GALLATIN COUNTY
EMS Guidelines

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FOREWORD

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Gallatin County EMS Guidelines
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The guidelines are intended to be used in addition to the most recent Montana State Board of Medical Examiners EMS Protocol set.

FOREWORD

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Accessing Clinical Training at BDH - *Updated Jan. 2023*

All Providers:
Process to access the ER/OR for all clinical training:
Contact the Education Department at Bozeman Health at least 2 months prior to the date of training. Check with them to make sure your agency has an affiliation agreement and a certificate of liability insurance (COI) on file. If your agency *does not* have an agreement, the Student Education Coordinator will start the process with the legal department. This is a 6-8 week minimum process.

Please include the following information in your agreement request:

- Full name and title of the contact for affiliation agreements at your agency
- Address, telephone number, and email address
- Primary Contact: Julie Eickman, Student Education Coordinator
- Office: (406) 414-5519
- Email: JEickman@bozemanhealth.org

Once the agreement and COI are on file, the requesting Paramedic/EMT must complete the required educational packet. All items listed on the "Informational Letter" must be turned in to the student education coordinator before the next step.

ALS-level Training: In order to access the OR/ER for all clinical training please have your training officer contact the OR/Anesthesia Department to arrange for an appropriate time and date.

Anesthesia Contact: Dr. Susan Paglia, mobile: (406) 570-2731
OR Contact: OR Educator or OR Manager, office: (406) 414-1008

IV Endorsement Training:
First, obtain permission from both your agency chief and medical director to pursue the IV endorsement. Once you have completed the appropriate classroom training you can pursue hospital IV training. Have your training officer contact the student education coordinator to arrange for an appropriate time and date to start training through phlebotomy and/or the Emergency Department. Phlebotomy locations may vary depending on the number of students in the department and experience. Please ask the Education Department first before reaching out to Phlebotomy contacts.

Phlebotomy Contact:
Hospital Out-Patient Services - Doug Smoot, office: (406) 414-1006; email: DSmoot@bozemanhealth.org

Emergency Department Contacts:
Chris Grimes, Emergency Department Nurse Manager, office: (406) 414-1079; email: CGrimes@bozemanhealth.org

TRIAGE & TRANSPORT

Destination Hospital Choice

PROTOCOL:
Patients should be transported to the closest appropriate receiving hospital unless:

- In consultation with medical control it is determined that a more distant hospital is more appropriate to meet the needs of the patient;

-OR-

- The patient meets criteria or published EMS guidelines for transport to a specialty care center (i.e. Trauma, STEMI);

-OR-

- The patient requests a specific hospital,
- **AND** The patient's condition is considered stable to tolerate additional transport time without need for more urgent stabilization before more lengthy transport;
- **AND** The EMS transport service has determined that such a transport would not unreasonably remove the unit from its primary area of response causing a decrease of 911 coverage to the local area;
- **AND** The patient has been informed that the transport to a more distant location will be more expensive and may not be covered by insurance if the added transport is not felt to be medically necessary by the insurance company.

TRIAGE & TRANSPORT

Air Medical Activation Guidelines

Air Medical Activation Guidelines

INDICATIONS:

- The decision for mode of transport for both field and inter-facility transfer patients is based on the premise that the time to definitive care and quality of care are critical to achieving optimal outcomes.
- Factors of distance, injury severity, road conditions, weather and traffic patterns must be considered when choosing between air or ground transport. The skill level of the transport team must also be considered.
- The potential benefit to the patient should outweigh the risks associated with air transport.

In general, use of air ambulances should be considered in the following situations:

Skill-based reasons: The skill set or medical equipment of the critical care air medical team is required for the patient's condition. *Example: Expected need for rapid sequence intubation in a patient with airway difficulties.*

Aircraft-based reasons: The specific qualities of aircraft transport, such as speed of transport over large distances, are expected to benefit the patient. The National Association of State EMS Officials' National Model of EMS Guidelines (2019 Version 2.2, pg. 11) recommends considering "air medical transport, if available, for patients with time-critical conditions where ground transport time exceeds 45 minutes."

Provider discretion: Local providers are often aware of resource limitations and/or challenges specific to certain incidents or locations. Use of air ambulance resources may be considered per incident command discretion based on these circumstances.

Canceling Air Medical Transport

- When air medical transport (AMT) has been requested, consideration for canceling it should only be made by trained EMS providers who are on scene and able to evaluate the situation and patient care needs.
- Discretion will still go to the AMT team as to whether they will continue to the scene.
- Resources are often dispatched before the full details of a situation are known. If AMT arrives on scene, it is appropriate to make a decision to transport the patient by ground EMS if it is felt by all providers that the patient does not require the higher level services of the AMT team.

Defining a Patient:

FIRST & SECOND PARTY CALLS:
All first party calls (the patient calls to summon assistance for themselves) and second party calls (someone who knows the patient or who is involved in the situation summons EMS) should generate a refusal of care (including lift assists). If the patient refuses vitals/assessment/etc., that should be documented.

EXAMPLES OF SECOND PARTY CALLS:

- A family member calls for a choking relative who is better by arrival.
- A motorist calls for someone they have hit in an MVC.
- Law enforcement calls for someone involved in an MVC.

THIRD PARTY CALLS:
Third party calls are calls where the reporting party does NOT know the person(s) involved or the situation.

EXAMPLES OF THIRD PARTY CALLS:

- Someone passes an accident on the road and calls 911 without knowledge of the individuals involved.
- Someone driving down the road calls for someone unknown to them who was lying in the grass.

If it is a third party call and the parties refuse EMS and state there is no medical problem (as in the person sleeping in the park, or multiple parties involved in an MVC), and they do not appear obviously injured, ill, or impaired, then the incident may be documented as “no patient found.” Providers are encouraged to document that they made a visual assessment of the scene and the person(s) involved in the paperwork to demonstrate due diligence.

TRIAGE & TRANSPORT

Prehospital Report Format

PURPOSE:
The purpose of the prehospital report is to give the receiving hospital notification of an inbound ambulance. The report should be brief and concise. It allows the receiving hospital to properly assign a room and assemble appropriate staff and resources depending on the acuity level. A full detailed report can be given at bedside to the receiving staff.

PROTOCOL:
In the case of an MCI, early notiication is key so the hospital has time to assemble extra staff and resources. As soon as triage is complete, the triage officer or incident command should contact the hospital with a patient count and corresponding triage categories (eg 2 red, 2 yellow, and 3 green).

The preferred method of contacting BHDRMC is via Pulsara. It is also acceptable to call on the designated EMS landline. As a backup, communication to BHDRMC can be via the white channel.

<table>
<tr><th colspan="2">Prehospital Report Format</th></tr>
<tr><td colspan="2">The expected prehospital report format is MIVT for trauma and SSVT for medical. A full set of vital signs should be reported including blood pressure, heart rate, respiratory rate, and oxygen saturation. Terms such as “within normal limits” or “stable” are not acceptable.</td></tr>
<tr><td colspan="2">• Name and DOB
• Activation? (trauma, STEMI, stroke)
• ETA</td></tr>
<tr><td>Trauma (MIVT)
• Mechanism
• Injuries
• Vital signs
• Treatment</td><td>Medical (SSVT)
• Signs
• Symptoms
• Vital signs
• Treatment</td></tr>
</table>

Refusal Protocol:

PURPOSE:
To define the requirements a patient must meet in order to refuse treatment and/or transport to the hospital.

PROTOCOL:
Any patient refusing treatment must be informed of the risk of potential worsening of their condition, and the possibility it could lead to death or permanent disability.
A patient may refuse care:

- IF the patient has capacity (see below)
- AND has no signs of being under the influence of an intoxicating substance,
- AND is alert and oriented to person, place, and time,
- AND is not a minor,
- AND is not showing signs of suicidal ideation or homicidal intent,
- AND still refuses,

THEN the patient must sign a refusal form indicating they understand and are accepting the risk of refusal and cannot hold anyone responsible for any negative outcome as a result of their refusal. If there are any questions or concerns about a patient's state of mind (capacity, intoxication, or altered mental status) who is refusing care or transport, EMS providers should involve medical direction, enlist the help of family members, and/or notify law enforcement as appropriate.

NOTE: Multiple services do not need to obtain refusals from the same patient, and the responsibility to obtain a refusal should fall to the agency with jurisdiction for the call, the agency holding incident command, or the transporting EMS agency. Refusals should be obtained by ALS level providers when available on scene.

TRIAGE & TRANSPORT

Patient Refusals - All Providers:

Patient Refusals - All Providers:

A BLS provider may obtain a refusal:

- If there is no ALS provider on scene, including before ALS has arrived to the scene, if en route.
- If the ALS provider is occupied with care of a more seriously ill or injured patient on scene.
- If there are multiple patient refusals within the same call.

For the purpose of EMS, a patient with CAPACITY is defined as:

- At least 18 years old (unless emancipated minor)
- **AND** is alert, responsive, oriented to person, place, time and situation
- **AND** has no signs of injury or illness which may impair the ability to make an informed decision
- **AND** displays no signs of the patient's judgment being impaired by an intoxicating/mind altering substance (including carbon monoxide)
- **AND** is not suicidal or homicidal and does not want to hurt themselves
- **AND** the patient demonstrates an understanding of:

1. **Diagnosis, possible diagnosis, or current medical problem:** Does the patient understand the condition/medical problem for which the specific treatment/transport is being offered?

2. **Nature and purpose of treatment:** Is the patient able to explain the nature of the treatment and understand relevant information?

3. **Risk and benefits of proposed treatment/transport:**
   - Is the patient aware of the possible outcomes of treatment, alternatives or lack of treatment, and is able to verbalize the potential danger/risk to their health and well-being by refusing transport/care?
   - Is the patient able to make a decision and communicate a choice, and/or the expectations realistic? Are they able to manipulate the information rationally?

DOCUMENTATION:

- Documentation of the refusal requires a patient care report with as much information regarding the patient's evaluation as possible, including, but not limited to:
  - Any history obtained & any physical exam or objective observations. This may include visual descriptions if the patient declined any physical exam.
  - Documentation describing the discussions about risks of refusal and options presented to the patient.

POLST/Palliative Care Guidelines[1]

POLST forms have replaced the previous program of Comfort One in Montana. However, Comfort One forms are still valid and still present in the community. They should be honored if one is presented to you in the course of patient care.

POLST:

Out-of-Hospital Protocol when presented with POLST Documentation

- POLST documentation, if presented to the out-of-hospital provider, MUST be followed.
- POLST documentation MUST accompany the patient and be presented to other health care providers who subsequently attend the patient.
- The out-of-hospital patient care documentation must include the POLST documentation and care provided based on the POLST documentation.
- Never delay patient care to determine if the patient has POLST documentation.
- COMFORT One bracelet identifies a patient who has a POLST document and a DNR (section A).
- A POLST document can be disregarded if the patient requests or if the terminal condition no longer exists.
- A verbal DNR order from a physician MUST be followed.
- If there is a question regarding POLST, contact Medical Control.

End-Of-Life Care/Palliative Care

PATIENT CARE GOALS: When providing care for a patient near end-of-life:

- Provide relief from pain and other distressing symptoms.
- Affirm dying as a normal process.
- Integrate psychological and spiritual aspects of patient care.
- Offer a support system to help the family cope during the patient's illness and in their own bereavement.

Inclusion Criteria

- Patient enrolled in hospice or palliative care, or who have advanced care directives, experiencing complaints related to the illness for which the patient is receiving those services.

Exclusion Criteria

- Complaints unrelated to the illness for which they are receiving those services.

TRIAGE & TRANSPORT

POLST/Palliative Care Guidelines

PATIENT MANAGEMENT:[2]

Patients with decision making capacity:

If the patient is able to communicate and has the capacity to make decisions regarding treatment and transport, consult directly with the patient before treatment or transport.

Patients without decision making capacity:

If the patient lacks the capacity to make decisions regarding treatment or transport, identify any advanced care planning in place for information relating to advanced care planning and consent for treatment, including:

- Advanced care directives
- POLST or similar forms
- Guardian, healthcare power of attorney, or other accepted healthcare proxy
- In collaboration with hospice or palliative care provider, coordinate with guardian, healthcare power of attorney, or other accepted healthcare proxy if refusal of transport is considered.

TREATMENT CONSIDERATIONS:

- If the patient has **EXCESSIVE SECRETIONS:** provide suction
- If the patient requires **PAIN RELIEF**: *see Pain Management protocol*
- If the patient has **NAUSEA:** see *Nausea/Vomiting guidelines, pg. 35*

PATIENT SAFETY CONSIDERATIONS:

Careful and thorough assessments should be performed to identify complaints not related to the illness for which the patient is receiving hospice or palliative care. Care should be delivered with the utmost patience and compassion.

KEY CONSIDERATIONS:

- Social interactions with family may affect end-of-life care
- Scene safety should be considered when deciding on management

PERTINENT ASSESSMENT FINDINGS:

- Vital signs
- Pain score
- Neurological exam
- Lung sounds

KEY DOCUMENTATION ELEMENTS:

- Interaction with hospice or palliative care provider
- Confirmation of advanced directive or other advanced care documentation
- Pain score if applicable

PERFORMANCE MEASURES:

- If patient is in pain, pain score change.
- If patient is nauseated, symptom relief.

Determination of Death in the Field

In addition to those factors discussed in the Montana State EMS Protocols, determination of death in the field without initiating resuscitative efforts should be considered under the following conditions:

- Patient qualifies as a "Comfort One"/POLST patient. (Follow directions on the document for the appropriate level of resuscitation.)
- Any situation that puts the rescuers at risk.
- The patient has suffered blunt traumatic arrest, is pulseless and apneic, has had verification of a patent airway and there has been consideration of treatment for a tension pneumothorax if there is evidence of significant chest trauma.

AVALANCHE/SNOW BURIAL:
In an avalanche rescue or snow burial situation, resuscitation should NOT be attempted if:

- The victim was buried greater than 30 min with no air pocket, airspace, or breathing device.
- The victim's airway is occluded with ice/snow and time of burial has been 30 minutes or more.

BACKCOUNTRY CPR:
In addition to the above, after 30 minutes of CPR and resuscitation efforts for cardiac arrest in a backcountry situation (i.e.: any situation where CPR cannot be adequately performed during extrication/transport and medical control contact is not available), consideration should be given to stopping resuscitation efforts even if medical control cannot be contacted and a defibrillator is unavailable.

ENVIRONMENTAL EXPOSURE EXCEPTION:
All victims of electrocution, lightning strikes, and cold-water drowning should have resuscitative efforts begun with communication to on-line medical control. Any decision to determine death in the field in these cases should be made only after consultation with the medical control physician.

DOCUMENTATION:

- Patient care documentation will include procedures performed and time performed.
- Conversations with medical control will include physician's name, time, and instructions.
- Documentation must include the patient's name, age, and date of birth at a minimum.
- If the EMS provider is unable to acquire a name, a police report number should be documented.
- In non-traumatic deaths, all non-resuscitation or stopped resuscitation cases should have an ECG strip attached (when available based on provider level and equipment) to the field report that shows the patient's rhythm/cardiac activity AND confirmation of the absence of cardiac activity in two leads.

TRIAGE & TRANSPORT

Legal Blood Draws

LEAVING THE SCENE:

- All unattended deaths in the field are coroner's cases.
- Care must be exercised to not unnecessarily disturb the scene. Do not remove ECG patches, pick up material, etc. that could potentially alter the scene.
- Prior to leaving the scene ensure an officer (either fire or police) is in charge of the scene, or the coroner is on scene.

Legal Blood Draws

PROTOCOL: Steps for Legal Blood Draws

1. Obtain patient ID
2. Ask their full name and DOB
3. Use the kit Law Enforcement provides
4. Prepare the site with a non-alcohol prep
5. Draw gray topped tube from the kit, label it, and hand the tube to the officer
6. Fill out the paperwork from the kit and hand the paperwork to the officer
7. Document in your own records

Ex: "On May 7th at 1800 I drew blood from Tom Smith, DOB 1/2/99, into a gray topped vacutainer, which I subsequently labeled with the name Tom Smith and my initials (EL). Tube and associated paperwork were handed to officer John Doe of the Bozeman PD, Badge number 123."

Big Sky Area Cardiac Triage

PROTOCOL:

Cardiac patients in the Big Sky area not meeting STEMI criteria:

- Cardiac patients *not* meeting STEMI criteria should be taken by ground to the closest facility.

Cardiac patients in the Big Sky area with suspected STEMI:

- Patients meeting STEMI criteria should be taken to BHDH as the closest PCI center by ground *UNLESS*:
  - Transport to BHDH is estimated to be greater than 90 minutes and/or road conditions are prohibitive of expeditious transport to BHDH.
  - Provider discretion determines that the closest available center is required due to patient condition AND transport to BSMC is expected to be shorter than air transport to BHDH.

Examples of patient conditions requiring diversion to a closer facility:
(This is not an exhaustive list.):

- There is airway instability requiring emergent intervention beyond that which is available in the field.
- There is active CPR.

Air Transport of suspected STEMI:

- Air transport for suspected STEMI patients should only be utilized if it is expected to significantly reduce transport time. Air transport should be to the closest PCI center.
- While awaiting air medical arrival, plans for transport to the closest medical facility by ground should be continued in case air medical resources are unable to complete the transfer.
- If ground transport to BSMC is estimated to be shorter than the arrival time for air resources, the hospital helipad should be considered as a rendezvous point.

NOTE: *Provider discretion can overrule the above criteria if extenuating circumstances exist. In those cases, contact with on-line medical control should be attempted, but difficulty with pre-hospital communication (lack of cell service, lack of radio coverage, etc.) in the Big Sky area is recognized to at times be prohibitive of contact with on-line medical control.*

Trauma Field Triage Job Aid

Priority 1	Priority 2	Priority 3
STEP 1: Traumatic mechanism with unstable vital signs / altered mental status/ noted injuries	**STEP 2: Traumatic mechanism with isolated injury and stable vital signs**	**STEP 3: Traumatic mechanism with stable vital signs and no noted injury / single orthopedic injury**
Activate helicopter and transport to the closest Level 3 or higher facility	Bypass Big Sky Medical Center —can be ground	Transport to Big Sky Medical Center

Airway: unable to maintain airway or need for vent
Breathing: RR<10 or >29, SpO2<88% despite supp. O2
Circulation: confirmed reading at any time
• Age 0-9 <70mmHg + (2 x age in years)
• Age 10-64 ≤90mmHg
• Age 65+ <110mmHg
Disability: GCS <9
 	
Post-arrest with ROSC
Injury Patterns
 	
-Skull deformity, suspected skull fracture
-Suspected spinal injury with motor or sensory loss
-Significant penetrating injuries to head, neck, chest, abdomen, back, groin, buttocks or extremities proximal to elbow or knee
-Chest wall instability, deformity or suspected flail chest
-Unstable pelvic fracture (unable to ambulate)
-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
-Burns >20% TBSA COMBINED with other injury and trauma
-Chest wall injury with suspected pneumothorax
-Blunt abdominal trauma with significant firmness, distention or tenderness
-High voltage electrical injury with or without significant injury
 	
Transport to nearest Level 2 facility
-Isolated neurological injury
-Isolated burns >20% TBSA with no associated trauma
	-Pregnancy >20 weeks with stable vital signs and without priority 1 injuries
	-Geriatric (>65) with SBP >110 with multiple body regions injured
	
	Injury Patterns
	
	-Suspected hip fracture
	-Orthopedic injury needing OR: Obvious femur fracture, obvious tib/fib fracture , open fractures, etc.
	
