CLINICAL GUIDELINES

2026

Brownsville Rural Fire District, Halsey-Shedd Fire Protection District, Jefferson Fire District, Lebanon Fire District, Scio Fire District & Sweet Home Fire & Ambulance District

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Clinical Guidelines & Procedures

These Clinical Guidelines and Procedures have been developed as a collaborative effort and are intended to provide a suggested level of care. When available, scientific evidence has been diligently evaluated and incorporated into these guidelines. When the evidence was lacking, we have relied on best practices, expert advice, and consensus to guide the development of this document.

Many variables are involved in out-of-hospital patient care. As such, providers are expected to exercise good medical judgment and take action, within their respective scope and practice, in the best interest of the patient. The risks and benefits of any intervention, including the time required to perform it, must be considered. Frequently, simple observation and rapid transport is the best course of action. Therefore, this document should be used as a guideline only, and in no way prohibits prudent medical treatment.

In addition, due to a broad range of training, experience, and EMS resources available, we understand it may not always be feasible to undertake the full extent of specific guidelines. To that end, these guidelines should not be construed as rigid and linear.

As approved by the Supervising Physician, EMS agencies may adopt or omit approved medications, procedures, or equipment based on the needs of their individual jurisdictions. In these cases, providers should apply the guidelines in accordance with their training and experience, utilizing available resources, including online medical consultation, to provide the best possible patient care.

These clinical guidelines and procedures apply only to those licensed EMS responders affiliated with agencies I supervise and only while operating within the scope and course of their official duties. Furthermore, a complex document such as this is prone to errors. Please review the guidelines carefully and route any potential errors, unclear directions, or suggestions for improvement to the agency's respective EMS administrator.

Finally, we would like to thank all providers for your continued dedication and commitment to the provision of high-quality Emergency Medical Services to the citizens we serve.

Daniel Sprague M.D.

Supervising Physician May 1, 2026

Linn County Emergency Medical Services Special Deployment EMT and Paramedic Standing Orders Provision

This provision covers Linn County licensed EMS providers deployed in an official capacity on behalf of their licensing agency for the practice of their licensing agency for the practice of emergency medicine during a conflagration, EMAC/FEMA request, or other natural disaster event. These individuals are covered under their existing medical standing orders as approved by Linn County physician advisor (Daniel Sprague, M.D.) and their respective department-approved protocols. This coverage extends beyond the normal boundaries of mutual aid and may extend across state lines. State boundary extensions are contingent upon being granted temporary reciprocity by the receiving state.

This does not expand the scope of practice for any individual, but rather extends the employee's individual standing orders and department protocols beyond a normal mutual aid event.

The selection of equipment and medication sent with each apparatus will be at the discretion of each agency's EMS administrator.

Documentation & Reporting:

The EMS providers are responsible for documentation of all activities of patient care or evaluation, including a Patient Care Report (PCR) and patient refusal, if applicable.

The natural disaster deployment environment is, by its very nature, a dynamic and possibly chaotic situation in which to practice EMS. For this reason, a separate "incident report" may be requested by the sponsoring agency or medical director to review the events surrounding the EMS care rendered.

Natural disaster medicine reports will be reviewed by the employee's respective agency once the team returns home to ensure QA/QI measures were met.

Daniel Sprague, M.D.

Supervising Physician

May 1, 2026

OREGON EMS PROVIDER SCOPE AND PRACTICE

- The Oregon Medical Board has established a scope of practice for pre-hospital care. EMS responders may provide pre-hospital care as an incident of the operation of ambulance services and as incidents of other public or private safety duties and is not limited to "emergency care" as defined in OAR 847-035-0001(5).
- **The scope of practice for EMS responders is not intended as statewide standing orders or protocols. The scope of practice is the maximum functions which may be assigned to EMS responders by a Board-approved supervising physician.**

EMR

- Conduct primary and secondary patient examinations;
- Take and record vital signs;
- Utilize noninvasive diagnostic devices in accordance with manufacturer's recommendation;
- Open and maintain an airway by positioning the patient's head;
- Provide external cardiopulmonary resuscitation and obstructed airway care for infants, children, and adults;
- Provide care for musculoskeletal injuries;
- Provide hemorrhage control;
- Provide emergency moves for endangered patients;
- Assist with pre-hospital childbirth;
- Complete a clear and accurate pre-hospital emergency care report form on all patient contacts and provide a copy of that report to the senior emergency medical services provider with the transporting ambulance;
- Administer medical oxygen Maintain an open airway through the use of:
  - A nasopharyngeal airway device
  - A oropharyngeal airway device.
  - A pharyngeal suctioning device.
- Operate a bag mask ventilation device with reservoir;
- Provision of care for suspected medical emergencies, including administering liquid oral glucose for hypoglycemia;
- Prepare and administer aspirin by mouth for suspected myocardial infarction (MI) in patients with no known history of allergy to aspirin or recent gastrointestinal bleed;
- Prepare and administer epinephrine by automatic injection device for anaphylaxis;
- Prepare and administer Naloxone via intranasal device or auto-injector for suspected opioid OD;
- Prepare and administer naloxone via intranasal device or auto-injector for suspected opioid overdose;
- Perform cardiac defibrillation with an automatic or semi-automatic defibrillator, only when the EMR has successfully completed a Section-approved course of instruction in the use of the automatic or semi-automatic defibrillator; and complies with the periodic requalification requirements for automatic or semi-automatic defibrillator as established by the Authority.

EMR

EMT

- **Perform all procedures that an EMR can perform;**
- Ventilate with a non-invasive positive pressure delivery device;
- Insert a supraglottic airway device to facilitate ventilation through the glottic opening by displacing tissue and sealing of the laryngeal area;
- Perform tracheobronchial tube suctioning;
- Provide care for suspected shock;
- Provide care for suspected medical emergencies, including:
  - Obtaining a capillary blood specimen for blood glucose monitoring
  - Prepare and administer epinephrine by subcutaneous injection, intramuscular injection, or automatic injection device for anaphylaxis
  - Administer activated charcoal for poisonings.
  - Prepare and administer nebulized Albuterol sulfate treatments for known asthmatic and chronic obstructive pulmonary disease (COPD) patients suffering from suspected bronchospasm;
- Perform cardiac defibrillation with an automatic or semi-automatic defibrillator;
- Transport stable patients with saline locks, heparin locks, foley catheters, or in-dwelling vascular devices;
- Assist the on-scene Advanced EMT, EMT-Intermediate or Paramedic by:
  - Assembling and priming IV fluid administration sets and
  - Opening, assembling, and uncapping preloaded medication syringes and vials;
- Perform other emergency tasks as requested if under the direct visual supervision of a physician and then only under the order of that physician;
- Complete a clear and accurate pre-hospital; emergency care report form on all patient contacts;
- Assist a patient with administration of sublingual nitroglycerine tablets or spray and with metered dose inhalers that have been previously prescribed by the patient's personal physician and that are in possession of the patient at the time the EMT is summoned to assist;
- In the event of a release of organophosphate agents the EMT-Basic, who has completed Section-approved training, may administer atropine sulfate and pralidoxime chloride by autoinjector, using protocols approved by the Section and adopted by the supervising physician;
- In the event of a declared Mass Casualty Incident (MCI) as defined in the local Mass Casualty Incident plan, monitor patients who have running isotonic intravenous fluids flowing;

EMT

OREGON EMS PROVIDER SCOPE AND PRACTICE CONT.

AEMT

- **Perform all procedures that an EMT can perform;**
- Initiate and maintain peripheral intravenous (I.V.) lines;
- Initiate saline or similar locks;
- Draw peripheral blood specimens.
- Initiate and maintain an intraosseous infusion; and
- Prepare and administer the following medications under specific written protocols authorized by the Supervising Physician or direct orders from a licensed Physician:
  - Physiologic isotonic crystalloid solution
  - Epinephrine for anaphylaxis
  - Naloxone hydrochloride
  - Hypertonic Glucose
  - Glucagon
  - Nitroglycerine
  - Albuterol (nebulized)
  - Ipratropium bromide (nebulized)
  - Nitrous Oxide for Analgesia
  - Lidocaine (for IO infusion anesthetic)

AEMT

EMT-I

- **Perform all procedures that an AEMT can perform**
- Initiate and maintain an intraosseous infusion.
- Prepare and administer the following medications under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician
  - Epinephrine for all indications
  - Vasopressin
  - Atropine sulfate
  - Lidocaine, (includes IO anesthetic)
  - Amiodarone
  - Morphine
  - Nalbuphine Hydrochloride
  - Ketorolac tromethamine
  - Fentanyl
  - Diphenhydramine
  - Furosemide
  - Ondansetron
- Initiate electrocardiographic monitoring and interpret presenting rhythm
- Perform cardiac defibrillation with a manual defibrillator
- Insert an orogastric tube
- Prepare and administer immunizations in the event of an outbreak or epidemic as declared by the Governor of the state of Oregon, the State Public Health Officer or a county health officer, as part of an emergency immunization program, under the agency's supervising physician's standing order
- Prepare and administer immunizations for seasonal and pandemic influenza vaccinations according to the CDC Advisory Committee on Immunization Practices (ACIP), and/or the Oregon State Public Health Officer's recommended immunization guidelines as directed by the agency's supervising physician's standing order;
- Maintain during transport any intravenous medication infusions or other procedures which were initiated in a medical facility, and if clear and understandable written and verbal instructions for such maintenance have been provided by the physician, nurse practitioner or physician assistant at the sending medical facility.

EMT-I

PARAMEDIC

- **Perform all procedures that an Oregon-EMT-Intermediate can perform**
- Initiate the following airway management techniques
  - Endotracheal intubation;
  - Cricothyrotomy; and
  - Transtracheal jet insufflation which may be used when no other mechanism is available for establishing an airway.
- Initiate a nasogastric tube
- Provide advanced life support in the resuscitation of patients in cardiac arrest
- Perform emergency cardioversion in the compromised patient
- Attempt external transcutaneous pacing of bradycardia that is causing hemodynamic compromise.
- Electrocardiographic interpretation including multi-lead electrocardiograms.
- Initiate needle thoracentesis for tension pneumothorax in a prehospital setting
- Access indwelling catheters and implanted central IV ports for fluid and medication administration
- Initiate placement of a urinary catheter for trauma patients in a prehospital setting who have received diuretics and where the transport time is greater than thirty minutes
- Initiate or administer any medications or blood products under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician providing that the EMT-P has had adequate and appropriate instruction, including the risks, benefits, and use of the medication or blood product.

PARAMEDIC

OREGON EMS PROVIDER SCOPE AND PRACTICE CONT.

Clinical Care Pearls

- Supervising physicians may not assign functions exceeding the scope of practice; however, they may limit the functions within the scope at their discretion
- An Oregon-EMS Provider, acting through standing orders, shall respect the patient's wishes including life-sustaining treatments. EMS Providers shall request and honor life-sustaining treatment orders executed by a physician, nurse practitioner or physician assistant if available. A patient with life-sustaining treatment orders always requires respect, comfort, and hygienic care.

DEATH IN THE FIELD

PURPOSE

To provide guidelines for pre-hospital care personnel to follow when at the scene of deceased patient who do not have existing Do Not Resuscitate/POLST orders.

RESPONSIBILITY

All personnel are responsible for the information set forth in the following procedures.

PROCEDURES

- EMRs and EMTs may declare "death in the field" under the following circumstances:
  - Major injuries incompatible with life (e.g., Decapitation, Incineration)
  - Avulsion of vital body organs
  - Decomposition of the body
  - Presence of rigor mortis and/or lividity
  - Patients triaged into the black category during MCI situations
- Advanced EMTs, Intermediates, and Paramedics, in addition to the above, may declare a patient dead under the following circumstances:
  - Asystole in three leads, unresponsive to ACLS
  - Traumatic full arrest
- When it is determined beyond any doubt that the patient is deceased, EMS personnel shall request the law enforcement agency having jurisdiction to respond a 'deputy ME'.
  - Deaths requiring an investigation per ORS 146.090:
    - Apparently homicidal, suicidal, or occurring under suspicious or unknown circumstances;
    - Resulting from the unlawful use of controlled substances or the use or abuse of chemicals or toxic agents;
    - Occurring while incarcerated in any jail, correction facility, or in police custody;
    - Apparently accidental or following an injury;
    - By disease, injury, or toxic agent during or arising from employment;
    - While not under the care of a physician during the period immediately (within two weeks) previous to death;
    - Related to a disease which might constitute a threat to public health; or
    - In which a human body apparently has been disposed of in an offensive manner.
- Emergency personnel should take care not to disturb the body and any objects that may be surrounding the body. If the body or objects around the body must be moved:
  - Latex-free gloves must be worn;
  - A written notice should be made of its original location/position; and
  - Law enforcement officer should be advised of its original location/position.
- In the event of a delay by the investigating law enforcement agency, at least one individual must remain with the body
  - The individual remaining on scene shall make available to the investigating law enforcement agency the names and position titles of all personnel initially on scene.
- The investigating law enforcement officer or medical examiner will arrange for the removal of the body.
- Any invasive medical equipment such as IVs, ET tubes, needle thoracotomy, cricothyrotomy, etc., shall not be removed without prior approval from the ME. It is acceptable to occlude IV tubing to prevent fluid leakage.

PHYSICIAN'S ORDER FOR LIFE SUSTAINING TREATMENT (POLST) & DNR DIRECTIVES

PURPOSE

The purpose of this guideline is to define appropriate actions in the presence of a completed Physicians Order for Life Sustaining Treatment (POLST) and/or Do Not Resuscitate requests.

DEFINITIONS

1) ***POLST*** – Physician Orders for Life Sustaining Treatment form is a physician order written with the family and patient. It outlines what types of treatment should and should not be performed
2) ***DNR*** – "Do Not Resuscitate" means no CPR, no cardiotonic drugs, no intubation, and no defibrillation. The patient may specify which if any of these procedures they would like performed. This does not prevent the paramedic from treating pain, airway obstruction, or other illnesses or injury unrelated to the terminal condition.
3) **Comfort Measures Only** – Indicates a desire for only those interventions that enhance comfort. Use medication by any route, positioning, wound care, and oxygen, suction, and manual treatment of airway obstruction (choking) as needed for comfort. *DO NOT* transfer to a hospital unless comfort needs cannot be met in the current location.
4) **Limited Additional Interventions** – Includes comfort measures and medical treatment and cardiac monitoring as indicated. This order is also used to indicate treatment for those with short term dehydration. Intubation, advanced airway interventions, mechanical ventilation is *NOT* used. An injured person should NOT be enrolled in the Trauma System, although transfer to a local hospital may be appropriate.
5) **Full Treatment** – Includes all care with no limitation of treatment. All support measures needed to maintain and extend life are utilized.

A patient may rescind either a DNR or POLST by verbal or written statement at any time.

RESPONSIBILITY

All EMS providers should make every effort to honor a patient's preferences for levels of treatment outlined on the POLST form. The Incident Commander and/or highest certified provider on scene are charged with the ultimate decision regarding POLST forms. If conflicts arise on scene regarding the appropriateness of resuscitation and/or clinical interventions, on-line medical control shall be contacted.

ACTIONS

The EMS Provider should consider the following when making DNR/POLST decisions:

- Section A - These orders apply only when the person has no pulse and is not breathing. This section **DOES NOT** apply to any other medical circumstances.

A Check One	CARDIOPULMONARY RESUSCITATION (CPR): *Patient has no pulse and is not breathing.*
	☐ Attempt Resuscitation/CPR
	☐ Do Not Attempt Resuscitation/DNR
	When not in cardiopulmonary arrest, follow orders in B and C.

PHYSICIAN'S ORDER FOR LIFE SUSTAINING TREATMENT (POLST) & DNR DIRECTIVES CONT.

- Section B - These orders apply to emergency medical circumstances for a person who has a pulse and/or is breathing. This section provides orders for situations that are not covered in section A and were developed in accordance with EMS guidelines. Comfort care is always provided regardless of indicated level of EMS treatment.

B *Check One*

MEDICAL INTERVENTIONS: ***If patient has pulse and/or is breathing.***

☐ **Comfort Measures Only** (**A**llow **N**atural **D**eath). Relieve pain and suffering through the use of any medication by any route, positioning, wound care and other measures. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. ***Patient prefers no transfer to hospital*** *for life-sustaining treatments.* ***Transfer*** *if comfort needs cannot be met in current location.*
Treatment Plan: Maximize comfort through symptom management.

☐ **Limited Additional Interventions** In addition to care described in Comfort Measures Only, use medical treatment, antibiotics, IV fluids and cardiac monitor as indicated. No intubation, advanced airway interventions, or mechanical ventilation. May consider less invasive airway support (e.g. CPAP, BiPAP). ***Transfer*** *to hospital if indicated. Generally avoid the intensive care unit.*
Treatment Plan: Provide basic medical treatments.

☐ **Full Treatment** In addition to care described in Comfort Measures Only and Limited Additional Interventions, use intubation, advanced airway interventions, and mechanical ventilation as indicated. ***Transfer to hospital*** *and/or intensive care unit if indicated.*
Treatment Plan: Full treatment including life support measures in the intensive care unit.

Additional Orders: _____

- Section C – These orders indicate the patient's instructions regarding the use of artificially administered nutrition for a patient who cannot take fluids by mouth.

C *Check One*

ARTIFICIALLY ADMINISTERED NUTRITION: ***Offer food by mouth if feasible.***

☐ No artificial nutrition by tube.
☐ Defined trial period of artificial nutrition by tube.
☐ Long-term artificial nutrition by tube.

Additional Orders: _____

- Section D – Upon completion of the orders, the physician/nurse practitioner/physician assistant checks the box(es) indicating with whom the orders were discussed. It is recommended that the patient or surrogate sign the form. **POLST forms MUST be signed to be valid**.

D

DOCUMENTATION OF DISCUSSION:

☐ Patient (Patient has capacity)
☐ Parent of minor
☐ Court-Appointed Guardian
☐ Health Care Representative or legally recognized surrogate
☐ Surrogate for patient with developmental disabilities or significant mental health condition (Note: Special requirements for completion. See reverse side.)
☐ Other _____

Signature of Patient or Surrogate

Signature: ***recommended***	Name (print):	Relationship (write "self" if patient):

This form will be sent to the POLST Registry unless the patient wishes to opt out, if so check opt out box ☐

- Section E - The professional signing the form is acknowledging that the signature below indicates that the orders are consistent with the patient/surrogate preferences. The signer is recommended to include additional information supporting the basis for the orders.

E

SIGNATURE OF PHYSICIAN / NP/ PA

My signature below indicates to the best of my knowledge that these orders are consistent with the patient's **current** medical condition and preferences.

Print Signing Physician / NP / PA Name: ***required***	Signer Phone Number:	Signer License Number: *(optional)*
Physician / NP / PA Signature: ***required***	Date: ***required***	Office Use Only

SEND FORM WITH PATIENT WHENEVER TRANSFERRED OR DISCHARGED, SUBMIT COPY TO REGISTRY

PHYSICIAN'S ORDER FOR LIFE SUSTAINING TREATMENT (POLST) & DNR DIRECTIVES CONT.

- Reverse Side - The June 2011 POLST form includes an educational section for the patient and/or surrogate. This section is intended to help patients know who the POLST form is intended to serve, the role the POLST form plays in advance care planning, and the relationship of the POLST and Advance Directive.

HIPAA PERMITS DISCLOSURE TO HEALTH CARE PROFESSIONALS & ELECTRONIC REGISTRY AS NECESSARY FOR TREATMENT			
Information for patient named on this form **PATIENT'S NAME:** _____			
The POLST form is **always voluntary** and is usually for persons with advanced illness or frailty. POLST records your wishes for medical treatment in your current state of health. Once initial medical treatment is begun and the risks and benefits of further therapy are clear, your treatment wishes may change. Your medical care and this form can be changed to reflect your new wishes at any time. However, no form can address all the medical treatment decisions that may need to be made. The Oregon Advance Directive is recommended for all capable adults, regardless of their health status. An Advance Directive allows you to document in detail your future health care instructions and/or name a Health Care Representative to speak for you if you are unable to speak for yourself.			
Contact Information			
Surrogate (optional):	Relationship:	Phone Number:	Address:
Health Care Professional Information			
Preparer Name:	Preparer Title:	Phone Number:	Date Prepared:
PA's Supervising Physician:		Phone Number:	
Primary Care Professional:			

OTHER CONSIDERATIONS

- When presented with a Durable Power of Attorney for Health Care, the wishes of the person designated to make health care decisions for the patient shall be followed, but shall not override the wishes of a competent patient.
- The patient may always override a physician or previous DNR order.
- In situations where the wishes of the patient are unclear, the family may be consulted. Contact medical control for final decision.
- If unable to ascertain the patient's or family wishes, begin full resuscitation efforts, and contact medical control.
- Fully document the incident and the witnesses present.
- Contact medical control at any time for assistance in these situations.
- For any situation where efforts are terminated in the field, follow "Death in the Field" guideline.

HEALTHCARE PROFESSIONAL ON SCENE

PURPOSE

To outline the procedures to be followed when encountering other licensed healthcare professionals (e.g., physicians) on the scene of an EMS event; a medical facility or doctor's office.

PROCEDURES

- Personnel should seek to obtain a 'transfer of care' report from licensed healthcare providers rendering care at the scene of any EMS event. It is preferable this report come from an individual licensed as an RN, NP, PA, MD, or DO.
- EMS personnel should make every attempt to honor treatment/care wishes of licensed providers who are actively caring for an established patient within his/her practice. However, any care/treatments must remain within the scope of the EMS providers.
    - If no special requests regarding the patient's care are made, then the clinical guidelines established should be followed.
- If the licensed healthcare provider makes a request for patient treatment(s) outside the scope and course of these guidelines, (including withholding patient treatment), OLMC will be contacted for direction. EMS providers should make every effort to explain to the attending provider what treatments are available from EMS as they may not be familiar with these guidelines.
- In the event EMS providers encounter a licensed health care provider rendering care on the scene of an EMS event (acting as a Good Samaritan), EMS personnel should ensure a smooth transition of care as noted above. However, if the provider is an Oregon licensed physician and wishes to direct and maintain patient care, EMS providers should:
    - Make a reasonable effort to verify the individual is an Oregon licensed physician.
    - Inform the treating physician they may continue to direct patient care so long as they are willing to accompany the patient in the ambulance to the receiving facility. This should be re-enforced by providing the Physician on Scene card illustrated below.
    - Any conflicts arising between EMS providers and the physician on scene should immediately prompt contact with OLMC.
    - If the Physician agrees to accompany the patient:
        - EMS providers may assist the attending physician so long as personnel remain within the scope of their license level and within the general course of these clinical guidelines.
    - EMS personnel should make every effort to inform the physician on scene that patients are treated under clear clinical standing orders/guidelines approved by the agency's EMS Supervising Physician

DOCUMENTATION:

- In all situations, incident documentation to include a PHCR should be completed in accordance with documentation guidelines. The Name of the Physician on scene must be included in the documentation to allow for appropriate follow-up.

HEALTHCARE PROFESSIONAL ON SCENE

The following Physician On-Scene Cards should be printed on brightly colored cardstock.

Brownsville Rural Fire Protection District, Halsey-Shedd Fire Protection District, Jefferson Fire District, Lebanon Fire District, Scio Rural Fire District, and Sweet Home Fire District Emergency Medical Services Physician On-Scene Card

As the Supervising Physician of the EMS providers on scene, I would like to thank you for your offer of assistance. It is important to understand that these EMS providers are operating under the authority of Oregon State law and a set of standing clinical guidelines approved by me. No physician or other person may intercede in patient care without the online medical Control physician relinquishing responsibility via radio or telephone.

If responsibility is given to <u>you</u> (a physician at the scene), <u>you</u> are now responsible for any and all care given at the scene and en route to the hospital, and must remain with the patient until care is assumed by the ED physician in the emergency department of the receiving facility.

USE OF HELICOPTER EMS RESOURCES

PURPOSE

To establish guidelines for the safe and effective use of Helicopter EMS resources for the evacuation, treatment, and transport of sick or injured patients.

HELICOPTER ACTIVATION

- Quick Response Team (QRT) members, fire, or ambulance personnel may place a helicopter on standby and/or request a helicopter to respond. However, QRT's should consult with transport unit prior to activation.
- Once the decision to use air transport has been made, the destination facility should be the closest appropriate facility capable of meeting the patient's needs. If possible, on-line medical consultation should be sought to determine patient destination.
- Personnel may cancel helicopter services at any time if it is determined that the patient does not meet guidelines for use of air medical transport.
- Request for helicopter support for search and rescue or other non-medical missions must be authorized by County Sheriff/Emergency Management prior to activation.

GUIDELINES FOR USE OF AIR MEDICAL RESOURCES

- The use of air-medical resources may be considered in the following clinical situations:
    - Patients meeting Physiological (section 1) and/or Anatomical Criteria (section 2) of the Trauma System Entry criteria.
    - Cases of medical illness when it is determined after consultation with medical control that air transport of the patient would be more appropriate than by ground ambulance. Situations may include:
        - ST elevation myocardial infarction (STEMI)
        - Cerebral vascular insult (CVA) with onset ≤ 4 hours.
        - Patients with complicating conditions or complex underlying medical conditions confounding a traumatic injury.
- Operational considerations which may warrant use of air-medical resources include:
    - Patient access and/or evacuation from an area inaccessible by ground resources (e.g., hoisting operations, search, rescue, etc).
    - Environmental considerations causing delay of ground resources.
    - Multiple patient scenes where the number of patients exceeds the capabilities of ground resources.
- Transport time of air vs ground must be carefully considered. The use of air-medical transport may be considered in the above situations if air-medical can reduce transport time by 15 minutes or more over ground.

PROCEDURE

- Helicopter resources shall be coordinated through agency dispatch centers. The closest available civilian Helicopter EMS resource to the incident will be requested. Situations may arise requiring the request of a specific agency, and nothing within this guideline precludes the use of more appropriate resources in these situations.

