from patient/bystanders. **ADVANCED LEVEL** Maintain continuous pulse ox and ECG until transferred to hospital staff Initiate continuous PetCO2 if signs/symptoms of shock, hypoperfusion, or respiratory distress Obtain 12-Lead ECG before and during transport. Transmit ANY STEMI ECG or to request consultation. For hemodynamically significant dysrhythmias, chest pain, or shock treat according to the relevant CPG. Establish IV/IO access at TKO rate with a saline lock. Treat shock/hypotension with fluid resuscitation using relevant CPG. All patients with syncope shall be encouraged to accept ambulance transport to E.D. for further evaluation. For further assistance and Medical Control physician guidance, contact BioTel

PEARLS:

- NOTE: Consider ruptured ectopic pregnancy in any woman of childbearing age with syncope, lightheadedness or fainting (refer to the OB-Gyn CPG)
- NOTE: Obtain a complete medication/drug history and signs/symptoms leading up to the event:
  - Example: Syncope that occurs during exercise suggests an ominous cardiac cause
  - Example: Obtain history of fluid losses (vomiting, diarrhea, blood loss) and fluid intake

See also Bradycardia CPG, Tachycardia-Stable CPG, Tachycardia-Unstable PG, Chest Pain CPG, Shock, CPG, OB-GYN CPG, Stroke CPG, Diabetic Emergencies CPG, Spinal Motion Restriction Policy and Trauma CPG.

TACHYCARDIA WITH PULSE: STABLE

ADULT 14 YEARS AND OLDER

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult
Treat signs and symptoms of shock per the Shock CPG
Treat chest pain/discomfort according to the Chest Pain CPG
Initiate continuous ECG monitoring
Assess for and treat possible acute stroke according to the Stroke CPG

Perform and document a POC glucose and treat according to the Diabetic Emergencies CPG
Do not administer glucose unless there is documented, symptomatic hypoglycemia

Obtain SAMPLE history, focusing on prescription and OTC meds, stimulants, and cardiac history (CHF)

ADVANCED LEVEL

Maintain continuous SpO_2 and ECG monitoring until transferred to hospital staff
Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion, or respiratory distress are present or develop (see Tachycardia-Unstable CPG)

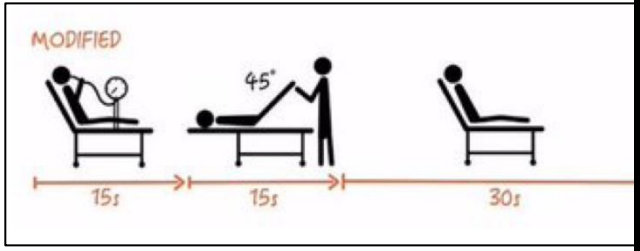
Obtain 12-lead ECG & transmit any STEMI ECG or to request consultation

Obtain a thorough SAMPLE history and perform a thorough physical exam to exclude sinus tachycardia as likely cause of the patient's symptoms
Narrow-complex tachycardia (NCT) with a rate greater than (220-patient age in years) is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia

Establish IV/IO access at TKO (if signs/symptoms of shock, refer to Tachycardia-Unstable CPG)

STABLE patient with **NARROW-Complex (QRS duration less than/equal to 0.12 seconds) Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):**
If rhythm is regular, attempt Modified Valsalva Maneuver:

1. Position patient sitting up at approximately 45°
2. Ask patient to blow continuously into the tip of a 10-mL syringe, displacing the plunger, for **15 seconds**
3. Immediately lower the head of the bed flat **AND** elevate the patient's legs at a 45° angle at the hips for **15 seconds**
4. Return the patient to sitting position for **30 seconds**



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

PEDIATRIC < 14 YEARS OLD

BASIC LEVEL

Assess and support ABCs see Universal Care-Pediatric
Treat signs and symptoms of shock per the Shock CPG
Treat chest pain/discomfort according to the Chest Pain CPG
Initiate continuous ECG monitoring
Assess for and treat possible acute stroke according to the Stroke CPG

Perform and document a POC glucose and treat according to the Diabetic Emergencies CPG
Do not administer glucose unless there is documented, symptomatic hypoglycemia

Obtain SAMPLE history, focusing on prescription and OTC meds, stimulants, and cardiac history (CHF)

ADVANCED LEVEL

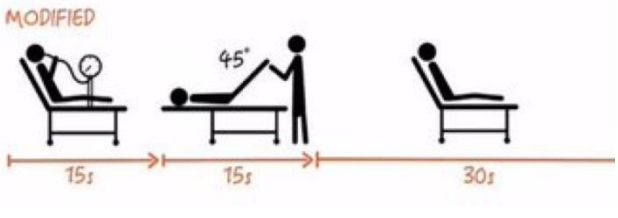
Maintain continuous SpO_2 and ECG monitoring until transferred to hospital staff
Initiate continuous $PetCO_2$ monitoring if signs/symptoms of shock, hypoperfusion, or respiratory distress are present or develop (see Tachycardia-Unstable CPG)

Obtain 12-lead ECG & transmit any STEMI ECG or to request consultation

Obtain a thorough SAMPLE history and perform a thorough physical exam to exclude sinus tachycardia as likely cause of the patient's symptoms
Child 1 year of age or older: Heart rate greater than 180 bpm is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia
Infant less than 1 year of age: Heart rate greater than 220 bpm is more likely to be SVT than Sinus Tachycardia

STABLE patient with **NARROW-Complex (QRS duration less than/equal to 0.09 seconds) Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):**
If rhythm is regular, consider Valsalva Maneuver:

1. Position patient sitting up at approximately 45°
2. Ask patient to blow continuously into the tip of a 10-mL syringe, displacing the plunger, for **15 seconds**
3. Immediately lower the head of the bed flat **AND** elevate the patient's legs at a 45° angle at the hips for **15 seconds**
4. Return the patient to sitting position for **30 seconds**



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

5. If no response, administer adenosine: 12 mg RAPID IVP + flush with 10-20 mL NS 6. If no response, repeat adenosine: 12 mg RAPID IVP + flush with 10-20 mL nS 7. **NOTE:** ECG monitor must run continuously (preferably with printout) during Valsalva maneuver, adenosine administration, and response **NOTE:** DO NOT administer adenosine if: ○ Rhythm is irregularly irregular (atrial fibrillation) ○ Rhythm shows "saw tooth" patter (atrial flutter) ○ Poisoning- or drug-induced tachycardia is suspected	5. If no response, contact BioTel and establish IV access 6. BioTel may authorize adenosine 0.1 mg/kg RAPID IVP (maximum 6 mg) + NS flush 7. If no response, BioTel may authorize repeat adenosine 0.2 mg/kg RAPID IVP (maximum 12 mg) + NS flush 8. **NOTE:** ECG monitor must run continuously (preferably with printout) during Valsalva maneuver, adenosine administration, and response **NOTE:** DO NOT administer adenosine if: ○ Rhythm is irregularly irregular (atrial fibrillation) ○ Rhythm shows "saw tooth" patter (atrial flutter) ○ Poisoning- or drug-induced tachycardia is suspected
STABLE patient with **WIDE-Complex (QRS duration greater than 0.12 seconds) Tachycardia (WCT) (possible Ventricular Tachycardia)** Patients with non-sustained WCT: 1. Initiate transport and monitor vital signs, ECG, and SpO_2 2. Prepare for clinical deterioration and the need for synchronized cardioversion or other care Patients with sustained (greater than 30 seconds) WCT: 1. Initiate transport and monitor vital signs, ECG, and SpO_2 2. Prepare for clinical deterioration and the need for synchronized cardioversion or other care 3. Consider lidocaine or amiodarone infusion: Contact BioTel for dosing guidance 4. Do not give adenosine if ECG shows irregular WCT suggestive of Wolff-Parkinson-White 5. **NOTE:** ECG monitor must run continuously	**STABLE** patient with **WIDE-Complex (QRS duration greater than 0.09 seconds) Tachycardia (WCT) (possible Ventricular Tachycardia)** Patients with non-sustained WCT: 1. Initiate transport and monitor vital signs, ECG, and SpO_2 2. Prepare for clinical deterioration and the need for synchronized cardioversion or other care Patients with sustained (greater than 30 seconds) WCT: 1. Initiate transport and monitor vital signs, ECG, and SpO_2 2. Contact BioTel for guidance 3. Prepare for possible IV/IO anti-arrhythmic administration and/or cardioversion 4. Do not give adenosine if ECG shows irregular WCT suggestive of Wolff-Parkinson-White 5. **NOTE:** ECG monitor must run continuously
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	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
For additional assistance and Medical Control physician guidance contact BioTel	For additional assistance and Medical Control physician guidance contact BioTel

PEARLS:

- **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 pulseless arrest develops, immediately begin CPR and refer to the Cardiac Arrest, Asystole/PEA, and Vfib/Pulseless VTach CPGs as appropriate

See also Tachycardia-Unstable CPG, Cardiac Arrest, Asystole/PEA, and Vfib/Pulseless VTach CPGs, Shock CPG, Chest Pain CPG, Stroke CPG, Diabetic Emergencies CPG