	Provider Judgement
		Mechanism of Injury
		
		-High-risk auto crash
		• Partial or complete ejection
		• Death in passenger compartment
		• Significant intrusion (including roof)
		  • >12 inches occupant site OR
		  • >18 inches any site
		• Child (age 0-9) unrestrained or in unsecured child safety seat
		-Pedestrian/bicycle rider thrown, run over or with significant impact
		-Fall from height >10ft (all ages)
		-Rider separated from transport vehicle with significant impact (motorcycle, ATV, horse, snowmobile etc.)
		-High energy dissipation/rapid deceleration incidences striking fixed object with momentum (Skier, mountain biker, etc.)
		Injury Patterns
		
		-Orthopedic injury with neurovascular compromise for relocation
		-Stable, isolated orthopedic injury; upper extremity fractures, ankle fractures, etc.
		-GCS 10-13 (suspected concussion)
		-Penetrating injury to hand or foot

RESPIRATORY

RESPIRATORY

CPAP (Continuous Positive Airway Pressure)

Airway Management - Basic

CPAP (Continuous Positive Airway Pressure)
PROVIDER LEVEL: EMT & Above
INDICATIONS: Any patient who is in respiratory distress with signs and symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia ***AND who is:*** • Awake and able to follow commands • Over 12 years old and is able to fit the CPAP mask • Has the ability to maintain an open airway ***AND* who exhibits two or more of the following:** • A respiratory rate greater than 25 breaths per minute • Pulse oximetry of less than 90% at any time • Use of accessory muscles during respirations
CONTRAINDICATIONS: • Patient does not have adequate spontaneous respiratory effort • Patient unable to follow commands • Patient unable to protect airway or active vomiting • Systolic blood pressure < 90 mmHg • Respiratory distress secondary to trauma or suspected pneumothorax
CPAP SETTINGS: • 5 cm H2O for moderate distress • 5 cm H2O for moderate or severe distress when systolic BP 90-100 (observe closely for BP change) • 10 cm H2O for severe distress
NOTE: CPAP does not take the place of pharmacology. Although CPAP is listed in the protocol in a linear list, it need not be interpreted that all interventions must be completed in the written order. Providers should use good clinical judgment to determine at what point in the course of the various therapies CPAP should be initiated.

REASSESS: Be alert for circumstances in which the patient continues to deteriorate despite CPAP and/or medication therapy, in which case, terminate CPAP administration, and perform BVM ventilation and/or establish advanced airway if necessary.

- Slowing respirations do not necessarily indicate improvement.
- Monitor for hypotension.
- Be aware for need for more aggressive airway interventions if the patient shows signs of further respiratory decompensation.

POTENTIAL CPAP COMPLICATIONS:

- Continued decompensation in respiratory status
- Decrease in blood pressure
- Panic or anxiety from claustrophobia
- Gastric distension
- Pneumothorax
- Exhaustion of oxygen supplies

CLAUSTROPHOBIA: Claustrophobia is a common complaint with CPAP masks

- It is recommended that in the case of a claustrophobic patient, they be allowed to hold the mask and remove it if necessary.
- It is common that as the benefits are felt, patients will be inclined to keep the mask on their face. Face straps can then be attached as the patient becomes more comfortable.

NOTE: Some patients will not tolerate the mask and should not be forced.

RESPIRATORY

Simple Airways & Bag Valve Mask

Simple Airways & Bag Valve Mask
PROVIDER LEVEL: Basic & Above
PROTOCOL: • Bag valve mask (BVM) devices should be used prior to or in conjunction with advanced airway insertion. • Ideally, usage of a BVM is a two person procedure. • Monitoring of on-going BVM ventilation rates and volumes using end-tidal CO_2 monitoring is encouraged when this equipment and expertise are available.
Proper BVM usage should follow this mnemonic: C - Cervical-spine control, where indicated O - Oral airway (and/or 1-2 nasal airways) in place P - Proper head and neck positioning E - Elevate the jaw S - Seal the mask (two hands using thenar eminence technique) S - Steady, slow, single-hand, 1 second squeeze followed by quick release of the bag O - Oxygen supply sufficient and functioning properly S - Sellick's maneuver (cricoid pressure)
NOTE: If an effective airway is being maintained by BVM with continuous pulse oximetry readings >90%, it is acceptable for basic and/or advanced level providers to continue with these measures instead of using a supraglottic airway or endotracheal intubation, especially if a difficult airway is anticipated.

Airway Management - Intermediate/Advanced

Supraglottic Airways
PROVIDER LEVEL: Endorsed EMT & Above Endorsed EMT Basics may insert an approved supraglottic airway provided: • Their agency is approved for this procedure by the Medical Director. • The individual carries an appropriate and current endorsement at this level.
INDICATION: Any approved supraglottic airway is a suitable alternative to endotracheal intubation for all patients where laryngeal swelling (e.g., anaphylaxis or airway burns) is not a concern and is preferable in many circumstances (e.g., to minimize disruptions in chest compressions during cardiac arrest).
PROTOCOL: The use of continuous waveform capnography is mandatory for monitoring ongoing placement and ventilation with use of supraglottic airways, when the equipment and expertise is available and the provider's level of licensure permits its use.

RESPIRATORY

Airway Management - Advanced

Airway Management - Advanced

Endotracheal Intubation

PROVIDER LEVEL: Paramedic & Above

INDICATION:

- Apnea: No spontaneous respiratory effort
- Inadequate spontaneous respiratory effort and lack of a gag reflex
- Inability to protect or maintain airway with other less invasive means

PROTOCOL:
EMS personnel must use assessment adjuncts to aid in intubation decisions and for confirmation of advanced airway placement, with the following caveats:

ADJUNCTS: Use of adjuncts such as a gum elastic bougie and/or video laryngoscope is strongly encouraged for all intubation attempts when appropriate and when the provider has been adequately trained on the available device. Specific devices used should be approved by medical direction.

TUBE PLACEMENT CONFIRMATION:

- End-tidal CO_2 ($EtCO_2$) - The use of end-tidal CO_2 is mandatory (when approved for your licensure level) for verifying initial advanced airway placement. Use of continuous waveform capnography for ongoing airway and ventilation surveillance is mandatory if available. Be aware that certain conditions (e.g., prolonged cardiac arrest, massive pulmonary embolus, and poor chest compressions) may not produce detectable quantities of carbon dioxide.

CONFIRMATION OPTIONS:

- **Option 1:** assess initial placement with qualitative colorimetric CO_2 detector then transfer to continuous waveform capnography for ongoing surveillance.
- **Option 2:** assess both initial and ongoing tube placement with continuous waveform capnography.

NOTE: Pulse oximetry is a valuable tool to detect occult hypoxia, however, a normal reading does not rule out respiratory distress or the need for airway management. Pulse oximetry should *NOT* be used to confirm endotracheal tube placement.

ASSESSMENT & DOCUMENTATION OF TUBE PLACEMENT

Proper assessment and documentation of endotracheal intubation requires the medic to:

- Visualize the tube passing between the vocal cords (for oral intubation)
- Ensure no sounds are heard over the stomach when ventilating the patient through the ET tube
- Ensure good bilateral breath sounds when ventilating the patient through the ET tube
- Observe the chest rising and falling with each ventilation
- Confirm initial and ongoing placement with waveform capnography (less sensitive in certain cardiac arrest situations) and document results. If waveform capnography is unavailable, colorimetric end-tidal capnometry is mandatory.

NOTE: Do not assume either a tube is in the correct or the incorrect position based on any one of these steps in isolation. Continue to re-evaluate every few minutes (preferably with each set of vital signs) and particularly after patient movement. If there is ANY doubt as to the appropriate placement of an endotracheal tube, REMOVE the tube and ventilate the patient using a BVM.

ENDOTRACHEAL INTUBATION ATTEMPTS:

- Providers may make only TWO endotracheal intubation attempts per patient. An endotracheal intubation attempt is defined as the passage of an endotracheal tube past the teeth.
- An attempt made by a paramedic student counts as an attempt.
- If the attempts are unsuccessful, medics should insert an approved supraglottic airway or provide effective ventilation with a BVM.
- Mandatory notification of Medical Director via email within 24 hours of any failed intubation attempt. For simplicity, may use this online form: https://forms.gle/G3RPJQ8fEugRafMTA

SEDATION:
In a patient who has been successfully intubated (with appropriate confirmation as above), sedation with the following may be considered for patient agitation, gagging against the tube, or other activity likely to displace the airway or interfere with appropriate ventilation:

Midazolam (Versed)

PROVIDER LEVEL: Paramedic & Above

INDICATION: May be considered for patient agitation, gagging against the tube or other activity likely to displace the airway or interfere with appropriate ventilation.

DOSING:

- 2.0-5.0 mg IV, may repeat once to max of 10.0 mg.

SPECIAL CIRCUMSTANCES:

- Call Medical Control for further dosing or combination opiate/benzodiazapine dosing.

RESPIRATORY
Cricothyrotomy

Cricothyrotomy
PROVIDER LEVEL: Paramedic & Above
INDICATION: Cricothyrotomy (open surgical with North American Rescue Bougie-Aided Cricothyroidotomy Pack (BAC-Pack) if approved by medical direction and/or with another device approved by medical direction) is a **LAST** option to be used only in a circumstance where you cannot oxygenate and/or ventilate the patient by ANY other means (BVM, endotracheal intubation, or supraglottic airway).
PROTOCOL: • Proper assessment and documentation of surgical airway placement should be identical to endotracheal intubation as above, aside from visualizing the tube pass the vocal cords and documenting failure of all other available airway management techniques. • Mandatory notification of Medical Director within 24 hours of any attempted, successful, and/or failed cricothyrotomy in the field. For simplicity, may use this online form: https://forms.gle/G3RPJQ8fEugRafMTA

CARDIOVASCULAR

CARDIOVASCULAR

High Performance CPR

High Performance CPR

1

IMMEDIATELY UPON ARRIVAL (or arrest, if witnessed) verify circulatory arrest by the absence of:

- consciousness
- carotid pulse
- normal/regular respiration (ignore agonal respirations)

CHOOSE

2

If the cardiac arrest **IS *NOT* WITNESSED** by EMS providers:

- ***PROVIDE 2 MIN OF CHEST COMPRESSIONS***
- **Compression Person** will immediately begin continuous chest compressions for 2 minutes at a rate of 100-120 compressions/minute.
- **Do NOT interrupt chest compressions.**

2

If the cardiac arrest **IS WITNESSED** by EMS providers:

- **Compression person** begin immediate chest compressions while **AED person** attaces defibrillator.
- Once defibrillator is connected STOP CPR and push "ANALYZE" button.
- Continue starting at steps 6 and 7 above.

3

DEFIBRILLATION

Designated AED Person will:

1. TURN ON the AED as soon as cardiac arrest has been verified.
2. Cut clothing as necessary.
3. Place the AED electrodes on the patient in the appropriate locations:

- one patch under the right clavicle
- one patch just below the left nipple line on the chest wall

Do NOT interrupt chest compressions.

CHOOSE

4

If "SHOCK ADVISED":

- AED will charge.
- Deliver shock and immediately begin 2 min. of CPR.
- Do NOT Check for Pulse after Shock.

4

If "NO SHOCK ADVISED":

- Check for Pulse. (<10 seconds)
- If no pulse, immediately begin 2 min. of CPR

5

AIRWAY/VENTILATION

The **Designated Ventilation Person** will begin ventilations.

- Ventilate the patient at a rate of 30 compression to 2 breaths unless an advanced airway is in place.
- Prepare suction equipment.
- Do NOT interrupt chest compressions.

If there is no **Designated Ventilation Person available, the **Designated AED Peson** will immediately assume the responsibilities of the Designated Ventilation Person after the AED is operational.

6

IV/IO PLACEMENT

- If ALS personnel or BLS personnel with an IV endorsement are available, the **IV Person** will prepare the patient for IV placement and begin to assemble the IV set.
- Consider IO access as this has less risk of interfering with chest compressions.

ALS ARRIVAL

- Upon arrival of ALS continue the current 2 min. CPR cycle.
- Paramedics will pre-charge defibrillator and analyze/shock at end of 2 min. of CPR.
- After each 2 min. CPR cycle paramedics should analyze or treat in <10 sec.
- Continue cycles of 2 min. CPR with breaks <10 sec. for analysis and/or treatment by paramedics.

Cardiac Arrest and High Performance CPR Guidelines - Rationale

Continuous Chest Compression (CCC) CPR Note:
The science of CPR/Resuscitation is constantly being updated and improved. The AHA standards for CPR and Resuscitation have been revised several times in the past to reflect the newest advances. CCC-CPR is a new CPR protocol that strives to eliminate any pause in chest compressions. There is compelling data currently available that indicates any unnecessary pause in chest compressions, including during patient ventilations or establishing an advanced airway, is detrimental to patient outcome.

High-Performance CPR (HP CPR) is identical to CCC-CPR but also stresses the importance of CPR quality, specifically maintaining the proper minimum CPR rate, as well as adequate depth and recoil during chest compressions. This is alternatively referred to as "Pit Crew CPR." Gallatin County Medical Direction believes that HP CPR provides potential benefit to cardiac arrest patients and prefers that this protocol be followed during the resuscitation of cardiac arrest patients. EMS providers that have not been trained or are not comfortable with HP CPR may default to the current AHA standards.

Research indicates that HP CPR can save lives. In order to create an environment of sustained HP CPR, everyone must be on board. EMTs or first responders who are first on scene must take responsibility or "own" the CPR portion of the resuscitation. When paramedics arrive, they will perform the ALS measures of the resuscitation and work in coordination with ongoing CPR.

For systems in which an EMT/paramedic team arrives first at the scene the EMT must assume responsibility for CPR while the paramedic assumes responsibilities for ALS. The goal is for additional resuscitation care such as defibrillation, medication therapies, and/or airway management to compliment CPR. CPR should be the default action at all times. The paramedic should integrate ALS care in a way that enables the EMT to achieve consistent CPR. This partnership between EMTs and paramedics will provide the basis to achieve HP CPR and in turn improve the chances of successful resuscitation.

Note: This section is meant to be a supplement to the Montana State Protocol for Cardiac Arrest as well as the current AHA cardiac arrest treatment guidelines.

The purpose of these standing orders is to enable a properly qualified Emergency Medical Responder to provide prompt CPR and cardiac defibrillation using an AED for patients 15 years of age or older who have confirmed circulatory arrest from non-traumatic causes. These protocols are for the adult only. Follow AHA/PALS standards to your level of licensure and training for neonates, infants and children with close attention to good quality chest compressions with minimal interruptions.

CARDIOVASCULAR

13 Principles of High Performance CPR

13 Principles of High Performance CPR
1. EMTs own CPR. 2. Minimize interruptions in CPR at all times. 3. Ensure proper depth of compressions (>2 inches). 4. Ensure full chest recoil/decompression. 5. Ensure proper chest compression rate (100-120/min). 6. Use of a metronome set at 110 beats/min is strongly recommended. 7. Rotate compressors every 2 minutes. 8. Hover hands over chest during shock administration and be ready to compress as soon as patient is cleared. 9. If using an AED, use the analysis time to change compressors and rotate crew members.
10. If using a manual defibrillator, precharge the device 15 seconds before the pause for pulse and rhythm check. 11. Intubate or place advanced airway with ongoing CPR. 12. Place IV or IO with ongoing CPR. IO is preferred as it interferes less with ongoing CPR.
13. Coordination and teamwork between EMTs and paramedics is key to successful outcomes.

Other Expectations:

- **UNWITNESSED ARREST:** If there is no CPR happening at the time of the first EMS provider arrival at a cardiac arrest, 2 minutes of CPR should be performed before the first attempt at defibrillation. This allows a period of blood flow to the heart, and allows the heart to better "accept" the shock making it more likely to be successful. If any CPR is ongoing at the time of defibrillator arrival, defibrillation can be attempted before further cycles of CPR, as the desired blood flow is already achieved.

- **AIRWAY PLACEMENT:** CPR should not be stopped to allow airway placement. BVM ventilations or a supraglottic airway such as a King airway should be used if intubation cannot be completed on the first attempt without stopping chest compressions. Pay strict attention to ventilation rates. When an advanced airway is in place the patient should be ventilated every 6 seconds. Do not over-ventilate the patient.

LUCAS Chest Compression Device

PROVIDER LEVEL: EMT-Basic & Above: All providers must be appropriately trained to use the device with both initial and ongoing training per agency and state requirements.

RATIONALE: The LUCAS is a non-invasive mechanical CPR device. It has a role in providing uninterrupted chest compressions at an appropriate rate and depth, but it has not been shown to be superior to well-performed manual chest compressions. Manual compressions are still considered the standard of care by the AHA. Consider the device a tool to use in non-traumatic cardiac arrest, but it should not distract from beginning manual chest compressions as soon as possible, or cause unneeded interruptions in compressions at any point. Use of a LUCAS device can make chest compressions during transport more effective and safer for the transporting crew. However, availability of a LUCAS should not prompt transport when it would not have otherwise been considered. Cardiac arrests are still best managed in place unless there are extenuating circumstances mandating transport such as V-fib resistant to multiple shocks.

INDICATIONS: Non-traumatic cardiac arrest, to include PEA, requiring CPR.

CONTRAINDICATIONS:
- Traumatic arrest.
- Patient too small for the pressure pad in the suction cup to make contact with the chest. OR Patient too large for legs to lock.
- Patient is a child under 12 years old.
- Pregnancy.

PROTOCOL:
- The LUCAS shall be used in accordance with the manufacturer's recommendations.
- LUCAS should not be used until after two full cycles of manual compressions. A defibrillator should be applied before the LUCAS. Starting manual chest compressions and initial defibrillation should take precedence over placement of the LUCAS. Use a two-step application and minimize pauses.
- The machine is a tool but not a priority. Placement of the device should be done to take opportunity of inevitable pauses and to minimize no-flow states.
- The LUCAS should NOT be paused for intubations.
- Do NOT attempt to lift the patient or the device by the arm straps.
- A member of the agency that placed the device and has been trained on the LUCAS must remain with the patient at all times until the LUCAS is removed. That person shall be responsible for the safe operation of the device.
- One agency's hood may be exchanged for another but keep the initial back plate in place and minimize any interruptions.

DEVICE MALFUNCTION: If there is a device malfunction, immediately remove the device and resume high performance CPR. The device may be reapplied only after the problem has been addressed.

MAINTENANCE: Change battery and recharge after every use and per manufacturer recommendations.

CARDIOVASCULAR

Epinephrine 1:10,000 in Cardiac Arrest

Epinephrine 1:10,000 in Cardiac Arrest
PROVIDER LEVEL: Paramedic & Above
Guideline: • In cardiac arrest, continue to follow ACLS protocols with a focus on high performance CPR and early defibrillation. • When giving epinephrine for cardiac arrest, give the doses per ACLS recommendations to a total of 3 doses or 3 mg. • Do not give further doses of epinephrine beyond 3 mg in cardiac arrest.
Rationale: • Epinephrine use in cardiac arrest has been shown to increase ROSC, but it has not been shown to increase neurologically intact survival. In fact, some studies have shown a correlation between increased epinephrine use and worse neurologic outcome. • At this point there is not clear definitive data to support an optimal dose of epinephrine in cardiac arrest, however there is data supporting possible harm from high end dosing. This change in our guidelines mirrors guideline changes put in place by many larger EMS systems through the country to limit use of epinephrine in cardiac arrest.

Norepinephrine

PROVIDER LEVEL: Paramedic & Above

DOSING:

Start at initial dose 1 mcg/minute. Titrate to effect. Max dose for refractory shock 20 mcg/min.

- Guidelines based on 4mg norepinephrine in 250cc D5W or NS for 16mcg/cc concentration
- Use 60 gtts/cc tubing
- Frequent checks of IV patency and blood pressure are required
- Contact medical control for pediatric/neonatal dosing.
- These are only guidelines. Cater individual dosing to patient's clinical presentation

PRECAUTIONS:

- Norepinephrine is preferentially given through a central line but in the field and in emergent situations it can be given peripherally through good IV access.
- Norepinephrine should *not* be given through a wrist or hand IV.
- Watch closely for any signs of extravasation.
- The site should be checked at least every 5 minutes during peripheral infusion of norepinephrine.
- If there are any signs of extravasation of norepinephrine:
  - Switch the infusion to another peripheral site or switch to IO access
  - Leave the IV cannula in place at the site of the extravasation.
  - Aspirate as much fluid as possible through the cannula.
  - Document findings at the site and monitor for change during transport.
  - Alert the destination facility of the extravasation.
  - Phentolamine may be considered with administration through the IV at the site of the extravasation and/or subcutaneous administration.