USE OF HELICOPTER EMS RESOURCES CONT

- When requesting Helicopter EMS resources ensure an estimated time of arrival (ETA) to on scene is obtained from the responding resource. Ensuring the response time will prove to be valuable and is essential to the appropriate use of these resources. Ground transport should not be delayed waiting for the Helicopter to arrive on scene.
- Upon requesting helicopter resources, the following information shall be obtained and relayed to dispatch.
    - GPS coordinates and location
    - Approximate patient weight and general condition
    - General weather at the scene
    - Radio channel for air to ground operations
- The incident commander or the landing zone coordinator will select a radio channel / frequency for communications with the helicopter and the landing zone
- The helicopter(s) should contact the landing zone coordinator as soon as they are in range. If unable to communicate with the helicopter, dispatch may relay through the helicopter operations center.
- All communications between the landing zone coordinator and the aircraft should be through "clear text."
- Landing zones (LZs) shall be set up as soon as possible. The Landing Zone Coordinator shall be assigned by the Incident Commander.
- Elements of the helicopter LZ should include:
    - An area approximately 100 x 100 feet.
    - The area should be free of obstructions, including overhead wires and excessive loose ground cover (e.g. dust or gravel).
    - The LZ should be clearly marked at four corners with high-intensity glow sticks or other marking devices. Avoid the use of flares or other objects that present fire hazards, or objects which may become airborne due to rotor wash.
- Upon making initial contact with the aircraft, the Landing Zone Coordinator should briefly relay the following information
    - Hazards
    - Obstacles
    - Terrain
    - Slope
    - Animals
    - Wind direction

USE OF HELICOPTER EMS RESOURCES CONT

MILITARY RESOURCES:

- The use of military assets should be requested through the Oregon Emergency Management (OEM) duty officer. The Coast Guard or Air National Guard resources will respond to all areas of our jurisdiction and may be utilized when:
    - Civilian Air Medical Resources have been contacted and are unable to respond, or:
    - The situation requires the utilization of the specialized capabilities (e.g., the rescue hoist) which are not available with Civilian resources and there is a threat to life, limb, or eyesight.
- ALS personnel or equipment may not be available on military helicopters. In the event of patient transport by military helicopters, personnel and equipment may be called upon to accompany the patient. Due to weight limitations, this may require the offloading of equipment and personnel from the military aircraft. EMS personnel should assist in returning personnel and equipment to the helicopter upon completion of the transport.
- Military helicopters do not routinely carry a medical packaging and treatment equipment. Providers should request any tools needed for patient care while in flight. These tools include but are not limited to:
    - Stokes basket
    - Multiple patient carousel (1042nd only)
    - Winch capability
    - ECG monitor
    - Patient packaging materials (blankets, etc.)
- Communications and Landing Zone requirements specified above will be adequate for military helicopter use. However, aircraft size should be considered when establishing LZ size. Radio channels/frequencies and GPS coordinates are within the capabilities of the military helicopters.

INDIVIDUAL CARE PLANS

PURPOSE

It is recognized that agencies may be approached by individuals, who have a medical condition requiring a specific response plan to an emergent situation, which has been designed by their physician. In the interest of these patients, and for the protection of responding agencies, these plans will be considered and followed.

PROCEDURE

- The patient, the patient's family or the patient's physician may submit a detailed request for an individual care plan. The individual care plans must align with the scope and practice established by the Oregon Medical Board for emergency medical providers. Therefore, it may be subject to modification upon submittal.
- Submitted individual care plans shall be routed to both the first response and transport provider servicing the area in which the patient resides.
- The supervising physician(s) of the agencies involved will review the care plan and recommend approval and/or disapproval, or recommend alternatives as appropriate.
- Following the recommendation of the supervising physician, each agency's Chief executive (or designee) will either concur with the recommendation and/or meet with the supervising physician to address individual departmental or operational concerns.
- All agencies and supervising physicians impacted must reach consensus prior to the approval of any individual care plan.
- Once the plan has been approved, agencies will orient their responders for this specific individualized patient plan.

STANDING CARE PLANS

1) LEFT VENTRICULAR ASSIST DEVICES

Individuals may be within an area's jurisdictions that have an implanted Left Ventricular Assist Device. There may be different manufactured models implanted. Therefore, department will make an effort to recognize the type(s) of LVAD present within their District, and become aware of potential "trouble-shooting" they may be asked to perform.

- Possible scenarios may involve when the pump has stopped due to a loose connections, the batteries need to be changed, or the controller needs to be changed.
- Common presenting non-pump related complications include bleeding and infection.
- CLINICAL PEARLS RELATED TO LVADS INCLUDE:
  - Blood Pressure may be difficult to obtain on these patients. Most patients have a mean arterial blood pressure of 70-90 with a narrow pulse pressure.
  - Palpable pulse may be weak or absent
  - Do NOT perform CPR, no hand pump is available
  - All ACLS drugs may be administered
  - Pump does not affect the patient's ECG
  - The patient can be defibrillated while connected to the device
  - The patient can be paced per our normal standard operating procedures
  - Set of batteries last approximately 3 hours
  - Any emergency mode of transportation is OK. These patients are permitted to fly
  - Be sure to bring ALL the patients' equipment with them.

INDIVIDUAL CARE PLANS CONT.

- Flashing Alarms
  - This may indicate a Low Flow Hazard:
    - Check patient – the flow may be too low. This alarm will consist of red heart alarm indicator light and steady audio alarm if the flow rate is less than 2.5 liters per minute.
- If the patient is hypovolemic, treat per established guidelines
- If patient is in right heart failure, treat per established guidelines
- If pump has stopped, check connections, batteries, and controllers as instructed in the section above
- In situations where the LVAD continues to be non-operational and transport is indicated, transport to the closest facility is warranted unless otherwise advised by OLMC.

2) HEALTH EMERGENCY READY OREGON (HERO)

Hero Kids Registry is a voluntary system that lets any Oregon family share critical information about their child's health before an emergency. The information can be quickly and easily accessed by emergency medical services.

- In an emergency, the person calling 911 provides the child's HERO Kids Registry ID number or indicates that the child is registered with HERO Kids.
- EMS providers use the child's information and/or Registry ID number to access key health information through a confidential provider line. Information is relayed by phone in less than 90 seconds.

EMS ASSESSMENT

PURPOSE

During EMS responses, personnel encounter many different situations involving a wide variety of people and circumstances. During these interactions, the level of service and/or intervention required can vary widely. As a result, the following guideline is intended to assist responders in determining an individual's need for an EMS medical assessment.

BACKGROUND

Many agencies that provide EMS services also provide a wide variety of Fire, Rescue, and other Hazard mitigation services. As a result, Persons encountered during emergency responses typically fall into two primary service categories: Those who require EMS medical assessment and services (often referred to as "Patients") and those who require Fire, Rescue, or other Hazard mitigation.

DEFINITIONS

1) ***EMS Assessment*** - An assessment performed by Emergency Medical Services personnel including but not limited to the acquisition of a chief complaint, history of the presence illness or injury, medical history, and performance of a physical exam in order to arrive at an assessment of potential injuries or cause of illness. An EMS assessment is necessary in order to adequately determine an appropriate plan of action for the "patient" involved.

2) ***Patients*** – Individual(s) who exhibit one or more of the following:
   - Is involved in a situation involving a sufficient mechanism to cause injury
   - Appears ill, injured, or the EMS provider suspects an alteration of the individual's baseline level of consciousness
   - The individual or "guardian" requests an evaluation/assessment.
   - Individuals who are declared deceased in the out of hospital setting.

ACTION

Providers should initiate contact with persons immediately in and around an emergency response in order to determine the number of persons involved, mechanism, contributing or co-morbid factors, and etc. Utilizing the above criteria, responders will identify individuals who require the completion of an EMS assessment ("Patients") and care should be initiated per the clinical guidelines. If it is determined that "patients" are not present, then personnel would not be required to complete an EMS assessment.

DOCUMENTATION

Assessment and treatment of any "patient" will be documented in accordance with individual departmental documentation requirements on the Pre-Hospital Care Report.

In those situations where no PHCR is required, documentation consistent with each department's policies shall be completed (e.g., dispatch report/form 10). Documentation for the response should be completed indicating that none of the criteria noted above were present. Crews should also indicate the circumstances which lead to the activation of EMS, if known.

INTERFACILITY TRANSFER

PURPOSE

The purpose of this guideline and Transfer Algorithm is to establish a uniform procedure for inter-facility transfers.

APPLICATION

- Patient transfer is a physician-to-physician referral. It is the responsibility of the transferring facility to perform a screening examination, determine if transfer to another facility is in the patient's best interest and to initiate appropriate stabilization measures prior to transfer.
- Responsibility for the patient during transport lies with the transferring physician until the patient arrives at the receiving facility.

GENERAL GUIDING PRINCIPALS

- The transferring physician is responsible for securing the acceptance of the patient by an appropriate physician at the receiving facility.
- Care initiated by the transferring facility may need to be continued during transport. The transferring physician should clearly outline the treatment and/or monitoring needs of the patient and relay this information to the EMS crew attending. Personnel should include treatments and/or interventions being continued or monitored during transport in the PHCR.
- Specialty Care Transport (SCT) may be required at the discretion of the sending physician. Additional health care personnel (i.e. RN or RRT) and/or a Paramedic with specialized training may qualify as SCT and will accompany the patient. These person(s) shall be considered part of the Specialty Care Transport team. Patient care shall be considered a collaborative effort between the Paramedic and RN. When possible, follow written physician orders; otherwise contact OLMC for patient care concerns.
- EMS personnel, even in the presence of additional health care personnel (e.g., RN; RT) must complete assessments, monitoring, and documentation in accordance with these clinical guidelines and procedures. In addition, personnel shall adhere to individual departmental policies as required.
- All medications anticipated in these situations should be provided by the transferring facility. It will be the responsibility of the transferring facility to provide clear direction as to the disposition, tracking, or return of any medications.
- If the transferring physician elects to transfer the patient in the care of paramedics, the physician must provide written orders as noted above. These orders must be consistent with staff scope, training, and abilities. EMS staff may decline the transfer if he/she is convinced patient care is outside their scope of practice and training or, alternatively, to request hospital staff member accompanies them on the transfer. Any declination of transfers must be prior approved by the on-duty Battalion Chief.
- Infusing medications may require the use of a programmable pump to be supplied by the transporting service and/or transferring facility. EMS personnel must have received training in the use of both the medication(s) and the pump.
- Should questions or problems arise during transfer, the crew may contact the transferring facility. If this is not possible or in event of an emergency, the appropriate guideline should be followed and the receiving Medical Control contacted for direction.

INTERFACILITY TRANSFER CONT.

PROCEDURE

- Requests for transfer should be coordinated via each agency's established guidelines (typically through a communications center & the on-duty Battalion Chief of the transporting agency).
- Upon receiving a request for an inter-facility transport, crews will be assigned per individual departmental policies and dispatching guidelines.
- Crews may contact the sending facility to obtain specific patient information and transport needs. Any concerns or issues should be forwarded to the on-duty Battalion Chief for guidance, and/or resolution.
- Crews should respond to the sending facility in a timely manner.
- Crews should ensure they have received a thorough transfer of care report to include but not be limited to:
    - Patient primary diagnosis & pertinent medical history
    - Medications & Allergies
    - Clinical reason for transfer
    - Monitoring & care needs of the patient during transport
    - Any specific medication or care orders to include ordering physician
    - Name of sending and receiving physician
    - Verification of bed assignment at receiving facility.

TRANSFER ALGORITHM

Advanced Life Support (ALS)	Specialty Care Transport (SCT)
STABLE/UNSTABLE PATIENTS	CRITICAL PATIENTS
EMT (driver) EMT-P	EMT (driver) SCT trained EMT-P, RN, RT, L&D Nurse
Advanced Airway Management: ☐ Administer O2 ☐ Perform tracheal suctioning ☐ NO intubated patients ☐ NO patients on ventilators ☐ NO acute onset resp. distress patients on CPAP	Advanced Airway Management: ☐ Administer O2 ☐ Perform tracheal suctioning ☐ Intubated patients ☐ Patients on ventilators ☐ Acute onset resp. distress patients on CPAP
IV/Medications: • Start/Maintain IV saline drip • Patients with PCA pumps • Drips or bolus meds only within agency protocol • NO infusion pumps other than PCA	IV/Medications: ☐ Start/maintain IV saline drip ☐ Patients with PCA pumps ☐ Drips and bolus meds outside agency protocol ☐ Maintain infusion pumps
Cardiac Monitoring: ☐ Stable/Unstable rhythms ☐ Read and interpret 12 leads ☐ Manually defibrillate/cardiovert ☐ External pacing	Cardiac Monitoring: ☐ Stable/Unstable rhythms ☐ Read and interpret 12 leads ☐ Manually defibrillate/cardiovert ☐ External pacing ☐ STEMI ☐ Active chest pain with ongoing dynamic ECG changes
OB: transfers (stable) • Acute low risk labor/delivery, not imminent	OB: transfers (stable/unstable) • Acute high-risk labor/delivery, may be imminent

MEDICATION ADMINISTRATION

PURPOSE

During EMS responses personnel routinely administer medications to patients with a wide range of needs due to a wide range of clinical conditions. An error associated with the administration of medications is a concern throughout the medical establishment. Therefore, in order to reduce and/or eliminate the potential for medication errors, it is important that the "8 Rights" of Medication Administration be observed during these instances.

APPLICATION

EMS providers preparing to administer medications in the out of hospital setting should review and/or recite the "8 Rights" prior to administering any medication to a patient. While all 8 elements are important, In the out of hospital setting, special attention should be paid to the right medication, right dose, and right route - as these are frequently the areas of error in the EMS environment. In addition, EMS providers should ensure the patient is informed as to what medications they are receiving, and afford an opportunity for the patient to refuse. Lastly, documentation is essential so that medications administered in the out of hospital setting become part of the patient's clinical medical record. By following the "8 Rights" of medication administration, EMS providers will significantly decrease the potential and number of errors associated with medication administration.

DEFINITIONS

1) ***Medication:*** Any pharmacological intervention used to treat, prevent, or reduce signs and symptoms of diseases, disorders, and/or traumatic injuries. Medication administration routes include the following: Intramuscular, Intravenous, Intraosseous, Oral, Buccal, Rectal, Inhaled, and Subcutaneous.

PROCEDURE

- Prior to the administration of any medication ensure the following are reviewed and/or verbalized by at least **two providers** – if available (checked, and double checked):

  8 Rights of Medication Administration

  - Right Patient
  - Right Dose
  - Right Medication
  - Right Route
  - Right Time
  - Right Documentation
  - Right to Know About the Medication
  - Right to Refuse the Medication

- Following administration of controlled medications, EMS personnel shall follow their individual department's policy on the correct accounting, disposal, and restocking of these medications.

Patient Handoff Procedure

PURPOSE

To clearly delineate EMS practices and responsibilities upon arrival of our ambulances on the hospital's property with an incoming emergency department patient, recognizing that responsibility for the patient belongs with the hospital upon arrival of the patient upon the hospital's property and the provision of continuing care to a hospital patient on hospital property is voluntary by the ambulance service.

AUTHORITY

42 U.S.C § 1395dd
42 CFR § 489.24
42 CFR § 413.65
CMS State Operations Manual, Appendix V, Section 489.24(a)(1)

POLICY

1. Upon arrival at a hospital emergency department (ED) with an incoming patient, our ambulance crew will verbally inform a Charge Nurse of the facility:
    a. Of the fact of our arrival with an ED patient.
    b. A general description of the patient's condition.
    c. A summary of treatment and/or interventions provided to the patient prior to ED arrival.

2. The patient is the responsibility of the hospital upon arrival of the patient on the hospital's property, as defined in 42 CFR § 489.24 (b).

3. Our general policy, subject only to the exceptions enumerated in this Policy, is that patient handoff shall be deemed complete, and the ambulance crew will depart the hospital, within (30) minutes of arrival on hospital property. EMS will track arrival at the Hospital and return to service APOT (Ambulance Patient Offload Time).

4. In the event that the hospital staff are unable to assume responsibility for care of the patient within the above time window, hospital staff may request that the ambulance staff remain with the hospital patient for an extended period of time which shall hereafter be known as "extended ambulance wait time".

5. Upon receipt of such a request by the hospital for extended ambulance wait time, the ambulance crew will consider the request in light of the following factors:

    a. The current condition of the patient
    b. The capability of the ambulance crew to furnish the services, treatments and/or interventions needed to care for the patient.
    c. The availability of other ambulances to cover emergency calls in the ambulance service's coverage area.
    d. Whether the ambulance crew is denied physical access to the emergency department.
    e. Other pending calls that require the services of this ambulance crew.

6. If no request is made by hospital staff for extended ambulance wait time, the ambulance crew may leave after every effort has been made to hand off to the Charge Nurse or the Nursing Supervisor, if the Charge Nurse is not available. (*Phone numbers to be posted in the Ambulance).

7. Regardless of whether or not a request for extended ambulance wait time is made by the hospital, the ambulance crew shall remain with a patient until care is physically assumed by a hospital clinical provider in the following circumstances, and only for so long as such circumstances persist, or until relieved by a hospital clinical provider:

    a. Any patient in cardiac or respiratory arrest or undergoing active resuscitative efforts.
    b. Any patient who is unstable in one or more bodily systems, including cardiovascular or neurological/neurovascular.
    c. Any patient who is an active threat to self or others and for whom the withdrawal of trained monitoring could pose a risk.
    d. Any patient in active labor, whether or not presenting with complications.
    e. Any other patient for whom the ambulance service's medical protocols or judgement of the EMS crew dictates an extended ambulance wait time.

8. When furnishing care to a patient, the ambulance crew shall at all times adhere to their scope of practice and applicable treatment protocols. The crew should document all care in-hospital as part of the ambulance patient care report.

9. In cases where the ambulance crew leaves the hospital prior to physical assumption of care by a hospital clinical provider, and the ambulance crew determines that the hospital patient does not clinically require continued care or monitoring from the ambulance crew, in accordance with the written criteria above, the crew will transfer the patient to a hospital bed whenever available. If no bed is available, and as long as clinically appropriate, the ambulance crew may place the patient in the ED waiting room, in a chair in the hallway, in an available portable cot or similar device, or other appropriate location inside the hospital, and make every effort to handoff to the Charge Nurse/Nursing Supervisor prior to leaving the patient.

10. In all cases, prior to departure, the ambulance crew shall make every effort to provide a verbal report, or, when available, a preliminary written report to a Nurse or to a representative of the facility, summarizing the condition of the hospital patient, the location in the facility of where the hospital patient is being left, and any treatments and/or interventions provided prior to departure.

11. Ambulance crew members shall use their best efforts to obtain a handoff of care signature, but if no hospital representative is available or willing to sign, the crew shall contact the Nursing Supervisor and proceed with departure from the hospital in accordance with this Policy.

12. The Ambulance patient care report being given, the identity of the person to whom report was given (if known), interventions/treatments provided while in the hospital, and the condition of the patient at the time of crew departure from the hospital.

REFUSAL OF CARE AND/OR TRANSPORT

PURPOSE

To define procedures for patients who refuse Emergency Medical Services treatment and/or transport.

DEFINITIONS

1) ***Patients*** – Individual(s) who exhibit one or more of the following:
   - ❑ Is involved in a situation involving a sufficient mechanism to cause injury
   - ❑ Appears ill, injured, or the EMS provider suspects an alteration of the individual's baseline level of consciousness
   - ❑ The individual or "guardian" requests an evaluation/assessment.

2) ***Competent Adults*** - An individual 18 years of age or older who are determined to be competent.

3) ***Minor*** - An individual, who is under the age of 18 who is unmarried, or has not been granted a decree of emancipation, is considered a minor (ORS 109.510, 109.520).

DETERMINING PATIENT CAPACITY

An adult patient may be considered to have the capacity to refuse medical care and/or transport if all of the following can be reasonably established:

- ❑ The patient is oriented as to person, place, time, and event.
- ❑ In your best opinion, his/her judgment is not significantly impaired by any mind-altering substances.
- ❑ S/He demonstrates normal reasoning capability.
- ❑ S/He expresses an understanding of the potential impact resulting from refusal to be transported for his/her condition.

NOTE: If there is any question regarding capacity, contact OLMC for direction.

ADULT PATIENT REFUSAL

An adult patient may refuse transport and/or treatment (in whole or part) if:

- ❑ The patient is determined to have capacity to refuse as noted above.
- ❑ The risks and benefits of treatment and/or transport have been explained.
- ❑ The patient understands and is able to relay the risk/benefits of treatment and/or transport.
- ❑ The patient has a reasonable follow-up plan if their condition worsens.

If a patient is deemed able to refuse but will not sign the refusal form, document all witnesses of this event (name, address, D.O.B); and describe the situation in the PHCR.

If the patient is refusing transport, and there is a significant threat to life or limb, contact OLMC for advice and/or try to establish communication directly between the patient and physician.

FOR THE PATIENT WHO DOES NOT MEET CAPACITY CRITERIA

Implied consent may be invoked to treat and transport a patient that has an injury and/or illness which may present a significant threat to life or limb. However, when approaching these patients and attempting to gain voluntary compliance with the decision to treat/transport, the following standard shall be utilized and clearly documented in the patient care report:

- ❑ Request for compliance.
- ❑ Explain why you need compliance.
- ❑ Outline patient options.
- ❑ Confirmation (e.g., “Is there anything I can say or do that will convince you to...”)
- ❑ Action

In the event the patient requires physical/chemical restraint to facilitate transport, personnel shall abide by the “Physical Restraint” guideline.

REFUSAL OF CARE AND/OR TRANSPORT CONT.

Patients who are chronically ill may have decisions made for them by guardians appointed by the court. In addition, family members may also be granted decision making powers by patients in the event of a sudden incapacitating illness; this is usually provided by a "Durable Power of Attorney for Health Care." In these situations (documentation must be available on scene to confirm); the guardian or family member may make treatment/transport decisions so long as he/she has capacity to do so in accordance with this guideline.

USE OF POLICE HOLDS

Currently, ORS 426.228 gives peace officers authority to "take into custody a person who the officer has probable cause to believe is dangerous to self or to any other person and is in need of immediate care, custody or treatment for mental illness."

If a police officer chooses not to place a hold on a patient after you have requested they do so, contact medical control. If necessary, establish communication between the officer and the physician. If unable to obtain a police hold, clearly document your attempts to do so.

MINORS

For patients who are under the age of 18, the EMS provider shall assume responsibility for the patient under implied consent. Any limb or life-threatening condition should be treated/transported as with any other implied consent situation. However, in non-life-threatening situations, a reasonable attempt should be made to contact the responsible party for permission to treat and/or transport. If a parent/guardian cannot be contacted, then it becomes prudent to transport the minor to the hospital for follow up and safekeeping.

In the event an adult is refusing treatment/transport for a child in a limb or life-threatening situation, police should be immediately contacted to assist in placing the patient in protective custody. Under such circumstances, the minor may be treated under implied consent.

If a minor is clearly not significantly ill or injured and there is no evidence the situation puts the child at risk, it is acceptable to arrange a custodial situation with a responsible, competent familiar adult willing to accept responsibility until a parent or guardian is available.

A minor (even one under the age of 15) is deemed to have attained majority if the minor is the mother, father, or putative father of a child and may refuse transport for the child and for him/herself (ORS.109.112).

Medical control should be consulted in any situations where uncertainty is present.

DOCUMENTATION

Patient refusals must be clearly documented. Quoting actual patient response to questions and statements is encouraged. All patient refusals require the use of a Pre-Hospital Care Report (PHCR) to document the EMS assessment. In addition to the PHCR, a "Patient Refusal" form must also be completed. (NOTE: This form can be used as a guide for completion of the essential elements of a refusal on the PHCR)

Documentation should include attempts to allow an examination, treatment, and/or transport. If medical control is contacted, document the physician's name and guidance obtained.

The patient's orientation and mentation must be clearly documented along with his/her response to explanations of potential risks and any follow-up instructions that were given.

REQUESTS BY LAW ENFORCEMENT

PURPOSE

To provide a framework including actions to be taken and documentation to be completed for various responses initiated by law enforcement.

BACKGROUND

When you are confronted by a violent patient you should call law enforcement. In the same manner, when law enforcement officers are faced with a suspect who has a complicated medical history, current medical complaint, or has been forcefully subdued, they call upon EMS to perform assessments and make recommendations.

Whenever you are on scene at the request of law enforcement you should consider the following:

- Make sure the scene is safe; watch for environmental hazards, and expect suspects/patients to be dangerous.
- Criminal Suspects are only suspects and should be treated with respect and dignity
- If you are not comfortable with the situation, advise law enforcement on what actions they need to take before you are willing to perform assessment or treatment.

DEFINITIONS

1) ***Hyperactive Delirium*** – Condition characterized by a severe disturbance in the level of consciousness and a change in mental status over a relatively short period of time, manifested by mental and physiological arousal, agitation, hostility and heightened sympathetic stimulation. It can result from mental illness, substance abuse (usually stimulants) or a combination of both.

ACTIONS

Consider the following additional points while performing law enforcement requests. ***Remember that you may not "clear" any patient of injuries***. Transport any patient you feel warrants further treatment or assessment.

- **Assessments**
  - Always attempt to complete a thorough assessment focused around the patient or officer complaint.
- **Taser discharge:** Tased patients have been associated with "sudden in-custody deaths" in national studies. These patients should receive special attention to factors that have been known to contribute to fatalities.
  - Each agency covered by these guidelines may choose **TO** or **NOT TO** remove taser barbs.
  - Those choosing to remove barbs shall ensure all personnel are trained appropriately in their removal and will **NOT** remove any barb which has penetrated the face, anterior neck, or genitals.
  - In addition to barb removal, EMS personnel should consider the following:
    - Consider ECG monitoring.
    - Consider mechanisms associated with Taser discharge; falls, labor complications, etc.
    - Consider the reason why Taser discharge was required; drug use, anxiety, etc.
    - Consider that other methods of subduing a suspect may have been employed before or concurrent with Taser discharge.

REQUESTS BY LAW ENFORCEMENT CONT.

- **OC spray discharge:** OC spray is a respiratory/skin irritant. The following should be considered when evaluating and treating patients exposed to OC spray:
    - Flushing eyes and skin may help with the discomfort associated with irritation caused by OC exposure. Over time, the irritation will eventually subside. If permissible by law enforcement consider providing the suspect with a damp towel to rest over their eyes or skin.
    - Patients with history of respiratory conditions may require nebulized medications (see respiratory distress guideline).
    - Consider that other methods of subduing a suspect may have been employed before or concurrent with OC discharge. Attempt to complete a full assessment.
    - Consider the reason why OC discharge was required; drug use, anxiety, and etc requiring additional EMS assessment and/or monitoring. In some cases, patients should be transported by ambulance for evaluation.

SUMMARY:

Transport is always recommended for patients who have been involved in physical altercations with law enforcement due to the increased potential for delayed signs/symptoms. **Transport is strongly encouraged for the following conditions:**

- Evidence of hyperactive delirium before or after altercation
- Persistent, abnormal vital signs
- History or physical findings consistent with amphetamine or hallucinogenic drug use
- Cardiac history
- Altered level of consciousness or aggressive, violent behavior including resistance to evaluation
- Evidence of hyperthermia
- Abnormal, subjective complaints, including chest pain, shortness of breath, nausea or headache.

DOCUMENTATION

Due to the nature of law enforcement requests for EMS assistance, it is important for personnel to thoroughly document all assessments and findings on the Pre-Hospital Care Report in accordance with the documentation guideline.

START TRIAGE

PURPOSE

To provide an established standard of triage of persons involved in a multiple casualty incident (MCI) or a multiple patient scene (MPS).

RESPONSIBILITY

All personnel are responsible for the information set forth in the following procedures. During an MCI or MPS primary care givers will be overwhelmed and all additional personnel will be expected to assist in the triage and treatment of patients.