TACHYCARDIA WITH PULSE: UNSTABLE

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs see Universal Care-Adult Treat signs and symptoms of shock per the Shock CPG Treat chest pain/discomfort according to the Chest Pain CPG Initiate continuous ECG monitoring Assess for and treat possible acute stroke according to the Stroke CPG Perform and document a POC glucose and treat according to the Diabetic Emergencies CPG Do not administer glucose unless there is documented, symptomatic hypoglycemia Obtain SAMPLE history, focusing on prescription and OTC meds, stimulants, and cardiac history (CHF) **ADVANCED LEVEL** Maintain continuous SpO_2 and ECG monitoring, and initiate continuous $PetCO_2$ monitoring until patient care has been transferred to hospital staff. Obtain 12-Lead ECG ASAP, preferably before transport, & transmit STEMI ECG or to request consultation **NOTE:** DO NOT delay care of the unstable patient for 12-Lead ECG acquisition Obtain a rapid, focused SAMPLE history and physical examination to exclude tachycardia as the likely cause of the patient's symptoms Narrow-complex tachycardia (NCT) with a rate greater than (220-patient age in years) is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia Establish IV/IO access at TKO Prepare for immediate, synchronized cardioversion, especially if IV/IO access is problematic **UNSTABLE** patient with **NARROW-Complex (QRS duration less than/equal to 0.12 seconds) Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):** 1. Immediate synchronized cardioversion: Initial and subsequent recommended doses depend on the device manufacturer's recommendations a. Narrow QRS, regular rhythm (probable SVT): Initial synchronized dose is 50 to 100 J b. Escalate subsequent synchronized shock doses, up to 200 J, or as specified by the device manufacturer 2. If the patient is conscious and IV/IO access is in place, consider sedation: a. Midazolam 2.5-5 mg slow IV/IO/IM/IN b. May repeat once after 5-10 minutes (maximum total, cumulative dose: 10 mg) **OR** c. Diazepam 2.5-5 mg slow IV/IO/IM d. May repeat once after 5-10 minutes (maximum total, cumulative dose: 10 mg) 3. **NOTE:** If ECG rhythm is narrow and regular, AND rate is greater than (220-age in years), AND if an antecubital	**BASIC LEVEL** Assess and support ABCs see Universal Care-Pediatric Treat signs and symptoms of shock per the Shock CPG Treat chest pain/discomfort according to the Chest Pain CPG Initiate continuous ECG monitoring Assess for and treat possible acute stroke according to the Stroke CPG Perform and document a POC glucose and treat according to the Diabetic Emergencies CPG Do not administer glucose unless there is documented, symptomatic hypoglycemia Obtain SAMPLE history, focusing on prescription and OTC meds, stimulants, and cardiac history (CHF) **ADVANCED LEVEL** Maintain continuous SpO_2 and ECG monitoring, and initiate continuous $PetCO_2$ monitoring until patient care has been transferred to hospital staff. Obtain 12-Lead ECG ASAP, preferably before transport, & transmit STEMI ECG or to request consultation **NOTE:** DO NOT delay care of the unstable patient for 12-Lead ECG acquisition Obtain a rapid, focused SAMPLE history and physical examination to exclude tachycardia as the likely cause of the patient's symptoms **Child 1 year of age or older:** Heart rate greater than 180 bpm is more likely to be Supraventricular Tachycardia (SVT) than Sinus Tachycardia **Infant less than 1 year of age:** Heart rate greater than 220 bpm is more likely to be SVT than Sinus Tachycardia Establish IV/IO access at TKO Prepare for immediate, synchronized cardioversion, especially if IV/IO access is problematic **UNSTABLE** patient with **NARROW-Complex (QRS duration less than/equal to 0.09 seconds) Tachydysrhythmia e.g. SVT (NOT Sinus Tachycardia):** 1. Administer adenosine: 0.1 mg/kg (maximum 6 mg) RAPID IVP + NS flush (5-10 mL) 2. If no response, may repeat once: 0.2 mg/kg (maximum 12 mg) RAPID IVP + NS flush 3. **NOTE:** ECG monitor must run continuously (preferably with printout) during adenosine administration and response 4. **NOTE:** DO NOT administer adenosine if: ○ Rhythm is irregularly-irregular (Atrial Fibrillation) ○ Rhythm shows "saw-tooth" pattern (Atrial Flutter) ○ Poisoning- or drug-induced tachycardia is suspected 5. If IV access is unavailable, or if adenosine is unavailable or ineffective, prepare for immediate

IV access is in place, consider adenosine: 12 mg IVP + 10-20 mL NS flush prior to attempting cardioversion
4. **NOTE:** ECG monitor must run continuously (preferably with printout) during adenosine administration and response
5. **NOTE:** DO NOT administer adenosine if:
   - Rhythm is irregularly-irregular (Atrial Fibrillation)
   - Rhythm shows "saw-tooth" pattern (Atrial Flutter)
   - Poisoning- or drug-induced tachycardia is suspected

UNSTABLE patient with **WIDE-Complex (QRS duration greater than 0.12 seconds) Tachycardia (WCT) (possible Ventricular Tachycardia):**

1. Immediate synchronized cardioversion: Initial and subsequent doses recommended depend on the device manufacturer's recommendations:
   a. Wide QRS, regular rhythm (probable VTach): Initial synchronized shock dose is 100 J
   b. Escalate subsequent synchronized shock doses, up to 200 J, or as specified by the device manufacturer
2. If the patient is conscious, consider sedation:
   a. Midazolam 2.5-5 mg slow IV/IO/IM/IN
   b. May repeat once after 5-10 minutes (maximum total cumulative dose: 10 mg)

   OR

   c. Diazepam 2.5-5 mg slow IV/IO/IM
   d. May repeat once after 5-10 minutes (maximum total cumulative dose: 10 mg)
3. **NOTE:** If WCT and IRREGULAR rhythm, deliver unsynchronized DEFIBRILLATION shock (dose depends on device manufacturer – refer to VF/pVT CPG)
4. **NOTE:** If WCT morphology suggests Torsades de Pointes, administer magnesium sulfate:
   a. Add 2 g to 100 mL NS; infuse IVPB over 15 minutes (contraindicated in dialysis pt.)

Initiate transport and monitor vital signs, LOC, ECG, SpO_2 and $PetCO_2$

For additional assistance and Medical Control physician guidance, contact BioTel

synchronized cardioversion
   a. BioTel may authorize sedation with midazolam (0.1 mg/kg IV/IO/IM/IN)
   b. Initial synchronized shock dose: 0.5-1.0 J/kg
   c. Repeat synchronized shock dose: 1-2 J/kg
   d. Contact BioTel as soon as possible after adenosine or cardioversion

UNSTABLE patient with **WIDE-Complex (QRS duration greater than 0.09 seconds) Tachycardia (WCT) (possible Ventricular Tachycardia):**

1. Prepare for immediate synchronized cardioversion
   a. Contact BioTel prior to cardioversion, if possible
   b. Initial synchronized shock dose: 0.5-1.0 J/kg
   c. Repeat synchronized shock dose: 1-2 J/kg
2. BioTel may authorize sedation with midazolam (0.1 mg/kg IV/IO/IM/IN)
3. **NOTE:** If WCT morphology suggests Torsades de Pointes, BioTel may authorize magnesium sulfate:
   a. Add 2 g to 250 mL NS; administer 5 mL/kg (40 mg/kg) IVPB over 15 minutes
4. Contact BioTel as soon as possible, if not already done

Initiate transport and monitor vital signs, LOC, ECG, SpO_2 and $PetCO_2$

For additional assistance and Medical Control physician guidance, contact BioTel

PEARLS:

- **This CPG is intended to treat hemodynamically unstable patients with narrow- or wide-complex tachydysrhythmias and HR usually greater than 150 bpm, NOT sinus tachycardia**
- Sinus tachycardia should be treated according to the underlying cause
- If pulseless arrest develops, immediately begin CPR and refer to the Cardiac Arrest, Asystole/PEA, and Vfib/pulseless VTach CPGs

See also Tachycardia-Stable CPG, Cardiac Arrest, Asystole/PEA, and Vfib/Pulseless VTach CPGs, Shock CPG, Chest Pain CPG, Stroke CPG, Diabetic Emergencies CPG

TOXIC CHEMICAL EXPOSURE

ADULT 14 YEARS AND OLDER

BASIC LEVEL

Consult BioTel and the North Texas Poison Control Center early to coordinate patient care, especially for the following:

- **Confirmed or suspected exposure to chemical weapons of mass effect (WME)**
- **Confirmed or suspected multi-substance poisoning or overdose**
- **Drug(s) or substance(s) no covered by this or other BioTel CPGs**
- **Drug(s) or substance(s) are unknown**

Scene safety and use of appropriate PPE – especially respiratory protection – are critical!

Observe for scene clues suggesting toxic chemical exposure:

- Sudden onset within minutes, especially among multiple victims
- Unusual fogs, smokes, or odors; however, many toxic chemicals are odorless at toxic concentrations
- Common clinical findings in multiple patients, especially downwind from release site
- Failure to respond to usual therapy
- Unexplained human, animal, fish, or plant deaths

Remove patient from toxic environment – follow scene safety principles and agency HazMat SOPs
Triage, treatment, and decontamination may need to proceed simultaneously
Dry decontamination is usually sufficient in vapor exposures – remove patient contact lenses, if possible; see Eye Injury CPG
Avoid accidental hypothermia during wet decontamination
Patient body fluids may be contaminated even after decontamination

Assess and support ABCs see Universal Care-Adult

Perform POC glucose and treat according to Diabetic Emergencies CPG

Assess for general and toxidrome-specific signs and symptoms
Check for needle marks, paraphernalia, bites, bottles, or other items, and for possible trauma

Obtain SAMPLE history: focus on Rx/OTC meds (identify drug name, time of ingestion, dose, and quantity)
Collect using PPE and transport with patient all pill bottles or other containers

ADVANCED LEVEL

Maintain continuous SpO_2 and ECG monitoring until patient has been transferred to hospital staff
Initiate continuous $PetCO_2$ monitoring if patient has signs/symptoms of shock, hypoperfusion, or respiratory distress

Obtain 12-lead ECG and transmit STEMI ECG

Establish IV/IO access at TKO rate or saline lock

Follow agency SOPs for patient decontamination prior to E.D.

PEDIATRIC < 14 YEARS OLD

BASIC LEVEL

Consult BioTel and the North Texas Poison Control Center early to coordinate patient care, especially for the following:

- **Confirmed or suspected exposure to chemical weapons of mass effect (WME)**
- **Confirmed or suspected multi-substance poisoning or overdose**
- **Drug(s) or substance(s) no covered by this or other BioTel CPGs**
- **Drug(s) or substance(s) 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!