CARDIOVASCULAR

Unstable Bradycardia/"Push-Dose" Epinephrine

Unstable Bradycardia/"Push-Dose" Epinephrine When norepinephrine was added and dopamine was removed from the stock carried, concern was raised about the ACLS algorithm for unstable bradycardia as Norepinephrine does not primarily increase heart rate and is not indicated for bradycardia.
For unstable or symptomatic bradycardia with a pulse: Transcutaneous pacing should be used along with dosing of epinephrine as needed (see below)
PROVIDER LEVEL: Paramedic & Above
EPINEPHRINE DOSING FOR SYMPTOMATIC BRADYCARDIA: **Adult - consider EPINEPHRINE** (1:10,000=1mg/10ml) (IV) 1 to 2 ml (0.1-0.2mg), repeat every 3-5 minutes to a minimum B/P 90 systolic and improvement of symptoms **Pediatric - consider EPINEPHRINE** (1:10,000=1mg/10ml) (IV) 0.1ml/kg to a max of 2 ml (0.2mg), repeat every 3 TO 5 minutes to a minimum B/P 90 systolic and improvement of symptoms

Nitroglycerin Infusions (for interfacility transfers)

PROVIDER LEVEL: Paramedic & Above

Montana state EMS protocols authorize use of a nitroglycerin drip per "local protocol" at the paramedic level for chest pain patients. This protocol is intended to be used by paramedics who have been authorized by their agency to transport patients on a nitroglycerin drip. It is intended to be used for inter-facility transports when the nitroglycerin drip has been started by the sending facility.

This protocol is not meant to be used for starting nitroglycerin drips in the field during scene calls. Use of this protocol assumes the provider has had appropriate training on and familiarity with the IV pump that will be used during the transport.

STANDARD DOSING: Nitroglycerin (50 mg/250 ml D5: 200 mcg/ml)

PROTOCOL:

- Maintain oxygen flow rate for an O_2 concentration of greater than or equal to 94%.
- Maintain cardiac monitoring during transport.
- Assess and record vital signs, to include temperature, prior to transfer and every 5 to 10 minutes en route.
- Reassess patient frequently during transport and document findings.
- Collect all transfer documentation: transfer sheet, EKG's, lab, and any other pertinent information.
- Document indication and order for drug during transport.
- Document drip rate at the beginning of transport and patient's response.

Drip rate changes during transport:

- If chest pain is present: increase the nitroglycerin drip by 5 mcg/min (1.5 ml/hr) or 3.3 mcg/min (1.0 ml/hr) depending on your pump, every five minutes until the chest pain resolves or systolic blood pressure drops below 100.
- If more than an additional 10 mcg/min required, contact the on-line medical director (medical control).
- If systolic blood pressure drops below 100, decrease the nitroglycerin by 5 mcg/min (1.5 ml/hr) or 3.3 mcg/min (1.0 ml/hr) depending on your pump.
- If systolic blood pressure drops below 90, stop the nitroglycerin drip, place patient in Trendelenberg position and consider a fluid bolus.

***NOTE* on Heparin and Lovenox (Enoxaparin) for chest pain or potential cardiac patients:** Paramedics may transfer patients who have been administered heparin or enoxaparin at the sending facility. These patients should be considered at risk for and monitored for bleeding complications similar to any other patient on anticoagulants.

NEUROLOGICAL

Acute Stroke Care and Stroke Alert Criteria:

RATIONALE:
For patients meeting certain criteria, treatment of stroke can be very time dependent. Treatment with thrombolytic medications (medications to dissolve clots) for ischemic strokes requires early and rapid diagnosis with a time limit on the use of this therapy.

PROVIDER LEVEL: All Care Providers

CODE STROKE:
When transporting a potential stroke patient to Bozeman Deaconess Hospital, the following criteria should trigger a call to alert the hospital of a "Code Stroke Patient." If a patient is suspected to have had a stroke, but does NOT meet the following criteria, a standard report should be given to convey this information.

"Code Stroke" should be activated if a patient meets *both* of the following two criteria:

1. The patient has new symptoms with a positive Cincinnati Stroke Scale or positive "BE FAST" Criteria.

AND

2. The patient will arrive at the hospital in less than 4.5 hours from the time of onset of the suspected stroke symptoms. Patients who wake up with symptoms from sleep should have the time they went to sleep used as the time of onset.

KEY DOCUMENTATION ELEMENTS FOR SUSPECTED STROKE

- "Last seen normal" must be specific
- If the patient was last seen normal prior to bedtime the night before, this is the time to be documented (not time the patient woke up with symptoms present).
- Blood glucose results
- Specific validated stroke scale used and findings
- Time of notification to receiving hospital

PERFORMANCE MEASURES

- Documentation of time "last seen normal"
- Use of validated stroke scale.- such as BE-FAST or Cincinnati Stroke Scale.
- Blood glucose level obtained EMS
- Scene time minimized (goal: less than 20 minutes)
- Hospital stroke team pre-arrival alert or activation occurred as early as possible after positive stroke assessment finding

NEUROLOGICAL

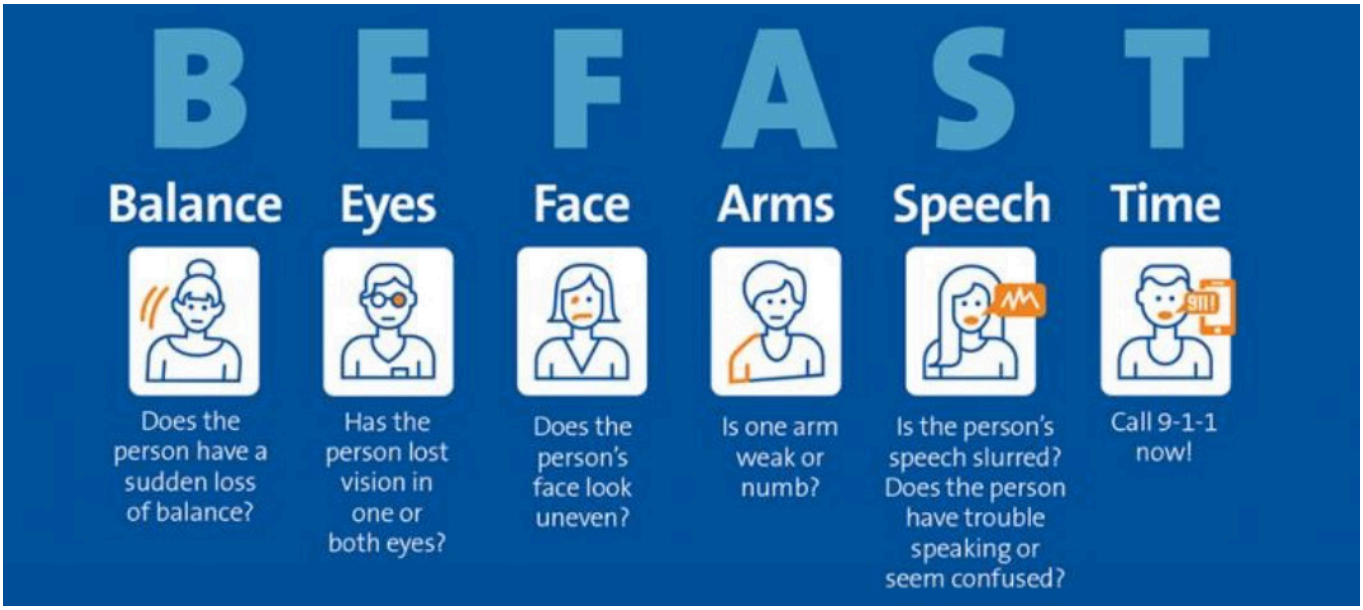
Stroke Assessment Tools:

Stroke Assessment Tools:

While either the Cincinnati Stroke Scale or the BE FAST scale are acceptable for use by EMS, the nursing staff at Bozeman Health is currently using the BE FAST scale. Use of this scale will help coordinate with them. The BE FAST scale is also meant to be more sensitive as it does a better job of picking up strokes involving the posterior circulation of the brain. This type of stroke is often missed by the Cincinnati Stroke Scale. Any positive finding on this scale should lead you to consider the possibility of stroke.

Cincinnati Stroke Scale: If any one of the three categories below is abnormal, it is a positive test.
FACIAL DROOP: Have the person smile or show his or her teeth. If one side doesn't move as well as the other so it seems to droop, that could be a sign of a stroke. **Normal**: Both sides of face move equally **Abnormal:** One side of face does not move as well as the other (or at all)
ARM DRIFT: Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds. If one arm does not move, or one arm winds up drifting down more than the other, that could be a sign of a stroke. **Normal:** Both arms move equally or not at all **Abnormal:** One arm does not move, or one arm drifts down compared to the other side
SPEECH: Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. If the person slurs the words, gets some words wrong, or is unable to speak, that could be sign of stroke. **Normal:** Patient uses correct words with no slurring. **Abnormal:** Slurred or inappropriate words or mute.
Patients with 1 of these 3 findings as a new event have a 72% probability of an ischemic stroke. If all 3 findings are present the probability of an acute stroke is more than 85%.

BE-FAST/VAN Stroke Assessment



VAN Assessment

***Any weakness PLUS** any one of the following is considered positive:*

Visual disturbance - field cut, double or blind vision
Aphasia – inability to speak or understand
Neglect – gaze to one side or ignoring one side

*If the patient is **VAN Positive** and has a high probability of having **LVO**.*

NAUSEA/VOMITING

Nausea/Vomiting

RATIONALE: Vomit is the most commonly aspirated material. Those most at risk are patients with an altered or decreased mental status. In addition to obstructing the airway, vomit can lead to significant damage to bronchiolar tissue and alveoli. Nausea and vomiting can be due to any number of causes and care should be directed to address the underlying pathology (i.e., cardiac event, head injury, etc.) along with the symptoms. Also, it is important to determine if blood is present in vomit.

PROTOCOL: *(SEE PROTOCOL PER PROVIDER LEVEL BELOW)*

EMT:

- Initial Medical Care.
- Consider trial of inhalation from an alcohol pad (See footnote below**).

**Inhaled isopropyl alcohol has shown promise as an antiemetic and may be superior to oral ondansetron. In a recent trial of 120 adult ED patients with nausea or vomiting who did not require IV access, inhaled isopropyl alcohol with or without oral ondansetron provided greater nausea relief than oral ondansetron alone (1). Patients were instructed to take deep nasal inhalations as frequently as required to achieve nausea relief from a standard alcohol swab, with the pad held 1 - 2 cm from the nares. No adverse events occurred. The mechanism of isopropyl alcohol's antiemetic effect remains unclear.

Changing practice based upon a small, single-center study is hardly recommended, but the EM community might find these results interesting given that inhaling an alcohol pad is simple and without adverse effects, and possibly quite effective. In its commentary of this study, the New England Journal of Medicine in its Journal Watch stated "these results are truly remarkable and are consistent with prior research. For patients not obviously requiring IV therapy, we should treat nausea with repeated inhalations from an isopropyl alcohol swab instead of administering any other drug" (2).

References: EmedHome (1) April MD, et al. Ann Emerg Med. 2018 Feb 17. [Epub ahead of print] (2) Pallin DJ in Practice Changing Research 2018, NEJM Journal Watch, April 2018.

AEMT or EMT with IV endorsement:

- Initial Medical Care.
- 500-1000 ml IV fluid bolus if patient presents with dehydration/hypotension.
- Consider ALS resources.

PARAMEDIC:

- Initial Medical Care.
- 500-1000 ml IV fluid bolus if patient presents with dehydration/hypotension.
- **SEE ADDITIONAL OPTIONS NEXT PAGE**

NAUSEA/VOMITING

Antiemetic Medications

Antiemetic Medications

Diphenhydramine (Benadryl)
INDICATIONS, *Consider for:* • Nausea/vomiting • Motion sickness • Nausea/vomiting during pregnancy (FDA pregnancy category B)
DOSING: **Adult DIPHENHYDRAMINE dose:** • 12.5-25 mg PO, IV, or IM. May repeat dose x1.
PRECAUTIONS: • Be aware of the potential for sedation. • Diphenhydramine's antihistamine action can be helpful as an antiemetic, especially in cases of motion sickness. However, use is often limited by side effects such as sedation.

Ondansetron (Zofran)
INDICATIONS, *Consider for:* • Nausea/vomiting. • In adults, oral route may be considered for prophylactic use for long-distance transports and prolonged spinal immobilization.
DOSING: **Adult ONDANSETRON dose:** • 4 mg IV or 4-8 mg PO (Oral Dissolving Tablet) • May repeat 4mg IV dose to total of 8 mg if no improvement in 15 min. **Pediatric ONDANSETRON dose:** • Oral route (preferred) 8-15 kg: 2 mg PO x1 • 15-30 kg: 4 mg PO x1 • >30 kg: 4 mg PO and may repeat x1 • IV ≥3 year old: 0.15 mg/kg IV • Maximum initial dose 4 mg, may repeat x1 • ONDANSETRON IV dosing for <3 year old: Contact Medical Control

Metoclopramide (Reglan)
INDICATIONS, *Consider for:* • Nausea/vomiting • Migraine headache • Nausea/vomiting during pregnancy (FDA pregnancy category B)

DOSING:
- **Adult METOCLOPRAMIDE dose:** 10 mg slow IV/IM for adults age 18-65 (IV diluted and over 1-2 minutes)
- **Elderly METOCLOPRAMIDE dose:** 5 mg slow IV/IM for adults age >65 (IV diluted and over 1-2 minutes)

TRAUMA

Trauma Alert Criteria

RATIONALE:
Mechanism of injury alone is not reason enough to activate the Trauma Team, although it should heighten the awareness of the potential for serious injury. Physiological findings with or without one of the listed mechanisms of injury should be enough to activate the trauma team.

Due to time constraints, it is preferable to advise ED of mechanism of injury and physiologic findings in a brief radio report. Lengthy radio reports are not helpful and can distract the EMT from other more important patient treatment modalities. The following criteria are from the Bozeman Deaconess Hospital Trauma Team Activation Policy (Updated 10/2020):

One way to consider the two levels of activation is as follows:

Level 1 trauma patients have signs showing they are significantly injured, and they may need early surgery. This level of activation will get a surgical team as part of the response.

Level 2 trauma patients do not have signs or symptoms of injury, but they have a mechanism or other comorbidities that make you feel they need rapid evaluation. They will not get a surgical team as part of the response but they will get everyone else to ensure rapid and thorough evaluation.

TRAUMA

Trauma Alert Criteria

Bozeman Health Trauma Activation Criteria

Level 1 Activation

Physiologic

	Adult	Pediatric (additional)
CODES	-Hanging -Drowning	-Out of hospital pediatric codes
AIRWAY	-Intubated -Compromised airway	
BREATHING	-Assisted ventilations -RR <10 or > 29	-hypoxia -accessory muscles -grunting -mottled skin

	Adult	Pediatric	Geriatric
CIRCULATION	-SBP < 90mmHg	-SBP < 70 + 2x child's age in years	-SBP < 110mmHg
DISABILITY	-GCS < 9 with mechanism attributed to trauma	AVPU -responsive to pain -Unresponsive	-GCS <13 with unequal pupils, blurred vision, severe or persistent headache, N/V

Anatomic

- Open or depressed skull fractures
- Paralysis or suspected spinal cord injury
- Significant penetrating injuries to the head, neck, chest, abdomen or extremities proximal to elbow and knee
- Flail chest
- Blunt abdominal trauma – significant firmness, distension or tenderness
- Unstable pelvis
- Two or more proximal long bone fractures
- Amputation proximal to the wrist or ankle
- Crushed, degloved, or mangled extremity
- Burns ≥25% BSA or high-energy electrical injury

Geriatric >65 years of age

- Proximal long bone fracture in MVC

Transfer from another hospital

- Receiving blood to maintain vital signs
- Intubated with ongoing respiratory compromise
- Requiring OR

Other

- Mass casualty – 3 or more major trauma
  - Activate trauma alert and surge activation
- ED Provider/ RN discretion

Level 2 Activation

Physiologic/Anatomic

- GCS <13 with mechanism attributed to trauma
- Geriatric >65 years of age: multiple body regions injured

Mechanism

- MVC
  - Ejection – partial or complete
  - Death in the same passenger compartment
  - Intrusion >12 inches at occupant site or >18 inches at any site
- Auto vs Pedestrian/Cyclist
  - Thrown
  - Run over
  - >20mph impact
- Falls
  - Adults >20 feet
  - Pediatrics >10 feet or 2-3 times the height of child
  - Fall from any height (including standing) with evidence of traumatic head/brain injury
- Motorcycle/ATV crash >20mph
- High-energy dissipation/rapid deceleration incidents:
  - Horse/large animal – roll-over or ejection
  - Blast or explosion
  - Striking fixed object with momentum
- Suspected non-accidental trauma

Transfer from another hospital

- Trauma mechanism at BDH
- Known injuries regardless of mechanism

Consider trauma activation or upgrading one level

- EMS/Triage RN judgement
- Age <10 or >55
- Pregnancy >20 weeks
- Anticoagulation and bleeding disorders
- Diabetes or cirrhosis
- >65 years old with cardiac disease, pulmonary disease or immunosuppressive disorder

Notes

- Trauma activations can be initiated by ED physician, ED RN, or EMS. EMS/triage RN responsible for activating an alert and it is the ED physician/ ED RNs responsibility to determine the level of activation.
- A combination of physiologic and anatomic parameters along with mechanism of injury, comorbidities and demographics provides better triage than any smaller combination or any criteria alone.
- Trauma Activation Upgrades or Downgrades follow the Pathway of the Level of which they are changed to.
- Level 1 Trauma Activation requires surgeon arrival time of <30 minutes.
- All Trauma Patients being transferred to Bozeman Health with traumatic event <48 hours old will be transferred to the ED (exception are patients that are redirected by the trauma surgeon).

Tourniquet Use

General: Tourniquets should be considered part of standard equipment for all prehospital personnel due to their proven lifesaving benefits in the setting of uncontrolled extremity hemorrhage.
The use of windlass, pneumatic, or ratcheting type commercial tourniquets is advised instead of improvised tourniquets, elastic, or bungee type tourniquets. This is due to their proven superiority in occluding arterial flow. All providers should be familiar with and train on the use of the specific devices they carry or to which they have access.

PROVIDER LEVEL: All Providers

Indications:
- Life-threatening extremity hemorrhage that cannot be controlled by other means
- Serious or life-threatening extremity hemorrhage in a setting where tactical, extrication, or man-power considerations prevent the use of standard hemorrhage control techniques

Contraindications:
- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical
- Hemorrhage controllable by standard means

Procedure:
1. Place tourniquet proximal to wound.
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions.
4. Note time of tourniquet application and communicate this to receiving care providers.

