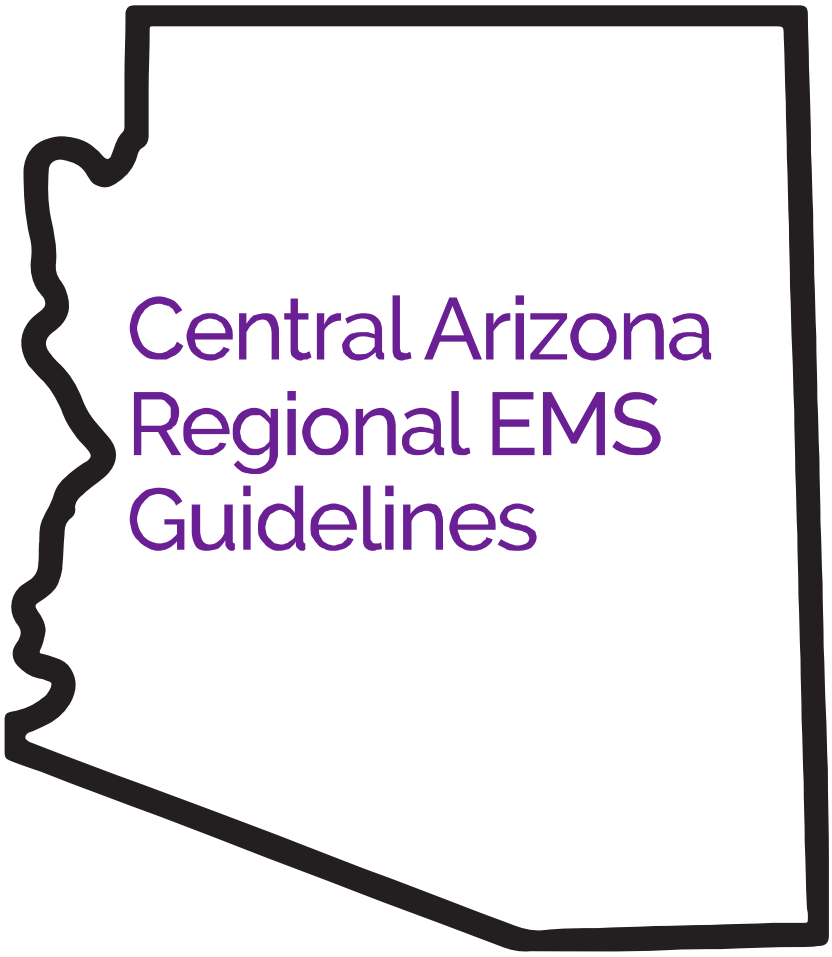


Central Arizona Regional EMS Guidelines

These guidelines are a collaborative effort between the following EMS entities, with clinical basis from the ADHS BEMSTS T3Gs and NASEMSO:

EMS ROCC
AEMS
WEMSCOM
CAREMDC

Updated and approved November 2023

DISCLAIMER

These guidelines are designed to be a resource document for use by Medical Direction Authorities, as defined by A.R.S. § 36-2205, responsible for the administrative, organizational and on-line medical direction of pre-hospital Emergency Medical Care Technicians (EMCTs). It is specifically recognized that documented regional or local variations from the guidelines contained within are not only acceptable, but also appropriate, depending on the individual circumstances of the involved areas and organizations.

By Statute and Rule, all advanced life support pre-hospital EMCTs shall have administrative and on-line medical direction. These guidelines are not meant to act as a substitute, proxy or alternative to that medical direction. Any conflict between these guidelines and the EMCT's medical direction shall default to the Administrative or on-line medical direction.

These guidelines are deemed to be within the acceptable standard of medical care. It is specifically recognized that there are acceptable documented regional or local variations from these procedures and protocols, which may also satisfy the standard of care. This manual does NOT define, limit, expand, or otherwise purport to establish the legal standard of care.

HOW TO USE THESE GUIDELINES

These guidelines have been adapted from the National Association of State EMS Officials (NASEMSO) Model EMS Clinical Guidelines published online in January 2019. These algorithms include specific recommendations for evaluation and treatment.

Inclusion and exclusion patient criteria are listed under the title of each guideline.
The recommendations within each guideline are listed in order by provider level scope of practice. It is assumed that more advanced levels of EMCT will perform all recommended evaluations and treatments included in the preceding level of care.

STR stands for Special Training Required. "STR skill" means "Specialty Training Requirement skill," defined as a medical treatment, procedure, or technique or administration of a medication for which an EMCT needs specific training per R9-25-502. This includes oversight by administrative and online medical direction.

The guidelines include specific pediatric recommendations, highlighted by the EMS for Children bear logo, where specific pediatric recommendations differ from those for adults. It is assumed that children will receive the evaluation and care recommended for all patients, unless specific pediatric recommendations are included in the algorithm.

A pediatric patient is defined as age less than 15 years. Age 15 and above is considered an adult patient in regard to treatment guidelines.

The guidelines include specific energy/shock recommendations for cardioversion and defibrillation highlighted by the lighting bolt symbol.

The Universal Care treatment guideline should be applied to all patient encounters and encompasses both adult and pediatric patients. All initial patient care is included in this guideline to reduce the need for extensive reiteration of basic assessment and other considerations in every guideline.

When IV/IO access and drug routing is specified, it is intended to include IO access. Any IV/IO medication may be administered IO. For life threatening conditions, IO is preferred.

On-line medical direction may be utilized at any time during the patient encounter.

The appendix contains additional reference material applicable to these guidelines, such as burn assessment and neurologic assessment tools.

The NASEMSO model guidelines include additional information that medical direction authorities may find helpful for education, training, and quality improvement activities, including patient safety considerations, educational pearls, performance measures, and literature references:
https://nasemso.org/wp-content/uploads/National-Model-EMS-Clinical-Guidelines_2022.pdf

Version 3.0, Published March 2022.

"TOC" = Table of Contents

General Policies and Guidance Documents

Universal Care: Adult & Pediatric (2 pages)

TOC

These general recommendations apply to all patient encounters. Patient care goals are to facilitate appropriate initial assessment and manage treatment of any EMS patient.

EMT

- Assess scene safety
- Use appropriate personal protective equipment (PPE)
- Determine number of patients
- Determine need for formal triage and additional resources
- Determine mechanism of injury
- Determine SMR needs

- It is preferable for minors to have a parent or legal guardian who can provide consent for treatment on behalf of the child; however, EMS providers may provide emergency treatment when a parent is not available to provide consent.
- Use commercially available tool for weight estimate

Primary Survey (Airway, Breathing, Circulation, Disability, Exposure)

- Open airway as indicated
  - Consider position, suction, and use of airway adjuncts as indicated
- Administer oxygen as appropriate
- Assess circulatory status
  - Control any major external bleeding & Initiate chest compressions as indicated
- Evaluate patient responsiveness: AVPU/GCS
- Evaluate gross motor and sensory function in all extremities
- Expose patient as appropriate to the chief complaint

Secondary Survey

- Obtain baseline vital signs
- Assess blood glucose as indicated
- OPQRST history
- SAMPLE history
- Check temperature as indicated, treat environmental hyperthermia/hypothermia

Ongoing Reassessment

- Proceed to the appropriate guideline as indicated
- Determine need for transport, resources available, and location of most appropriate destination - transport as indicated
- Reassess chief complaint, assessment findings, and response to treatment
- Assess vital signs at least every 5 minutes for unstable patients; every 15 minutes for stable

Paramedic

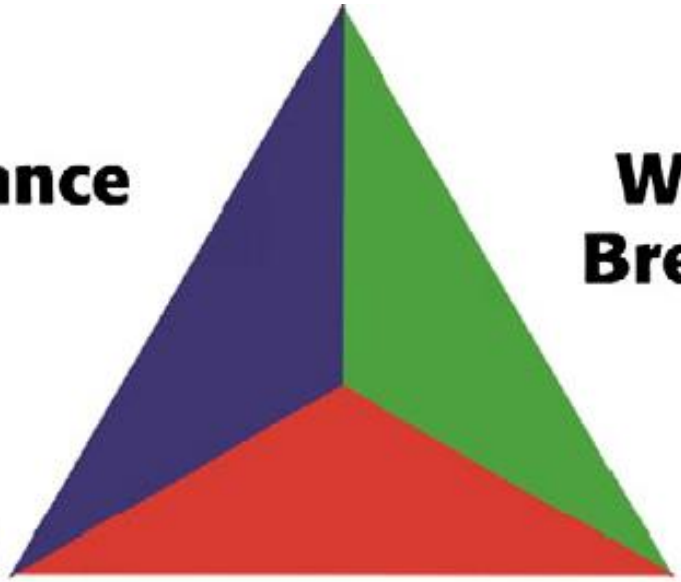
- Consider appropriate airway management adjuncts.
- Confirm supraglottic or endotracheal airway placement with waveform capnography (EtCO2). If unable to confirm EtCO2, remove airway and place alternate device.
- IV/IO access as indicated
- Initiate IV/IO fluids as indicated

- Use commercially available tool for medication dosing and equipment size selection.

- Consider appropriate airway management adjuncts, escalate as indicated.
- 12-lead ECG should be performed early in patients with potential cardiac complaints, goal within 5 minutes of patient contact.
- In patients with cardiac or respiratory complaints:
  - Continuous cardiac monitoring
  - Consider waveform capnography ($EtCO_2$) in addition to pulse oximetry (SpO2)

Pediatric Assessment Triangle

TOC



Appearance

Abnormal Tone
↓ Interactiveness
↓ Consolability
Abnormal Look/Gaze
Abnormal Speech/Cry

Work of Breathing

Abnormal Sounds
Abnormal Position
Retractions
Flaring
Apnea/Gasping

Circulation to Skin

Pallor
Mottling
Cyanosis

Functional Needs: Adult & Pediatric

TOC

Includes: Patients with physical, sensory, mental health, and cognitive and/or intellectual disabilities affecting their ability to function independently without assistance.

EMT

- Identify the functional need by means of information from the patient, the patient's family, bystanders, medic alert bracelets or documents, or the patient's adjunct assistance devices.
- The physical examination should not be intentionally cut short, although the manner in which the exam is performed may need to be modified to accommodate the specific needs of the patient.
- Medical care should not intentionally be reduced or abbreviated during the triage, treatment and transport of patients with functional needs, although the manner in which the care is provided may need to be modified to accommodate the specific needs of the patient.
- For patients with communication barriers (language or sensory), it may be desirable to obtain secondary confirmation of pertinent data (e.g. allergies) from the patient's family, interpreters, or written or electronic medical records.
- The family members can be an excellent source of information and the presence of a family member can have a calming influence on some of these patients.
- Transport patients with all assistance adjuncts and service animals if feasible.

Paramedic

If an individual (or the parent or legal guardian of the individual) declines or refuses care and/or ambulance transport to a hospital after EMS providers have been called to the scene, providers should determine the decision maker's capacity to make medical decisions and clearly document the encounter and refusal including a signed statement of the refusal.

Decision-Making Capacity

An individual who is alert, oriented, and has the ability to understand the circumstances surrounding his/her illness or impairment, as well as the possible risks associated with refusing treatment and/or transport, typically is considered to have decision-making capacity. Decision-making capacity should be demonstrated and documented as defined by the presence of all 4 criteria below. In addition, the decision to refuse treatment and/or transport must be made without undue influence from others. The patient must be able to:

- Receive and comprehend information needed to make a decision,
- Process and deliberate a decision and its potential consequences,
- Make and articulate a decision that is consistent over time,
- Justify that decision with logic that fits the individual's own value system.

The individual's judgement must not be impaired by illness, injury, or clinically apparent drug/alcohol intoxication. GCS score must be normal (15).

Individuals who have attempted suicide, verbalized suicidal intent, or who otherwise exhibit indicators that lead EMS providers to reasonably suspect suicidal intent may not decline transport to a receiving facility. In addition, patients with court order for psychiatric care may not refuse care.

If a patient is in a healthcare facility (doctor's office, urgent care, medical clinic, free standing ED, etc.) and they want to refuse transport, refer to **Healthcare Facilities guideline**.

All patients who request transport to the hospital will be transported.

EMT

- EMS providers should make all reasonable efforts to avoid danger to themselves.
- Obtain a complete set of vital signs.
- Complete an initial assessment with particular attention to neurologic and mental status.
- Perform appropriate medical care with the consent of the individual.

- It is preferable for a minor to have a parent or legal guardian who can provide consent for treatment on behalf of the minor. However, EMS providers may provide emergency treatment when a parent is not available to provide consent.
- Parent or legal guardian must refuse care on behalf of a minor.
- Parents may not refuse care if abuse or neglect is suspected. Notify law enforcement as necessary to facilitate transport to the hospital.
- Emancipated minors must provide state-issued emancipated identification card.

- Individuals must be advised of the risks and consequences resulting from refusal of medical care.
- Assess the patient's understanding of the medical emergency: the possible medical problems, the proposed medical care, the benefits of medical care and risks of refusal.
- Contact online medical direction for patients with concerning presentation/evaluation who refuse treatment and/or transport
- You may contact online medical direction at any time.
- You may utilize a 3rd party to assist the patient with decision makings (as appropriate).

Abuse and Maltreatment: Adult & Pediatric

TOC

Be aware of potential clues to abuse/maltreatment from caregivers, the general environment, and the patient's physical condition.
Recognize any act, or series of acts of commission or omission by a caregiver or person in a position of power over the patient, that results in harm, potential for harm, or threat of harm to a patient.
EMS role is to:

- Document concerns,
- Assess and stabilize potentially serious injuries,
- Disclose concerns to the appropriate authorities (hospital *and* law enforcement or state authorities).
- EMS personnel are mandatory reporters of any suspicion for abuse, maltreatment, neglect, or suspected human trafficking or sex trafficking of a minor per **A.R.S. §13-3620.A** and **A.R.S. §13-3212**
- Notify one of the following applicable entities:
  1. Law enforcement.
  2. Arizona Department of Child Safety (**1-888-SOS-CHILD** 1-888-767-2445)
  3. Adult Protective Services Central Intake Unit (**1-877-SOS-ADULT** 1-877-767-2385.) Link to their online reporting form: https://hssazapsprod.wellsky.com/assessments/?WebIntake=1F74FCDA-C6AB-4192-9CEE-F8D20DE98850
  4. A tribal law enforcement or social services agency for any Native American minor who resides on an Indian reservation

  NOTE: Reporting to hospital personnel *does not* qualify as having fulfilled the mandatory reporting requirement.
- Leave the investigation to law enforcement.

EMT

- **Primary survey**
  - Identify potentially life-threatening issues.
  - Refer to **General Trauma Management** as needed.
- **Secondary survey**
  - Assess physical issues, document any statements made spontaneously by patient, avoid extensive investigation of the specifics of abuse.
- Report concerns immediately about caregivers impeding your ability to assess/transport patient or refusing care for the patient.
- Attempt to preserve the evidence, but the overriding concern should be providing emergency care to the patient.

- Scenarios that call for a high index of suspicion for abuse in children include:
  - **Brief Resolved Unexplained Event (BRUE)**
  - Any bruising on a patient <4 months, or any bruising on the torso, ears, neck on a patient < 4 years. (See TEN-4-FACESp below)

Pain Management: Adult & Pediatric

TOC

Assess pain as part of general patient care in children and adults. Consider all patients as candidates for management of acute pain, regardless of transport interval.

Caution: Multi-system trauma patients.

Excludes:
- SpO2 < 90%
- Active labor

EMT

- Initiate **Universal Care**.
- Use an age-appropriate pain scale to assess pain, such as Numeric Rating Scale.
- If available, consider use of non-pharmaceutical pain management techniques:
  - Place patient in position of comfort, while adhering to safe transport recommendations.
  - Apply ice packs and/or splints.
  - Verbal reassurance (will lower anxiety).

Use an age-appropriate pain scale to assess pain:
- Age < 4 years: Consider using an observational scale such as FLACC (face, legs, activity, cry consolability) or CHEOPS (Children's Hospital of Eastern Ontario Pain Scale).
- Age 4-12 years: Consider using a self-report scale such as Faces Pain Scale-revised or Wong-Baker Faces.
- Age > 12 years: Consider using a self report scale such as Numeric Rating Scale.

Paramedic

- Apply a pulse oximeter and administer oxygen as needed to maintain SpO2 ≥ 94%.
- **Morphine**: 0.1 mg/kg/dose IV/IO, max 2-5 mg increments, max total dose 15 mg.

  or
- **Fentanyl**: 1 mcg/kg/dose IN/IV/IO, max initial dose 100 mcg, max total dose 200 mcg.
  - Consider intranasal route for medication if available.
- Reassess pain every 5 minutes, observe for adverse effects, and re-dose as indicated.
- Use ETCO2 as an early predictor of hypoventilation.
- Consider administration of antiemetic for **Nausea/Vomiting** as needed.

or
- **Ketamine**: 0.25 mg/kg IV/IO, max per dose 25 mg, max total dose 100 mg.
- Ketamine should be administered slow IV/IO push or may be diluted in 50mL NS and administered as an infusion over 3-5 minutes.

- Ketamine is not indicated for pediatric pain management.

Communication Options

TOC

Clearly state at the beginning of an on-line communication if you are making a “courtesy notification” or if you need to “obtain On-line Medical Direction.” If you are seeking physician orders, you are making a decision to “obtain On-line Medical Direction.”

In the setting of time-sensitive illnesses, it is appropriate to initiate communication by identifying the patient as a Trauma, STEMI, Stroke, or Sepsis Alert

Online Medical Direction

Online medical direction may only be obtained from a facility that is a DHS-recognized base hospital or centralized Medical Direction Communications Center.

An ALS provider may obtain online medical direction with the receiving hospital if they are a recognized ADHS base hospital, the designated back-up to their administrative base facility, or specialty center.

A Courtesy Notification (CN) should be brief and include the following patient-related information:

Provider’s name and unit number
Patient identifier (name/incident number)
Age
Chief complaint
ETA
Special equipment in use or needed. Examples include: NIPPV, ventilator, bariatric equipment, translator or restraints.
Treatments rendered
Vital signs, if abnormal (complete set)
Mechanism of injury (trauma)

If a facility refuses to accept a patient during phone notification, contact on-line medical direction.

Initial Medical Care – Special Circumstances

TOC

Special circumstances may occur in any incident in which the resources of the fire department / emergency medical services , such as personnel and equipment, are overwhelmed by the event type, number, and severity of casualties.

In the event of a special circumstance such as hostile event, or a situation in which resources are overwhelmed, triage and treatment may be altered from the traditional off-lines in order to maximize use of resources and best care for patients. Each agency may have guidelines in place that assist in the management of these situations.

If the scene is hazardous, due to potential violence, chemicals, or other factors, it is acceptable to delay traditional treatment until patient extraction to a safe area has been completed. Only treatments that can immediately affect life or limb may be performed in an unsafe environment. These treatments may include, but not limited to:

Hemorrhage control- application of bandage or tourniquet
Performing an emergency move or rapid extrication of the patient
Tension pneumothorax- chest needle decompression/seal
Airway protection- patient positioning or BLS airway

On Scene Physician

TOC

In the event that an on-scene physician wants to continue patient care after the arrival on EMS personnel;

1. The on-scene physician must be licensed to practice medicine in the state of Arizona

2. The on-scene physician must agree to accompany the patient to the receiving hospital in the ambulance.

3. Online Medical Direction REQUIRED - A Paramedic may follow the orders of an On-Scene Physician after contacting on-line medical direction and obtaining order to follow direction of On-Scene physician. The Paramedic may wish to have the on-scene physician communicate directly with medical control to optimize patient care.

- The Paramedic may not follow any requests that are outside the scope of practice of a paramedic in the state of Arizona.

- The Paramedic should clearly document the name and license number of the physician along with obtaining their signature on the patient care record.

Healthcare Facilities

TOC

When responding to a healthcare facility in which a medical provider (Physician, Physician Assistant, or Nurse Practitioner) is on scene including, but not limited to, doctor's office, urgent care, medical clinic, free standing Emergency Department and the provider requests transport, the arriving EMS personnel should;

- Facilitate patient transport by ambulance to the appropriate destination.

If the patient refuses ambulance transport:

- The paramedic, on-scene provider, and patient will meet and discuss the patients' refusal of ambulance transport. If unable to meet with the provider, document the attempt in the chart.

- Continued refusal by the patient to allow ambulance transport will require a High-Risk Refusal and online medical control must be contacted.

- Attempts should be made to transport to the pre-determined destination if the destination aligns with regional guidelines. If the transport destination decided by the on-scene provider is not the most appropriate destination due to distance, patient stability, or is in direct conflict with guidelines, contact online medical direction for appropriate destination triage.

Destination Guideline

TOC

For the purpose of providing guidelines to field EMS providers, the EMS Medical Directors recommend that patients be transported to the closest, most appropriate destination based on AEMS categorization criteria. We do not recommend transport to facilities that have not been categorized by AEMS. The EMS Medical Directors feel that patients confirmed or suspected to acutely have the following conditions would be best served by being triaged and transported initially to emergency departments affixed to hospitals:

- STEMI
- Post-code arrest with Return of Spontaneous Circulation (ROSC)
- CVA/TIA
- Adult LI and LIII trauma, including burns
- Pediatric trauma (age <15)
- Submersion Incidents/Drownings/Near-Drownings
- Suspected OB/GYN related complications in women known or suspected to be beyond 20 weeks Estimated Gestational Age
- Head, neck, back, thoracic, or pelvic trauma in women known or suspected to be beyond 20 weeks Estimated Gestational Age
- Post-delivery complaints by mother or neonate, up to 30 days post delivery
- Home deliveries, midwife-attended or otherwise
- Those intubated, with supraglottic airways, or on NIPPV as acute treatment for respiratory distress
- Brief Resolved Unexplained Event (BRUE)

The following should be taken to the closest **AEMS categorized ED** regardless of inpatient, interventional and subspecialty capabilities:

- Code arrest without ROSC (excluding traumatic arrest)
- Lack of functional airway: ET, supraglottic or BLS
- Unstable patient where delayed transport to a more distant facility may be detrimental to patient outcome

In addition, the EMS Medical Directors realize that other factors should be considered when deciding on a best destination. These include, but are not limited to:

- Patient choice
- Continuity of care
- Availability of resources
- Specialty services
- Hospital diversion status

Contact on-line Medical Direction, as needed, for assistance with determining destination.

TOC

Destination Decisions for Pediatric Cardiac Arrest

Traumatic Cardiac Arrest

Pediatric traumatic cardiac arrest patients who do not meet the criteria for field termination of resuscitative efforts should be transported by the most expedient means to an appropriate Trauma Center, preferably with pediatric capabilities. If the patient is considered non-salvageable, On-line Medical Direction should be contacted for the consideration of field termination or for an alternative destination.

Non-traumatic (Medical) Cardiac Arrest

In the absence of a specific protocol recommending a destination.

If an airway and IV/IO access is obtained and there is return of spontaneous circulation during the resuscitative effort pediatric patients should be transported to an appropriate hospital with pediatric critical care capability. Transport should be performed by the most expedient means.

If an airway or IV/IO access cannot be established, the patient should be transported to the closest local hospital emergency department by the most expedient means.

If there is no return of spontaneous circulation during the resuscitative effort, the patient should be transported to the closest local hospital emergency department by the most expedient means.

Notes

Airway stabilization may be either an advanced airway or BVM ventilation with good air movement and appropriate monitoring.

Air medical services may transport directly to a facility with pediatric critical care services if transport time is not significantly prolonged.

Additional Personnel Ride-in/Follow-up Guideline

TOC

It is recommended that an additional provider consider riding in to assist in the care of the patient if there is an increased likelihood of patient complications or deterioration, or concerns of patient/crew safety. Some criteria that should be considered include:

- Abnormal vital signs
- Altered mental status
- Abnormal neurologic exam
- Current, or risk of, unstable cardiac dysrhythmia
- Use of medication to support blood pressure
- Respiratory compromise or impending failure
- Uncontrolled or difficult to control bleeding

- Situations to consider additional personnel (which may be either ALS or BLS provider) include:
  - Suicide ideation**
  - Homicidal ideation **
  - Sexual assault **

Excludes:

- Agency/jurisdictional guidelines that supersede this CAREMSG document.
- If situation dictates transport without additional personnel, documentation to support this decision should be included in the ePCR.

EMT

Paramedic

- **Required indications-**
  - STEMI Alert
  - Stroke Alert
  - Trauma Alert
  - Cardiac Arrest/ROSC
  - Respiratory Arrest or impending Respiratory Failure/Distress (including use of RSI or NIPPV)
  - Seizure
    - Adult – active seizure/status epilepticus
    - Pediatric – active seizure/status epilepticus, first time seizure, persistent febrile seizure
  - Unstable cardiac dysrhythmia
  - Cardioversion/Defibrillation/Transcutaneous pacing
  - Imminent delivery
  - Vaginal bleeding in pregnant patient > 20 weeks gestation (viable fetus)
  - Eclampsia/Preeclampsia
  - Drowning/near drowning
  - Restraints/combative/medication administered for pharmacologic management of agitation
  - Request of transporting ALS provider for additional assistance
  - Patient in handcuffs/police custody **

- If agency policy dictates: Controlled substance administered for pain management

** = second provider could be ALS or BLS personnel

ALS Release of Patients for BLS Transportation: Adult & Pediatric

TOC

Includes: These general recommendations apply to all patient encounters where it is deemed safe and appropriate based on the below criteria to release a patient from the care of a Paramedic to a BLS level for transportation.

EMT

Criteria 1: Vital Signs must be within the following limit:

- Blood pressure:
  - SBP 90-160
  - DBP 60-110
- Pulse: 60-100
- Respirations: 10-20

- See abnormal pediatric vital sign table below
- Vital signs must be within age-appropriate norms

Criteria 2: The following high-risk indications must be absent:

- Acute change in mental status or motor/neurologic from baseline (new confusion, weakness, inability to ambulate, etc.)
- BRUE
- Cardiac dysrhythmia
- Chest pain of possible cardiac etiology
- Electrocution
- Overdose or poisoning
- Pregnancy-related complaint
- Respiratory distress
- Seizures
- Submersion incidents
- Syncope or near syncope
- TASER
- Trauma requiring trauma center destination

Criteria 3: Absence of emergent condition or significant abnormal findings on physical exam

If all of the above criteria are met then the patient may be released to a BLS level.
If any of the above criteria are not met, ALS crew must obtain online medical direction to allow transfer of care to a BLS level.

Abnormal Pediatric Vital Signs

Age	Heart Rate	Resp Rate	Systolic BP	Temp (°C)
0 d – 1 m	> 205	> 60	< 60	<36 or >38
≥ 1 m - 3 m	> 205	> 60	< 70	<36 or >38
≥ 3 m - 1 r	> 190	> 60	< 70	<36 or >38.5
≥ 1 y - 2 y	> 190	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 2 y - 4 y	> 140	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 4 y - 6 y	> 140	> 34	< 70 + (age in yr × 2)	<36 or >38.5
≥6 y- 10 y	> 140	> 30	< 70 + (age in yr × 2)	<36 or >38.5
≥ 10 y - 13 y	> 100	> 30	< 90	<36 or >38.5
> 13 y	> 100	>16	< 90	<36 or >38.5

General Medical

Syncope and Presyncope: Adult & Pediatric

TOC

Includes: patients presenting with both abrupt loss of consciousness and loss of postural tone. Presyncope or prodromal symptoms may be described as "nearly blacking out" or "nearly fainting" and should be considered to have the same or similar risk for significant illness as any patient who has lost consciousness.

Excludes:

- Patients with trauma – refer to **Traumatic Brain Injury (EPIC-TBI)** and **General Trauma Management.**
- Patients with ongoing mental status changes or coma should be treated per the **Altered Mental Status**.
- Evidence of other alternate etiology. Refer to appropriate guideline: **Seizures**, **Suspected Stroke**, **Hypoglycemia**.

EMT

- Initiate **Universal Care.**
- Assess blood glucose, refer to **Hypoglycemia** as indicated.

Paramedic

- If symptoms of poor perfusion, give 500 mL IV/IO fluid bolus, and repeat as necessary. Max 30 ml/kg. Titrate to MAP > 65 or SBP > 90.
- Refer to **Shock** as needed.

- If symptoms of poor perfusion, give 20 mL/kg IV/IO fluid bolus, repeat as needed. Titrate to age appropriate SBP (**Abnormal Vital Signs**) **using push-pull methods.**
- Refer to **Shock** as needed.

- Place on cardiac monitor – treat arrhythmias if present.
  - **Bradycardia**
  - **Tachycardia with a Pulse**
  - **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- Perform 12-lead ECG, transmit when indicated.

Stroke/Transient Ischemic Attack: Adult & Pediatric

TOC

Includes:
Acute neurologic deficit such as facial droop, localized weakness, gait disturbance, difficulty speaking or slurred speech, altered mental status that fall within 24 hours of onset or last known well time eligible for stroke treatment and transport to a stroke center. Patients with sickle cell anemia have a higher risk of stroke.

Excludes: Patients with potential traumatic brain injury, refer to **Traumatic Brain Injury (EPIC-TBI)** and **General Trauma Management**. If seizure activity present, refer to **Seizures**.

EMT

- Initiate **Universal Care**.
- Use a validated **prehospital stroke screening scale**.
- Document patient weight and last known well time or time of onset.
- Obtain blood glucose level, refer to **Hypoglycemia** as indicated.
- If altered mental status and SBP > 100, elevate head of bed to 15-30 degrees.
- Obtain waveform capnography (ETCO2) and SPO2 as indicated.
- Transport to Stroke Center.
- Notify receiving facility as soon as possible.

- Although rare, pediatric patients can have strokes.
- Stroke scales are not validated for pediatric patients.
- Call receiving facility or base hospital to ensure appropriate destination decision.

Paramedic

- Consider appropriate airway management adjuncts, escalate airway as indicated.
- Perform 12 lead ECG and transmit when indicated.

Altered Mental Status: Adult & Pediatric

TOC

Excludes: Traumatic Brain Injury (EPIC-TBI).

Assessment: Evaluate for treatable causes, refer to specific guidelines when applicable.

- **Shock**
- Dysrhythmia
- **Hypoglycemia**
- **Hyperglycemia**
- Toxic ingestion or substance use
- **Hyperthermia**, hypothermia
- **Opioid poisoning/Overdose**
- **Agitated or Violent Patient/Behavioral Emergency**
- **Seizures**

EMT

- Initiate **Universal Care.**
- Check blood glucose, treat **Hypoglycemia** or **Hyperglycemia** if indicated.
- Assess for possible stroke using a validated **prehospital stroke scale**.
- Check temperature – refer to **Sepsis** as needed.

- **Naloxone**: SPECIAL TRAINING REQUIRED (STR)
  - Intranasal (IN)
    - 4 mg/0.1 mL nasal spray
    - 1 spray in single nostril
    - May repeat as indicated

Paramedic

- Administer IV/IO fluid bolus if indicated, refer to **Shock.**

- **Naloxone:** 0.4-2 mg IV/IO/IM/IN. Repeat if indicated.

- **Naloxone:** 0.1 mg/kg IV/IO/IM/IN. Repeat if indicated.

- Perform 12 lead ECG and transmit when indicated.
- Maintain ventilatory support in least invasive way possible, BVM ventilation is reasonable for pediatric patients.
- Obtain waveform capnography (EtCO2) and SPO2 as indicated.
- Treat dysrhythmias as indicated.

Seizures: Adult & Pediatric

TOC

Includes: Ongoing seizure upon EMS arrival or seizure lasting > 5 minutes, more than two seizures in one hour (AKA status epilepticus.)

Seizures in patients greater than 20 weeks of pregnancy or up to six weeks postpartum (regardless of the age of the patient) are managed with magnesium sulfate. See below.

EMT

- Initiate **Universal Care.**
- Provide airway support as needed.
- Assess neurologic status (AVPU/GCS).
- If pregnant, place in left lateral recumbent position.
- Check blood glucose – refer to **Hypoglycemia** as indicated.

Paramedic

- If blood glucose <60 mg/dL, refer to **Hypoglycemia.**

- Administer **benzodiazepines**.
  - If age >60, consider reducing dose by half.
  - May repeat for total of 2 doses regardless of route.
- **Midazolam: 0.2 mg/kg IM/IN**
  - Max 5 mg if <40kg.
  - Max 10 mg if ≥40kg.
- **Lorazepam, Midazolam: 0.1 mg/kg IV/IO**
  - Administer slowly over 2 minutes.
  - Max single dose 4 mg.

- If greater than 20 weeks of pregnancy or postpartum up to six weeks, administer **Magnesium sulfate** 5 g slow push IV/IO over 5-10 minutes. Refer to **Obstetrical/Gynecological Conditions.** If unclear etiology, you may administer a benzodiazepine simultaneously with the magnesium.
- Initiate continuous cardiac and $EtCO_2$ monitoring.
- Patients requiring pharmacologic management for agitation in the postictal state, refer to **Agitated or Violent Patient/Behavioral Emergency**. Ketamine is not indicated for postictal patients.

Hypoglycemia: Adult & Pediatric

TOC

Includes: Adult or pediatric patient with blood glucose < 60 mg/dL with symptoms of hypoglycemia.

EMT

- Initiate **Universal Care**.
- Assess GCS, mental status, validated **Prehospital Stroke Screening Scales** and refer to **Altered Mental Status** or **Suspected Stroke** as needed.

- If hypoglycemia (glucose < 60 mg/dL), administer **Glucose** 15-25 g PO (ONLY if Alert level of consciousness).

- If hypoglycemia:
  - Birth to 1 month, glucose < 40 mg/dL
  - 1 month and older, glucose < 60 mg/dL
- Administer **Glucose** 0.5-1 g/kg PO, max dose 25 g (ONLY if Alert level of consciousness)

- Reassess vital signs, mental status, finger stick blood glucose.
- Document patient's current medications and doses.
- Criteria for release without transport:
  - Patient returns to normal mental status, with no focal neurologic signs/symptoms after receiving glucose/dextrose,
  - Repeat glucose is > 80 mg/dL,
  - Patient takes insulin or metformin (use caution with patients taking long-acting insulins (Lantus, Levemir, NPH) or other oral diabetic medications),
  - Tolerating oral intake,
  - Patient or legal guardian refuses transport,
  - A reliable adult will be staying with patient,
  - No major co-morbid symptoms exist (chest pain, dyspnea, seizures, intoxication).

Paramedic

- If hypoglycemia (glucose < 60 mg/dL), administer
  - **Dextrose** (max single dose 25 g, repeat as needed)
    - **D_{10} IV/IO** – 1 mL/kg, max dose 250 mL, titrate to effect (preferred)
      (or)
    - **D_{50} IV/IO** - 50 mL
      (or)
  - **Glucagon** 1 mg IM/IN

- If hypoglycemia:
  - Birth to 1 month, glucose < 40 mg/dL
  - 1 month and older, glucose < 60 mg/dL
- Administer
  - **Dextrose**
    - **D_{10} IV/IO:** 1 mL/kg, max dose 250 mL
      (or)
  - **Glucagon**
    - 1 mg IM/IN (if > 20 kg or > 5 yo)
    - 0.5 mg IM/IN (if < 20 kg or < 5 yo)

- Reassess VS, mental status, finger stick blood glucose.
- If continued altered mental status and hypoglycemia, may repeat dose of dextrose or glucagon until symptoms have resolved.
- Patients with Insulin pump:
  - ALOC/AMS – stop insulin pump or disconnect at insertion site.
  - GCS 15 and able to take oral glucose – leave connected with pump running.