Observe for scene clues suggesting toxic chemical exposure:

- Sudden onset within minutes, especially among multiple victims
- Unusual fogs, smokes, or odors; however, many toxic chemicals are odorless at toxic concentrations
- Common clinical findings in multiple patients, especially downwind from release site
- Failure to respond to usual therapy
- Unexplained human, animal, fish, or plant deaths

Remove patient from toxic environment – follow scene safety principles and agency HazMat SOPs
Triage, treatment, and decontamination may need to proceed simultaneously
Dry decontamination is usually sufficient in vapor exposures – remove patient contact lenses, if possible; see Eye Injury CPG
Avoid accidental hypothermia during wet decontamination
Patient body fluids may be contaminated even after decontamination

Assess and support ABCs see Universal Care-Pediatric

Perform POC glucose and treat according to Diabetic Emergencies CPG

Assess for general and toxidrome-specific signs and symptoms
Check for needle marks, paraphernalia, bites, bottles, or other items, and for possible trauma

Obtain SAMPLE history: focus on Rx/OTC meds (identify drug name, time of ingestion, dose, and quantity)
Collect using PPE and transport with patient all pill bottles or other containers

ADVANCED LEVEL

Maintain continuous SpO_2 and ECG monitoring until patient has been transferred to hospital staff
Initiate continuous $PetCO_2$ monitoring if patient has signs/symptoms of shock, hypoperfusion, or respiratory distress

Obtain 12-lead ECG and transmit STEMI ECG

transport

Contact BioTel and the North Texas Poison Control Center for patient considerations not covered under standing orders

SPECIFIC CONSIDERATIONS FOR TOXIN CLASSES

Scene safety & se of appropriate PPE – especially respiratory protection – are critical

ASPHYXIANTS
CARBON MONOXIDE (CO) – refer to the Carbon Monoxide Exposure CPG
CYANIDE (CN) – refer to the Cyanide Exposure CPG
HYDROGEN SULFIDE (H_2S) – Supplemental oxygen, bronchodilators, consider sodium nitrite, if available
INCAPACITATING AGENTS
NARCOTICS/OPIOIDS (including fentanyl, carfentanil, and related substances) – refer to Altered Mental Status CPG
STIMULANTS (methamphetamine, PCP, Ecstasy, etc.) – Request additional EMS and Law Enforcement resources as needed; refer to Behavioral Emergencies/Excited Delirium Syndrome CPG
RIOT CONTROL AGENTS (tear gas, mace, pepper spray_ - Patients with persistent symptoms 30 mins after exposure should be transported to an E.D. for ophthalmologic evaluation; refer to Eye Injury CPG

RESPIRATORY IRRITATANTS
UPPER AIRWAY TOXIDROME (ammonia, bleach+ammonia mixture, sulfur dioxide, formaldehyde)
- Upper airay (and other mucous membrane) irritation and swelling, stridor, cough, laryngospasm, respiratory distress, respiratory arrest

UPPER AND LOWER AIRWAY TOXIDROME (chlorine)
- Upper airway toxidrome PLUS bronchospasm, non-cardiogenic pulmonary edema

LOWER AIRWAY TOXIDROME (phosgene, nitrogen dioxide)
- Bronchorrhea, bronchospasm, non-cardiogenic pulmonary edema, cyanosis, chest pain, headache

TREATMENT:
- 100% supplemental oxygen, suction, inhaled bronchodilators
- For laryngospasm causing upper airway obstruction, consider emergency Cricothyroidotomy
- Symptom onset after phosgene exposure may be delayed; E.D. transport is mandatory – lack of early symptoms or mucous membrane irritation does not exclude exposure
- Refer to Airway Management – Adult CPG

NERVE AGENTS (organophosphates or carbamate pesticides)
TOXIDROME: “DUMBBELS” (cholinergic-muscarinic)
- Diarrhea, Urination, Miosis (pinpoint pupils), Bronchorrhea and Bronchospasm, Bradycardia, Emesis, Lacrimation (watery eyes), Salivation; “wet patients who cannot breathe”

TOXIDROME: “Days of the Week” (cholinergic-nicotinic)
- Mydriasis (dilated pupils), Tachycardia, Weakness, Hypertension, Fasiculations
- Patients may present with either toxidrome or a combination of both

TREATMENT:
- Immediately treat with IM atropine/2-PAM via (Duodote®) autoinjector if available – mid-lateral thigh injection preferred (avoid femur, zippers, and foreign objects in pockets)

Establish IV/IO access at TKO rate or saline lock

Follow agency SOPs for patient decontamination prior to E.D. transport

Contact BioTel and the North Texas Poison Control Center for patient considerations not covered under standing orders

SPECIFIC CONSIDERATIONS FOR TOXIN CLASSES

Scene safety & se of appropriate PPE – especially respiratory protection – are critical

ASPHYXIANTS
CARBON MONOXIDE (CO) – refer to the Carbon Monoxide Exposure CPG
CYANIDE (CN) – refer to the Cyanide Exposure CPG
HYDROGEN SULFIDE (H_2S) – Supplemental oxygen, bronchodilators, consider sodium nitrite, if available
INCAPACITATING AGENTS
NARCOTICS/OPIOIDS (including fentanyl, carfentanil, and related substances) – refer to Altered Mental Status CPG
STIMULANTS (methamphetamine, PCP, Ecstasy, etc.) – Request additional EMS and Law Enforcement resources as needed; refer to Behavioral Emergencies/Excited Delirium Syndrome CPG
RIOT CONTROL AGENTS (tear gas, mace, pepper spray_ - Patients with persistent symptoms 30 mins after exposure should be transported to an E.D. for ophthalmologic evaluation; refer to Eye Injury CPG

RESPIRATORY IRRITATANTS
UPPER AIRWAY TOXIDROME (ammonia, bleach+ammonia mixture, sulfur dioxide, formaldehyde)
- Upper airay (and other mucous membrane) irritation and swelling, stridor, cough, laryngospasm, respiratory distress, respiratory arrest

UPPER AND LOWER AIRWAY TOXIDROME (chlorine)
- Upper airway toxidrome PLUS bronchospasm, non-cardiogenic pulmonary edema

LOWER AIRWAY TOXIDROME (phosgene, nitrogen dioxide)
- Bronchorrhea, bronchospasm, non-cardiogenic pulmonary edema, cyanosis, chest pain, headache

TREATMENT:
- 100% supplemental oxygen, suction, inhaled bronchodilators
- For laryngospasm causing upper airway obstruction, consider emergency Cricothyroidotomy
- Symptom onset after phosgene exposure may be delayed; E.D. transport is mandatory – lack of early symptoms or mucous membrane irritation does not exclude exposure
- Refer to Airway Management – Pediatric CPG

NERVE AGENTS (organophosphates or carbamate pesticides)
TOXIDROME: “DUMBBELS” (cholinergic-muscarinic)
- Diarrhea, Urination, Miosis (pinpoint pupils), Bronchorrhea and Bronchospasm, Bradycardia, Emesis, Lacrimation (watery eyes), Salivation; “wet patients who cannot breathe”

TOXIDROME: “Days of the Week” (cholinergic-nicotinic)
- Mydriasis (dilated pupils), Tachycardia, Weakness, Hypertension, Fasiculations
- Patients may present with either toxidrome or a combination of both

TREATMENT:
- Immediately treat with IM atropine/2-PAM via (Duodote®)

○ If atropine/2-PAM (Duodote®) unavailable, administer atropine 2 mg IV/IO ○ Repeat dosing every 3-5 minutes, max 3 doses; BioTel may authorize additional doses if needed ○ Treatment endpoint: improved respiratory status ○ Atropine side effects: tachycardia, decreased sweating, confusion ○ 2-PAM side effects: laryngospasm, tachycardia, hypertension ○ NOTE: Patients with mild (e.g. runny nose) or no symptoms 60 minutes after vapor exposure do not need antidote treatment ○ Refer to Respiratory Distress – Adult CPG ○ Treat seizures according to Seizure CPG **BLISTER AGENTS** (Vesicants, e.g. Mustard, Lewisite) TOXIDROME: ○ Vapor – Eye and mucous membrane irritation, hoarseness, sore throat (early); pneumonia, respiratory failure, sepsis (late) ○ Liquid – Skin itching, burning, stinging (early); redness, swelling, blisters, pain (late) ○ Symptom onset may be delayed (except for Lewisite); EMS providers may be inadvertently exposed if patient decontamination is not performed before patient care TREATMENT ○ Immediate wet decontamination according to agency SOP ○ Avoid hot water and excessive scrubbing ○ Treat respiratory distress according to the Respiratory Distress Adult CPG ○ Treat eye exposures according to the Eye Injury CPG ○ Treat skin burns according to the Burns CPG ○ Treat pain according to the Pain Management CPG	*pediatric* autoinjector if available – mid-lateral thigh injection preferred (avoid femur, zippers, and foreign objects in pockets) ○ If symptoms are severe, consider administering 1 adult autoinjector ○ If atropine/2-PAM (Duodote®) unavailable, administer atropine 0.05 mg/kg (0.5 mL/kg) IV/IO, max single dose 2 mg ○ Repeat dosing every 3-5 minutes, max 3 doses; BioTel may authorize additional doses if needed ○ Treatment endpoint: improved respiratory status ○ Atropine side effects: tachycardia, decreased sweating, confusion ○ 2-PAM side effects: laryngospasm, tachycardia, hypertension ○ NOTE: Patients with mild (e.g. runny nose) or no symptoms 60 minutes after vapor exposure do not need antidote treatment ○ Refer to Respiratory Distress – Adult CPG ○ Treat seizures according to Seizure CPG ○ **BLISTER AGENTS** (Vesicants, e.g. Mustard, Lewisite) TOXIDROME: ○ Vapor – Eye and mucous membrane irritation, hoarseness, sore throat (early); pneumonia, respiratory failure, sepsis (late) ○ Liquid – Skin itching, burning, stinging (early); redness, swelling, blisters, pain (late) ○ Symptom onset may be delayed (except for Lewisite); EMS providers may be inadvertently exposed if patient decontamination is not performed before patient care TREATMENT ○ Immediate wet decontamination according to agency SOP ○ Avoid hot water and excessive scrubbing ○ Treat respiratory distress according to the Respiratory Distress Pediatric CPG ○ Treat eye exposures according to the Eye Injury CPG ○ Treat skin burns according to the Burns CPG ○ Treat pain according to the Pain Management CPG

PEARLS:

- 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 HazMat experts is strongly encouraged
- Toxidrome definition: Constellation of signs and symptoms associated with exposure to a specific class of medications, drugs, or toxins
  - NOTE: Toxidromes may be masked in cases of multi-substance poisoning
- **Consult BioTel and the North Texas Poison Control Center early to coordinate patient care**

See also Poisoned Patient/Overdose CPG, Eye Injury CPG, Carbon Monoxide Exposure CPG, Cyanide Exposure CPG, Altered Mental Status CPG, Behavioral Emergencies/Excited Delirium CPG, Pain Management CPG, Shock CPG, Diabetic Emergencies CPG Airway Management – Adult and Pediatric CPG, Respiratory Distress - Adult and Pediatric CPG, Burns CPG.