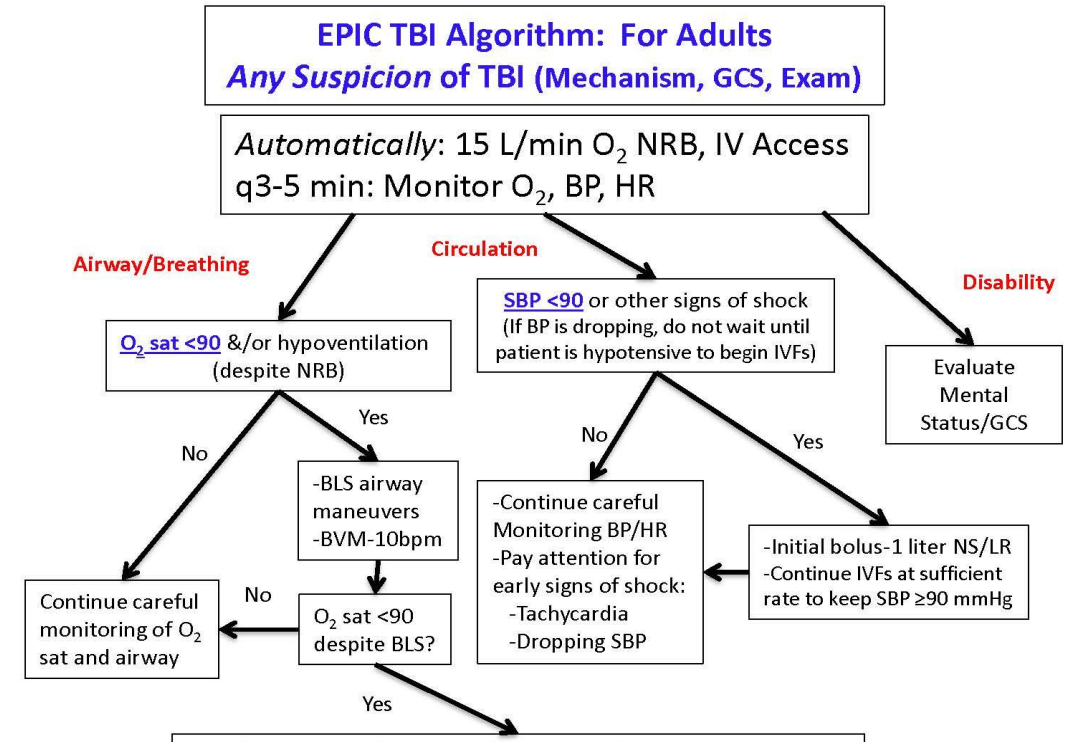
NOTE:
- *Dress wounds per standard wound care protocol*
- *If delayed or prolonged transport and tourniquet application time > 45 minutes: consider re-attempting standard hemorrhage control techniques and removing tourniquet.*

Key Documentation Elements:
- Vital signs and vascular status of extremity after placement of tourniquet, pressure dressing, or splint
- Documentation of elimination of distal pulse after tourniquet placement
- Time of tourniquet placement

Performance Measures:
- Proper placement of tourniquet (location, elimination of distal pulse)
- Proper marking and timing of tourniquet placement and notification of subsequent providers of tourniquet placement
- Appropriate splinting of fractures

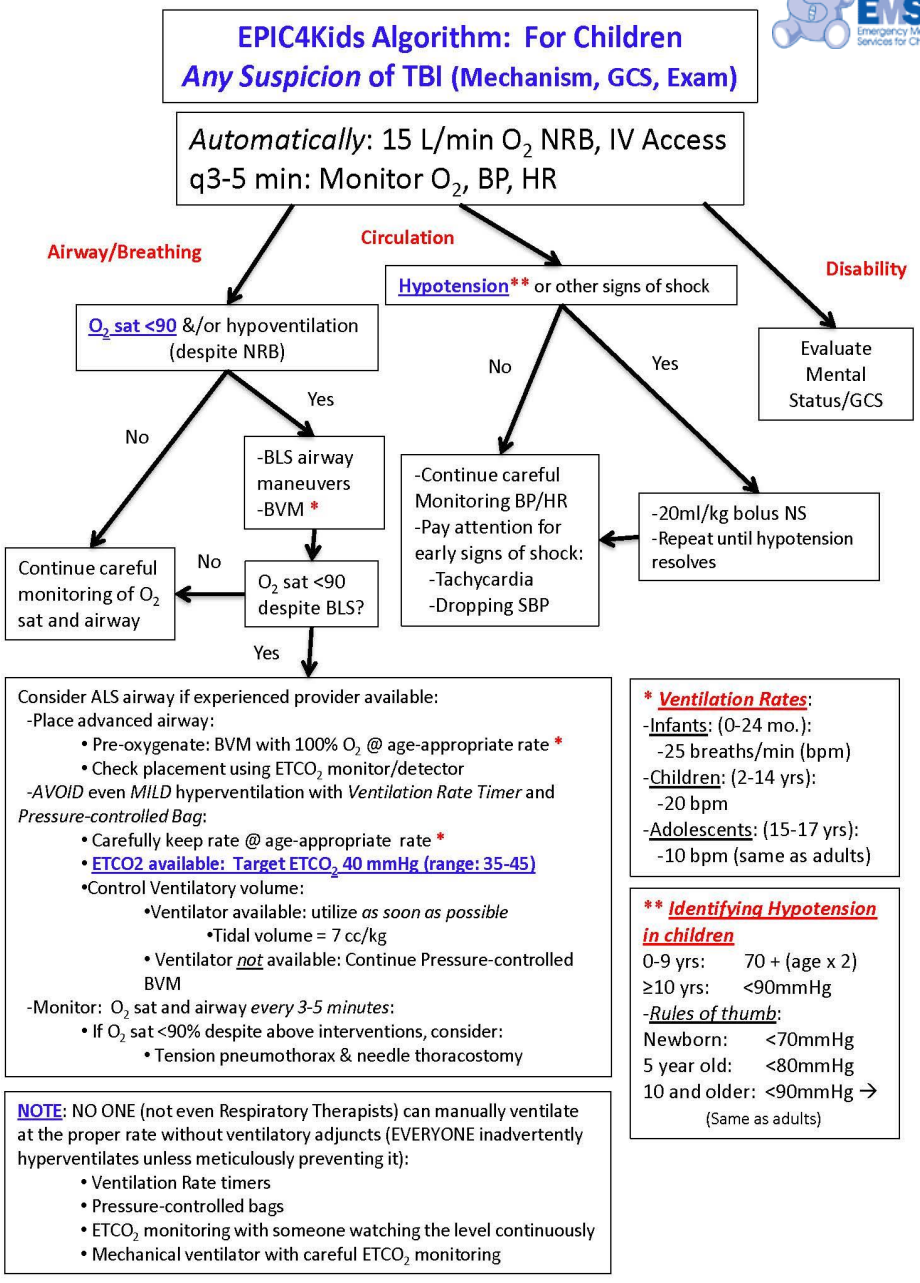
EPIC TBI - Adults

EPIC ALGORITHM FOR ADULTS



EPIC TBI - Pediatrics

EPIC4KIDS ALGORITHM



TRAUMA

Tranexamic Acid (TXA) Medication Protocol

Tranexamic Acid (TXA) Medication Protocol

PROVIDER LEVEL: Paramedic & Above Standing Order

INDICATION:

- Age ≥16 years OR weight > 100lbs (45kg)

AND

- Trauma with suspected hemorrhagic shock (SBP ≤90, measured or reported)

PHARMACOLOGY/ACTIONS:

Tranexamic Acid (TXA) is a potent antifibrinolytic drug. The main action is blocking of the lysine-binding sites of the plasminogen molecule. This prevents activation of plasminogen by plasminogen activator. There is no evidence of a thrombogenic effect.

DOSING:

•ADULTS	•PEDIATRICS(<45kg)
• TXA Bolus (IV/IO): Infuse 2g in 100 cc (NS or LR) over 10 minutes before IV fluids if possible	• Not appropriate for children less than 16 years or under 100 lbs (45 kg)

CONTRAINDICATIONS:

- Time since injury > 3 hours
- Isolated spinal shock (cord injury without evidence of hemorrhage)
- Known clot physiology – MI, PE, DVT

PAIN MANAGEMENT

PAIN MANAGEMENT

Acetaminophen (Tylenol) Medication Protocol

Acetaminophen (Tylenol) Medication Protocol
PROVIDER LEVEL: Paramedic & Above Standing Order
CLASS: Analgesic, antipyretic
INDICATION: • Pain control of mild to moderate pain.
PHARMACOLOGY/ACTIONS: Acetaminophen is a para-aminophenol derivative. Analgesic effects are believed to be due to activation of descending serotonergic inhibitory pathways in the CNS. Interactions with other nociceptive systems may also be involved. Antipyretic effects are produced from inhibition of the hypothalamic heat-regulating center.
ONSET/DURATION: •Onset: 5-10 minutes •Duration: 4-6 hours.
DOSING:

•ADULTS	•PEDIATRICS(<45kg)
•1000 mg IV/IO infusion over 15 minutes	•15 mg/kg (max 1000 mg) IV/IO infusion over 15 minutes

SIDE EFFECTS: Acute hepatotoxicity, nausea, and vomiting.
DRUG INTERACTIONS: Alcohol and Sorafenib.
PREGNANCY SAFETY: Category A – considered safe during pregnancy.
CONTRAINDICATIONS: • Hypersensitivity/allergy, patient who has received acetaminophen in any form within the previous 6 hours • Acetaminophen overdose • Severe hepatic impairment • Severe active liver disease.
COMMENTS: • Use with caution in patients with severe hypovolemia (ie dehydrated or blood loss). • Use with caution in patients with known G6PD deficiency. • Generally avoid in alcoholics. • Limit acetaminophen dose from all sources and all routes of administration to < 4 grams/day for adults.

PAIN MANAGEMENT

Ketorolac (Toradol) Medication Protocol

Ketorolac (Toradol) Medication Protocol

PROVIDER LEVEL: Paramedic & Above Standing Order

CLASS: Nonsteroidal anti-inflammatory (NSAID).

INDICATION:
Pain control of mild to moderate pain (age ≤65 years old).

PHARMACOLOGY/ACTIONS:
Works by reducing hormones that cause inflammation and pain in the body. Possesses no sedative or anxiolytic properties. Also inhibits platelets.

ONSET/DURATION:
- Onset: 30 minutes
- Duration: 4-6 hours.

DOSING:

•ADULTS	•PEDIATRICS(<45kg)
•15 mg IV, IO, IM	•None

ROUTE: IV, IO, IM

SIDE EFFECTS: Acute kidney injury, stomach upset, nausea, vomiting, dizziness, blurred vision, dry mouth, and irritation at the injection site.

DRUG INTERACTIONS: Other NSAIDs, steroids, aspirin, and anticoagulants (ex Coumadin, Xarelto, Eliquis).

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus. Avoid in pregnancy after 20 weeks gestation.

CONTRAINDICATIONS:
- NSAID allergy, ASA-sensitive asthma, active hemorrhage, hypotension,
- History of renal disease or kidney transplant, blood clotting disorder, multisystem trauma, closed head
- Injury or bleeding in brain, history of GI bleed or ulcers, patient potentially needing surgery, open fracture or fracture deformity, and pregnancy.

COMMENTS:
- Use with caution in patients who are dehydrated or taking ACEIs or ARBs. Ensure
- patient has not taken oral NSAID in last 6 hours (ibuprofen, Motrin), 12 hours (naproxen), or 24 hours (meloxicam) given potential for cumulative risk of inducing serious NSAID-related side effects.

PAIN MANAGEMENT

Ketamine (Ketalar) `Medication Protocol

Ketamine (Ketalar) `Medication Protocol
PROVIDER LEVEL: Paramedic & Above Standing Order
CLASS: NMDA antagonist.
INDICATION: Pain of traumatic origin, opioid-tolerant patient with an acute exacerbation of pain, and/or pain that is refractory to opioids.
PHARMACOLOGY/ACTIONS: Ketamine is a rapid-acting, general anesthetic producing an anesthetic state characterized by profound analgesia, amnesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, cardiovascular and respiratory stimulation, and occasionally a transient and minimal respiratory depression. Ketamine bronchodilation relaxes bronchiolar musculature and prevents bronchoconstriction induced by histamine.
ONSET/DURATION: •**Onset:** 30-60 seconds **Duration:** 15 minutes
DOSING:

•**ADULTS**	•**PEDIATRICS(<45kg)**
•0.2 mg/kg (max 20 mg) slow IV push or infusion over 10 minutes. May repeat every 15 minutes as needed	•None

ROUTE: IV, IO.
SIDE EFFECTS: Hallucinations, disorientation, delirium, agitation, dizziness, diplopia, dysphoria, rotary nystagmus, nausea, vomiting, hypertension, tachycardia, laryngospasms, and hypersalivation.
DRUG INTERACTIONS: Azelastine, Bromperidol, Flunarizine, Kratom, Olopatadine, Orphenadrine, Oxomemazine, and Thalidomide.
PREGNANCY SAFETY: Not classified.
CONTRAINDICATIONS: Hypersensitivity, chest pain of suspected cardiac origin, hypertensive crisis, amphetamine abuse, acute pulmonary edema, pregnancy, and history of psychiatric disorder (relative contraindication).
COMMENTS: Sub-dissociative, low-dose ketamine used to treat pain. May be used in hypotensive patients although state protocols require SBP ≤ 100 mmHg. Accidental overdose not associated with long-term morbidity. $EtCO_2$ monitoring required if patient also receives narcotic pain medication.May treat adverse effects of agitation, aggression, and negative psychological reactions with Midazolam. Treat laryngospasm with ventilation with BVM, airway adjuncts, and suctioning as necessary. May treat hypersalivation with Atropine 0.5 mg IV.

REFERENCE

Notes & References

1
- http://b.bsd.dli.mt.gov/license/bsd_boards/med_board/pdf/POLST_Protocol.pdf (Accessed 1/13/18)
- http://bsd.dli.mt.gov/license/bsd_boards/med_board/polst.asp (Accessed 1/1/14)

2
- This End-of-life/Palliative care guideline has been adapted from the *2017 NASEMSO National Model EMS Clinical Guidelines, Version 2.0*.

3
- The ideas and some of the information in this section were developed and graciously shared by the Medic One Foundation of Seattle, King County, Washington.

4
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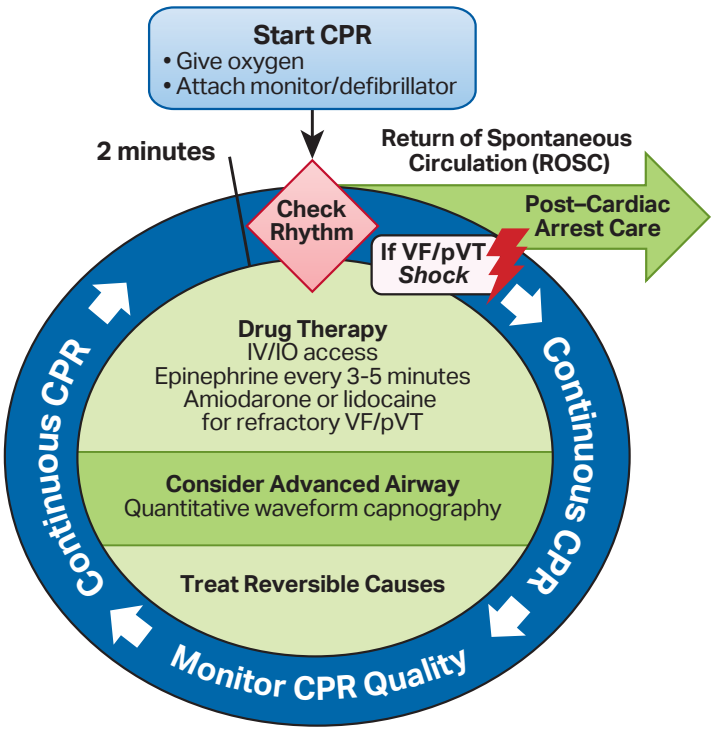
SUPPLEMENT

Adult Cardiac Arrest Algorithm

Adult Cardiac Arrest Circular Algorithm



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P_{ETCO_2} is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
  or
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

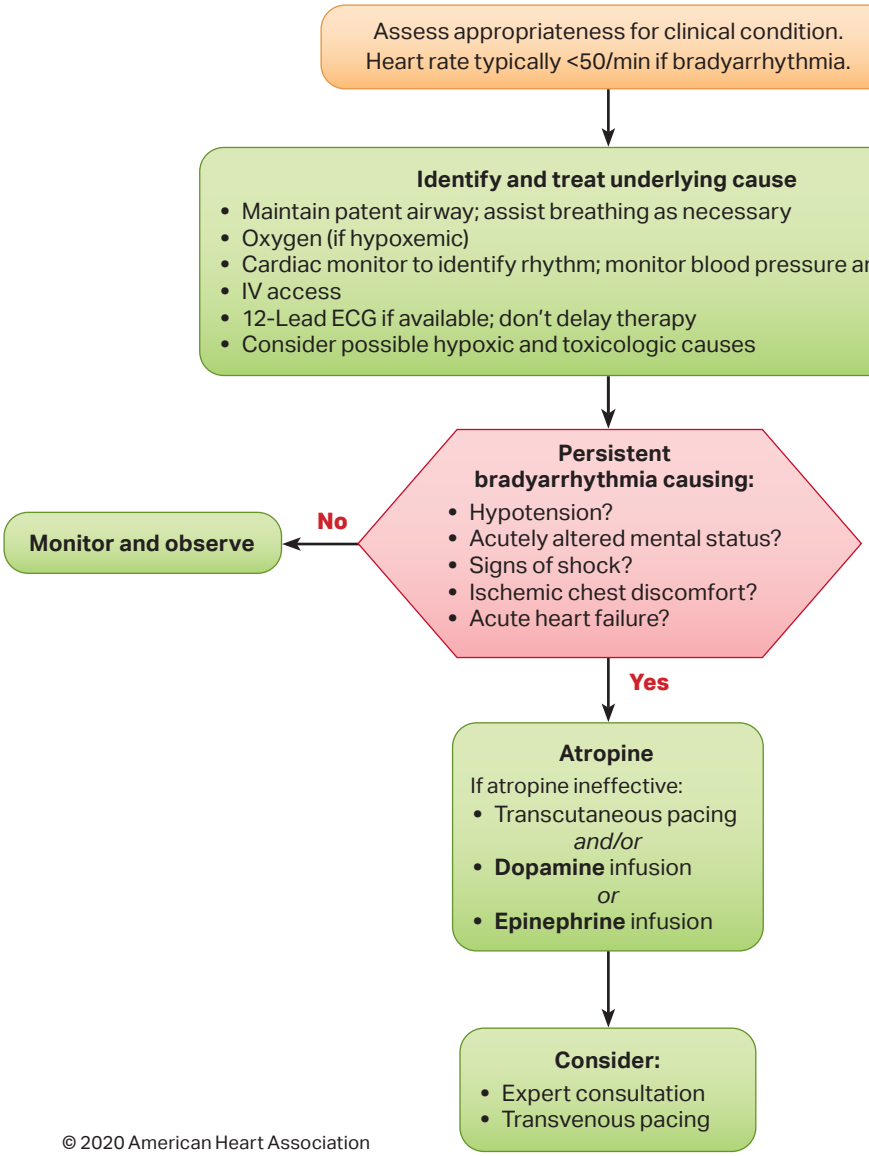
Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

SUPPLEMENT
Adult Bradycardia Algorithm

Adult Bradycardia Algorithm

Adult Bradycardia Algorithm



Doses/Details

Atropine IV dose:
First dose: 1 mg bolus.
Repeat every 3-5 minutes.
Maximum: 3 mg.