DEFINITIONS

1) ***MCI (Multiple Casualty Incidents.)*** - Any emergency scene that creates a number of patients sufficient to significantly overwhelm available resources.
2) ***MPS (Multiple Patient Scene)*** – Any emergency scene involving more than two patients which does not significantly overwhelm available resources.
3) ***Triage*** – The process of sorting and categorizing patients based on the severity of their symptoms. Patients will be categorized into the four following groups. Each group has a color designation to assist in the rapid sorting of triaged patients.
   - Immediate (**Red**) – Critically injured patients who must be transported as soon as resources allow.
   - Delayed (**Yellow**) – Severely injured patients who must be evaluated and treated but may not need immediate treatment.
   - Minor (**Green**) – Those patients who need minor treatment or prophylactic evaluation.
   - Deceased (**Black**) – Patients who are or will be deceased before appropriate treatment would be available.

PROCEDURES

- Patients will be triaged according to START and/or Jump-START triage criteria during every MCI/MPS event.
- Triage tags and/or identification (e.g., surveyor's tape) should be utilized when START or Jump-START are utilized.
- During primary triage, providers should spend no more than 30 seconds to triage each patient.
- Upon completion of triage and/or when adequate resources are available, patient care can be undertaken. However, ALS and ILS providers should consider providing care at a BLS level in order to give care to as many people as possible.
- **START Triage (adult patients).**
  - Direct all ambulatory patients to a designated location – these individuals would be initially triaged into the MINOR (**Green**) category.
  - Patients with no respiratory effort should be triaged into the DECEASED (**Black**) category following an attempt to open the airway.
  - Patients with difficulty in Respirations, poor Perfusion, or altered Mental status (RPM) as specified below should be categorized into the IMMEDIATE (**Red**) category
    - Respirations > 30/min
    - Perfusion – No radial pulse or capillary refill times >2 seconds.
    - Mental status – unable to follow simple commands
  - All patients who cannot walk, but have respiratory effort, and do not meet criteria for RPM as above should be categorized into the DELAYED (**Yellow**) category.

START TRIAGE

- **Jump-START triage (pediatric patients).**
  - Direct all ambulatory patients to a designated location – these individuals would be initially triaged into the MINOR (**Green**) category.
  - Patients with no respiratory effort or peripheral pulse should be triaged into the DECEASED (**Black**) category.
  - Patients with a peripheral pulse but who are not breathing should receive 5 ventilations then categorize as IMMEDIATE (**Red**) if respiratory effort resumes. If apnea continues categorize as DECEASED(**Black**)
  - Patients with difficulty in Respirations, poor Perfusion, or altered Mental status (RPM) as specified below should be categorized into the IMMEDIATE (**Red**) category
    - Respirations > 45/min or < 15/min
    - Perfusion – No radial pulse or capillary refill times >2 seconds.
    - Mental status – unable to follow simple commands
  - All patients who cannot walk but have respiratory effort, and do not meet criteria for RPM as above should be categorized into the DELAYED (**Yellow**) category.

ACUTE ADRENAL INSUFFICIENCY

EMR

- ❑ Take thorough history of patient's steroid use/dependence, PMH
- ❑ Assess and support ABC's
- ❑ Oxygen therapy to maintain pulse oximetry >95%.
- ❑ Monitor vitals

EMT

- ❑ Check blood glucose
- ❑ If blood glucose is <60: administer glucose solution orally if the patient is awake and able to protect own airway
- ❑ Obtain 12 lead ECG; if time permitted.

AEMT

- ❑ If blood glucose < 60 and the patient is unable to protect own airway:
  - Initiate IV
  - Dextrose
- ❑ Fluid Bolus 500 cc NS (or 20cc/kg for peds); repeat if hypotensive with standard tubing
- ❑ Do Not Delay Transport
- ❑ IO as indicated for patient condition

EMT-I

- ❑ Monitor cardiac rhythm

PARAMEDIC

In patients with known/suspected adrenal crisis:

- ❑ Immediately administer steroid
  - **Solu-Medrol**: 20 mg IV/IM (Pediatric: 0.5 mg/kg IM, MAX 20 mg)
- ❑ If the patient has their own steroid medications prescribed by their physician, the Paramedic may administer them according to the accompanying directions. This includes **Solu-Medrol, Solu-Cortef,** and **Dexamethasone**. If dosing information is not provided with the medication, use the doses recommended above.
- ❑ Treat ECG findings of hyperkalemia

Clinical Care Pearls

- Acute adrenal crisis is an immediately ***life-threatening*** emergency, and must be treated aggressively.
- No other life saving measures will be effective without first receiving stress dose of steroids in the steroid dependent patient.
- There are no contraindications for giving a stress dose of steroids.
- More than 60 diseases can lead to Adrenal Insufficiency, including Addison's Disease, Congenital Adrenal Hyperplasia (CAH), long-term administration of steroids, pituitary gland dysfunction, auto-immune diseases, cancers, and infections.
- Acute adrenal insufficiency (crisis) can occur in the following settings:
  - During neonatal period (undiagnosed adrenal insufficiency)
  - In patients with known, pre-existing adrenal insufficiency
  - In patients who are chronically steroid dependent (i.e. taking steroids daily, long- term, for any number of medical conditions)
  - Adrenal crisis can be triggered by any acute stressor (e.g. trauma, illness, extreme emotional or physical stress), as well as by abrupt cessation of steroid use.
- Early signs of adrenal crisis: pallor, dizziness, headache, weakness, abdominal pain, nausea, diarrhea, and vomiting.
- Late signs of adrenal crisis: confusion, lethargy, hypotension, shock, cardiorespiratory failure, and death.
- Persons with adrenal insufficiency are unable to respond to physiologic stressors and may develop hypoglycemia, shock, or cardiovascular collapse that is refractory to treatment until adrenal corticosteroid replacement is given.
- All patients receiving steroids using this protocol must be transported to the hospital for further evaluation and treatment.

ALLERGIC REACTION/ANAPHYLAXIS

EMR

- Routine Medical Assessment and Intervention.
- Consider present history and possible cause (ex. bites/stings, toxic substances, nuts, fish, fruit, medications, etc).
- Evaluate for signs of a severe systemic reaction which will likely require rapid intervention and/or administration of Epinephrine:
  - Edema, hypotension, respiratory distress, vomiting.
- Oxygen as needed.
- **May utilize automatic injector device**
  - **Epinephrine (0.3mg)** into thigh or shoulder.

EMT

- **Epinephrine 1:1000 0.3 mg IM**. May repeat if the following remain: blood pressure < 100, Heart rate > 100, with associated signs of shock. If more than 2 doses of Epi needed, **contact OLMC.**
- **May assist with prescribed metered dose inhaler –** administer as indicated on prescription
- **OR if know Asthmatic/COPD with allergic reaction, may consider, Albuterol** unit dose – 2.5mg in 3cc 'pearl' administer by small volume nebulizer @ 6 to 8 LPM oxygen flow
  - Dose may be repeated as needed q 20 minutes.

AEMT

- Initiate vascular access as needed and indicated
- Obtain ECG as needed and indicated
- **Administer Normal Saline** per Shock guideline.

EMT-I

- Consider administration of **Benadryl 25-50 mg IV/IO or IM** following administration of Epinephrine or for more mild reactions.
- Consider **Nebulized Epinephrine 1:1000 0.5ml/kg (max 5ml).**

PARAMEDIC

- If no response to above treatments, consider **Epinephrine Drip at 0.5-10 mcg/min**.
- When available, may consider administration of **Solu-Medrol 125 mg IV/IO/IM**

Clinical Care Pearls

- Epinephrine Drip: Mix 8 mg 1:1000 in 1000 ml NS. See flow rates in Medication Drip Appendix

BRADYDYSRHYTHMIAS

EMR

- Routine Medical Assessment and Intervention
- Oxygen per guideline if SpO_2 is less than 94%
- Position of comfort for patient.
- If patient becomes unresponsive proceed with appropriate arrest guideline.

EMT

- If equipment is available & trained, may acquire **12 lead ECG**
  - Report any computer interpretation indicating potential for **Acute ST elevation MI or STEMI** to responding ambulance.
  - May consider use of air medical resources if appropriate (see HEMS guideline)

AEMT

- Establish vascular access
- Consider administration of **Normal Saline** 250mL to 500mL bolus to maintain systolic BP of 100 mmHg

EMT-I

- Interpret limb lead ECG
- Consider **Atropine 1mg IV/IO** may repeat in 3 to 5 minutes as needed to max of 3mg

PARAMEDIC

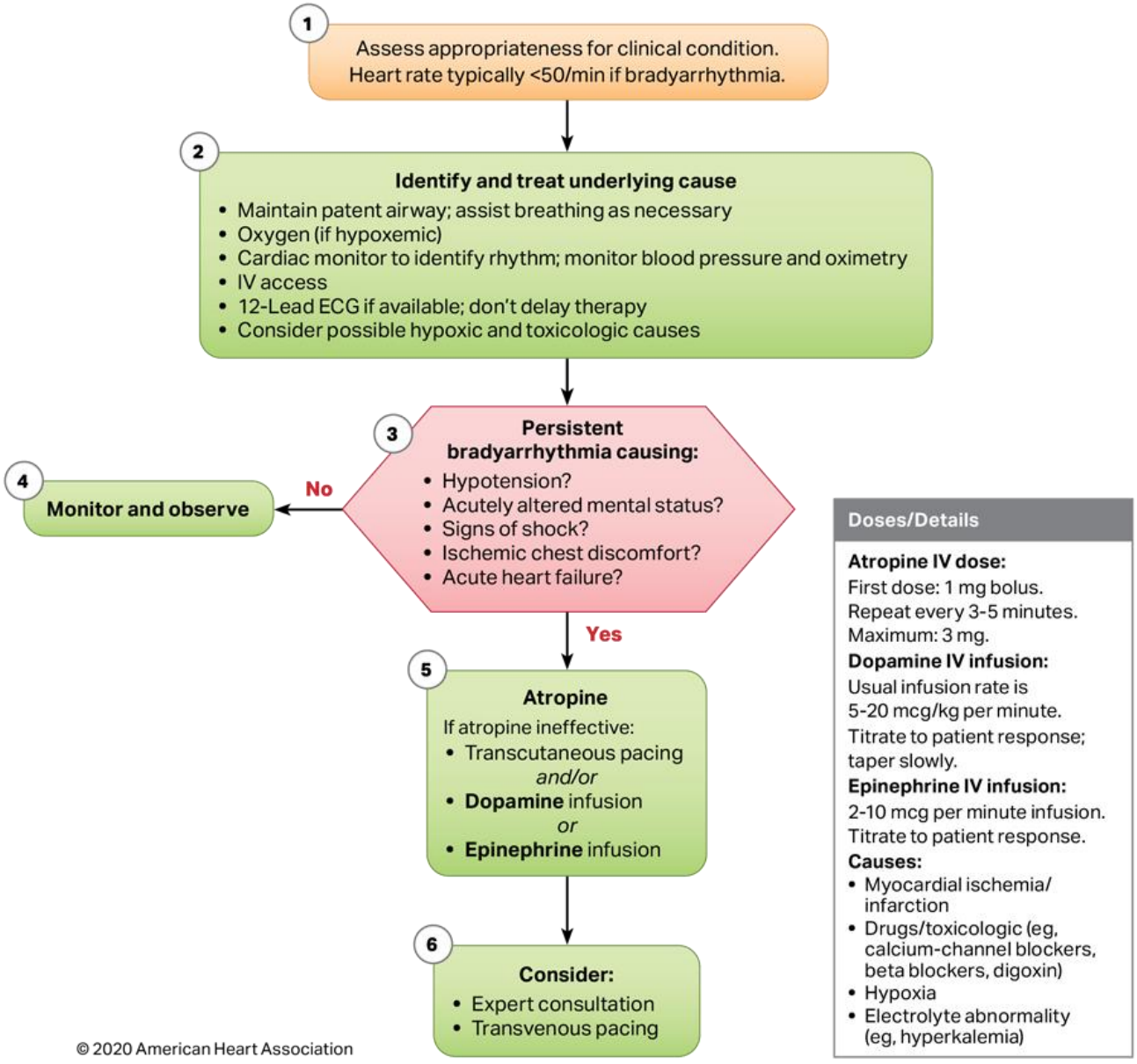
- **Acquisition and Interpretation of 12-lead ECG**
- **Transcutaneous Pacing (TCP) – See TCP procedure guideline**:
  - Consider preparing to initiate TCP in those patients presenting with 2nd degree Type II or 3rd degree AV block, but who may be asymptomatic.
  - Initiate TCP if patient presets with hypotension with other signs of instability while establishing vascular access and administering Atropine.
- If no electrical **and** mechanical capture during TCP **and** BP <90 then consider the following if available:
  - **Epinephrine Drip 2-10 mcg/min IV/IO**

Clinical Care Pearls

- Patients should be considered **symptomatic** if they display: HR <60 **with** BP <90 systolic **and/or** one or more of the following:
  - Altered mental status
  - Pale, cool, diaphoretic skin
  - Chest pain
  - Syncope
  - Dyspnea
- Patient's presenting with chest pain with associated bradycardia, and who are not hypotensive are likely experiencing an ischemic cardiac event. Treat these patients according to the Chest pain – ACS – STEMI guideline.

BRADYDYSRHYTHMIAS CONT.

Adult Bradycardia
(With Pulse)



CARDIAC ARREST MANAGEMENT

EMR

- ❑ Routine Medical Assessment and Intervention.
- ❑ **Immediately initiate CPR at a rate of 100 per minute** per current AHA guidelines for approx. 2 minutes while attaching AED.
- ❑ **Analysis of rhythm – Deliver Shock if AED advises**
- ❑ **Continue CPR immediately;** making efforts to minimize interruptions of chest compressions & analyze rhythm every two minutes until advanced life support arrive.
- ❑ Ensure concurrent use of Airway guideline(s).
- ❑ Determine underlying cause of arrest if able; see Hs and Ts on next page
- ❑ Pause compressions for ventilations if simple airway adjunct is in place.
- ❑ Rotate crew member performing chest compressions every two minutes.

EMT

- ❑ Consider placement of **supraglottic device** if authorized and trained
- ❑ Initiate **Capnography** if available/trained.

AEMT

- ❑ **Initiate peripheral IV line.**
- ❑ **Normal saline infusion** at TKO rate unless volume loss suspected. If volume loss, give **250-500 cc fluid challenge.**
- ❑ **Consider Adult IO if no peripheral IV line**

EMT-I

- ❑ **May utilize manual defibrillation when indicated per manufactures recommendation**
- ❑ During 2-minute periods of CPR administer medications of possible benefit as outlined below:

ALL RHYTHMS:

- ❑ **Epi 1:10,000 1 mg IVP** repeat q 3-5 min throughout resuscitation efforts.

***SHOCKABLE RHYTHMS (VF/VT)*:**

- ❑ Administer anti-arrhythmic medication**:**
  - **Lidocaine 1-1.5 mg/kg IVP, repeat 0.5/0.75 mg/kg IVP**
  - **Amiodarone 300 mg IVP**, **repeat 150 mg IV push**, then 150mg IV in 100ml NS over 10 minutes.

REFRACTORY VF

- ❑ After 3 attempted defibrillations move pads to anterior and posterior positions.

***NON-SHOCKABLE RHYTHMS (PEA/Asystole)*:**

- ❑ **Normal saline** up to max of 1000 mL

PARAMEDIC

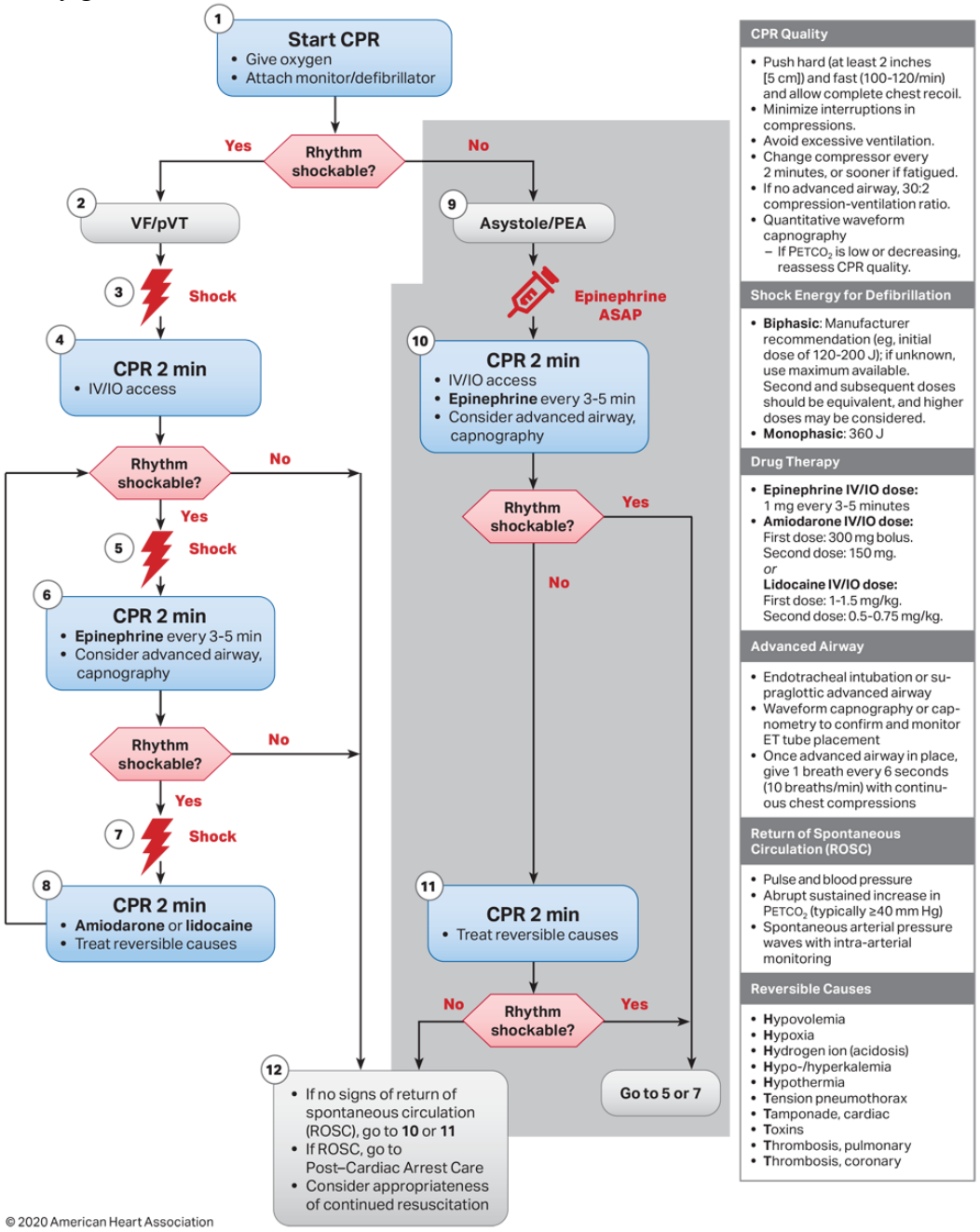
SHOCKABLE RHYTHMS (VF/VT)

- ❑ Suspected torsades de pointes or hypomagnesemia condition
  - **Magnesium Sulfate 2 grams** (dilute in 20 ml NS) for 10% solutions and administer IV over 2 minutes.
- ❑ Suspected hyperkalemia/calcium channel blocker OD
  - **Calcium Gluconate 2 gram and/or**
  - **1 mEq/kg Sodium Bicarb IVP**
  - **Do Not** mix Sodium Bicarb with Calcium Gluconate. Slowly flush first med prior to administering the second medication.

CARDIAC ARREST MANAGEMENT (CONT.)

Clinical Care Pearls

- Transport all ROSC patient to closest available Cath lab when:
  - Patient's presenting rhythm was V-Tach or V-fib even in the absence of ST elevation
  - Patient's post-code 12 lead ECG shows ST elevation
  - Follow STEMI alert procedure
- Consider Hs and Ts for potential reversible causes and treat according to appropriate clinical guideline(s)
  - **H**ypovolemia – see shock guideline; **H**ypoxia; **H**ydrogen Ion (acidosis) – see respiratory & sodium bicarbonate guidelines; **H**yper/**H**ypokalemia – see dialysis emergencies guideline; Hypothermia – see environmental emergencies guideline
  - **T**ension pneumothorax – see chest decompression procedure; **T**amponade (cardiac) – see shock guideline; **T**oxins – see toxic exposures guideline; **T**hrombosis (Pulmonary/cardiac) – see respiratory guidelines



CHEST PAIN / ACS / STEMI

EMR

- ❑ Routine Medical Assessment and Intervention
- ❑ Oxygen per guideline if SpO_2 is less than 94%
- ❑ Position of comfort for patient.
- ❑ If patient becomes unresponsive proceed with cardiac arrest guideline.
- ❑ **ASA 324 mg (chewable by mouth)**.

EMT

- ❑ May assist patient with **prescription NTG**, if systolic BP is greater than 100 mmHg; may repeat q 3-5 min for a total of 3 doses.
- ❑ If equipment is available & trained, may acquire **12 lead ECG**
  - Report any computer interpretation indicating potential for **Acute ST elevation MI or STEMI** to responding ambulance.
  - May consider use of air medical resources if appropriate (see HEMS guideline)

AEMT

- ❑ Establish vascular access prior to NTG if possible.
- ❑ Consider **NTG 0.4mg** SL q 5 minutes PRN to maintain systolic BP of 100 mmHg

EMT-I

- ❑ Interpret limb lead ECG
- ❑ Pain management per pain management guideline

PARAMEDIC

- ❑ **Acquisition and Interpretation of 12-lead ECG**
- ❑ Consider **STEMI** in the following situations:
  - Chest Pain with no LBBB, **AND**
    - >1 mm ST elevation in 2 contiguous lateral leads (I, aVL, V4, V5, & V6) **OR**
    - >1 mm ST elevation in 2 contiguous inferior leads (II, III, & aVF) **OR**
    - >2 mm ST elevation in two contiguous chest leads (V1, V2, & V3)
  - If LBBB is present consider Sgarbossa Criteria:
    - Concordant ST elevation > 1mm in leads with a positive QRS complex (score 5)
    - Concordant ST depression > 1 mm in V1-V3 (score 3)
    - Excessively discordant ST elevation > 5 mm in leads with a negative QRS complex (score 2)

Clinical Care Pearls

- ❑ **MEDICATION WARNING:** NTG is contraindicated if pt has taken any erectile dysfunction medication (Viagra, Levitra, or Cialis) within last 24 hours.
- ❑ Differential diagnosis for non-traumatic chest pain should include: AMI; Aortic aneurism; PE; Pneumothorax (simple, tension, and spontaneous); Pericarditis; GERD; Gastrointestinal distress; Pleuritis.
- ❑ Index of suspicion for silent AMI should increase in patients who display any of the following symptoms - regardless of chest pain: Syncope; N/V of unknown etiology; CHF/pulmonary edema; Fatigue; Generalized pain outside of typical chest pain or chest discomfort.
- ❑ Index of suspicion for silent AMI should increase in patients who report any of the following risk factors - regardless of chest pain: Previous MI; HTN; Age > 60; Women; Diabetics.
- ❑ **Transporting crews should notify the receiving hospital of a declared STEMI in order to allow for adequate time to activate appropriate resources (e.g., Cath lab) – See STEMI Alert Procedure.**

CHILDBIRTH & OBSTETRICAL EMERGENCIES

EMR

- ❑ Routine Medical Assessment and Interventions
- ❑ Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- ❑ Oxygen as indicated, if SpO_2 is below 94%

NORMAL DELIVERY

- ❑ Use clean or sterile technique
- ❑ Guide and control, but do not retard or hurry delivery
- ❑ After delivery of head - check to see if umbilical cord is looped around infant's neck - if so, remove from head.
- ❑ Suction mouth (not throat), then nose with bulb syringe
- ❑ Complete delivery:
  - Keep infant level with perineum
  - Dry infant off and wrap in warm, dry, clean blanket
  - Check vitals; record APGAR
  - Clamp cord in two places approximately 8"-10" from infant, cut cord between clamps
  - If pink, crying, and good tone (APGAR >8) then, place on mother's abdomen, cover warmly. Allow nursing.
  - If multiple deliveries expected, do not allow nursing until all deliveries completed
  - If APGAR <8 then see Newborn/Neonatal Resuscitation Guideline.
- ❑ Massage uterus to aid in reducing blood loss
- ❑ Repeat APGAR at 5 min postpartum

CORD PROLAPSE

- ❑ Insert gloved hand in vagina; gently elevate presenting body part to relieve pressure on cord.
- ❑ Place mother in knee/chest position
- ❑ Transport immediately

BREECH/LIMB PRESENTATION

- ❑ Transport immediately, with mother in left lateral recumbent position

A - EMT

- ❑ Initiate vascular access as needed and indicated.
  - Large bore, adjust rate as needed for situation
- ❑ If patient's SBP < 100 mmHg treat per "Shock" guideline

PARAMEDIC

POSTPARTUM BLEEDING

- ❑ Deep fundal massage

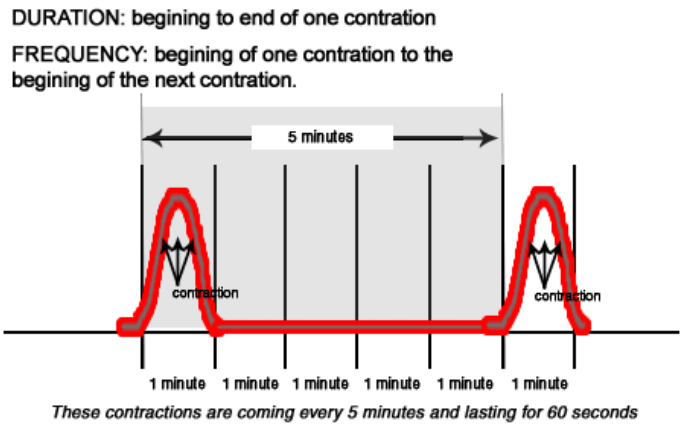
ECLAMPSIA SEIZURES

- ❑ Initially treat seizures per "Seizure" guideline
- ❑ **Mag Sulfate -** 4 g in 20 mL NS for 10% solution and administer over 2 to 3 minutes.

CHILDBIRTH & OBSTETRICAL EMERGENCIES CONT.

CONSIDERATIONS:

- Do not pull on the cord
- Remember, babies are slippery
- Some elements of patient history should include: Gravida/Para (number of pregnancies/number of live births); due date; level and frequency of prenatal care; any problems with pregnancies; any abnormal bleeding; any excessive swelling; and the presence of hypertension.
- When assessing contractions it is important to obtain the duration and frequency.
  - Duration time is measured from the start of the contraction to the end of the contraction.
  - Frequency time is measured from the start of one contraction to the start of the next.
- Contractions longer in duration and more frequent likely indicate delivery is close. timing should
- If equipment is available, providers should make an attempt to obtain fetal heart rates.



These contractions are coming every 5 minutes and lasting for 60 seconds

- Providers should conduct a visual exam of the perineum to assess:
  - Excessive bleeding
  - Evaluate color of fluids (assess for meconium)
  - Check for crowning.