TRAUMA (GENERAL)

ADULT 14 YEARS AND OLDER

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult and Airway Management – Adult, following the MARCH algorithm:

- M (Massive hemorrhage): Control life-threatening hemorrhage according to the Hemorrhage Control/Tourniquet CPG
- A (Airway): Assess and support airway patency
- R (Respirations): Provide supplemental oxygen
- C (Circulation): Initiate continuous ECG monitoring; treat Shock per Shock CPG
- H (Head injury): Document GCS & pupil size/reaction; refer to Head Injury/TBI CPG; avoid hypoxia
- NOTE: Assess for missed injuries, prevent heat loss

Refer to the Spinal Motion Restriction Policy and Helmet Removal Procedure

Provide basic care based on injuries:

- Eye: refer to Eye Injury CPG
- Head/Neck/Spine: refer to Head Injury/TBI CPG
  - If TBI is suspected, avoid hypoxia, elevate head 15-30° if possible
- Chest:
  - Open/sucking chest wound – cover with occlusive dressing that is taped on only 3 sides
  - Flail chest – closely monitor respiratory status; do not attempt to “stabilize” flail segment
- Abdomen/Pelvis:
  - Open abdominal wound/evisceration – Apply saline-moistened dressing and cover with waterproof material to minimize heat loss
  - Unstable pelvic fracture with hemodynamic instability/shock – Apply pelvic binder; minimize manipulation during movement
- Extremity:
  - Splint and pad fractures as they lie, unless manipulation is needed to restore distal pulses
  - Monitor and document every 5-10 minutes the neurovascular status of injured extremities
  - Open fracture – Apply saline-moistened dressing
  - Amputation – Refer to Amputation CPG
- Impaled object: Use bulky dressings to stabilize and secure the object – DO NOT remove the object

Perform and document a POC Glucose, refer to Diabetic Emergencies CPG

Obtain a SAMPLE history with emphasis on injury mechanisms and patient medications, **especially prescription blood thinners**

ADVANCED LEVEL

Initiate continuous $PetCO_2$, ECG, and SpO_2 monitoring
Hypoxia must be avoided during the pre-hospital care of TBI

Initiate advanced airway placement according Airway Management – Adult if needed

PEDIATRIC < 14 YEARS OLD

BASIC LEVEL

Assess and support ABCs see Universal Care-Pediatric and Airway Management – Pediatirc, following the MARCH algorithm:

- M (Massive hemorrhage): Control life-threatening hemorrhage according to the Hemorrhage Control/Tourniquet CPG
- A (Airway): Assess and support airway patency
- R (Respirations): Provide supplemental oxygen
- C (Circulation): Initiate continuous ECG monitoring; treat Shock per Shock CPG
- H (Head injury): Document GCS & pupil size/reaction; refer to Head Injury/TBI CPG; avoid hypoxia
- NOTE: Assess for missed injuries, prevent heat loss

Refer to the Spinal Motion Restriction Policy and Helmet Removal Procedure

Provide basic care based on injuries:

- Eye: refer to Eye Injury CPG
- Head/Neck/Spine: refer to Head Injury/TBI CPG
  - If TBI is suspected, avoid hypoxia, elevate head 15-30° if possible
- Chest:
  - Open/sucking chest wound – cover with occlusive dressing that is taped on only 3 sides
  - Flail chest – closely monitor respiratory status; do not attempt to “stabilize” flail segment
- Abdomen/Pelvis:
  - Open abdominal wound/evisceration – Apply saline-moistened dressing and cover with waterproof material to minimize heat loss
  - Unstable pelvic fracture with hemodynamic instability/shock – Apply pelvic binder; minimize manipulation during movement
- Extremity:
  - Splint and pad fractures as they lie, unless manipulation is needed to restore distal pulses
  - Monitor and document every 5-10 minutes the neurovascular status of injured extremities
  - NOTE: Do not use traction splints for patients less than 14 years of age
- Impaled object: Use bulky dressings to stabilize and secure the object – DO NOT remove the object

Perform and document a POC Glucose, refer to Diabetic Emergencies CPG

Obtain a SAMPLE history with emphasis on injury mechanisms and patient medications, **especially prescription blood thinners**

ADVANCED LEVEL

Initiate continuous $PetCO_2$, ECG, and SpO_2 monitoring
Hypoxia must be avoided during the pre-hospital care of TBI

Initiate advanced airway placement according Airway Management – Pediatric if needed

Establish at least one large-bore peripheral IV (preferred) or IO

Establish at least one large-bore peripheral IV (preferred) or IO

Infuse Normal Saline to achieve SBP 80 mmHg or palpable radial pulse according to the following guidelines:

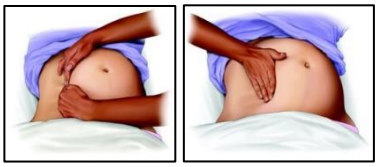
- Administer NS 500 mL IV/IO
- Repeat up to 2 more times, ONLY as needed
- Consider norepinephrine infusion (4-10 mcg/kg/min) for possible neurogenic shock from spinal cord injury unresponsive to fluid resuscitation (*not for hemorrhagic shock*)

SPECIFIC CARE GUIDELINES BASED ON ANATOMICAL INJURIES:

- Eye: refer to Eye Injury CPG
- Head/Neck/Spine: refer to Head Injury/TBI CPG
  - Avoid hypotension (for isolated TBI, target SBP 110 mmHg, not 80 mmHg)
  - Avoid hypoxia, but titrate FiO_2 to minimize hyperoxia
  - Avoid both hypoventilation and hyperventilation; target $PetCO_2$ is 35-45 mmHg
- Chest: If tension pneumothorax is suspected, perform Needle Thoracostomy as soon as possible
  - Monitor for improvement and contact BioTel as soon as possible
- Wound irrigation: Irrigation of grossly contaminated wounds should be performed using only NS or tap water (DO NOT use hydrogen peroxide, Betadine®, or other antiseptic solution)
- Crush injury: Vigorous fluid resuscitation, preferably before extrication, monitor for ECG changes of hyperkalemia & hypocalcemia
  - Tourniquets are indicated only to control life-threatening hemorrhage

SPECIAL CIRCUMSTANCES – PREGNANCY

- Consider any female patient of childbearing age to be pregnant
- Normal pregnancy physiology may mask severe maternal or fetal injury:
  - “Normal” maternal vital signs may indicate shock or impending respiratory failure
  - The fetus may be in grave danger after seemingly minimal trauma
  - The pregnant trauma patient requires more aggressive fluid resuscitation
- Assess for fetal movement, vaginal bleeding, excessive uterine tone and contractions in the visibly pregnant trauma patient
- 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®)
- A 2nd rescuer must travel in the passenger compartment when transporting a third-trimester pregnant trauma patient in order to take measurements to prevent aorto-caval compression syndrome:
  - Left Uterine Displacement may be more effective and safer than “backboard tilt”:



Infuse Normal Saline according to the following guidelines:

- Administer NS 20 mL/kg IV/IO (1 L max per bolus) for SBP less than 70 mmHg or 60 mmHg in infant
- Repeat up to 2 more times, ONLY as needed to maintain palpable brachial (infant) or radial (child) pulse or target SBP for age
- Discontinue fluids if there are signs/symptoms of volume overload
- Contact BioTel for norepinephrine authorization if neurogenic shock is suspected

SPECIFIC CARE GUIDELINES BASED ON ANATOMICAL INJURIES:

- Eye: refer to Eye Injury CPG
- Head/Neck/Spine: refer to Head Injury/TBI CPG
  - Avoid hypotension
  - Avoid hypoxia, but titrate FiO_2 to minimize hyperoxia
  - Avoid both hypoventilation and hyperventilation; target $PetCO_2$ is 35-45 mmHg
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- Normal pregnancy physiology may mask severe maternal or fetal injury:
  - “Normal” maternal vital signs may indicate shock or impending respiratory failure
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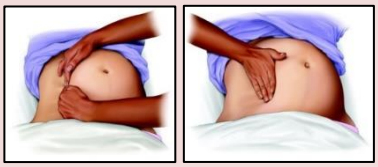
  - Left Uterine Displacement may be more effective and safer than “backboard tilt”:



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

(Images adapted from 2015 American Heart Association Guidelines Update for CPR and ECC doi.org/10.1161/CIR.0000000000000264) Treat pain according to Pain Management CPG NOTE: Closely monitor cardiorespiratory status when administering parenteral analgesics (especially opioids) to trauma patients with hypovolemia and signs/symptoms of shock Cold packs, padding, and splinting may provide partial analgesia Initiate transport as soon as possible to an appropriate facility, following guidelines in the Destination Policy and Hospital Capabilities Matrix Consult BioTel for destination decision-making guidance and/or Medical Control physician guidance	Treat pain according to Pain Management CPG NOTE: Closely monitor cardiorespiratory status when administering parenteral analgesics (especially opioids) to trauma patients with hypovolemia and signs/symptoms of shock Cold packs, padding, and splinting may provide partial analgesia Initiate transport as soon as possible to an appropriate facility, following guidelines in the Destination Policy and Hospital Capabilities Matrix Consult BioTel for destination decision-making guidance and/or Medical Control physician guidance

PEARLS:

- 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

See also Amputation CPG, Burns CPG, Cardiac Arrest CPG, Eye Injury CPG, Head Injury/TBI CPG, Hemorrhage Control/Tourniquet CPG, Lightning Injury CPG, Pain Management CPG, Toxic Chemical Exposure CPG, Spinal Motion Restriction Policy, Airway Management – Adult and Pediatric CPG, OB/Gyn CPG, Destination Policy