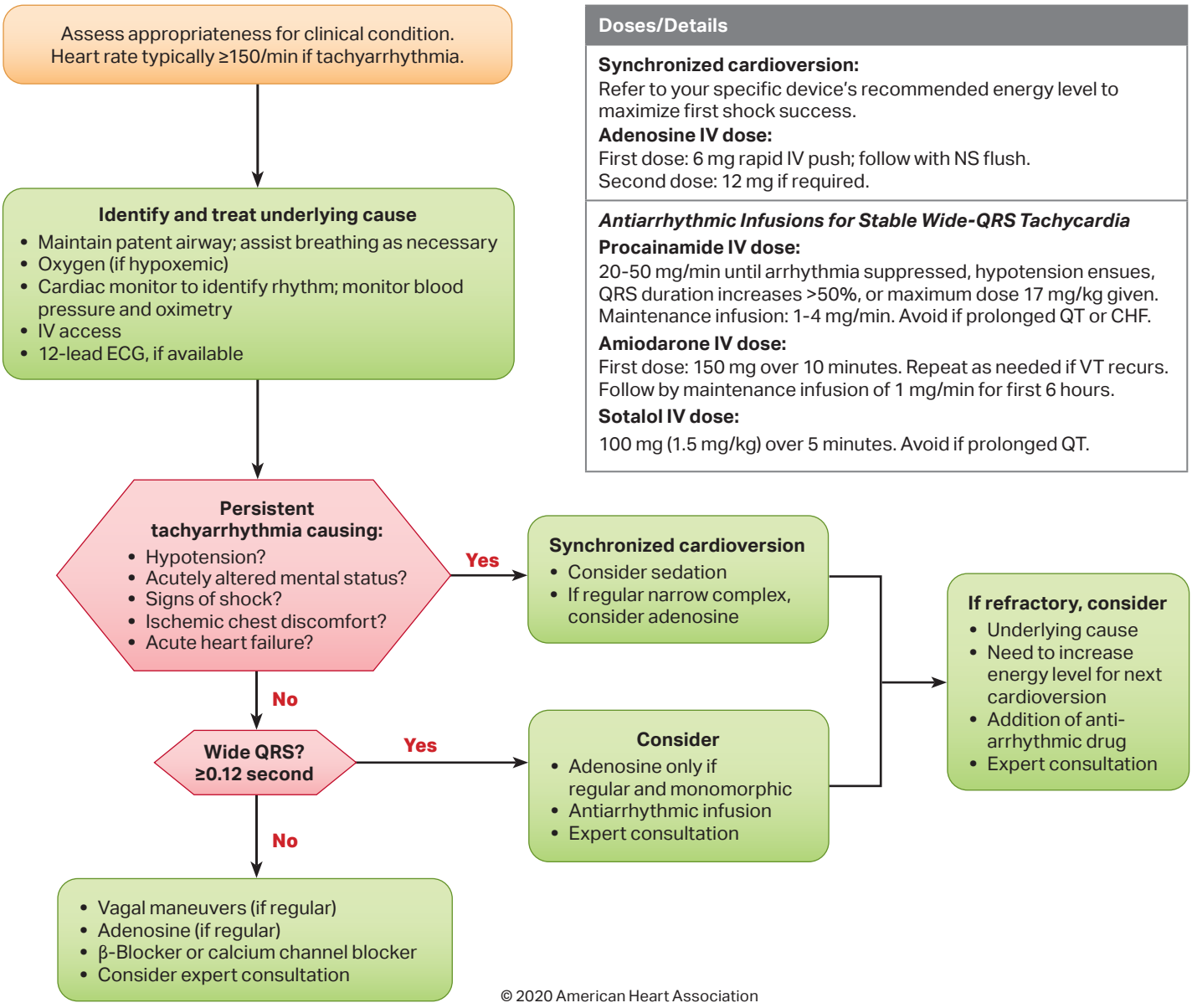
Dopamine IV infusion:
Usual infusion rate is 5-20 mcg/kg per minute.
Titrate to patient response; taper slowly.

Epinephrine IV infusion:
2-10 mcg per minute infusion.
Titrate to patient response.

Causes:
- Myocardial ischemia/infarction
- Drugs/toxicologic (eg, calcium-channel blockers, beta blockers, digoxin)
- Hypoxia
- Electrolyte abnormality (eg, hyperkalemia)

Adult Tachycardia with a Pulse Algorithm

Adult Tachycardia With a Pulse Algorithm

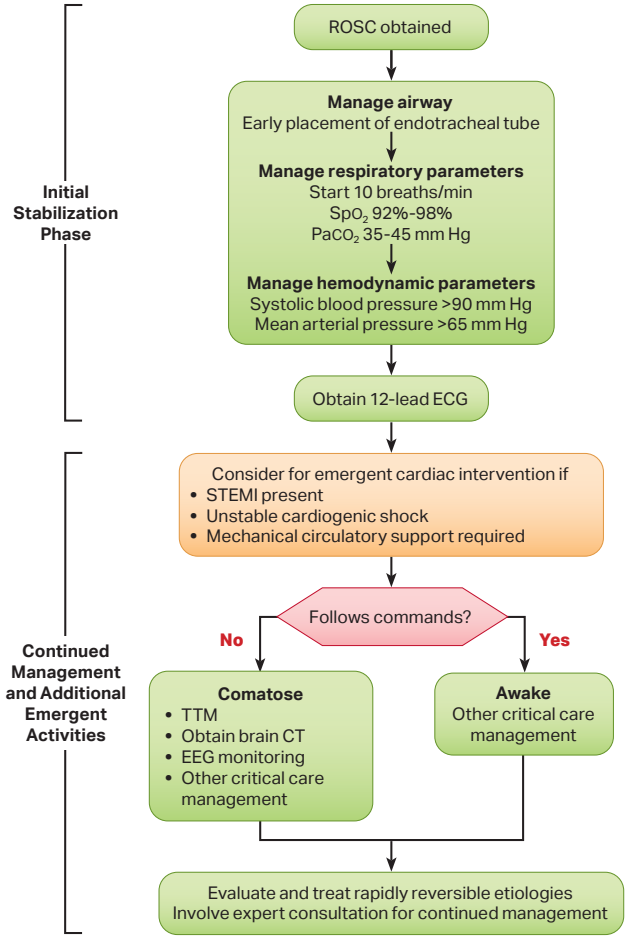


SUPPLEMENT

Post-Cardiac Arrest Care Algorithm

Post-Cardiac Arrest Care Algorithm

ACLS Healthcare Provider
Post–Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

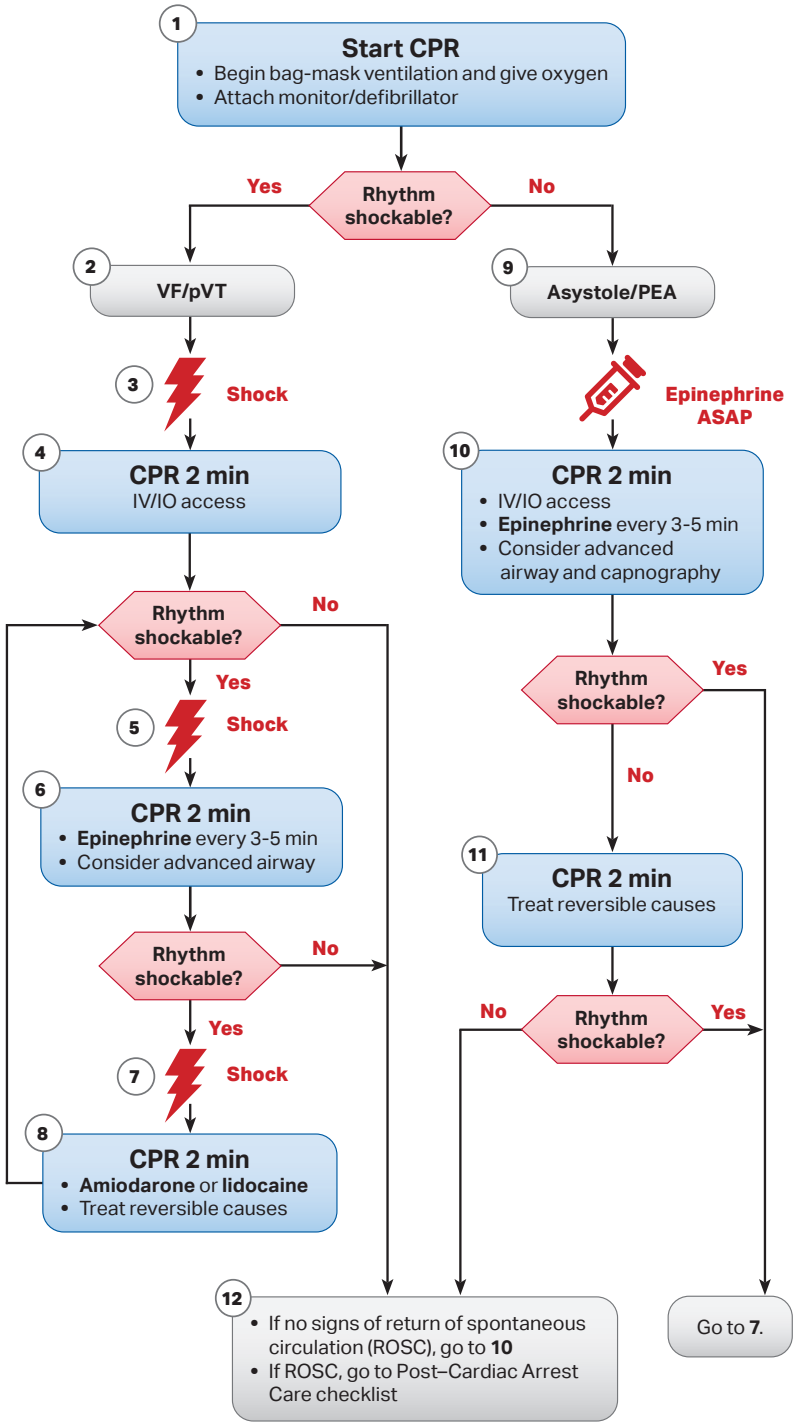
- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/**h**yperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

Pediatric Cardiac Arrest Algorithm

Pediatric Cardiac Arrest Algorithm



CPR Quality

- Push hard (≥⅓ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- **Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT
  or
  Lidocaine IV/IO dose: Initial: 1 mg/kg loading dose

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

Reversible Causes

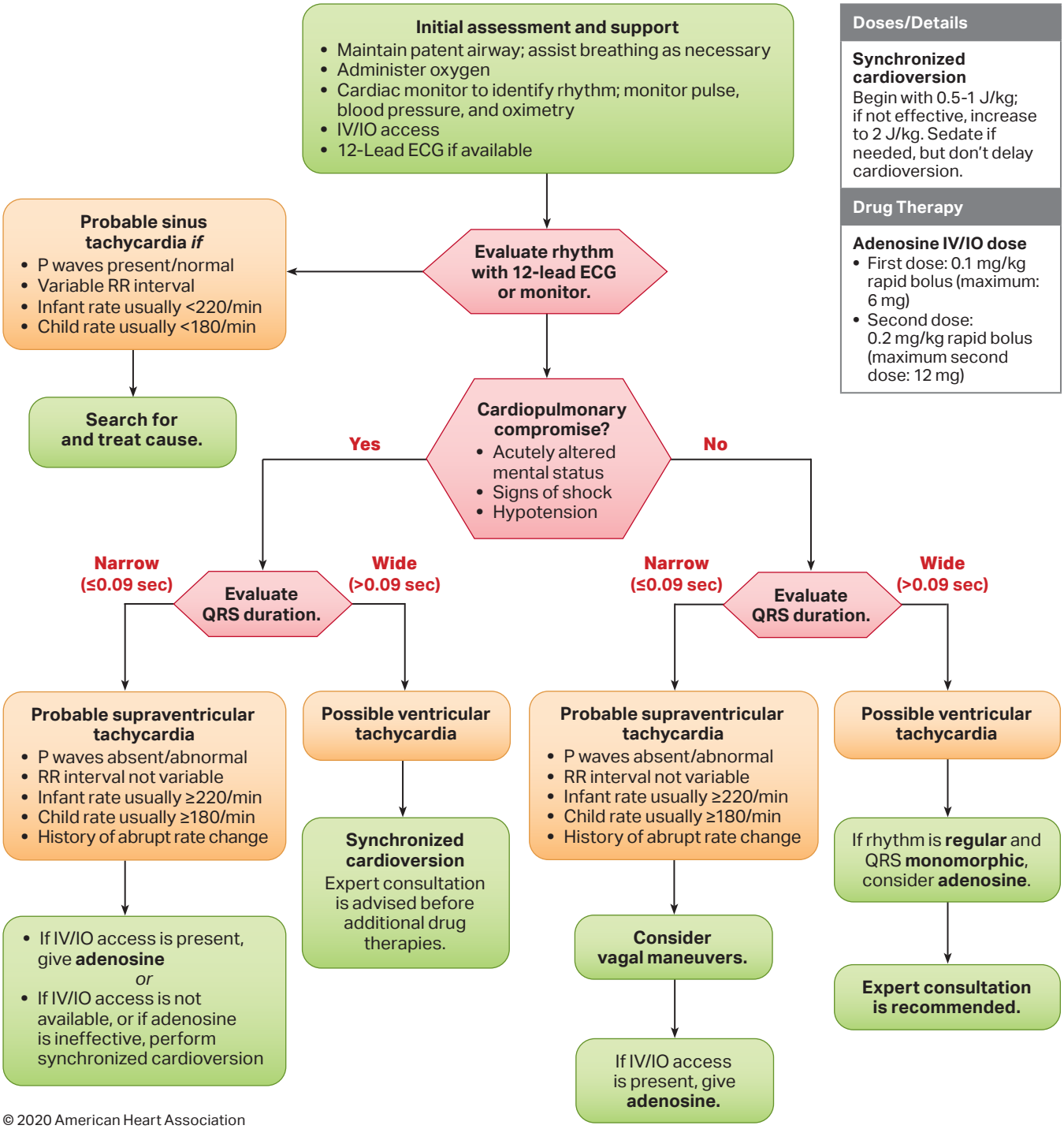
- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

SUPPLEMENT

Pediatric Tachycardia With a Pulse Algorithm

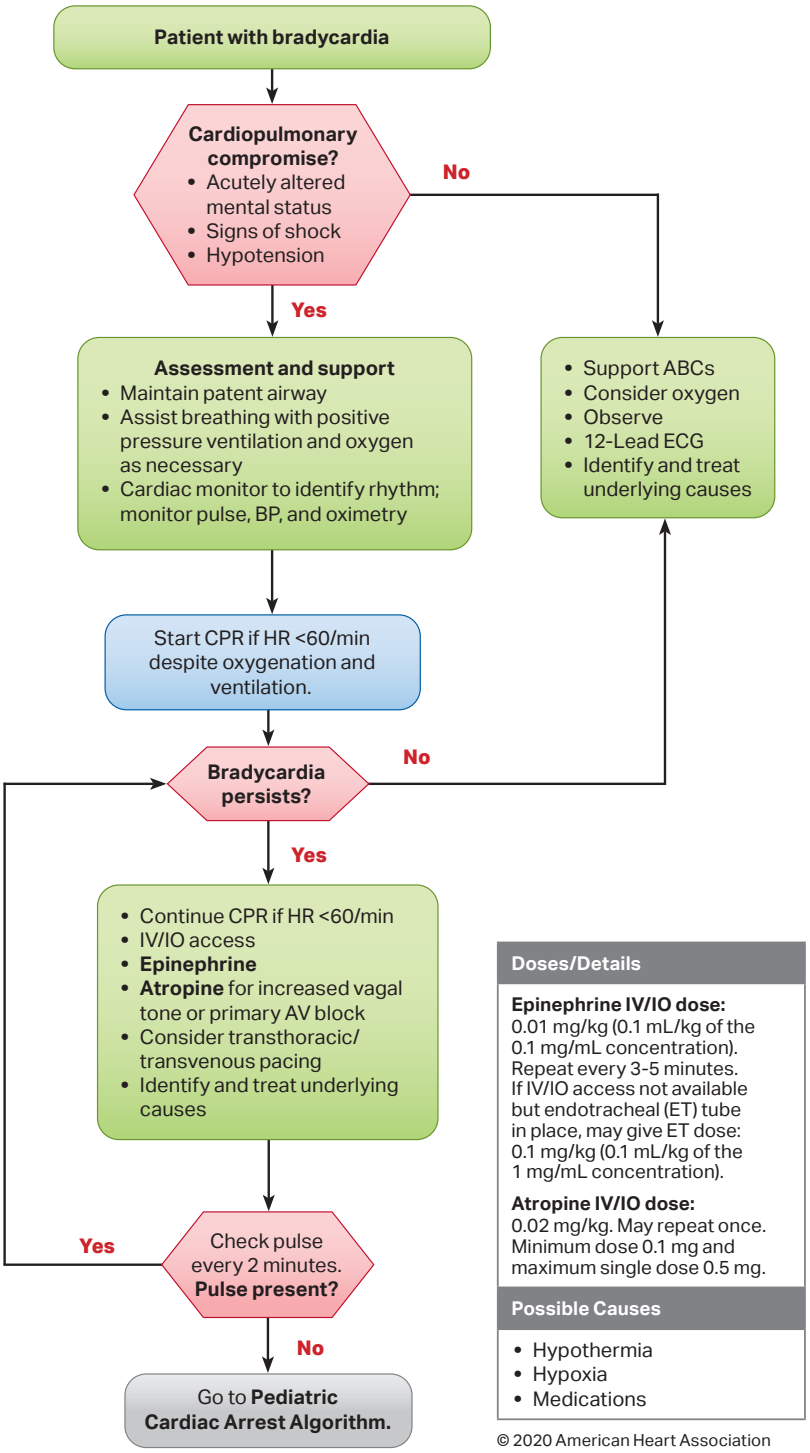
Pediatric Tachycardia With a Pulse Algorithm

Pediatric Tachycardia With a Pulse Algorithm



Pediatric Bradycardia With a Pulse Algorithm

Pediatric Bradycardia With a Pulse Algorithm



Comprehensive Medication Protocols - update 2023

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Tranexamic acid

ACETAMINOPHEN (TYLENOL)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Analgesic, antipyretic.

PHARMACOLOGY/ACTIONS: Acetaminophen is a para-aminophenol derivative. Analgesic effects are believed to be due to activation of descending serotonergic inhibitory pathways in the CNS. Interactions with other nociceptive systems may also be involved. Antipyretic effects are produced from inhibition of the hypothalamic heat-regulating center.

ONSET/DURATION: Onset: 5-10 minutes / Duration: 4-6 hours.

INDICATIONS: Pain control of mild to moderate pain.

CONTRAINDICATIONS: Hypersensitivity/allergy, patient who has received acetaminophen in any form within the previous 6 hours, acetaminophen overdose, severe hepatic impairment, and severe active liver disease.

SIDE EFFECTS: Acute hepatotoxicity, nausea, and vomiting.

DRUG INTERACTIONS: Alcohol and Sorafenib.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
1000 mg IV/IO infusion over 15 minutes	15 mg/kg (max 1000 mg) IV/IO infusion over 15 minutes

PREGNANCY SAFETY: Category A – considered safe during pregnancy.

COMMENTS: Use with caution in patients with severe hypovolemia (ie dehydrated or blood loss). Use with caution in patients with known G6PD deficiency. Generally avoid in alcoholics. Limit acetaminophen dose from all sources and all routes of administration to ≤ 4 grams/day for adults.

ACTIVATED CHARCOAL
(Medication Protocol)

EMT PROVIDER
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Absorbent.

PHARMACOLOGY/ACTIONS: Activated charcoal is a fine black powder that binds and absorbs ingested toxins still present in the GI tract. It has a tremendous surface area. Once it binds and absorbs the ingested toxin, the combined complex is excreted from the body.

ONSET/DURATION: Onset: immediate / Duration: unknown.

INDICATIONS: Acute poisoning in alert patients within 1 hour of ingestion.

CONTRAINDICATIONS: Poisonings by corrosive agents, cyanide, iron, mineral acids, or organic solvents. Patients with altered mental status, active vomiting, absence of bowel sounds, and GI perforation.

SIDE EFFECTS: Vomiting, abdominal cramping, bloating, constipation, and risk of aspiration.

DRUG INTERACTIONS: None significant.

ROUTE: PO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
1 gram/kg PO	1 gram/kg PO

PREGNANCY SAFETY: Undetermined. Generally considered safe during pregnancy as no systemic absorption.

COMMENTS: Consider pre-medication with antiemetic. May be combined with sorbitol, which acts as a laxative decreasing GI transit time. Consider contacting Poison Control at 1-800-222-1222 to determine if recommend administration of activated charcoal.

ADENOSINE (ADENOCARD)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antidysrhythmic, endogenous nucleoside.

PHARMACOLOGY/ACTIONS: Adenosine primarily is formed from the breakdown of adenosine triphosphate (ATP) which is found in every cell of the body and has a wide range of metabolic roles. Adenosine slows SVT by decreasing electrical conduction through the AV node without causing negative inotropic effects. It also acts directly on sinus pacemaker cells and vagal nerve terminals to decrease chronotropic activity.

ONSET/DURATION: Onset: 20-30 seconds / Duration: 30 seconds.

INDICATIONS:
- Regular narrow-complex PSVT.
- Regular wide-complex undifferentiated tachycardia.
  - if ventricular fibrillation, adenosine will likely have no effect.
- Dysrhythmias associated with bypass tracts such as WPW syndrome.

CONTRAINDICATIONS: Second- or third-degree heart block, sick sinus syndrome, known hypersensitivity.

SIDE EFFECTS: Facial flushing, headache, chest pain, SOB, dizziness, and nausea.