Hyperglycemia: Adult & Pediatric

TOC

Includes:
- Adult or pediatric patient with symptoms of hyperglycemia (e.g. polyuria, polydipsia, weakness, dizziness, abdominal pain, tachypnea).
- Adult or pediatric patient with history of diabetes and other medical symptoms.

Excludes: Patient in **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric.**

EMT

- Initiate **Universal Care** and refer to **Airway Management** as indicated**.**
- Obtain blood glucose level.
- Assess GCS, mental status, **Prehospital Stroke Screening Scales**, and refer to **Altered Mental Status** or **Suspected Stroke** accordingly.
- Evaluate for possible sepsis and septic shock, refer to **Sepsis** or **Shock** as needed.

Paramedic

- Obtain waveform capnography (EtCO2) and SPO2 as indicated.
- If hyperglycemia (glucose >250 mg/dL) with symptoms of dehydration, vomiting, or altered level of consciousness:
  give 20mL/kg IV/IO fluid bolus, maximum 2 L.

- Obtain 12-lead ECG to assess for peaked T waves or other findings consistent with hyperkalemia. Refer to **ECG Changes in Hyperkalemia** as needed.

- If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:

  – **Calcium Gluconate** 2 g IV/IO over 5 minutes
  (or)
  – **Calcium Chloride** 1 g IV/IO over 5 minutes, ensure IV/IO patency and do not exceed 1mL/minute
  (and)
  – **Albuterol** 5 mg nebulized.

- If hyperglycemia (glucose >250 mg/dL) with symptoms of dehydration, vomiting, or altered level of consciousness, give 10 mL/kg IV fluid bolus, not to exceed adult dose.

- Obtain 12-lead ECG to assess for peaked T waves or other findings consistent with hyperkalemia. Refer to **ECG Changes in Hyperkalemia** as needed.

- If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:

  - **Calcium Gluconate** 100 mg/kg IV/IO over 5 minutes, max dose 2 g
  (or)
  - **Calcium Chloride** 20 mg/kg (0.2 mL/kg) IV/IO over 5 minutes, max dose 1 g, ensure IV/IO patency and do not exceed 1ml/minute
  (and)
  - **Albuterol** 5 mg nebulized.

Anaphylaxis and Allergic Reaction: Adult & Pediatric

TOC

Includes: patients of all ages with known or suspected allergic reaction and/or anaphylaxis.

EMT

- Initiate **Universal Care**.
- Evaluate for patent airway and presence of oropharyngeal edema.
- Auscultate for wheezing and assess level of respiratory effort.
- Assess adequacy of perfusion.

Determine whether:

- Anaphylaxis:
  - severe and acute onset (and)
  - respiratory compromise (dyspnea, wheeze, stridor, hypoxemia)
  - decreased BP (SBP<90), (or)
  - combination of 2 of the following:
    - Urticaria
    - Swollen tongue and lips
    - Vomiting
    - abdominal pain
    - Syncope
    - Incontinence
- Non-anaphylactic allergic reaction:
  - localized symptoms,
  - localized angioedema without airway or GI symptoms,
  - hives alone.
- If signs of anaphylaxis, assist with patient's own auto-injector, when available.
- Any patient with concern for anaphylaxis or who has received Epinephrine IM, patient should be transported to the ED, even if symptoms have resolved.

	• Hypotension: Minimum SBP = 70 + 2x (age in years.) (Refer to **Abnormal Vital Signs**) 

Paramedic

• Anaphylaxis: **Epinephrine 1 mg/mL**, 0.3 mg IM. May repeat every 5 minutes as indicated.	• Anaphylaxis: **Epinephrine 1 mg/mL,** 0.01 mg/kg IM, max dose 0.3 mg. May repeat every 5 minutes as indicated. 

- If respiratory distress with wheezing, consider:
  - **Nebulized Albuterol** 5 mg.
- For severe respiratory distress with stridor, consider:
  - **Nebulized Epinephrine 1 mg/mL**, 5 mg (5mL of 1mg/mL solution) nebulized.

Assess for sign of **Shock**, fluid bolus IV/IO as indicated.

- For urticaria, rash, itching, or anaphylaxis, administer:
  - **Diphenhydramine:** 1 mg/kg IV/IO/IM/PO, max dose of 50 mg (IV/IO preferred if patient in severe shock).
- If signs of cardiovascular collapse (persistent hypotension with altered mental status, pallor, diaphoresis, or delayed capillary refill) despite administration of IM **Epinephrine** along with IV/IO fluid bolus, refer to **Shock** for **Epinephrine (push dose)**.

Shock: Adult & Pediatric

For shock due to suspected trauma, refer to **General Trauma Management** section guidelines. For shock due to anaphylaxis, refer to **Anaphylaxis** and **Allergic Reaction** .

Shock can present as:

- Tachycardia out of proportion to temperature
- Altered mental status
- Delayed/flash capillary refill >2 seconds
- Hypoxia
- Decreased urine output
- Tachypnea
- Hypotension for age, refer to **Abnormal Vital Signs**
- Weak, decreased or bounding pulses
- Cool/mottled or flushed/ruddy skin

EMT

- Initiate **Universal Care**.
- Check blood glucose, treat per **Hypoglycemia** or **Hyperglycemia** as indicated.
- If pregnant, place in left lateral recumbent position.

Paramedic

- Administer 30 mL/kg IV/IO fluid bolus rapidly.
  - Administer in 10 mL/kg increments reassessing in between boluses, discontinue if vital signs/perfusion normalizes, patient develops rales, crackles or respiratory distress.
- Reassess after each IV fluid bolus.

- For shock unresponsive to IV/IO fluids, or cardiogenic shock with signs of fluid overload, consider:
- **Epinephrine (push dose)**: 10-20 mcg boluses (1-2 mL) every 2 minutes titrated to MAP ≥ 65.

- For shock unresponsive to IV/IO fluids, or cardiogenic shock with signs of fluid overload, consider:
- **Epinephrine (push dose)**: 1 - 10 mcg boluses (0.1 - 1 mL) every 2 minutes, titrated to age-appropriate blood pressure or other indications of adequate perfusion.

- **Epinephrine (push dose) preparation**: mix 1 mL of 0.1 mg/mL (CARDIAC) epinephrine with 9 mL of NS. This results in 10 mcg/mL concentration.

If history of adrenal insufficiency (congenital adrenal hyperplasia, daily steroid use) administer:

- **Methylprednisolone:** 2 mg/kg IV/IO, max 125 mg.
- Dexamethasone is not indicated for adrenal insufficiency.

Sepsis: Adult & Pediatric

Includes: patients meeting sepsis criteria (Elements from Box 1 **PLUS** Box 2) as well as severe sepsis or septic shock (Elements from Boxes 1 + 2 + 3).

1

Suspected Infection or immunosuppression
- Open wounds, sores, cellulitis
- UTI
- Pneumonia
- Meningitis
- Indwelling medical device
- Vomiting, diarrhea
- Recent surgery/procedure
- Chronic steroid use

High-Risk Criteria
- Malignancy and/or chemotherapy
- Asplenia or sickle cell disease
- Bone marrow transplant
- Solid organ transplant
- Severe intellectual disability or cerebral palsy
- Immunocompromise, chronic steroid use

2

Two or more markers of Systemic Inflammatory Response Syndrome (SIRS)
- Temp ≥ 100 or ≤ 97
- HR ≥ 90
- RR ≥ 20
- Glucose > 140 in non-diabetic
- Altered mental status

Exam Criteria	0-2 y	≥ 2-10 y	≥ 10-14 y
HR	>190	>140	>100
RR	>50	>34	>30
Pulses	Decreased, weak, or bounding		
Cap refill	Delayed (> 2 sec) or flash (< 1 sec)		
Skin	Mottled, ruddy, petechiae		
Mental status	Decreased, irritability, confusion, inappropriate crying, poor interaction, diminished arousability		

3

Findings of **Shock**
- SBP < 90 or MAP < 65 or SBP drop of 40 mmHg from prior baseline
- $EtCO_2 \leq 25$
- O_2 sat ≤ 92% on RA
- Mottled or cold extremities
- Central cap refill ≥ 3 seconds
- Purpuric rash
- No radial pulse

Findings of **Shock**
- SBP < 70 + (age in yr X 2).
- 3 or more exam criteria.
- 2 or more exam criteria in patient meeting high-risk criteria.

EMT

- Initiate **Universal Care**.

Paramedic

- Administer 30 mL/kg IV/IO fluid bolus, refer to treatment for **Shock** as indicated.
- Obtain waveform capnography (EtCO2) and SPO2 as indicated.
- Acquire and transmit 12 lead ECG as indicated.
- Provide pre-arrival notification of patient with possible sepsis.

Nausea/Vomiting: Adult & Pediatric

TOC

Includes: Patients currently nauseated and/or vomiting.

EMT

- Initiate **Universal Care**.

Paramedic

- Consider 10-20 mL/kg IV/IO fluid bolus, unless contraindicated (history of CHF, renal failure).
- May repeat as indicated to a max total of 30 mL/kg.

- **Ondansetron** 4 mg PO/SL/IV/IO.
- Contraindicated for known or suspected prolonged QT syndrome.

- Patients 6 mo. – 14 yo.:
  - **Ondansetron** 0.15 mg/kg PO/SL/IV/IO, max 4 mg.
- Contraindicated for known or suspected prolonged QT syndrome.

Cardiac

Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI): Adult

TOC

Includes: Chest pain or discomfort in other areas of the body (e.g. arm, jaw, epigastrium) of potential cardiac origin, shortness of breath, unexplained sweating, nausea, vomiting, or dizziness. Also includes chest pain associated with sympathomimetic use (e.g. cocaine, amphetamines). Atypical or unusual symptoms are more common in women, the elderly and diabetic patients. Patients may also present with CHF, syncope, and/or shock.

EMT

- Initiate **Universal Care**.
- If short of breath, hypoxic, or with obvious signs of heart failure, administer oxygen and titrate to SpO2 of ≥ 94%
- Administer **Aspirin** 325 mg PO or 324 mg chewed.

Paramedic

- Administer **Nitroglycerin** 0.4 mg SL tablets or 1 full spray if SBP > 100 mm Hg.
  - May repeat every 3-5 minutes, until pain resolves and as blood pressure allows.
  - Location of infarct does not preclude use of **nitroglycerin**, however, continuously monitor hemodynamic status and be prepared to resuscitate if hypotension occurs.

Caution: do not give **Nitroglycerin** to any patient who has taken PDE5-inhibitor medication (sildenafil, Tadalafil, epoprostenol, treprostinil) for erectile dysfunction or pulmonary hypertension within 48 hours.

- *For STEMI chest pain* unresponsive to nitrates consider:
  - **Fentanyl** 0.5 mcg/kg/dose IN/IV/IO, max total dose 200 mcg.
  - **Morphine** 0.05 mg/kg/dose IV/IO, max of single dose of 3 mg. May repeat in 10 minutes to a total max of 10 mg if pain unresolved, if blood pressure allows.
    - Morphine should be used with caution in unstable angina/non-STEMI due to an association with increased mortality.

- Obtain 12 lead ECG and transmit, goal within 5 minutes of patient contact.
- Transport patient to **Cardiac Receiving or Referral Center**
- Notify receiving facility immediately for STEMI.
- Transmit 12 lead ECG to receiving facility if possible.
- Performance of serial ECGs is recommended if not diagnostic or change in patient condition.

Bradycardia: Adult & Pediatric

TOC

Includes: Heart rate < 60 with either symptoms (altered mental status, chest pain, congestive heart failure, seizure, syncope, shock, pallor, cyanosis, hypoxia, diaphoresis) or evidence of hemodynamic instability.

EMT

- Initiate **Universal Care.**
- Manage airway as indicated.
- Administer supplemental oxygen as indicated.

- For age ≤ 6 months and heart rate <60 with signs of poor perfusion despite oxygenation and ventilation, initiate chest compressions and refer to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric.**

Paramedic

- Place on cardiac monitor.
- Perform 12-lead ECG.
- In cases of impending hemodynamic collapse (shock), proceed directly to transcutaneous pacing.

- If bradycardia and symptoms of hemodynamic instability continue, consider the following:
  - **Epinephrine (push dose):** 10-20 mcg boluses (1-2 mL) every 2 minutes.
    - Titrate to MAP > 65 or SBP > 90
  - **Atropine Sulfate:** 1 mg IV/IO every 3-5 min, max total dose 3 mg.

Epinephrine (push dose) preparation: mix 1 mL of 0.1mg/mL (CARDIAC) epinephrine with 9 mL of NS. This results in 10 mcg/mL concentration.

- If bradycardia and symptoms or hemodynamic instability continue, consider the following:
  - **Epinephrine 0.1 mg/mL**: 0.01 mg/kg (0.1 mL/kg) IV/IO every 3-5 minutes.
  - **Atropine Sulfate:** 0.02 mg/kg IV/IO (min dose 0.1 mg), max initial dose 0.5 mg, max total dose 3 mg.

- If bradycardia and symptoms of hemodynamic instability continue, consider transcutaneous pacing.
- Consider pharmacologic management or pain control per **Management of Acute Pain** when pacing.
- Initiate $EtCO_2$ for all patients receiving pharmacologic management for pain control.

- Pharmacologic management (if age > 60 consider reducing dose by half):
  - **Midazolam:** 1 mg IV/IO slowly every 2-3 minutes, max dose 5 mg.
  - **Lorazepam:** 1 mg IV/IO every 5-10 minutes, max dose 4 mg.

- Pharmacologic management:
  - **Midazolam:** 0.1 mg/kg IV/IO slowly, every 2-3 minutes, max dose 5mg.
  - **Lorazepam:** 0.1 mg/kg IV/IO every 10 minutes, max dose 4 mg.

Tachycardia with a Pulse: Adult & Pediatric

Includes: Elevated heart rate for age, with or without associated symptoms such as palpitations, dyspnea, chest pain, syncope/near-syncope, hemodynamic compromise, altered mental status or other signs of end organ malperfusion. Adults: HR > 100.
Excludes: sinus tachycardia. Rate-related symptoms are uncommon when heart rate < 150.

EMT

- Initiate **Universal Care.** Search for underlying causes (medications, drugs, history of dysrhythmia, CHF, etc.)

Paramedic

All Unstable tachycardias

- Deliver synchronized cardioversion. Use **Pharmacologic Management** as indicated.

Consider the following if stable symptomatic tachycardia (if known WPW contact on-line medical direction):

Stable SVT

- Perform vagal maneuvers.
- **Adenosine**
  - 6 mg IV/IO.
  - If tachycardia continues, give 12 mg IV/IO.
  - Always follow with 10 mL fluid bolus.
- **Diltiazem**
  - 1st dose = 0.125 mg/kg, max 12.5mg, IV/IO over 2 minutes. Patients > 65 years old, max 10mg.
  - 2nd dose = 0.125 mg/kg, max 12.5mg, IV/IO over 2 minutes, after 10 minutes as needed and as blood pressure allows. Patients > 65 years old, max 10mg.

Irregular narrow complex tachycardia (A-fib, A-flutter, multifocal atrial tachycardia), Stable

- **Diltiazem**
  - 1st dose = 0.125 mg/kg, max 12.5mg, IV/IO over 2 minutes. Patients > 65 years old, max 10mg.
  - 2nd dose = 0.125 mg/kg, max 12.5mg, IV/IO over 2 minutes, after 10 minutes as needed and as blood pressure allows. Patients > 65 years old, max 10mg.

Regular wide complex tachycardia, Stable

- **Amiodarone**
  - 150 mg IV/IO over 10 minutes; repeat once as needed if VT recurs. (or)
- **Lidocaine**
  - 1-1.5 mg/kg IV/IO repeated every 5 minutes, max total dose 3 mg/kg. May repeat at half the original dose.

Irregular wide complex tachycardia, Stable

- **Amiodarone**
  - 150 mg IV/IO over 10 minutes; may repeat.

Torsades

- **Magnesium sulfate**
  - 2 g IV/IO over 5-10 minutes.

Unstable SVT or unstable wide complex tachycardia

- Deliver synchronized cardioversion 1 J/kg. Use **Pharmacologic Management** as indicated.
- Repeat doses should be 2 J/kg.

Consider the following if stable symptomatic tachycardia (if known WPW contact on-line medical direction):

Stable SVT

- Perform vagal maneuvers.
- **Adenosine**
  - 0.1 mg/kg IV/IO, max 6 mg.
  - May repeat with 0.2 mg/kg IV/IO, max 12 mg.
  - Always follow with 10 mL fluid bolus.

Wide complex tachycardia, stable

- **Amiodarone**
  - 5 mg/kg IV/IO over 10 minutes, max 150 mg over 10 minutes.

Hyperlinks to Monitor Reference Sheets:

Philips MRx Monitor

Physio LIFEPAK Monitor

Zoll X Series Monitor

Implantable Ventricular Assist Devices (VAD, LVAD): Adult & Pediatric

TOC

Includes: patients that have had an implantable ventricular assist device (VAD), including a left ventricular assist device (LVAD), right ventricular assist device (RVAD), or biventricular assist device (BiVAD).
Excludes: Total artificial heart (TAH) patients, refer to **Total Artificial Heart (TAH)**.

EMT

- Initiate **Universal Care**.
- BP measurement will require manual cuff and doppler to obtain mean arterial pressure (MAP), assess patient for signs of hypoperfusion, pallor, altered LOC.
- Pulse is variable and not clinically significant in VAD patients.
- Pulse oximetry can be unreliable – look for physical signs and symptoms .
- **Contact the patient's VAD program on-call coordinator using the phone number on the device; follow coordinator's advice.**
  - Banner University Phoenix VAD -----602-819-7910
  - Banner University Tucson VAD ------ 520-694-6000
  - Dignity St. Joseph's VAD---------- 602-406-8000
  - Mayo VAD ---------- 480-342-2999
  - Phoenix Children's Hospital VAD----- 602-933-8800
- Decision to perform CPR should be made in consultation with patient's VAD-trained companion and VAD coordinator. CPR may be initiated only where:
  - Confirmation that the pump has stopped and troubleshooting efforts have failed, and
  - Patient is unresponsive and has no detectable signs of life.
- Bring the patient's backup equipment bag.

- Assess for alarms.
- Assess for possible pump malfunction – mechanical hum should be present on auscultation.
- Contact the patient's VAD-trained companion, if available.
- Check all connections to the system controller; change batteries and/or controller as indicated.
- If patient is experiencing VAD-related complications or cardiovascular problems, transport destination preference is 1) their VAD program, 2) nearest VAD-trained facility, 3) nearest appropriate facility.

Paramedic

- Establish IV/IO.
- If patient has a functioning VAD and is hypoperfusing (pale, diaphoretic, delayed capillary refill, altered mental status), administer 30 mL/kg IV/IO fluid bolus, maximum 1 L, over < 15 minutes, using push-pull method or pressure bag.
- May repeat up to 3 times based on patient's condition and clinical impression.
- Apply cardiac monitor.
- Acquire 12-lead EKG.
- Patient's baseline may be arrhythmia; obtain VAD coordinator's advice prior to administering antiarrhythmics.
- **Do not administer nitroglycerin.**

Total Artificial Heart (TAH): Adult & Pediatric

TOC

Includes: patients that have had a total artificial heart device (TAH). Patients no longer have a native heart.

EMT

- Initiate **Universal Care**.
- BP measurement may use auto-cuff or manual cuff.
- Patient will have a pulse if the device is working.
- **Contact the patient's TAH/VAD program on-call coordinator using the phone number on the device; follow coordinator's advice.**
  - Banner University Phoenix TAH/VAD -----602-819-7910
  - Banner University Tucson TAH/VAD ------ 520-694-6000
  - Dignity St. Joseph's TAH/VAD---------- 602-406-8000
  - Mayo TAH/VAD ---------- 480-342-2999
  - Phoenix Children's Hospital TAH/VAD----- 602-933-8800
- **Never perform CPR for TAH patients.**
- Patient's travel bag with backup controller and spare batteries should ALWAYS accompany them.

- Assess for alarms.
- Assess for possible pump malfunction – pneumatic thumping sound should be audible.
- Assess for signs of hypoperfusion including pallor, diaphoresis, altered mental status.
- Contact the patient's TAH-trained companion, if available.
- If patient is experiencing TAH-related complications or cardiovascular problems, transport destination preference is 1) TAH program, 2) nearest TAH-trained facility, 3) nearest appropriate facility.

Paramedic

- Establish IV/IO.
- If patient has a functioning TAH and is hypoperfusing (pale, diaphoretic, delayed capillary refill, altered mental status), administer 30 mL/kg IV/IO fluid bolus, maximum 1 L, over < 15 minutes, using push-pull method or pressure bag.
- May repeat up to 3 times based on patient's condition and clinical impression.
- There will be no electrical activity on cardiac monitor/EKG.
- **Nitroglycerin** may be administered after consultation with TAH coordinator.

Airway

EMS Guideline for Care of Patients with Known/Suspected Highly Infectious Airborne Respiratory Illness

updated on 3/30/2022

TOC

Clinical concern for highly infectious airborne illness requiring EMS Treatment and Transport

↓

Don Enhanced PPE**
Place surgical mask on patient (may use NC under mask)

↓

Stabilizing Measures

1. Perform all basic and advanced airway procedure in enhanced PPE **
   - Administer oxygen as indicated, up to via nonrebreather at 15 LPM.
   - Place surgical mask over nasal cannula or oxygen mask.
2. Obtain IV/IO access as indicated
3. Treat Shock as indicated, refer to Shock guideline
4. Minimize aerosolization*
5. When available, insert viral filter between BVM/SGA/ETT and bag/ventilator

Highly Infectious Airborne Respiratory Illness

↓

1. Transport to the closest appropriate receiving facility
2. Provide receiving facility notification:
   - "Possible Highly Infectious Airborne Respiratory Illness" and Primary Symptoms
   - If any aerosolizing measures (SVN, CPAP, BVM, CPR) are in use.

*Medications:

- If nebulizer is necessary for concurrent wheezing, this should be administered in open air space and discontinued prior to entering any enclosed space, including hospital hallways.
- Consider using patient's own MDI, 1-2 puffs every 5 minutes.

*Noninvasive Positive Pressure Ventilation (NIPPV):

- Use CPAP/BIPAP when necessary and discontinue prior to entry into a public space, including hospital hallways. If the patient has impending respiratory failure and cannot be safely transitioned to a nonrebreather, coordinate with receiving facility prior to entering. If viral filter is available, place between the mask and oxygen delivery port.

*Advanced Airway Management:

- In patients with suspected/known highly infectious airborne respiratory illness, supraglottic airway is preferred to endotracheal intubation.

**Enhanced PPE: prioritize use of masks blocking aerosolized particles (N95, P100, etc.) when any medication or procedure is being provided that generates aerosolized particles (nebulizers, PPV, airway suction, etc.) and when available wear gown, gloves and eye protection.

Airway Management: Adult & Pediatric

Includes:
- Children and adults with signs of severe respiratory distress/respiratory failure.
- Patients with evidence of hypoxemia or hypoventilation.
- If suspected/known highly infectious airborne respiratory illness, influenza, etc. refer to **Highly Infectious Airborne Respiratory Illness.**

Excludes:
- Patients with tracheostomies.
- Chronically ventilated patients.
- Newborn patients.

EMT

- Use BVM ventilation with appropriate sized mask in the setting of respiratory failure or arrest.
- Consider the addition of oropharyngeal airways (OPA) or nasopharyngeal airways (NPA) or supraglottic (STR) for effective BVM.
- Avoid excessive pressures or volumes during BVM ventilation.
- Elevate head of bed 30 degrees when possible.
- Monitor pulse oximetry

Paramedic

- **NIPPV**: **Non-invasive positive pressure ventilation** for severe respiratory distress or impending respiratory failure **without** decreased level of consciousness:
  - Continuous positive airway pressure (CPAP)
  - Bi-level positive airway pressure (B-PAP)
  - Use **Pharmacologic Management** as indicated
- Consider the use of a supraglottic airway (SGA) if BVM or NIPPV are not effective in maintaining oxygenation or ventilation.
- Patients ≥ 8 yo: Endotracheal intubation should be considered only when less invasive methods fail.
  - Cuffed endotracheal tube should be used for all patients.
  - Tubes should be continuously secured with a commercial tube holder or tape.
  - Continuously monitor clinical signs and ETCO2 for the intubated patient.
  - ETCO2 should be used to verify tube placement and prevent hyper- or hypoventilation.
- Confirm supraglottic or endotracheal airway placement with waveform capnography (EtCO2).
  - If unable to confirm EtCO2, remove airway and place alternate device.
- Gastric decompression may improve oxygenation and ventilation.

- Consider cricothyroidotomy when patients cannot be oxygenated/ventilated with above interventions and the risk of death seems to outweigh the risk of a procedural complication.

- OPA & supraglottic airway (SGA) for patients < 8 yo.
- Contact online medical direction for consideration of endotracheal intubation for special circumstances.
- For children < 8 years old, the only option for cricothyroidotomy is needle cricothyroidotomy.

- **Post-Intubation**
  - Place OG tube placement for gastric decompression when advanced airway adjuncts are placed
  - Repeat vital signs post intubation, If SBP < 100, give IV/IO fluid bolus prior to administering additional pharmacologic management
  - Assess patient comfort and pain during transport, use lower dose for suspected TBI (refer to Traumatic Brain Injury (EPIC-TBI): Adult & Pediatric)
    - **Fentanyl** 1 mcg/kg IV/IO, max 50 mcg, may repeat as needed
    - **Morphine** 0.1 mg/kg IV/IO, max 5mg, may repeat as needed
    - **Midazolam** 0.1 mg/kg IV/IO, max 5mg, , may repeat as needed
    - **Lorazepam** 0.1 mg/kg IV/IO, max 2mg , may repeat as needed
    - **Ketamine** 1mg/kg IV/IO, Max dose 150mg, may repeat every 5 minutes as needed
  - Document EtCO2 reading upon arrival at hospital/transfer of care

Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric

TOC

Respiratory distress with wheezing or decreased air entry in patients ≥ 2 years of age.
Patients < 2 years old, refer to **Pediatric Respiratory Distress – Wheezing < 2 Years Old (Bronchiolitis)**
If suspected COVID, influenza, etc refer to **Highly Infectious Airborne Respiratory Illness.**
Includes: asthma exacerbation, COPD exacerbation, wheezing from suspected pulmonary infection (e.g. pneumonia, bronchitis).
Excludes: anaphylaxis, bronchiolitis, croup, epiglottitis, foreign body aspiration, drowning, congestive heart failure, trauma.

EMT

- Initiate **Universal Care**.
- Provide supplemental O_2 as needed to maintain SpO2 ≥ 94%.
- Assist patient with own medication: **Albuterol** by nebulization or metered dose inhaler.
- Maintain position of comfort.
- Suction the nose and/or mouth (via bulb, Yankauer or catheter) if excessive secretions are present.

Paramedic

- **Albuterol**: 5mg nebulized; Repeat as needed.
- **Ipratropium:** 0.5 mg nebulized with albuterol, may repeat x 2 for maximum of 3 doses

- **Epinephrine** (consider for severe respiratory distress without clinical improvement)
  - 1 mg/mL, 0.01 mg/kg IM, max dose 0.3 mg (anterolateral thigh).
- Initiate $EtCO_2$ monitoring.

- IV/IO placement IF:
  - Clinical evidence of dehydration.
  - Need for IV/IO medication(s).
- Steroids:
  - **Methylprednisolone**
    - 2 mg/kg IV/IO/IM, max dose 125 mg
  - **Dexamethasone**
    - 0.6 mg/kg IV/IO/IM/PO, max dose 10 mg
- **Magnesium sulfate** (consider for severe respiratory distress)
  - 50 mg/kg over 5-10 minutes, max dose = 2 g IV/IO

- **NIPPV: Non-invasive positive pressure ventilation**
  - CPAP/B-PAP.
  - Should be administered for severe respiratory distress or if not improving with less invasive support.
  - Discontinue NIPPV for shock or altered LOC
  - Use **Pharmacologic Management** as indicated
  - If NIPPV is contraindicated or if no improvement with less invasive support, refer to **Airway Management.**
- BVM ventilation is reasonable for pediatric patients or when non-invasive positive pressure ventilation is not available.
- Supraglottic devices and intubation should be utilized only if BVM ventilation fails.
- Confirm supraglottic or endotracheal airway placement with waveform capnography (EtCO2). If unable to confirm EtCO2, remove airway and place alternate device.

Pulmonary Edema: Adult & Pediatric

TOC

Includes:
- Respiratory distress with signs of pulmonary edema and fluid overload.
- If suspected COVID, influenza, etc. refer to **Highly Infectious Airborne Respiratory Illness.**

Excludes:
- Clinical impression consistent with infection (e.g. fever).
- Clinical impression consistent with asthma/COPD.

EMT

- Initiate **Universal Care.**
- Manage airway as necessary.
- Provide supplemental O_2 as needed to maintain SpO2 ≥ 94%.

Paramedic

- **Nitroglycerin:** 0.4 mg SL tablets or 1 full spray if SBP > 100
  - Repeat every 3 minutes as blood pressure allows
  - Contraindicated when patients have taken an PDE5-inhibitor medication (sildenafil, tadalafil, epoprostenol, trepostinil) for erectile dysfunction or pulmonary hypertension within 48 hours.

- Nitroglycerin not indicated in pediatric patients.

- Initiate $EtCO_2$ monitoring.
- Initiate continuous cardiac monitoring.
- Perform 12-lead ECG, refer to **Chest Pain/ACS/STEMI** as indicated.
- **NIPPV**: **Non-invasive positive pressure ventilation**
  - CPAP/B-PAP.
  - Should be administered for severe respiratory distress or if not improving with less invasive support.
  - Discontinue NIPPV for shock or development of altered LOC.
  - Use **Pharmacologic Management** as indicated
  - If NIPPV is contraindicated or if no improvement with less invasive support, refer to **Airway Management.**

Rapid Sequence Intubation (RSI): Age ≥15
Special Training Required (STR)

TOC

Indications: Respiratory failure, facial/airway burns, inability to maintain airway/ventilation. If suspected COVID, influenza, etc refer to **Highly Infectious Airborne Respiratory Illness.**

Relative Contraindications: Known or presumed difficult airway, RSI would delay transport to definitive care. Always consider transport time to hospital.

Contraindications: History of neuromuscular disease, known or suspected renal failure, history of malignant hyperthermia, during management of patient in cardiac arrest, scenarios where intubation can be performed without drug assistance.

EMT

- Initiate **Universal Care**

Paramedic

- Initiate continuous cardiac monitoring, pulse oximetry, and waveform capnography.
- Establish IV/IO
- **Pre-oxygenate**: Nasal cannula plus BVM with high flow oxygen (or) Nasal cannula plus nonrebreather mask with high flow oxygen.
- **Apneic oxygenation**: Place nasal cannula with supplemental oxygen from second source set to max flow. Maintain throughout the procedure.
- **Sedate**:
  - **Etomidate** 0.3 mg/kg IV/IO push, max 20mg, (one-time only dose)
    OR
  - **Ketamine** 1.5 mg/kg IV/IO push, max dose 150mg
- **Paralyze**:
  - **Succinylcholine** 1.5 mg/kg IV/IO push (one-time only dose)
    OR
  - **Rocuronium** 1mg/kg IV/IO push (one-time only dose) – Requires agency/medical director approval
- **Intubate**:
  - Maximum 2 attempts. Ventilate patient between attempts
  - If unable to intubate place OPA or supraglottic airway (SGA) and ventilate via BVM
  - Cricothyrotomy if unable to intubate or oxygenate/ventilate via OPA/SGA and BVM
- **Airway confirmation and documentation:**
  - Confirm supraglottic or endotracheal airway placement with waveform capnography (EtCO2). If unable to confirm EtCO2, remove airway and place alternate device.

- **Post-Intubation**
  - Place OG tube placement for gastric decompression when advanced airway adjuncts are placed
  - Repeat vital signs post intubation.
    - If SBP < 100, give IV/IO fluid bolus prior to administering additional pharmacologic management
  - Assess patient comfort and pain during transport, use lower dose for suspected TBI (refer to **Traumatic Brain Injury (EPIC-TBI): Adult & Pediatric)**
    - **Fentanyl** 1 mcg/kg IV/IO, max 50 mcg, may repeat as needed
    - **Morphine** 0.1 mg/kg IV/IO, max 5mg, may repeat as needed
    - **Midazolam** 0.1 mg/kg IV/IO, max 5mg, , may repeat as needed
    - **Lorazepam** 0.1 mg/kg IV/IO, max 2mg , may repeat as needed
    - **Ketamine** 1mg/kg IV/IO, Max dose 150mg, may repeat every 5 minutes as needed
  - No repeat doses of Etomidate or Succinylcholine
  - Document EtCO2 reading upon arrival at hospital/transfer of care

Resuscitation

Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric

Includes: patients with cardiac arrest. For adult patients who obtain return of spontaneous circulation (ROSC), refer to **Post-Cardiac Arrest and Return of Circulation (ROSC): Adult**.

Excludes:

- Newborns, refer to **Neonatal Resuscitation**.
- Patients with identifiable Do Not Resuscitate (or equivalent) order, refer to **Do Not Resuscitate**.
- Patients with traumatic cardiac arrest, refer to **General Trauma Management** and **Traumatic Cardiac Arrest TOR**.

EMT

- Initiate chest compressions
  - Compression rate: 100-120/minute, perform 200 compressions per round (2 minutes).
  - Ensure adequate recoil.
  - Every 2 minutes, check rhythm (and pulse when indicated), defibrillate if indicated.
  - Chest compressions should resume immediately after defibrillation attempts with no pauses for pulse checks.
- Airway/Ventilation
  - Patients ≥ 8 years old - Initiate passive oxygenation with either non-rebreather mask plus oral airway or supraglottic airway (STR) plus O2 via passive oxygenation port.
    - If no response after 8 minutes, begin manual ventilation (BVM or supraglottic airway (STR)) at rate of 10 breaths per minute.
  - If unwitnessed or respiratory, overdose, trauma, drowning, pediatric patients < 8 years old: immediately begin manual ventilation (BVM or supraglottic airway (STR)) at rate of 10 breaths per minute.
  - Airway management should not interrupt compressions – avoid excessive ventilation volume and pressure
  - All ventilatory support can be administered asynchronously.
- Attach AED without interruption of chest compressions.
  - Immediately perform rhythm analysis and defibrillation, if appropriate.

Paramedic

- IV/IO access as soon as possible without interrupting chest compressions.