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

ADULT

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult or Universal Care – Pediatric AND perform CPR using the modified "CAB" sequence in the Cardiac Arrest CPG

ADVANCED LEVEL

For adults and *children 8 years and older*:
Follow the Cardiac Arrest CPG, focus on high-quality, team-based CPR

- Initiate $PetCO_2$ monitoring and vascular access during CPR and after the 1st shock
- Do not interrupt chest compression for these procedures
- Defibrillate according to the energy protocol specified by the manual defibrillator device manufacturer

	1st shock	2nd shock	3rd + shock
LifePak 12 or 15	200 J	300 J	360 J
Phillips	150 J	150 J	150 J
Zoll	120 J	150 J	200 J

- If rescuers deliver one or more shocks prior to arrival of ALS Provides, remember to increase the energy level accordingly (do not start at the lowest energy level)
- At the end of each 2-minute CPR cycle, check the ECG rhythm and pulse
  - In the event of Return of Spontaneous Circulation (ROSC), refer to the Post-Cardiac Arrest CPG
  - If asystole or PEA develops, resume CPR and refer to the Asystole/PEA CPG
  - If VFib/pVT persists or recurs, resume chest compressions while charging the defibrillator – immediately resume CPR for 2 minutes without first checking rhythm or pulse
- If Vfib/pVT persists or recurs after 1st shock, resume chest compressions while charging the defibrillator
  - Immediately AFTER the 2nd shock, resume CPR for 2 full minutes and administer both epinephrine **AND** an anti-arrhythmic followed by a NS flush:
    - **Epinephrine (0.1 mg/mL): 1 mg IVP/IO and NS flush; AND**
    - **Lidocaine 1-1.5 mg/kg IVP/IO and NS flush (preferred) *OR***
    - **Amiodarone 300 mg IVP/IO and NS flush**
- If VFib/pVT persists or recurs after 2nd shock, resume chest compression while charging the defibrillator
  - Immediately AFTER 3rd shock, resume CPR for 2 full minutes and administer a second dose of an anti-arrhythmic followed by a NS flush
    - **Amiodarone 150 mg IVP/IO and NS flush *OR***
    - **Lidocaine 1-1.5 mg/kg IVP/IP and NS flush**
- If VFib/pVT persists or recurs after 3rd shock, resume chest compressions while charging the defibrillator
  - Attempt defibrillation with a single shock at the highest energy level recommended for that

PEDIATRIC

BASIC LEVEL

Assess and support ABCs see Universal Care-Adult or Universal Care – Pediatric AND perform CPR using the modified "CAB" sequence in the Cardiac Arrest CPG

ADVANCED LEVEL

***For children <8 years and infants*:**
Follow the Cardiac Arrest CPG, focus on high-quality, team-based CPR

- Initiate $PetCO_2$ monitoring and vascular access during CPR and after the 1st shock
- Do not interrupt chest compression for these procedures
- Defibrillate according to the energy protocol specified by the manual defibrillator device manufacturer
- Use pediatric pads

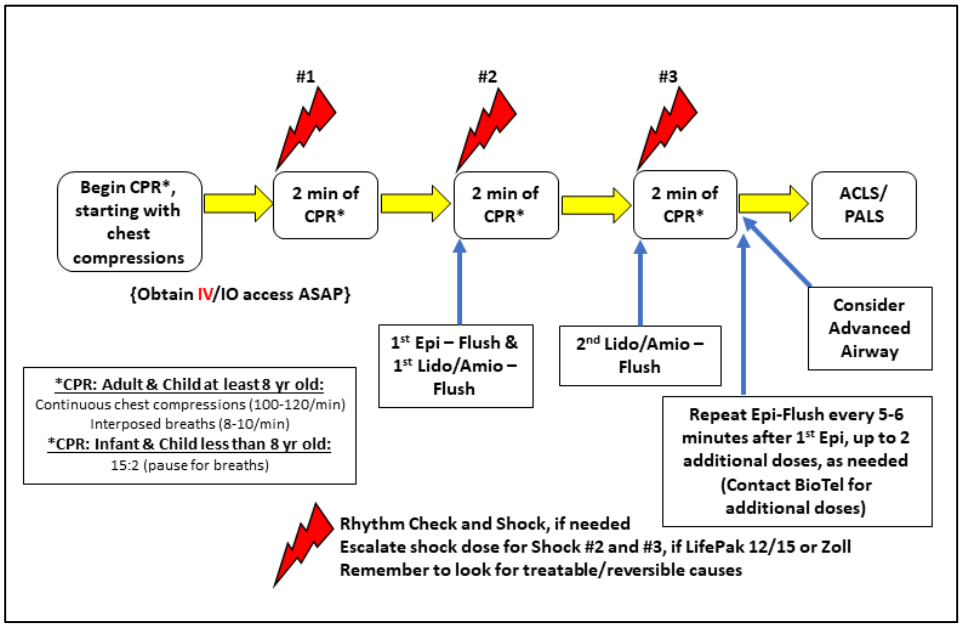
	1st shock	2nd shock	3rd + shock
Manual defibrillator	2 J/kg	4 J/kg	4-10 J/kg
AED	Use special pediatric AED pads or device-specific pediatric settings		

- If rescuers deliver one or more shocks prior to arrival of ALS Provides, remember to increase the energy level accordingly (do not start at the lowest energy level)
- At the end of each 2-minute CPR cycle, check the ECG rhythm and pulse
  - In the event of Return of Spontaneous Circulation (ROSC), refer to the Post-Cardiac Arrest CPG
  - If asystole or PEA develops, resume CPR and refer to the Asystole/PEA CPG
  - If VFib/pVT persists or recurs, resume chest compressions while charging the defibrillator – immediately resume CPR for 2 minutes without first checking rhythm or pulse
- If Vfib/pVT persists or recurs after 1st shock, resume chest compressions while charging the defibrillator
  - Immediately AFTER the 2nd shock, resume CPR for 2 full minutes and administer both epinephrine **AND** an anti-arrhythmic followed by a NS flush:
    - **Epinephrine (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg) IVP/IO with NS flush; AND**
    - **Lidocaine 1 mg/kg IVP/IO with NS flush (max dose 100 mg) *OR***
    - **Amiodarone 5 mg/kg IVP/IO with NS flush (max dose 300 mg)**
- If Vfib/pVT persists or recurs after 2nd shock, resume chest compression while charging the defibrillator
  - Immediately AFTER 3rd shock, resume CPR for 2 full minutes and administer a second dose of an anti-arrhythmic followed by a NS flush
    - **Consider repeat lidocaine or amiodarone dose, as above**
- If VFib/pVT persists or recurs after 3rd shock, resume chest compressions while charging the defibrillator
  - Attempt defibrillation with a single shock at the highest energy level recommended for that

device ○ Immediately resume CPR for 2 minutes after each shock ○ Repeat if Vfib/pVT persists or recurs ○ Consider causes of ineffective defibrillation: ▪ Sweat/moisture, excessive body hair, or poor pad contact) – Replace pads, dry the chest, shave body hair; use gloved hands and a thick towel to place pressure on pads to increase contact (ensure no bare skin of EMS Provider is in contact with the patient) ▪ Non-optimal pad location or need for alternate electrical vector – consider changing pad location from anterolateral to anteroposterior (or vice versa) or to bilateral axillae ○ Consider advanced airway placement ○ Search for treatable and reversible causes (“Hs and Ts”) ○ Consider early transport to a PCI-capable facility, IF high-quality CPR can be maintained en route	device ○ Immediately resume CPR for 2 minutes after each shock ○ Repeat if Vfib/pVT persists or recurs ○ Consider causes of ineffective defibrillation: ▪ Sweat/moisture, excessive body hair, or poor pad contact) – Replace pads, dry the chest, shave body hair; use gloved hands and a thick towel to place pressure on pads to increase contact (ensure no bare skin of EMS Provider is in contact with the patient) ▪ Non-optimal pad location or need for alternate electrical vector – consider changing pad location from anterolateral to anteroposterior (or vice versa) or to bilateral axillae ○ Consider advanced airway placement ○ Search for treatable and reversible causes (“Hs and Ts”) ○ Consider early transport to a PCI-capable facility, IF high-quality CPR can be maintained en route
○ **Repeat epinephrine every 5-6 minutes up to 2 more times, *if needed*, immediately after a shock** ○ **Epinephrine (0.1 mg/mL): 1 mg IVP/IO and NS flush**	○ **Repeat epinephrine every 5-6 minutes up to 2 more times, *if needed*, immediately after a shock** ○ **Epinephrine (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg) IVP/IO with NS flush**
○ Medication notes: ○ 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 ○ DO NOT administer more than 2 total doses of amiodarone/lidocaine without BioTel authorization ○ DO NOT administer lidocaine or amiodarone after ROSC is achieved without BioTel authorization	○ Medication notes: ○ 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 ○ DO NOT administer more than 2 total doses of amiodarone/lidocaine without BioTel authorization ○ DO NOT administer lidocaine or amiodarone after ROSC is achieved without BioTel authorization
○ Potentially reversible causes and special circumstances (refer to Asystole/PEA CPG) ○ **Hyperkalemia (renal failure or dialysis) OR preexisting metabolic acidosis (e.g. methanol/ethylene glycol ingestion, aspirin OD) OR tricyclic antidepressant OD:** Sodium bicarbonate 1 mEq/kg IVP or IO, per Asystole/PEA CPG ○ **Torsades de Pointes:** Magnesium sulfate 2 g diluted with 6 mL NS; administer 10 mL IV over 2 minutes ○ **Beta-blocker OD**: Consider glucagon, as per Asystole/PEA CPG ○ **Calcium-channel blocker OD:** Consider calcium chloride, as per Asystole/PEA CPG ○ **Prolonged resuscitation (>15 minutes):** Consider sodium bicarbonate and/or calcium chloride, as per Asystole/PEA CPG ○ **Tension pneumothorax**: Perform needle thoracostomy, as per Needle Thoracostomy Procedure ○ **Lighting/Lightning strike:** Refer to CPG	○ Potentially reversible causes and special circumstances (refer to Asystole/PEA CPG) ○ **Hyperkalemia (renal failure or dialysis) OR preexisting metabolic acidosis (e.g. methanol/ethylene glycol ingestion, aspirin OD) OR tricyclic antidepressant OD:** Sodium bicarbonate 1 mEq/kg IVP or IO, per Asystole/PEA CPG ○ **Torsades de Pointes:** Contact BioTel ASAP (before dose if possible) ▪ See Magnesium Sulfate drug sheet and BioTel Pedi-Guide© ○ **Beta-blocker OD**: Consider glucagon, as per Asystole/PEA CPG ○ **Calcium-channel blocker OD:** Consider calcium chloride, as per Asystole/PEA CPG ○ **Prolonged resuscitation (>15 minutes):** Consider sodium bicarbonate and/or calcium chloride, as per Asystole/PEA CPG ○ **Tension pneumothorax**: Perform needle thoracostomy, as per Needle Thoracostomy Procedure ○ **Lighting/Lightning strike:** Refer to Lightning/Lightning Strike CPG ○ For additional assistance and Medical Control physician guidance, contact BioTel