CVA/TIA

EMR

- Routine Medical Assessment and Interventions
- Obtain SpO_2, and $ETCO_2$, readings via non-invasive devices if equipment is available/trained.
  - Attempt to maintain ETCO2 readings between 32mmHg and 35mmHg
- Administer Oxygen as indicated (SpO2<94%)
- Position of comfort for patient – consider elevation of the patient's head to 30 degrees if possible.
- Complete 'Cincinnati Pre-Hospital Stroke Assessment" or "BEFAST Assessment".
- If onset of signs/symptoms can be definitively narrowed to < 24 hours and there is no improvement noted, then **Rapid Transport (code 3)** and **Stroke Alert** are indicated.
  - In situations where emergent transport times may exceed 15 minutes, consider the use of Aero-Medical – See HEMS guideline.
- May acquire a 12-Lead ECG to relay to incoming Paramedic level providers if trained and equipment is available

EMR

EMT

- **Check glucose level**
  - If abnormal findings are noted, consider administration of **Oral Glucose** per diabetic emergencies guideline.

EMT

AEMT

- Initiate **vascular access**
- Obtain Standard **ECG**
- Consider administration of **Normal Saline** to maintain systolic blood pressure > 100mmHg.
- May administer **Dextrose IV/IO** to hypoglycemic patients presenting with stroke like symptoms – see diabetic guideline

AEMT

EMT-I

- May consider **Ondansetron 8mg IV/IO/IM** (over 1-2 minutes), for nausea

EMT-I

PARAMEDIC

- Acquire and interpret 12-lead as appropriate

PARAMEDIC

Clinical Care Pearls

- Consultation with OLMC is always appropriate if there are questions regarding patient destination.
- Hospital staff may direct ambulance personnel directly to CT unit with patient upon arrival if onset is within the 24-hour window; the patient does not show signs of improvement, and there is no immediate concern for airway compromise. Be sure to relay information during HEAR report.
- Providers should have a high index of suspicion for the presence of an intracranial vascular emergency for those patients presenting with acute onset of central neurological signs/symptoms (e.g., headache, vision changes). Even in the absence of a positive Cincinnati exam, providers may consider calling a stroke alert for these patients.

Interpretation: if any of these 3 signs is abnormal, the probability of a stroke is 72%

Arm Drift

The patient closes eyes and extends both arms straight out, with palms up for 10 seconds

- Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)
- **Abnormal – one arm does not move or one arm drifts downward**

Facial Droop

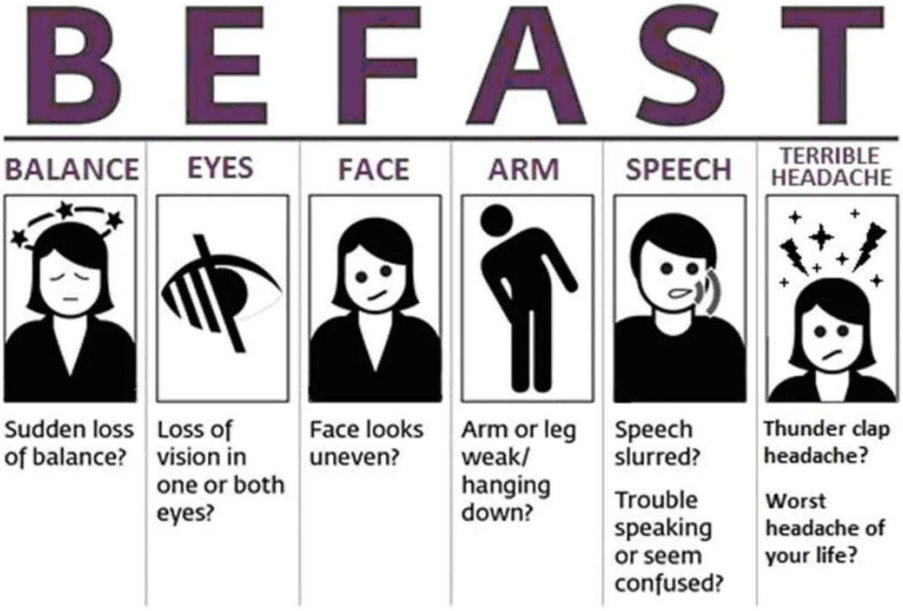
The patient shows teeth or smile

- Normal – both sides of the face move equally
- **Abnormal – one side of the face does not move as well as the other side**

Abnormal Speech

The patient repeats "you can't teach an old dog new tricks"

- Normal – patient uses correct words with no slurring
- **Abnormal – patient slurs words, uses the wrong words, or is unable to speak**



DIABETIC EMERGENCIES

EMR

- Airway, ventilation, and oxygen as needed

EMT

- Obtain blood glucose level
- If glucose level is < 60 mg/dl and patient is able to control airway administer **oral glucose**.
- Re-assess and document blood glucose level after the administration of glucose, Dextrose, or Glucagon

AEMT

- If pt. is unable to take oral glucose, establish a large bore IV with Normal Saline.
- Administer **Dextrose (12.5gm - 25gm)** IV/IO.
- If unable to establish an IV, administer **Glucagon 1 mg IM**, repeat q 20 mins
- For hyperglycemia > 250 mg/dL and patient exhibiting AMS, Kussmaul respirations, dry skin with poor turgor, and/or ketotic breath: **NS 500 mL** fluid challenge then TKO and reassess. Consider rapid transport.

EMT-I

- If Glucagon is ineffective, and IV access is unobtainable, consider IO access.
- If the patient refuses transport encourage them to eat protein or carbohydrates. If possible, ensure the patient does not remain alone.

PARAMEDIC

Clinical Care Pearls

- Hypoglycemia can present as confusion, Intoxication, Behavior problems, Stroke-like signs and symptoms, especially in elderly patients, seizures, and coma
- Check for unusual odor on patient's breath and medic alert tags.
- Pt history of diabetes, last insulin dose, and use of oral antidiabetic Rx should be noted.
- Hx regarding control diabetes and frequency of EMS intervention.
- If administering high concentration dextrose (D50W), dextrose should be administered through a running IV line with a minimum of 250 mL NS infused after administration

DIALYSIS EMERGENCIES

EMR

- Routine Medical Assessment and Intervention
- Oxygen as indicated SpO_2 is less than 94%

HEMORRAGE:

- Use of direct pressure and elevation as needed

EMT

AEMT

- Initiate vascular access as needed and indicated – **do not use fistula**.

HYPOTENSION/VOLUME PROBLEMS:

- Administer **Normal Saline** as needed to maintain systolic BP of 100mmHg.
  - Do not to exceed two liters of fluid.

CHF/PULMONARY EDEMA DUE TO MISSED DIALYSIS:

- **CPAP if indicated and available –** set pressure to approximately **2-10 cmH_2O**

EMT-I

- Limb-lead ECG & Interpretation

CHF/PULMONARY EDEMA DUE TO MISSED DIALYSIS:

- **NTG 0.4 mg SL** repeated q 3-5 min, titrated to effect and BP >100 systolic. If more than 4 doses required contact **Medical Control.**

PARAMEDIC

- Acquire and interpretation of 12-lead ECG

ISCHEMIC CHEST PAIN:

- Treat in accordance with Chest Pain/ACS/STEMI Guideline

HYPERKALEMIA (suspected):

- 4 doses Nebulized **Albuterol 2.5mg** in 3mL continuously.
- Consider Calcium Gluconate 1 gram IV/IO push over 5-10 minutes and/or
- Consider 1 mEq/kg Sodium Bicarb IVP over 2 minutes
- **Do Not** mix Sodium Bicarb with Calcium Gluconate. Slowly flush first med prior to administering the second medication.

CARDIAC ARREST:

- Sodium Bicarb, 50 mEq, IVP.
- 1 gram slow IVP Calcium Gluconate

Clinical Care Pearls

- If a renal failure/dialysis patient presents with marked weakness, respiratory insufficiency rapid assessment is essential to determine potential treatable causes in the pre-hospital setting.
- If monitor shows widened QRS (>.14 msec) and small or absent P waves; or showing a sine wave pattern, patient should be considered hyperkalemic until proven otherwise, and treated accordingly.
- Evidence of desired effect includes narrowing of QRS and improved perfusion

ENVIRONMENTAL EMERGENCIES

EMR

- Routine Medical Assessment and Interventions.
- Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%

HYPOTHERMIA (CORE TEMP < 93° F):

- Handle patient gently – avoid sudden/jerky movement if possible.
- Remove from environment: note length of exposure.
- Remove wet clothing.
- Provide gentle re-warming to head, chest, groin, armpits.
- Do not re-warm frostbitten extremities if there is any risk of refreezing.
- Assist with ventilation as necessary
- If patient is in cardiac arrest, begin CPR - **If shock advised, defibrillate one time only**

HYPERTHERMIA (CORE TEMP > 105° F):

- If skin is hot, red and dry
  - Remove clothing
  - Place ice packs in groin and axilla
- Mist patient with water to promote evaporative cooling and/or cover with wet sheets allowing good air flow.
- Obtain frequent vital signs & re-assess patient's status frequently

EMT

ALL SITUATIONS:

- Check blood glucose

AEMT

ALL SITUATIONS:

- Initiate vascular access as needed and indicated
- Consider administration of **Normal Saline 250mL bolus** as needed (warmed – if hypothermia; room temperature if hyperthermia).

EMT-I

ALL SITUATIONS:

- Obtain ECG as needed and indicated

HYPOTHERMIA:

- Withhold anti-arrhythmic and epinephrine in cardiac arrest until core temperature > 86° F. Then treat as normal per ACLS

PARAMEDIC

HYPOTHERMIA:

- Withhold endotracheal intubation if patient has perfusing pulse and a respiratory effort – assist only.
- If patient has ROSC, focus on supportive care and ventilator support. Withhold anti-arrhythmic medications unless otherwise indicated – See cardiac arrest management guideline.

ALL SITUATIONS:

- If patients present with seizure activity, may consider **Midazolam 1.25mg to 2.5mg** IV/IO/IM/IN as indicated to control seizure – Note dose is ½ normal. Consider OLMC consultation if additional medication is required.

ENVIRONMENTAL EMERGENCIES CONT.

Clinical Care Pearls

- Hyperthermia may exhibit via several signs/symptoms which have descriptive terms. These conditions/terms represent an increase in severity and acuity. These include:
  - Heat cramps: abdominal or leg cramps – usually indicates electrolyte imbalance and need for rest and hydration. Body's normal temperature regulation mechanisms remain intact, but can deteriorate if exposure/exertion continues.
  - Heat exhaustion: Usually a gradual onset and presents with pale and moist skin and signs/symptoms of dehydration (e.g., tachycardia, tachypnea, compensatory shock). Body is losing the ability to thermo regulate.
  - Heat stroke: Presents with altered mental status, hot/red and dry skin. This is a true medical emergency, and represents the inability for the body to thermo regulate. Rapid intervention is essential.
- The potential for hypothermia exists year-round in Oregon. As a result, providers should not overlook the need to keep patients warm during transport situations – even if providers are uncomfortable. The following provides some perspective on signs/symptoms of hypothermia:
  - Shivering occurs between 93-98^{o} F (34-37^{o} C)
  - Shivering stops when body temperatures fall below 90^{o} F
  - The heart is more likely to fibrillate if core temp falls below 86^{o} F (30^{o} C) and will likely not convert until body temperatures increase to >88^{o} F (31^{o} C)
  - Hypothermic patients should receive warm IV fluids if available

Mild	Moderate	Severe
>93^{o}F	**86 ^{o}F to 93 ^{o}F**	**< 86 ^{o}F**
• Shivering • Lethargy • Staggering gait	• Shivering lessens • Confusion • Loss of balance	• Stupor • Coma • Dysrhythmias • Cardiac arrest

GENERAL PAIN MANAGEMENT

EMR

- Routine Medical Assessment and Intervention.
- Oxygen as appropriate.
- Position of comfort.
- Splinting as appropriate for suspected fractures and/or dislocations.

EMT

AEMT

- **Initiate vascular access**

EMT-I

- May consider **Fentanyl 50 mcg IV/IO/IM/IN**, titrated to reduction in pain.
- May consider **Toradol**, **15mg IV/IM/IO** only for those patients not likely to undergo surgical intervention(s) for their injury and/or illness.
- Consider **Ondansetron 8mg IV/IO/IM; -*OR*- 8mg PO** *Orally disintegrating tablet* for associated nausea. Repeat x1 q 15 minutes.

PARAMEDIC

- May consider **Midazolam 1-2.5 mg IV/IO/IM/IN** for added sedation and to potentiate effects of pain medications.
- May consider **Dilaudid, 1-2 mg IV//IO/IM, contact OLMC for additional doses**
    - Half dose for patients > 70 years old
- May consider **Ketamine 0.2 mg/kg IV/IO (2 min push) or 0.5 mg/kg IM** as a stand-alone pain management. NOTE: Those receiving Ketamine for analgesia should also receive 1-1.5 mg Midazolam to reduce potential for negative emergence reaction.

Clinical Care Pearls

- Obtain level of pain via 1-10 scale.
- Administration of narcotic analgesia should be completed in an incremental manner - Providers have the discretion to administer a lower starting dose if desired.
- Providers must ensure adequate time between administrations of narcotic analgesia to allow for onset of action/effect. Administrations spaced too closely may result in over sedation. – especially when used in conjunction with other medications (e.g., Versed, Ketamine).
- In most situations, the use of narcotic analgesia should be reserved for those patients with moderate to severe pain. Mild pain may be managed by restrictions of movement/immobilization.
- Nausea/vomiting associated with the administration of narcotic analgesia are frequently the result of rapid administration of the medication. Individual doses of narcotic analgesia should be administered over 1 to 2 minutes.
- Toradol is an effective pain management adjunct in the presence of back and /or flank pain.

HYPERTENSIVE EMERGENCIES

EMR

- Assess and support ABC.
- Oxygen Administration.
- Elevate the head of the bed 15-20 degrees if possible.
- Monitor vitals and level of consciousness every 5 min.

AEMT

- Establish IV with saline lock.
- IO as indicated

PARAMEDIC

Sustained elevation in BP> 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either or both).

- 10 mg Labetalol IV/IO slow IVP over 1-2 minutes.
- May repeat twice (3 doses total) every 15 minutes.
- Depending on the effect of the preceding dose, double the remaining doses (e.g., 1st dose 10mg, 2nd dose 20mg, 3rd dose 40mg, with a Maximum total dose of 70mg). Target systolic BP 140-150 mmHg and diastolic BP 90-100 mmHg. Stop administration if HR < 60 bpm or other adverse effects.

Clinical Care Pearls

- The treatment of uncontrolled and sustained hypertension in pregnant and postpartum women.
- The treatment of uncontrolled and sustained hypertension with symptomatic hypertension (e.g. vision disturbance, headache, chest pain, ataxia, or any acute neurological change).

OVERDOSE

EMR

- ❑ Routine Medical Assessment and Interventions
- ❑ Obtain SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- ❑ Oxygen as indicated, if SpO_2 is below 94%
- ❑ If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.
- ❑ If the patient is unconscious, place in the recovery position and follow the Routine Assessment Guideline.
- ❑ If airway is compromised with no gag reflex, consider use of an oropharyngeal airway

SUSPECTED NARCOTIC OD:

If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan 2-4mg,** repeat as needed, until respiratory drive returns.

EMR

EMT

- ❑ May consider placement of **supraglottic** airway if approved and trained
- ❑ If the patient is unconscious, check blood glucose. If < 60 follow the Diabetic Emergencies Guideline.

EMT

AEMT

- ❑ Initiate vascular access as needed and indicated
- ❑ Consider **Normal Saline TKO** or if the patient is hypotensive or tachycardic consider administration of **250 to 500mL fluid bolus.**

SUSPECTED NARCOTIC OD:

- ❑ If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan, 0.4-2mg IV/IN 2-4mg IM/ IN** repeat as needed, until respiratory drive returns.

AEMT

EMT-I

SUSPECTED NARCOTIC OD:

If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan, 0.4-2mg IV/IO, 2-4mg IM/IN**, repeat as needed, until respiratory drive returns.

EMT-I

PARAMEDIC

TRICYCLIC OD:

- If widening QRS (greater than 0.12 seconds) **or** BP<100, **or** HR>120 then, **Sodium Bicarb 1.0 mEq/kg IVP.**

CALCIUM CHANNEL BLOCKER:

- If patient is unstable/grossly symptomatic an unresponsive to fluids then consider:
  - **Glucagon 3 mg IM or slow IV/IO.** May repeat q five minutes to up to max of 15 mg.
  - After OLMC consider **Calcium Gluconate 1 gm IV/IO** over 5-10 minutes

BETA BLOCKERS:

- If patient is unstable/grossly symptomatic then consider:
  - **Glucagon 3 mg IM or slow IV/IO.** May repeat q five minutes to up to max of 15 mg.

EXTRAPYRAMIDAL REACTIONS:

- Consider administration of **Benadryl 25-50 mg slow IV/IM**

PARAMEDIC

Clinical Care Pearls

- **Poison Control**: 1-800-222-1222
- **Tricyclic Medications**: amitryptyline (Elavil, Endep) chlomipramine (Anafranil), desipramine (Norpramine, Pertofrane), doxipin (Sinequan, Apapin); imipramine–(Tofranil, Presamine), nortryptaline (Avenyl, Pamelor), protryptaline (Vivactil), trimipramine (Surmontil). Combination medications containing tricyclics: Limbitrol, Triavil, Tryptazine, Perphenyline

POST ARREST CARE - (POST - ROSC)

EMR

- ❑ Routine Medical Assessment and Interventions
- ❑ Continue to monitor SpO_2, $ETCO_2$, via non-invasive devices when equipment is available.
- ❑ Institute basic measures to maintain blood pressure

EMT

- ❑ If placed, monitor adequacy of **cuffed pharyngeal device** to maintain $SpO_2 \geq 94\%$ and $ETCO_2$ of 35 to 40 mmHg
  - If cuffed pharyngeal device not placed, consider placement as per Airway guideline.
- ❑ Obtain capillary blood specimen for blood glucose evaluation.

AEMT

- ❑ Initiate vascular access as needed and indicated
- ❑ Consider administration of **Normal Saline 250mL bolus** as needed to maintain blood pressure.
  - Do not exceed 2 liters of fluid.
- ❑ Administer **Dextrose** for those patients with low blood glucose levels – see diabetic emergencies guideline.
- ❑ May consider placement of **Adult IO access** if vascular access has not been obtained.

EMT-I

- ❑ Continue ECG monitoring

PARAMEDIC

- ❑ Obtain and interpret **12-Lead ECG** – Activate STEMI alert if indicated.

REFRACTORY HYPOTENSION:

- ❑ **Epinephrine drip – 0.1 to 0.5 mcg/kg/min** titrate to a systolic BP $\geq$100 mmHg

POST ARREST SEDATION & PARALYSIS:

- ❑ If patient begins to shiver, move or awaken, reconfirm placement of advanced airway, then, consider **Versed 2.5 - 5 mg IV/IO/IN titrate to effect with SBP >100 mmHg to max of 15mg**.
- ❑ If transport time is greater than 15 minutes and unable to maintain sedation with Versed, may administer **Vecuronium, 0.1 mg/kg** IV/IO max 10 mg/dose.

CPR INDUCED CONSCIOUSNESS DURING MECHANICAL CPR

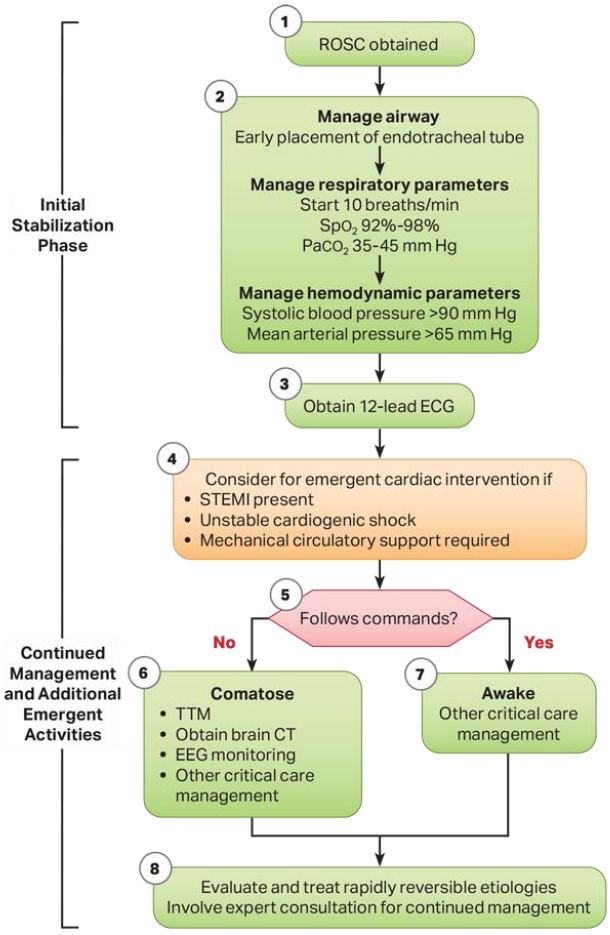
- ❑ If patient displays signs of consciousness such as eye opening, purposeful movement, or verbal response treat as follows:
- ❑ **Ketamine, 2mg/kg IVP/IO**

POST ARREST CARE - (POST - ROSC) CONTINUED

Clinical Care Pearls

- Do not hyperventilate (use end tidal CO2 as a guide).
- Appropriate levels of sedation must always precede chemical paralysis.

Adult Post – Cardiac Arrest Care



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

RESPIRATORY DISTRESS

EMR

- Routine Medical Assessment and Interventions
- Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%
- If foreign body obstruction, follow AHA guidelines for adult choking.
- Position of comfort for patient
- If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.

EMT

KNOWN ASTHMATICS/COPD:

- **Albuterol** unit dose – 2.5mg in 3cc 'pearl' administer by small volume nebulizer @ 6 to 8 LPM oxygen flow
  - Dose may be repeated as needed q 20 minutes.
- **Assist with prescribed metered dose inhaler –** administer as indicated on prescription

BRONCHOSPASM/COPD:

- **CPAP if indicated and available – s**et pressure to approximately **2-5 cmH_2O**
- **Administer nebulized bronchodilator**
  - Duo-neb unit dose "pearl" - nebulized via SVN in 3mL total solution. May repeat q 10 minutes x 2 for total of 3 doses. Defer to Albuterol – as above, if patient is taking Spiriva or has peanut allergy.

CHF/PULMONARY EDEMA/PNEUMONIA:

- **CPAP if indicated and available –** set pressure to approximately **2-10 cmH_2O**

- Initiate vascular access as needed and indicated

PNEUMONIA:

- May consider nebulized bronchodilator
  - **Albuterol** unit dose – 2.5mg in 3cc 'pearl' administer by small volume nebulizer @ 6 to 8 LPM oxygen flow
    - Dose may be repeated as needed q 20 minutes.
- Consider administration of **Normal Saline 250mL bolus** as needed.

EMT-I

- Obtain ECG as needed and indicated

CHF/PULMONARY EDEMA:

- **NTG 0.4 mg SL** repeated q 3-5 min, titrated to effect and BP >100 systolic. If more than 4 doses required contact **Medical Control.**

RESPIRATORY DISTRESS CONT.

PARAMEDIC

BRONCHOSPASM/COPD:

- If severe & continued bronchospasm, unresponsive to nebulized bronchodilator and initial dose of IM Epi, may consider **Epi drip at 0.5-10 mcg/min IV/IO**.
- When available, administer **Solu-Medrol, 125 mg IV/ IM** following reversal of bronchospasm.
    - **Contact OLMC** for patients >50 years old or who have a history of coronary artery disease.

SEVERE ASTHMA:

- Consider Mag Sulfate 2 grams in 20 mL NS for 10% solution, administer over 2-3 mins.

PARAMEDIC

Clinical Care Pearls

- Respiratory distress is a common and often life-threatening complaint in the pre-hospital setting. Providers should use every tool available to select the appropriate treatment regime. Providers should also continually be aware that many conditions create a symptom of respiratory distress without a disease process of the lungs themselves.
- Consider the following differential diagnoses while assessing respiratory complaints.
    - Bronchospasm – (asthma, emphysema, bronchitis, COPD), CHF, Pneumonia, AMI, ARDS, Pneumothorax – (simple, tension, and spontaneous), PE, Psychosomatic / Anxiety, Metabolic, Anaphylaxis, Trauma, Croup
- Concurrent preparation for ETI should occur in every patient placed on CPAP.
- Patients receiving CPAP who continue or abruptly deteriorate should be immediately evaluated for pneumothorax.
- To prepare Epi drip mix 8 mg Epi 1:1000 in 1000 ml NS (concentration = 8 mcg/mL)

ROUTINE ASSESSMENT/INTERVENTIONS

EMR

- All individuals identified as "patients" should have a complete assessment attempted. This assessment should include, but not be limited to:
  - Obtaining a history and/or determining the mechanism of the present illness or injury.
  - Obtaining applicable medical history, medications, allergies, and social situation.
  - Obtaining a summary of findings and information obtained by first responders
  - Completion of a physical assessment and diagnostic interventions as appropriate.
- Basic vital signs include: pulse rate, respiratory rate, blood pressure, SpO_2, $ETCO_2$, and mentation (GCS). **If possible, baseline vital signs should be obtained manually and before any medications are administered**.
  - Vital signs should be monitored and recorded as follows:
    - Unstable patients, every 5 min.
    - Stable patients transported from a scene, every 15 min.
    - Stable Interfacility transport patients, every 30 min.
    - Unstable Interfacility transport patients, every 5 min
- Pain should be assessed using a 0-10 scale before and after every treatment of pain (chest pn, musculoskeletal, etc) and with every set of vital signs when appropriate.
- In any patient where spinal immobilization was performed or considered, the presence or absence of a sensation to light touch, distal circulation, and motor function in all extremities should be assessed and recorded: (if immobilized, assess and record pre and post).
- Sensation, circulation, and motor function should be assessed for all extremity injuries or complaints.
- Oxygenation and ventilation should be assessed and provided as needed during all patient encounters.
- The expedient packaging and transport of patients is central to out of hospital care. Therefore, the risks and benefits of on scene interventions must be carefully considered. In general, interventions for a medical chief complaint may be initiated on scene while interventions in trauma, shock and OB complications should be completed during transport.
- Alert the hospital as soon as possible of your transport.
- Contacting On-Line Medical Control (OLMC) for any unusual or unfamiliar situations is encouraged.
- QRT's should notify responding transport unit, as soon as possible, of:
  - Patient Gender
  - Chief Complaint
  - Level of Consciousness
  - Unusual Vital Signs (normal signs may be reported as "within normal limits")
  - Consider reducing ambulance response mode if patient condition and situation warrants. If unsure, consultation with responding advanced life support unit would be appropriate.
- QRT's should render care and (if possible) package patient for transport prior to ambulance arrival. This is especially vital with trauma patients

EMR

ROUTINE ASSESSMENT/INTERVENTIONS CONT.

EMT

- Blood glucose testing on all patients with altered mentation
- Allowed to obtain ECG and 12-lead recordings, if trained.
- Conduct a BEFAST assessment to rule out CVA with altered mentation.

AEMT

- Establish IV or IO as appropriate. Lung sounds should be assessed and recorded in all patients receiving IV fluids.
- Pediatric IO access may be initiated in pediatric patients in extremis where other IV access is not possible in a timely manner; any med given by IV may be given by IO.