- Apply cardiac monitor/defibrillator, if shockable rhythm:
  - Defibrillate per monitor settings

Philips MRx Monitor
Physio LIFEPAK Monitor
Zoll X Series Monitor

• **Epinephrine:** 1 mg (0.1 mg/mL) IV/IO every 3-5 minutes (max 3 total doses of epinephrine)	• **Epinephrine:** 0.01 mg/kg (0.1 mg/mL) IV/IO (max dose 1mg) every 3-5 minutes (max 3 total doses of epinephrine) 

- For shock-refractory VF/Pulseless VT, consider:
  - **Amiodarone:** 5 mg/kg, max 300 mg IV/IO, may repeat at half the original dose at 5 minutes (or)
  - **Lidocaine:** 1mg/kg IV/IO, may repeat at half the original dose every 5 minutes (max total dose of 3 mg/kg).
- For Torsades de Pointes:
  - **Magnesium sulfate:** 50 mg/kg IV/IO, max dose 2g (adult dose) over **5** minutes

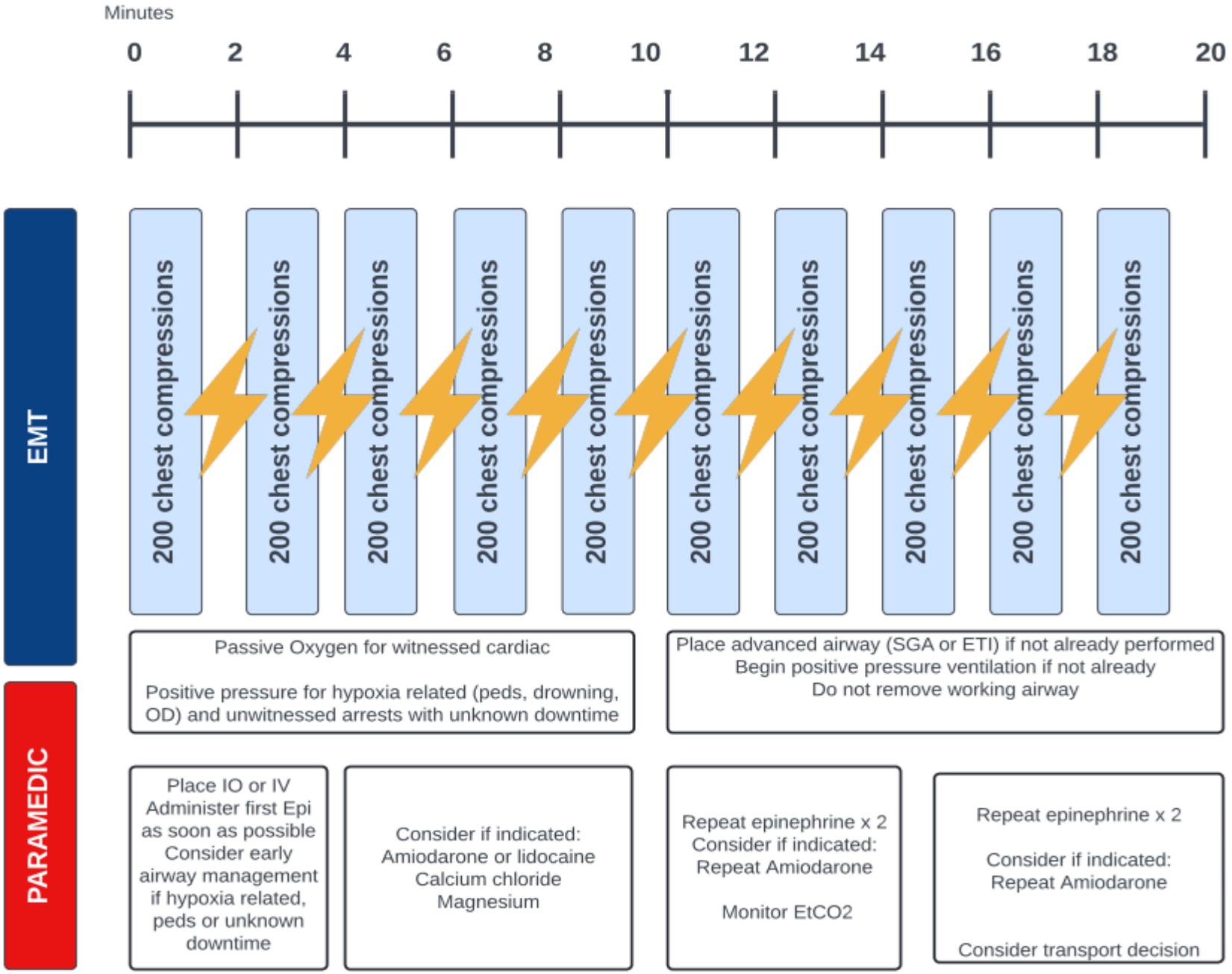
Consider reversible causes of cardiac arrest:

- Hypothermia
- Hyperkalemia
- If findings of or concern for **hyperkalemia** are present, administer IV/IO fluids and:
  - **Calcium Gluconate** : 100 mg/kg IV/IO, max dose 2g over 5 minutes, IV/IO over 5 minutes (or)
  - **Calcium Chloride**: 20 mg/kg (0.2 mL/kg), max dose 1g IV/IO over 5 min, ensure IV/IO patency.
- Hypovolemia
- Overdose, refer to **Poisoning/Overdose Universal Care.**
- Tension pneumothorax

If patient remains unresponsive to treatment after 4 rounds, make transport decision or refer to **Non-Traumatic TOR** as indicated.

Prehospital CPR Timeline

Prehospital CPR Timeline



Post-Cardiac Arrest and Return of Spontaneous Circulation (ROSC) Care, Transport to Cardiac Receiving Center (CRC): Adult & Pediatric

TOC

Includes: patients with return to spontaneous circulation following cardiac arrest resuscitation.

EMT

Support Airway/Oxygenation/Ventilation.

- Titrate oxygen to SpO2 of ≥ 94%.
- Maintain ventilation rate of 10 bpm if no spontaneous respirations at 10 bpm. Avoid hyperventilation/overventilation.

Evaluate and treat hypoglycemia.

- Check blood glucose.
- If hypoglycemic (BG <60 mg/dL), refer to **Hypoglycemia**.
- If hyperglycemic, notify hospital on arrival, refer to **Hyperglycemia**.

- Notify receiving facility as soon as possible.
- Transport to a recognized **Cardiac Receiving Center** when feasible and resources available or
- Transport to the closest appropriate facility, if any of the following apply:
  - Traumatic cardiac arrest,
  - Ongoing CPR without ROSC,
  - If transport to CRC will add >15 additional minutes to transport time

Paramedic

- Escalate airway management as indicated.
- Monitor EtCO2 levels, maintain at 35-45 mmHg. Adjust ventilatory rate as needed.
  - EtCO2 should remain > 20 mmHg, lower readings may be indicative of rearrest
- Perform 12-lead ECG as soon as possible.

Maintain hemodynamic stability and prepare for potential rearrest.

- Keep finger on pulse to detect loss of pulses and monitor EtCO2 levels
- Administer Push Dose (PD) Epi if heart rate or blood pressure down-trending or signs of shock, refer to **Shock guideline.**
  - While administering fluid boluses, frequently reassess perfusion for improvement and/or fluid overload. If patient develops signs of fluid overload, discontinue IVF infusion.
- Treat bradycardia per **Bradycardia guideline** (bradycardia may precede rearrest)
  - Consider transcutaneous pacing for bradycardia post ROSC unresponsive to push dose Epi.

Rearrest:

- Resume chest compressions & treat underlying rhythm
- If PEA → likely due to shock
  Resume chest compressions
  Treat shock (IV fluids, push dose Epi)
- If VF/VT → defibrillate and resume compressions

- **Max total dose Epi during resuscitation is 3 doses**
  - If 1 or 2 doses of Epi were administered prior to ROSC, the additional dose(s) can be given to reach max of 3 doses

- Prevent hyperthermia only, do not perform therapeutic hypothermia.
- Do not warm patient unless environmental hypothermia is suspected.

Obvious/Apparent Death: Adult & Pediatric

TOC

At a likely crime scene, disturb as little potential evidence as possible.

Excludes:
- Hypothermia, drowning, or lightning strikes.
- If patient does not meet the criteria below, refer to **Traumatic Cardiac Arrest TOR** or **Non-Traumatic TOR** or **Do Not Resuscitate Status/Advanced Directives/Healthcare Power of Attorney (POA) Status** as indicated.

EMT

- If the patient meets the criteria listed below, no resuscitative efforts need to be initiated. On-line medical direction is NOT necessary. Contact law enforcement and initiate grief support. An EMS provider must remain with the patient until released to law enforcement, medical examiner, crisis response, or other authorized personnel.

- For these conditions, confirmation with cardiac monitor is NOT required:
  - Decapitation
  - Decomposition
  - Transection of the torso
  - Incineration: 90% of body surface area with full thickness burns as exhibited by ash rather than clothing and complete absence of body hair with charred skin

- For these conditions, confirmation of pulseless and apneic state is REQUIRED:
  - Currently pulseless, presumed pulseless time of greater than 30 minutes, and nonshockable rhythm
  - Dependent lividity
  - Rigor mortis
  - Injuries incompatible with life (such as massive crush injury, complete exsanguination, severe displacement of brain matter)

- For all others that do not meet above criteria:
  - Refer to **Traumatic Cardiac Arrest TOR** or **Non-Traumatic TOR** or **Do Not Resuscitate Status/Advanced Directives/Healthcare Power of Attorney (POA) Status** as indicated.

Paramedic

Do Not Resuscitate Status/Advanced Directives/Healthcare Power of Attorney (POA) Status: Adult & Pediatric

TOC

1. Patients must have one of the following documents or a valid alternative (such as identification bracelet indicating wishes) immediately available:
   - **Orange Form/Prehospital Medical Care Directive/Do Not Resuscitate (DNR)**: identifies that CPR and intubation are not to be initiated if the patient is in arrest. The form must be signed by a physician or other licensed medical provider to be valid.
   - **Provider Orders for Life Sustaining Treatment (POLST) or Medical Orders for Life Sustaining Treatment (MOLST):** explicitly describes acceptable interventions for the patient in the form of medical orders, must be signed by a physician or other licensed medical provider to be valid. The interventions covered by this order and the details around when to implement them can vary widely.
   - **Advanced directives:** document that describes acceptable treatments under a variable number of clinical situations including some or all of the following; what to do for cardiac arrest, whether artificial nutrition is acceptable, organ donation wishes, dialysis, etc. Frequently does not apply to emergent or potentially transient medical conditions.
   - In the absence of formal written directions (MOLST, POLST, DNR, advanced directives), a person on scene with power of attorney for healthcare, or healthcare proxy, may prescribe limits of treatment.
2. Any of the documents described above are valid when they meet all of the following criteria:
   - Intact condition; it should not been cut, broken or shows signs of being repaired (and)
   - Displays the patient's name and the physician's name.
3. If there is question about the validity of the document/instrument, the best course of action is to proceed with the resuscitation until additional information can be obtained to clarify the best course of action and contact on-line medical direction.

EMT

- If the patient has a valid DNR, no CPR or airway management should be attempted. Comfort measures should still be offered. If resuscitative efforts were initiated and a valid DNR was recovered later, efforts may be discontinued. On-line medical direction is not required.
- If the patient has a MOLST, POLST, or advanced directive, initiate CPR and airway management and contact on-line medical direction for consideration or termination of resuscitation.

- If there is a valid DNR and there are signs of life (pulse and respirations), EMS providers should provide standard, appropriate treatment under existing protocols according to the patient's condition.
- If the patient has a MOLST or POLST, contact on-line medical direction for specific guidance on how to proceed in this situation.
- Contact on-line medical direction if for any reason an intervention that is prohibited by an advanced directive is being considered.

Paramedic

Non-Traumatic Termination of Resuscitative Efforts (TOR): Adult & Pediatric

TOC

Includes:

- Any **non-traumatic** cardiac arrest patient that has received resuscitation in the field, but has not responded to treatment.
- After termination, do not alter body condition in any way or remove equipment (lines, tubes, etc.). Doing so may compromise potential Medical Examiner investigation.

Excludes:

- Patients in cardiac arrest associated with medical conditions that may have better outcome despite prolonged efforts, such as hypothermia, lightning strikes, submersion/drowning. Consider continuing efforts in such cases or contact on-line medical direction.
- Patients meeting criteria for **Obvious/Apparent Death.**

EMT

- Initiate resuscitation, refer to **Cardiac Arrest (VF/VT/Asystole/PEA: Adult & Pediatric.** If a valid DNR is available refer to **Do Not Resuscitate Status/Advanced Directives/Healthcare Power of Attorney (POA) Status.**
- Perform 4 rounds of CCR/MICR or ACLS. Focus on resuscitation on-scene versus "load and go."
- Apply AED and follow prompts.

- Consider Termination of Resuscitation (TOR) if the following criteria are met:
  - Not Witnessed,
  - No shock advised by AED,
  - No ROSC (return of spontaneous circulation).
- If patient meets all 3 TOR criteria after 4 rounds of CCR/MICR, consider TOR. TOR requires on-line medical direction. If ROSC is achieved, continue treatment and refer to **Post Cardiac Arrest and Return of Spontaneous Circulation (ROSC) Care, Transport to Cardiac Receiving Center (CRC).**

- Contact on-line medical direction if patient does not meet all TOR criteria or other special circumstances surround resuscitation or if the patient is < 18.

Paramedic

- IV/IO access as soon as possible without interrupting chest compressions.

- Apply cardiac monitor/defibrillator.
- For narrow complex PEA with rate > 40 or refractory VF/VT, consider resuscitation for up to 60 minutes from time of dispatch.

- In addition to above criteria for TOR, consider TOR if **ALL** the following:
  - Witnessed arrest, 20 minutes of resuscitation , $ETCO_2$ <20, and non-shockable rhythm (PEA/Asystole)

Pediatric Only Guidelines

Pediatric Respiratory Distress – Wheezing < 2 Years Old (Bronchiolitis)

TOC

Includes: Child < 2 yo with wheezing or diffuse rhonchi with a viral or other undifferentiated illness characterized by rhinorrhea, cough, fever, tachypnea and/or respiratory failure.

Excludes: Suspected **Anaphylaxis**, **Croup**, epiglottitis, foreign body aspiration, submersion/**Drowning**.

EMT

- Initiate **Universal Care** and refer to **Airway Management** as indicated.
- Suction the nose and/or mouth (via bulb, Yankauer or catheter) if excessive secretions are present.
- Supplemental oxygen: escalate from nasal cannula to face mask to non-rebreather mask as needed in order to maintain normal oxygenation.
- BVM ventilation for children with respiratory failure or impending respiratory failure.

Paramedic

- IV/IO should only be placed for clinical concerns of severe dehydration requiring immediate treatment or for administration of IV/IO medications.
- ETCO2 should be routinely used as an adjunct to other forms of respiratory monitoring.
- For severe respiratory distress, if suctioning and oxygen fail to result in clinical improvement, administer
  - **Nebulized Epinephrine:** 1 mg/mL, 5 mg (5mL of 1mg/mL solution) nebulized.
    - Patients receiving inhaled epinephrine should be transported to definitive care.

- For severe respiratory distress, non-invasive positive pressure ventilation or high flow nasal cannula may be administered, if available.
  - Do not delay administration of medication to administer non-invasive positive pressure ventilation.
- Supraglottic airway should be utilized only if BVM ventilation fails.
- The airway should be managed in the least invasive way possible.

Pediatric Stridor (e.g., Croup)

TOC

Includes: History of stridor or barky cough.

Excludes: Suspected **Anaphylaxis**, foreign body aspiration, submersion/**Drowning**, **Asthma**, **Bronchiolitis**.

EMT

- Initiate **Universal Care**.
- Suction the nose and/or mouth (via bulb, Yankauer or catheter) if excessive secretions are present.
- Initiate BVM ventilation for children with respiratory failure.
- Monitor pulse oximetry.

Paramedic

- IV/IO should only be placed for clinical concerns of severe dehydration requiring immediate treatment or for administration of IV/IO medications.
- For severe respiratory distress, if suctioning and oxygen fail to result in clinical improvement, administer
  - **Nebulized Epinephrine:** 1 mg/mL, 5 mg (5 mL of 1mg/mL solution) nebulized.
    - Repeat epinephrine at the above dose with unlimited frequency for ongoing distress.
    - Patients receiving inhaled epinephrine should be transported to definitive care.

- $EtCO_2$ should be routinely monitored as an adjunct to other forms of monitoring.
- **Dexamethasone:** 0.6 mg/kg PO/IM/IV/IO, max dose 10 mg.
- For severe respiratory distress, non-invasive positive pressure ventilation may be administered, if available.
  - Do not delay administration of medication(s) to administer non-invasive positive pressure ventilation.
- Supraglottic airway should be utilized only if BVM ventilation fails.
- The airway should be managed in the least invasive way possible.

Pediatric Brief Resolved Unexplained Event (BRUE)

TOC

Includes:
An infant with a sudden, brief episode, that is frightening to the observer which is unexplained and completely resolved upon arrival of EMS with some combination of the following:

- Absent, decreased or irregular breathing (apnea: central or obstructive) including choking or gagging.
- Color change (usually cyanosis or pallor), not including only redness (face) or isolated hands/feet cyanosis.
- Marked change in muscle tone (flaccid or rigid).
- Altered level of responsiveness (increased or decreased, irritability).

Excludes:

- Age > 12 months,
- **Seizures**,
- **Respiratory distress**,
- Cardiopulmonary arrest, refer to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**,
- Trauma with known mechanism of injury, refer to **General Trauma Management**.
- History or exam concerning for child abuse or maltreatment. Refer to **Abuse and Maltreatment**.

EMT

- Initiate **Universal Care**.
- Have high index of suspicion for abuse in children presenting with BRUE.
- Check blood glucose; refer to **Hypoglycemia** if appropriate.

- Regardless of patient appearance, all patients with a history of signs or symptoms of BRUE should be transported for further evaluation.
    - Given possible need for intervention, all patients should be transported to facilities with baseline readiness to care for children.
    - Consider a facility with pediatric critical care capability, if available, for patients with any **high-risk criteria:**
        - Less than 2 months of age.
        - History of prematurity ($\leq$ 32 weeks gestation).
        - More than 1 BRUE, now or in past.
        - Event duration > 1 minute.
        - CPR or resuscitation by caregivers or trained rescuers.
- Contact medical direction if parent/guardian refusing medical care and/or transport especially with high-risk criteria.

Paramedic

- IV/IOs should only be placed in children for clinical concerns of shock, or when administering IV/IO medications.
- Supraglottic airway should be used only if BVM ventilation fails in setting of respiratory failure or apnea. The airway should be managed in the least invasive way possible.
- For severe respiratory distress, refer to **Airway Management**.

Neonatal Resuscitation page 1 of 2

TOC

Includes: all neonates immediately following birth.

EMT

- Wait at least 60 seconds post-delivery before clamping and cutting the umbilical cord in 2 places and cut between clamps..
- Warm, dry, and stimulate baby for 30 seconds.
- Wrap infant in dry towel and keep as warm as possible during resuscitation. Keep head covered if possible. If gestational age is less than 32 weeks, additional thermoregulation interventions are recommended (plastic wrap or bag).
- If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin to skin with mother and covered with dry linen.
- If weak cry, signs of respiratory distress, poor tone, or preterm gestation, then position airway (sniffing position) and clear airway as needed. If signs of respiratory distress with airway obstruction, suction mouth then nose; routine suctioning is not recommended.
- Consider checking blood glucose for ongoing resuscitation, maternal history of diabetes, ill appearing, or unable to feed. Refer to **Hypoglycemia** as needed.

First 30-60 seconds:

If heart rate > 100 beats per minute:

- Monitor for central cyanosis and provide blow-by oxygen as needed.
- Monitor for signs of respiratory distress. If apneic or in significant respiratory distress, initiate BVM ventilation with room air at 20 breaths per minute. Goal SPO2 at 10 minutes is 85-95%.

If heart rate < 100 beats per minute:

- Initiate BVM ventilation with room air at 20 breaths per minute while monitoring heart rate closely.
- If no improvement after 90 seconds: change O_2 delivery to 100% FiO_2 until heart rate normalizes

If heart Rate < 60 beats per minute:

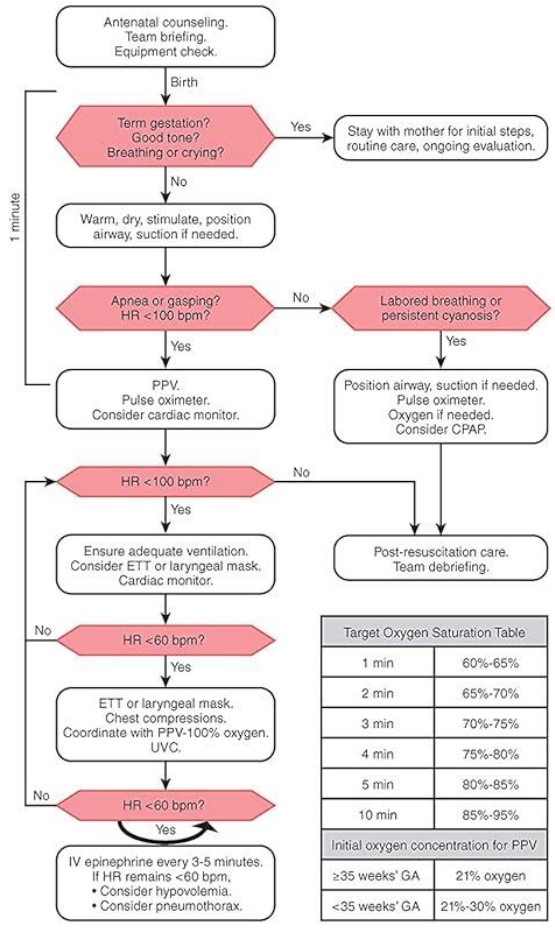
- Ensure effective ventilations with supplementary oxygen and adequate chest rise.
- If no improvement after 30 seconds, initiate chest compressions (2 thumb technique preferred).
- Coordinate chest compressions with BVM ventilations (3:1 ratio, 90 compressions and 30 breaths per minute).

Paramedic

- Supraglottic devices should be used only if BVM ventilation fails in setting of respiratory failure or apnea. The airway should be managed in the least invasive way possible.
- If apneic or in significant respiratory distress, refer to **Airway Management**.
- Ensure adequate ventilation prior to beginning chest compressions.
- Administer Epinephrine after 30 seconds of positive pressure ventilations and heart rate remains less than 60 beats per min.
  - **Epinephrine:**
    - 0.1 mg/mL, 0.01 mg/kg IV/IO every 3-5 minutes if heart rate remains < 60 beats/min
- Administer 20 mL/kg IV/IO fluid bolus for signs for shock or post-resuscitative care.

Neonatal Resuscitation Program®, 8th Edition - Reference Chart

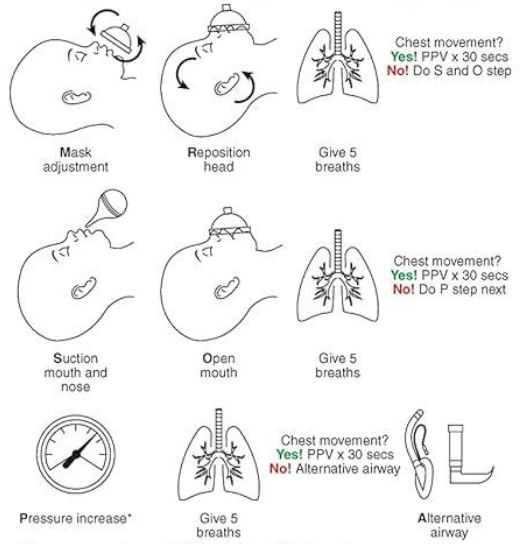
The most important and effective step in neonatal resuscitation is ventilation of the baby's lungs.



Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Ventilation Corrective Steps (MR. SOPA)

When a MR. SOPA step results in chest movement, ventilate for 30 seconds and reassess heart rate.



* Increase pressure incrementally by 5 to 10 cm H_2O. The maximum recommended pressure is 40 cm H_2O in a term baby.

Endotracheal Intubation

Gestational Age (weeks)	Depth of Insertion at Lips (cm)	ET Tube Size (ID, mm)
23-24	5.5	Size 2.5
25-26	6.0	< 1 kg or < 28 weeks
27-29	6.5	Size 3.0
30-32	7.0	1-2 kg or 28-34 weeks
33-34	7.5	Size 3.5
35-37	8.0	> 2 kg or > 34 weeks
38-40	8.5	
41-43	9.0	3.5-4.0

Shaded table adapted from Kempley ST, Moreiras JW, Petrone FL. Endotracheal tube length for neonatal intubation. *Resuscitation*. 2008;77(3):369–373.

Neonatal Code Medications

Drug	Dose*	0.5 kg	1 kg	2 kg	3 kg	4 kg	Administration
Epinephrine IV/IO Concentration: 0.1 mg/mL 1 mg/10 mL	0.02 mg/kg Equal to 0.2 mL/kg	IV Dose: 0.01 mg Volume: 0.1 mL	IV Dose: 0.02 mg Volume: 0.2 mL	IV Dose: 0.04 mg Volume: 0.4 mL	IV Dose: 0.06 mg Volume: 0.6 mL	IV Dose: 0.08 mg Volume: 0.8 mL	IV/IO rapid push Flush with 3 mL NS Repeat every 3-5 minutes if heart rate less than 60 bpm
Epinephrine ETT Concentration: 0.1 mg/mL 1 mg/10 mL	0.1 mg/kg Equal to 1 mL/kg	ET Dose: 0.05 mg Volume 0.5 mL	ET Dose: 0.1 mg Volume 1 mL	ET Dose: 0.2 mg Volume 2 mL	ET Dose: 0.3 mg Volume 3 mL	ET Dose: 0.4 mg Volume 4 mL	May administer while vascular access is being established ETT rapid push No need for flush. Provide PPV breaths to distribute into lungs.
Normal Saline IV 0.9% NaCl	10 mL/kg	5 mL IV	10 mL IV	20 mL IV	30 mL IV	40 mL IV	Give over 5-10 min

*The recommended dose range for intravenous or intraosseous administration is 0.01 to 0.03 mg/kg (equal to 0.1 to 0.3 mL/kg).
The recommended dose range for endotracheal administration is 0.05 to 0.1 mg/kg (equal to 0.5 to 1 mL/kg).

These suggested epinephrine doses are based on a desire to simplify dosing for educational efficiency and do not endorse any particular dose within the recommended dosing range. Additional research is needed to ascertain the ideal epinephrine dose.

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NRP339

OB/GYN

Childbirth

Includes: Imminent delivery with crowning.
Excludes: Vaginal bleeding in any stage of pregnancy without signs of imminent delivery, refer to **Obstetrical/Gynecological Conditions**.
Emergencies in first or second trimester of pregnancy, refer to **Obstetrical/Gynecological Conditions**.
Seizure from eclampsia, which can occur up to 6 weeks postpartum, refer to **Seizures**.

EMT

- Delivery should be controlled and support the newborn's head.
- Check the umbilical cord. If surrounding the neck, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
- Do NOT routinely suction the infant's airway (even with a bulb syringe) during delivery.
- Grasping the head with hand over the ears, gently pull down to allow delivery of the anterior shoulder.
- Gently pull up on the head to allow delivery of the posterior shoulder.
- Slowly deliver the remainder of the infant.
- Wait at least at least 1 minute post delivery before clamping and cutting the umbilical cord.
- Clamp cord 5-6 inches from the abdomen with 2 clamps and cut the cord between the clamps.
- Record **APGAR** scores at 1 and 5 minutes. After delivery of infant, suctioning (including suctioning with a bulb syringe) should be reserved for infants who have obvious obstruction to the airway or require positive pressure ventilation. Refer to **Neonatal Resuscitation** for further care of the infant.

If complications of delivery are identified, apply high-flow oxygen to mother and perform the following steps:

- **Shoulder Dystocia:** if delivery fails to progress after head delivers, quickly attempt the following:
  - Hyperflex mother's hips to severe supine knee-chest position (i.e.. McRobert's maneuver).
  - Apply firm suprapubic pressure to attempt to dislodge shoulder. This often requires 2 EMS providers to perform and allows for delivery in up to 75% of cases.
  - Attempt to angle the baby's head as posteriorly as possible but never pull.
  - Continue with delivery as normal once the anterior shoulder is delivered
- **Prolapsed Umbilical Cord:**
  - Place gloved fingers into vagina and gently lift head/body off the cord.
  - Assess for pulsations in cord, if no pulses felt, lift the presenting part off the cord.
  - Wrap the prolapsed cord in moist sterile gauze.
  - If previous techniques are not successful, mother should be placed in prone knee-chest position or extreme Trendelenburg with hips elevated.
- **Maternal cardiac arrest:**
  - Apply manual pressure to displace uterus from right to left.
  - Refer to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**.
  - Transport as soon as possible if infant is estimated to be over 24 weeks gestation (perimortem Cesarean section at receiving facility is most successful if done within 5 minutes of maternal cardiac arrest).
- **Breech birth – if head fails to deliver:**
  - Place gloved hand into vagina with fingers between infant's face and uterine wall to create an open airway.
  - Place your index and ring fingers on the baby's cheeks forming a "V" taking care not to block the mouth and allowing the chin to be tilted toward the chest flexing the neck.
  - Transport as soon as possible and contact on-line medical direction and/or closest appropriate receiving facility for direct medical oversight and to prepare team.

Paramedic

- The placenta will deliver spontaneously, often within 5-15 minutes of the infant. Do not force the placenta to deliver. Contain all tissue in plastic bag and transport.
- Postpartum hemorrhage: After delivery, massaging the uterus (fundal massage) and allowing the infant to nurse will promote uterine contraction and help control bleeding. If bleeding continues, consider:
  TXA: 1 g IV bolus.
- If signs or symptoms of **Preeclampsia/Eclampsia** refer to **Obstetrical/Gynecological Conditions.**

Obstetrical/Gynecological Conditions

TOC

Includes:
- Female patient with vaginal bleeding in any trimester of pregnancy,
- Female patient with pelvic pain or possible ectopic pregnancy,
- Maternal age at pregnancy may range from 10 to 60 years of age.

Excludes:
- Childbirth and active labor. Refer to **Childbirth**.
- Seizure related to pregnancy/eclampsia, which can occur up to 6 weeks postpartum, refer to **Seizures**.
- Post-partum hemorrhage, refer to **Shock**.

EMT

- Initiate **Universal Care**.
- Check blood glucose. Refer to **Hypoglycemia** if needed.
- Monitor pulse oximetry if signs of hypotension or respiratory symptoms.
- If signs of **Shock** or orthostasis are present, position patient supine or in the left lateral recumbent position if third trimester and keep patient warm.
- Patients in third trimester of pregnancy should be transported on left side or with uterus manually displaced to left if hypotensive.
- Do not place hand/fingers into vagina of bleeding patient except in cases of prolapsed cord or breech birth that is not progressing. Refer to **Childbirth**.

Paramedic

- If signs of shock or orthostasis, refer to **Shock**.
- Reassess vital signs and response to fluid resuscitation.

- Initiate cardiac monitoring and obtain 12-lead ECG if there is history of syncope or lightheadedness.
- **Pre-eclampsia/Eclampsia** symptoms:
  - BP >140/90 and any of the following:
    - visual disturbances (e.g. blurred vision, spots, floaters, vision loss)
    - dizziness
    - headache
    - altered mental status
    - peripheral edema
    - abdominal pain
    - nausea or vomiting
    - seizure
- Any pregnant patient more than 20 weeks gestation who is seizing should be assumed to have **eclampsia** and treated as such until arrival at the hospital.
- Treatment with **Magnesium sulfate**:
  - Seizure prophylaxis: 4 g IV over 10-15 minutes, followed by 2 g/hr IV if available.
  - Seizure management: 5 g IV over 5-10 minutes.
    - For active seizure not responding to magnesium, refer to **Seizure**, and treat with benzodiazepines.
- For nausea or vomiting refer to **Nausea/Vomiting**.

TOC

Perinatal Facilities

	Level IV	Level IIIB	Level IIIA	Level II
Abrazo Arrowhead			X	
Abrazo West				X
Banner Del Webb				X
Banner Desert/Cardon Children's		X		
Banner Casa Grande				X
Banner Estrella			X	
Banner Gateway				X
Banner Ironwood				X
Banner Ocotillo				X
Banner Thunderbird		X		
Banner UMC-P	X			
Chandler Regional			X	
HonorHealth Scottsdale-Shea		X		
HonorHealth Sonoran				X
Valleywise/Maricopa Integrated Health		X		
Mercy Gilbert				X
Mountain Vista				X
Phoenix Children's		X		
St. Joseph's		X		

Perinatal Facilities

TOC

High risk pregnancies include prematurity (<32 weeks), any bleeding in third trimester, pre-eclampsia/eclampsia (seizures), no prenatal care, twins or >, premature rupture of membranes, ante-partum hemorrhage (placental abruption, placenta previa, and uterine rupture), or other complications of labor (breech position, prolapsed cord, ect.), or recent drug use. These patients need transport to appropriate perinatal facility.

Level IV Facilities: Provide care for low-risk, uncomplicated to more critical maternal and neonatal medical conditions, obstetric and fetal complications .

Centers care for all gestational ages, all subspecialty and intensive care

Level IIIB Facilities: Provide care for low-risk, uncomplicated to more complex maternal and neonatal medical conditions, obstetric and fetal complications. Requires the ability to detect, stabilize and initiate management of unanticipated problems until the patient can be transferred to appropriate level of care.

Centers care for all gestational ages and select subspecialty and intensive care

Level IIIA Facilities: Provide care for low-risk, uncomplicated and selected high-risk mothers and newborns. Requires the ability to detect, stabilize and initiate management of unanticipated problems until the patient can be transferred to a facility for the appropriate level of care

Gestational age 28 weeks and greater only.

Level II Facilities: Provide care for low-risk, uncomplicated and selected high-risk mothers and newborns. Requires the ability to detect, stabilize and initiate management of unanticipated problems until the patient can be transferred to a facility for the appropriate level of care

Specialty care 32 weeks gestational age and greater.

All OB patients should be transported to the ED if the Labor & Delivery (L&D) department does not have a ground floor direct entrance. If the patient needs to go to L&D without further delay, a hospital provider will accompany the patient and EMS crew to L&D, according to hospital policy.

Trauma

General Trauma Management: Adult & Pediatric

TOC

Includes:
- Blunt trauma,
- Penetrating trauma,
- Burns.

EMT

- Initiate **Universal Care**.