DRUG INTERACTIONS: Methylxantines (eg Aminophylline, Theophylline) may decrease the effectiveness, thus requiring larger doses. Dipyridamole (Persantine, Aggrenox) can potentiate the effects, thus dosage may need to be reduced.

ROUTE: Rapid IV push.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Initial dose: 6 mg over 1 second period, followed by 20 ml flush; elevate extremity Additional 12 mg in 1-2 minutes if PSVT continues	Initial dose: 0.1 mg/kg (max 6 mg) over 2 second period, followed by 5-10 ml flush; elevate extremity May be doubled once (max 12 mg)

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Due to extremely short half-life, adenosine must be administered rapid IV push, preferable via large bore IV closest to central circulation as possible (ie AC, EJ).

ALBUTEROL
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
STANDING ORDER – PATIENT PRESCRIBED ALBUTEROL INHALER ONLY
EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Sympathomimetic, bronchodilator, β_2-agonist.

PHARMACOLOGY/ACTIONS: Albuterol is a sympathomimetic that is selective for β_2-adrenergic receptors. It relaxes smooth muscles of the bronchial tree and peripheral vasculature by stimulating adrenergic receptors of the sympathetic nervous system.

ONSET/DURATION: Onset: 5-15 minutes / Duration: 3-4 hours.

INDICATIONS: Relief of bronchospasm in patients with reversible obstructive airway disease (ie acute asthma exacerbation, acute COPD exacerbation, anaphylactic reaction).

CONTRAINDICATIONS: Hypersensitivity, cardiac dysrhythmias associated with tachycardia.

SIDE EFFECTS: Restlessness, apprehension, dizziness, palpitations, tachycardia, dysrhythmias.

DRUG INTERACTIONS: Other sympathomimetics may exacerbate adverse cardiovascular effects. Antidepressants may potentiate effects on the vasculature (vasodilation). β-blockers may antagonize albuterol. May potentiate diuretic-induced hypokalemia.

ROUTE: Inhalation.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
MDI: 1-2 inhalations (90-180 mcg) every 4 hr; use of spacer is preferred Nebulizer: 2.5 mg (0.5 ml of 0.5% solution) diluted to 3 ml with 0.9% NS (0.083% solution); administer over 5-15 min; may repeat once Note: if setting of severe asthma exacerbations, 4 inhalations or continuous nebulized Albuterol may be indicated	MDI: 1-2 inhalations (90-180 mcg) every 4 hr; use of a mask and/or spacer is preferred Nebulizer: 2.5 mg (0.5 ml of 0.5% solution) diluted to 3 ml with 0.9% NS (0.083% solution); administer over 5-15 min; may repeat once Note: if setting of severe asthma exacerbations, 4 inhalations or continuous nebulized Albuterol may be indicated

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Consider use in combination with Ipratropium (Atrovent). May precipitate angina pectoris and dysrhythmias. Use in caution in patients with diabetes mellitus, hyperthyroidism, prostatic

hypertrophy, seizure disorder, or cardiovascular disorders. Spacer use is desirable with meter dose inhalers as it will increase drug delivery.

AMIODARONE (CORDARONE)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Class III antidysrhythmic agent (with multiple other class properties).

PHARMACOLOGY/ACTIONS: Prolongs the action potential duration and effective refractory period, and when given short-term IV, probably induces noncompetitive β-adrenoreceptor and calcium channel blocker activity. The IV formulation relaxes vascular smooth muscle, decreases peripheral vascular resistance, and increases coronary blood floow.

ONSET/DURATION: Onset: within minutes / Duration: varies.

INDICATIONS:
- Ventricular fibrillation (V-fib)/pulseless ventricular tachycardia (V-tach).
- Hemodynamically unstable V-tach with a pulse.
- Other atrial and ventricular dysrhythmias.

CONTRAINDICATIONS: No contraindications if in cardiac arrest or unstable dysrhythmia. Relative: pulmonary congestion, cardiogenic shock, hypotension, bradycardia, advanced AV block, known hypersensitivity, and sick sinus syndrome. Caution in patients with severe liver disease.

SIDE EFFECTS: Hypotension, headache, dizziness, bradycardia, AV conduction abnormalities, flushing, and abnormal salivation.

DRUG INTERACTIONS: Multiple complex drug interactions.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
PULSELESS ARREST	
Initial: 300 mg rapid IV bolus Additional: 150 mg in 3-5 min if needed	Initial: 5 mg/kg rapid IV bolus Additional: 5 mg/kg in 3-5 min if needed
WIDE COMPLEX TACHYCARDIA	
Loading dose of 150 mg in 100 ml over 10 min (15 mg/min) IV/IO.	Loading dose 5 mg/kg IV/IO over 20-60 min (max dose 15 mg/kg/day)

PREGNANCY SAFETY: Category D – positive risk to fetus, maternal benefit may outweigh risk to fetus.

COMMENTS: Continuous ECG monitoring is required. Slow infusion or discontinue if bradycardia or AV blocks occur. Maintain drug at room temperature and protect from excessive heat. Administer 150 mg in 100 ml over 10 minutes if ventricular cardiac arrest with return of spontaneous circulation (ROSC) and did not previously push amiodarone as part of ACLS v-fib/pulseless v-tach algorithm.

ASPIRIN (ASA)
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Platelet aggregator inhibitor and anti-inflammatory agent.

PHARMACOLOGY/ACTIONS: Aspirin blocks the formation of the substance thromboxane A2, which causes platelets to aggregate and arteries to constrict.

ONSET/DURATION: Onset: 15-30 minutes / Duration: 4-6 hours.

INDICATIONS: Chest pain suggestive of acute coronary syndrome (ACS).

CONTRAINDICATIONS: Absolute: known hypersensitivity, known hemorrhagic stroke.
Relative: GI bleeding, bleeding disorders, active ulcer disease, aortic aneurysm, asthma.

SIDE EFFECTS: Heartburn, GI bleeding, nausea, vomiting, wheezing, and prolonged bleeding.

DRUG INTERACTIONS: Other anti-inflammatory agents; ↓ effects with antacids and steroids; ↑ effects with anticoagulants, insulin, oral hypoglycemics, fibrinolytic agents.

ROUTE: PO – chewable.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Chew 324 mg (81 mg x 4)	Adults only

- If patient has taken at least 324 mg in past 12 hours, do not give additional dose
- If patient has taken less than 324 mg – give additional dose to supplement total dose to 324 mg

PREGNANCY SAFETY: Category D – positive risk to fetus, maternal benefit may outweigh risk to fetus.

COMMENTS: Do not substitute acetaminophen or ibuprofen.

ATROPINE
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Anticholinergic (parasympatholytic).

PHARMACOLOGY/ACTIONS: Atropine acts by blocking acetylcholine receptors, thus inhibiting parasympathetic stimulation. Antagonizes excess muscarinic receptor stimulation caused by organophosphate insecticides or chemical nerve agents (eg sarin).

ONSET/DURATION: Onset: immediate / Duration: 2-6 hours

INDICATIONS: Hemodynamically significant bradycardia, organophosphate or nerve gas poisoning (large doses usually required).

CONTRAINDICATIONS: Tachycardia, hypersensitivity.

SIDE EFFECTS: Blurred vision, dilated pupils, dry mouth, tachycardia, drowsiness, and confusion.

DRUG INTERACTIONS: There are few interactions in the prehospital setting.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
SYMPTOMATIC BRADYCARDIA	
1 mg IV/IO. Repeat every 3-5 min for a maximum dose of 0.04 mg/kg or 3 mg	0.02 mg/kg IV/IO (minimum 0.1 mg, maximum 1 mg). Repeat every 5 min to a maximum dose of 0.04 mg/kg
ANTICHOLINESTERASE POISONING	
2 mg IV/IO push every 5-15 min until atropine effects are observed	0.02 mg/kg IV/IO (minimum 0.1 mg, maximum 2 mg). Repeat every 5-15 min until atropine effects are observed

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: May worsen bradycardia associated with second-degree Mobitz II and third-degree AV blocks. A maximum dose of 0.04 mg/kg or 3 mg should not be exceeded except in the case of organophosphate poisoning.

CALCIUM GLUCONATE
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Electrolyte.

PHARMACOLOGY/ACTIONS: Calcium gluconate provides elemental calcium in the form of the cation Ca^{2+} which is necessary for many physiologic activities. Calcium causes a significant increase in myocardial contractility. Calcium also increases cardiac muscle tone and force of systolic contractions (positive inotropic effect) making it especially useful for patients with sympathetic blockade.

ONSET/DURATION: Onset: immediate / Duration: unknown.

INDICATIONS:
- Hyperkalemia associated with known dialysis patient.
- Calcium channel blocker overdose with hypotension and bradycardia.
- Toxicity from magnesium sulfate overdose.
- Tetany associated with black widow spider bite.
- Hydrofluoric acid burns.

CONTRAINDICATIONS: Digitalis toxicity, ventricular fibrillation, and hypercalcemia.

SIDE EFFECTS: Hypotension, bradycardia, arrhythmias, syncope, cardiac arrest, and tissue irritation.

DRUG INTERACTIONS: Will interact with sodium bicarbonate forming a precipitate.

ROUTE: IV, topical.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Systemic toxicity / cardiac arrest	
20 ml of 10% solution slow IV push over 2-5 minutes	2 ml of 10% solution slow IV push over 2-5 minutes

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Calcium is no longer recommended for routine administration during cardiac arrest. Calcium should be administered slowly through a patent IV in a large vein to avoid possibility of extravasation and resultant tissue necrosis.

DEXTROSE
(Medication Protocol)

AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Carbohydrate.

PHARMACOLOGY/ACTIONS: The term dextrose is used to describe the six-carbon sugar d-glucose, the principal form of carbohydrate used by the body. 50% dextrose solution is used in emergency care to treat hypoglycemia and in the management of coma of unknown origin.

ONSET/DURATION: Onset: 1 minute / Duration: dependent.

INDICATIONS:
- Altered mental status of unknown origin.
- Hypoglycemia.
- Seizures.
- Head trauma with decreased mental status if unable to check blood glucose.
- Hypothermia if unable to take oral nutrition safely (prolonged field setting).

CONTRAINDICATIONS: None if documented or suspected hypoglycemia. Intracranial hemorrhage, ICP, and known or suspected CVA in the absence of hypoglycemia.

SIDE EFFECTS: Warmth, pain, burning from medication infusion, hyperglycemia, and thrombophlebitis.

DRUG INTERACTIONS: None significant.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
D10: 100-200 ml IV/IO infusion; may be repeated as needed to maintain normal blood glucose D50: 12.5-25 gm slow IV/IO; may be repeated as needed to maintain normal blood glucose	D50: 0.5-1 gm/kg IV/IO; may be repeated as needed to maintain normal blood glucose > 1 month: 2-4 ml/kg 25% (D25) Neonate: 5-10 ml/kg 10% (D10)

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: An infusion of dextrose 10% (D10) is preferred over dextrose 50% (D50). D10 is more physiologic (D50 is hypertonic). D10 results in lower post-treatment blood glucose levels. Extravasation may cause tissue necrosis, use large vein and aspirate occasionally to ensure route patency. Draw blood sample and check BGL prior to administration if possible.

DIAZEPAM (VALIUM)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Benzodiazepine.

PHARMACOLOGY/ACTIONS: Acts on the limbic, thalamic, and hypothalamic regions of the CNS to potentiate the effects of inhibitory (GABA) neurotransmitters, raising the seizure threshold in the motor cortex.

ONSET/DURATION: Onset: 1-5 minutes IV / Duration: 15 minutes – 1 hour.

INDICATIONS:
- Seizure activity.
- Acute anxiety states.
- Premedication before cardioversion or TCP.
- Acute alcohol withdrawal.
- Skeletal muscle relaxation.

CONTRAINDICATIONS: Hypersensitivity, shock, coma, CNS depression due to head injury, and respiratory depression. Use with caution in substance abuse patients.

SIDE EFFECTS: Hypotension, respiratory depression, ataxia, psychomotor impairments, confusion, and nausea.

DRUG INTERACTIONS: May precipitate CNS depression and psychomotor impairment in patients who are taking other CNS depressant medications. Diazepam should not be administered with other drugs because of possible precipitation.

ROUTE: IV, IO, Rectal.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Seizures: 2-10 mg slow IV/IO **Sedation/anxiety/pain:** 2.5-5 mg slow IV, may repeat once for sedation	**Seizures:** 0.3 mg/kg IV/IO/PR (max 10 mg)

PREGNANCY SAFETY: Category D – positive risk to fetus, maternal benefit may outweigh risk to fetus.

COMMENTS: DEA schedule IV drug with potential for abuse. May cause local venous irritation. Has short duration of anticonvulsant effect. Reduce dose by 50% in elderly patients or with known liver disease. Resuscitation equipment should be readily available.

DILTIAZEM (CARDIZEM)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Class IV antidysrhythmic agent.

PHARMACOLOGY/ACTIONS: Non-dihydropyridine calcium channel blocker (CBB). Inhibits calcium ion influx through slow channels into cells of myocardium and arterial smooth muscle resulting in intracellular calcium remaining at subthreshold levels insufficient to stimulate cell excitation and contraction. Dilates coronary arteries and arterioles and inhibits coronary artery spasms, thus increases myocardial oxygen delivery (antianginal effect). Slows SA and AV node conduction (antidysrhythmic effect). Vasodilation of peripheral arterioles resulting in decreased peripheral vascular resistance and reduced arterial blood pressure (antihypertensive effect).

ONSET/DURATION: Onset: immediate / Duration: 1-3 hours (bolus), 1-10 hours (infusion).

INDICATIONS: Supraventricular tachydysrhythmias.

CONTRAINDICATIONS: Known hypersensitivity, sick sinus syndrome, advanced AV block, hypotension, and Wolf-Parkinson-White syndrome.

SIDE EFFECTS: Headache, dizziness, edema, second- or third-degree AV block, bradycardia, and hypotension.

DRUG INTERACTIONS: Digoxin, cimetidine, rifampin, and cyclosporine.

ROUTE: IV.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
0.25 mg/kg IV (max 20 mg), may repeat 0.35 mg/kg IV (max 25 mg) in 15 minutes	Adults only

Maintenance: start infusion at 5 mg/hr, increase by 5 mg/hr every 15 minutes as needed, maximum 15 mg/hr. Goal HR < 110 bpm.

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Continuous ECG monitoring and carefully monitor blood pressure – slow or stop infusion if develop bradycardia and/or hypotension. Avoid in patients with decompensated heart failure or decreased LV systolic function. Calcium gluconate or chloride can be used to reverse effects of diltiazem overdose.

DIPHENHYDRAMINE (BENADRYL)
(Medication Protocol)

EMT WITH MEDICATION ENDORSEMENT
STANDING ORDER – PO ONLY
AEMT PROVIDER
STANDING ORDER – PO AND IM ONLY
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antihistamine.

PHARMACOLOGY/ACTIONS: Antihistamines prevent the physiological actions of histamines by blocking H1 and H2 receptor sites. It may inhibit MAST cell damage, preventing more histamine release. It also has anticholinergic and antiemetic effects.

ONSET/DURATION: Onset: maximum effects 1-3 hours / Duration: 6-12 hours.

INDICATIONS:
- Moderate to severe allergic reactions.
- Anaphylaxis.
- Acute extrapyramidal (dystonic) reactions.
- Nausea/vomiting (related to motion sickness and other causes).

CONTRAINDICATIONS: Hypersensitivity, patients taking MAO inhibitors, narrow-angle glaucoma (relative), newborns and nursing mothers.

SIDE EFFECTS: Drowsiness, disturbed coordination, hypotension, palpitations, tachycardia, bradycardia, thickening of bronchial secretions, dry mouth and throat, paradoxical excitement in children.

DRUG INTERACTIONS: CNS depressants may increase depressant effects, MAO inhibitors may prolong and intensify anticholinergic effects.

ROUTE: PO, IV, IO, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
25-50 mg IM, slow IV/IO 25-50 mg PO	>10 kg: 0.5-1 mg/kg (max 50 mg) PO, IV, IO, IM

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Use with caution in patients with CNS depression or lower respiratory disease such as asthma. Intramuscular epinephrine is the first line agent for treatment of allergic reactions/anaphylaxis, whereas diphenhydramine is a second line agent.

DOPAMINE (INTROPIN)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Sympathomimetic.

PHARMACOLOGY/ACTIONS: Dopamine is chemically related to epinephrine and norepinephrine. It acts primarily on α1- and β1-adrenergic receptors in a dose-dependent fashion. At low doses ("renal doses"), dopamine may act on dopaminergic receptors, causing renal, mesenteric, and cerebral vascular dilation. At moderate doses ("cardiac doses"), dopamine stimulates beta-adrenergic receptors, causing enhanced myocardial contractility, increased cardiac output, and a rise in blood pressure. At high doses ("vasopressor doses"), dopamine has an alpha-adrenergic effect producing peripheral arterial and venous constriction. Dopamine is commonly used in the treatment of hypotension associated with cardiogenic and vasogenic shock.

ONSET/DURATION: Onset: 2-4 minutes / Duration: 10-15 minutes.

INDICATIONS:
- Hemodynamically significant hypotension in the absence of hypovolemia.
- Symptomatic bradycardia.

CONTRAINDICATIONS: Tachydysrhythmias, ventricular fibrillation, patients with pheochromocytoma.

SIDE EFFECTS: Dose-related tachydysrhythmias, hypertension, increased myocardial oxygen demand (eg ischemia).

DRUG INTERACTIONS: Dopamine may be deactivated by alkaline solutions (sodium bicarbonate). MAO inhibitors may potentiate the effect of dopamine. Sympathomimetics and phosphodiesterase inhibitors exacerbate dysrhythmia response. Beta-adrenergic antagonists may blunt inotropic response. When administered with phenytoin, hypotension, bradycardia, and seizures may develop.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
5-25 mcg/kg/min titrated to effect	5-25 mcg/kg/min titrated to effect

*** Recommended pre-hospital dosing: start at 10 mcg/kg/min

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Refer to dopamine drip flow sheet for amounts and flow rates. First highlighted column is 10 mcg/kg/min dosing, second highlighted column is 20 mcg/kg/min dosing.

DOPAMINE DRIP FLOW SHEET

Maintenance infusion – mcg/kg/min for concentrations 1600 mcg/ml

Pt. weight		Infusion Rates mL/hr						
Lbs	Kg	10 mcg/kg/min						20 mcg/kg/min
		13						26
88	40	15	16	18	19	21	22	30
		17						34
110	50	19	21	22	24	26	28	38
		21						41
132	60	22	25	27	29	31	34	45
		24						49
154	70	26	29	31	34	37	39	52
		28						56
176	80	30	33	36	39	42	45	60
187		32						64
198	90	34	37	40	44	47	51	68
		36						71
220	100	38	41	45	49	53	56	75
		40						79
242	110	41	46	50	54	58	62	83
		43						86
264	120	45	50	54	59	63	68	90
		47						94
286	130	49	54	58	63	68	73	98
		51						101

EPINEPHRINE 1:1,000
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
STANDING ORDER – FOR ANAPHYLAXIS ONLY AND PATIENT PRESCRIBED EPIPEN
EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
STANDING ORDER – FOR ANAPHYLAXIS ONLY
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Sympathetic agonist (sympathomimetic).

PHARMACOLOGY/ACTIONS: Epinephrine acts directly on α- and β-adrenergic receptors. Its effect on β-receptors is much more profound than its effect on α-receptors. Effects include: ↑ HR, ↑ cardiac contractile force, ↑electrical activity in the myocardium, ↑ systemic vascular resistances, ↑ BP, and ↑ automaticity.

ONSET/DURATION: Onset: < 2 minutes / Duration: 5-10 minutes.

INDICATIONS:
- Anaphylaxis/Allergic reaction.
- Severe asthma.

CONTRAINDICATIONS: Hypovolemic shock, severe hypertension. Relative: coronary artery disease, pregnancy, severe tachydysrhythmias, PVC's, hyperthyroidism, and cerebrovaslcular insufficiency.