EMT-I

- ECG monitoring for potentially life-threatening complaints (chest pain, SOB, abdominal pain) and/or anyone who may benefit from monitoring.

PARAMEDIC

- Interpretation of 12-lead ECG for potential cardiac event and/or STEMI

Clinical Care Pearls

- TKO means about 20 ml/hr.
- Normal Saline: contact Medical Control if necessary to administer greater than 2L.

SEIZURES

EMR

- Routine Medical Assessment and Interventions
- Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%
- Ensure safety of patient by removing potential hazards from the immediate surroundings (e.g., chairs etc). Place patient in 'recovery' position during post-ictal period. Do not attempt to physically restrain an actively seizing patient.
- If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.

EMT

- Acquire peripheral blood specimen for blood glucose monitoring.
  - Follow diabetic emergency guideline as indicated

AEMT

- Initiate vascular access as needed and indicated.
- May consider Glucagon if hypoglycemic – see Diabetic Emergencies Guideline
- Consider administration of **Normal Saline 250mL bolus** as needed.

EMT-I

- Obtain ECG as needed and indicated.

PARAMEDIC

- If seizure persists more than 5 minutes or seizure recurs before patient returns to consciousness then:
  - **Midazolam (Versed) 2.5 to 5mg IV/IO/IN**. May repeat as needed in 10 minutes.
  - Consider advanced airway interventions if seizure is prolonged and patient becomes aspiration risk.

Clinical Care Pearls

- Be sure to allow for adequate time for pharmacological interventions to take effect prior to administration of additional doses.
- If RSI is undertaken in the seizing patient, it is important to understand despite absence of movement, seizure impulses remain and will require administration of benzodiazepine medications.

SEPSIS

EMR

- ❑ Routine Medical Assessment and Intervention
- ❑ Oxygen per guideline if SPO2 is less than 94%.
- ❑ Place the patient in position of comfort
- ❑ If the patient becomes unresponsive proceed with appropriate guideline.
- ❑ **Obtain full set of vital signs including temperature.**
- ❑ Consider ETCO2

EMT

- ❑ Obtain blood glucose level
- ❑ If glucose level is <60 mg/dL and patient is able to control airway administer oral glucose.

AEMT

If suspected infection and patient has 1 or more of the following:

- ❑ Systolic Blood Pressure <100 mmHg
- ❑ Respiratory Rate > 22 breaths per minute (and/or EtCO2 < 25 mmHg)
- ❑ Fever > 100.6
- ❑ Altered Mental Status (GCS <15)

Initiate vascular access

- ❑ Consider **Normal Saline 500- 1000 mL bolus** as needed to maintain Systolic BP > 100 mmHg. Repeat once if continued signs of shock and no pulmonary edema present **(DO NOT exceed 2 Liters of fluid)**.
- ❑ If blood glucose is <60 mmHg and the patient is unable to protect their own airway:
  - Dextrose (12.5gm-25gm) IV/IO

EMT-I

- ❑ Obtain ECG as needed and indicated.

PARAMEDIC

- ❑ Acquire and interpret 12-lead
- ❑ If shock state is unresponsive to fluid therapy and/or is likely due to sepsis, may consider administration of vasopressor.
  - **P**ush dose Epi: 1 mL 1:10,000 drawn up in 9 mL of normal saline SLOW IVP**.** May repeat every 1-5 minutes as needed **OR**
    Epi infusion 2-10 mcg/min IV/IO.

Clinical Care Pearls

- ❑ **DO NOT** delay transport to obtain vascular access.
- ❑ Relative hypotension should be considered with systolic blood pressure of less than or equal to 100 mmHg.
- ❑ Relative tachycardia should be considered with any heart rate greater than or equal to 120 bpm.
- ❑ Sepsis is a rapidly progressing, life threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and/or death.
- ❑ To prepare Epi drip mix 8 mg EPI 1:1000 in 1000 mL (concentration = 8 mcg/mL)

SHOCK

EMR

- Routine Medical Assessment and Interventions
- Obtain SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%
- If able, without risk of exacerbating injury etc, position patient to ensure maximum circulation – legs elevated 8 to 10 inches and on left side.
- Control bleeding as indicated
- Maintain normal body temperature as much as possible – use of silver space blanket; avoid removal of clothing unless necessary.
- Consider entry into Trauma System if appropriate – see Trauma Entry Procedure

EMT

- If anaphylactic shock suspected, consider Epinephrine – See Allergic Reaction/Anaphylaxis guideline

AEMT

- Initiate vascular access as needed and indicated.
  - Consider 2 large bore IVs if patient presents with unstable signs/symptoms – do not delay on scene if ambulance transportation is available to initiate IV/fluid resuscitation.
- Consider **Normal Saline 250 to 500mL bolus** as needed to maintain Systolic BP > 100mmHg (do not exceed 2 liters of fluid).
  - If Cardiogenic shock is suspected, monitor lung sounds closely and conservatively administer fluids. Discontinue fluids if any signs of pulmonary edema present.
  - May consider adult IO placement if peripheral access limited or non-existent

EMT-I

- Obtain ECG as needed and indicated.

PARAMEDIC

- **Acquisition and Interpretation of 12-lead ECG**
- If shock state is unresponsive to fluid therapy and/or is likely due to cardiogenic or sepsis, may consider administration of vasopressive medications (where available):
  - Push Dose Epi: 1 mL Epi 1:10,000 drawn up in 9 mL of normal saline SLOW IVP. May repeat every 1-5 minutes as needed. **OR** Epinephrine Drip 2-10 mcg/min IV/IO.

Clinical Care Pearls

- Do not delay patient transport to obtain vascular access.
- Relative hypotension should be considered with a systolic blood pressure of less than or equal to 100mmHg.
- Relative tachycardia should be considered with any heart rate greater than or equal to 120 bpm.

TACHYDYSRHYTHMIAS

EMR

- Routine Medical Assessment and Intervention
- Oxygen per guideline if SpO_2 is less than 94%
- Position of comfort for patient.
- If patient becomes unresponsive proceed with appropriate arrest guideline.

EMT

- If equipment is available & trained, may acquire **12 lead ECG**
  - Report any computer interpretation indicating potential for **Acute ST elevation MI or STEMI** to responding ambulance.
  - May consider use of air medical resources if appropriate (see HEMS guideline)

AEMT

- Establish vascular access

EMT-I

- Interpret limb lead ECG
- Pain management per pain management guideline

STABLE NARROW COMPLEX TACHYCARDIA:

- **Vagal** maneuvers

STABLE WIDE COMPLEX TACHYCARDIA:

- **Amiodarone 150 mg IV drip @ 15 mg/min** - Follow with 1mg/min maintenance drip.
- **Lidocaine 1.0-1.5 mg/kg SLOW IV –** Follow with 1-4 mg/min maintenance drip.

PARAMEDIC

- **Acquisition and Interpretation of 12-lead EC**

STABLE NARROW COMPLEX TACHYCARDIA:

- Narrow complex with regular QRS – consider **Adenosine 12mg** rapid IV push. May repeat x 1
- Narrow complex with irregular QRS (A-Fib or A-Flutter) – consider **Cardizem 0.25mg/kg slow IV**. May repeat x 1 with **0.35mg/kg IVP. Max 30mg per dose.**
- Narrow complex where Wolf Parkinson White (WPW) known or suspected - consider **Amiodarone 150mg IV drip @ 15mg/min,** follow with 1mg/min drip.

UNSTABLE TACHYCARDIAS:

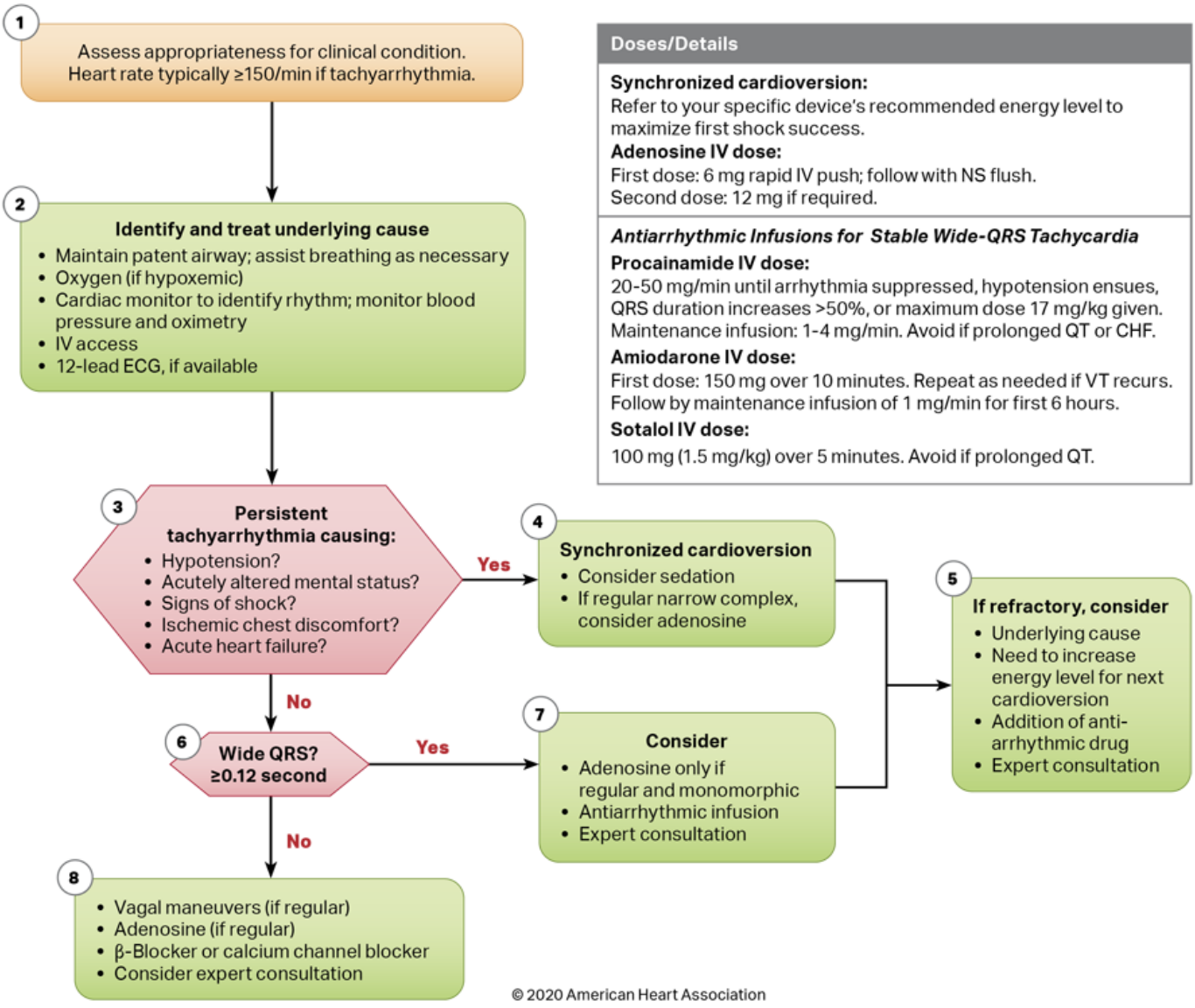
- **Synchronized Cardioversion –** see cardioversion procedure guideline

Clinical Care Pearls

- **MEDICATION WARNING:** If patient is taking Carbamazepine (Tegretol) or Dipyridamole (Persantine), or if asthmatic with active bronchospasm, administer ½ the normal Adenosine dose
- Adenosine has a half-life (in the body) of 6-10 seconds; administer quickly and follow immediately with 20cc flush.
- Other potential causes for tachydysrhythmias include: Hypovolemia; Hypoxia; Cardiac Tamponade; Tension Pneumothorax; Hypothermia; Pulmonary Embolism; Drug Overdose; Hyper/Hypo-kalemia; Acidosis.

TACHYDYSRHYTHMIASCONT.

Adult Tachycardia
(With Pulse)



TOXIC EXPOSURES & POISONING

EMR

- Routine Medical Assessment and Interventions
- Obtain SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94% - However, be aware of potential erroneous SpO_2 readings in some poisoning/toxic situations (e.g., CO exposure). When in doubt as to SpO_2, provide oxygen.
- If the patient is unconscious, place in the recovery position and follow routine patient assessment and care guideline.
- If airway is compromised with no gag reflex, consider use of an oropharyngeal advanced airway, if approved.
- Consider contacting poison control and/or medical control or if Haz-Mat related exposure – consider contacting regional Haz-Mat team for assistance.
- If skin irritation due to chemical exposure – flush with water for 30 minutes
  - DO NOT irrigate with water if exposure was to Lye.

EMR

EMT

- If patient is unconscious, check blood glucose. If < 60 follow the hypoglycemia Guideline.
- If toxic exposure to the eyes – may carefully remove contact lenses if applicable and able to do so safety. See Eye Injuries guideline.

EMT

AEMT

- Initiate vascular access as needed and indicated
- Consider **Normal Saline TKO** or if the patient is hypotensive or tachycardic consider administration of **250 to 500mL fluid bolus.**
- If the patient has an altered level of consciousness and a narcotic overdose is suspected follow Overdose guideline.
- May administer bronchodilator if patient is suffering from bronchospasm associated with exposure – See Respiratory Distress guideline.

HALOGENATED HYDROCARBON SOLVENTS

- Use caution with administration of Beta-adrenergic medications (**Albuterol**) as these medications may either precipitate or exacerbate cardiac dysrhythmias.

AEMT

EMMT-I

- Obtain ECG as indicated and initiate care for dysrhythmias per applicable Cardiac guideline(s).

HALOGENATED HYDROCARBON SOLVENTS

- Consider longer interval between administrations of **Epinephrine** in cardiac arrest situations.

EMT-I

TOXIC EXPOSURES & POISONING CONT.

P

- If patient is unconscious consider establishment of an advanced airway

ORGANOPHOSPHATE EXPOSURE:

- May administer **Atropine 2 MG IV or IM every 3-5 min** until lung sounds are clear to auscultation.

CARBON MONOXIDE AND/OR CYANIDE EXPOSURE:

- If source of CO exposure (combustion) is likely to contain Hydrogen Cyanide or the patient is suspected of having been exposed to cyanide, and is presenting with unstable signs/symptoms may consider administration of **Cyano-Kit (Hydroxocobalamin) 5 g IV/IO to max of 10 g**
  - Consider contacting mutual-aid for additional doses early in multiple patient situations and/or significant exposures.

HYDROGEN FLOURIDE (hydrofluoric acid) EXPOSURES:

- Inhalation exposure – Mix 1 ml of 10% Calcium Gluconate with 3 ml of NS in nebulizer and administer.

P

Clinical Care Pearls

- Perform scene size-up and ensure crew safety. In a hazardous materials incident, stage up wind of the incident, and do not attempt to treat any patients who have not been decontaminated. Be especially suspicious of scenes in which many people or animals appear to be affected.
- Beware of the potential for the pt. to vomit spontaneously. Following any form of cyanide ingestion, emesis may off-gas toxic hydrogen cyanide, placing rescuers and health care workers at risk.
- Beware of the potential for seizures or altered level of consciousness due to toxic exposures.
- Beware of potential for cardiovascular collapse and respiratory compromise due to toxic exposures.
- Carbon monoxide clinical manifestations

SpCO %	Clinical Manifestations
0-4%	None - Normal
5-9%	Minor Headache
10-19%	Headache, Shortness of Breath
20-29%	Headache, Nausea, Dizziness, Fatigue
30-39%	Severe Headache, Vomiting, Vertigo, ALOC
40-49%	Confusion, Syncope, Tachycardia
50-59%	Seizures, Shock, Apnea, Coma
60% -up	Coma, Death

AMPUTATION/CRUSH INJURY

EMR

- ❑ General Trauma Assessment & Interventions
- ❑ Oxygen moderate to high flow as needed to ensure SpO_2 >94%. Evaluate for need of Ventilatory support.
- ❑ Protect patient from hypothermia – maintain body temperature as close to normal as possible
- ❑ Control hemorrhage as indicated for scope & training.

***CRUSH INJURY*:**

- ❑ If pelvis is involved, consider the use of a pelvic wrap or sling

***AMPUTATION*:**

- ❑ Cover the wound with sterile dressing and attempt to control bleeding with direct pressure
- ❑ If bleeding is not controlled apply a mechanical advantage tourniquet
- ❑ Severed part should be wrapped in gauze and placed in a water tight container which should then be placed on ice or in ice water, do not use salt or saline
- ❑ If amputation is partial splint in anatomical position, avoiding torsion and angulations
- ❑ May consider use of air-medical resources. Contact OLMC for destination facility for possible re-implantation.

EMR

EMT

EMT

AEMT

- ❑ Initiate vascular access via peripheral **IV** line (two if possible) with Normal Saline - **Do Not Delay Transport to Establish Vascular Access**
- ❑ If unable to place peripheral IV may initiate **IO** placement

CRUSH INJURY:

- ❑ For significant entrapment lasting > 2 hours prior to reperfusion, administer **1000cc NS** (provided clear lung sounds) followed by a **500cc/hr drip of NS**

AEMT

EMT-I

CRUSH INJURY:

- ❑ Initiate cardiac monitoring of baseline rhythm.
- ❑ Consider pain management as per pain management guideline

EMT-I

PARAMEDIC

CRUSH INJURY:

- ❑ For severe crush injury or suspected compartment syndrome: Consider administration of **Sodium Bicarbonate 1mEq/kg** IV/ IO prior to release of compression.
  - Consider possible need for repeat dose of **Sodium Bicarbonate 0.5mEq/kg** IV/IO with **OLMC order**
- ❑ **Albuterol 2.5mg/3ml** Nebulized @ 6-8 LPM, Repeat x 3.

PARAMEDIC

Clinical Care Pearls

- ❑ Do not use Succinylcholine for RSI in patient with severe crush injury, substitute with Vecuronium
- ❑ Contact OLMC to arrange for a surgeon if there is a need for field amputation
- ❑ With partial amputations, be sure to evaluate distal circulation.

BURNS

EMR

- General Trauma Assessment & Interventions
- Oxygen moderate to high flow as needed to ensure SpO_2 >94%. Evaluate for need of ventilation support.
- If suspected airway burns, aggressive airway management per guidelines - consider humidified O_2
- Remove jewelry and non-adherent clothing
- Monitor distal pulses on any burns that are circumferential in nature, (i.e. arms, hands, feet, legs) and monitor circumferential chest burns for adequate ventilation.
- May apply tepid water for 3 to 5 minutes to cool burned areas.
- Keep patient warm and dry
- For chemical burns refer to Hazmat section if available or contact OLMC or the regional hazmat team

EMT

AEMT

- Initiate vascular access via peripheral **IV** line (two if possible) with isotonic solution (Lactated Ringers or NS) - **Do Not Delay Transport to Establish Vascular Access**
- If unable to place peripheral IV may initiate **IO** placement
- **Fluids administration** to maintain systolic BP of 100mmHg
  - For severe burns: **NS** wide open to max of 2 liters (notify ER staff of amount administered)

EMT-I

- Cardiac monitoring
- **Pain management** as per pain management guideline

PARAMEDIC

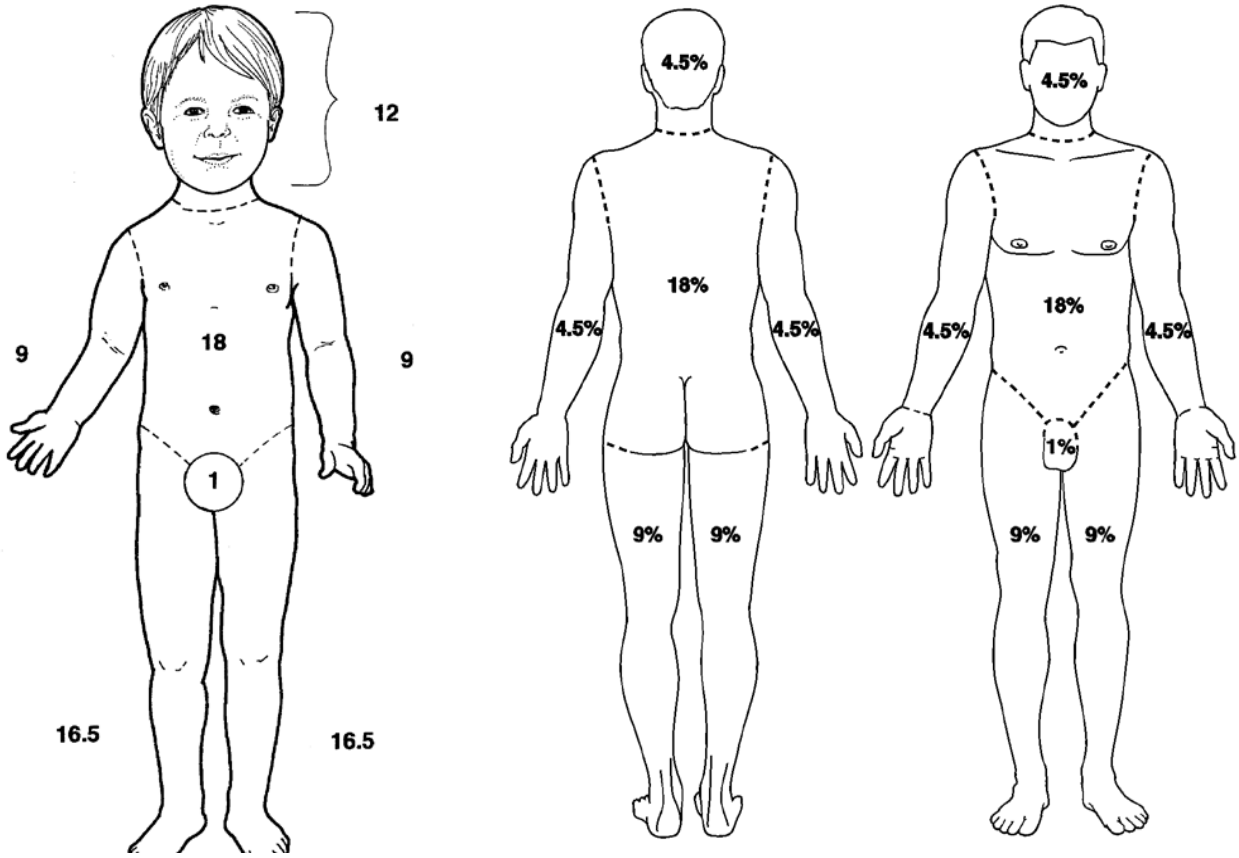
- May consider **Midazolam 2.5mg – 5mg** for sedation – see Midazolam guideline

Clinical Care Pearls

- Suspect airway burns in a patient with facial burns or burns received in an enclosed space
- Consider CO poisoning HCN exposure in any burns received in enclosed spaces
- Consider: MI in firefighters who are burned, child abuse in pediatric burns, possibility of suicide attempt
- Keep damaged skin warm
- Consider alternate transportation (helicopter) to burn center, Consult OLMC

BURNS CONT.

- Estimation of Body Surface Area:



DROWNING/ NEARDROWNING

EMR

- General Trauma Assessment & Interventions
- Initiate CPR as appropriate – see cardiac arrest management guideline
- Provide for respiratory care & oxygen as needed to ensure SpO_2 >94% - see respiratory emergencies guideline
- Position the patient to ensure adequate patency of airway – suction as required
- Initiate care for hypothermia – see environmental emergencies guideline.

EMT

- May consider **CPAP** for conscious patients who exhibit signs of pulmonary edema.
- Aggressive airway management per guidelines – consider placement of **supraglottic device** if patient has a GCS < 8 & **no gag reflex** (if available and trained).

AEMT

- Initiate vascular access via peripheral **IV** line
- If unable to place peripheral IV may initiate **IO** placement
- **Fluids administration** to maintain systolic BP of 90mmHg to a maximum of 2 Liters

EMT-I

- Initiate cardiac monitoring – See related environmental emergencies & cardiac guidelines
- May consider pain management if indicated per pain management guideline

PARAMEDIC

- Consider **Intubation/Rapid Sequence** as indicated for patients with GCS <8 or in patients requiring positive pressure ventilation/oxygenation.
  - If able to maintain adequate airway/ventilation and transport time is less than 10 minutes, continue with BLS measures and rapid transport.
- Consider **Midazolam (Versed) 2.5 to 5mg**
  For patients experiencing seizure activity – see seizure guideline.
  For combative patients – Use higher dose IM/IN to achieve sedation. Also see patient restraint guideline.

Clinical Care Pearls

- Consider possible medical condition or traumatic event as causes
- Near drowning patients may appear fine and develop complications such as pulmonary edema, ARDS, and pneumonia which may cause them to deteriorate rapidly
- Inform receiving facility of fresh v. salt water exposure and any potential for diving accident that may require hyperbaric intervention.
- Water temperature if available.

ELECTROCUTION

EMR

- ❑ General Trauma Assessment & Interventions
- ❑ Oxygen moderate to high flow as needed to ensure SpO_2 >94%. Evaluate for need of ventilation support.
- ❑ Apply appropriate cardiac related guidelines as required.
- ❑ Initiate spinal precautions as indicated by Spinal Immobilization Procedure
- ❑ Evaluate for Trauma System Entry Criteria and enter as appropriate
- ❑ Consider the need for additional resources, including alternate transportation (air-medical)
- ❑ Follow other applicable trauma guidelines as needed (e.g., Burns/Soft Tissue Injury etc)
- ❑ Assess exit site and treat accordingly.

EMT

- ❑ Aggressive airway management per guidelines – consider placement of **supraglottic device** if patient has a GCS < 8 & **no gag reflex** (if available and trained).

AEMT

- ❑ Initiate vascular access via peripheral **IV** line (two if possible) with isotonic solution (Lactated Ringers or NS) - **Do Not Delay Transport to Establish Vascular Access**
- ❑ If unable to place peripheral IV may initiate **IO** placement
- ❑ **Fluids administration** to maintain normal blood pressure and/or systolic BP of 100mmHg (do not exceed 2 liters of fluid).

EMT-I

- ❑ Initiate cardiac monitoring.
- ❑ Consider Pain Management per pain management guideline

PARAMEDIC

- ❑ Consider **Intubation/Rapid Sequence** as indicated for patients with GCS <8 or in patients requiring positive pressure ventilation/oxygenation. (**SEE NOTE BELOW**)
  - o If able to maintain adequate airway/ventilation and transport time is less than 10 minutes, continue with BLS measures and rapid transport.
- ❑ **Interpretation of 12-lead ECG –** Follow Chest Pain/ACS/STEMI guideline as needed.

Clinical Care Pearls

- ❑ Anticipate greater tissue damage than is visible externally
- ❑ Examine the patient for associated injuries to bones and internal organs and immobilize as necessary.
- ❑ Administration of IV fluids may aid in protecting the kidneys from byproducts of muscular breakdown. Providers are encouraged to administer proactive fluids (not to exceed 2 liters).
- ❑ Transport all electrical burn patients to appropriate facility.
- ❑ With electrical burns, the potential of release of muscle potassium can cause a significant increase in the serum level, which can result in cardiac dysrhythmias.
- ❑ **Elevated potassium levels can make use of depolarizing muscle relaxant Succinylcholine dangerous – Defer to Vecuronium**.