Primary survey
- Hemorrhage control, refer to **External Hemorrhage Management**.
  - Apply direct pressure or tourniquet (if extremity hemorrhage) as needed to control bleeding.
- Establish patent airway with cervical spine precautions (refer to **Airway Management** and **Spinal Motion Restriction** as needed).
- Monitor oxygen saturation, provide supplemental oxygen.
- For open chest wound, place occlusive dressing, refer to **Thoracic Injury Management**.
- If pelvis is unstable and patient is hypotensive, place pelvic binder or sheet to stabilize pelvis.
- Maintain spine precautions per **Spinal Motion Restriction**.
- Splint extremity deformities per **Extremity Trauma**.
- If clinical signs of traumatic brain injury, refer to **Traumatic Brain Injury (EPIC-TBI)**.
- Evaluate for increased risk for bleeding, see **Blood thinner list**

Paramedic

- If SBP < 90 mmHg or HR > 120, give 1 L IV/IO fluid bolus, may repeat as indicated.
- Provide pain medications per **Management of Acute Pain.**

- Consider administration if potential hemorrhagic shock and within 3 hrs of injury: **TXA**:
  - 1 g bolus

- If tachycardia for age with signs of poor perfusion, give 20 mL/kg IV/IO fluid bolus, may repeat as indicated.
- Provide pain medications per **Management of Acute Pain**.

- Consider administration if potential hemorrhagic shock and within 3 hrs of injury: **TXA**:
  - 15 mg/kg, max 1 g bolus

- If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax. Perform needle decompression. Refer to **Thoracic Injury Management**.
- Avoid hypothermia.
- Transport to most appropriate facility, see **Guideline for Field Triage of Injured patient.**

National Guideline for the Field Triage of Injured Patients

RED CRITERIA

High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
• Penetrating injuries to head, neck, torso, and proximal extremities • Skull deformity, suspected skull fracture • Suspected spinal injury with new motor or sensory loss • Chest wall instability, deformity, or suspected flail chest • Suspected pelvic fracture • Suspected fracture of two or more proximal long bones • Crushed, degloved, mangled, or pulseless extremity • Amputation proximal to wrist or ankle • Active bleeding requiring a tourniquet or wound packing with continuous pressure	**All Patients** • Unable to follow commands (motor GCS < 6) • RR < 10 or > 29 breaths/min • Respiratory distress or need for respiratory support • Room-air pulse oximetry < 90% **Age 0–9 years** • SBP < 70mm Hg + (2 x age in years) **Age 10–64 years** • SBP < 90 mmHg or • HR > SBP **Age ≥ 65 years** • SBP < 110 mmHg or • HR > SBP

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

YELLOW CRITERIA

Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash – Partial or complete ejection – Significant intrusion (including roof) • >12 inches occupant site OR • >18 inches any site OR • Need for extrication for entrapped patient – Death in passenger compartment – Child (age 0–9 years) unrestrained or in unsecured child safety seat – Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height > 10 feet (all ages)	**Consider risk factors, including:** • Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers **If concerned, take to a trauma center**

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

RAMP Triage

Establish Priority for Treatment and Evacuation with **R**apid **A**ssessment of **M**ental Status and **P**ulse (**RAMP**)

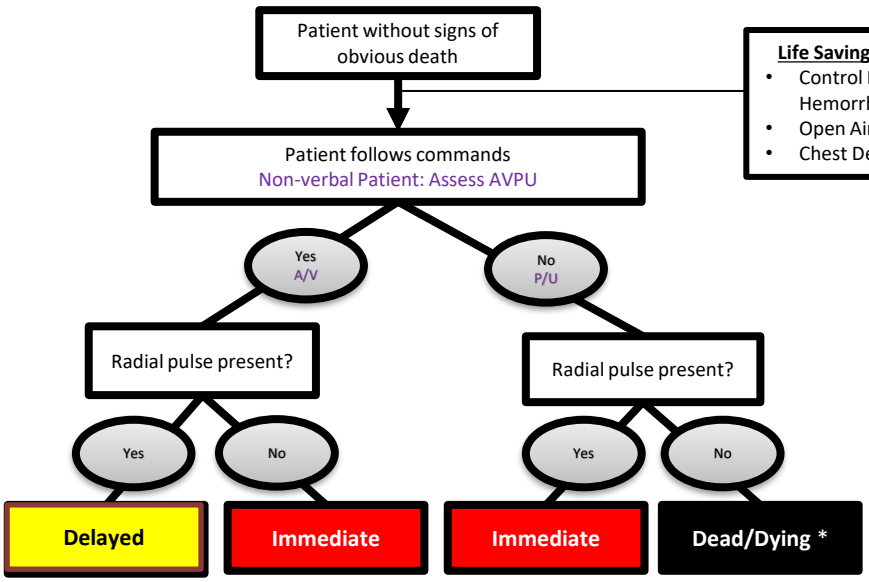
A	Alert	Y
V	Verbal	

P	Painful	N
U	Unresponsive	

All others
INA = Involved; Needs Assessment

May not have apparent injury, but need assessment

Assess Last



*These patients should be reassessed as more resources become available. If not breathing after life-saving interventions, they are considered dead.

Traumatic Cardiac Arrest – Withholding/Termination of Resuscitative (TOR) Efforts: Adult & Pediatric

TOC

Includes:
- Any patient found in **traumatic** cardiac arrest.

Excludes:
- Patients meeting criteria for **Obvious/Apparent Death.**
- Patients who lose pulses during EMS transport should have full resuscitation and transport.
- Patients in cardiac arrest associated with medical conditions that may have better outcome despite prolonged efforts, such as hypothermia, lightning strikes, submersion/drowning. Consider continuing efforts in such cases or contact on-line medical direction.
- When the mechanism does not correlate with the clinical condition (suggesting a non-traumatic cause of cardiac arrest) standard resuscitative measures should be followed.

EMT

- Resuscitation efforts may be withheld in any blunt traumatic cardiac arrest patient who is found apneic and pulseless.
- Provide resuscitation according to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric.**

Paramedic

- **PENETRATING Trauma**:
  - Consider transport to highest-level Trauma Center if time less than 15 minutes from time of loss of pulses.

- **BLUNT Trauma**:
  - If patient arrests with EMS on scene, treat suspected airway obstruction with OPA/NPA and consider bilateral needle thoracostomy for potential tension pneumothorax. Refer to **Thoracic Injury Management**.
  - If pulses are not restored, Termination of Resuscitation (TOR) is appropriate.

- Contact online medical direction when:
  - patient is <15 years old
    or
  - other special circumstances surround resuscitation.

TOC

Burns: Adult & Pediatric

Includes:
- Patients sustaining thermal burns,
- Patients who are exposed to electrical current (AC or DC),
- Patients of all ages who have been the victim of lightning strike injury.

Excludes:
- Chemical and radiation burns, refer to **Radiation Exposure** or **Chemical Burns**, as needed.

EMT

- Verify scene is secure.
- Initiate **Universal Care**.
- Assess for cardiac arrest.
  - Even patients who appear dead may have good outcomes with prompt intervention, refer to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric.**
- Determine characteristics of source if possible. AC or DC, voltage, amperage, time of injury.
- Consider pain management, refer to **Management of Acute Pain**.
- Monitor oxygen saturation, provide supplemental oxygen as needed or if patient rescued from confined space.
- Refer to **Cyanide Poisoning** and **Carbon Monoxide/Smoke Inhalation** as needed.
- Assist respirations as needed.
- Stop the burning:
  - Soak clothing and skin with water if burning or smoldering.
  - Remove clothing if not stuck to patient.
  - Remove jewelry.
- Evaluate for high risk burn injuries, refer to **Burn Triage**.
- Leave blisters intact.
- Cover burns with dry dressing or clean sheet.
- Keep patient warm.
- Estimate BSA burned and depth of burn, refer to **Burn Estimation Charts**.

Paramedic

- If establishing IV/IO access, avoid placement through burned skin.
- Initiate fluid resuscitation:
  - 20 mL/kg IV/IO fluid bolus, repeat as needed.
  - If patient in shock, give fluid per **Shock**.
  - Manage pain appropriately, refer to **Management of Acute Pain**.

- Initiate cardiac and $EtCO_2$ monitoring.
- If thermal burn to airway is suspected, early airway control is vital. Refer to **Airway Management**.

Burn Triage

TOC

Does The Patient Have Any Of The Following?

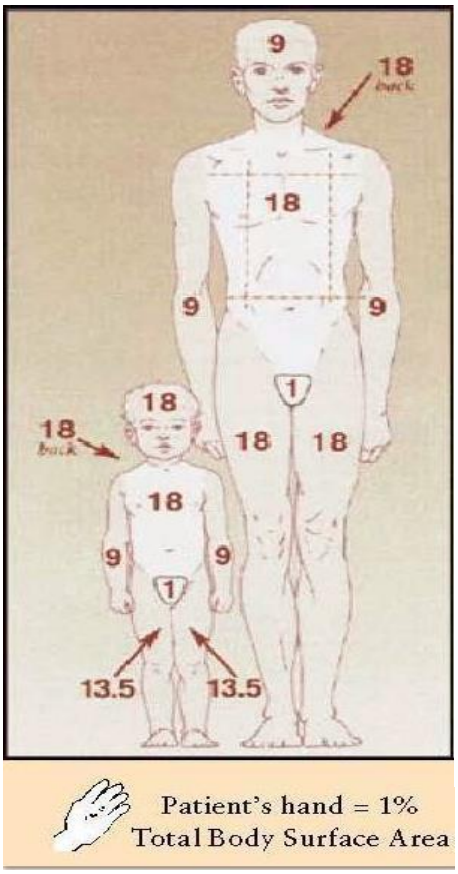
1. Partial thickness/2nd Degree burns ≥ 10% Total Body Surface Area
2. Any full thickness/3rd Degree burns of any age group
3. Burns that involve the face, hands, feet, genitalia, perineum, or major joints
4. Circumferential Burns
5. Electrical burns including lightning injury
6. Chemical burns
7. Radiation Burns
8. Inhalation injury or airway compromise
9. Burn injury with pre-existing medical disorders: CHF, ESRD, COPD, or cardiac that could complicate management, prolong recovery, and affect mortality
10. Burns with concomitant trauma (such as fractures)
11. Pediatric burns, especially requiring ICU care
12. Burn injury in patients who will require special social, emotional or long term rehabilitation

No	Yes
• Courtesy notification to receiving facility of patient's choice.	• Prepare patient for transport to the burn center. • CN to Burn Center (Valleywise/Maricopa Medical Center) • The patient may be transported to the closest trauma center if unstable or unable to manage the patient's airway.

Burn Estimation Charts

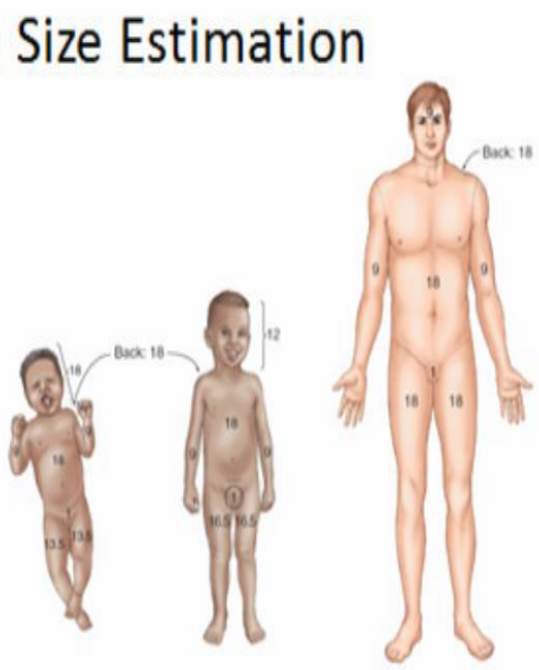
TOC

Burn Size Chart 1



Source: University of Utah Burn Center

Burn Size Chart 2



- Rule of 9's
- The "rule of palm" is another way to estimate the size of a burn. The patient's palm to tips of fingers is about 1% of the body. Use the person's palm to measure the body surface area burned.

Percentage of Total Body Surface Area by Age and Anatomic Structure			
	Infant < 10 kg	Child	Adult
Head and neck	20%		
Anterior head		9%	4.5%
Posterior head		9%	4.5%
Anterior torso	16%	18%	18%
Posterior torso	16%	18%	18%
Leg, each	16%		
Anterior leg, each		6.75%	9%
Posterior leg, each		6.75%	9%
Arm, each	8%		
Anterior arm, each		4.5%	4.5%
Posterior arm, each		4.5%	4.5%
Genitalia/perineum	1%	1%	1%

External Hemorrhage Management: Adult & Pediatric

TOC

Includes: patients with uncontrolled bleeding.

EMT

- Apply direct pressure/pressure dressing/wound packing to injury.

- If direct pressure ineffective or impractical (hemorrhage not controlled) for extremity wound, apply a tourniquet.
  - Use of tourniquet for extremity hemorrhage is strongly recommended if sustained direct pressure is ineffective or impractical.
  - Use a commercially available, windlass, pneumatic, or ratcheting device that has been demonstrated to reliably occlude arterial flow.
  - Avoid applying narrow, elastic, or bungee-type devices.
  - Use improvised tourniquets only if no commercial device is available.
  - Do not release a properly-applied tourniquet until the patient reaches definitive care.

- If hemorrhage is not controlled (e.g. junctional injury)
  - Apply a topical hemostatic agent with direct pressure or commercially available junction hemorrhage control device.

- Apply a topical hemostatic agent, in combination with direct pressure, for wounds in anatomic areas where tourniquets cannot be applied and sustained direct pressure alone is ineffective or impractical.
  - Only apply topical hemostatic agents in a gauze format that supports wound packing.

Paramedic

Extremity Trauma: Adult & Pediatric

TOC

Includes: patients with amputations or potential extremity fractures or dislocations.

EMT

- For active bleeding, refer to **External Hemorrhage Management**.
- Evaluate for
  - deformity or instability,
  - neuro status of extremity,
  - pallor,
  - pulse,
  - capillary refill,
  - degree of bleeding/blood loss, with assessment of the color of the blood and if it is pulsatile or not.
- Stabilize suspected fractures/dislocations.
- Apply splint to limit movement of suspected fracture.
  - Reassess distal neurovascular status after any manipulation or splinting.
- Elevate extremity fractures above heart level whenever possible to limit swelling.
- Apply ice/cool packs to limit swelling in suspected fractures or soft tissue injury; do not apply ice directly to skin.
- Amputation:
  - Transport amputated part(s) wrapped in a dry, sterile dressing.
  - Place in a water tight container or plastic bag.
  - Keep cool, but do not place directly on ice.
- Manage pain, refer to **Management of Acute Pain**.

Paramedic

- Strongly consider administering pain medication according to **Management of Acute Pain** before attempting to move a suspected fracture.

Crush Injury:

- High flow oxygen.
- Initiate 10-15 mL/kg IV/IO fluid bolus prior to extrication if possible.
- For significant crush injury or prolonged entrapment of extremity, consider
  - **Sodium Bicarbonate:** 1 mEq/kg IV/IO, maximum dose 50 mEq bolus over 5 minutes.
- Apply cardiac monitor to assess for peaked T waves or other findings consistent with hyperkalemia. Refer to **ECG Changes in Hyperkalemia** as needed.

- If findings suggestive of hyperkalemia, continue fluid resuscitation with 500-1000 mL/hr IV/IO fluid infusion.
- If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:
  - **Calcium Gluconate** 2 g IV/IO over 5 minutes
    (or)
  - **Calcium Chloride** 1 g IV/IO over 5 minutes, ensure IV/IO patency and do not exceed 1 mL/minute.
    (and)
  - **Albuterol** 5mg nebulized.

- If findings suggestive of hyperkalemia, continue fluid resuscitation with 10 mL/kg/hr IV/IO fluid infusion.
- If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:
  - **Calcium Gluconate** 100 mg/kg IV/IO over 5 minutes, max dose 2 g
    (or)
  - **Calcium Chloride** 20 mg/kg (0.2 mL/kg) IV/IO over 5 minutes, max dose 1 g, ensure IV/IO patency and do not exceed 1 mL/minute.
    (and)
  - **Albuterol** 5mg nebulized.

Traumatic Brain Injury (EPIC-TBI): Adult & Pediatric

TOC

Includes: Adult or pediatric patient with suspicion of Traumatic Brain Injury (EPIC-TBI) by mechanism, GCS, or exam.

EMT

Airway/Breathing:

- Continuously monitor pulse oximetry.
- High flow oxygen supplementation with nonrebreather mask, target SPO2 100%.
- Aggressively prevent any desaturation < 90%.
- BLS airway maneuvers as indicated.
- Do not hyperventilate/over-ventilate patient.

- Adult BVM 10 breaths/min as needed to maximize SpO2.

- Peds BVM rates as indicated:
  - Infants (0-24 mo): 25 breaths/min
  - Children (2-14 yrs): 20 breaths/min
  - Adolescents (15-17 yrs): 10 breaths/min (same as adults)

Circulation:

- Frequent blood pressure, SpO2, HR measurement (at least every 5 minutes).
- Watch for early signs of shock such as tachycardia, falling systolic blood pressure.
- Be aware that "near-hypotension" (i.e. SBP 90-110) may be detrimental, especially if dropping.

Disability:

- Evaluate blood glucose, refer to **Hypoglycemia**.
- Maintain cervical stabilization (refer to **Spinal Motion Restriction**).
- Control bleeding with direct pressure if no suspected open skull injury.
- Trend neurologic status assessment (GCS).

Paramedic

- IV/IO access as indicated.
- Avoid hypotension.
- For SBP approaching < 100 mmHg or other signs of shock:
  - Initial treatment: 1 L IV/IO fluid bolus.
  - Repeat 500 mL IV/IO fluid bolus until SBP > 90 mmHg.

- Approaching hypotension in children:
  - 0-9 yrs: SBP < [70 + (age in years x 2)]
  - ≥ 10 yrs: SBP < 90 mmHg
- For hypotension or other signs of shock:
  - 20 mL/kg IV/IO fluid bolus.
  - Repeat until hypotension resolves.

- Initiate $EtCO_2$ monitoring for hypoventilation and apnea; target $EtCO_2$ 40mmHg (Range 35-45 mmHg.).
- If O_2 saturation < 90% despite BLS airway, consider advanced airway:
  - Pre-oxygenate with 100% O_2 BVM at age appropriate rate. (Avoid hyperventilation even before advanced airway is obtained.)
  - Use with caution and monitor blood pressure if administering medications for intubation/post intubation, and/or for pain control. Be aware how detrimental decreased perfusion is to the injured brain.
  - Avoid nasal intubation.

Spinal Motion Restriction (SMR): Adult & Pediatric

TOC

Includes: Adult or pediatric patient with potential for spinal injury due to blunt traumatic injury.

Exclusion: Adult or pediatric patient with penetrating spinal injury (SMR not indicated).

EMT

Apply SMR if ANY of the following are present:

- Any altered mental status (GCS < 15) including possible intoxication from alcohol or drugs, agitation.
- Pediatric patients may demonstrate altered mental status with agitation, apnea, hypopnea, or somnolence (drowsiness).
- Midline neck or back pain and/or tenderness.
- Focal neurologic signs and/or symptoms (ie. weakness, tingling, or numbness).
- Anatomic deformity of the spine.
- Torticollis (self-splinting or painful rotation/tilt of the neck).
- Unreliable patient interaction including distraction from painful injury or distressing circumstances.
- Communication/language barrier that prevents accurate assessment.
- Lack of cooperation or contribution during exam.

Consider SMR with ANY high risk characteristics:

- Guideline for Field Triage mechanism criteria
- Age > 65,
- Axial load injuries (diving injuries, spearing tackle),
- Sudden acceleration/deceleration, lateral bending forces to neck/torso.

Apply SMR with ANY high risk mechanisms of injury:

- High speed MVC or rollover,
- Axial load injuries (diving injuries, spearing tackle),
- Sudden acceleration/deceleration, lateral bending forces to neck/torso.

- Patients without any of the above findings may be transported without the use of a cervical collar or any other means to restrict spinal motion. Low risk characteristics include:
  - Simple rear end collision,
  - No neck pain on scene,
  - No midline cervical tenderness,
  - Ambulatory on scene at any time.

- Low risk characteristics have not been studied in pediatric patients and should not be used alone to determine need for SMR.

- SMR may be achieved by use of a scoop stretcher, vacuum splint, ambulance stretcher, or long spine board with the patient safely secured.
- Minimize time on backboards.
- SMR cannot be safely performed with a patient in a sitting position.
- If elevation of the head is required, the device used to stabilize the spine should be elevated at the head while maintaining alignment of the neck and torso.

- Children may require additional padding under the shoulders to avoid excessive cervical spine flexion with SMR.

Paramedic

Fall Injury/Minor Injury/Lift Assist: Adult ≥ 18 y/o

TOC

Includes: Patient who has sustained fall injury, minor injury, or dispatch as lift assist.

EMT

- Initiate **Universal Care**.
- Assess the need for **Spinal Motion Restriction**.
- Complete a patient encounter form.

- Evaluate mental status
- Perform **prehospital stroke screening scale**.
- Obtain vital signs
- Complete secondary assessment – Assess movement and for any injury
- Blood glucose
- Orthostatic vital signs

Determine cause of fall

- Syncope or near syncope
- Dizziness prior to fall
- Chest pain or difficulty breathing prior to fall
- Is patient normally ambulatory?
- Is this a mechanical fall? (i.e. did they trip, stumble, has a chronic balance issues, not using assistance device such as cane or walker, fall out of bed?)

Courtesy notification to receiving facility or contact on-line medical direction for high risk refusal.

Exclusion Criteria

A YES to any of the following requires on-line medical direction.

- Does the patient have a concurrent illness that caused the fall?
- Is the patient confused or lacking decision making capacity?
- Is there a history of recent falls? If patient lives independently, do they need additional intervention?
- Abnormal vital signs or positive orthostatic changes?
- Positive FAST score?
- Abnormal EKG - if being assessed by ALS provider?
- Abnormal blood glucose?
- Is patient on blood thinners? (see **Blood thinner list** appendix)
- Secondary assessment reveals significant injury?

Risk assessment

- Assess patient's residence for possible trip hazards and educate.
- Refusal (ensure pt understands potential risk.)
- If patient has POA, contact POA.
- Is patient safe to leave at home? Assure patient has responsible adult to stay with or check on patient. If someone is not at home with patient, contact friend/relative that is willing to check on patient.

Paramedic

- Initiate cardiac monitoring as indicated
- Consider 12-lead ECG.

Thoracic Injury Management: Adult & Pediatric

TOC

Includes:

- Anterior and/or posterior thoracic injuries, such as flail segment, penetrating, or sucking chest wound.
- Signs/symptoms of suspected tension pneumothorax may include: agitation, chest pain, dyspnea, decrease in SPO2, unilateral diminished/absent breath sounds, tachycardia, tachypnea, resistance to BVM ventilations, decompensated shock, traumatic cardiac arrest.

Note: Tracheal deviation, neck vein distention and cyanosis are late and unreliable sign of tension pneumothorax.

EMT

- Initiate **Universal Care** and **General Trauma Management**
- Seal open thoracic wounds with occlusive dressings.
- Stabilize flail segment, if indicated.
- High flow O2
- Place patient in position of respiratory comfort if no spinal injury suspected.
- Rapid transport code 3 to trauma facility.

Paramedic

- Should the patient develop pre terminal signs of tension pneumothorax, perform immediate needle decompression (NDC). These signs include increased respiratory rate >20, deteriorating level of consciousness, hypotension <90 SBP, SpO2 <92% despite high flow O2.
- These signs develop much more rapidly in patients undergoing positive pressure ventilation leading to sudden cardiac arrest.
- Consider NDC in trauma code patients with thoracic injuries.
- In the absence of diagnostic equipment such as during an ASHE (Active Shooter/Hostile Event), consider immediate NDC for thoracic trauma when severe respiratory distress, altered mentation, and/or signs of shock are present.

Adult: 7-8.25 cm
14-16 gauge

Procedure:

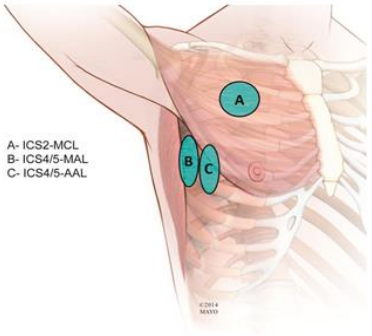
1. Select an appropriately sized needle/device based on patient anatomy. (See guide)
2. Locate the anatomical landmark of the affected side. (See below)
3. Advance the needle over (Superior to the lower landmarked rib)
4. Advance the needle/device until it passes into the plural space, avoid advancing directly toward the heart or major vessels.
5. Remove needle and advance catheter.
6. Reassess the patient, consider repeating the procedure as indicated.

Pediatric Age <13: 1.5" standard needle/14-18 g

Landmarks Adult & Pediatric:

For Anterior-Axillary Line (AAL): (Preferred site)

1. Locate the 4-5th intercostal space at the mid-axillary line (MAL) (B)
2. Move anterior to the point halfway between the MAL and MCL (C)
3. Insert the needle/catheter over the top of the rib. Remove needle.



For Mid-Clavicular Line (MCL):

1. Locate the 2nd intercostal space (above 3rd rib) (A)
2. Insert the needle/catheter over the top of the 3rd rib. Remove needle.

Toxicology & Environmental

Poisoning/Overdose Universal Care: Adult & Pediatric

TOC

Presentation may vary depending on the concentration and type of poison or medication and duration of exposure. Poisoning may occur by skin or mucous membrane absorption, ingestion, inhalation, or injection.

- Refer to guidelines for specific agents as indicated: **Agitated or Violent Patient/Behavioral Emergency**, **Riot Control Agents**, **Acetylcholinesterase Inhibitor Poisoning**, **Radiation Exposure**, **Dermal Chemical Burns**, **Stimulant Toxicity**, **Cyanide Poisoning**, **Carbon Monoxide/Smoke Inhalation**, **Hydrogen Sulfide Poisoning**, **Hydrocarbon Poisoning**, **Methemoglobin Toxicity**, **Opioid Poisoning/Overdose**, **Bites and Envenomations**.
- Arizona Opioid Assistance and Referral Line (OAR) 1-888-688-4222.
- Call the regional poison control center: 1-800-222-1222.
- Transport patient to hospital if suicidal.

EMT

- Ensure scene is safe.
- Consider Body Substance Isolation or appropriate skin and respiratory personal protective equipment (PPE).
- Safely remove patient from hazardous material environment.
- Remove clothing and decontaminate skin if contaminated.
- Prevent hypothermia when performing wet decontamination.
- Initiate **Universal Care**, including pulse oximetry monitoring for respiratory decompensation.
- Maintain or normalize patient temperature.
- Record and obtain all involved medications or products. Bring in medication containers or take pictures with camera-equipped, agency-owned device.
- Identify intoxicating agent by history, toxidrome, or environmental testing.
- Identify antidote or mitigating agent.

- Children often show signs of poisoning before adults due to increased absorption of poisons.
- Wet infants are slippery; care should be exercised during decontamination to avoid additional injuries.

Paramedic

- Initiate IV/IO access.
- Administer 20 mL/kg IV/IO fluid bolus if there is evidence of hypovolemia/hypoperfusion.

- Initiate $EtCO_2$ monitoring for respiratory decompensation.
- Initiate cardiac monitoring and consider 12-lead ECG (special attention to abnormal rate, rhythm, QRS prolongation, and QT prolongation).
- Consider blood samples if EMS management might change value (e.g. carbon monoxide, glucose, cyanide).

- Use pharmacologic management for patients with delirium with agitated behavior (combativeness, tachycardia, hyperthermia).
- Refer to **Agitated or Violent Patient/Behavioral Emergency**.
- Supraglottic devices and intubation should be utilized only if BVM ventilation fails. The airway should be managed in the least invasive way possible.

Agitated or Violent Patient/Behavioral Emergency: Adult & Pediatric

TOC

Includes: patients who are exhibiting agitated, violent, or uncooperative behavior or who are a danger to self or others.

Address underlying medical conditions that may result in agitated or violent behavior. This includes but is not limited to:

- **Traumatic Brain Injury (EPIC-TBI)**.
- **Hypoglycemia**, hypoxia.
- Postictal state, **Seizures**.
- **Hyperthermia**.
- Acute drug intoxication or withdrawal.

EMT

- Dispatch law enforcement immediately when necessary to secure and maintain scene safety. Do not attempt to enter scene before safety is ensured.
- Initiate **Universal Care**.
- Provide supplemental oxygen as indicated.
- Obtain blood glucose level as soon as possible.
- Attempt verbal reassurance and calm patient.
- Engage family members/loved ones to encourage patient cooperation if their presence does not exacerbate the patient's agitation.

- Consider physical restraints:
  Body:
  - Sheets can be used in addition to stretcher straps; place around the lower lumbar region, below buttocks, or around the thighs, knees and legs.
  - Do not apply restraints that restrict the patient's chest wall motion.

  Extremities:
  - Soft or leather restraints should not require key.
  - Restrain all four extremities to stationary frame of stretcher.

- Place stretcher in sitting position.
- If in police handcuffs, you must have access to the key at all times.

Paramedic

- Apply cardiac monitor as soon as possible, particularly when pharmacologic management has been administered.
- Utilize $EtCO_2$ for all patients receiving pharmacologic management.
- Pharmacologic management should be based upon patient's clinical condition; use caution as all these medications can cause respiratory depression/compromise.
- Consider half dose in patients > 65 years old or with concern for co-ingestion with CNS depressant (EtOH, narcotics, etc.).
- Benzodiazepines:
  - **Midazolam:** 5 mg IM/IN/IV/IO. May repeat every 3 minutes. Max total dose 20 mg.
    or
  - **Lorazepam:** 2-4 mg IM or 2 mg IV/IO. May repeat once after 15 minutes, max total dose 4 mg.
    or
- **Ketamine (Not indicated for postictal patients):**
  - 4 mg/kg IM/IN, max 250 mg per administration. May repeat once after 5 minutes.

- Pharmacologic management should be a later consideration for pediatric patients.
- Benzodiazepines:
  - **Midazolam:** 0.1-0.15 mg/kg IM or 0.05-0.1 mg/kg IV/IO or 0.3 mg/kg IN. Max dose 5 mg
    or
  - **Lorazepam:** 0.05 mg/kg IM/IV/IO. Max dose 2 mg IV/IO and 4 mg IM

- Ketamine is not indicated in pediatric patients.

Stimulant Toxicity: Adult & Pediatric

TOC

Includes: cocaine, amphetamines, methamphetamine, Ecstasy, phencyclidine (PCP), bath salts, etc.

EMT

- Initiate **Universal Care.**
- Refer to **Hyperthermia/Heat Exposure** as needed.
- Check for trauma, self-inflicted injury.
- Ask about chest pain and difficulty breathing.
- For chest pain refer to **Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI).**
- Refer to **Agitated or Violent Patient/Behavioral Emergency** as needed.

- Children may experience acute coronary syndrome due to coronary artery vasospasm caused by cocaine.
- Seizures are a more common serious event due to stimulant poisoning.

Paramedic

- Initiate IV/IO fluid resuscitation if necessary to obtain hemodynamic stability or to treat dehydration and hyperthermia.

- Initiate cardiac monitor and examine rhythm strip for arrhythmias.
- Monitor $EtCO_2$ for respiratory decompensation.
- Obtain 12-lead ECG.
- Refer to **Agitated or Violent Patient/Behavioral Emergency** as needed.

Opioid Poisoning/Overdose: Adult & Pediatric

TOC

Includes: patients of all ages with access to opioids and known or suspected opioid use or abuse.
Excludes: patients with altered mental status exclusively from other causes (e.g., head injury, hypoxia, or hypoglycemia).

EMT

- Initiate **Universal Care**.
- For respiratory depression, perform immediate resuscitation first, then consider:
- **Naloxone**: SPECIAL TRAINING REQUIRED (STR)
  - Intranasal (IN)
    - 4 mg/0.1 mL nasal spray
    - 1 spray in single nostril
    - May be repeated as indicated.

- Identify medication taken, noting immediate release vs. sustained release formulations, time of ingestion, and quantity.
- Bring pill container(s) to hospital, if possible (or take pictures with photography equipped, agency-owned device).
- Assess for other etiologies of altered mental status including hypoxia, hypoglycemia, hypotension, and traumatic head injury.
- Monitor for recurrent respiratory depression and decreased mental status.
- Recommend transport to hospital.
- If patient refuses transfer, with or without receiving naloxone, call the Arizona Opioid Assistance and Referral (OAR) Line at 888-688-4222.

Paramedic

- Naloxone should be given via IV/IO route to apneic patients while supporting airway and breathing through traditional methods.

• IV/IOF if indicated refer to **Shock**. • **Naloxone:** 0.4-2 mg IV/IO/IM/IN. Repeat if indicated.	• Consider IV/IO refer to **Shock**. • **Naloxone:** 0.1 mg/kg IV/IO/IM/IN. Repeat if indicated. 

Emergency Operations Rehabilitation

TOC

Includes: Individuals with occupational related hyperthermia and/or dehydration related to emergency operations requiring cooling and hydration. This includes Fire, EMS, and Law Enforcement personnel.
Excludes: Symptomatic injury, illness, or dysrhythmia (excluding sinus tachycardia). Non-occupational related **hyperthermia**/dehydration or occupational exposure not related to emergency operations.

EMT

- Time 0 minutes: initial vital signs obtained after oral hydration and cooling.
  - VS within NFPA parameters → Release
  - VS not within NFPA parameters → Rest and oral rehydration for 20 minutes
- Time 20 minutes after 1st evaluation: Obtain 2nd set of vital signs
  - VS within NFPA parameters → Release
  - VS not within NFPA parameters → Initiate ALS patient care (ePCR now required)
    - Initiate **Universal Care** as indicated.
    - Patient disposition either transport or Treat and Release

Paramedic

- Obtain 12 lead ECG
  - Abnormal ECG for the patient → Transport
  - Normal ECG for the patient→ Rest, rehydrate, and treatment for an additional 20 minutes. Treatment may include:
    - 20 mL/kg IV fluid bolus for mild hypotension or tachycardia
    - Oxygen as indicated for hypoxemia or elevated carboxyhemoglobin (SpCO) levels
- Time 40 minutes after 1st evaluation: Obtain 3rd set of vital signs.
  - VS within NFPA parameters → Release or Refusal per agency policy
  - VS not within NFPA parameters → Transport

NFPA 1584 Recommended Vital Signs for Release from Rehab:
- Temperature: < 100.6° F
- Heart Rate: < 100
- Respiratory Rate: 12-20
- Systolic Blood Pressure: < 160
- Diastolic Blood Pressure < 100
- Pulse Oximetry: > 94%

Carboxyhemoglobin (SpCO) Levels:
- SpCO 0-5% (and asymptomatic) → Release
- SpCO 5-14% and symptomatic → Oxygen via Nonrebreather mask X 30 minutes and reassess
  - If oxygen is administered, initiate patient care (ePCR now required)
  - Repeat SpCO < 5% and complete resolution of symptoms → Release or Refusal per agency policy
  - Repeat SpCO > 5% and any continued symptoms → Transport
- SpCO ≥ 15% → Oxygen via Nonrebreather mask and transport

Symptoms of Carbon Monoxide toxicity may include headache, nausea, dizziness, shortness of breath, chest pain, or loss of judgment.