PEARLS:

- For additional assistance and Medical Control physician guidance, contact BioTel



See also Asystole/PEA CPG, Cardiac Arrest CPG, Post-Cardiac Arrest CPG, Determination of Death Policy

VOMITING

ADULT 14 YEARS AND OLDER	PEDIATRIC < 14 YEARS OLD
BASIC LEVEL Assess and support ABCs; See Universal Care – Adult CPG Obtain SAMPLE history **ADVANCED LEVEL** Initiate continuous ECG and $PetCO_2$ monitoring if respiratory distress or shock is present or develops If signs/symptoms of dehydration or hypoperfusion, establish IV/IO access and administer Normal Saline 20 mL/kg (up to 1000 mL max per bolus) May repeat once, if NO history of congestive heart failure, renal failure, or age >65 years For persistent vomiting despite fluid resuscitation, consider anti-emetic medication: ○ Ondansetron HCL 4-8 mg SLOW IV/IO over 1 minute (preferred) **OR** ○ Ondansetron (Zofran®) ODT 4-8 mg orally if patient is not actively vomiting **OR** ○ Promethazine 12.5-25 mg IM **ONLY** (DO NOT administer IV) ○ DO NOT administer more than one drug OR more than one dose to any patient ○ DO NOT administer Ondansetron during known or suspected 1st trimester pregnancy 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) For additional assistance and Medical Control physician guidance, contact BioTel	**BASIC LEVEL** Assess and support ABCs; See Universal Care – Pediatric CPG Obtain SAMPLE history **ADVANCED LEVEL** Initiate continuous ECG and $PetCO_2$ monitoring if respiratory distress or shock is present or develops If signs/symptoms of dehydration or hypoperfusion, establish IV/IO access and administer Normal Saline 20 mL/kg (up to 1000 mL max per bolus) May repeat once, if NO history of congestive heart failure or renal failure For persistent vomiting despite fluid resuscitation, consider anti-emetic medication in children >2 years: ○ Children 2-4 years: Contact BioTel for possible ondansetron authorization ○ Children 5-13 years and at least 19 kg: Consider ondansetron (refer to BioTel PEDI-Guide©) ○ 0.15 mg/kg (max dose 4 mg) SLOW IV/IO over 1 minute **OR** ○ Ondansetron (Zofran®) ODT 4 mg orally if patient is not actively vomiting **OR** ½ of 8 mg ODT ○ DO NOT administer more than one dose to any patient ○ DO NOT administer Ondansetron during known or suspected 1st trimester pregnancy 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) For additional assistance and Medical Control physician guidance, contact BioTel

PEARLS:

- Observe Body Substance Isolation Precautions and employ appropriate PPE

See also Symptom-specific CPGs and Ondansetron and Promethazine Drug Sheets.

SPECIAL PROCEDURES

Continuous Positive Airway Pressure (CPAP)

Indications: Moderate to severe dyspnea of ANY etiology NOT due to pneumothorax.

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

Cricothyrotomy (Needle)

Indications: The inability to adequately oxygenate and ventilate by any other means OR completely obstructing upper airway foreign body that cannot be removed by BLS maneuvers or Magill forceps with direct visualization.

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 50 psi delivery pressure
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

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

Emergency Childbirth: Normal

Indications: To aid EMS providers in emergency childbirth for all pregnant women in active, uncomplicated labor with impending delivery.

Contraindications:

- Known or suspected complications
- High-risk conditions requiring additional care

Equipment:

1. Obstetrical kit (prepare bulb syringe, cord clamps, scalpel/scissors, towels, newborn blanket)
2. Biohazard bag (place open bag under mother's buttocks)

Patient Preparation:

1. Maternal vital signs, including POC Glucose analysis (if time permits), per UNIVERSAL CARE - ADULT
2. Continuous ECG and SpO_2 monitoring (no supplemental oxygen *unless* SpO_2 is less than 94%)
3. Remove clothing and position patient with perineum elevated on a clean, folded blanket, pad, or pillow
4. 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

Deliver the newborn:

1. During contractions, urge patient to push
2. Deliver and support the emerging fetal head (support the mother's perineum, if possible)
3. Routine suctioning of mouth/pharynx/nose during delivery is no longer recommended
4. 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
5. Assess for and document presence of meconium (if present, do not attempt suctioning at this time)
6. Deliver the shoulders, then the rest of the body
7. Place newborn on mother's abdomen or level with the mother's uterus
   ii. If preterm/term infant is vigorous and mother is stable, delay cord clamping/cutting for 30 to 60 seconds
8. Note the time of birth (county of birth is also needed for birth certificate documentation)

Maternal care:

1. Control, document and treat maternal hemorrhage with volume resuscitation, if needed
2. Monitor and document maternal vital signs and refer to related CPGs for additional guidance

Newborn care:

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

30 to 60 seconds postpartum:

i. Initiate neonatal resuscitation per neonatal CPG if needed
ii. Ventilation is more important than oxygenation
iii. Clamp and cut the umbilical cord
iv. Calculate and document the 1-minute APGAR score **AND** calculate and document the 5-minute APGAR score

Continue to monitor maternal and neonatal vital signs, and prepare for transport

1. If possible, a neonate should be transported secured in an infant seat unless resuscitation is needed. "Skin-to-skin" transport under blankets on the mother's chest may be more feasible.

For additional assistance and Medical Control physician guidance, contact BioTel

Emergency Childbirth: Abnormal

Indications: To aid EMS providers in emergency childbirth for term and preterm emergency deliveries with known or suspected complications.

Equipment:

1. Obstetrical kit (prepare bulb syringe, cord clamps, scalpel/scissors, towels, newborn blanket)
2. Biohazard bag (place open bag under mother's buttocks)
3. 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
4. IV/IO access for mother (and possibly for infant)
5. Neonatal/infant resuscitation equipment, especially BVM and pulse oximetry equipment

Patient Preparation:

1. Maternal vital signs, including POC Glucose analysis (if time permits), per correlated CPG
2. Continuous ECG and SpO_2 monitoring (administer 100% oxygen via NRBM)
3. Establish at least one, large-bore peripheral IV, if time permits (two IVs preferred if maternal hemorrhage)
4. SAMPLE and focused obstetrical history, per Emergency Childbirth (Normal), if time permits
5. Remove clothing and position patient with perineum elevated on a clean, folded blanket, pad or pillow
6. Request additional EMS resources, if time permits

Deliver the newborn – Refer to specific guidance on the next pages, and/or consult BioTel:

1. During contractions, urge patient to push (EXCEPTION: cord prolapse)
2. Deliver and support the emerging fetal part, if not the head
3. Recognize abnormal presentation requiring immediate care and **transport for emergency C-section**:
   i. Prolapsed cord, hand/shoulder presentation ("transverse lie")
   ii. Cephalopelvic Disproportion ("CPD"), breech presentation when the head does not deliver within 3 minutes
   iii. shoulder dystocia
4. If breech or other non-vertex presentation, deliver the legs and body, then the head
5. 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)
6. **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
7. Assess for and document the presence of meconium
8. Initiate rapid transport to an appropriate Obstetrical/Neonatal Specialty Care Facility according to policy
9. Deliver the shoulders, if not previously delivered
10. Deliver the remainder of the body, if not previously delivered
11. Place newborn on mother's abdomen or level with the mother's uterus
12. If preterm/term infant is vigorous and mother is stable, delay cord clamping/cutting for 30 to 60 seconds

Note the time of birth (county of birth is also needed for birth certificate documentation)

Maternal care:

1. Control, document and treat maternal hemorrhage with volume resuscitation, if needed
2. Monitor and document maternal vital signs
3. Refer to OB-Gyn CPG for additional post-partum care guidance

Newborn care (refer to Emergency Childbirth (Normal) on previous page and to corresponding CPG

Continue to monitor maternal vital signs and fetal viability/neonatal vital signs en route.

For additional assistance and Medical Control physician guidance, contact BioTel

Intraosseous (IO) Access

Indications: Any critical illness/injury where rapid IV access is unavailable with 1-2 attempts, or 90 secondsm multi-system trauma with severe hypovolemia, severe dehydration, vascular collapse, unconsciousness, or respiratory failure/arrest.

Contraindications:

- Fractured selected extremity
- Infection at the insertion site
- Excessive tissue at insertion site
- Inability to locate anatomic landmarks
- Vascular compromise of the extremity
- IO insertion with 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

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.

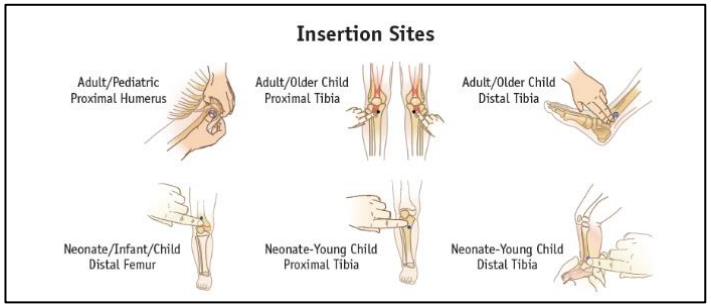
2. Pain:

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.