EYE INJURIES

EMR

- General Trauma Assessment & Interventions.
- Oxygen as required to maintain SpO_2>94%
- Initiate spinal precautions as indicated by Spinal Immobilization Procedure
- Evaluate "impaled" objects – secure those appearing to have penetrated the globe of the eye and also cover the unaffected eye.
- May irrigate superficial contaminants from the eyes using water and/or normal saline/drip set
  - Positively identify contaminants prior to irrigation and confirm treatment via MSDS/Product label or other appropriate source. If unsure, contact OLMC.
- Treat soft tissue injuries as per soft tissue injury guideline
- Remove contact lenses – if applicable and able to do so safely.

EMR

EMT

EMT

AEMT

- Initiate vascular access via peripheral **IV**
- If unable to place peripheral IV may initiate **IO** placement
- **Fluids administration** to maintain systolic BP of 90mmHg to a maximum of 2 Liters.
- May consider pain management if indicated per pain management guideline.

AEMT

EMT-I

EMT-I

PARAMEDIC

- Consider **Midazolam** 2-5mg IV/IO/IN/IM for sedation and/or in addition to pain management.

PARAMEDIC

Clinical Care Pearls

FRACTURES/ DISLOCATIONS/ SOFT TISSUE INJURIES

EMR

- General Trauma Assessment & Interventions.
- Oxygen as required to maintain SpO_2 >94%
- Initiate spinal precautions as indicated by Spinal Immobilization Procedure
- May consider application of ice pack to closed soft tissue injuries
- Apply sterile dressings to open fractures and control bleeding
- Splint as appropriate (in position found or position of comfort); monitor pulse, motor, and sensation distal to the injury before and after splinting.
- If pulse or sensation is absent distal to any long bone fracture: move toward anatomical position or alignment, without pulling any exposed bone back into the wound.
- Consider Pelvic wrap or sling for suspected pelvic fracture or dislocation. Secure patient to long backboard to minimize movement and blood loss.
- Consider application of traction splints to femoral shaft fractures

EMR

EMT

EMT

AEMT

- Initiate vascular access via peripheral **IV** line with normal saline - **Do Not Delay Transport to Establish Vascular Access**
- If unable to place peripheral IV may initiate **IO** placement
- **Fluid administration** to maintain systolic BP of 90mmHg to a maximum of 2 Liters.
- May consider pain management if indicated per pain management guideline

AEMT

EMT-I

EMT-I

PARAMEDIC

- Consider **Midazolam** 2-5mg IV/IO/IN/IM for suspected dislocations, femur or hip fractures in addition to pain management.

PARAMEDIC

Clinical Care Pearls

- Dislocations of the patella should be immobilized in anatomical position.

GENERAL TRAUMA GUIDELINE

EMR

- ❑ Perform assessments & interventions outlined for all EMS patients – *See Routine Medical Assessment and Intervention Guideline*
- ❑ Oxygen moderate to high flow as needed to ensure SpO_2 >94%. Evaluate for need of ventilation support and/or position the patient to ensure adequate patency of airway – suction as required.
- ❑ Protect patient from hypothermia – maintain body temperature as close to normal as possible
- ❑ Initiate spinal precautions as indicated by Spinal Immobilization Procedure
- ❑ Control hemorrhage and consider hemostatic agent & Apply tourniquet to if unable to control with routine measures.
- ❑ Perform routine wound care – protect from debris & infection by covering with appropriate dressing.
- ❑ Treat suspected fractures/dislocations; burns; and amputations as per specific guideline.
- ❑ Cover eviscerated bowel with moist sterile dressings and protect as much as possible from contamination**.**
- ❑ Stabilize suspected flail chest with bulky dressing & tape.
- ❑ Evaluate for Trauma System Entry Criteria and enter as appropriate

EMT

AEMT

- ❑ Initiate vascular access via peripheral **IV** line (two if possible) with normal saline- **Do Not Delay Transport To Establish Vascular Access**
- ❑ If unable to place peripheral IV may initiate **IO** placement
- ❑ **Fluid administration** to maintain systolic BP of 100mmHg to a maximum of 2 Liters.
- ❑ May consider pain management if indicated per pain management guideline

EMT-I

PARAMEDIC

- ❑ Suspected **Tension Pneumothorax -** in a patient with decreased lung sounds and hypotension with thoracic trauma, or a traumatic arrest.
  - **Consider needle decompression –** see needle decompression procedure

Clinical Care Pearls

- ❑ A good scene assessment is necessary to prevent injury to rescuers and further injury to the patient(s).
- ❑ Providers must determine the need for rapid extrication as a priority over spinal stabilization.
- ❑ Life threatening injuries should be identified and managed immediately upon identification.
- ❑ Transport unstable patients to closest appropriate hospital.
- ❑ Pregnant women in 2nd or 3rd trimester should be immobilized with the board tilted so that they are positioned on their left lateral recumbent when possible.

HEAD AND NEUROTRAUMA

EMR

- ❑ General Trauma Assessment & Interventions
- ❑ Oxygen moderate to high flow as needed to ensure SpO_2 >94%. Evaluate for need of ventilation support
- ❑ Determine Glasgow Coma Score (**GCS**) & evaluate neurological status repeatedly during care.
- ❑ Initiate spinal precautions as indicated by Spinal Immobilization Procedure
- ❑ Treat and transport with head elevated 30 degrees if possible.
- ❑ Manage **ETCO2 between 32-40mmHg**
- ❑ Contact OLMC to determine closest receiving facility with Neuro-surgical coverage.
- ❑ Evaluate for Trauma System Entry Criteria and enter as appropriate
- ❑ Excessive bleeding should be controlled with direct pressure when possible
- ❑ Consider the need for additional resources, including alternate transportation (air-medical)

Glasgow Coma Scale,

Eye opening	
Spontaneous	4
To loud voice	3
To pain	2
None	1
Verbal response	
Oriented	5
Confused, disoriented	4
Inappropriate words	3
Incomprehensible sounds	2
None	1
Best motor response	
Obeys	6
Localizes	5
Withdraws (flexion)	4
Abnormal flexion posturing	3
Extension posturing	2
None	1

EMT

- ❑ Evaluate **blood glucose** level
- ❑ Aggressive airway management per guidelines – consider placement of **supraglottic device** if patient has a GCS < 8 & **no gag reflex**.

AEMT

- ❑ Initiate vascular access via peripheral **IV** line (two if possible) with normal saline - **Do Not Delay Transport to Establish Vascular Access**
- ❑ If unable to place peripheral IV may initiate **IO** placement
- ❑ **Fluids administration** to maintain normal blood pressure and/or systolic BP of 100mmHg (do not exceed 2 liters of fluid).

EMT-I

- ❑ Consider **Pain management** per pain management guideline.
- ❑ May consider **Ondansetron (Zofran) 8mg** for patients experiencing severe nausea and/or vomiting may repeat x 1 in 15 minutes.

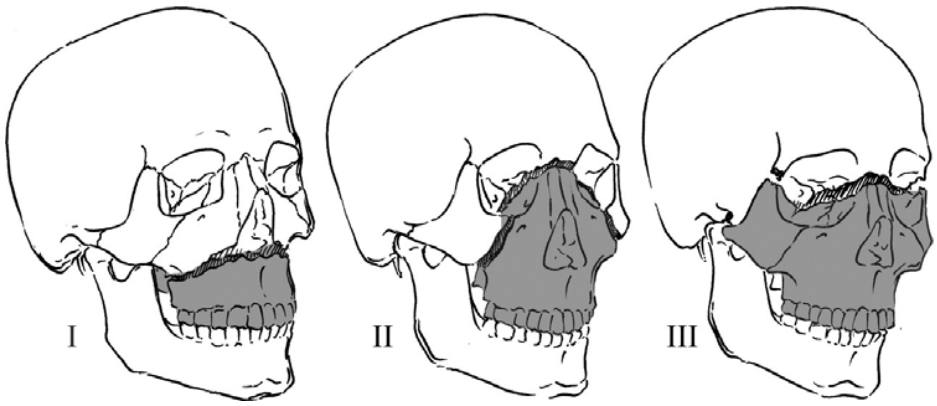
PARAMEDIC

- ❑ Consider **Intubation/Rapid Sequence** as indicated for patients with GCS <8
  - o If able to maintain adequate airway/ventilation and transport time is less than 10 minutes, continue with BLS measures and rapid transport.
- ❑ Consider **Midazolam (Versed) 2.5 to 5mg**
  - o For patients experiencing seizure activity – see seizure guideline.
  - o For combative patients – Use higher dose IM/IN to achieve sedation. Also see patient restraint guideline.
- ❑ Notify receiving facility of signs of Increased ICP
  - o May consider increasing ventilations to reduce **$ETCO_2$ to 28 to 30mmHg** if signs/symptoms (e.g., posturing, seizure, etc.) are presenting.

HEAD AND NEURO TRAUMACONT.

Clinical Care Pearls

- Patients exhibiting signs of concussion such as repetitive statements or questions, loss of consciousness, shock, etc., should be transported especially if they have a history of previous concussion or other head injury
- Maxilo-Facial trauma
  - Apply direct pressure if bleeding
  - Remove dislodged teeth from mouth
- Mid-face fractures:
  - **Le Fort I fracture**- horizontal detachment of the maxilla from the nasal floor.
    - Air passage through the nares may not be affected
    - The oropharynx may be compromised by a blood clot or edema in the soft palate.
  - **Le Fort II fracture-** *pyramidal fracture* includes the right and left maxillae, the medial portion of the orbital floor, and the nasal bones.
    - This fracture may be associated with airway compromise from significant hemorrhage.
  - **Le fort III fracture-** involves facial bones being fractured off the skull.
    - Because of the forces involved, this injury may be associated with:
      - Airway compromise
      - Presence of traumatic brain injury (TBI)
      - Injuries to the tear ducts
      - Malocclusion of teeth
      - CSF leakage from the nares



ALLERGIC REACTION/ANAPHYLAXIS - PEDIATRIC

EMR

- Routine Medical Assessment and Intervention.
- Consider present history and possible cause (ex. bites/stings, toxic substances, nuts, fish, fruit, medications, etc).
- Evaluate for signs of a severe systemic reaction which will likely require rapid intervention and/or administration of Epinephrine:
  - Edema, hypotension, respiratory distress, vomiting.
- Oxygen as needed.
- Assist with Patient's Epi Pen.

EMT

- **Epinephrine 1:1000 0.01 mg/kg IM**. May repeat if the following remain: blood pressure < 90, Heart rate > 100, with associated signs of shock, and no response to initial Epinephrine. If more than 2 doses of Epi needed, **contact OLMC.**
- **Albuterol 2.5 mg Nebulized.** May repeat PRN > 3 y/o.
- **May assist with prescribed metered dose inhaler –** administer as indicated on prescription

AEMT

- Initiate vascular access as needed and indicated
- Obtain ECG as needed and indicated
- **Administer Normal Saline 10 – 20 ml/kg**.

EMT-I

- Consider administration of **Benadryl 1 - 2 mg/kg IV/IO or IM** following administration of Epinephrine or for more mild reactions.
- If no response to IM Epinephrine, may contact **OLMC** to request use of **IV Epinephrine 1:10,000 0.1 mg/kg slow IV/IO over 3 minutes.**
- Consider **Nebulized Epinephrine 1:1000 0.5ml/kg (max 5ml).**

PARAMEDIC

- If no response to above treatments, where available may consider **Epinephrine Drip at 0.4 mcg/min**, titrate to effect, max 10 mcg/min.
- When available, may consider administration of **Solu-Medrol 2 mg/kg IV/IO/IM** (max of 125mg)

Clinical Care Pearls

- Epinephrine Drip: Mix 8 mg 1:1000 in 1000 ml NS. See flow rates in Medication Drip Appendix

BRADYCARDIA-PEDIATRIC

EMR

- Routine Medical Assessment and Intervention.
- Oxygen as indicated
- **If HR <60/min initiate chest compressions at a rate of at least 100 per minute per AHA guidelines.**
- **Continue compressions and continue to reassess** until advanced life support arrive.
- Ensure concurrent use of Airway guideline(s).
- Determine underlying cause if able
- Rotate crew member performing chest compressions every two minutes.

EMT

- If patient has no gag reflex, may consider placement of appropriately sized **supraglottic device** if authorized and trained.
- Initiate **capnography** if available/trained and appropriate (supraglottic device placed).

AEMT

- **Initiate peripheral IV/IO line.**
- **Normal saline infusion** at TKO rate unless volume loss suspected. If volume loss, give 20ml/kg fluid challenge.
- **Look for causes of arrest**

EMT-I

UNRESPONSIVE TO CPR/RESPIRATIONS:

- **Epi 1:10,000, 0.01 mg/kg IV/IO,** repeat q 3-5 min throughout resuscitation efforts.
- **Atropine 0.02mg/kg IV/IO** (minimum of 0.1 mg, maximum of 0.5 mg) may repeat x 1

PARAMEDIC

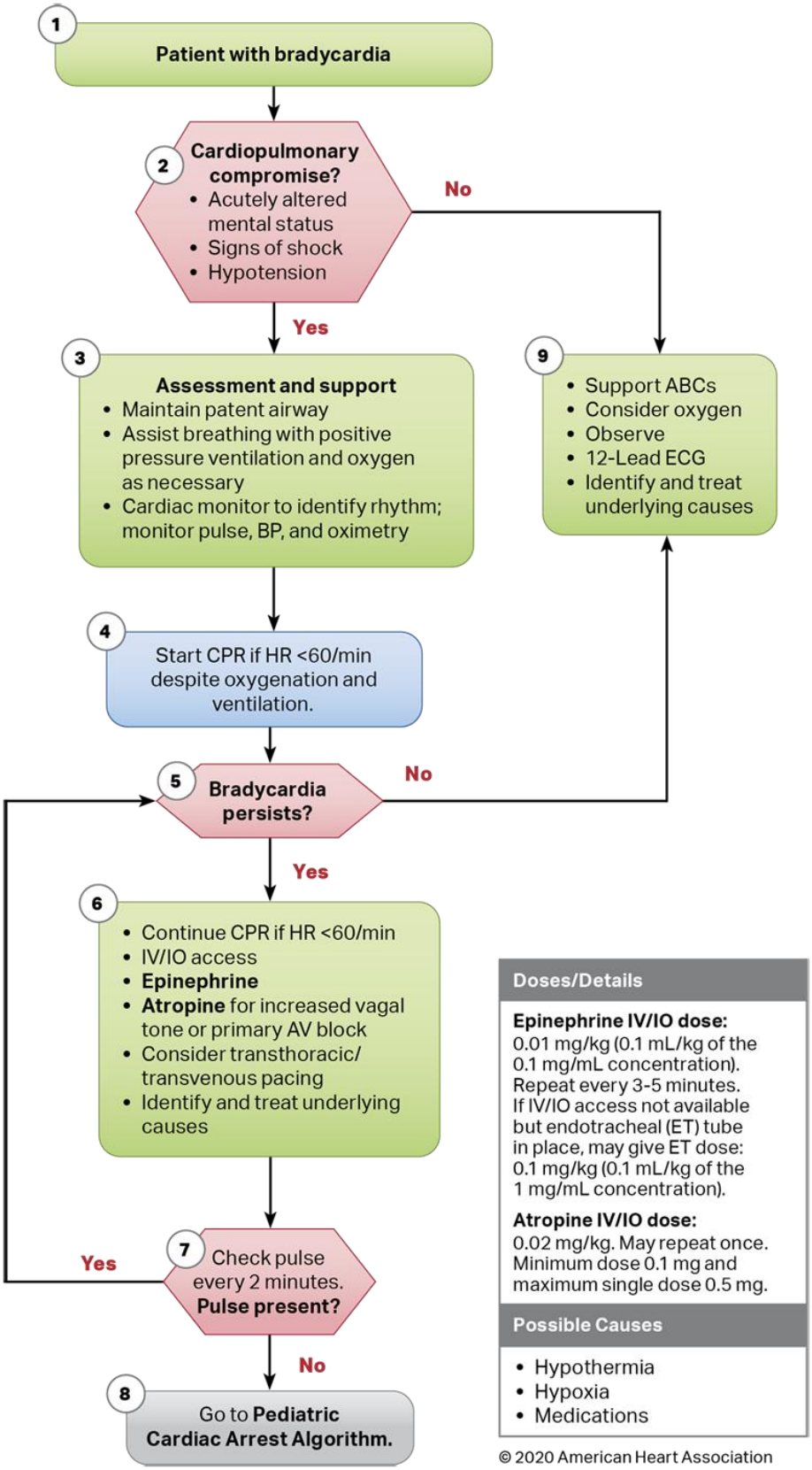
UNRESPONSIVE TO EPI AND/OR ATROPINE:

- **Consider transcutaneous pacing (TCP) – see pacing procedure**
- Consider acquisition of **12-lead ECG**

BRADYCARDIA- PEDIATRIC CONT.

Clinical Care Pearls

Pediatric Bradycardia with a Pulse and Poor Perfusion



CARDIAC ARREST MANAGEMENT - PEDIATRIC

EMR

- This guideline applies to patients >1-month-old. If <1-month-old, refer to Newborn Resuscitation guideline.
- Routine Medical Assessment and Intervention.
- **Immediately initiate CPR at a rate of at least 100 per minute** per current AHA guidelines for approx 2 minutes while attaching AED.
- **Analysis of rhythm – Deliver Shock if AED advises**
- **Continue CPR immediately –** making efforts to minimize interruptions of chest compressions & analysis of rhythm every two minutes until advanced life support arrive.
- Ensure concurrent use of Airway guideline(s).
- Pause compressions for ventilations if simple airway adjunct is in place.
- Rotate crew member performing chest compressions every two minutes.

EMT

- Consider placement of **supraglottic device** if authorized and trained
- Initiate **capnography** if available/trained and appropriate.

AEMT

- **Initiate peripheral IV/IO line.**
- **Normal saline infusion** at TKO rate unless volume loss suspected. If volume loss, give 20ml/kg fluid challenge.
- **Look for causes of arrest**

EMT-I

- **May utilize manual defibrillation when indicated per manufactures recommendation**
- During 2-minute periods of CPR administer medications of possible benefit as outlined below:

ALL RHYTHMS:

- **Epi 1:10,000, 0.01 mg/kg IV/IO,** repeat q 3-5 min throughout resuscitation efforts.
- **Look for potential reversible causes**

SHOCKABLE RHYTHMS (VF/VT):

- Administer anti-arrhythmic medication*:*
  - **Lidocaine 1mg/kg IV/IO, Infusion 20-50mcg/mg/min**
  - **Amiodarone 5mg/kg IV/IO** (dilute with NS)

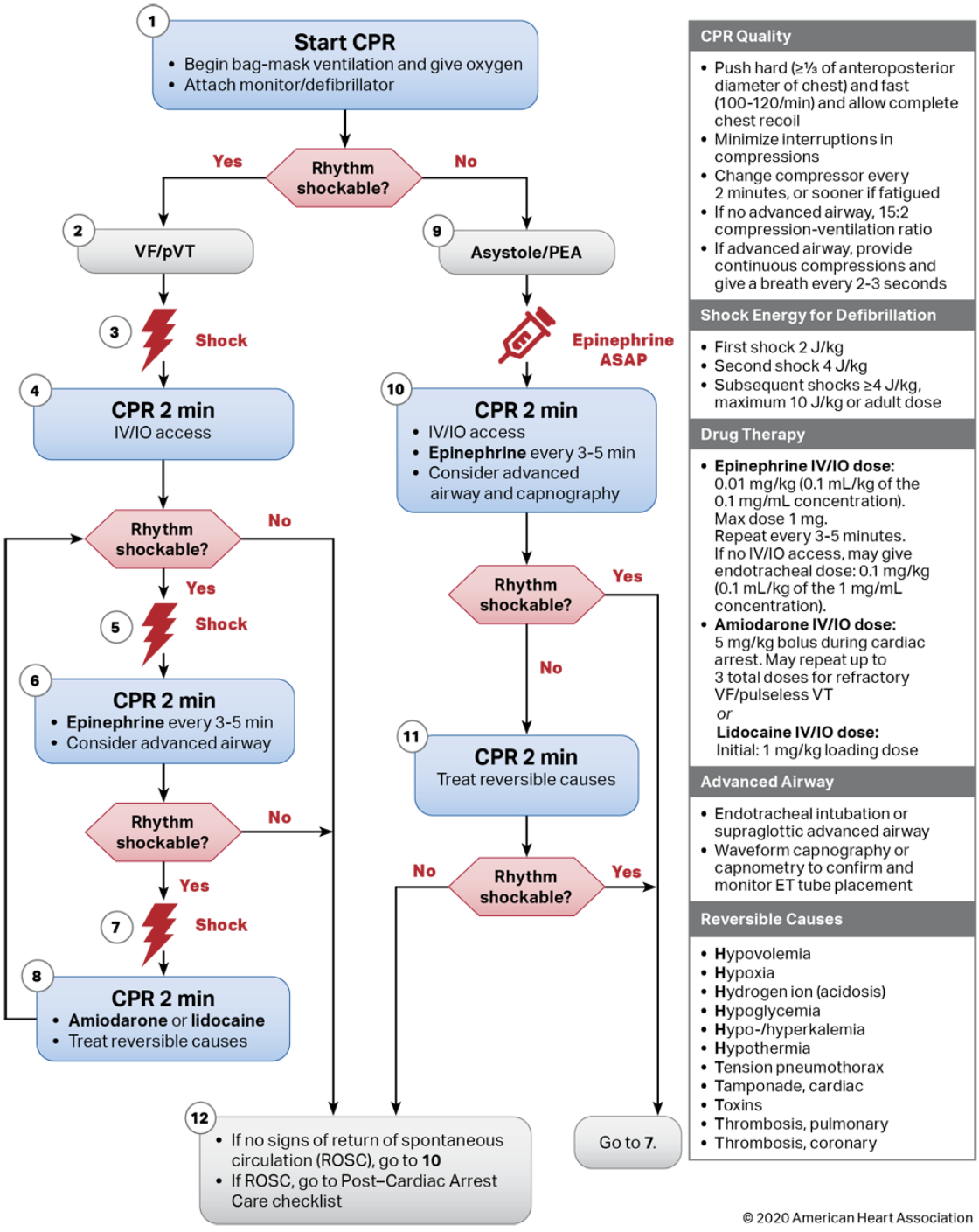
NON-SHOCKABLE RHYTHMS (PEA/Asystole):

- **Normal saline** 20ml/kg

CARDIAC ARREST MANAGEMENT- PEDIATRIC CONT.

Clinical Care Pearls

- Consider Hs and Ts for potential reversible causes and treat according to appropriate clinical guideline(s).
    - **H**ypovolemia – see shock guideline; **H**ypoxia; **H**ydrogen Ion (acidosis) – see respiratory & sodium bicarbonate guidelines; **H**yper/**H**ypokalemia – see dialysis emergencies guideline; **H**ypothermia – see environmental emergencies guideline **T**ension pneumothorax – see chest decompression procedure; **T**amponade (cardiac) – see shock guideline; **T**oxins – see toxic exposures guideline; **T**hrombosis (Pulmonary/cardiac) – see respiratory guidelines



DIABETIC EMERGENCIES -PEDIATRIC

EMR

- Routine medical assessment and interventions
- Airway, ventilation, and oxygen as needed
- If glucose level is:
  - **< 30 mg/dl** for newborn – allow breast or bottle feed
  - **< 45 mg/dl** for infants and children – If able to swallow then may administer 1 gm/kg oral glucose.

EMT

- Obtain blood glucose level
- If glucose level is:
  - **< 30 mg/dl** for newborn – allow breast or bottle feed
  - **< 45 mg/dl** for infants and children – If able to swallow then may administer 1 gm/kg oral glucose.
- Re-assess and document blood glucose level after the administration of any treatments

AEMT

- If pt. is unable to take oral glucose, establish IV/IO with Normal Saline.
- Administer **Dextrose D50 1 ml/kg in** IV/IO should be diluted 50% in NS.
- For hyperglycemia > 250 mg/dL and patient exhibiting AMS, kussmaul respirations, dry skin with poor turgor, and/or ketotic breath:
  - **NS 20 ml/kg** fluid challenge then TKO and reassess.
  - Rapid transport.
- If unable to establish vascular access, may administer **Glucagon 0.1 mg/kg IM max of 1mg**

EMT-I

- If the patient is not transported, ensure they consume protein and/or carbohydrates to avoid additional hypoglycemic episode as dextrose/glucose are short acting. Ensure the patient does not remain alone

PARAMEDIC

Clinical Care Pearls

- Check for unusual odor on patient's breath and medic alert tags.
- D10W should be administered through a running IV/IO line with a 10 to 20 ml/kg volume of NS infused after administration.
- Monitor closely for extravasation.
- To dilute D50W to lower concentration do the following:
  - **D10W** – expel 40ml of D50W and refill with 40ml of normal saline (result is 0.1 gm/ml)

GENERAL PAIN MANAGEMENT -PEDIATRIC

EMR

- Routine Medical Assessment and Intervention.
- Oxygen as appropriate.
- Position of comfort.
- Assess level of pain via Wong-Baker faces
- Splinting as appropriate for suspected fractures and/or dislocations.

EMT

AEMT

- **Initiate vascular access**

EMT-I

- May consider **Fentanyl 1 mcg/kg IV/IM/IO/IN,** titrated to reduction in pain – may repeat every 5 minutes as needed. **Max dose 4mcg/kg** for any pediatric patient.
- May consider **Toradol 0.5 mg/kg IV (max of 15mg) or 1.0 mg/kg IM (max 15mg).** Do not repeat
- Consider **Ondansetron 0.1 mg/kg max dose of 4mg IV/IO/IM** for associated nausea.

PARAMEDIC

- May consider **Midazolam 0.1 mg/kg IV/IO/IM/IN** for added sedation and to potentiate effects of pain medications.
- May consider **Dilaudid, 0.015 mg/kg IV//IO/IM**

Clinical Care Pearls

- Obtain level of pain via Wong-Baker 'Faces' pain rating scale
- Administration of narcotic analgesia should be completed in an incremental manner - Providers have the discretion to administer a lower starting dose if desired.
- Providers must ensure adequate time between administrations of narcotic analgesia to allow for onset of action/effect. Administrations spaced too closely may result in over sedation.
- Nausea/vomiting associated with the administration of narcotic analgesia are frequently the result of rapid administration of the medication. Individual doses of narcotic analgesia should be administered over 1 to 2 minutes.
- Ketamine is contraindicated in the pediatric patient.