Cyanide Poisoning: Adult & Pediatric

TOC

Includes: occupational or smoke exposures (e.g., firefighting), industrial or laboratory accidents, natural catastrophes, suicide and murder attempts, and chemical warfare/terrorism. Signs and symptoms of high concentration of cyanide include:

- Arrhythmias
- Cardiovascular collapse
- Cardiac arrest
- Loss of consciousness
- Seizures
- Apnea

EMT

- Ensure scene safety.
- Don appropriate personal protective equipment, e.g., special equipment for low oxygen environments (SCBA).
- Initiate **Universal Care** including pulse oximetry monitoring.
- Safely remove patient from toxic environment and provide high flow supplemental oxygen via non-rebreather mask or BVM.
- If indicated, expose patient, then cover to protect against hypothermia.
- Consider consulting with Regional Poison & Drug Information Center (800-222-1222) from the scene as needed.

Paramedic

- Initiate cardiac and $EtCO_2$ monitoring and analyze rhythm strip for arrhythmias.
- Obtain 12-lead ECG.
- For patients with appropriate history and manifesting one or more signs or symptoms of high concentrations of cyanide:
  - **Hydroxocobalamin** (Cyanokit)
    - Collect pre-treatment blood sample, if possible
    - 5 g IV/IO over 15 minutes
    - Additional dose as indicated (or)
- **Sodium Nitrite (Tox Paramedic Only)**
  - 300 mg IV/IO over 5 minutes
  - Should not be given if hypoxemic or hypotensive (and)
- **Sodium Thiosulfate (Tox Paramedic Only)**
  - 12.5 g IV/IO over 10 minutes

- For patients with appropriate history and signs/symptoms of cyanide poisoning (e.g. cardiovascular collapse, shock, or cardiopulmonary arrest):
  - **Hydroxocobalamin** (Cyanokit®)
    - Collect pre-treatment blood sample, if possible
    - 70 mg/kg IV/IO over 15minutes; (maximum dose 5 g)
    - Additional dose as indicated (or)
- **Sodium Nitrite (Tox Paramedic Only)**
  - 6 mg/kg IV/IO (0.2 mL/kg) at rate of 5 mL/minute, max dose 300 mg
  - Should not be given if hypoxemic or hypotensive (and)
- **Sodium Thiosulfate (Tox Paramedic Only)**
  - 250 mg/kg (1 mL/kg) over 10 minutes

- May repeat Sodium Nitrite/Thiosulfate combination at one-half original doses if signs of poisoning reappear.
- Refer to **Seizures** as needed.

Carbon Monoxide/Smoke Inhalation: Adult & Pediatric

TOC

Includes: known or suspected exposure to carbon monoxide (CO) or smoke from fire, propane or charcoal stoves/heaters, or combustion engines, and recreational enclosed smoking areas. Consider scene/environment monitoring with commercial CO monitors if available. Patient and environmental CO levels are helpful information for hospital personnel.

Patients may present with:

Mild	Moderate to Severe
• Nausea • Fatigue • Headache • Vertigo • Lightheadedness • Dyspnea	• Altered Mental Status • Tachypnea • Tachycardia • Seizure/Convulsions • Chest pain, shortness of breath • Cardiopulmonary Arrest

EMT

- Ensure scene safety.
- Don appropriate personal protective equipment, e.g., special equipment for low oxygen environments (SCBA).
- Initiate **Universal Care** including pulse oximetry monitoring.
- Safely remove patient from toxic environment.
- Inquire about other possible exposed persons (other inhabitants, neighbors, family member coming home later).
- Monitor transcutaneous CO levels, if available.
- 100% oxygen via non-rebreather mask or bag valve mask.
- Refer to **Seizures** as needed.

Paramedic

- Initiate cardiac and $EtCO_2$ monitoring and analyze rhythm strip for arrhythmias.
- Obtain 12-lead ECG.
- Obtain blood sample as soon as possible (for later testing at the hospital).

COHb	Severity	Signs and Symptoms
<20%	Mild	Headache, nausea, vomiting, dizziness, blurred vision
21-40%	Moderate	Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness
41-59%	Severe	Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest
>60%	Fatal	Death

Dermal Chemical Burns: Adult & Pediatric

TOC

Includes: Patients exposed to a chemical that causes injury to skin, eyes, and mucous membranes.

EMT

- Ensure scene safety.
- Don appropriate personal protective equipment.
- Remove the patient's clothing, if necessary.
- Contaminated clothing should preferably be placed in impermeable bags.
- Carefully brush off solid chemicals and/or blot off liquid chemicals prior to flushing with copious amounts of water.
- Flush the patient's skin (and eyes, if involved) with copious amounts of tepid (body temperature) water or normal saline.
- Take measures to minimize hypothermia.
- Calculate the estimated total body surface area that is involved; refer to **Burn Estimation Charts**.
- For hydrofluoric acid exposure: after irrigating with water for 3 minutes, apply generous amounts of calcium gluconate gel to the exposed skin sites.

Paramedic

- Initiate IV/IO fluid resuscitation if necessary to obtain hemodynamic stability.

- Refer to **Management of Acute Pain** as needed.
- For chemical burns of the eye, begin eye decontamination immediately.
  - **Proparacaine** or **Tetracaine** eye drops for pain control: 1-2 drops in affected eye(s). Wait 30-60 seconds for anesthetic effect. May reapply as indicated.
  - Continuous irrigation with water or saline. Consider eye irrigation device to facilitate decontamination.
- For wide complex tachycardia, refer to **Tachycardia** for magnesium dosing.
- Hydrofluoric acid: If cutaneous exposure, may apply **Calcium Gluconate gel** if available.

- For hydrofluoric acid exposure:
  - Apply cardiac monitor due to risk of hyperkalemia and hypocalcemia. Refer to **ECG Changes in Hyperkalemia** as needed. If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:
  - **Calcium Gluconate** 2 g IV/IO over 5 minutes
    (or)
  - **Calcium Chloride** 1 g IV/IO over 5 minutes, ensure IV/IO patency and do not exceed 1 mL/minute.
    (and)
  - **Albuterol** 5 mg nebulized.

- For hydrofluoric acid exposure:
  - Apply cardiac monitor due to risk of hyperkalemia and hypocalcemia. Refer to **ECG Changes in Hyperkalemia** as needed. If findings of hyperkalemia are present, maintain continuous cardiac monitoring, administer IV/IO fluids and:
  - **Calcium Gluconate** 100 mg/kg IV/IO over 5 minutes, max dose 2 g
    (or)
  - **Calcium Chloride** 20 mg/kg (0.2 mL/kg) IV/IO over 5 minutes, max dose 1 g, ensure IV/IO patency and do not exceed 1 mL/minute.
    (and)
  - **Albuterol** 5mg nebulized.

Acetylcholinesterase Inhibitor Poisoning (Nerve Agents, Organophosphates, and Carbamates): Adult & Pediatric

TOC

DUMBBELLS mnemonic used to describe the signs and symptoms of organophosphate toxicity:

D - Diarrhea
U - Urination
M - Miosis (pinpoint pupils)/Muscle weakness
B - Bronchospasm/Bronchorrhea
B - Bradycardia
E - Emesis
L - Lacrimation/Laryngospasm
L - Lethargy
S - Salivation/Sweating/Seizures

Central nervous system effects can manifest with seizures, coma, and/or apnea.

EMT

- Don appropriate personal protective equipment (PPE)
- Initiate **Universal Care**.
- For decontamination, refer to **Poisoning/Overdose Universal Care**.
- ABCDE assessment including pupils.
- When wet decontaminating, avoid hypothermia.
- Remove patient's clothing and wash the skin with soap and water.

Paramedic

- Establish IV/IO access.
- Initiate continuous cardiac and $EtCO_2$ monitoring.

• **Atropine Sulfate** 2 mg IV/IO. Repeat 2x initial dose as needed every 3-5 minutes until patient's dyspnea resolves or is easy to ventilate. • Assess for resolution of bronchorrhea, improving vital signs, drying of airway secretions.	• **Atropine Sulfate** 0.1 mg/kg IV/IO, up to 2 mg. Repeat 2x initial dose as needed every 3-5 minutes, until patient's dyspnea resolves or is easy to ventilate. • Assess for resolution of bronchorrhea, improving vital signs, drying of airway secretions.
• **Pralidoxime Chloride (2 PAM)**: 1-2 grams IV/IO over 10-15 minutes. Reconstitute with 20cc of sterile water. **(Tox Paramedic Only)** • Consider 2-PAM drip for severe cases after initial dose.	• **Pralidoxime Chloride (2 PAM)**: 30-50mg/kg IV/IO over 10-15 minutes. Reconstitute with 20cc of sterile water. **(Tox Paramedic Only)** • Sudden onset apnea may occur in infants, usually after the second dose. • Consider 2-PAM drip for severe cases after initial dose.

- Clinical improvement should be based upon the drying of secretions, improved respiratory effort and pulse oximetry.
- Continuous and ongoing patient reassessment is critical.
- For patients with seizure activity refer to **Seizures** as needed.
- Nerve agents typically require lower doses of atropine than insecticide Ops/Carbamates.

Radiation Exposure: External and/or Internal Contamination: Adult & Pediatric

TOC

Includes: Patients exposed to a known or suspected source of radiation or contaminated with a radioactive source, signs and symptoms of acute radiation syndrome are typically delayed (hours to days) but may include:

- Nausea
- Vomiting
- Diarrhea
- Dizziness
- Headache
- Confusion, altered level of consciousness

Most patients will be asymptomatic, initially. Early nausea and vomiting is a poor prognostic indicator.
All body fluids from patients receiving *systemic radiation therapy (particularly radioactive iodine)* carry a potential risk of minor exposure, usually to primary caregivers and family members. Use Body Substance Isolation techniques, personal protective equipment (PPE), and Universal Precautions when caring for these patients.
Standard PPE does not protect against penetrating radiation from a radioactive source, it only mitigates contamination. Limit radiation exposure effectively by limiting time around, maintaining distance from , and using effective shielding against the source. Turnout gear and paper coveralls can be potentially adequate PPE to prevent contamination.

Excludes: Patients exposed to normal dose of ionizing radiation from medical imaging studies and therapeutic medical procedures.

EMT

- Ensure scene safety. For decontamination, initiate **Poisoning/Overdose Universal Care**.
- Don appropriate personal protective equipment.
- Exercise universal precautions at all times.
- Initiate **Universal Care**.
- Decontamination should not delay stabilization of limb- or life-threatening traumatic injuries.
- Place contaminated towels, wastewater, and body fluids in secured containers denoted for radioactive waste materials.
- When wet decontaminating, attempt to prevent hypothermia.

- For skin contaminated with radioactive sources:
  - Remove patient's clothing and wash the skin with wet gauze, skin wipes, or soap and water.
  - Collect the wastewater, if possible.

- For inhalation contamination:
  - Administer oxygen as appropriate
  - Maintain the airway as needed

- Trauma patients who have been exposed to radiation or contaminated with radioactive sources should be triaged and treated on the basis of the severity of their conventional traumatic injuries. If possible, decontamination of the patient and wounds in particular should occur prior to arrival into a trauma bay (on scene, outside of the ED). Refer to **General Trauma Management**.
- Consider transport to a burn center in cases of severe radiation exposure.

Paramedic

Hydrogen Sulfide Poisoning: Adult & Pediatric

TOC

Includes: Known or potential hydrogen sulfide poisoning. Hydrogen sulfide should be suspected in patients with rapid loss of consciousness particularly in an enclosed space, collapse of previously healthy worker, multiple sudden death victims, and if rotten egg odor is detected. The odor threshold is low <0.3ppm but olfactory fatigue with prolonged exposure results in extinction of odor recognition.

- Signs and symptoms of sulfide poisoning may include:
  - May report “rotten egg” odor.
  - Mucous membrane and upper airway irritation.
  - Non-Cardiogenic Pulmonary Edema (late onset).
  - Rapid collapse.
  - Rapid olfactory overload; may not report rotten egg odor.
- Causative agents include:
  - Decaying organic matter.
  - Petroleum refining.
  - Mining.
  - Pulp/Paper factories.
  - Sewage.
  - Hot asphalt fumes.
  - Septic systems.

EMT

- Ensure scene safety.
- Don appropriate personal protective equipment, e.g., special equipment for low oxygen environments (SCBA).
- Initiate **Universal Care** including pulse oximetry monitoring.
- Safely remove patient from toxic environment and provide high flow supplemental oxygen via non-rebreather mask or BVM.
- If indicated, expose patient, then cover to protect against hypothermia.
- Evaluate and take precautions for traumatic injury from falls (C-spine precautions), refer to **General Trauma Management.**
- Consider consulting with Regional Poison & Drug Information Center (800-222-1222) from the scene as needed.
- Confirm exposure, amount, and duration.

Paramedic

- Initiate cardiac monitoring.
- Consider 12-lead ECG.

Bites and Envenomations: Adult & Pediatric

TOC

Bites, stings, and envenomations can come from a variety of marine and terrestrial animals, arthropods, and insects causing local or systemic effects. Patients may present with toxin-specific reactions. There is a spectrum of toxins or envenomations and limited EMS interventions that will have any mitigating effect on the patient in the field. The critical intervention is to get the patient to a hospital that has access to the relevant antivenin, if applicable, as soon as possible.

EMT

- Initiate **Universal Care.**
- Check blood glucose level.
- Monitor pulse oximetry for respiratory decompensation.
- Pain control, including limited external interventions to reduce pain, refer to **Management of Acute Pain.**
- Refer to **Seizures, Anaphylaxis and Allergic Reaction**, or **Shock** as needed.
- Transport all rattlesnake bites/envenomations to the hospital.

DO NOT perform the following:

- Tourniquet or constricting bands.
- Incision and/or suction.
- Application of cold packs.

- Envenomations known to have specific antivenin or antitoxin (scorpions, rattlesnakes, and black widow spider):
  - Consider transport to hospital that has access to antivenin, if feasible,
  - Call the **Poison & Drug Information Center** (**800-222-1222**) for treatment advice and location of antivenin.

Paramedic

- Consider 20 mL/kg IV/IO fluid bolus.

- Initiate cardiac and $EtCO_2$ monitoring and analyze rhythm strip for arrhythmias.
- Obtain 12-lead ECG.
- Pain control, including limited external interventions to reduce pain, refer to **Management of Acute Pain**
  - Fentanyl is preferred over morphine due to histamine release.
- Consider vasopressors after adequate fluid resuscitations if hypotension persists, refer to **Shock** as needed.
  - **Push Dose Epi**: 10-20 mcg boluses (1-2 mL) every 2 minutes
- Refer to **Agitated or Violent Patient/Behavioral Emergency** as indicated. Do not use ketamine for scorpion stings.

Hyperthermia/Heat Exposure: Adult & Pediatric

TOC

Includes:

- Heat cramps are minor muscle cramps usually in the legs and abdominal wall. Temperature is normal.
- Heat exhaustion has both salt and water depletion usually of a gradual onset. As it progresses tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur. Heat exhaustion can progress to heat stroke.
- Heat stroke occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and/or electrolyte imbalances. Temperature is usually > 104 F. When no thermometer is available, it is distinguished from heat exhaustion by altered level of consciousness.

Excludes:

- Fever from infectious or inflammatory conditions.
- Malignant hyperthermia.
- Neuroleptic malignant syndrome.

EMT

- Initiate **Universal Care**.
- Move patient to a cool area and shield from the sun or any external heat source.
- Remove as much clothing as is practical and loosen any restrictive garments.
- If alert and oriented, give small sips of cool liquids.
- If altered mental status, check blood glucose level.
- Maintain airway vigilance for emesis, seizure.
- If temperature is > 104° F (40° C) or if altered mental status is present, begin active cooling by:
  - Medically-supervised ice bath immersion provides the most rapid cooling mechanism. Consider maintaining cold water immersion if already instituted. Discontinue immersion when core-temp reaches 101 degrees.
  - If ice bath immersion is not available, consider the following:
    - Rotating ice water-soaked towels or sheets.
    - Continually wet the exposed skin with tepid water while fanning the victim.
    - Truncal ice packs may be used but are less effective than evaporation.

Paramedic

- Establish IV/IO access for heat stroke.
- Administer 20 mL/kg IV/IO cool fluid bolus and reduce to 10 mL/kg IV/IO boluses when vital signs are stable.

- Initiate cardiac monitoring and record ongoing vital signs and level of consciousness.
- Monitor for arrhythmia and cardiovascular collapse (refer to appropriate guidelines as needed).
- Refer to **Seizures** as needed.

Drowning: Adult & Pediatric

TOC

Includes: patients suffering from drowning or drowning events independent of presence or absence of symptoms.

EMT

- Initiate **Universal Care** and refer to **Airway Management** as indicated**.**
- Ensure scene safety.
- Remove patient from water as soon as possible.
- Initiate aggressive airway management and restoration of adequate oxygenation and ventilation.
- A-B-C approach.
- Administer Oxygen to maintain SpO2 ≥ 94%. Refer to **Airway Management** as needed.
- Assist ventilation as needed. Consider PEEP valve 5-10 cm H2O with BVM to support oxygenation.
- Refer to **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- Consider possible C-spine injury; consider **Spinal Motion Restriction** as indicated.
- Consider hypothermia and treat as indicated.
- Remove wet clothing.
- Do not aggressively re-warm cold-water drownings.
- Initiate pulse oximetry.

Paramedic

- Establish IV/IO access.
- Fluid bolus as indicated.

- Escalate airway management as indicated, assist ventilation as needed.
  - Consider PEEP 5-10 cm H2O as indicated to support oxygenation
- Initiate cardiac and $EtCO_2$ monitoring.
- Consider nasogastric or orogastric tube for gastric decompression.

Conducted Electrical Weapon (TASER): Adult & Pediatric

TOC

Includes:

- Patients who received either the direct contact discharge or the distance two-barbed dart discharge of the conducted electrical weapon.
- Patient may have sustained fall or physical confrontation trauma.
- Patient may be under the influence of toxic substances and/or may have underlying medical or psychiatric disorder.

EMT

- Initiate **Universal Care** when safe.
- May remove barbed dart(s) if they are not in a high-risk area (face, neck, hand, bone, groin, or spinal column) where it may injure bone, nerves, blood vessels, or an eye.
- Evaluate patient for evidence of delirium with agitated behavior. Refer to **Agitated or Violent Patient/Behavioral Emergency** as indicated.
- Refer to **General Trauma Management** as indicated.

Paramedic

- Initiate cardiac monitoring.
- Consider 12-lead ECG.

Riot Control Agents: Adult & Pediatric

TOC

Includes: Chloroacetophenone (CN or Mace), Chlorobenzylidenemalononitrile (CS or tear gas), Oleoresin capsicum (OC or pepper spray), harassing agents, incapacitating agents, chemical crowd control agents, lacrimators. These products are typically oil based.

Excludes: Exposure to chlorine, phosgene, ammonia or unknown agents that are intended to cause significant injury or fatality. Exposure to these agents should result in a call to Poison Control 602-253-3334 or 1-800-222-1222.

EMT

- Initiate **Universal Care.**
- Move affected individual from contaminated environment into fresh air if possible
- Remove contaminated clothing, avoid removing over head
- Have patient remove contact lenses if appropriate
- Decontaminate eye exposure with a stream of plain water for 10-15 min. Do not use Morgan Lenses for initial decontamination. Baby shampoo can be used for washing spray from around the eye area.
- Irrigation with water or saline may initially facilitate resolution of symptoms but can spread contamination to unaffected areas. Washing the affected area with hand soap, shampoo, or dish soap can break up the oil-based product.
- If patient is in respiratory distress, refer to **Airway Management** or **Bronchospasm** as indicated.
- For persistent pain of the eye or skin, refer to **Dermal Chemical Burns**.
- Traumatic injury may result when exposed individuals are in proximity to the device used to disperse the riot control agent (e.g. hose/stream under pressure, riot control agent projectiles), refer to **General Trauma Management** as indicated.

Hydrocarbon Poisoning: Adult & Pediatric

TOC

Includes: known or suspected hydrocarbon toxicity with ventricular dysrhythmias.

- Signs and symptoms of hydrocarbon toxicity poisoning may include:
  - Rapid onset of CNS depression and seizures
  - Chemical pneumonitis
  - Cardiac dysrhythmias are less common but can include PVCs or fatal dysrhythmias such as ventricular tachycardia and Torsades de Pointes.
- Causative agents include:
  - Aliphatic Hydrocarbons: Methane, ethane, propane, butane, hexane, cyclohexane, etc.
  - Aliphatics from pine include turpentine, pine oil, pine tar, etc.
  - Aromatic & Substituted Aromatic Hydrocarbons: Benzene, aniline, phenols, etc.
  - Other substituted hydrocarbons include halogenated hydrocarbons, etc.
  - Accidental exposure is more often in younger children and deliberate exposure, often from inhalation (i.e. huffing).
- Note: **Avoid epinephrine & albuterol because catecholamines lower the threshold for ventricular fibrillation in the setting of hydrocarbon & substituted hydrocarbon exposures.**

EMT

- Ensure scene safety.
- Don appropriate personal protective equipment, e.g., special equipment for low oxygen environments (SCBA).
- Initiate **Universal Care** including pulse oximetry monitoring. Refer to **Airway Management** as indicated.
- Safely remove patient from toxic environment and provide high flow supplemental oxygen via non-rebreather mask or BVM.
- Consider consulting with Regional Poison & Drug Information Center (800-222-1222) from the scene as needed.
- Confirm exposure, amount, and duration.

Paramedic

- Initiate cardiac monitoring.
- Monitor waveform capnography (EtCO2) and SPO2.
- Consider 12-lead ECG.
- Refer to **Seizures** as needed.

In the setting of known huffing or prolonged exposure to gasoline vapors, etc., with tachyventricular dysrhythmia:

Propranolol (Tox Paramedic only):

- 1 mg IV/IO over 2 minutes.
- May repeat x 1 in 5 minutes

In the setting of known huffing or prolonged exposure to gasoline vapors, etc., with tachyventricular dysrhythmia:

Propranolol (Tox Paramedic only):

- 0.01 mg/kg slow IV/IO push over 10 minutes (max initial dose 1 mg)
- May repeat x 1 in 5 minutes

Methemoglobin Toxicity: Adult & Pediatric

TOC

Includes: known or suspected methemoglobinemia.

- Signs and symptoms of methemoglobinemia may include:
  - Mild or moderate methemoglobinemia: Cyanosis without altered mental status, chest pain, or dyspnea
  - **Severe methemoglobinemia: Cyanosis with altered mental status, chest pain, or dyspnea.**
- Causative agents include:
  - Amyl nitrite
  - Isobutyl nitrite
  - Sodium nitrite
  - Topical anesthetics
  - Aniline
  - Nitrobenzene

EMT

- Ensure scene safety.
- Initiate **Universal Care** including pulse oximetry monitoring, and refer to **Airway Management** as indicated.
- High flow O2 via non-rebreather mask.
- BVM ventilation, if necessary.
- Consider consulting with Regional Poison & Drug Information Center (800-222-1222) from the scene as needed.
- Confirm exposure, amount, and duration.

Paramedic

- Initiate cardiac monitoring.
- Consider 12-lead ECG.
- Advanced airway management, if needed.

Methylene Blue (Tox Paramedic only):

- Methylene blue for severe methemoglobinemia 1 mg/kg, IV/IO (max dose 100 mg) over 5 minutes.
- Do not administer in patients with known glucose-6-phosphate dehydrogenase (G6PD).

Appendix Pg. 1

Appendix Pg. 2

Abnormal Pediatric Vital Signs

TOC

Age	Heart Rate	Resp Rate	Systolic BP	Temp (°C)
0 d – 1 m	> 205	> 60	< 60	<36 or >38
≥ 1 m - 3 m	> 205	> 60	< 70	<36 or >38
≥ 3 m - 1 r	> 190	> 60	< 70	<36 or >38.5
≥ 1 y - 2 y	> 190	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 2 y - 4 y	> 140	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 4 y - 6 y	> 140	> 34	< 70 + (age in yr × 2)	<36 or >38.5
≥6 y- 10 y	> 140	> 30	< 70 + (age in yr × 2)	<36 or >38.5
≥ 10 y - 13 y	> 100	> 30	< 90	<36 or >38.5
> 13 y	> 100	>16	< 90	<36 or >38.5

Neurologic Status Assessment: Adult & Pediatric, page 1 of 2

TOC

AVPU (Medical and Trauma)

A: The patients is alert
V: The patient responds to verbal stimulus
P: The patient responds to painful stimulus
U: The patient is completely unresponsive

Motor/Sensory Exam for Suspected Spinal Injury

- Wrist/hand/finger extension bilaterally
- Foot plantarflexion/dorsiflexion bilaterally
- Gross sensation in all extremities
- Check for paresthesias

Traditional Glasgow Coma Scale (Trauma)

	Points	Adult	Pediatric
Eyes	1	No eye opening	
	2	Eye opening to pain	
	3	Eye opening to verbal	
	4	Eyes open spontaneously	
Verbal	1	No verbal response	No vocalization
	2	Incomprehensible sounds	Inconsolable, agitated
	3	Inappropriate words	Inconsistently consolable, moaning
	4	Confused	Cries but consolable, inappropriate interactions
	5	Oriented	Smiles, oriented to sounds, follows objects, interacts
Motor	1	No motor response	
	2	Extension to pain	
	3	Flexion to pain	
	4	Withdraws from pain	
	5	Localizes pain	
	6	Obeys commands	

Neurologic Status Assessment: Adult & Pediatric; page 2 of 2

TOC

2014 Updated Glasgow Coma Score (Trauma)

The updates to the GCS 2014 are intended to increase reliability. These provide a basis for standardizing practice and ensure the scale is useful, in a practical sense, in the future.

	Points	≥ 6 years old	< 6 years old
Eyes	4	Eye opening Spontaneously	
	3	Eye opening to Sounds	
	2	Eye opening to Pressure	
	1	No Response	
	NT	Not Testable	
Verbal	5	Oriented	Smiles, oriented to sounds, follows objects, interacts
	4	Confused	Cries but consolable, inappropriate interactions
	3	Words	Inconsistently consolable, moaning
	2	Sounds	Inconsolable, moaning
	1	No Response	No vocalization
	NT	Not Testable	Not Testable
Motor	6	Obeys Commands	
	5	Localizes to Pressure	
	4	Normal Flexion to Pressure	
	3	Abnormal Flexion to Pressure	
	2	Extension to Pressure	
	1	No Response	
	NT	Not Testable	

There are several distinct differences between the Traditional GCS and 2014 versions:

- Scoring for each component of the assessment (Eyes: Verbal: Motor) are recommended rather than reporting an aggregate score.
- A Not Testable (NT) descriptor is now recommended rather than scoring the component as a 1 for None when the assessment is, in fact, not testable for a particular reason.
- Terminology has been changed to reduce subjective interpretations, ie, inappropriate words to Words and Incomprehensible /garbled sounds to Sounds.
- Pain is no longer used to elicit responses. Pressure is applied instead.
- Pressure is applied in the same method for each assessment beginning with the periphery and moving to the central areas of the body above the clavicles, as necessary.
- The sternum rub is strongly discouraged, as it may cause tissue damage with repeated maneuvers.

Prehospital Stroke Screening Scales/FAST/VAN

TOC

FAST/Cincinnati Stoke Screening Scale - Required

FACE	ARMS	SPEECH	TIME
Ask patient to smile	Ask patient to raise both arms	Ask patient to speak a simple phrase	Time is BRAIN
Does the face look uneven?	Does one arm drift down?	Does the speech sound strange?	Time of symptom onset?
Yes= 1 point	Yes= 1 point	Yes= 1 point	

VAN: Screening Tool for Large Vessel Occlusion

Is ARM weakness present?

- □ Yes Continue the VAN exam
- □ No Patient is VAN negative. Stop VAN Exam.

	Yes	No
Visual Disturbance?	□	□
Aphasia?	□	□
Neglect?	□	□

If patient has **any degree of weakness PLUS any one of the below:**
Visual Disturbance (Assess field cut by testing both sides, 2 fingers right, 1 left)
Aphasia (Inability to speak or understand. Repeat and name 2 objects, close eyes, make fist)
Neglect (Forced gaze to one side or ignoring one side, touching both sides)

This is likely a large artery clot (cortical symptoms) = VAN Positive

Pediatric Pain Scores: FLACC / CHEOPS

TOC

FLACC Scale[2]	0	1	2
1 Face	No particular expression or smile.	Occasional grimace or frown, withdrawn, disinterested.	Frequent to constant frown, clenched jaw, quivering chin.
2 Legs	Normal position or relaxed.	Uneasy, restless, tense.	Kicking, or legs drawn up.
3 Activity	Lying quietly, normal position, moves easily.	Squirming, shifting back and forth, tense.	Arched, rigid or jerking.
4 Cry	No crying (awake or asleep).	Moans or whimpers; occasional complaint.	Crying steadily, screams or sobs, frequent complaints.
5 Consolability	Content, relaxed.	Reassured by occasional touching, hugging or being talked to, distractible.	Difficult to console or comfort.

Score	0	1	2
Cry	No cry	Crying, moaning	Scream
Facial	Smiling	Composed	Grimace
Verbal	Positive	None or other complaints	Pain complaint
Torso	Neutral	Shifting, tense, upright	Restrained
Legs	Neutral	Kicks, squirm, drawn up	Restrained

Modified CHEOPS (Children's Hospital of Eastern Ontario Pain Scale)

12 Lead Indications

Does the patient have one or more complaints from the following list:

Arm numbness or tingling
Chest pressure/heaviness
Unexplained diaphoresis
Suspected diabetic ketoacidosis
Suspected drug overdose
Altered mental status
Syncope
Unconscious Patient
Palpitations
Heart Rate <50 or >150
Return of Spontaneous Circulation (ROSC)
Metabolic derangement
Examples include: dialysis patients
liver impairment
Shortness of Breath**
Unexplained general weakness**
Nausea/vomiting**
Dizziness**
New onset of abnormal pain for the patient**
Examples include: jaw pain
shoulder pain
back pain

** = these symptoms plus risk factor for ACS

Yes

Perform 12 lead ECG.

Risk Factors for Acute Coronary Syndromes (ACS) include, but are not limited to:

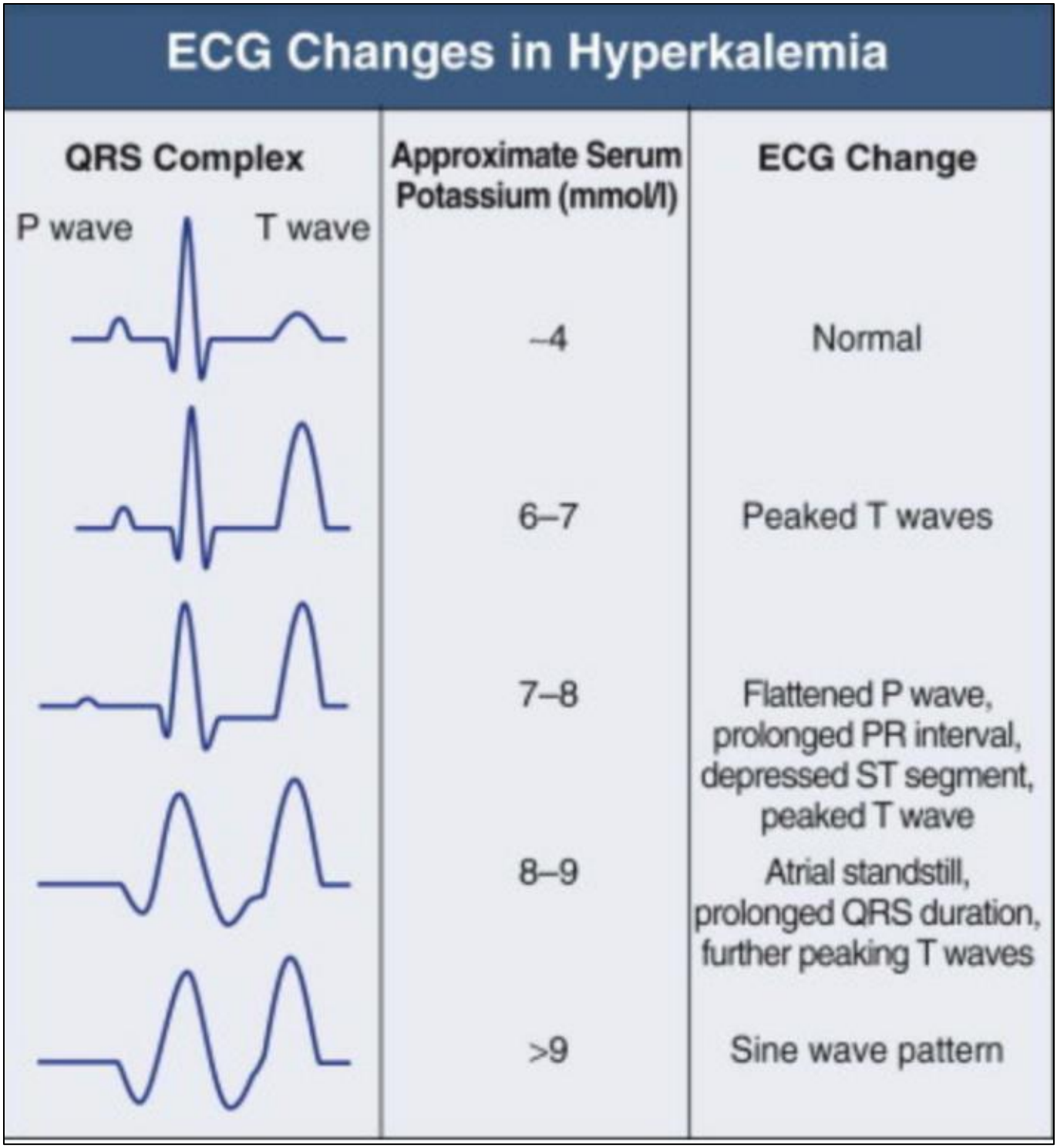
Family History
Hypertension
High Cholesterol
Diabetes
Obesity
High Stress
Sedentary Lifestyle
>65 years old or older.
Male sex (gender)
Alcohol intake
Heredity (including Race) —
African Americans
Mexican Americans
American Indians
Native Hawaiians
Some Asian Americans.
Tobacco smoke

Females, diabetic, and elderly patients often present with atypical chest pain or anginal equivalents.

When a 12 Lead is performed, a copy should be provided when transferring care.