SIDE EFFECTS: Tachycardia including V-tach and V-fib, palpitations, anxiety, tremor, headache, nausea, weakness, restlessness, and hypertension.

DRUG INTERACTIONS: MAO inhibitors may potentiate effects. β-adrenergic antagonists may blunt inotropic response. Sympathomimetics and phosphodiesterase inhibitors may exacerbate dysrhythmia response.

ROUTE: IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Auto-injector: 0.3 mg IM **Asthma/allergic reaction**: 0.3-0.5 mg (0.3-0.5 ml) IM; may repeat every 5-15 minutes PRN	**Auto-injector**: 0.15 mg IM **Asthma/allergic reaction**: 0.01 mg/kg (0.01 ml/kg) IM (max 0.5 mg); may repeat every 5-15 minutes PRN

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Epinephrine 1:1000 should only be given intramuscular (IM), NEVER intravenous (IV). Be extremely cautions with dosage calculations and administration. Use with caution in patients with peripheral vascular insufficiency. Epinephrine is pH dependent and can be deactivated by alkaline solutions such as sodium bicarbonate. Effects can be intensified in patients who are taking antidepressants. Intramuscular epinephrine is the first line agent for treatment of allergic

reactions/anaphylaxis. Use with caution in patients over 50 years old due to cardiovascular stress, however to not withhold for severe allergic reaction/anaphylaxis.

EPINEPHRINE 1:10,000
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Sympathetic agonist (sympathomimetic).

PHARMACOLOGY/ACTIONS: Epinephrine acts directly on α- and β-adrenergic receptors. Its effect on β-receptors is much more profound than its effect on α-receptors. Effects include: ↑ HR, ↑ cardiac contractile force, ↑electrical activity in the myocardium, ↑ systemic vascular resistances, ↑ BP, and ↑ automaticity.

ONSET/DURATION: Onset: < 2 minutes / Duration: 5-10 minutes.

INDICATIONS:
- Cardiac arrest (asystole, v-fib, pulseless v-tach, PEA).
- Anaphylaxis.
- Unstable bradycardia.

CONTRAINDICATIONS: None in cardiac arrest.

SIDE EFFECTS: Tachycardia including V-tach and V-fib, palpitations, anxiety, tremor, headache, nausea, weakness, restlessness, and hypertension.

DRUG INTERACTIONS: MAO inhibitors may potentiate effects. β-adrenergic antagonists may blunt inotropic response. Sympathomimetics and phosphodiesterase inhibitors may exacerbate dysrhythmia response.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Cardiac arrest: 1 mg (10 ml) rapid IV/IO push every 3-5 minutes PRN **Anaphylaxis/unstable bradycardia**: 0.1-0.2 mg (1-2 ml) slow IV/IO push; may repeat every 3-5 minutes PRN **Drip**: 1-10 mcg/min IV (mix 1 mg in 250 ml of D5W; 30 microdrips/minute = 2 mcg/min) titrate to effect	**Cardiac arrest**: 0.01 mg/kg (0.1 ml/kg) rapid IV/IO push every 5 minutes PRN **Anaphylaxis/unstable bradycardia**: 0.01 mg/kg (0.1 ml/kg – maximum 2 ml) slow IV/IO push; may repeat every 3-5 minutes PRN

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Epinephrine is pH dependent and can be deactivated by alkaline solutions such as sodium bicarbonate. Effects can be intensified in patients who are taking antidepressants. Epinephrine use in cardiac arrest has been shown to increase ROSC, but has not been shown to increase neurologically intact survival. Some studies have shown a correlation between increased epinephrine use and worse neurological outcome. While there is not clear definitive data to support an optimal dose of epinephrine,

there is data supporting possible harm from high end dosing. Epinephrine should be limited to no more than 3 mg in cardiac arrest.

FENTANYL (SUBLIMAZE)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Synthetic opioid agonist.

PHARMACOLOGY/ACTIONS: Analgesic with short duration of action. Minimal histamine release, so less hemodynamic compromise.

ONSET/DURATION: Onset: 5-8 minutes / Duration: 1-2 hours.

INDICATIONS:
- Pain control.
- Cardiac suspected chest pain **after** administration of oxygen, aspirin, and nitroglycerin according to protocol.
- Sedation for invasive procedures (TCP/cardioversion).

CONTRAINDICATIONS: Respiratory depression or insufficiency, uncorrected hypotension, and hypersensitivity.

SIDE EFFECTS: Respiratory depression, bradycardia, hypotension, hypertension, nausea and vomiting.

DRUG INTERACTIONS: Effects may be increased when given with other CNS depressants or skeletal muscle relaxants.

ROUTE: IV, IO, IM, IN.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
25-50 mcg slow IV/IO push/IM/IN every 5 minutes as needed to control pain Paramedic – maximum 150 mcg prior to medical control contact	0.5 mcg/kg (max 50 mcg) slow IV/IO/IM/IN; may repeat once after 5 minutes if needed to control pain

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: DEA schedule II drug with potential for abuse. Fentanyl should be used with caution in elderly patients and in those with severe respiratory disorders, seizure disorders, cardiac disorders, or pregnancy. Rapid administration or large doses may cause skeletal muscle (chest wall) rigidity so severe that ventilation is difficult or impossible.

GLUCAGON
(Medication Protocol)

EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
STANDING ORDER – HYPOGLYCEMIC REACTION ONLY
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Pancreatic hormone, insulin antagonist.

PHARMACOLOGY/ACTIONS: Glucagon is a protein secreted by the alpha cells of the pancreas. It increases blood glucose by converting glycogen in the liver into glucose. Glucagon also has positive inotropic action on the heart and decreases renal vascular resistance which makes it useful in beta-blocker and calcium channel blocker overdose.

ONSET/DURATION: Onset: 1 minute / Duration: 60-90 minutes.

INDICATIONS:
- Persistent hypoglycemia despite glucose supplementation.
- Hypoglycemic patient where unable to establish IV access.
- Beta-blocker or calcium channel blocker toxicity.

CONTRAINDICATIONS: Hypersensitivity (allergy to proteins). Relative is patient with no glycogen storage (malnutrition, alcoholism).

SIDE EFFECTS: Tachycardia, hypotension, urticaria, nausea, and vomiting.

DRUG INTERACTIONS: Effects of anticoagulants may be increased if given with glucagon. Do not mix with saline.

HOW SUPPLIED: Glucagon must be reconstituted with provided diluent before administration. Dilute 1 unit (1 mg) white powder in 1 ml of diluting solution (1 mg/ml).

ROUTE: IV, IO, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Hypoglycemia: 1 mg IM **β-blocker or CCB toxicity**: 2 mg IV initially, may require higher doses	**Hypoglycemia**: 0.5-1 mg IM **β-blocker and CCB toxicity**: safety and efficacy have not been established

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters.

COMMENTS: Glucagon should not be considered a first-line choice for hypoglycemia. IV glucose will need to be administered if the patient does not respond to a second dose of glucagon. Do not give more than 2 doses of Glucagon as maximal glycogen release from the liver has occurred.

HALOPERIDOL (HALDOL)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antipsychotic/neuroleptic.

PHARMACOLOGY/ACTIONS: The drug is thought to block dopamine (type 2) receptors in the brain, altering mood and behavior.

ONSET/DURATION: Onset: 10-60 minutes / Duration: 12-24 hours.

INDICATIONS:
- Acute psychotic episodes.
- Emergency sedation of severely agitated, aggressive, or delirious patients who present a danger to themselves or others.

CONTRAINDICATIONS: Hypersensitivity, CNS depression, combativeness from trauma, pregnancy, severe liver or cardiac disease.

SIDE EFFECTS: Dose-related extrapyramidal reactions: pseudoparkinsonism, akathesia, dystonias, orthostatic hypotension, allergic reactions, nausea and vomiting, blurred vision.

DRUG INTERACTIONS: Other CNS depressants may potentiate effects. May inhibit vasoconstrictor effects of epinephrine.

ROUTE: IM, IV.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
2-5 mg IM, or slow IV, may repeat once	Safety not established

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Do not use in patients with suspected head injury. Administer diphenhydramine for patients with dystonic reaction. Fluid challenge is indicated with significant drop in blood pressure. Cardiac monitoring for prolongation of QT interval required with IV administration.

IPRATROPIUM BROMIDE (ATROVENT)
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
STANDING ORDER – PATIENT PRESCRIBED IPRATROPIUM INHALER ONLY
EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: β2-agonist.

PHARMACOLOGY/ACTIONS: Ipratropium is an anticholinergic bronchodilator which is chemically related to atropine. Ipratropium is a parasympatholytic used in the treatment of respiratory emergencies. It causes bronchodilation and dries respiratory tract secretions. Ipratropium acts by blocking acetylcholine receptors, thus inhibiting parasympathetic stimulation.

ONSET/DURATION: Onset: 5-15 minutes / Duration: 4-6 hours.

INDICATIONS: Treatment of bronchial asthma, reversible bronchospasm associated with chronic bronchitis or emphysema.

CONTRAINDICATIONS: Known hypersensitivity to atropine or its derivatives. Not indicated as a single agent for acute treatment of bronchospasm where rapid response is required.

SIDE EFFECTS: Tachycardia, paradoxical bronchospasm may occur.

DRUG INTERACTIONS: None reported.

ROUTE: Inhalation.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
500 mcg (one unit dose vial) administered by nebulizer	500 mcg (one unit dose vial) administered by nebulizer

*** Generally used in conjunction with first Albuterol dose, subsequent nebulizers should be with Albuterol only.

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters.

COMMENTS: Vital signs must be monitored during therapy with ipratropium. Caution should be used when administering to elderly patients and those with cardiovascular disease and hypertension. Use caution in patients with significant tachycardia (120+), prostatic hypertrophy, narrow angle glaucoma or bladder neck obstruction.

KETAMINE (KETALAR)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: NMDA antagonist.

PHARMACOLOGY/ACTIONS: Ketamine is a rapid-acting, general anesthetic producing an anesthetic state characterized by profound analgesia, amnesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, cardiovascular and respiratory stimulation, and occasionally a transient and minimal respiratory depression. Ketamine bronchodilation relaxes bronchiolar musculature and prevents bronchoconstriction induced by histamine.

ONSET/DURATION: Onset: 30-60 seconds / Duration: 15 minutes.

INDICATIONS:
- Pain of traumatic origin.
- Opioid-tolerant patient with an acute exacerbation of pain.
- Pain that is refractory to opioids.
- Excited delirium (extreme agitation and/or combativeness).

CONTRAINDICATIONS: Hypersensitivity, chest pain of suspected cardiac origin, hypertensive crisis, amphetamine abuse, acute pulmonary edema, pregnancy, and history of psychiatric disorder (relative contraindication).

SIDE EFFECTS: Hallucinations, disorientation, delirium, agitation, dizziness, diplopia, dysphoria, rotary nystagmus, nausea, vomiting, hypertension, tachycardia, laryngospasms, and hypersalivation.

DRUG INTERACTIONS: Azelastine, Bromperidol, Flunarizine, Kratom, Olopatadine, Orphenadrine, Oxomemazine, and Thalidomide.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
PAIN CONTROL	
0.2 mg/kg (max 20 mg) slow IV push over 60 seconds or infusion over 10 minutes, may repeat every 15 minutes as needed	
EXCITED DELIRIUM	
4 mg/kg IM (max 400 mg) or 1-2 mg/kg IV (max 100 mg)	

PREGNANCY SAFETY: Not classified.

COMMENTS: Sub-dissociative, low-dose ketamine used to treat pain. May be used in hypotensive patients although state protocols require SBP > 100 mmHg. Accidental overdose not associated with long-term morbidity. EtCO2 monitoring required if patient also receives narcotic pain medication. May treat adverse effects of agitation, aggression, and negative psychological reactions with Midazolam. Treat laryngospasm with ventilation with BVM, airway adjuncts, and suctioning as necessary. May treat hypersalivation with Atropine 0.5 mg IV.

KETOROLAC (TORADOL)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Nonsteroidal anti-inflammatory (NSAID).

PHARMACOLOGY/ACTIONS: Works by reducing hormones that cause inflammation and pain in the body. Possesses no sedative or anxiolytic properties. Also inhibits platelets.

ONSET/DURATION: Onset: 30 minutes / Duration: 4-6 hours.

INDICATIONS: Pain control of mild to moderate pain (age < 65 years old).

CONTRAINDICATIONS: NSAID allergy, ASA-sensitive asthma, active hemorrhage, hypotension, history of renal disease or kidney transplant, blood clotting disorder, multisystem trauma, closed head injury or bleeding in brain, history of GI bleed or ulcers, patient potentially needing surgery, open fracture or fracture deformity, and pregnancy.

SIDE EFFECTS: Acute kidney injury, stomach upset, nausea, vomiting, dizziness, blurred vision, dry mouth, and irritation at the injection site.

DRUG INTERACTIONS: Other NSAIDs, steroids, aspirin, and anticoagulants (ex Coumadin, Xarelto, Eliquis).

ROUTE: IV, IO, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
15 mg IV/IO/IM once	

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus. Avoid in pregnancy after 20 weeks gestation.

COMMENTS: Use with caution in patients who are dehydrated or taking ACEIs or ARBs. Ensure patient has not taken oral NSAID in last 6 hours (ibuprofen, Motrin), 12 hours (naproxen), or 24 hours (meloxicam) given potential for cumulative risk of inducing serious NSAID-related side effects.

LIDOCAINE (XYLOCAINE)
(Medication Protocol)

AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER – ANESTHESIA FOR IO FLUSH ONLY

CLASS: Antidysrhythmic (Class IB), local anesthetic.

PHARMACOLOGY/ACTIONS: Local anesthetic properties in small local doses.

ONSET/DURATION: Onset: 30-90 seconds.

INDICATIONS: Anesthesia for initial IO line flush.

CONTRAINDICATIONS: Hypersensitivity to the drug.

SIDE EFFECTS: Limited at IO anesthetic dose. Higher doses may cause hypotension, bradycardia, confusion, dizziness, seizures, and slurred speech.

DRUG INTERACTIONS: Limited interactions at IO anesthetic dose.

ROUTE: IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
60 mg (3 ml) IO flush for pain control prn.	0.5 mg/kg IO flush for pain control prn.

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters.

LORAZEPAM (ATIVAN)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Short-acting benzodiazepine.

PHARMACOLOGY/ACTIONS: Lorazepam is a water-soluble short-acting benzodiazepine with anticonvulsant, anxiolytic, sedative, and hypnotic effects. It acts on the limbic, thalamic, and hypothalamic regions of the CNS to potentiate the effects of inhibitory (GABA) neurotransmitters. Like diazepam, it suppresses the spread of seizure activity through the motor cortex of the brain while not abolishing the abnormal discharge focus.

ONSET/DURATION: Onset: 1-5 minutes IV, 15-30 minutes IM / Duration: 6-8 hours.

INDICATIONS:
- Seizure activity.
- Acute anxiety states.
- Premedication before cardioversion or TCP.
- Chemical restraint in combative patient.
- Skeletal muscle relaxation.

CONTRAINDICATIONS: Hypersensitivity and pregnancy. Relative in respiratory depression, glaucoma, and psychosis.

SIDE EFFECTS: Hypotension, respiratory depression, apnea, and anterograde amnesia.

DRUG INTERACTIONS: Alcohol, CNS depressants, and anticonvulsants may precipitate CNS depression. Cimetidine increases plasma levels and potential toxicity.

ROUTE: IV, IO, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Seizures: 1-4 mg slow IV/IO push/IM **Sedation/anxiety/pain:** 0.5-2 mg slow IV push/IM, may repeat once for sedation	**Seizures:** 0.05 mg/kg slow IV/IO push/IM (max 4 mg)

PREGNANCY SAFETY: Category D – positive risk to fetus, maternal benefit may outweigh risk to fetus.

COMMENTS: DEA schedule IV drug with potential for abuse. Because lorazepam is a relatively short-acting drug, seizure activity may recur requiring additional dosing. Resuscitation equipment should be readily available. Shelf life of unrefrigerated lorazepam is 60 days, expiration dates and medication rotation must be monitored.

MAGNESIUM SULFATE
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Electrolyte.

PHARMACOLOGY/ACTIONS: Magnesium acts as a physiologic calcium channel blocker and blocks neuromuscular transmission, thereby providing electrical stability in the myocardium. Affects impulse formation and conduction time in the myocardium, thus reduces incidence of dysrthymias associated with hypomagnesemia or prolonged QT interval. Also has anticonvulsant properties thought to be produced by CNS depression.

ONSET/DURATION: Onset: immediate / Duration: 30 minutes.

INDICATIONS:
- Torsades de pointes (polymorphic V-tach).
- Eclampsia.
- Reactive airway disease/asthma refractory to other treatments.

CONTRAINDICATIONS: Myocardial damage, heart block, and renal disease.

SIDE EFFECTS: Respiratory depression, CNS depression, hypotension, pulmonary edema, flushing and swelling.

DRUG INTERACTIONS: Neuromuscular blocking agents and CNS depressants add to respiratory depression and apnea.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Torsades de pointes: 1-2 gm slow IV/IO push **Eclampsia**: 4 gm in 250 ml NS IV/IO infused over 5 minutes **RAD/asthma**: 2 gm in 50 ml NS IV/IO infused over 10 minutes	**Torsades de pointes**: 25-50 mg/kg slow IV/IO push, maximum 2 gm **RAD/asthma**: 25-50 mg/kg in 50 ml NS IV/IO infused over 10 minutes, maximum 2 gm

PREGNANCY SAFETY: Category A – considered safe during pregnancy.

COMMENTS: Administer magnesium sulfate slowly at no more than 1 gram/minute, no matter what the clinical condition. Calcium chloride or gluconate can be used as an antidote if serious side effects occur. Early indicators of magnesium toxicity include cathartic effect, profound thirst, feeling of warmth, sedation, confusion, depressed reflexes, and muscle weakness.

METHYLPREDNISOLONE (SOLU-MEDROL)
(Medication Protocol)

EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
STANDING ORDER – ADRENAL INSUFFICIENCY ONLY
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Glucocorticoid.

PHARMACOLOGY/ACTIONS: Methylprednisolone is a synthetic steroid that suppresses acute and chronic inflammation.

ONSET/DURATION: Onset: 1-2 hours / Duration: 8-24 hours.

INDICATIONS:
- Anaphylaxis/severe allergic reaction.
- Severe asthma exacerbation.
- COPD exacerbation.
- Patient with adrenal insufficiency in medical distress at risk of acute adrenal crisis.

CONTRAINDICATIONS: Use with caution in patients with gastrointestinal bleeding, diabetes mellitus, or severe infection.

SIDE EFFECTS: Headache, hypertension, sodium and water retention, hypokalemia, and alkalosis.

DRUG INTERACTIONS: Hypoglycemic responses to insulin and oral hypoglycemic agents may be blunted. Potassium-depleting agents may potentiate hypokalemia induced by corticosteroids.

ROUTE: IV, IO, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
125 mg slow IV/IO/IM	1-2 mg/kg slow IV/IO/IM

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Methylprednisolone should not be considered first line therapy as onset of action takes 1-2 hours.

METOCLOPRAMIDE (Reglan)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antiemetic.

PHARMACOLOGY/ACTIONS: Metoclopramide is a potent central and peripheral dopamine receptor antagonist. The exact mechanism of action is not clear, but it appears to sensitize GI smooth muscle to effects of acetylcholine by direct action. It increases the resting tone of the esophageal sphincter and the tone and amplitude of upper GI contractions. As a result, gastric emptying and intestinal transit are accelerated with little effect if any on gastric, biliary (ie gallbladder), or pancreatic secretions (eg promotility effect). Antiemetic action results from drug-induced elevation of CTZ threshold and enhanced gastric emptying.

ONSET/DURATION: Onset 1-3 minutes IV versus 10-15 minutes IM / Duration: 1-3 hours.

INDICATIONS: Nausea and vomiting.

CONTRAINDICATIONS: Prior sensitivity or intolerance to the drug, allergy to sulfite agents, and suspected small bowel obstruction or perforation. Use with caution in patients with concurrent use of drugs that can cause extrapyramidal symptoms.