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

For additional assistance and Medical Control physician guidance, contact BioTel

Nasotracheal Intubation

Indications: Conscious, spontaneously breathing patients with intact gag reflex, unconscious patients with GCS less than 8, or patients with possible C-spine injury whose injury may be worsened by neck movement.

Contraindications:

- Apnea
- LESS THAN 14 YEARS OLD
- Severe midface congenital/traumatic deformity
- Nasal airway obstruction
- Acute hypertension
- Anticoagulants
- Suspected basilar skull fractures (raccoon's eyes, Battle's sign, CSF leakage from ears/nose)
- Coagulopathy
- Suspected elevated intracranial pressure (ICP)

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; PetCO2 detection; conscious patient is unable to speak; auscultation of symmetrical, bilateral breath sounds; & stable/improving SpO2
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)

For additional assistance and Medical Control physician guidance, contact BioTel

Needle Thoracostomy (Pleural Decompression)

Indications: To provide emergency, out-of-hospital treatment for tension pneumothorax, for clinically confirmed or suspected pneumothorax.

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)

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):

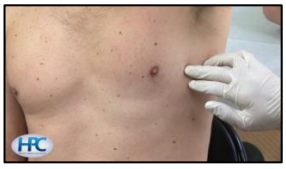


Figure 1

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:

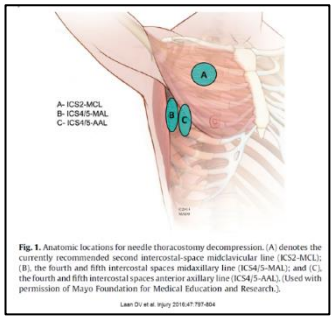


Fig. 1. Anatomic locations for needle thoracostomy decompression. (A) denotes the currently recommended second intercostal-space midclavicular line (ICS2-MCL); (B), the fourth and fifth intercostal spaces midaxillary line (ICS4/5-MAL); and (C), the fourth and fifth intercostal spaces anterior axillary line (ICS4/5-AAL). (Used with permission of Mayo Foundation for Medical Education and Research.).

Laan DV et al. Injury 2016;47:797-804

Figure 2

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):

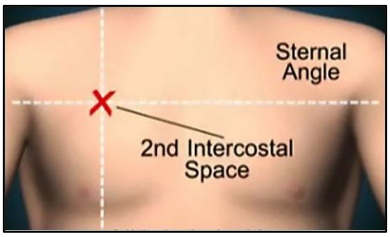


Figure 3

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):

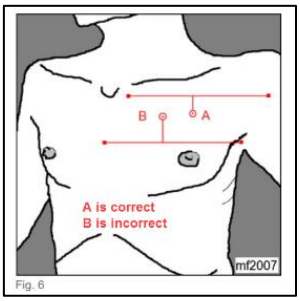


Figure 4

4. Insertion site: **mid-clavicular line, over the top of the 3rd rib (2nd intercostal space)** then 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

For additional assistance and Medical Control physician guidance, contact BioTel

Pharmacologically Assisted Intubation (PAI)

Indications: Trauma with GCS less than 8 and intact gag reflex, significant facial trauma, poor airway control, butns with airway involvement, TBI or stroke requiring mild hyperventilation, severe asthma/COPD with hypoxia with respiratory failure, overdose with decreased respiratory drive and cannot protect airway, combative, agitated, or confused patient needing definitive airway, or other patient approved by BioTel.

Contraindications:

- When any indication present, there are **NO** absolute contraindications

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

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)

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

For additional assistance and Medical Control physician guidance, contact BioTel

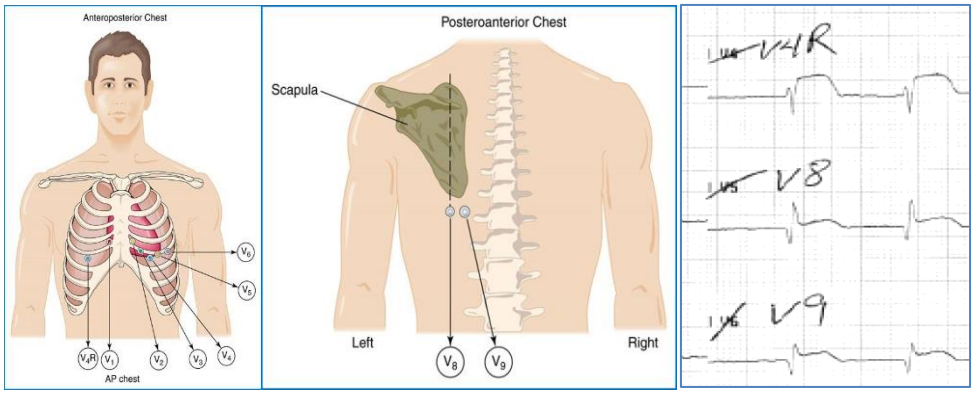
Right-Sided (V4R) ECG and Posterior ("15-Lead") ECG

Indications: 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 corresponding 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)

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.
- This procedure is rarely indicated in pediatric patients.
- Refer to associated CPGs for further guidance

For additional assistance and Medical Control physician guidance, contact BioTel

TASER ® Barb Removal

Indications: Any adult or pediatric patient with a TASER® barb lodged in skin. This includes the assessment and care following TASER® deployment as well.

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 corresponding 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 EMS transports the patient or not.**

For additional assistance and Medical Control physician guidance, contact BioTel

Tracheostomy and Stoma Care

Indications: Patients of all ages with a tracheostomy tube or laryngectomy stoma. **NOTE: Patients, parents, family members and caregivers are usually trained in "trach care": ask for their help.** Definitions are included below for reference.

Equipment and Supplies:

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

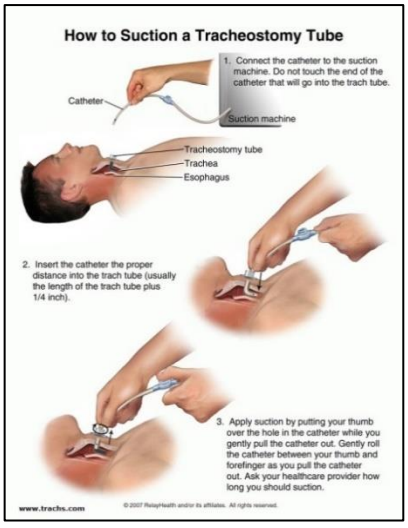
Use appropriate PPE and Body Substance Isolation precautions, including eye protection, for ALL care.

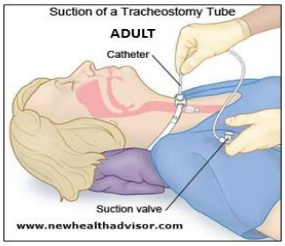
Procedure:

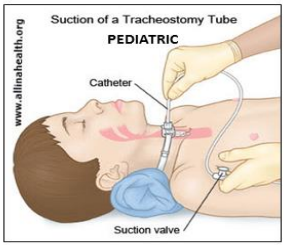
1. Assess and support ABCs according to UNIVERSAL CARE – ADULT and Airway Management – Adult, or UNIVERSAL CARE – PEDIATRIC and Airway Management – Pediatric, as clinically indicated, with:
    a. Continuous ECG, SpO_2 and $PetCO_2$ monitoring
2. BVM Ventilation of the TOTAL laryngectomy patient:
    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. NOTE: The bag-valve device 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 2 inches (5 cm) – do not suction during insertion
        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
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

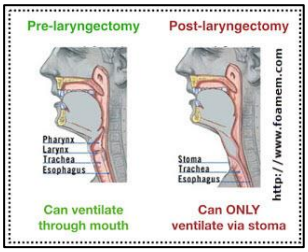






DEFINITIONS:

- **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.



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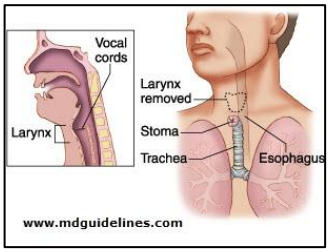
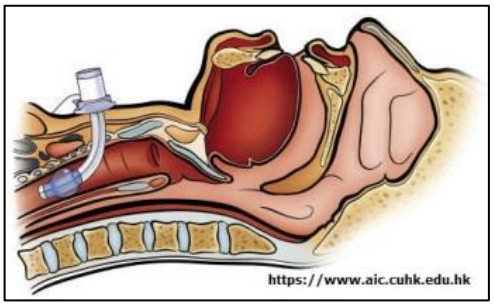


- **Partial laryngectomy:** Removal of part of the larynx. In some cases, there may be continuity between the upper and lower airways. Sealing the mouth and nose when ventilating via the stoma might be necessary to prevent air leakage.

- **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.

or



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

Transcutaneous Pacing (TCP)

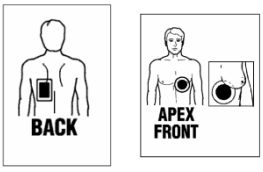
Indications: Adult patients, at least age 14, with symptomatic bradycardia. Adult patients with heart rate less than 60 bpm due to 3rd degree heart block with hemodynamic compromise. This includes hypotension, shock, chest pain, altered LOC, or acute heart failure/pulmonary edema.

Special Notes:
- 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)
- TCP must be initiated promptly in order to optimize patient outcome
- Consider TCP for 1st- or 2nd-degree heart block, **IF** there are signs or symptoms of hypoperfusion, as above

Contraindications:
- Absolute: Asystole, Pulseless Electrical Activity (PEA) or asymptomatic Sinus Bradycardia

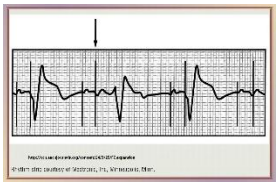
Procedure (observe Body Substance Isolation Precautions and employ appropriate PPE):

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)

For additional assistance and Medical Control physician guidance, contact BioTel

FORMULARY TABLE OF CONTENTS

- ***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

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

✦ BioTel MEDICATION ADMINISTRATION CROSS-CHECK (MACC)

Indications: To facilitate timely delivery of correct dose of the correct medication (dose, route, volume, and rate) for the correct indication to the correct patient. If extenuating circumstances prevent MACC use should be documented in the ePCR.