ECG Changes in Hyperkalemia

TOC



TOC

AEMS Categorized Emergency Departments

Abrazo Arrowhead Campus
Abrazo Cave Creek Hospital
Abrazo Central Campus
Abrazo Scottsdale Campus
Abrazo Surprise Hospital
Abrazo West Campus
Banner Baywood Medical Center
Banner Boswell Medical Center
Banner Casa Grande Medical Center
Banner Del Webb Medical Center
Banner Desert Medical Center
Banner Estrella Medical Center
Banner Gateway Medical Center
Banner Goldfield Medical Center
Banner Ironwood Medical Center
Banner Ocotillo Medical Center
Banner Payson Medical Center
Banner Thunderbird Medical Center
Banner University Medical Center - Phoenix
Cobre Valley Community Hospital
Dignity Arizona General Hospital
Dignity Health Chandler Regional Medical Center
Dignity Health Mercy Gilbert Medical Center
Dignity Health St. Joseph's Hospital and Medical Center
Dignity Health St. Joseph's Westgate Medical Center
East Valley ER & Hospital
Exceptional Community Hospital - Maricopa
HonorHealth Deer Valley Medical Center
HonorHealth John C. Lincoln Medical Center
HonorHealth Scottsdale Osborn Medical Center
HonorHealth Scottsdale Shea Medical Center
HonorHealth Scottsdale Thompson Peak Medical Center
HonorHealth Sonoran Crossing Medical Center
Hu Hu Kam Memorial Hospital
Mayo Clinic Hospital
Steward Mountain Vista Medical Center
Steward Tempe St. Luke's Hospital
Valleywise Health Medical Center
Valleywise Emergency - Maryvale
Wickenburg Community Hospital

TOC

AEMS Categorized Satellite Centers/ Free Standing Emergency Departments

Abrazo Buckeye Emergency Center
Abrazo Peoria Emergency Center
Dignity Health/Arizona General - Ahwatukee
Dignity Health/Arizona General - Chandler
Dignity Health/Arizona General - Chandler McQueen
Dignity Health/Arizona General - Gilbert
Dignity Health/Arizona General - Glendale Olive
Dignity Health/Arizona General - Glendale Camelback
Dignity Health/Arizona General – Goodyear
Dignity Health/Arizona General - Mesa Baseline
Dignity Health/Arizona General - Mesa Power Road
Dignity Health/Arizona General - San Tan Valley
Dignity Health/Arizona General - Surprise
Dignity Health/Arizona General - Tempe Rural
Fountain Hills Medical Center Emergency Room
HonorHealth Complete Care - Paradise Valley
HonorHealth Complete Care - Prasada
Phoenix Children’s Avondale Emergency Department

Stroke Centers

The Arizona Stroke Consortium has identified the following hospitals as Primary Stroke Centers (PSC) for the Phoenix Metropolitan area. The following hospitals have provisionally met the criteria to become a Primary Stroke Center:

Abrazo Arrowhead Campus
Abrazo Central Campus
Abrazo Scottsdale
Abrazo West Campus
Banner Baywood Medical Center
Banner Boswell Medical Center
Banner Del Webb Medical Center
Banner Desert Medical Center
Banner Estrella Medical Center
Banner Thunderbird Medical Center
Banner-University Medical Center *Phoenix*
Dignity Health Chandler Regional Medical Center
Dignity Health Mercy Gilbert Medical Center
Dignity Health St Joseph's Hospital and Medical Center
HonorHealth Deer Valley Medical Center
HonorHealth North Mountain
HonorHealth Scottsdale Osborn
HonorHealth Scottsdale Shea
HonorHealth Thompson Peak
Mayo Clinic Hospital
Steward Mountain Vista Medical Center
Steward Tempe St. Luke’s Hospital

Candidates for Stroke Alert:

Any patient with acute onset of focal neurological deficit(s) such as facial asymmetry, arm drift, or slurred speech, known to have had an onset within 24 hours.

Trauma Center Locations

TOC

Level 1 Trauma Centers as of 11/4/2023

	Adult ≥15y/o	Pediatric ≤ 14y/o	Burns (any age)	OB >20 weeks
Abrazo West Campus	X			
Banner Desert Medical Center	x	x		x
Banner-University Medical Center *Phoenix*	X			X
Banner Thunderbird Medical Center	X			X
Dignity Health Chandler Regional	X			**X**
St. Joseph's Hospital and Medical Center	X			X
HonorHealth Deer Valley	X			
HonorHealth John C. Lincoln	X			
HonorHealth Scottsdale Osborn	X			
Valleywise Health Medical Center	X	X	X	X
Phoenix Children's Hospital		X		
Level III Trauma Centers as of 11/4/2023				
Banner Baywood Medical Center				
Banner Del E. Webb				
Steward Mountain Vista Medical Center				

Pediatric Intensive Care Units (PICU)

	Medical	Trauma
Banner Desert Medical Center/Cardon Children's Medical Center	X	**X**
Banner Thunderbird Medical Center	X	
Valleywise Health Medical Center	X	**X**
Phoenix Children's Hospital	X	**X**
HonorHealth Scottsdale Shea	X	

CARDIAC RECEIVING & REFERRAL CENTERS

TOC

RECEIVING CENTERS – Treatment capability for STEMI patients	CITY
Abrazo Arizona Heart Hospital	Phoenix
Abrazo Arrowhead Campus	Glendale
Abrazo West Campus	Goodyear
Banner Boswell Medical Center	Sun City
Banner Del E Webb Medical Center	Sun City West
Banner Desert Medical Center	Mesa
Banner Estrella Medical Center	Phoenix
Banner Heart Hospital at Banner Baywood Medical Center	Mesa
Banner Thunderbird Medical Center	Glendale
Banner University Medical Center Phoenix	Phoenix
Dignity Chandler Regional Medical Center	Chandler
Dignity Mercy Gilbert Medical Center	Gilbert
Dignity St. Joseph's Hospital and Medical Center	Phoenix
HonorHealth Deer Valley Medical Center	Phoenix
HonorHealth John C Lincoln Medical Center	Phoenix
HonorHealth Scottsdale Osborn Medical Center	Scottsdale
HonorHealth Scottsdale Shea Medical Center	Scottsdale
Mayo Clinic Hospital	Phoenix
Mountain Vista Medical Center	Mesa
Phoenix Children's Hospital	Phoenix
Tempe St. Luke's Hospital	Tempe
Valleywise Health Medical Center	Phoenix
REFERRAL CENTERS – have agreements in place for rapid transfer to Cardiac Receiving center	**CITY**
Banner Goldfield	Apache Junction
Banner Ironwood	Queen Creek
HonorHealth Sonoran Crossing Medical Center	Phoenix
HonorHealth Thompson Peak Medical Center	Scottsdale

Blood Thinner List

TOC

Antiplatelets	**Anticoagulants**
• Salicylate (Aspirin) • Clopidogrel (Plavix®) • Prasugrel (Effient®) • Ticagrelor (Brilinta®) • Dipyridamole (Persantine®) • Dipyridamole/Aspirin (Aggrenox®)	• Enoxaparin (Lovenox®) • Dabigatran (Pradaxa®) • Rivaroxaban (Xarelto®) • Warfarin (Coumadin®) • Apixaban (Eliquis®) • Heparin • Fondaparinux (Arixtra®)

FYI: The most common new drugs you will see patients on are **Xarelto** and **Eliquis.** Several Cardiologists are starting to use these for patients with A-Fib instead of Coumadin. **Aggrenox** is commonly used for stroke/TIA patients

Drug Category	**BRAND NAMES** of Blood Thinners	**GENERIC NAMES** of Blood Thinners
Vitamin K antagonists	Coumadin	Warfarin
Heparin (Carbohydrate) drugs	Clexane, Lovenox	Enoxaparin
	Hep-Lock, Hep-Pak	Heparin
	Fragmin	Dalteparin
	Arixtra	Fondaparinux
	Orgaran	Danaparoid
	Innohep	Tinzaparin
Thrombin (enzyme) inhibitors	Acova	Argatroban
	Refludan	Lepirudin rDNA
	Angiomax, Angiox	Bivalirudin
	Pradaxa	Dabigatran
Salicylate	Aspirin	Acetylsalicylic acid
P2Y (Platelet receptor) inhibitor	Plavix	Clopidogrel bisulphate
Thromboxane (specialized small molecule) inhibitor	Persantine Aggrenox	Dipyramidole Aspirin dipyramidole

Useful Phone Numbers	
Adult Protective Services	1-877-767-2385
Child Protective Services	1-888-767-2445
Mesa Alarm Room	480-644-2400
Phoenix Fire Alarm Room	602-262-6595
Poison Control	1-800-222-1222
Arizona Opioid Assistance and Referral Line	1-888-688-4222
Translation Line (charges may apply)	1-800-523-1786
Banner EMS Poison Control	602-462-0460.
Crisis Response Network	602-222-9444
Banner University Phoenix VAD	602-819-7910
Banner University Tucson VAD	520-694-6000
Mayo VAD	480-342-2999
Dignity St. Josephs VAD	602-406-8000
PCH VAD	602-933-8800

Utilization of Over-the-Counter Medications by Arizona EMS Agencies

TOC

GD-111-PHS-EMS: Utilization of Over-the-Counter Medications by Arizona EMS Agencies MDC Approved: 5/21/15 Adopted August 1, 2015

STATE OF ARIZONA ● EMERGENCY MEDICAL SERVICES AND TRAUMA SYSTEM
Utilization of Over-the-Counter Medications by Arizona EMS Agencies

Background
Over-the-counter (OTC) medications are FDA-regulated substances that are readily available to the general public. Although regulated by the FDA, the general public may access and self-administer these medications without the advice or prescription from a licensed physician or other licensed healthcare professional.
The Bureau of Emergency Medical Services and Trauma System (BEMSTS) does not currently regulate the administration of OTC medications by Emergency Medical Care Technicians (EMCTs). In the absence of regulation, OTC medications should be treated like other FDA-approved products that are not regulated by BEMSTS, but are used in EMS operations.

Process
The Medical Direction Commission recommends that the following clinical guidelines be met by EMS agencies that supply, carry, or distribute OTC medications:

1. EMCTs may distribute OTC medications while involved in wildfire operations, special events, search and rescue, or when performing disaster relief.
2. OTC medications may be distributed by EMCTs at the request of an individual and for the individual's self-administration only.
3. EMCTs should only carry OTC medications approved by their medical directors.
4. Medical directors should ensure EMCTs have appropriate knowledge of available OTC medications and the common contraindications of those OTC medications.
5. Medical directors should develop a policy that outlines the types of OTC medications and circumstances in which those medications can be made available for self-administration.
6. OTC medications should be distributed in single dose packaging with instructions on the appropriate use of the medication kept on hand.

Epinephrine (Push Dose)

TOC

Preparation:
- Mix 1mL of epinephrine 0.1 mg/mL (CARDIAC) with 9 mL of Normal Saline (NS) in a 10 mL syringe.
- This results in a 10 mcg/mL concentration.
- Label syringe to indicate new concentration.

Indications:
- Shock unresponsive to fluid resuscitation.
- Post-ROSC with persistent hypotension.
- **Adult** patients with symptomatic bradycardia.

Excludes:
- **Pediatric** Bradycardia.
- Anaphylaxis - use standard IM epinephrine dosing first. Only use epinephrine (push dose) if non-responsive to repeat IM epinephrine doses and 60 mL/kg NS IV/IO fluid bolus.

Dose:
- **Adults** = 10-20 mcg boluses (1-2 mL) every 2 minutes titrated to MAP ≥ 65.
- **Pediatric** = 1 - 10 mcg boluses (0.1 - 1 mL) every 2 minutes, titrated to age-appropriate blood pressure or other indications of adequate perfusion.

Philips MRx Monitor

TOC

Electrical Therapy ADULTS (Ages 8+)

Apply Pads and 4 Leads

Bradycardia	PACING	Start at 10mA, 70-80bpm (Increase "Output" until both electrical and mechanical captures are confirmed)		
SVT	SYNC (push & hold)	50 J	100 J	200 J
A-Flutter	SYNC (push & hold)	50 J	100 J	200 J
A-Fib	SYNC (push & hold)	120 J	200 J	200 J
V-Tach with a pulse	SYNC (push & hold)	100 J	200 J	200 J
Torsades (with or without a pulse) & Pulseless V-Tach / V-Fib	DEFIB	150 J	150 J	150 J

The MRx adjusts the energy setting from the impedance sensed through the multifunction pads, no need to increase the manual defibrillation above the 150 J

Electrical Therapy PEDIATRICS (Ages 7 and under)

Apply Pads and 4 Leads

Pediatric Pulseless V-Tach/V-Fib	DEFIB	2 J/kg	4 J/kg	10 J/kg
Pediatric Tachycardia	SYNC (push & hold)	1 J/kg	2 J/kg	2 J/kg
Pediatric Bradycardia	PACING	Start at: 10mA, 100 bpm		

Unstable Tachycardia Signs & Symptoms

TOC

Is your patient unstable because of tachycardia?

Consider Cardioversion	Most important factor is hemodynamic instability. These include signs of shock: • Low Systolic Blood Pressure • Weak Pulse • Syncope or postural lightheadedness • General signs of poor perfusion Note: Flash pulmonary edema from acute heart failure is also considered unstable.
Withhold Cardioversion	Rates 100-150 are generally tolerable and often are appropriate compensatory response (sepsis, hemorrhage, tox, etc). These patients likely do not need cardioversion.
Caution	Use caution with altered LOC alone, since this could be from poor perfusion (less likely without other signs) or some other medical problem associated with otherwise stable tachycardia. Remember to treat any ongoing hemodynamic shock regardless of if you have decided to cardiovert.

TOC

Physio LIFEPAK Monitor

Electrical Therapy ADULTS

Apply Pads and 4 Leads

Bradycardia	PACING	Start at 10mA, 60bpm (Increase "Output" until both electrical and mechanical captures are confirmed)				
SVT	SYNC (push & hold)	50 J	100 J	200 J	300 J	360 J
A-Flutter	SYNC (push & hold)	50 J	100 J	200 J	300 J	360 J
A-Fib	SYNC (push & hold)	120 J	200 J	300 J	360 J	360 J
V-Tach with a pulse	SYNC (push & hold)	100 J	200 J	300 J	360 J	360 J
Torsades (with or without a pulse) & Pulseless V-Tach / V-Fib	DEFIB	200 J	300 J	360 J	360 J	360 J

Electrical Therapy PEDIATRICS

Apply Pads and 4 Leads

Pediatric Pulseless V-Tach/V-Fib	DEFIB	2 J/kg	4 J/kg	10 J/kg
Pediatric Tachycardia	SYNC (push & hold)	1 J/kg	2 J/kg	2 J/kg
Pediatric Bradycardia	PACING	Start at: 10mA, 100 bpm		

TOC

ZOLL X Series Monitor

Electrical Therapy ADULTS

Apply Pads and 4 Leads

Bradycardia	PACING	Set "Rate" at 60-80bpm. Increase "Output" until both electrical and mechanical capture are confirmed.			
SVT	SYNC (push & hold)	70 J	120 J	150 J	200 J
A-Flutter	SYNC (push & hold)	70 J	120 J	150 J	200 J
A-Fib	SYNC (push & hold)	70 J	120 J	150 J	200 J
V-Tach with a pulse	SYNC (push & hold)	70 J	120 J	150 J	200 J
Torsades (with or without a pulse) & Pulseless V-Tach / V-Fib	DEFIB	120 J	150 J	200 J	200 J

Electrical Therapy PEDIATRICS

Apply Pads and 4 Leads

Pediatric Pulseless V-Tach/V-Fib	DEFIB	2 J/kg	4 J/kg	4-10 J/kg
Pediatric Tachycardia	SYNC (push & hold)	1 J/kg	2 J/kg	2 J/kg

Pharmacologic Management – Synchronized Cardioversion and NIPPV

Includes: Pharmacologic Management for patients requiring:
- Synchronized Cardioversion for unstable **Tachycardia.**
- NIPPV for Bronchospasm, Pulmonary Edema, general Airway Management

Paramedic

- **Fentanyl**: 1 mcg/kg/dose IN/IV/IO, max initial dose 100 mcg, max total dose 200 mcg.
    - If age > 60 consider reducing dose by half

APGAR Score

SIGN	0	1	2
Appearance	**Blue and pale**	**Body pink, limbs blue**	**All pink**
Pulse	**Absent**	**Less than <100**	**More than >100**
Grimace	**No response**	**Grimace**	**Coughing and crying**
Activity	**Limp**	**Weak**	**Strong**
Respiration	**Absent**	**Irregular, slow**	**Good, crying**

TOC

Alternative Destinations (Agency Specific)
Behavioral Health Patient Management

Adult (18-59 y/o)

Patients ≥ 60, contact on-line medical direction.

Patients < 18, contact on-line medical direction.

Paramedic

• Initiate Universal Care
• Exclusion Criteria for Transfer to Behavioral Health Facility:
  − Current complaint of Chest Pain
  − Hypoperfusion
  − Any new medical condition or complaint requiring medical evaluation
  − Any new injury or wounds requiring medical evaluation
  − Any known or suspected toxic ingestion, injection, or inhalation (including OTC and prescriptions medications)
  − Need for medical IV for any reason
  − Medication administration by EMS
  − Trauma
  − Combative, violent, and/or agitated
  − Unable to perform activities of daily living due to medical or physical limitations
  − Pregnant > 20 weeks
• If exclusion criteria are present, transport to the Emergency Department or contact on-line medical direction.
• Patient should have decision making capacity and voluntarily agree to transfer to a Behavioral Health Facility.
• When in doubt contact on-line medical direction

For direct transport to Behavioral Health Facility, vital signs should be within the following limits: • Temp <101 • Respirations 10-20 • BP 90-160 systolic 60-110 diastolic • Pulse 60-110 • Pulse oximetry ≥ 94% RA • Blood Glucose 60-250
Transport to Behavioral Health Facility: • Substance Abuse (Alcohol/Drugs) • Mood Disorder (Depression/Anxiety) • Danger to Self/Danger to Others/Suicide Threat • Acute Psychotic Episode (with known history of psychosis)

Resource Section: For agencies that use the following skills or equipment, these are optional references

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Guidelines for Use of Restraints

Restraints may be used to ensure patient safety when the prehospital provider determines that the patient requires medical evaluation and/or treatment, and/or the patient's behavior and/or actions may potentially cause harm to himself or to others.

The prehospital provider that is confronted with a combative patient shall at all times consider the safety of himself, bystanders, and the patient. He/she shall avoid unreasonable force with the objective being the quickest and safest restraints called for by the situation. Use of additional manpower should be utilized as needed. Consider use of pharmacologic management for agitation as indicated. Assistance from law enforcement should be requested.

Once restrained, it is the prehospital provider's duty to protect the patient from harm and to treat all apparent emergency medical problems. The patient should be restrained in such a manner that allows adequate assessment of the patient's status and immediate access to the patient for necessary care without compromising a safe environment for the patient, prehospital providers, and bystanders.

Patient Assessment

1. An ALS provider must assess a patient that is restrained.
2. The patient must be under direct supervision at all times during treatment and transport.
3. The patient's airway, breathing, and vital signs – including pulse oximetry – must be monitored.
4. Circulation to the extremities shall be evaluated and documented at least every 10 minutes when restraints are applied.
5. Any patient in restraints shall have a cardiac monitor applied, and a monitor strip documented, as soon as is reasonable after restraints are applied.
6. A patient in restraints requires ALS transport to the hospital with at least one ALS provider in the back of the ambulance during transport.
7. Notify the receiving facility of the incoming restrained patient.
8. Obtain VS every 5 minutes if possible

Type of Restraint

1. Handcuffs may only be used as restraint devices when a law enforcement officer accompanies the patient to the hospital. A patient that is in police custody will require a handcuff key inside the ambulance during transport. The paramedic should have immediate access to keys needed to release handcuffs or other restraining devices.
2. Only leather or other agency-approved "soft" restraints may be used. If locking restraints are used, the key must be transported with the patient in the ambulance. The use of linens as a restraint device is acceptable, providing they can be secured in a manner that allows rapid patient access if needed in an emergency.

Guidelines for Use of Restraints

TOC

Patient Positioning

1. Patients shall be positioned in a manner that does not compromise airway or breathing.
2. Access to the airway must be maintained for possible advanced airway management.
3. Access to the chest must be maintained for possible CPR or defibrillation.
4. Access to the extremities must be maintained for possible IV/IO placement.
5. No patient will be restrained in a prone position or "hog-tied."
6. No patient will be placed between backboards or stretchers.
7. Patient is preferably restrained to a backboard allowing transfer of the patient without removing the restraints, and also to allow patient to be turned to the side in case vomiting occurs.
8. Restraints shall be placed in such a manner as to not preclude evaluation of the patient's medical status or to cause injury.

Documentation

If restraints are necessary, documentation must include:

1. Reason restraint was required (patient's behavior prior to application of restraints, including statements made by the patient, family members, or bystanders)
2. Type of restraint used
3. Position of the patient during treatment and transport
4. Patient response to application of restraints
5. Data indicating constant supervision of ABCs and vital signs, including pulse oximetry
6. Status of circulation distal to restraints
7. Total time the patient was restrained while in the care of EMS
8. Any assessment or treatment that cannot be implemented due to the patient's combative or uncooperative state
9. Patient status at the time of transfer of care

ARS 13-403: A person acting under a reasonable belief that another person is about to commit suicide or to inflict serious physical injury upon himself may use physical force upon that person to the extent reasonably necessary to thwart the result.

EZ-IO: Adult and Pediatric

TOC

Indications:

- Immediate vascular access in emergencies.
- Intravenous fluids or medications are urgently needed and a peripheral IV/IO cannot be established in 2 attempts or 90 seconds **AND** the patient exhibits one or more of the following:
- An altered mental status (GCS of 8 or less)
- Respiratory compromise (SpO2 <90% after appropriate oxygen therapy, respiratory rate <10 or >40 min)
- Hemodynamic instability

Contraindications:

- Fracture of the bone selected for IO infusion (*consider alternate site*)
- Excessive tissue at insertion site with the absence of anatomical landmarks (relative contraindication)
- Previous significant orthopedic procedures (*IO within 24 hours, prosthesis)*
- Infection at the site selected for insertion

If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain informed consent.

Insertion Site (Adult):

1. Proximal Humerus (preferred)
2. Proximal Tibia
3. Distal Tibia

Insertion Site (Pediatric):

1. Proximal Humerus (for age 5 and older)
2. Proximal Tibia
3. Distal Femur

Prepare:

Wear approved BSI equipment. Determine indications and rule out contraindications. Locate appropriate insertion site and prepare using aseptic technique. Prepare the EZ-IO driver and appropriate needle set.

Insert:

Stabilize site. Gently push needle through skin @ 90 degrees until needle tip touches bone. Ensure at least 5 mm of catheter is visible (single line). Apply gentle pressure while powering driver until needle is set. Remove driver from needle set while stabilizing catheter hub. Remove stylet from catheter, place stylet in sharps container. Confirm placement and patency.

Flush:

Connect primed tubing. Slowly administer **Lidocaine*** 2% (preservative-free) IO to conscious patients (after ensuring patient has no allergy or sensitivity to **Lidocaine**):
Adults- 40 mg; Peds- 0.5 mg/kg (up to 40mg max)
Slowly infuse lidocaine over 2 minutes. Allow lidocaine to dwell in IO space for 60 seconds.
Flush with normal saline (Adult 5-10mL, Pediatric 2.5-5mL)
Slowly administer a second bolus of lidocaine (Adults 20mg, Pediatrics ½ initial dose) over 60 seconds. Dress site, secure tubing. Monitor site and patient condition. Repeat as needed.

Notes:

1. EZ-IO 45mm (Yellow) to be used for patients 40kg and over. EZ-IO 25mm (Blue) to be used for patients 3-39 Kg.
2. Due to the anatomy of the IO space, flow rates may appear to be slower than those achieved with an IV/IO catheter.
3. Insertion of the EZ-IO in conscious patients has been noted to cause mild to moderate discomfort, however, IO infusion in conscious patients has been noted to cause severe discomfort.
4. EZ-IO catheter should be removed within 24 hours

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i-gel Supraglottic Airway Reference

Adult i-gel size chart:

Size 3 (small adult):
Patient weight: 30-60 kg (65-130 lbs)

Size 4 (medium adult):
Patient weight: 50-90 kg (110-200 lbs)

Size 5 (large adult):
Patient weight: 90+ kg (200+ lbs)

Pediatric I-gel size chart:

Size 1 (Neonate):
Patient weight: 2-5 kg (5-11 lbs)

Size 1.5 (Infant):
Patient weight: 5-12 kg (11-25 lbs)

Size 2 (small pediatric):
Patient weight: 10-25 kg (22-55 lbs)

Size 2.5 (large pediatric):
Patient weight: 25-35 kg (55-77 lbs)

Prepare for Insertion:

Select the appropriate size. Open package, dispense bolus of lubricant on inner side package shell. Lubricate all sides of the gel-cuff.

Insertion:

Open airway (sniffing position best if able). Position i-gel so that cuff faces patient's chin. Glide device down and back along soft palate gently until a "definitive" resistance is felt. Patient's incisors should be resting on the bite block. Slide securing strap under the neck and attach to hook ring.

Gastric Channel:

A gastric tube may be inserted through the I-gel gastric channel when indicated.

Notes:

1. i-gel notes: excessive air leak usually due to depth of insertion not deep enough. Do not apply "excessive force" during insertion. A feel of "give-way" may be felt before the end point resistance is met; continue until "definitive" resistance.
2. The supplemental oxygen port may be used to deliver passive oxygenation, as a component of CCR or as indicated.
3. Confirm proper placement by observing for chest rise, bilateral breath sounds, proper bag compliance, negative epigastric sounds, and/or monitored ETCO2. Document appropriately.

Orogastric/Nasogastric Tube Placement Skill

TOC

Indications

- To decompress the stomach & improve ventilation
- Reduce aspiration risk

Contraindications

- Suspected fracture of the basilar skull
- Facial Trauma with suspected fractures
- Known or suspected esophageal varices

Sizing

Nasogastric

- Pediatrics: 2 x ETT size (Usually 8 - 16 Fr.)
- Adult: Largest size that will fit the nare (Usually 10-18 Fr.)

Orogastric

Use largest tube you can safely pass.

Positioning

Conscious: Sitting tall, head tilted foreword (chin on chest)
Unconscious: Supine or recovery.

Measure Depth

Nasogastric

Tip of the nose, around the ear, to a point half-way between xiphoid & umbilicus.

Orogastric

Corner of mouth, around the ear, to a point half-way between xiphoid & umbilicus

Hold measurement between fingers or mark with tape.

Nasal Insertion

Apply water-soluble lubricant. Direct tube along the floor of nostril to the posterior pharyngeal then direct the tube downward through the nasopharynx. Instruct patient to swallow if able.

Oral Insertion

Apply water-soluble lubricant. Direct tube to the back of the tongue, them downward through the oropharynx.
Instruct patient to swallow if able.

Post Insertion

Confirm placement by aspirating stomach contents, or by injecting 5-10 cc air while auscultating over the epigastrium. After insertion, tape in place. Suction as needed.

Human Trafficking Reference

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Victims of trafficking are recruited into prostitution, groomed and tricked by their trafficker and forced to comply through beatings, rape, starvation and threats of violence to loved ones. Most trafficking victims suffer extreme physical and psychological trauma and often have a strong bond with their trafficker, similar to a domestic violence victim.

Victims may not recognize that they are victims, and may not ask for help

Red Flags to assist identifying a victim

- Any minor working in commercial sex.
- Presence of a companion who answers for the patient.
- Discrepancy in reported age and apparent age.
- Lack of ID documents (they are generally held by their handlers as a form of control).
- Not an English speaker and their companion refuses the use of a translator.
- Reluctance to explain tattoos/branding.
- Rectal/vaginal trauma.
- Bald patches or missing hair.
- Inadequately, and at times inappropriately or provocatively dressed.
- Bruises in various stages of healing caused by physical abuse.
- Scars, mutilations, or infections due to improper medical care.
- Poor hygiene.
- Urinary difficulties, pelvic pain, pregnancy, or rectal trauma caused from working in the sex industry.
- Malnourishment and/or serious dental problems.
- Disorientation, confusion, phobias, or panic attacks.
- Use of street lingo with references to “The game” or “The life.”

Physical environment clues

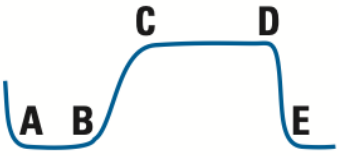
- Rooms with numerous beds on the floor.
- Small rooms in a residence with locks on the OUTSIDE of the door.
- Locks on many/all of the windows.
- Presence of drugs or drug paraphernalia.
- Presence of restraint devices (rope, chain, etc.)
- Numerous phones present, expensive cars, jewelry and purses that seem out of place.

Sample messages you can use to gain trust

- “We are not the police.”
- “We are not here to get you in trouble, we just want to help.”
- “We will not make you do anything you don’t want to do or feel comfortable with.”
- “I am here to help you.”
- “My first priority is your safety.”
- “We will get you the care you need.”
- “We spoke to our doctor; they feel that we should take you to the hospital to get (issue x) checked out.”

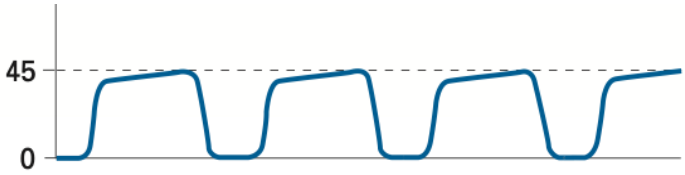
TOC

Capnography Reference



A-B	Respiratory Baseline
B-C	Expiratory upslope
C-D	Expiratory plateau
D	Peak CO2 concentration; End-tidal numerical value
D-E	Inspiratory downslope

Normal Waveform:

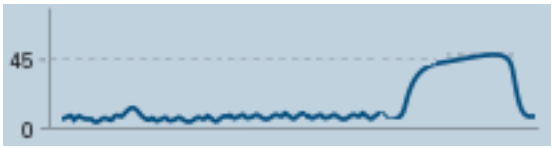


Normal Capnometry Ranges:
- Adult: 35-45 mmHg
- Pediatric: 35-45 mmHg

Capnography for Intubated Patients:

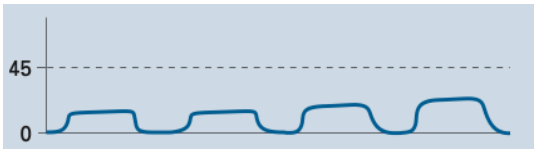
Applications:
- Verify ET Tube Placement
- Monitor and detect ET tube dislodgment
- Loss of circulatory function
- Determination of adequate chest compressions
- Identify return of spontaneous circulation

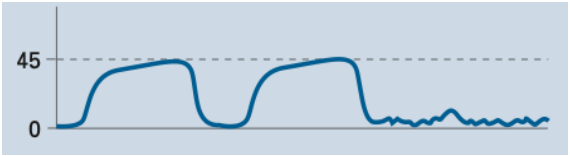
ET Tube Confirmation:
- Presence of waveform with ventilation



Effectiveness of CPR:
- Gradual drop of EtCO2 reading indicates rescuer fatigue
- Try to maintain a minimum EtCO2 reading of 10 mmHg

Sudden loss of wave form:
- Loss of circulatory function; or
- ET tube dislodged, kinked or obstructed

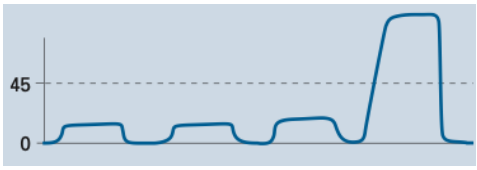




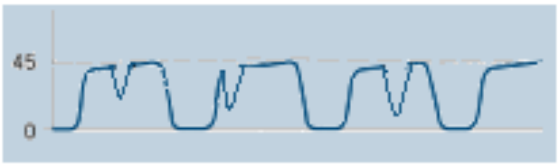
Capnography Reference

TOC

Sudden increase in EtCO2:
- Return of spontaneous circulation
- Check pulse



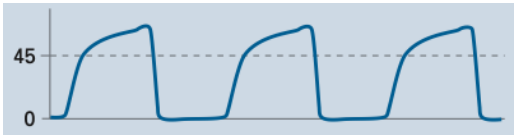
Curare Cleft:
- Patient is spontaneously breathing
- Induction agent/paralytic is wearing off



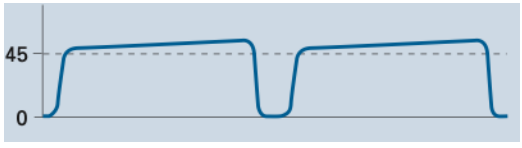
Capnography for Non-Intubated Patients:

Applications:
- Identify Bronchospasm
- Identify hypoventilation
- Identify hyperventilation

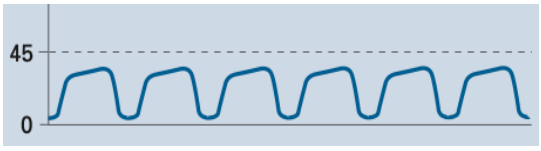
Bronchospasm:
- "Shark-fin" appearance
- Seen in Asthma/COPD



Hypoventilation:
- Slow rate
- EtCO2 >50 mmHg
- Potential Causes:
  - CNS depression
  - Drug ingestion
  - Alcohol intoxication
  - Stroke
  - CNS infection
  - Head injury



Hyperventilation
- Rapid rate
- EtCO2 < 35 mmHg
- Potential Causes:
  - Stress/anxiety
  - Head injury
  - Stroke
  - Metabolic Acidosis (DKA, lactic acidosis, renal failure)



Nasal Intubation

TOC

Paramedic

Assess the need for nasal intubation vs. other airway management techniques. Avoid in patients with mid facial trauma, a suspected cribiform plate fracture, or who are apneic.

Consider pharmacologic management for conscious patients

Select the largest and least obstructed nare. Consider one to two sprays of Phenylepherine spray.

Prepare tube:
-Use of a nasal tube (trigger tube) is preferred
- Check cuff for leaks
-Remove stylette if applicable
-Apply whistle device (ex. BAAM)
-Lubricate tube

Insert tube into the selected nare, bevel toward the septum. Advance the tube, aiming toward the patient's contralateral nipple. Stop if you meet resistance.

As the tube approaches the glottic open, the whistling should get louder. Advance the tube past the vocal cords as the patient inhales.

Confirm tube placement.

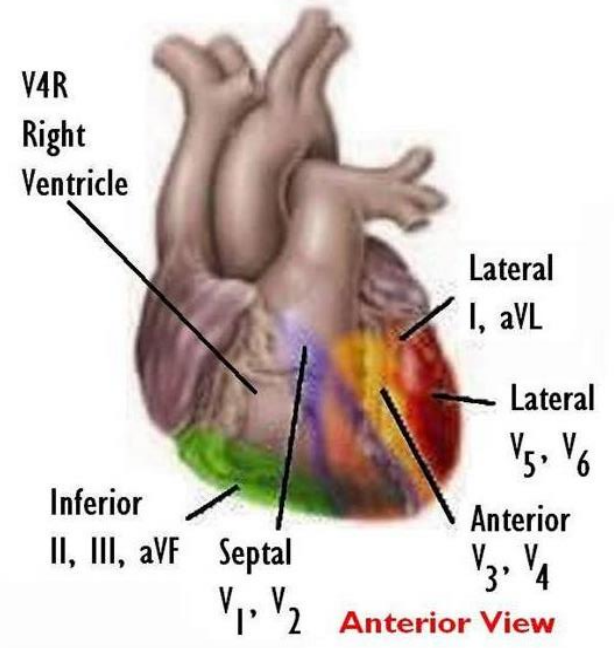
STEPS FOR 12 LEAD ECG INTERPRETATION

A Step by Step Analysis of 12 lead ECG's
RULE #1 – NEVER RELY ON THE INTE-PRATIVE STATEMENT PRINTED ON THE 12 LEAD ECG !!!