SIDE EFFECTS: mild sedation, dizziness, restlessness, agitation, extrapyramidal symptoms (acute dystonic type), blurry or double vision, and dry mouth.

DRUG INTERACTIONS: Alcohol and other CNS depressants may add to sedation. Phenothiazines (antipsychotic medications) may potentiate extrapyramidal symptoms. Hypertension may occur when metoclopramide is administered to patients taking MAO inhibitors.

ROUTE: IM, IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
5-10 mg slow IV/IM	

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters. Generally considered safe in pregnancy.

COMMENTS: The injection form contains sodium metabisulfite as an antioxidant. If patient has history of allergy to sulfite agents, this product should be avoided. Extrapyramidal symptoms are most likely to occur in young adults, elderly, and with high-dose treatment of vomiting associated with cancer chemotherapy. Development of extrapyramidal symptoms can be reduced or eliminated by diluting the medication and slow administration over several minutes. Diphenhydramine (Benadryl) should be available as an antidote.

MIDAZOLAM (VERSED)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Short-acting benzodiazepine.

PHARMACOLOGY/ACTIONS: Midazolam is a water-soluble short-acting benzodiazepine that is metabolized by the liver and excreted in the urine. It binds benzodiazepine receptors and enhances GABA central nervous system effects.

ONSET/DURATION: Onset: 1-3 minutes / Duration: 2-6 hours.

INDICATIONS:
- Seizure activity.
- Acute anxiety states.
- Premedication before cardioversion or TCP.
- Chemical restraint in combative patient.
- Skeletal muscle relaxation.

CONTRAINDICATIONS: Hypersensitivity, glaucoma (relative), shock, coma, alcohol intoxication (relative), depressed vital signs and concomitant use of barbiturates, alcohol, narcotics, or other CNS depressants used by the patient.

SIDE EFFECTS: Respiratory depression, hiccups, cough, over sedation, nausea and vomiting, headache, blurred vision, fluctuation in vital signs, hypotension, and respiratory arrest.

DRUG INTERACTIONS: Sedative effect of midazolam accentuated by concomitant use of barbiturates, alcohol, or narcotics.

ROUTE: IV, IO, IM, IN.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Seizures: 1-5 mg slow IV/IO push/IM/IN **Sedation/anxiety/pain:** 2-4 mg IV/IM, may repeat once for sedation Note: in elderly or patients with known liver disease, lower dosage should be used due to impaired metabolism	**Seizures:** 0.2 mg/kg slow IV/IO push/IM/IN (max 5 mg)

PREGNANCY SAFETY: Category D – positive risk to fetus, maternal benefit may outweigh risk to fetus.

COMMENTS: DEA schedule IV drug with potential for abuse. Provide continuous monitoring of respiratory and cardiac function. Have resuscitation equipment available. Never administer as rapid push IV bolus, which may lead to profound hypotension and/or respiratory impairment.

MORPHINE
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Narcotic analgesic.

PHARMACOLOGY/ACTIONS: Extremely potent narcotic analgesic. It dilates peripheral vasculature (reducing pre-load and after-load and decreasing myocardial oxygen demand). Morphine also tends to reduce the respiratory rate and tidal volume and causes pupils to constrict. It reduces apprehension and anxiety. The vasodilatation should cause no problems if patients are supine and not upright, not volume depleted, or have a decreased cardiac output. The onset of action is immediate if given IV. Peak effects are seen within 20 minutes.

ONSET/DURATION: Onset: 1-2 minutes / Duration: 2-7 hours.

INDICATIONS:
- Cardiac suspected chest pain **after** administration of oxygen, aspirin, and nitroglycerin according to protocol.
- Pain control in absence of hypotension.

CONTRAINDICATIONS: Major blood loss (hypovolemia), hypotension, head or abdominal injuries, increased ICP, and respiratory difficulties. Relative contraindication in patients who have taken alcohol, tricyclic antidepressants, MAO inhibitors, or other depressants.

SIDE EFFECTS: Respiratory depression, hypotension, nausea and vomiting, decreased LOC, constricted pupils, urinary retention, and histamine release.

DRUG INTERACTIONS: CNS depressants may potentiate effects of morphine (respiratory depression, hypotension, sedation). Phenothiazines and benzodiazepines may potentiate analgesia. MAO inhibitors may cause paradoxical excitation.

ROUTE: IM, IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
2-5 mg slow IV/IO push/IM every 5 minutes as needed to control pain Paramedic – maximum 15 mg prior to medical control contact	0.1 mg/kg slow IV/IO push/IM (max 5 mg); may repeat once after 5 minutes if needed to control pain

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters.

COMMENTS: DEA schedule II drug with potential for abuse. Closely monitor the patient's blood pressure before and after administration of morphine. Use with caution in the elderly, those with asthma, and in those susceptible to CNS depression. Naloxone should be readily available.

NALOXONE (NARCAN)
(Medication Protocol)

EMR WITH NALOXONE ENDORSEMENT
EMT WITH NALOXONE ENDORSEMENT
STANDING ORDER – INTRANASAL (IN) ONLY
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Narcotic antagonist.

PHARMACOLOGY/ACTIONS: Naloxone is a narcotic antagonist which competitively binds to narcotic sites, but which exhibits almost no pharmacologic activity of its own.

ONSET/DURATION: Onset: 2 minutes / Duration: 30-60 minutes.

INDICATIONS: Coma, altered mental status, ingestions, poisoning, drug overdose, head trauma with decreased mental status.

CONTRAINDICATIONS: Known hypersensitivity. Use with caution in narcotic-dependent patients who may experience withdrawal syndrome (including neonates of narcotic-dependent mothers).

SIDE EFFECTS: Tachycardia, hypertension, dysrhythmias, nausea, vomiting, diaphoresis, blurred vision, and opiate withdrawal.

DRUG INTERACTIONS: Incompatible with bisulfite and alkaline solutions.

ROUTE: IM, IV, IO, IN.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
0.4 – 4 mg IV/IO/IM/IN. Talwin, Lomotil, or Darvon overdose 2 – 4 mg IV/IO/IM/IN. Consider repeated doses if transient response is noted.	0.1 mg/kg IV/IO/IM (max 2 mg) or 0.2 mg/kg IN, ½ dose each side (max 4 mg).

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters.

COMMENTS: Naloxone may not reverse hypotension. Exercise caution when administering naloxone to narcotic addicts (may precipitate withdrawal with hypertension, tachycardia, and violent behavior).

NITROGLYCERIN (NITROSTAT)
(Medication Protocol)

EMT WITH MEDICATION ENDORSEMENT
AEMT PROVIDER
STANDING ORDER – SUBLINGUAL (SL) ONLY
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Anti-anginal / vasodilator.

PHARMACOLOGY/ACTIONS: Nitrates and nitrites relax smooth muscle dilating arterioles and veins in the periphery (and coronary arteries in high doses). The resultant reduction in preload, and to a lesser extent in afterload, decreases the workload of the heart and lowers myocardial oxygen demand. Antianginal, anti-ischemic, and antihypertensive effects.

ONSET/DURATION: Onset: 1-3 minutes (SL/TD), immediate (IV) / Duration: 30-60 minutes (SL/TD), 3-5 minutes (IV).

INDICATIONS: Chest pain suggestive of acute coronary syndrome (ACS), acute pulmonary edema, congestive heart failure, hypertensive emergency with normal mental status and no focal weakness.

CONTRAINDICATIONS: Increased intracranial pressure, cerebral edema, severe hypotension, dehydration, children under 12, aortic stenosis, and recent use of erectile dysfunction drugs such as Viagra, Cialis, Levitra, Revatio, Staxyn, etc.

SIDE EFFECTS: Hypotension, headache, dizziness, tachycardia, nausea, vomiting and diaphoresis.

DRUG INTERACTIONS: Other vasodilators may have additive hypotensive effects.

ROUTE: SL, TD, IV.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
0.4 mg (1 tablet or spray) SL, may be repeated every 5 minutes up to three doses Paramedic – Consider NTG paste 1” to chest wall	Adults only

Maintenance: infusion 10 mcg/min IV, titrate 5 mcg/min every 3-5 min, maximum 200 mcg/min

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Establish IV access. Use only if SBP > 100 mmHg. Recheck BP and pulse after administration. Therapeutic effect is enhanced but adverse effects are increased when patient is upright. Transient headache is common. If become hypotensive, stop drip, Trendelenburg, and consider fluid bolus. Use with caution if concern for RV ischemia/infarction (ECG changes in leads II, III, aVF, and V4R) and be prepared to augment preload if BP precipitously drops.

NOREPINEPHRINE (LEVOPHED)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Sympathomimetic.

PHARMACOLOGY/ACTIONS: Norepinephrine is a direct-acting sympathomimetic amine identical to the body catecholamine norepinephrine. It acts primarily on α-adrenergic receptors, with little action on β-adrenergic receptors except in the heart (beta1 receptors). Main therapeutic effects are vasoconstriction and cardiac stimulation. Powerful vasoconstrictor action on resistance and capacitance blood vessels. Peripheral vasoconstriction and moderate inotropic stimulation of heart result in increased systolic and diastolic blood pressure, myocardial oxygenation, coronary artery blood flow, and work of heart.

ONSET/DURATION: Onset: 1-2 minutes / Duration: 1-2 minutes after termination of infusion.

INDICATIONS:
- Hemodynamically significant hypotension in the absence of hypovolemia.
- Neurogenic shock.

CONTRAINDICATIONS: Hypovolemia. Use with caution in patients taking MAOIs, antihistamines, and antidepressants (imipramine or imipramine types) due to risk of prolonged hypertension.

SIDE EFFECTS: Headache, hypertension, reflexive bradycardia, anxiety, dyspnea, ischemic injury due to vasoconstriction, dysrhythmias, and tissue necrosis at injection site (with extravasation).

DRUG INTERACTIONS: Alpha and beta blockers antagonize pressor effects. TCAs may potentiate pressor effects.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
1-20 mcg/min IV/IO titrated to effect	0.05-0.1 mcg/kg/min IV/IO (max 20 mcg/min) titrated to effect

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Utilize a large vein to decrease risk of extravasation with can cause tissue necrosis. Continually check IV site for patency and signs/symptoms of infiltration. Mix in D5W to protect against loss of potency due to oxidation. Do not use solution if discoloration or precipitate is present. Protect from light. Early consultation with Medical Control to discuss medical decision making and treatment is encouraged when possible.

NOREPINEPHRINE DRIP PREPARATION FLOW SHEET

1. Prepare a 250 ml bag of D5W.
2. Decant the volume of medication to be added to the bag.
3. Add 8 mg to create a concentration of 32 mcg/ml.
4. **Use of an IV Pump use is preferred.**

Dose	**IV Pump** 15 drops/ml tubing	**If IV pump not available:** Use 60 drops/ml administration set
2 mcg/min	Utilize IV Pump settings	4 drops/min.
4 mcg/min		8 drops/min.
6 mcg/min		11 drops/min.
8 mcg/min		15 drops/min.
10 mcg/min		19 drops/min.
12 mcg/min		23 drops/min.

ONDANSETRON (ZOFRAN)
(Medication Protocol)

AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antiemetic.

PHARMACOLOGY/ACTIONS: Ondansetron's mechanism of action has not been fully characterized. The released serotonin my stimulate the vagal afferents through the 5-HT_3 receptors and initiate the vomiting reflex. Ondansetron selectively antagonizes the 5-HT_3 receptors. It has limited effectiveness for motion sickness, consider diphenhydramine (Benadryl) for refractive nausea/vomiting in those settings.

ONSET/DURATION: Onset: 30 minutes for peak effect / Duration: 5-7 hours.

INDICATIONS: Prevention and treatment of nausea and vomiting in adults and pediatrics.

CONTRAINDICATIONS: Hypersensitivity to drug/class (Kytril and Aloxi), gastric/abdominal surgery in pediatric patients.

SIDE EFFECTS: Headache, dizziness, diarrhea, rash, agitation, and prolonged QT interval.

DRUG INTERACTIONS: Apomorphine and Dronedarone.

ROUTE: IV, IO, PO (oral disintegrating tablet).

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
4 mg slow IV/IO or 4-8 mg PO (oral disintegrating tablet) may administer an additional 4 mg IV/IO if symptoms do not improve in 15 minutes	8-15 kg: 2 mg PO once 15-30 kg: 4 mg PO once >30 kg: 4 mg PO and may repeat once ≥ 3 years old: 0.15 mg/kg IV (max 4 mg), may repeat once if symptoms do not improve in 15 minutes

PREGNANCY SAFETY: Category B – unproven or unknown risk to fetus, and no risk in later trimesters. Generally considered safe in pregnancy.

COMMENTS: Consider early in patients with spinal immobilization to decrease risk of vomiting and aspiration. Use caution in patients with severe liver disease, the dose should not exceed 8 mg in 24 hours. Not commonly used in patients < 1 year of age.

ORAL GLUCOSE (GLUTOSE)
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Oral hypoglycemic agent, carbohydrate (sugar).

PHARMACOLOGY/ACTIONS: Elevates blood glucose. Causes hyperosmolar diuresis and decreases cerebral edema.

ONSET/DURATION: Onset: 10 minutes / Duration: varies.

INDICATIONS: Hypoglycemia, seizures, and/or altered mental status and unable to determine blood sugar level.

CONTRAINDICATIONS: Unconscious, unable to protect airway.

SIDE EFFECTS: May be aspirated if patient is unable to protect airway.

DRUG INTERACTIONS: None.

HOW SUPPLIED: Gel in 15 gm/tube (single use).

ROUTE: Oral.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
10-20 grams; may be repeated in 10 minutes if necessary. Check BGL with glucometer if available.	5-20 grams; may be repeated in 10 minutes if necessary. Check BGL with glucometer if available.

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Because changes in level of consciousness can occur rapidly in patients with hypoglycemia, it is important to ascertain the patient's ability to swallow an oral preparation without airway compromise.

OXYGEN
(Medication Protocol)

EMR PROVIDER
EMT PROVIDER
AEMT PROVIDER
PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Gas.

PHARMACOLOGY/ACTIONS: Helps to oxidize glucose to produce ATP.

ONSET/DURATION: Onset: immediate / Duration: < 2 minutes.

INDICATIONS: May be used in any trauma and/or medical patient – specifically hypoxia, ischemic chest pain, dyspnea, CO poisoning, and cardiac arrest.

CONTRAINDICATIONS: Should never be withheld in any critically ill patient.

SIDE EFFECTS: High-concentrations of oxygen may cause decreased level of consciousness and respiratory depression in patients with chronic carbon dioxide retention (ie COPD).

DRUG INTERACTIONS: None.

ROUTE: Inhaled.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
Low : 1 – 6 lpm via NC High : 10 – 15 lpm via NRB or BVM	Low : 1 – 6 lpm via NC or blow by High : 10 – 15 lpm via NRB or BVM

PREGNANCY SAFETY: N/A.

COMMENTS: Oxygen vigorously supports combustion.

OXYTOCIN (PITOCIN)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Hormone.

PHARMACOLOGY/ACTIONS: The medication is pharmacologically identical to naturally occurring oxytocin that is secreted by the posterior pituitary. Uterine sensitivity to oxytocin increases during pregnancy and peaks sharply before delivery. It produces phasic contractions characteristic of normal delivery.

ONSET/DURATION: Onset: immediately IV versus 3-5 minutes IM / Duration: 1 hour IV versus 2-3 hours IM.

INDICATIONS: Heavy postpartum hemorrhage following delivery of the placenta.

CONTRAINDICATIONS: Prior to delivery of fetus(es) and hypersensitivity to medication. When administered prior to delivery, may cause fetal hypoxia, fetal asphyxia, fetal dysrhythmias, and possible fetal intracranial bleeding.

SIDE EFFECTS: Tachycardia, cardiac dysrhythmias, hypertensive episodes, seizures, nausea, and vomiting. Hypersensitivity leads to uterine hypertonicity, tetanic contractions, uterine rupture, and/or anaphylactic reaction.

DRUG INTERACTIONS: Vasoconstrictors can cause severe hypertension.

ROUTE: IV, IM.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
20 units IV in 1000 ml NS or LR infused wide open	

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Ensure fetus and placenta have delivered and there is not an additional fetus in the uterus. Administer properly diluted IV solution by continuous infusion only. Fundus should be checked frequently. Incidence of hypersensitivity or allergic reactions is higher when given IM or IV injection rather than by IV infusion of diluted solution.

SODIUM BICARBONATE
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Buffer, alkalizing agent, and electrolyte supplement.

PHARMACOLOGY/ACTIONS: Sodium bicarbonate reacts with hydrogen ions to form water and carbon dioxide and thereby can act to buffer metabolic acidosis. As the plasma hydrogen ion concentration decreases, blood pH rises.

ONSET/DURATION: Onset: 2-10 minutes / Duration: 30-60 minutes.

INDICATIONS:
- Tricyclic antidepressant overdose with wide QRS/hypotension.
- Known or suspected hyperkalemia (dialysis patient in extremis).
- Alkalization for treatment of specific toxidromes/rhabdomyolysis (with medical control consultation).

CONTRAINDICATIONS: None if patient in extremis. Metabolic and respiratory alkalosis. Routine use in cardiac arrest.

SIDE EFFECTS: Metabolic alkalosis, hypoxia, rise is intracellular PCO_2 and increase in tissue acidosis, electrolyte imbalance (hypernatremia).

DRUG INTERACTIONS: Alkalization of urine may shorten elimination half-lives of certain drugs. Vasopressors may be deactivated.

ROUTE: IV, IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
1 mEq/kg IV/IO of 7.5% adult preparation; repeat with 0.5 mEq/kg every 10 minutes as needed.	1 mEq/kg IV/IO of 8.4% pediatric preparation; repeat with 0.5 mEq/kg every 10 minutes as needed; infuse slowly and only if ventilations are adequate.

PREGNANCY SAFETY: Category C – give only if potential benefits justifies risk to fetus.

COMMENTS: Bicarb administration produces carbon dioxide, which crosses cell membranes more rapidly than bicarbonate (potentially worsening intracellular acidosis). Bicarb may worsen CHF. Maintain adequate ventilation (gas exchange) to correct most underlying metabolic/respiratory acidosis states.

TRANEXAMIC ACID (TXA)
(Medication Protocol)

PARAMEDIC PROVIDER
STANDING ORDER

CLASS: Antifibrinolytic.

PHARMACOLOGY/ACTIONS: Potent antifibrinolytic drug. The main action is blocking the lysine-binding sites of the plasminogen molecule. This prevents activation of plasminogen by plasminogen activator. There is no evidence of a thrombogenic effect.

ONSET/DURATION: Onset: several minutes / Duration: 3 hours.

INDICATIONS: Trauma with suspected hemorrhagic shock (SBP < 90 mmHg).

CONTRAINDICATIONS: Time since injury > 3 hours, isolated spinal shock (cord injury without evidence of hemorrhage), known thromboembolic disease, and mechanical valve.

SIDE EFFECTS: Anaphylaxis, anaphylactoid reaction, seizure, headache, dizziness, and ocular effects.

DRUG INTERACTIONS: Anti-inhibitor coagulant complex, estrogen derivatives, factor IX complex, prothrombin complex concentrate, thrombolytic agents, and Tretinoin.

ROUTE: IV/IO.

DOSAGE:

ADULTS	PEDIATRICS(<45kg)
2 g in 100 ml (NS or LR) infusion over 10 minutes, preferrable before IV fluids	Adults only

PREGNANCY SAFETY: Category B – adequate studies in pregnant women have not demonstrated a risk to the fetus in the 1st trimester and there is no risk in the last trimesters.

COMMENTS: Randomized placebo-controlled trial showed early administration of TXA in patients with significant hemorrhage reduced the risk of death from bleeding. Post-hoc analysis revealed treatment beyond 3 hours was shown to be significantly less effective and possibly associated with harm. In patients with subarachnoid hemorrhage (SAH), may cause cerebral edema and infarction. The 2 gram bolus dose has a slightly increased risk of seizures, but did not increase adverse outcomes. There is an increased risk of venous thromboembolism (VTE) in doses above 30 mg/kg.