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

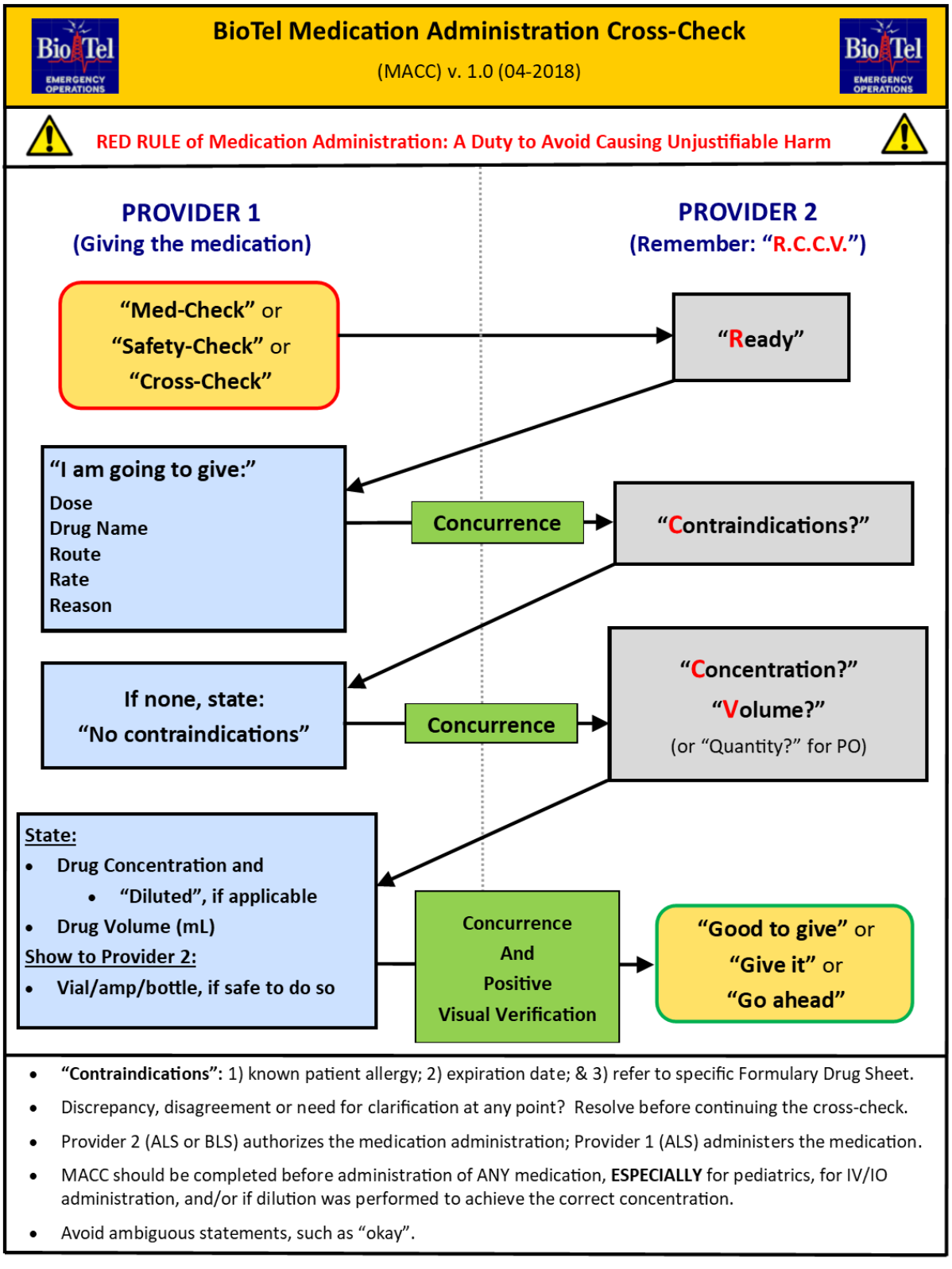
C. The large number of EMS pharmaceuticals, as well as supply-chain and other issues, creates complexity:
   1. EMS supplies are subject to availability of different medications, different concentrations and different size formulations

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 BioTel Medication Administration Cross-Check Figure Below



(Adapted from Wichita-Sedgwick County EMSS 2012, with permission)

✦ BioTel PEDI-Guide© (Pediatric Emergency Drug & Interventions-Guide©)

Version 1.0
August 26, 2018

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Special acknowledgement for assistance and expertise in the development of this tool:

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Craig Huang, MD
Geoffrey Lowe, MD
Lori Pandya, MD
Kara Quaney, PharmD

✦ BioTel PEDI-Guide© (Pediatric Emergency Drug & Interventions-Guide©)

Indications: For pediatric patients less than 14 years of age. This will facilitate timely, safe administration of pediatric emergency medications usine pre-calculated doses based on patient weight, length or age in order to minimize incidence of medication dosing errors.

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:

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).

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.***

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:

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	

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

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	

Aspirin (Acetylsalicylic 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**

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

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: ○ 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	

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)	

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	

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

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
- Large-bore, antecubital IV preferred: recheck IV patency frequently before, during and after administration

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)

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**				

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

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)**	
Mild allergic reaction or acute dystonic reaction	25 – 50 mg IM, IV or IO: • Monitor for hypotension with IV/IO administration	**SPECIAL NOTES** **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): ○ Dilution is not necessary ○ Administer 1 mg/kg (0.02 mL/kg) ○ 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	

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 or 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**

Dopamine infusion guide on next page

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

	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	
kg							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

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

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 and 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 • Maximum rate: 10 mcg/min (100 mL/min)	**Infusion Rate:** **Refer to chart (next page)** **MANDATORY:** **Contact BioTel ASAP after starting infusion**
	OR	
	• See next page for alternative IV slow bolus dose in select, non-elderly patients if infusion is unavailable	
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 ○ Maximum rate: 1 mcg/kg/min	**MANDATORY:** **Contact BioTel ASAP after starting infusion**

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

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:	• Refractory bronchospasm:
• NONE	• 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	• Tremors
• Hypertension	• Nausea/vomiting
• Chest pain	• 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

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
Continued on next ;age

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 UNAVAILABLE

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 UNAVAILABLE

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

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* ○ 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	

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**

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

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	

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, dilution and reduction instructions**		
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

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, or 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**

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

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 following pages**

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: • 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	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
PEDIATRIC KETAMINE 100 mg/mL STARTING CONCENTRATION		
Use BioTel MACC and BioTel PEDI-Guide© to ensure correct dose		
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		
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 (0.04 mL/kg **direct from 100 mg/mL vial**) one minute **prior to** intubation: • 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:** **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
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	

	0.4 mg/kg (0.04 mL/kg; **diluted**) **IM or IN**:
	• Maximum single dose: 40 mg (4 mL)
	  ○ Divide IN dose between both nostrils
	  ○ 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	

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: • 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	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

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: • 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	

	0.4 mg/kg (0.04 mL/kg; **diluted**) **IM or IN**:
	• Maximum single dose: 40 mg (4 mL)
	  ○ Divide IN dose between both nostrils
	  ○ 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	

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), or 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:
- Sedation, lightheadedness, anticonvulsant effects
- Anesthetic effects (local)
- Toxic Levels:
- 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

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), or 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)	Monitor for hypotension and respiratory depression

Pediatric dosing below

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:** ○ Mix 1 g (2 mL) in 100 mL NS: ○ Final concentration: 10 mg/mL ○ Less than 10 kg: Use **60 gtt/mL** drip set ○ At least 10 kg: Use **10 gtt/mL** drip set ○ Administer **4 mL/kg** over 15 min. ○ Set drip rate per BioTel PEDI-Guide© ○ **Set timer to stop infusion after 15 minutes** • **30 kg or more:** ○ Mix 2 g (4 mL) in 100 mL NS: ○ Final concentration: 20 mg/mL ○ Use **10 gtt/mL** drip set ○ Administer **2 mL/kg** over 15 min. ○ Set drip rate per BioTel PEDI-Guide© ○ **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:** ○ Mix 1 g (2mL) in 100 mL NS: ○ Final concentration: 10 mg/mL ○ Less than 10 kg: Use **60 gtt/mL** drip set ○ At least 10 kg: Use **10 gtt/mL** drip set ○ Administer **4 mL/kg** for 15 min. ○ Set drip rate per BioTel PEDI-Guide© ○ **Set timer to stop infusion after 15 minutes** • **30 kg or more:** ○ Mix 2 g (4 mL) in 100 mL NS: ○ Final concentration: 20 mg/mL ○ Use **10 gtt/mL** drip set ○ Administer **2 mL/kg** for 15 min. ○ Set drip rate per BioTel PEDI-Guide© ○ **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:** ○ Waste 1 mL from a 10-mL NS flush ○ Replace with 0.5 g (1 mL) mag sulfate* ○ Final concentration: 50 mg/mL ○ Administer dose per BioTel PEDI-Guide© • **15 kg or more:** ○ Waste 4 mL from a 10-mL NS flush ○ Replace with 2 g (4 mL) mag sulfate* ○ Final concentration: 200 mg/mL ○ 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**

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), or 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
- Possible exacerbation of CHF or hypertension
- Anaphylaxis (rare)
- 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: ○ Under 2 mo**: 6.25 mg (0.5 mL) ○ 2 mo to 11 mo**: 12.5 mg (1 mL) ○ 1 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 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**

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, Shivering in patients with accidental hypothermia or during emergency cooling for heatstroke, and agitated patient who may be a danger to self or others (Excited Delirium Syndrome)

- Includes: adjunct administration after ketamine administration, to prevent emergence reaction

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**

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, and 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

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**	

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, or 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**	

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	

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, and 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):** ○ **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:**
	  ○ **Final concentration: 4 mcg/mL**
	  ○ Maximum rate: 1 mcg/kg/min
	• **5 years and older: Add 2 mg (2 mL) to 250 mL NS:**
	  ○ **Final concentration: 8 mcg/mL**
	  ○ Maximum rate: 10 mcg/min
		Infusion Rate: Refer to chart (next page)
		
		MANDATORY: Contact BioTel ASAP after starting infusion

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

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**

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		

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		

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, or for 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

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), or 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	