Step #1 = Check Rate and Rhythm
Treat life threatening arrhythmias.

Step #2 = Evaluate ECG Measurements & Heart Rate
QRS Duration = ≤ .12sec or ≤ 120ms
PRI Duration = ≤ .20sec or ≤ 200ms
Is the heart rate slow, normal or fast?

Step #3= Evaluate Leads II and V1
What is the ECG rhythm?
Calculate the rate, does it match the computers calculation?



Step #4 = Group the ECG Leads Into Where They Are "Looking"
II, III, AVF – Inferior
I, AVL, V5, V6 – Lateral
V1, V2 – Septal
V3, V4 – Anterior
Ask Yourself:
Are there Q-waves? Pathologic or Physiologic?
Is the S-T segment depressed, elevated or normal when compared to the T-P segment?
Are the T-waves inverted?

Step #5 = Ask a Few Additional Questions???
Is there a presence of indicative changes?
Can it be localized to a specific area?
What coronary artery is involved?

Step #6 = Miscellaneous Conditions
LBBB
Ventricular Rhythms
Left Ventricular Hypertrophy (LVH)
Pericarditis
Early Repolarization

Step #7 = Clinical Presentation
Maintain a high index of suspicion, especially in those patients with significant cardiac risk factors (i.e. diabetes, HTN, obese, hereditary, elderly) Be a good detective:

Remember Anginal Equivalents and Atypical Presentations

Step #8 = If There Is Acute Infarction
Notify the receiving ER or Cardiac Catheterization Lab early on!
Anticipate possible complications.
Develop a customized treatment plan.
Be deliberate, fast and professional.

Remember Time is Muscle !!!

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Normal
- Non-diagnostic or base-line with no abnormalities

Ischemia
- Suspicious for ischemia—ST segment depressed, T wave may invert or be peaked
- Digitalis can cause de-pressed ST segments, but will be seen in all leads
- May be reciprocal, look for ST elevation in opposing leads

Injury
- Suspicious for injury or infarction– ST segment elevated, T wave may invert, T wave may be tall and peaked
- Signifies an acute injury process

Injury or Infarct
- Suspicious for injury or infarction–
ST segment elevated, T wave may invert, abnor-mal Q wave may be present
- Signifies an acute injury process

Suspicious for Injury
- Suspicious for injury– new onset bundle branch block

Location	Indicative	Reciprocal changes	Affected coronary artery
Lateral	I, aVL, V5, V6	V1, V2, V3	LCA—circumflex branch
Inferior	II, III, aVF	I, aVL	RCA—posterior descending branch
Septal	V1, V2	No specific leads di-rectly view, look for indicative changes	LCA—LADA, septal branch
Anterior	V3, V4	II, III, aVF	LCA—LADA,
Posterior	No specific leads directly view, look for reciprocal changes	V1, V2, V3, V4	RCA or left Cx artery
Right	V1R—V6R		RCA—proximal branches

(LAD) Left anterior descending artery
(RCA) Right Coronary Artery
(Cx) Circumflex artery
*There may be an overlap in blood supply by the RCA and Cx artery depending on which artery is dominant.

Ischemia Pattern	Inverted T-waves or S-T segment depression >1mm (one small box) in two automatically contiguous leads
***Ischemia**: a decreased supply of oxygenated blood to tissue*	
Injury Pattern	S-T segment elevation >1mm (one small box) in two anatomically contiguous leads
***Injury**: damage to tissue, may be irreversible*	
Infarct Pattern	Wide pathologic Q-waves wider than .04 sec. or 40 ms (one small box) in two anatomically contiguous leads
***Infarct**: Death to tissue, usually due to lack of oxygenate bloodflow*	

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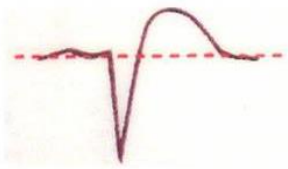

LEADS VR4 in a Right-sided ECG
RIGHT VENTRICULAR INFARCTION

Accompanies inferior MI 40% of time. If patients presents with changes in Leads II, III, and/or aVF, V3R and V4R (Right-sided chest lead) should be checked. Or run a full right-sided 12 lead (though V3R—V4R is adequate in most studies).

RV infarct (RVI) is an important cause of hypotension in inferior MI and is recognized by JVD with clear lung fields. Use extreme caution with nitrates and morphine in RVI, as both reduce right heart filling (preload) and thus compromise diastole (coronary perfusion pressure).

Appearance therapy is indicated—reperfusion strategies. IV fluids for right heart filling pressure and pacing to maintain rate. Overall mortality is high in RVI accompanying inferior Wall MI, mostly related to a lack of recognition of RV involvement: failure to run V4R chest leads.

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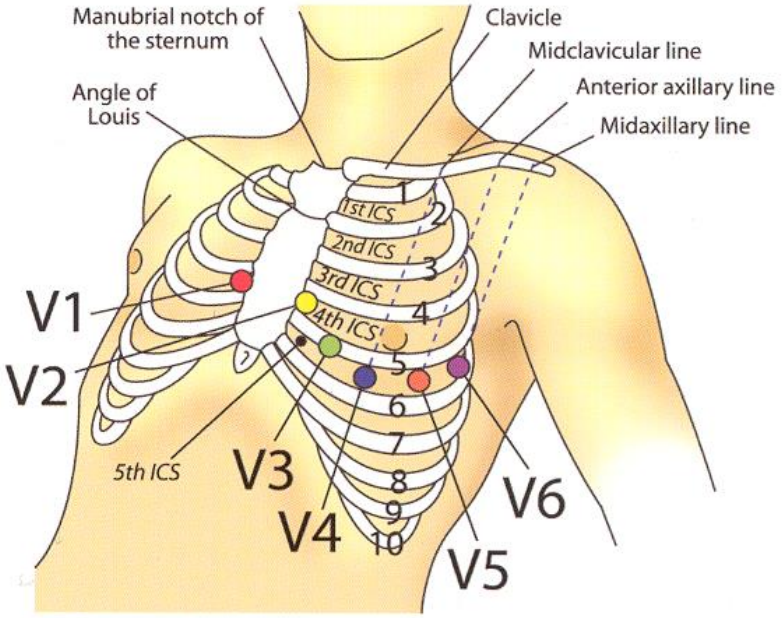
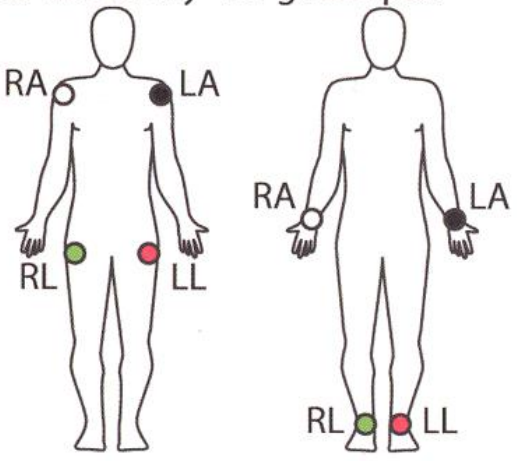


V1 = Right side of sternum, 4th intercostal space
V2 = Left side of sternum, 4th intercostal space
V3 = Midway between V2 and V4
V4 = Left midclavicular line, 5th intercostal space
V5 = Left anterior axillary line, same level as V4
V6 = Left midaxillary line, same level as V4
V4R = Right midclavicular line, 5th intercostal space

Skin Preparation To Reduce Artifact

- Use newly opened electrodes, check expiration dates
- Shave application area with razor (if needed)
- Rub application area with a dry 4x4 gauze pad

RA Right Arm
LA Left Arm
RL Right Leg
LL Left Leg



IV/IO Infusion Pump & Transport Infusions

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For agencies that carry an IV/IO infusion pump:

The paramedic may choose to utilize an IV/IO infusion pump for calculated administration of infusion medications found in the paramedic drug box, or for medications approved for monitoring during interfacility transports.

Interfacility Transports – Agencies other than Tribal require CON and agency approval

The following medications are approved for the transporting paramedic to monitor during interfacility transports by the Director of AZDHS. Medications in BOLD require the use of an infusion pump during the transport.

The transporting paramedic should consult with the transferring physician, together with medical direction, to determine if the specific medication dosage and infusion rate should remain fixed, titrated to effect, or discontinued if complications should arise. Obtain orders prior to transport if necessary.

If the patient starts to deteriorate or if serious complications arise, the transporting Paramedic should contact the sending physician or medical control for orders.

AZDHS approved interfacility medication maintenance infusion drug list (as of 11/2015) as listed in "Agents Eligible for Administration and Monitor during Interfacility Transports" Table as recommended by the Medical Direction Commission and approved by the Director of AZDHS.

*Items in bold require administration by infusion pump

- **Amiodarone**
- Antibiotics
- Blood
- Calcium Chloride
- Colloids
- **Corticosteroids**
- **Diltiazem**
- Diuretics
- **Dopamine**
- Electrolytes/Crystalloids
- **Epinephrine**
- **Fentanyl**
- **Fosphenytoin/Phenytoin**
- Glucagon
- Glycoprotein Iib/IIIa Inhibitors
- H2 Blockers
- **Heparin Na**
- **Insulin**
- **Norepinephrine (Levophed)**
- **Lidocaine**
- **Magnesium Sulfate**
- **Midazolam**
- **Morphine**
- **Nitroglycerin IV/IO Solution**
- **Pantoprazole**
- **Phenobarbital**
- **Potassium Salts**
- **Procainamide**
- **Propofol**
- **Total Parenteral Nutrition**
- Vitamins

GD-097-PHS-EMS

Approved by MDC May 21, 2020

Drug Profiles

As Recommended by the Bureau of EMS and Trauma System

ADHS

PREPAREDNESS

Arizona Department of Health Services

DISCLAIMER

These guidelines are designed to be a resource document for use by Medical Direction Authorities, as defined by A.R.S. § 36-2205, responsible for the administrative, organizational and on-line medical direction of pre-hospital Emergency Medical Care Technicians (EMCTs). It is specifically recognized that documented regional or local variations from the guidelines contained within are not only acceptable, but also appropriate, depending on the individual circumstances of the involved areas and organizations.

By Statute and Rule, all advanced life support pre-hospital EMCTs shall have administrative and on-line medical direction. These guidelines are not meant to act as a substitute, proxy or alternative to that medical direction. Any conflict between these guidelines and the EMCT's medical direction shall default to the Administrative or on-line medical direction.

These guidelines are deemed by the Bureau of EMS and Trauma System to be within the acceptable standard of medical care. It is specifically recognized that there are acceptable documented regional or local variations from these procedures and protocols, which may also satisfy the standard of care. This manual does NOT define, limit, expand, or otherwise purport to establish the legal standard of care.

Drug Profiles

Drugs listed as IV/IO administration can be given IO.

Adenosine

TOC

DRUG PROFILE	AZDHS
Adenosine	5/21/2020

PHARMACOLOGY & ACTIONS

- Slows conduction through the AV node.
- Most cases of PSVT involve AV nodal reentry, adenosine is capable of interrupting the AV nodal circuit and stopping the tachycardia, restoring normal sinus rhythm.

INDICATIONS

- To convert hemodynamically stable narrow complex regular tachycardia with a pulse.

ABSOLUTE CONTRAINDICATIONS

- Second- or third-degree heart block.
- Poison or drug-induced tachycardia.
- Know hypersensitivity.
- Adenosine allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause brief asystole, dizziness, facial flushing, headache, nausea, and transient shortness of breath.
- IV/IO adenosine has been shown to produce bronchospasm in asthmatic patients.
- If the patient becomes hemodynamically unstable, cardioversion should occur.

ADMINISTRATION

IV/IO	**Onset**: 20–30 seconds	**Peak Effect**: 20–30 seconds	**Duration**: 30 seconds

GUIDELINES CONTAINING ADENOSINE

- **Tachycardia with a Pulse: Adult & Pediatric**

Albuterol Sulfate

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DRUG PROFILE	AZDHS
Albuterol Sulfate	5/21/2020

PHARMACOLOGY & ACTIONS

- Relatively selective beta2-adrenergic bronchodilator.
- Beta-2 agonist that relaxes bronchial smooth muscle, resulting in bronchial dilation.
- Some beta-1 overlap with clinically significant cardiac effects such as tachycardia.
- Shift potassium intracellular, resulting in lower serum potassium.

INDICATIONS

- Treatment of bronchospasm.
- Treatment of hyperkalemia.

ABSOLUTE CONTRAINDICATIONS

- Albuterol sulfate allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause dizziness, anxiety, palpitations, headache, sweating, and muscle tremors.
- Clinically significant arrhythmias may occur especially in patients with underlying cardiovascular disorders.
- Relative contraindication include symptomatic tachycardia, tachyarrhythmias , or anginal chest pain.

ADMINISTRATION

SVN	**Onset**: 5–15 minutes	**Peak Effect**: 1–1.5 hours	**Duration**: 3–6 hours

GUIDELINES CONTAINING ALBUTEROL

- **Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric**
- **Anaphylaxis and Allergic Reaction: Adult & Pediatric**
- **Hyperglycemia: Adult & Pediatric**
- **Extremity Trauma: Adult & Pediatric**
- **Dermal Chemical Burns: Adult & Pediatric**

Amiodarone

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DRUG PROFILE	AZDHS
Amiodarone	5/21/2020

PHARMACOLOGY & ACTIONS

- Multiple effects on sodium, potassium, and calcium channels.
- Prolongs action potential and repolarization.
- Decreases AV conduction and sinus node function.
- Also has some alpha- and beta-adrenergic blocking properties.

INDICATIONS

- Ventricular fibrillation.
- Pulseless ventricular tachycardia.
- Regular wide complex tachycardia with a pulse.
- Irregular wide complex tachycardia.

ABSOLUTE CONTRAINDICATIONS

- Second- or third-degree AV blocks.
- Amiodarone allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause hypotension and bradycardia.

ADMINISTRATION

IV/IO	**Onset**: 1–2 minutes	**Peak Effect**: 10 minutes	**Duration**: variable

GUIDELINES CONTAINING AMIODARONE

- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- **Tachycardia with a Pulse: Adult & Pediatric**

Aspirin / Acetylsalicylic Acid / ASA

TOC

DRUG PROFILE	AZDHS
Aspirin / Acetylsalicylic Acid / ASA	5/21/2020

PHARMACOLOGY & ACTIONS

- Aspirin inhibits prostaglandin and disrupts platelet function.
- It is also a mild analgesic and anti-inflammatory.

INDICATIONS

- Adult patients with suspected acute coronary syndrome.

ABSOLUTE CONTRAINDICATIONS

- Active GI bleeding.
- If patient has taken 324 mg within the last 24 hours.
- Aspirin allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause GI discomfort and nausea.
- May cause wheezing.

ADMINISTRATION

Oral	**Onset**: 5–30 minutes	**Peak Effect**: 1–2 hours	**Duration**: 4–6 hours

GUIDELINES CONTAINING ASPIRIN

- **Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI): Adult**

Atropine & Pralidoxime (combined) Autoinjector (DuoDot®)

DRUG PROFILE	AZDHS
Atropine & Pralidoxime (combined) Autoinjector (DuoDote®)	1/20/2022

PHARMACOLOGY & ACTIONS

- Pralidoxime reactivates acetylcholinesterase which has been inactivated by phosphorylation due to an organophosphorus nerve agent or insecticide. Reactivation is clinically important because only a small proportion of active acetylcholinesterase is needed to maintain vital functions.

INDICATIONS

- Indicated for the treatment of poisoning by organophosphorus nerve agents as well as organophosphorus insecticides.

ABSOLUTE CONTRAINDICATIONS

- None.

PRECAUTIONS & SIDE EFFECTS

- Pralidoxime is not effective in the treatment of poisoning due to phosphorus, inorganic phosphates, or organophosphates not having anticholinesterase activity.
- Pralidoxime is not indicated as an antidote for intoxication by pesticides of the carbamate class since it may increase the toxicity of carbaryl.

ADMINISTRATION

IM/IV/IO	**Onset**: Within 16 mins.	**Peak Effect**: 35 minutes.	**Duration**: 4 hours.

GUIDELINES CONTAINING ATROPINE & PRALIDOXIME (COMBINED) AUTOINJECTOR

- **Acetylcholinesterase Inhibitor Poisoning (Nerve Agents, Organophosphates, and Carbamates): Adult & Pediatric**

Atropine Sulfate

TOC

DRUG PROFILE	AZDHS
Atropine Sulfate	5/21/2020

PHARMACOLOGY & ACTIONS

- Blocks action of acetylcholine as competitive antagonist at muscarinic receptor sites in smooth muscle, secretory glands, and the CNS.
- Blocks parasympathetic response, allowing sympathetic response to take over.
- Positive chronotropic properties with little to no inotropic effects.
  - Increases heart rate.
  - Increases conduction through AV node.
- Atropine reverses the muscarinic effects of cholinergic poisoning by the following mechanisms:
  - Reverses bronchorrhea and bronchoconstriction.
  - Reduces motility and tone of GI tract.
  - Reduces action and tone of the urinary bladder (may cause urinary retention).
  - Dilates pupils.
  - Decreases sweat production.

INDICATIONS

- Symptomatic bradycardia.
- Nerve agent/organophosphate and carbamate insecticide toxicity.

ABSOLUTE CONTRAINDICATIONS

- Bradycardia without evidence of cardiopulmonary compromise.
- Atropine allergy.

PRECAUTIONS & SIDE EFFECTS

- Avoid in hypothermic bradycardia.
- Paradoxical bradycardia may result from doses less than 0.5 mg, use in caution in pediatric patients.

ADMINISTRATION

IV/IO/IM	**Onset**: immediate	**Peak Effect**: 2–4 minutes	**Duration**: 4 hours

GUIDELINES CONTAINING ATROPINE

- Bradycardia: Adult & Pediatric
- Acetylcholinesterase Inhibitor Poisoning (Nerve Agents, Organophosphates, and Carbamates): Adult & Pediatric

Calcium Chloride

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DRUG PROFILE	AZDHS
Calcium Chloride	5/21/2020

PHARMACOLOGY & ACTIONS

- Increases extracellular and intracellular calcium levels.
- Stimulates release of catecholamines.
- Increases cardiac contractile state (positive inotropic effect).
- Essential to a number of physiologic processes including transmission of nerve impulses, contraction of cardiac, smooth and skeletal muscles.
- Has stabilizing effect on myocardial cell membranes in setting of hyperkalemia.

INDICATIONS

- Suspected hyperkalemia.
- Antidote for calcium channel blocker overdose.

ABSOLUTE CONTRAINDICATIONS

- Do not use in setting of suspected digoxin toxicity.
- Hypercalcemia.
- Suspected severe hypokalemia (life-threatening cardiac arrhythmias may occur).
- Calcium chloride allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause discomfort at injection site.
- Will precipitate if mixed with sodium bicarbonate.

ADMINISTRATION

IV/IO	**Onset**: immediate	**Peak Effect**: unknown	**Duration**: varies

GUIDELINES CONTAINING CALCIUM CHLORIDE

- **Hyperglycemia: Adult & Pediatric**
- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- **Extremity Trauma: Adult & Pediatric**
- **Dermal Chemical Burns: Adult & Pediatric**

Calcium Gluconate

TOC

DRUG PROFILE AZDHS

Calcium Gluconate 5/21/2020

PHARMACOLOGY & ACTIONS

- Increases extracellular and intracellular calcium levels.
- Stimulates release of catecholamines.
- Increases cardiac contractile state (positive inotropic effect).
- Essential to a number of physiologic processes including transmission of nerve impulses, contraction of cardiac, smooth and skeletal muscles.
- Has stabilizing effect on myocardial membranes in setting of hyperkalemia.

INDICATIONS

- Suspected hyperkalemia.
- Calcium channel blocker overdose.

ABSOLUTE CONTRAINDICATIONS

- Do not use in the setting of suspected digoxin toxicity.
- Hypercalcemia.
- Sarcoidosis.
- Suspected severe hypokalemia (life-threatening cardiac arrhythmias may occur).
- Calcium gluconate allergy.

PRECAUTIONS & SIDE EFFECTS

- Risk of digitalis toxicity.
- SQ or IM administration can cause severe tissue necrosis and tissue sloughing.
- Can induce serious cardiac dysrhythmias.

ADMINISTRATION

IV/IO	**Onset**: 1–3 minutes	**Peak Effect**: immediate	**Duration**: 30–120 minutes

GUIDELINES CONTAINING CALCIUM GLUCONATE

- **Hyperglycemia: Adult & Pediatric**
- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- **Extremity Trauma: Adult & Pediatric**
- **Dermal Chemical Burns: Adult & Pediatric**

Calcium Gluconate 2.5% Topical Gel

TOC

DRUG PROFILE	AZDHS
Calcium Gluconate 2.5% Topical Gel	5/21/2020

PHARMACOLOGY & ACTIONS

- Calcium gluconate combines with hydrofluoric acid to neutralize the fluoride ion, forming insoluble calcium fluoride.
- This helps stop the fluoride ion from penetrating into tissue and bone, preventing further damage.
- The gel does NOT treat or heal HF burns that have already developed.

INDICATIONS

- Used after contact with hydrofluoric acid to mitigate or prevent the related pain and potential tissue burns and bone damage.

ABSOLUTE CONTRAINDICATIONS

- For cutaneous/skin application only.
- Calcium gluconate allergy.

PRECAUTIONS & SIDE EFFECTS

- Personnel should wear appropriate HF-protective gloves (neoprene) and other safety equipment before assisting patient with application of gel.
- If possible, the patient should wash area and apply the gel themselves.
- Consider placing surgical glove over gel when applied to distal upper extremities.

ADMINISTRATION

	Onset: immediate	**Peak Effect**: varies	**Duration**: unknown

GUIDELINES CONTAINING CALCIUM GLUCONATE GEL

- **Dermal Chemical Burns: Adult & Pediatric**

Dexamethasone Sodium Phosphate (Decadron)

TOC

DRUG PROFILE	AZDHS
Dexamethasone Sodium Phosphate	5/21/2020

PHARMACOLOGY & ACTIONS

- Improves lung function and myocardial performance.
- Stabilization of lysosomal and cell membranes, inhibition of compliment-induced granulocyte aggregation.
- Rightward shift in oxygen-hemoglobin dissociation curve.
- Inhibition of prostaglandin and leukotriene production, increase in surfactant production, decrease in pulmonary edema, relaxation of bronchospasm.

INDICATIONS

- Reactive airway disease: Acute exacerbation of bronchial asthma.
- Anaphylaxis.

ABSOLUTE CONTRAINDICATIONS

- Systemic fungal infections.
- Preterm infants.
- Dexamethasone allergy.

PRECAUTIONS & SIDE EFFECTS

- If given IV/IO should be given as slow IV/IO push.
- Sodium retention, fluid retention, potassium loss, hypokalemic alkalosis, hypertension, convulsions, hyperglycemia, myocardial rupture following recent myocardial infarction.

ADMINISTRATION

IV/IO/IM	**Onset**: 4–8 hours	**Peak Effect**: 6–12 hours	**Duration**: 24–72 hours

GUIDELINES CONTAINING DEXAMETHASONE

- **Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric**
- **Pediatric Stridor (e.g., Croup)**

Dextrose

TOC

DRUG PROFILE	AZDHS
Dextrose	5/21/2020

PHARMACOLOGY & ACTIONS

- Rapidly increases blood glucose.

INDICATIONS

- Hypoglycemia.

ABSOLUTE CONTRAINDICATIONS

- None in prehospital setting.
- Dextrose allergy.

PRECAUTIONS & SIDE EFFECTS

- Extravasation of dextrose may cause tissue necrosis.
- Use caution during administration.
- If extravasation does occur, immediately stop administration of drug.
- Report extravasation of the medication to receiving hospital personnel and document.
- If there is any evidence of malnutrition or alcohol abuse, thiamine, if available, should precede the administration of dextrose (adult patients only).

ADMINISTRATION

IV/IO	**Onset**: < 1 minute	**Peak Effect**: variable	**Duration**: variable

PROTOCOLS CONTAINING DEXTROSE

- **Hypoglycemia: Adult & Pediatric**

Diazepam (Valium)

TOC

DRUG PROFILE	AZDHS
Diazepam	5/21/2020

PHARMACOLOGY & ACTIONS

- Benzodiazepine drug.
- Decreases seizures by increasing the seizure threshold.
- Sedative.
- Amnestic effect.

INDICATIONS

- Active seizures.
- Pharmacologic management prior to cardioversion, cardioversion, etc.

ABSOLUTE CONTRAINDICATIONS

- Severe respiratory depression.
- Diazepam allergy.

PRECAUTIONS & SIDE EFFECTS

- Since diazepam can cause respiratory depression and/or hypotension, the patient must be monitored closely. Diazepam should not be given to adult patients without a good IV/IO line in place and a bag valve mask ready.
- Paradoxical excitement or stimulation sometimes occurs.
- Most likely to produce respiratory depression in patients who have taken other depressant drugs, especially alcohol and barbiturates, or when given rapidly.
- If patient received rectal dose prior to EMS arrival, further benzodiazepine administration should be administered with caution.

ADMINISTRATION

IV/IO	**Onset**: 1–5 minutes	**Peak Effect**: 15 minutes	**Duration**: 15–60 minutes
IM	**Onset**: 15–30 minutes	**Peak Effect**: 30–45 minutes	**Duration**: 15–60 minutes

GUIDELINES CONTAINING DIAZEPAM

- **Hyperthermia/Heat Exposure: Adult & Pediatric**

Diltiazem (Cardizem)

TOC

DRUG PROFILE	AZDHS
Diltiazem	5/21/2020

PHARMACOLOGY & ACTIONS

- Calcium channel blocker.
- Inhibitory effects on cardiac conduction system, principally at the AV node, slowing the ventricular rate associated with Atrial Fibrillation and Atrial Flutter.
- Inhibits extracellular calcium ion influx across membranes of myocardial cells and vascular smooth muscle cells, resulting in inhibition of contraction and thereby dilating main coronary and systemic arteries.

INDICATIONS

- Narrow complex tachyarrhythmias – atrial fibrillation/atrial flutter.
- SVT not responding to adenosine.

ABSOLUTE CONTRAINDICATIONS

- Heart block/bradycardia.
- Systolic blood pressure < 90 mmHg.
- Sick sinus syndrome.
- Ventricular tachycardia.
- Diltiazem allergy.

PRECAUTIONS & SIDE EFFECTS

- Prolongation of AV node conduction may result in second- or third-degree AV block.
- Should not be administered to compromised myocardium (severe CHF, AMI, or cardiomyopathy).
- Use caution when giving to hypotensive patients.

ADMINISTRATION

IV/IO	**Onset**: 3 minutes	**Peak Effect**: 7 minutes	**Duration**: 1–3 hours

GUIDELINES CONTAINING DILTIAZEM

- **Tachycardia with a Pulse: Adult & Pediatric**

Diphenhydramine (Benadryl)

TOC

DRUG PROFILE	AZDHS
Diphenhydramine	5/21/2020

PHARMACOLOGY & ACTIONS

- Histamine H1-receptor antagonist (blocks histamine receptors) of effector cells in respiratory tract, blood vessels, and GI smooth muscle.
- Also has anticholinergic actions, making it useful in treating or preventing acute dystonic reactions to antipsychotic drugs. These reactions include oculogyric crisis, acute torticollis, and facial grimacing.

INDICATIONS

- Treatment of allergic reactions.
- Treatment or prevention of acute dystonic reactions to antipsychotic drugs.

ABSOLUTE CONTRAINDICATIONS

- Known hypersensitivity.
- Newborns.
- Diphenhydramine allergy.

PRECAUTIONS & SIDE EFFECTS

- Usually causes sedation, however it may paradoxically cause excitation in children.
- May have additive sedation effect with alcohol or other CNS depressants.
- May cause hypotension when given IV/IO.

ADMINISTRATION

IV/IO	**Onset**: 10–15 minutes	**Peak Effect**: 1 hour	**Duration**: 6–8 hours

GUIDELINES CONTAINING DIPHENHYDRAMINE

- **Anaphylaxis and Allergic Reaction: Adult & Pediatric**
- **Poisoning/Overdose Universal Care: Adult & Pediatric**

Dopamine 1 of 2 pages

TOC

DRUG PROFILE	AZDHS
Dopamine (1 of 2 pages)	5/21/2020

PHARMACOLOGY & ACTIONS

- Endogenous catecholamine.
- Acts on both dopaminergic and adrenergic neurons.
- Dose dependent effects:
  - 1–2 mcg/kg/min - dilates renal and mesenteric blood vessels, typically no effect on heart rate or blood pressure.
  - 2–10 mcg/kg/min - beta effects on heart which increases cardiac output without greatly increasing heart rate or blood pressure.
  - 10–20 mcg/kg/min - alpha peripheral effects causing peripheral vasoconstriction, which results in increase in systemic vascular resistance (SVR) and increased blood pressure.
  - 20–40 mcg/kg/min - alpha effects reverse dilatation or renal and mesenteric vessels with resultant decreased flow. Increases heart rate and oxygen demand to undesirable limits.

INDICATIONS

- Treatment of refractory cardiogenic or distributive shock.

ABSOLUTE CONTRAINDICATIONS

- Hypovolemia.
- Dopamine allergy.

PRECAUTIONS & SIDE EFFECTS

- May induce tachyarrhythmias, in which case infusion should be decreased or stopped.
- High doses (10 mcg/kg) may cause peripheral vasoconstriction.
- Should not be added to sodium bicarbonate or other alkaline solutions since dopamine will be inactivated in alkaline solutions.
- Consider hypovolemia and treat this with appropriate fluids before administration of dopamine.
- Dopamine is best administered by an infusion pump to accurately regulate rate. It may be hazardous when used in the field without an infusion pump. Monitor closely.

ADMINISTRATION

IV/IO	**Onset**: immediate	**Peak Effect**: 5–10 minutes	**Duration**: effects during infusion

PROTOCOLS CONTAINING DOPAMINE

- **Shock: Adult & Pediatric**
- **Bites and Envenomations: Adult & Pediatric**

Dopamine 2 of 2 pages

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DRUG PROFILE	AZDHS
Dopamine (2 of 2 pages)	5/21/2020

Dopamine Dosage Chart

800 mg dopamine per 500 mL NS (400 mg dopamine per 250 mL) NS for a concentration of 1600 mcg dopamine per mL. The following table assumes using a 60 drops per mL (microdrop) infusion set.

DOPAMINE TABLE

PT WEIGHT		DESIRED DOSE (drops/min)		
Lbs	Kg	5 mcg/kg/min	10 mcg/kg/min	20 mcg/kg/min
88	40	8	15	30
100	45	8	17	34
110	50	9	19	38
120	55	10	21	41
132	60	11	23	45
143	65	12	24	49
154	70	13	26	53
165	75	14	28	56
176	80	15	30	60
187	85	16	32	64
198	90	17	34	68
209	95	18	36	71
220	100	19	38	75
231	105	20	39	79
242	110	21	41	83
253	115	22	43	86
264	120	23	45	90
275	125	23	47	94
286	130	24	49	98
297	135	25	51	102
308	140	26	53	106

USING THE DOPAMINE TABLE:

Find patient weight and then move across row to the column for the desired dose. Set dial-a-flow to the corresponding flow rate.

Epinephrine

TOC

DRUG PROFILE	AZDHS
Epinephrine	5/21/2020

PHARMACOLOGY & ACTIONS

- Catecholamine with alpha and beta effects which increases heart rate and blood pressure.
- Potent bronchodilator.

INDICATIONS

- Cardiac Arrest.
- Bradycardia.
- Anaphylaxis.
- Shock.
- IM for severe refractory wheezing.
- Nebulized for croup and bronchiolitis.

ABSOLUTE CONTRAINDICATIONS

- Uncontrolled hypertension is a relative contraindication.
- Epinephrine allergy.

PRECAUTIONS & SIDE EFFECTS

- Epinephrine increases cardiac work and can precipitate angina, myocardial infarction or major dysrhythmias in an individual with ischemic heart disease.

ADMINISTRATION

IV/IO	**Onset**: < 2 minutes	**Peak Effect**: < 5 minutes	**Duration**: 5–10 minutes
IM	**Onset**: 3–10 minutes	**Peak Effect**: 20 minutes	**Duration**: 20–30 minutes

GUIDELINES CONTAINING EPINEPHRINE

- **Bradycardia: Adult & Pediatric**
- **Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric**
- **Anaphylaxis and Allergic Reaction: Adult & Pediatric**
- **Shock: Adult & Pediatric**
- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- **Pediatric Respiratory Distress – Wheezing < 2 Years Old (Bronchiolitis)**
- **Pediatric Stridor (e.g., Croup)**
- **Neonatal Resuscitation page 1 of 2**
- **Neonatal Resuscitation page 2 of 2**

Etomidate

TOC

DRUG PROFILE	AZDHS
Etomidate	5/21/2020

PHARMACOLOGY & ACTIONS

- Sedative and hypnotic.
- Appears to act similar to GABA by depressing the activity of the brain stem reticular activating system.
- No analgesic properties.

INDICATIONS

- Induction of anesthesia for rapid sequence intubation.

ABSOLUTE CONTRAINDICATIONS

- Known hypersensitivity.
- Etomidate allergy.

PRECAUTIONS & SIDE EFFECTS

- Not intended for prolonged infusion due to suppression of cortisol and aldosterone production.

ADMINISTRATION

IV/IO	**Onset**: 10–20 seconds	**Peak Effect**: < 1 minute	**Duration**: 3–5 minutes

GUIDELINES CONTAINING ETOMIDATE

- **Rapid Sequence Intubation (RSI)**

Fentanyl

DRUG PROFILE	AZDHS
Fentanyl	5/21/2020

PHARMACOLOGY & ACTIONS

- Opioid agonist-analgesic.
- Inhibits ascending pain pathways, thus altering response to pain, increases pain threshold.
- Produces analgesia, respiratory depression, and sedation.

INDICATIONS

- Severe pain of any etiology.

ABSOLUTE CONTRAINDICATIONS

- Oxygen saturation less than 90% or significant respiratory depression.
- Fentanyl allergy.

PRECAUTIONS & SIDE EFFECTS

- Fentanyl causes neurologic and respiratory depression. Respiratory depression may be worse in patients with underlying lung disease or concomitant use of other depressant drugs such as benzodiazepines or alcohol. Respiratory support must be available when administering fentanyl.
- Fentanyl can be reversed with naloxone.
- When fentanyl is given to treat pain, the goal is reduction of pain not total elimination of pain.

ADMINISTRATION

IV/IO	**Onset**: immediate	**Peak Effect**: 3–5 minutes	**Duration**: 30–60 minutes

GUIDELINES CONTAINING FENTANYL

- Management of Acute Pain: Adult & Pediatric
- Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI): Adult
- Pharmacologic Management – Synchronized Cardioversion and NIPPV

Glucagon

TOC

DRUG PROFILE	AZDHS
Glucagon	5/21/2020

PHARMACOLOGY & ACTIONS

- Increases serum glucose by releasing glycogen stores from the liver.
- Glucagon will only work if there are sufficient stores of glycogen in the liver and will not work if patient is malnourished.
- Counteracts effects of beta blocker or calcium channel blocker overdose.