NEWBORN RESUSCITATION

EMR

- Obtain clear history of pregnancy – term vs. pre-term; number of pregnancies vs. number of live births, pre-natal care & etc.
- Routine Medical Assessment and Interventions following delivery
- Clear & maintain airway as appropriate
- Consider blow-by Oxygen if newborn appears in moderate to severe distress
- Dry, stimulate, and maintain warmth.
- Initiate evaluation of **APGAR** @ 1 and 5 minutes
- If heart rate is < 60 bpm immediately begin **chest compressions per AHA guidelines**
- If heart rate adequate and no respiratory effort begin **mechanical ventilations via BVM**

Apgar Scale (evaluate @ 1 and 5 minutes postpartum)

	Sign	2	1	0
A	Activity (muscle tone)	Active	Arms and legs flexed	Absent
P	Pulse	>100 bpm	<100 bpm	Absent
G	Grimace (reflex irritability)	Sneezes, coughs, pulls away	Grimaces	No response
A	Appearance (skin color)	Normal over entire body	Normal except extremities	Cyanotic or pale all over
R	Respirations	Good, crying	Slow, irregular	Absent

EMT

- Evaluate **blood glucose** level if hypoglycemia suspected and treat per diabetic emergencies – pediatric guideline

AEMT

- Initiate **vascular access (IV/IO) line** as indicated
- May consider **fluid bolus of 20 ml/kg** if signs/symptoms of shock

EMT-I

- If bradycardia continues despite CPR and ventilator efforts, refer to Bradycardia – Pediatric guideline for further interventions.

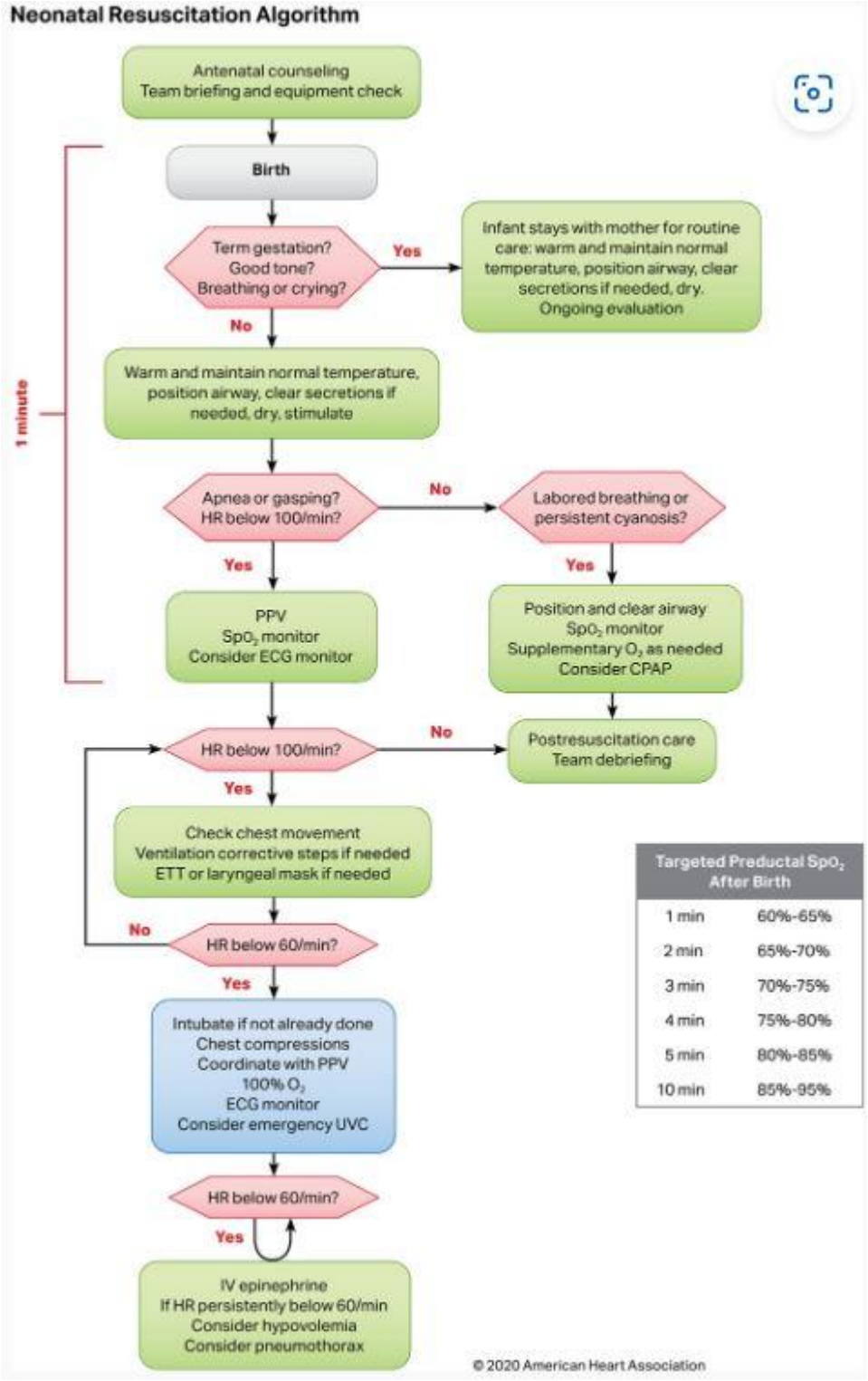
PARAMEDIC

- If meconium staining present, **immediately intubate and suction** via ETT
  - Make every effort not to ventilate patient until suctioning has been completed.
  - May require repeated intubation with clean ETT.
- Evaluate for possible hypovolemia and/or tension pneumothorax if no response to resuscitation efforts.

NEWBORN RESUSCITATION CONT.

Clinical Care Pearls

Newborn Resuscitation



OVERDOSE - PEDIATRIC

EMR

- ❑ Routine Medical Assessment and Interventions
- ❑ Obtain SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- ❑ Oxygen as indicated, if SpO_2 is below 94%
- ❑ If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.
- ❑ If the patient is unconscious, place in the recovery position and follow the Altered Level of Consciousness Guideline.
- ❑ If airway is compromised with no gag reflex, consider use of an oropharyngeal airway.

SUSPECTED NARCOTIC OD:

- ❑ If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan, 0.1mg/kg IN or auto-injection** – max 0.4 mg single doses. May repeat as needed, until respiratory drive returns.

EMR

EMT

- ❑ If patient is unconscious, check blood glucose. If hypoglycemic, follow the Diabetic Emergencies – Pediatric guideline.
- ❑ May consider placement of **supraglottic** airway if appropriate size is available and approved/trained

EMT

AEMT

- ❑ Initiate vascular access as needed and indicated
- ❑ Consider **Normal Saline TKO** or if the patient is hypotensive or tachycardic consider administration of **20 ml/kg fluid bolus.**

SUSPECTED NARCOTIC OD:

- ❑ If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan, 0.1mg/kg IV/IN/IM** – max 0.4 mg single doses. May repeat as needed, until respiratory drive returns.

AEMT

EMT-I

SUSPECTED NARCOTIC OD:

- ❑ If pinpoint pupils **and** diminished respirations **or** apnea then, **Narcan, 0.1mg/kg IV/IO/IN/IM** – max 0.4 mg single doses. May repeat as needed, until respiratory drive returns.

EMT-I

PARAMEDIC

TRICYCLIC OD:

- If widening QRS (greater than 0.12 seconds) **or** low BP<100, **or** HR>120 then, **Sodium Bicarb 1.0 mEq/kg IVP.**

CALCIUM CHANNEL BLOCKER:

- If patient is unstable/grossly symptomatic then may consider:
  - **Glucagon 0.5 mg IM** if unresponsive to fluids. Consult OLMC for additional doses.
  - **Calcium Gluconate 60mg/kg (0.6mL/kg) of 10% Solution.**

BETA BLOCKERS:

- If patient is unstable/grossly symptomatic then consider:
  - **Glucagon 0.5 mg IM**

EXTRAPYRAMIDAL REACTIONS:

- Consider administration of **1.0 mg/kg Benadryl IM or slow IV**

PARAMEDIC

Poison Control: 1-800-222-1222

- **Tricyclic Medications**: amitryptyline (Elavil, Endep) chlomipramine (Anafranil), desipramine (Norpramine, Pertofrane), doxipin (Sinequan, Apapin); imipramine–(Tofranil, Presamine), nortryptaline (Avenyl, Pamelor), protryptaline (Vivactil), trimipramine (Surmontil). Combination medications containing tricyclics: Limbitrol, Triavil, Tryptazine, Perphenyline

RESPIRATORY DISTRESS - PEDIATRIC

EMR

- Routine Medical Assessment and Interventions
- Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%
- If foreign body obstruction, follow AHA Guidelines.
- Position of comfort for patient
- If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.

EMT

KNOWN ASTHMATICS:

- **Albuterol** unit dose – 2.5mg in 3cc 'pearl' administer by small volume nebulizer @ 6 to 8 LPM oxygen flow
  - Dose may be repeated as needed q 15 minutes.
- **Assist with prescribed metered dose inhaler –** administer as indicated on prescription

BRONCHOSPASM:

- **CPAP if indicated and available –** set pressure to approximately **2-5 cmH_2O**
- If suspected allergic reaction may consider **0.01mg/kg Epi 1:1000 IM** – See allergic reaction guideline.

AEMT

- Initiate vascular access in those patients in extreme distress. Consider withholding so as not to further agitate the pediatric patient and worsen distress.
- May consider administration of **Normal Saline 10 – 20ml/kg** for those patients who's respiratory distress may be caused by dehydration and/or other volume losses.

BRONCHOSPASM:

- Administer a nebulized bronchodilator
  - **Duo-neb** unit dose - nebulized via SVN in 3 mL total solution**.** May repeat q 10 minutes x 2 for total of 3 doses. Defer to **Albuterol** – as above, if patient is taking Spiriva or has peanut allergy.

PARAMEDIC

SEVERE BRONCHIOLITIS OR CROUP

- 0.01 mg/kg **1:1,000** SQ/IM
- 0.5 mL/kg 1:1,000 nebulized

Max. dose 5 mL

BRONCHOSPASM:

- If severe & continued bronchospasm, unresponsive to nebulized bronchodilator and initial dose of IM Epi, may consider **Epi drip at 0.1-1 mcg/kg/min,** titrate to effect.

CROUP:

- Consider nebulized **Epi 1:1000 0.5 ml/kg (max 5ml)** in patients with moderate to severe symptoms.
- When available, administer **Solu-Medrol, 2 mg/kg IV/IO or IM max of 125mg** following reversal of bronchospasm.

RESPIRATORY DISTRESS – PEDIATRIC CONT.

Clinical Care Pearls

- Brochiolitis is most common in children < 2 years of age, and may be indistinguishable from asthma.
- Epiglottitis is caused by bacterial influenza, typically effects 3-8 year old and is usually accompanied by high fever. Patients will not talk, eat, or drink, and may be drooling, as their epiglottis is swollen to the point of blocking the trachea. Avoid manipulation and transport to the ED for care.
- Croup is characterized by barking cough and is the most common infectious disease in children. Croup is a viral infection of the larynx which typically affects children between the ages of 6 months to 3 years. Albuterol and/or DuoNeb are unlikely to be helpful unless patient is additionally a known asthmatic.
- Concurrent preparation for ETI should occur in every patient placed on CPAP.

SEIZURES - PEDIATRIC

EMR

- Routine Medical Assessment and Interventions
- Obtain Temperature, SpO_2, $ETCO_2$, and/or CO readings via non-invasive devices as indicated for the situation and when equipment is available.
- Oxygen as indicated, if SpO_2 is below 94%
- Ensure safety of patient by removing potential hazards from the immediate surroundings (e.g., chairs etc). Place patient in 'recovery' position during post-ictal period. Do not attempt to physically restrain an actively seizing patient.
- If suspected febrile seizure, remove clothing to aid in cooling patient – do not actively cool without OLMC consultation.
- If etiology of condition involves potentially hazardous causes (e.g., CO and etc) the toxic exposure guideline should be used in conjunction with this guideline.

EMT

- Acquire peripheral blood specimen for blood glucose monitoring.
  - Follow Diabetic Emergencies – Pediatric guideline as indicated

AEMT

- Initiate vascular access as needed and indicated.
- May consider Glucagon if hypoglycemic – see Diabetic Emergencies – Pediatric guideline
- Consider administration of **Normal Saline 20 mL/kg bolus** as needed.

EMT-I

- Obtain **ECG** as needed and indicated.

PARAMEDIC

- If seizure persists more than 3-5 minutes or seizure recurs before patient returns to consciousness then:
  - **Midazolam (Versed) 0.1 mg/kg IV/IO/IN or 0.2 mg/kg IM**. May repeat as needed in 10 minutes.
  - Consider advanced airway interventions if seizure is prolonged and patient becomes aspiration risk.

Clinical Care Pearls

- Be sure to allow for adequate time for pharmacological interventions to take effect prior to administration of additional doses.
- If RSI is undertaken in the seizing patient, it is important to understand despite absence of movement, seizure impulses remain and will require administration of benzodiazepine medications.

TACHYCARDIA-PEDIATRIC

EMR

- Routine Medical Assessment and Intervention.
- **Oxygen** per guideline if needed and appropriate.
- Obtain SpO_2
- **Immediately initiate CPR at a rate of at least 100 per minute** per current AHA guidelines if signs/symptoms of poor perfusion and/or no pulse present.
- Ensure concurrent use of Airway guideline(s).

EMT

- If patient has no gag reflex, may consider placement of appropriately sized **supraglottic device** if authorized and trained.
- Initiate **capnography** if available/trained and appropriate (Supraglottic device placed).
- If equipment is available and trained, may acquire **12-Lead ECG**.

AEMT

- Obtain IV/IO access
- Consider and treat underlying causes of tachycardia.

EMT-I

- Obtain and interpret limb-lead **ECG**
  - Evaluate for **Wide QRS** (>0.08 sec) vs. **Narrow QRS** (< 0.08 sec)

NARROW COMPLEX:

- ***Probable Sinus Tachycardia (infants <220/min – children <180/min):***
  - Consider/treat root causes within scope
- ***Probable Supraventricular Tachycardia (infants ≥220/min – children***
  - May consider **Vagal** maneuvers

WIDE COMPLEX:

- ***Stable Ventricular Tachycardia:***
  - May consider **Amiodarone 5mg/kg over 20 to 60 minutes** only after **OLMC** consultation.
  - May consider **Lidocaine 1mg/kg IV/IO (max 3mg/kg)**, Infusion 20-50 mcg/kg/min IV/IO.

PARAMEDIC

NARROW COMPLEX:

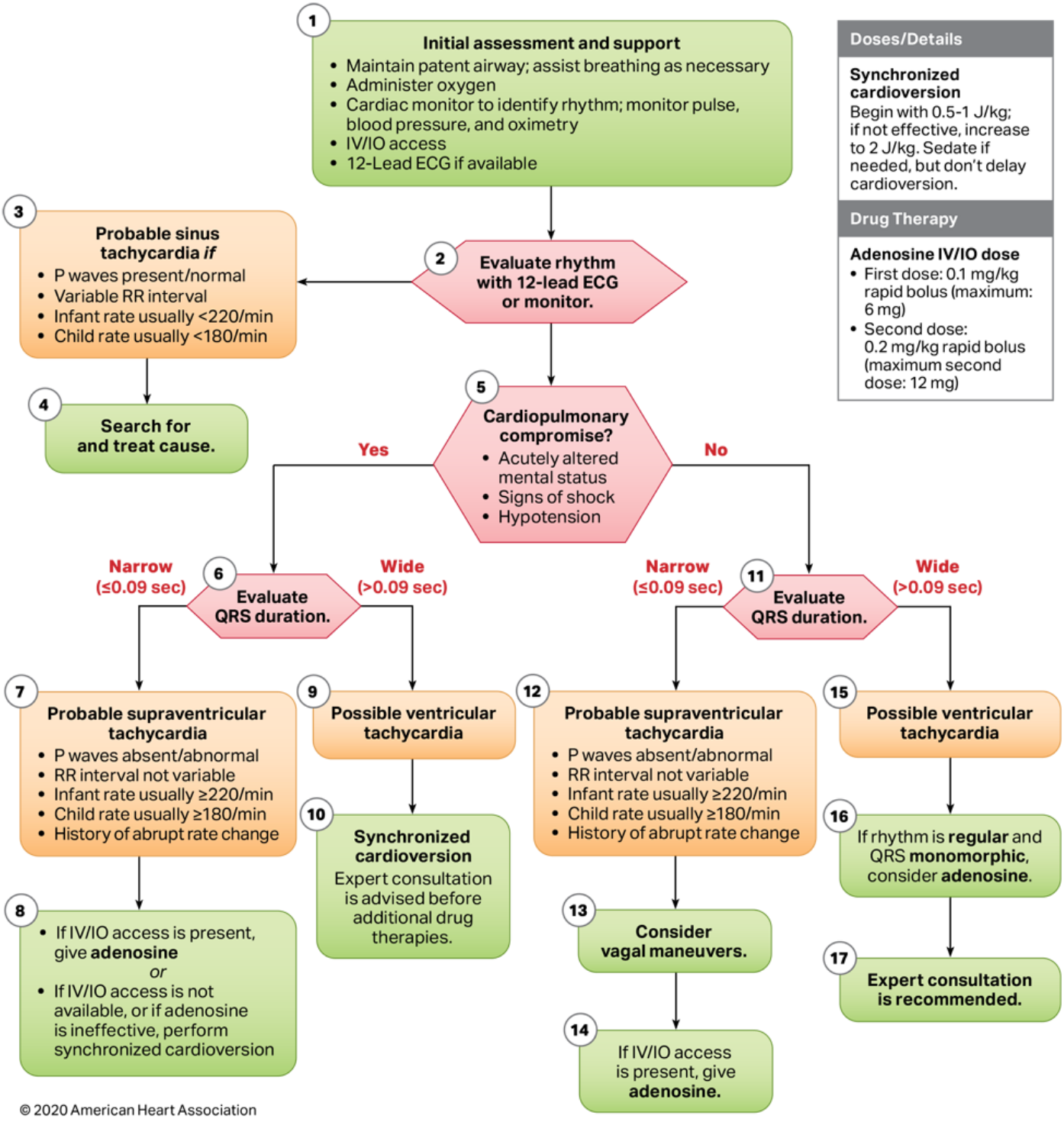
- ***Probable Supraventricular Tachycardia (infants ≥220/min – children***
  - May consider **Adenosine 0.1mg/kg (max 6mg)** may repeat x 1 at **0.2mg/kg (max 12mg)**

WIDE COMPLEX:

- ***Stable Ventricular Tachycardia:***
  - If regular and QRS monomorphic may consider **Adenosine 0.1mg/kg (max 6mg)** may repeat x 1 at **0.2mg/kg (max 12mg)**
  - If no response and remains stable may consider **Amiodarone 5mg/kg over 20 to 60 minutes**.
- ***Unstable Ventricular Tachycardia:***
  - **Synchronized Cardioversion – 0.5 to 1 J/kg may repeat at 2J/kg**
  - Consider the use of sedation during cardioversion with **Versed 0.1mg/kg IV or 0.2mg/kg IM**

TACHYCARDIACONTINUED

Clinical Care Pearls



12 LEAD ECG

OVERVIEW:

12 lead ECG allows rapid assessment of the cardiac complaint patient. Although 12 lead ECG is relatively accurate, always treat the patient, not the monitor. **Application of 12 lead monitoring leads is a simple task, which can be performed by any provider. However, only those at the Paramedic level may interpret & treat the findings obtained.** The reading of 12 lead ECG's is a complex process and will not be covered in this document.

INDICATIONS:

- Conscious, stable patients with suspected AMI (e.g., chest pain, pressure, or palpitations of presumed cardiac etiology; Shortness of breath with presumed cardiac etiology; CHF patients)
- As a tool to assist in the assessment of patients without chest pain or discomfort where AMI is suspected.
- As an additional assessment tool in potentially cardiac clinical situations (e.g., determination of SVT vs. rapid A-Fib; syncope/near syncope of suspected cardiac etiology; sudden onset of profound weakness; epigastric discomfort; hyperglycemia in diabetic patients; diaphoresis inconsistent with environment and etc).

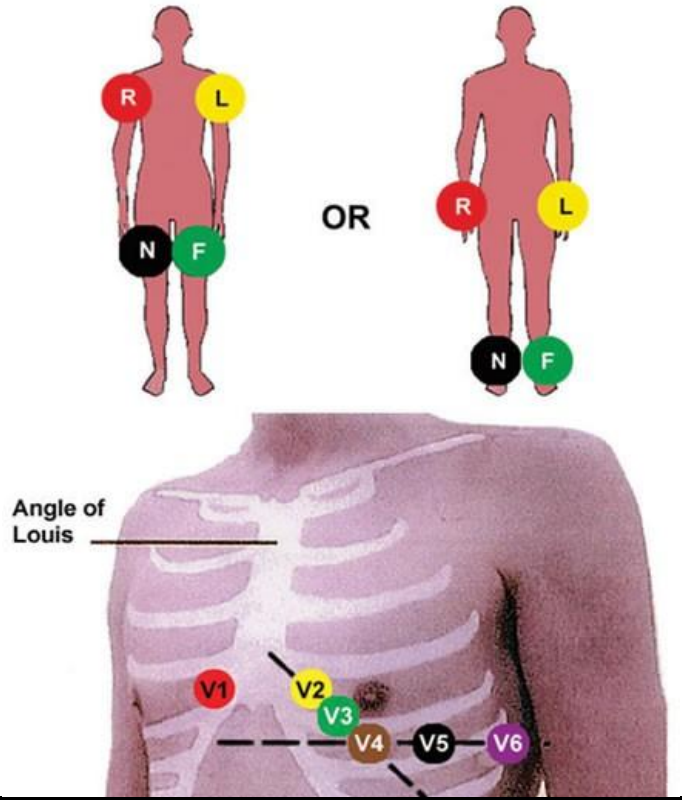
CONTRAINDICATIONS:

- None

PROCEDURE:

PARAMEDIC

- Place the 4 limb leads on extremities
  - **Right arm/white** - Right mid-clavicular line below clavicle or above wrist
  - **Left arm/black** - Left mid-clavicular line below clavicle or above wrist
  - **Left leg/red** – Left mid-clavicular line between 6th and 7th intercostal space, or ankle, or thigh
  - **Right leg/green** – Right mid-clavidular line between 6th and 7th intercostal space, or ankle, or thigh
- Place the 6 precordial leads
  - **V1** - 4th intercostal space to the right of the sternum. To locate, place finger at the manubrium notch move finger slowly down about 1½" until you feel the Angle of Louis, move laterally into the second intercostals space. Move finger down two more intercostal spaces to the 4th intercostal space
  - **V2** - 4th intercostal space to the left of the sternum
  - **V3** - Midway between V2 and V4
  - **V4** - On the mid-clavicular line at the 5th intercostal space
  - **V5** - On the anterior axillary line at the 5th intercostal space
  - **V6** - On the mid-axillary line at the 5th intercostal space



PARAMEDIC

12 LEAD ECG CONT.

CONSIDERATIONS:

- Providers below the level of Paramedic should report the 'computer' interpretation to the responding Paramedic resource
- V1 is the most important lead to place correctly due to it being the reference point for locating the remaining V leads
- Do not delay transport of critical or unstable patients to perform a 12-Lead
- On female patients, always place leads V3-V6 under the breast rather than on it
- A normal ECG does not definitively rule out an AMI
- Whenever possible attempt to obtain 12-Lead with patient in supine position
- Shave and clean the skin prior to placing leads if possible
- Leave the electrodes in place for the hospital staff to verify position and reuse if necessary
- Approx area of heart by contiguous lead:

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral

ADVANCED AIRWAY MANAGEMENT
CRICOTHYROTOMY

OVERVIEW:

Cricothyrotomy is the final and definitive airway management technique available to providers. The technique is rarely used but when needed must be performed rapidly without hesitation. Providers should review this skill often.

INDICATIONS:

- ❑ Attempts to control airway by any other available means have been unsuccessful
- ❑ Standard airway control methods are not possible or are contraindicated

CONTRAINDICATIONS:

- ❑ Pediatric patient
- ❑ Coagulopathy (relative contraindication)
- ❑ There are few true contraindications for cricothyrotomy but providers should be aware that presence of the following could indicate the possibility of difficulty. Locate your landmarks and don't lose them.
  - Surgery
  - Hematoma, tumor, or abscess
  - Obesity
  - Radiation
  - Trauma

PROCEDURE:

PARAMEDIC

- ❑ Consider sedation - Midazolam if needed and time warrants. See "Midazolam" Protocol

ADVANCED AIRWAY MANAGEMENT
CRICOTHYROTOMY CONT.

PARAMEDIC

SURGICAL CRICOTHYROTOMY

- Locate site: cricothyroid membrane- the soft aspect inferior to the larynx, mid-line anterior trachea
- Clean the site as you would an IV site
- Stabilize the larynx between thumb and fore finger of non-dominant hand
- Palpate cricothyroid membrane
- Make a vertical incision in the skin, then a horizontal incision through the membrane
- Insert the tracheal hook through the membrane and hook the cricoid cartilage, apply anterior displacement
- Insert 6mm ETT and direct distally into the trachea, inflate the cuff with 10cc of air
  Secure the tube to the pt. and ventilate

CONSIDERATIONS:

- Confirm placement with: chest rise, lung sounds, ETCO2(colormetric and/or capnography), and SpO2
- Ensure complete documentation of procedure to include:
  - Time of procedure
  - name of provider performing procedure
  - History and physical exam clearly demonstrating indications for procedure
  - Method used to secure Cric/ Trach device or ETT
  - Breath sound assessment and capnography levels before and after procedure,
  - Successful and non-successful attempts
  - Therapeutic effects/changes in patient condition
  - Difficulties with insertion or complications encountered

ADVANCED AIRWAY MANAGEMENT
ENDOTRACHEAL INTUBATION

OVERVIEW:

Endotracheal intubation remains the 'gold' standard for advanced airway security in the pre-hospital setting. While the procedure itself must be performed by Paramedic personnel, pre-oxygenation, and equipment preparation and assembly may be performed by all levels of provider.

INDICATIONS:

- Respiratory insufficiency or arrest
- Airway obstruction
- Unconsciousness or altered mental status with airway compromise
- Situations that require positive pressure ventilation

CONTRAINDICATIONS:

- Severe trauma to mouth, jaw, or trachea

PROCEDURE:

PARAMEDIC

- Pre-oxygenation for 1-2 minutes with supplemental high flow oxygen while preparing intubation equipment (may be done by all level of providers)
- Place stylet in ET tube and lubricate the tip
- Position patient's head using trauma jaw thrust or the head tilt chin lift
- Intubate the patient visualizing cords with laryngoscopy and inflate balloon with 10 mL syringe
- Verify placement of the tube
  - Watch for chest rise and fall
  - Auscultate over all fields and abdomen
  - Misting in the ET tube
  - $ETCO_2$
- Secure the tube at the correct depth
- If no breath sounds are auscultated or the ET tube is in the esophagus, deflate the balloon and withdraw the ET tube
  - Ventilate
  - Consider alternate airway
- Document
  - **At least 3 checks to verify proper placement**
  - Breath sounds before and after intubation

PARAMEDIC

CONSIDERATIONS:

- Possible complications of intubation include
  - Laryngeal spasm
  - Pneumothorax
  - Aspiration
  - Trauma to oropharyngeal cavity
  - Esophageal intubation
  - Intubation of the main stem bronchus
- A maximum of 2 attempts (defined as attempting to visualize cords with laryngoscopy) is permitted prior to the utilization of alternative airways (e.g., Supraglottic Airway).