INDICATIONS

- Hypoglycemia.
- Symptomatic bradycardia from beta blocker or calcium channel blocker overdose.

ABSOLUTE CONTRAINDICATIONS

- Glucagon is not the first line treatment for hypoglycemia and should ONLY be used in patient with symptomatic hypoglycemia when the EMCT is unable to obtain IV/IO access.
- Glucagon allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause nausea and vomiting.
- Slower onset than IV/IO dextrose.

ADMINISTRATION

IM	**Onset**: 5–20 minutes	**Peak Effect**: 30 minutes	**Duration**: 1–2 hours

GUIDELINES CONTAINING GLUCAGON

- Hypoglycemia: Adult & Pediatric

Glucose, oral

TOC

DRUG PROFILE	AZDHS
Glucose, oral	5/21/2020

PHARMACOLOGY & ACTIONS

- Monosaccharide carbohydrate.
- After absorption from GI tract, glucose is distributed in the tissues and provides a prompt increase in circulating blood sugar.

INDICATIONS

- Hypoglycemia.

ABSOLUTE CONTRAINDICATIONS

- Glucose allergy.

PRECAUTIONS & SIDE EFFECTS

- Altered level of consciousness.
- Ascertain the patient's ability to swallow an oral preparation of glucose without airway compromise.
- Must be swallowed, not absorbed sublingually or buccally.

ADMINISTRATION

PO	**Onset**: 10 minutes	**Peak Effect**: variable	**Duration**: variable

GUIDELINESS CONTAINING GLUCOSE

- **Hypoglycemia: Adult & Pediatric**

Hydroxocobalamin (Cyanokit)

TOC

DRUG PROFILE	AZDHS
Hydroxocobalamin (Cyanokit)	5/21/2020

PHARMACOLOGY & ACTIONS

- Precursor to Vitamin B12.
- Hydroxocobalamin binds cyanide ions to form Cyanocobalamin (vitamin B12) which is then excreted in the urine.

INDICATIONS

- Known or suspected cyanide poisoning.
- Closed-space smoke inhalation exposure with:
  - Shock
  - Cardiac arrest
  - Altered level of consciousness

ABSOLUTE CONTRAINDICATIONS

- Hydroxocobalamin allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause transient elevation of blood pressure.
- Will cause red colored urine (for up to 5 weeks) and red colored skin (for up to 2 weeks). The red color of the blood serum and urine will interfere with colorimetric laboratory tests for several days.

ADMINISTRATION

IV/IO	**Onset**: 2–15 minutes	**Peak Effect**: variable	**Duration**: variable

GUIDELINES CONTAINING HYDROXOCOBALAMIN (CYANOKIT)

- **Suspected Cyanide Poisoning: Adult & Pediatric**

Ipratropium Bromide (Atrovent)

TOC

DRUG PROFILE	AZDHS
Ipratropium Bromide	5/21/2020

PHARMACOLOGY & ACTIONS

- Antagonizes action of acetylcholine on the bronchial smooth muscle in the lungs, causing bronchodilation.

INDICATIONS

- Bronchoconstriction – asthma and COPD.
- Ipratropium may be given in a combination with albuterol anytime albuterol is indicated.

ABSOLUTE CONTRAINDICATIONS

- Ipratropium bromide allergy.

PRECAUTIONS & SIDE EFFECTS

- Use with caution in patients with narrow angle glaucoma.
- Side effects may include palpitations, dizziness, anxiety, headache, eye pain, urinary retention, and anxiety.

ADMINISTRATION

SVN	**Onset**: 5–15 minutes	**Peak Effect**: 1.5–2 hours	**Duration**: 4–6 hours

GUIDELINES CONTAINING IPRATROPIUM

- Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric

Ketamine

TOC

DRUG PROFILE	AZDHS
Ketamine	5/21/2020

PHARMACOLOGY & ACTIONS

- Ketamine is a non-competitive NMDA receptor antagonist.
- It functions as a dissociative, amnestic, analgesic, and anesthetic agent.

INDICATIONS

- Delirium with agitated behavior.
- Induction agent for intubation.
- Pain control.

ABSOLUTE CONTRAINDICATIONS

- Angina.
- CHF.
- Pregnancy.
- Ketamine allergy.

PRECAUTIONS & SIDE EFFECTS

- Transient periods of apnea (1-2 minutes) have occurred with IV/IO ketamine administration, especially with rapid infusion.
- May cause laryngospasm.
- May cause hypersalivation, increased airway secretions.
- May cause emergence reaction.
- May cause nystagmus.
- Use with caution in patients with schizophrenia.

ADMINISTRATION

IV/IO	**Onset**: < 1 minute	**Peak Effect**: 30 seconds – 5 minutes	**Duration**: 10–45 minutes
IM	**Onset**: 3–4 minutes	**Peak Effect**: 3–12 minutes	**Duration**: 25–60 minutes

GUIDELINES CONTAINING KETAMINE

- **Agitated or Violent Patient/Behavioral Emergency: Adult & Pediatric**
- **Management of Acute Pain: Adult & Pediatric**
- **RSI**

Lidocaine

TOC

DRUG PROFILE	AZDHS
Lidocaine	5/21/2020

PHARMACOLOGY & ACTIONS

- Antiarrhythmic drug that decreases automaticity by slowing the rate of depolarization.
- Terminates re-entry by decreasing conduction in re-entrant pathways.
- Local anesthesia for pain control caused by infusion of fluids or medications via an intraosseous (IO) site.

INDICATIONS

- Cardiac Arrest due to Ventricular Fibrillation of Pulseless Ventricular Tachycardia.
- Wide complex tachycardia with a pulse.
- Pain management after IO insertion in conscious patients.

ABSOLUTE CONTRAINDICATIONS

- Bradycardia.
- Lidocaine allergy.

PRECAUTIONS & SIDE EFFECTS

- At higher doses may cause CNS stimulation, seizure, depression, and respiratory failure.
- Toxicity is more likely in elderly patients and patients with Congestive Heart Failure or impaired liver function.

ADMINISTRATION

IV/IO	**Onset**: < 3 minutes	**Peak Effect**: 5–10 minutes	**Duration**: 10–20 minutes

GUIDELINES CONTAINING LIDOCAINE

- **Tachycardia with a Pulse: Adult & Pediatric**
- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**

Lorazepam (Ativan)

TOC

DRUG PROFILE	AZDHS
Lorazepam	5/21/2020

PHARMACOLOGY & ACTIONS

- Benzodiazepine that functions as a CNS depressant, anticonvulsant, and sedative.

INDICATIONS

- Seizures.
- Pharmacologic management of painful and/or anxiety inducing procedures/interventions.
- Delirium with agitated behavior.
- Uncontrolled shivering in hyperthermia.

ABSOLUTE CONTRAINDICATIONS

- Neurologic or respiratory depression.
- Acute angle glaucoma.
- Lorazepam allergy.

PRECAUTIONS & SIDE EFFECTS

- Respiratory depression and/or hypotension can occur, the patient should be monitored closely.
- Most likely to produce respiratory depression in patients who have taken other depressant drugs, especially alcohol and barbiturates, or when given rapidly.
- Elderly patients may have more profound respiratory and/or CNS depression, half dose should be administered.

ADMINISTRATION

IV/IO	**Onset**: 1–2 minutes	**Peak Effect**: < 15 minutes	**Duration**: 6–8 hours
IM	**Onset**: 15–30 minutes	**Peak Effect**: 2–3 hours	**Duration**: 6–8 hours

GUIDELINES CONTAINING LORAZEPAM

- **Agitated or Violent Patient/Behavioral Emergency: Adult & Pediatric**
- **Bradycardia: Adult & Pediatric**
- **Seizures: Adult & Pediatric**
- **Hyperthermia/Heat Exposure: Adult & Pediatric**

Magnesium Sulfate

TOC

DRUG PROFILE	AZDHS
Magnesium Sulfate	5/21/2020

PHARMACOLOGY & ACTIONS

- Smooth muscle relaxant.
- Decreases early after depolarizations and reduces arrhythmias.
- Decreases seizures in eclampsia and preeclampsia, possibly via cerebral vasodilation.
- CNS depressant.

INDICATIONS

- Eclampsia and preeclampsia.
- Torsades de pointes.
- Severe bronchospasm in patients with asthma or COPD.

ABSOLUTE CONTRAINDICATIONS

- Magnesium allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause hypotension and respiratory depression in large doses.
- Caution with use in patients with renal insufficiency or chronic renal failure/dialysis.

ADMINISTRATION

IV/IO	**Onset**: immediate	**Peak Effect**: variable	**Duration**: 1 hour

GUIDELINESS CONTAINING MAGNESIUM SULFATE

- **Tachycardia with a Pulse: Adult & Pediatric**
- **Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric**
- **Seizures: Adult & Pediatric**
- **Cardiac Arrest (VF/VT/Asystole/PEA): Adult & Pediatric**
- **Childbirth**
- **Obstetrical/Gynecological Conditions**

Methylene Blue

DRUG PROFILE	AZDHS
Methylene Blue	01/20/2022

PHARMACOLOGY & ACTIONS

- Used in the treatment of methemoglobin (MetHgb) toxicity. Converts MetHgb back to normal hemoglobin and reverses hypoxia. Acts as reducing agent to convert iron in methemoglobin from Fe^{3+} to Fe^{2+} regenerating normal hemoglobin.

INDICATIONS

- Treatment of symptomatic methemoglobinemia.

ABSOLUTE CONTRAINDICATIONS

- Known glucose-6-phosphate dehydrogenase (G6PD) deficiency.
- Hemolysis or history of hemolytic anemia.

PRECAUTIONS & SIDE EFFECTS

- Side effects: Chest pain, vomiting, flushing, confusion and headache.
- Pulse oximetry will be transiently unreliable (very low) immediately after administration.

ADMINISTRATION

IV/IO	**Onset**: Within 1-2 minutes.	**Peak Effect**: 30 minutes.	**Duration**: 30-60 minutes.

GUIDELINES CONTAINING METHYLENE BLUE

- Methemoglobin Toxicity: Adult & Pediatric

Methylprednisolone Sodium Succincate (Solu-Medrol)

TOC

DRUG PROFILE	AZDHS
Methylprednisolone Sodium Succinate	5/21/2020

PHARMACOLOGY & ACTIONS

- Potent synthetic steroid that inhibits many substances that cause inflammatory response.
- Controls or prevents inflammation by controlling rate of protein synthesis, suppressing migration of polymorphonuclear leukocytes (PMNs) and fibroblasts, reversing capillary permeability, and stabilizing lysosomes at cellular level.

INDICATIONS

- Acute bronchospastic disease (asthma or COPD).
- Adrenal Insufficiency.

ABSOLUTE CONTRAINDICATIONS

- Traumatic brain injury (high doses).
- Methylprednisolone sodium succinate allergy.

PRECAUTIONS & SIDE EFFECTS

ADMINISTRATION

IV/IO	**Onset**: 1–6 hours	**Peak Effect**: 8 hours	**Duration**: 18–36 hours

GUIDELINES CONTAINING METHYLPREDNISOLONE SODIUM SUCCINATE

- Bronchospasm (due to Asthma and Obstructive Lung Disease): Adult & Pediatric
- Shock: Adult & Pediatric

Midazolam (Versed)

TOC

DRUG PROFILE	AZDHS
Midazolam	5/21/2020

PHARMACOLOGY & ACTIONS

- Benzodiazepine that functions as a CNS depressant, anticonvulsant, and sedative.

INDICATIONS

- Seizures.
- Pharmacologic management of painful and/or anxiety inducing procedures/interventions.
- Delirium with agitated behavior.
- Uncontrolled shivering in hyperthermia.

ABSOLUTE CONTRAINDICATIONS

- Respiratory and/or CNS depression.
- Midazolam allergy.

PRECAUTIONS & SIDE EFFECTS

- Midazolam has more potential than the other IV/IO benzodiazepines to cause respiratory depression. Respiratory depression and/or hypotension can occur, the patient should be monitored closely.
- Most likely to produce respiratory depression in patients who have taken other depressant drugs, especially alcohol and barbiturates, or when given rapidly.
- Elderly patients may have more profound respiratory and/or CNS depression, half dose should be administered.

ADMINISTRATION

IV/IO/IN	**Onset**: immediate	**Peak Effect**: 3–5 minutes	**Duration**: < 2 hours
IM	**Onset**: 15 minutes	**Peak Effect**: 30–60 minutes	**Duration**: 1–6 hours

GUIDELINES CONTAINING MIDAZOLAM

- **Hyperthermia/Heat Exposure: Adult & Pediatric**
- **Agitated or Violent Patient/Behavioral Emergency: Adult & Pediatric**
- **Bradycardia: Adult & Pediatric**
- **Seizures: Adult & Pediatric**

Morphine Sulfate

DRUG PROFILE	AZDHS
Morphine Sulfate	5/21/2020

PHARMACOLOGY & ACTIONS

- Narcotic analgesic.
- Alleviates pain by acting on the pain receptors in the brain, elevates pain threshold.
- CNS depressant, depresses brainstem respiratory centers.
- Increases venous pooling, vasodilates arterioles, reducing preload and afterload.
- Histamine release.

INDICATIONS

- Analgesia.

ABSOLUTE CONTRAINDICATIONS

- Respiratory and/or CNS depression.
- Hypotension.
- Morphine sulfate allergy.

PRECAUTIONS & SIDE EFFECTS

- Morphine causes neurologic and respiratory depression. Respiratory depression may be worse in patients with underlying lung disease or concomitant use of other depressant drugs such as benzodiazepines or alcohol.
- Morphine can be reversed with naloxone.
- Check and document vital signs and patient response after each dose.
- When morphine is given to treat pain, the goal is reduction of pain not total elimination of pain.

ADMINISTRATION

IV/IO	**Onset**: seconds	**Peak Effect**: 20 minutes	**Duration**: 2–4 hours

GUIDELINES CONTAINING MORPHINE SULFATE

- Management of Acute Pain: Adult & Pediatric
- Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI): Adult

Naloxone (Narcan)

TOC

DRUG PROFILE	AZDHS
Naloxone	5/21/2020

PHARMACOLOGY & ACTIONS

- Naloxone is a narcotic antagonist which competitively binds to opioid receptors in the brain.
- Displaces opioid molecules, reversing the effect of opioids on the brain.

INDICATIONS

- Reversal of acute opioid toxicity.

ABSOLUTE CONTRAINDICATIONS

- Naloxone allergy.

PRECAUTIONS & SIDE EFFECTS

- May precipitate acute withdrawal symptoms in patients who chronically use opioids.
- Agitation, tachycardia, pulmonary edema, nausea, vomiting, and seizures (in neonates.)
- Be prepared to restrain the patient as they may become violent with reverse of the narcotic effect.
- The duration of some narcotics is longer than Naloxone.
- Repeated doses of Naloxone may be required for some opioid toxicities.

ADMINISTRATION

IV/IO	**Onset**: < 2 minutes	**Peak Effect**: < 2 minutes	**Duration**: 20–120 minutes
IM/IN	**Onset**: 2–10 minutes	**Peak Effect**: 2–10 minutes	**Duration**: 20–120 minutes

GUIDELINES CONTAINING NALOXONE

- **Altered Mental Status: Adult & Pediatric**
- **Opioid Poisoning/Overdose: Adult & Pediatric**

Nitroglycerin

TOC

DRUG PROFILE	AZDHS
Nitroglycerin	5/21/2020

PHARMACOLOGY & ACTIONS

- Potent smooth muscle relaxant.
- Causes systemic venodilation, decreasing preload.
- Arterial vasodilation, decreasing afterload.
- Coronary artery vasodilation.
- Increases blood flow to the myocardium.
- Decreases myocardial oxygen demand.

INDICATIONS

- Chest pain, particularly when Acute Coronary Syndrome is suspected.
- Hypertensive Emergency.
- Congestive Heart Failure with pulmonary edema.

ABSOLUTE CONTRAINDICATIONS

- Hypotension.
- Recent use of erectile dysfunction medications (48 hours).
- Nitroglycerin is **not to be given** to children in the prehospital setting.
- Nitroglycerin allergy.

PRECAUTIONS & SIDE EFFECTS

- Generalized vasodilatation may cause profound hypotension and reflex tachycardia.
- May cause profound hypotension in patients taking medication for erectile dysfunction.
- Common side effects include throbbing headache, flushing, dizziness and burning under the tongue.
- Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm.

ADMINISTRATION

SL	**Onset**: immediate	**Peak Effect**: 5-10 minutes	**Duration**: 20-30 minutes

GUIDELINES CONTAINING NITROGLYCERIN

- Chest Pain/Acute Coronary Syndrome/ST-segment Elevation Myocardial Infarction (STEMI): Adult
- Pulmonary Edema: Adult & Pediatric

Norepinephrine (Infusion Pump Only)

TOC

DRUG PROFILE	AZDHS
Norepinephrine (Infusion Pump Only)	5/21/2020

PHARMACOLOGY & ACTIONS

- Catecholamine that stimulates beta-1 and alpha-1 receptors in the sympathetic nervous system.
- Results in vasoconstriction, increased blood pressure, enhanced contractility, and increased heart rate.

INDICATIONS

- Hypotension unresponsive to IV/IO fluid resuscitation.

ABSOLUTE CONTRAINDICATIONS

- Hypotension caused by hypovolemia (blood volume deficit).
- Norepinephrine allergy.

PRECAUTIONS & SIDE EFFECTS

- Ensure adequate fluid replacement before starting norepinephrine.
- Administer through largest vein possible to reduce risk of tissue necrosis if it extravasates.
- Monitor blood pressure closely.
- Must be administered via infusion pump.

ADMINISTRATION

IV/IO (infusion pump only)	**Onset**: immediate	**Peak Effect**: < 1 minute	**Duration**: 1–2 minutes

GUIDELINES CONTAINING NOREPINEPHRINE

- **Shock: Adult & Pediatric**
- **Bites and Envenomations: Adult & Pediatric**

Ondansetron (Zofran)

TOC

DRUG PROFILE	AZDHS
Ondansetron	5/21/2020

PHARMACOLOGY & ACTIONS

- Selectively blocks serotonin 5-HT3 receptors in the brain.
- Primary effect is in the GI tract.
- No effect on dopamine receptors and therefore does not cause extrapyramidal symptoms.

INDICATIONS

- Nausea or vomiting.

ABSOLUTE CONTRAINDICATIONS

- Patients with prolonged QT.
- Patients < 1 month old.
- Ondansetron allergy.

PRECAUTIONS & SIDE EFFECTS

- May cause QT prolongation, avoid use in patients with prolonged QT syndrome.

ADMINISTRATION

IV/IO/PO /SL	**Onset**: 10–30 minutes	**Peak Effect**: 1.5 hours	**Duration**: 8 hours

GUIDELINES CONTAINING ONDANSETRON

- **Nausea/Vomiting: Adult & Pediatric**

Oxytocin (Pitocin)

TOC

DRUG PROFILE	AZDHS
Oxytocin	5/21/2020

PHARMACOLOGY & ACTIONS

- Binds to oxytocin receptor sites on surface of uterine smooth muscles.
- Increases force and frequency of uterine contractions.

INDICATIONS

- Postpartum hemorrhage due to uterine atony.

ABSOLUTE CONTRAINDICATIONS

- Known hypersensitivity.
- Oxytocin allergy.

PRECAUTIONS & SIDE EFFECTS

- Shock, tachycardia, dysrhythmias.
- Anaphylaxis.
- Nausea and vomiting.
- If used prior to delivery, can cause uterine rupture, uterine spasm, lacerations, and fetal damage.
- Clotting disorders, electrolyte disturbances.

ADMINISTRATION

IV/IO /IM	**Onset**: seconds	**Peak Effect**: variable	**Duration**: 1 hour after discontinued

GUIDELINES CONTAINING OXYTOCIN

None.

Phenylephrine (Neo-Synephrine)

TOC

DRUG PROFILE	AZDHS
Phenylephrine Nasal Spray 0.5%	5/21/2020

PHARMACOLOGY & ACTIONS

- Stimulates alpha receptors in the blood vessels of the nasal mucosa which causes their constriction and thereby decreases the risk of nasal bleeding.

INDICATIONS

- Facilitation of nasotracheal intubation.
- Epistaxis.

ABSOLUTE CONTRAINDICATIONS

- Phenylephrine allergy.

PRECAUTIONS & SIDE EFFECTS

- Each bottle is single patient use only.
- Hypertension, palpitations.
- Tremors.

ADMINISTRATION

IN	**Onset**: seconds	**Peak Effect**: 30 minutes	**Duration**: 30 minutes–4 hours

GUIDELINES CONTAINING PHENYLEPHRINE NASAL SPRAY

None.

Pralidoxime Autoinjector

TOC

DRUG PROFILE	AZDHS
Pralidoxime Autoinjector	5/21/2020

PHARMACOLOGY & ACTIONS

- Binds to organophosphates and breaks alkyl phosphate-cholinesterase bond (removes phosphate group from cholinesterase) to restore activity of acetylcholinesterase.
- Must be administered before the alkyl phosphate-cholinesterase bond becomes permanent (this is referred to as aging).

INDICATIONS

- Poisoning by organophosphate insecticides and related nerve gases (e.g., tabun, sarin, soman).

ABSOLUTE CONTRAINDICATIONS

- Pralidoxime allergy.

PRECAUTIONS & SIDE EFFECTS

- Rapid injection may cause laryngospasm, tachycardia, and muscle rigidity - intubation may be required.
- Speeds the effect of atropine when used together.
- Excitement and manic behavior can occur immediately after recovery from unconsciousness.

ADMINISTRATION

IM	**Onset**: variable	**Peak Effect**: 10–20 minutes	**Duration**: variable

GUIDELINES CONTAINING PRALIDOXIME

None.

Proparacaine Ophthalmic

TOC

DRUG PROFILE	AZDHS
Proparacaine Ophthalmic	5/21/2020

PHARMACOLOGY & ACTIONS

- Site of action is at the ophthalmic pain nerve cell membrane.
- Alleviates pain by limiting the sodium ion permeability in these nerve cell membranes; this elevates the threshold stimulus needed to trigger action potential in these cells. When the action is sufficiently well developed, block of conduction is produced.

INDICATIONS

- Induction of topical anesthesia prior to irrigation of eyes with or without adjuncts, e.g., Morgan's lens.

ABSOLUTE CONTRAINDICATIONS

- Known hypersensitivity.
- Proparacaine allergy.

PRECAUTIONS & SIDE EFFECTS

- Each bottle is single patient use only.
- Pupillary dilation, local irritation, softening and erosion of cornea (rare). Severe hyperallergic corneal reaction with corneal sloughing (extremely rare).
- Allergic dermatitis conjunctiva and eyelids (rare).

ADMINISTRATION

Eye Drops	**Onset**: 30–120 seconds	**Peak Effect**: 30–120 seconds	**Duration**: 5–10 minutes

GUIDELINES CONTAINING PROPARACAINE HYDROCHLORIDE OPHTHALMIC

- **Dermal Chemical Burns: Adult & Pediatric**

Propranolol

DRUG PROFILE	AZDHS
Propranolol	01/20/2022

PHARMACOLOGY & ACTIONS

- Propranolol is a nonselective beta-adrenergic receptor blocking agent possessing no other autonomic nervous system activity.

INDICATIONS

- Ventricular dysrhythmias caused by hydrocarbon inhalation/exposure (i.e. huffing).

ABSOLUTE CONTRAINDICATIONS

- Sinus bradycardia and greater than first degree block.
- Known hypersensitivity to propranolol hydrochloride.

PRECAUTIONS & SIDE EFFECTS

- Precautions: Caution against coadministration with epinephrine if in cardiac arrest following huffing.
- Side effects: May precipitate bronchospasm in asthmatics. May cause or exacerbate bradycardia, heart block, hypotension and CHF.

ADMINISTRATION

IV/IO	**Onset**: Within 5 minutes.	**Peak Effect**: 5-10 minutes.	**Duration**: 2-5 hours.

GUIDELINES CONTAINING PROPRANOLOL

- **Hydrocarbon Poisoning: Adult & Pediatric**

Rocuronium

TOC

DRUG PROFILE	AZDHS
Rocuronium	5/21/2020

PHARMACOLOGY & ACTIONS

- Non-depolarizing neuromuscular blocker.
- Binds to nicotinic cholinergic receptor sites at the motor end plate. Antagonizes acetylcholine binding at these sites, resulting in neuromuscular blockade.

INDICATIONS

- Induction of paralysis to facilitate endotracheal **intubation**.

ABSOLUTE CONTRAINDICATIONS

- Known hypersensitivity.
- Rocuronium allergy.

PRECAUTIONS & SIDE EFFECTS

- Use ideal body weight for dosing.
- Slightly elevates heart rate and blood pressure.
- Tachycardia may occur in children.

ADMINISTRATION

IV/IO	**Onset**: 30–60 seconds	**Peak Effect**: 1–3 minutes	**Duration**: 30–60 minutes

GUIDELINES CONTAINING ROCURONIUM

- **Rapid Sequence Intubation (RSI)**

Sodium Bicarbonate 7.5%-8.4%

TOC

DRUG PROFILE	AZDHS
Sodium Bicarbonate 7.5%–8.4%	5/21/2020

PHARMACOLOGY & ACTIONS

- Sodium bicarbonate reacts with hydrogen ions, forming water and carbon dioxide, correcting metabolic acidosis.
- Increases blood and urinary pH by releasing a bicarbonate ion, which in turn neutralizes hydrogen ion concentrations.

INDICATIONS

- Cardiac arrest when hyperkalemia or tricyclic antidepressant (TCA) overdose is suspected.
- Tricyclic antidepressant overdose.
- Extremity trauma, crush syndrome.

ABSOLUTE CONTRAINDICATIONS

- Sodium bicarbonate allergy.

PRECAUTIONS & SIDE EFFECTS

- Administration of sodium bicarbonate may result in metabolic alkalosis, which may be difficult to reverse.

ADMINISTRATION

IV/IO	**Onset**: immediate	**Peak Effect**: < 15 minutes	**Duration**: 1–2 hours

GUIDELINES CONTAINING SODIUM BICARBONATE

- **Extremity Trauma: Adult & Pediatric**

Sodium Nitrite

DRUG PROFILE	AZDHS
Sodium Nitrite	01/20/2022

PHARMACOLOGY & ACTIONS

- Interacts with hemoglobin to form methemoglobin which has a higher binding affinity for cyanide and prevents it from entering cells and causing toxicity. Similar mechanism for severe hydrogen sulfide poisoning.

INDICATIONS

- Antidote for cyanide poisoning (should be used with sodium thiosulfate).
- Rarely considered for treatment in confirmed hydrogen sulfide poisoning.

ABSOLUTE CONTRAINDICATIONS

- Hypotension.
- Hypoxia.

PRECAUTIONS & SIDE EFFECTS

- Side effects: Hypoxia (cyanosis due to formation of methemoglobin), tachycardia (due to hypoxia), tachypnea, syncope, vasodilation, vomiting, dizziness, headache and flushing.
- Precaution: Use with caution for significant carbon monoxide poisoning or smoke inhalation.

ADMINISTRATION

IV/IO	**Onset**: Within minutes.	**Peak Effect**: ~ 30 minutes.	**Duration**: ~ 60 minutes.

GUIDELINES CONTAINING SODIUM NITRITE

- **Suspected Cyanide Poisoning: Adult & Pediatric**
- **Sulfide Poisoning: Adult & Pediatric**

Sodium Nitrite & Sodium Thiosulfate (combined) (Nithiodote®)

DRUG PROFILE	AZDHS
Sodium Nitrite & Sodium Thiosulfate (combined) (Nithiodote®)	01/20/2022

PHARMACOLOGY & ACTIONS

- Interacts with hemoglobin to form methemoglobin which has a higher binding affinity for cyanide and prevents it from entering cells and causing toxicity. Similar mechanism for severe hydrogen sulfide poisoning.
- When used with sodium nitrite for cyanide poisoning, removes cyanide from cyanide-methemoglobin complex to form thiocyanate, which is then excreted by the kidneys.
- Is a reducing agent for some toxic ingestions (see below).

INDICATIONS

- Antidote for cyanide poisoning.
- See drug profiles for separate indications of sodium nitrite and sodium thiosulfate.

ABSOLUTE CONTRAINDICATIONS

- Hypoxia (sodium thiosulfate is okay, sodium nitrite is not).
- Hypotension (sodium thiosulfate is okay, sodium nitrite is not).

PRECAUTIONS & SIDE EFFECTS

- Side effect: May cause hypoxia (cyanosis due to formation of methemoglobin), tachycardia (due to hypoxia), tachypnea, syncope, vasodilation, vomiting, dizziness, headache and flushing.
- Side effect: May cause hypotension, vomiting, headache and muscle cramps.
- Precaution: Use with caution for significant carbon monoxide poisoning or smoke inhalation.

ADMINISTRATION

IV/IO	**Onset**: Within 5 mins.	**Peak Effect**: 5-10 minutes.	**Duration**: 2-5 hours.

GUIDELINES CONTAINING SODIUM NITRITE & SODIUM THIOSULFATE (COMBINED)

- Suspected Cyanide Poisoning: Adult & Pediatric

Sodium Thiosulfate

TOC

DRUG PROFILE	AZDHS
Sodium Thiosulfate	01/20/2022

PHARMACOLOGY & ACTIONS

- When used with sodium nitrite for cyanide poisoning, removes cyanide from cyanide-methemoglobin complex to form thiocyanate, which is then excreted by the kidneys.
- Is a reducing agent for some toxic ingestions (see below).

INDICATIONS

- Antidote for cyanide poisoning (when used with sodium nitrite).
- Can be used following ingestion of bromates, chlorates, chromates and iodine.

ABSOLUTE CONTRAINDICATIONS

- None.

PRECAUTIONS & SIDE EFFECTS

- Nausea, vomiting, headache and muscle cramps.

ADMINISTRATION

IV/IO	**Onset**: Within minutes.	**Peak Effect**: Varies based on dose.	**Duration**: Varies based on dose.

GUIDELINES CONTAINING SODIUM THIOSULFATE

- **Suspected Cyanide Poisoning: Adult & Pediatric**

Succinylcholine

TOC

DRUG PROFILE	AZDHS
Succinylcholine	5/21/2020

PHARMACOLOGY & ACTIONS

- Depolarizing neuromuscular blocker.
- Acts on the motor end plate receptors, producing depolarization or fasciculations, and inhibiting subsequent neuromuscular transmission for the duration of the medication (short acting).
- Muscles are unable to be stimulated by acetylcholine.

INDICATIONS

- Induction of paralysis to facilitate endotracheal **intubation**.

ABSOLUTE CONTRAINDICATIONS

- Malignant hyperthermia (may result in irreversible trismus).
- Known or suspected hyperkalemia.
- Penetrating eye injury (increases intraocular pressure).
- Inability to control the airway and/or support ventilations.
- Paraplegia/quadraplegia.
- Musculoskeletal disorders such as muscular dystrophy, spinal muscular atrophy.
- Prolonged immobilization.
- Stroke with residual motor dysfunction.
- Succinylcholine allergy.

PRECAUTIONS & SIDE EFFECTS

- Use with caution in patients with anticipated difficult airway.
- Has no effect on consciousness - sedatives should be used in conjunction with succinylcholine administration.

ADMINISTRATION

IV/IO	**Onset**: 30–60 seconds	**Peak Effect**: 1–3 minutes	**Duration**: 7–10 minutes

GUIDELINES CONTAINING SUCCINYLCHOLINE

- **Rapid Sequence Intubation (RSI)**

Tetracaine

TOC

DRUG PROFILE	AZDHS
Tetracaine	5/21/2020

PHARMACOLOGY & ACTIONS

- Local ocular anesthetic that blocks sodium ion channels required for the initiation and conduction of neuronal impulses, thereby effecting corneal local anesthesia.
- Used as a topical ophthalmic anesthetic to facilitate ocular irrigation and to provide analgesia.

INDICATIONS

- Chemical ocular exposure requiring irrigation.

ABSOLUTE CONTRAINDICATIONS

- Tetracaine allergy.

PRECAUTIONS & SIDE EFFECTS

- Each bottle is single use only.
- Patients should be advised that their eyes will be insensitive up to 20 minutes and that care should be taken to avoid ocular contact.

ADMINISTRATION

Eye Drops	**Onset**: immediate	**Peak Effect**: 15–30 seconds	**Duration**: 10–20 minutes

GUIDELINES CONTAINING TETRACAINE

- Dermal Chemical Burns: Adult & Pediatric

Thiamine (vitamin B1)

TOC

DRUG PROFILE	AZDHS
Thiamine (vitamin B1)	5/21/2020

PHARMACOLOGY & ACTIONS

- Required for carbohydrate metabolism, converts glucose into energy.
- Chronic alcohol intake interferes with the absorption, intake, and utilization of thiamine.
- Patients who are malnourished, or have chronic alcohol abuse, may develop Wernicke's encephalopathy if given IV/IO glucose without concomitant administration of thiamine.

INDICATIONS

- Thiamine should precede the administration of Dextrose or Glucagon in any adult patient if there is any evidence of malnutrition or alcohol abuse.

ABSOLUTE CONTRAINDICATIONS

- Thiamine allergy.

PRECAUTIONS & SIDE EFFECTS

- None in prehospital setting.

ADMINISTRATION

IV/IO	**Onset**: hours	**Peak Effect**: 3–5 days	**Duration**: unknown

GUIDELINES CONTAINING THIAMINE

None.

Tranexamic Acid (TXA)

TOC

DRUG PROFILE	AZDHS
Tranexamic Acid (TXA)	9/16/2021

PHARMACOLOGY & ACTIONS

- A synthetic derivative of lysine that inhibits fibrinolysis by blocking the lysine binding sites on plasminogen.
- A competitive inhibitor of plasminogen activation, which produces antifibrinolytic effects preserving and stabilizing fibrins matrix structure thus preventing clot breakdown rather than promoting new clot formation.
- Reversibly binds to plasminogen at the lysine binding site, thus preventing the binding of plasmin to fibrin.
- Inhibits the activation of plasminogen to plasmin, thereby preventing fibrinolysis and the breakdown of clots.

INDICATIONS

- Unstable patients with evidence of hemorrhagic shock.

ABSOLUTE CONTRAINDICATIONS

- Suspected CVA, MI or PE.
- Hypersensitivity to medication.

PRECAUTIONS & SIDE EFFECTS

- This medication should not replace guideline-based patient management of TBI or other trauma.
- Hypotension (if administered via IVP).
- Must be administered within 3 hours of injury.
- History of blood clots.
- Giddiness, allergic dermatitis, diarrhea, nausea, vomiting, blurred vision.

ADMINISTRATION

IV/IO	**Onset**: 5-15 minutes	**Peak Effect**: 1-2 minutes	**Duration**: 3 hours

GUIDELINES CONTAINING TRANEXAMIC ACID

- **General Trauma Management: Adult and Pediatric**
- **Childbirth**