ADVANCED AIRWAY MANAGEMENT-KING AIRWAY

OVERVIEW:

The King airway has proven to be an effective means of advanced airway control in the pre-hospital setting. While endotracheal intubation remains the 'gold' standard of airways, the use of the King airway should not be overlooked and may be performed by EMT level personnel if trained and equipped.

INDICATIONS:

- Acute airway or ventilatory compromise in trapped patient where endotracheal intubation cannot be accomplished.
- Endotracheal intubation by a paramedic cannot be accomplished after two attempts
- BVM with OPA/NPA is not adequate for patient and no higher-trained personnel are available

CONTRAINDICATIONS:

- Patient with gag reflex
- Patient with known esophageal disease
- Patient who has ingested caustic substances

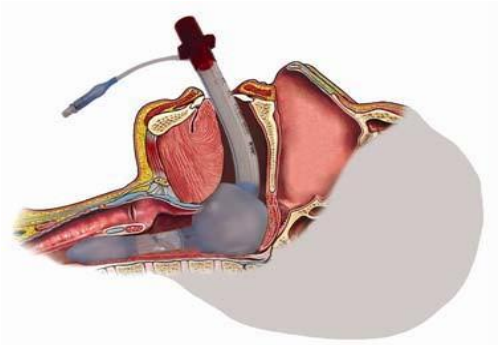
PROCEDURE:

EMT

- Pre-oxygenation with BVM for 1-2 minutes with supplemental high flow oxygen while preparing King equipment (may be done by all level of providers)
- Choose appropriate tube size for patient:

	Cuff Inflation
Size 2 **(Green)** 35" to 45" tall	25-35 cc
Size 2.5 **(Orange)** 41" to 51" tall	30-40 cc
Size 3 **(Yellow)** 4' to 5' tall	45-60 cc
Size 4 **(Red)** 5' to 6' tall	60-80 cc
Size 5 **(Purple)** >6' tall	70-90 cc

- Check cuffs for leaks and apply water soluble lubrication to tip
- Using Head Tilt Chin Lift or jaw thrust, from the corner of mouth, advance tip under the base of tongue. Then rotate the tube back to midline and advance the tube until the base of the connector is aligned with patient's teeth or gums. (Do not use excessive force.)
- Inflate cuff
- Attach BVM and assess proper tube placement via auscultation, chest movement, and/or CO2 Capnography
- Seccure King Airway with Endotracheal tube holder



EMT

CONSIDERATIONS:

- Do not force the airway
- If you are unable to ventilate the patient, deflate the cuff and withdrawal the tube lightly until ventilation is easy and free flowing. Then re-inflate cuff and secure.
- Document why you had to use King Airway and tube depth for the patient

ADVANCED AIRWAY MANAGEMENT- I GEL

OVERVIEW:

The I-Gel

INDICATIONS:

- Acute airway or ventilatory compromise where endotracheal intubation has a high likelihood to fail or cannot be accomplished
- Endotracheal intubation by a paramedic cannot be accomplished after two attempts
- BVM with OPA/NPA is not adequate for patient and no higher-trained personnel are available

CONTRAINDICATIONS:

- Patient with gag reflex

PROCEDURE:

EMT

- Pre-oxygenation with BVM for 1-2 minutes with supplemental high flow oxygen while preparing equipment (may be done by all level of providers).
- Choose appropriate tube size for patient:
  - Size 1 Neonate 2-5kg
  - Size 1.5 Infant 5-12kg
  - Size 2 Small Pediatric 10-25kg
  - Size 2.5 Large Pediatric 25-35kg
  - Size 3 Small Adult 50-90 kg
  - Size 4 Medium Adult 50-90kg
  - Size 5 Large Adult 90+kg

- Grasp the lubricated I-Gel firmly along the integral bite block (tube portion of the device). Position the device so that the I-Gel cuff outlet is facing toward the chin of the patient.
- The patient should be in the "Sniffing" position, with head extended and neck slightly flexed forward. If cervical injury is suspected, use modified "jaw thrust" instead of any flexion at the neck. The chin should be gently pressed down/inferior before proceeding to insert the I-Gel.
- Introduce the leading soft tip into the mouth of the patient in a direction toward the hard palate.
- Glide the device downwards and backwards along the hard palate with a continuous, but gentle push until a definitive resistance is felt.
- At this point, the tip of the device should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite block.
- Attach BVM and assess proper tube placement via auscultation, chest movement, and/or ETCO2 Capnography.
- Secure I-Gel with tape or appropriate tube holder.
- Place NG tube in side port and advance to appropriate position, apply suction to decompress the stomach.

EMT

ADVANCED AIRWAY MANAGEMENT- I GEL – (CONT.)

CONSIDERATIONS:

- This is NOT a definitive airway and aspiration can occur with this device.
- Apply a small amount of lubricating gel to the tip of the I-Gel to aid in insertion, but do not over lubricate. Use care to avoid the introduction of lubricant in or near the ventilatory openings.
- Do not force the airway!
- Document why the I-Gel was selected, size, and tube depth.
- Consider pre-loading the OG port with a 12fr tube to prevent any fluid leakage from this hole during insertion.

ADVANCED AIRWAY MANAGEMENT
NASOGASTRIC TUBE INSERTION

OVERVIEW:

While a patient is being ventilated, trapped air can gather in the stomach increasing the risk of vomiting and aspiration. In addition, an enlarged stomach can expand and push against the diaphragm, inhibiting the ability of the heart and lung expansion.

INDICATIONS:

- ❑ To relieve gastric distension in full arrest patients who are intubated

CONTRAINDICATIONS:

- ❑ Facial fractures
- ❑ Known alkali or acid ingestion
- ❑ Known esophageal disease (May be performed with physician order)
- ❑ Esophageal obstruction
- ❑ Unconscious patients with unsecured airway (intubate first)

PROCEDURE:

PARAMEDIC

- ❑ Use proper PPE
- ❑ Place patient's head in neutral position.
- ❑ Measure from epigastrium to angle of jaw, then to tip of nares
- ❑ Lubricate distal end of tube
- ❑ While occluding one nostril, determine which nare the patient has the best airflow and select for placement.
- ❑ Consider placing a nasopharyngeal airway in first to facilitate placement of the NG tube
- ❑ Insert gently into the nares and move along the nasal floor, with the bevel facing the septum
- ❑ Resistance will be felt as the tip of the tube reaches the nasopharynx; this is the most uncomfortable part of the procedure.
- ❑ If there is difficulty inserting into nare, consider using opposite nare
- ❑ Direct the patient to swallow or take a sip or two of water
- ❑ Coughing or gagging is common. The patient should maintain the ability to speak throughout. Inability or difficulty speaking, or excessive coughing, indicates the tube is in the trachea.
- ❑ If the tube curls into the mouth or goes into the trachea, DO NOT completely withdraw it; move it back to the level of the nasopharynx and attempt insertion again
- ❑ Once the patient begins to swallow, the tube should be passed quickly to the measured mark
- ❑ Advance to predetermined length
- ❑ To confirm placement:
  - Ask the patient to talk
  - Using an irrigation syringe, empty 30-60cc of air into the stomach while auscultating with a stethoscope over the epigastric region for the sound of air in the stomach.
  - Aspirate stomach contents using the syringe
- ❑ Remove tube if no air sounds are heard
- ❑ Securing the tube use a piece of tape split lengthwise down the middle
- ❑ Apply tape to nose; wrap tube with split tape ends

PARAMEDIC

CONSIDERATIONS:

- ❑ This procedure should not delay transport

ADVANCED AIRWAY MANAGEMENT - PARAPAC VENTILATOR

OVERVIEW:

The Parapac Ventilator provides timed cycle positive pressure ventilations for patients suffering from an absence of spontaneous respiratory effort. The ventilator incorporates an ability to detect spontaneous breathing by an adult patient allowing the device to function in a "demand" mode. If breathing is inadequate the ventilator will interpose ventilations synchronized with any patient efforts (demand). All demand breaths are supplied with 100% oxygen.

INDICATIONS:

- ❑ Patients requiring mechanical ventilation

CONTRAINDICATIONS:

- ❑ Patients under 5 kg

PROCEDURE:

EMT

STANDARD OPERATIONS (E.G., DURING CPR):

- ❑ Ventilator should be left with the controls set in these positions to enable it to be put to use with minimal re-adjustment
  - Rate of 10 to 12 bpm
  - Tidal volume of 500 ml (5 to 7 ml/Kg)
  - Air mix set to 100%
  - Relief pressure between 35 and 40 cmH_2O
- ❑ Connect oxygen supply to ventilator and slowly turn on oxygen
- ❑ Set ventilation parameters to suit patient and turn pneumatic switch to "ON"
- ❑ Briefly occlude the patient connection port of the patient valve and ensure peak inflation pressure reading on the manometer is appropriate for the patient, and that the pneumatic audible/visual alarms function.
- ❑ Connect ventilation circuit to patient (via mask or ETT) and ensure adequate ventilation is being delivered – good chest rise/fall; $ETCO_2$; SpO_2; etc.
- ❑ Make adjustments as necessary
- ❑ To conserve gas supply in clean atmosphere may set air mixture to 50%.

COPD & ASTHMA PATIENTS:

- ❑ A slower respiratory rate (e.g., 6 to 10 bpm) is recommended

POSITIVE END EXPIRATORY PRESSURE (PEEP)

- ❑ The exhaust collector adaptor allows a pop-off type PEEP valve to be attached to the exhalation port of the patient valve. The valve is rotated to the approximate cmH_2O pressure desired.
  - Routine ventilation – 0 to 5 cmH_2O as needed
  - COPD/Asthma – no more than 5 cmH_2O
  - ARDS/Lung Injury/Chest Trauma – 0 to 10 cmH_2O (may increase with OLMC)
  - Avoid PEEP in patients with suspected head injury.
- ❑ The pressure monitor will show the sum of the PEEP and the airway pressure drop as a step change when inspiration begins thus showing the effect of PEEP.

EMT

CONSIDERATIONS:

- ❑ Throughout treatment monitor airway, oxygen saturation, $ETCO_2$ and vital signs
- ❑ Specific ventilator settings will vary depending upon the patient's clinical situation. Consult OLMC any time questions arise as to specific settings.

AIRWAY MANAGEMENT

OVERVIEW:

Airway management is the first priority for the EMT. There are a multitude of procedures and adjuncts to manage a patient's airway. This protocol is a guideline for the proper use of these procedures and adjuncts when airway management needs to become more aggressive and/or invasive. Use this guideline in conjunction with the Oxygen Therapy guideline.

INDICATIONS:

- Patients that are unable to maintain their own airway
- Patients that are displaying signs or symptoms of inadequate oxygenation

CONTRAINDICATIONS:

- None

PROCEDURE:

EMR

Methods of Assessment:

- Auscultation - breath sounds in upper and lower lobes bilaterally including axillary areas & of the abdomen if patient is intubated
- Observe inspiration and expiration ratio, use of accessory muscles, or changes in respiratory patterns/rate
- Consider use of non-invasive monitoring equipment:
  - Capnography
  - Pulse Oximetry
  - ECG
- Patient position - Tripod, sitting upright
- Passive Delivery Systems
  - Nasal Cannula
    - Flow rate should not exceed 6LPM
  - High Flow Nasal Cannula
    - Flow rate 15LPM
  - Non-Rebreather Masks
    - Recommended when higher flows and greater concentrations of oxygen are needed
    - Can deliver near 100% oxygen concentration with good facial fit
  - Remove mask from patient's face when oxygen supply is disconnected
    - Always have a clear view of patient's mouth and nose
    - Use only when patient is able to maintain their airway
- Airway Maintenance Devices
  - Nasopharyngeal Airway (NPA)
    - For patients with gag reflex
  - Oropharyngeal Airway (OPA)
    - For patients that do not have a gag reflex
  - Bag Valve Mask (BVM)
    - For use in conjunction with the adjuncts above
    - Properly position patient's head, watch patient's chest rise and fall and auscultate lungs to ensure proper ventilation.

EMR

EMT

- Assess airway support already in place, if adequate leave in place, if inadequate then remove and continue.
- If no gag AND no immediately reversible cause (hypoglycemia, opiate OD, etc.) consider Supraglottic airway device.

EMT

AIRWAY MANAGEMENT CONT.

PARAMEDIC

- If no gag reflex AND;
  - No immediately reversible cause for respiratory depression/arrest (⇩ BG, opiate OD, etc.) OR
  - Expected course dictates (i.e., airway burns) then, Intubate
- If no muscle tone (code situation) may proceed with ETI via direct laryngoscopy w/o pharmacology
- Otherwise, Rapid Sequence Intubation (see 'RSI' protocol)
- Following successful ETI confirm via: direct cord visualization, lung sounds, ETCO2, and SpO_2 (see 'Endotracheal Intubation' protocol).
- If ETI failed, including re-attempts (max 2 attempts) then proceed with Supraglottic Device. See 'Advanced Airway' procedure.
- If airway not maintainable via other means noted above then; Cricothyrotomy
- Consider NG or OG if gastric distention.

- COMPLETE AIRWAY OBSTRUCTION
  - Remove foreign body with magill forceps
    - If unable to remove foreign body, laryngeal trauma or epiglottitis, consider cricothyrotomy and transtracheal jet insufflation.

PARAMEDIC

CONSIDERATIONS:

- Patients who need positive pressure ventilation should be intubated as soon as possible
- Endotracheal intubation provides the best means of airway control and is the preferred airway of choice for Paramedic level providers. **Never the less, there may be situations in which the use of an alternative device is clinically indicated and appropriate "first line".** In these situations, clear documentation of the clinical decision-making rationale is required.
- When faced with a difficult airway situation, providers should consider the use of the following techniques: BURP, Eschmann, two-provider laryngoscopy.

CAPNOGRAPHY

OVERVIEW:

Capnography provides a tool to measure the effectiveness of ventilations. Waveform capnography is the measurement of the carbon dioxide released by a patient during respiration, displayed as a waveform to allow interpretation of specific pathologies. $ETCO_2$ (End Tidal Carbon Dioxide) is a measurement of the peak amount of CO_2 expired during a single breath. $ETCO_2$ can provide information about the patient's ventilatory status and may be used by all provider levels.

INDICATIONS:

- Patients with respiratory complaints
- Every intubated patient
- Patients who may benefit from monitoring (e.g., altered mental status)

CONTRAINDICATIONS:

- None noted

PROCEDURE:

EMR

- Manage airway according to appropriate protocol
- Apply ETCO2 monitor
- Maintain ETCO2 output between 35-40 mmHg unless patient has clinical presentations that indicate a head injury
- The following approximates the degree of ventilation:
  - 40 mmHg = Hypoventilation
  - 35 – 40 mmHg = Normal ventilation
  - 30 – 35 mmHg = Hyperventilation
  - < 30 mmHg = Aggressive hyperventilation should be avoided in all patients
- Hyperventilation in the field is indicated only when patient is seizing or shows signs of brain stem herniation after correcting hypotension or hypoxemia.
  - Signs of brain stem herniation include:
    - Pupillary abnormalities
    - Neurologic posturing
    - Cushings reflex
- See "Head Trauma" Protocol

EMR

CONSIDERATIONS:

- *Normal Ventilation*

ADULT	***PEDIATRIC***
▪ *12 breaths/minute*	▪ *20 breaths/minute (children)* ▪ *25 breaths/minute (infants)* ▪ *35-40 mmHg $ETCO_2$ reading*

- *Hyperventilation*

ADULT	***PEDIATRIC***
▪ *20 breaths/minute*	▪ *25 breaths/minute (children)* ▪ *35 breaths/minute (infants)* ▪ *30-35 mmHg $ETCO_2$ reading*

NEEDLE CHEST DECOMPRESSION

OVERVIEW:

Needle thoracentesis is a relatively simple technique used to relieve intrathoracic pressures from tension pneumothorax. When performed correctly and under the correct circumstances needle thoracentesis is a safe and life-saving procedure.

INDICATIONS:

- To relieve tension pneumothorax
  - Signs and symptoms include:
    - decreased or absent breath sounds with:
      - History consistent with suspected tension pneumothorax
      - Chest trauma or COPD or Positive pressure ventilation
    - Shock or rapidly decreasing blood pressure
    - Progressive respiratory distress
    - Tracheal deviation away from the affected side
    - Jugular vein distension
    - Asymmetrical chest movement with inspiration
      - Also consider flail segment
    - Hyper-expanded chest on affected side
    - Drum like percussion on affected side
    - Increased resistance to positive pressure ventilation, especially if intubated

CONTRAINDICATIONS:

- Patients exhibiting no signs or symptoms of a tension pneumothorax

PROCEDURE:

PARAMEDIC

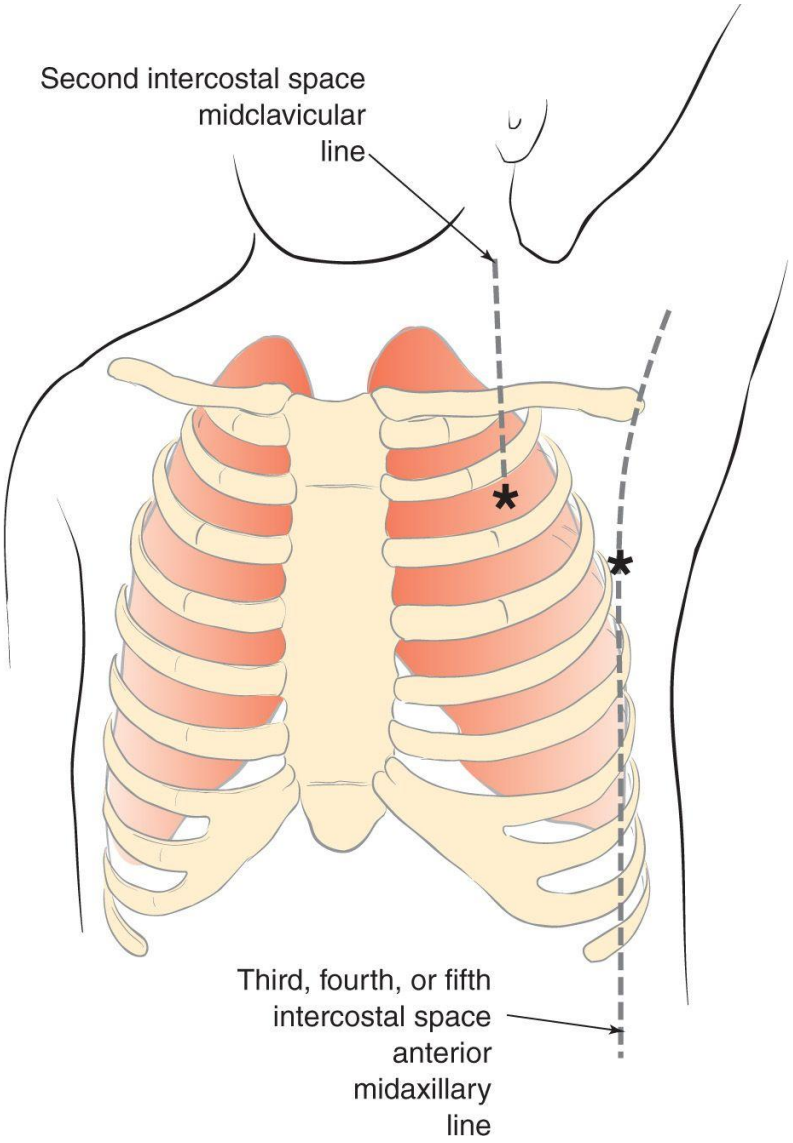
- Elevate head of stretcher to 30 degrees
- Connect syringe to top of 12 or 14G X (at least) 3" length, over-the-needle catheter
- Expose the entire chest
- Clean the chest vigorously with alcohol or Betadine
- On the affected side locate the mid-clavicular line and insert the IV catheter over the superior margin of the third rib (2nd intercostals space). If excessive tissue is encountered an acceptable alternate site is the 4-5th intercostal space at the anterior axillary line.
- The needle should make contact with the rib, then slide over it
  - This approach should avoid the intercostal vessels positioned near the lower border of each rib
- If air in the thoracic cavity is under tension, the plunger will easily pull and pop off the syringe
- Remove syringe, advance the catheter, and then remove the needle and dispose of it in a sharps container.
- Auscultate breath sounds
- Secure with gauze and tape
- Ventilate and monitor ETCO2

PARAMEDIC

NEEDLE CHEST DECOMPRESSION CONT.

CONSIDERATIONS:

- Simple/non-tension pneumothorax is relatively common and is not immediately life threatening. Do not decompress simple/non-tension pneumothorax in the field
- Patient's chest should be auscultated often for return of tension pneumothorax or other respiratory complications.
- Tension pneumothorax is a rare condition that can occur with trauma, or spontaneously; it can also occur as a complication of CPR.
- Tension takes time to develop, but the rate of development can be increased by forceful ventilation
- Needle chest decompression is painful; be sure the procedure is done promptly
- Tension pneumothorax can be precipitated by the occlusion of an open chest wound
  - If patient deteriorates after dressing an open chest wound, remove the dressing
- Possible complications of the procedure include:
  - Creation of pneumothorax if none existed previously
  - Laceration on the lung
  - Laceration of blood vessels
  - Infection



CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

OVERVIEW:

CPAP (Continuous Positive Airway Pressure) is a tool, which can be used to assist the oxygenation of several respiratory pathologies. CPAP is not a replacement for any medication or procedure, but a tool, which can provide a high level of ventilatory support without the need for RSI or intubation. Patients whose condition is resistant to parenteral medications but whose respiratory effort does not yet require intubation should be considered prime candidates for CPAP.

INDICATIONS:

- Patient must be:
  - At least 12 years of age for devices that the pressure cannot be specifically regulated.
  - Any age for devices that specifically regulate the pressure and appropriate mask seal is maintainable.
  - Alert and able to maintain an open airway on their own
  - Have a blood pressure of at least 100 SBP
- Severe respiratory distress secondary to non-traumatic causes and intubation requirements have not been met.

CONTRAINDICATIONS:

- Patient is hemodynamically unstable
- Traumatic injury
- Apnea
- Active GI bleed or history of recent gastric surgery
- Known:
  - Pulmonary embolism
  - Aspiration
  - Anaphylaxis
  - Pneumothorax

PROCEDURE:

EMT

- Monitor $ETCO_2$
- Prepare CPAP device
- Secure CPAP device to the patient with provided head straps
- Patient may require substantial coaching in order to receive compliance with mask seal, but a leak-less mask seal is essential.
- Reassess patient and device every 5 minutes
- Treatment should be given continuously. If treatment is abandoned, prepare for rapid decline and respiratory arrest.
- Advise receiving hospital as soon as possible of CPAP use, for continued treatment.
- Titrate CPAP pressure until improvement in patient's SpO_2 and symptoms:
  - For Bronchospasm Max 5 cmH_2O
  - For CHF, Pulmonary Edema, and Pneumonia Max 10 cmH_2O
  - For Pediatrics Max 5 cmH_2O

EMT

CONSIDERATIONS:

- Concurrent preparation for ETI/RSI should occur in every patient placed on CPAP
- Sedation to facilitate CPAP should be used with extreme caution
- Monitor for gastric distension
- CPAP is not a replacement for current parenteral medication treatments, but is to be used in conjunction with these treatments.

ESCHMANN

OVERVIEW:

The Eschmann (bougie) catheter is a device designed to facilitate intubation when traditional techniques may not succeed. This skill is authorized for Paramedic providers. Every provider should be prepared to operate as the primary provider's assistant.

INDICATIONS:

- Difficult intubation
  - Anticipated difficult intubation
  - Spinally immobilized
  - Obese
  - Narrow jaw
  - Short neck
  - Large tongue

CONTRAINDICATIONS:

- Patients requiring ET tube size below 6.5mm. ET tubes smaller than 6.5mm will not pass over the Eschmann.
- Presence of only one trained provider. This skill requires two trained providers.

PROCEDURE:

PARAMEDIC

- Prepare to intubate as with standard laryngoscopic endotracheal intubation
- Insert laryngoscope and visualize cords utilizing standard technique and external laryngeal manipulation (BURP).
- If you have a grade 1 view pass an ET tube through the cords and verify intubation
- If you have a grade 2 or 3 view hold the Eschmann with the "hockey stick" end oriented anterior and pass it through the cords or anterior to any visible glottic structure.
- Tracheal placement of the Eschmann is indicated by tactile feedback as the tip "clicks" passed each tracheal ring.
- Hold the Eschmann in place while continuing to visualize as much glottic structure as possible. The laryngoscopist's grip on the Eschmann should be very near the patient's teeth.
- Direct the second provider to thread the ET tube on to the back end of the Eschmann. The ET tube should be oriented with the Murphys eye toward the patient.
- Once the ET tube is fully threaded the second provider should take control of the back end of the Eschmann and notify the laryngoscopist to proceed.
- The laryngoscopist should then pass the ET tube down the Eschmann until it is appropriately located in the trachea.
  - If the ET tube resists passing the glottic opening, roll the tube between your fingers while applying gentle forward pressure.
- Discontinue laryngoscopy and remove the Eschmann
- Confirm ET tube placement and secure as with standard ET intubation.

PARAMEDIC

CONSIDERATIONS: None

EXTERNAL JUGULAR VEIN CANNULATION

OVERVIEW:

The external jugular vein is a reasonable alternative site for IV administration of fluids and/or medications. The external jugular vein should not be considered a 'central line' and is treated no differently than other more peripheral IV lines.

INDICATIONS:

- Consider accessing the external jugular vein when an extremity peripheral IV cannot be established.

CONTRAINDICATIONS:

- Peripheral IV in place and flow is adequate for patient condition.

PROCEDURE:

PARAMEDIC

- Turn patient's head to opposite side of access
- Select venipuncture site
- Occlude venous return by placing a finger on the external jugular just above the clavicle
- Cleanse the site starting at the site itself and working your way out
- Insert IV catheter at a 10º-30º angle with the bevel up, entering the vein midway between the angle of the jaw and the mid-clavicular line
- Advance until you feel the catheter pop into the vein or see blood in the flashback chamber
- Carefully advance the catheter further and withdraw the needle
- Occlude blood flow at the catheter tip, remove the needle, and attach the IV administration set tubing to the catheter.
- Dispose of the needle in a sharps container
- Open roller clamp and flush the line to ensure correct placement, then set clamp for appropriate drip rate.
- Secure the catheter and tubing
- Document:
  - Time procedure performed
  - Name of individual performing skill
  - IV site and catheter size
  - Rate of infusion and total amount infused
  - Successful and non-successful attempts
  - Therapeutic effects obtained or changes in patient condition
  - Complications encountered and remedies

PARAMEDIC

CONSIDERATIONS:

- Possible complications of external jugular vein IV access include
  - Pain at puncture site
  - Hematoma or infiltration
  - Local infection
  - Pyrogenic reaction
  - Catheter shear
  - Inadvertent arterial puncture
  - Circulatory overload
  - Thrombophlebitis
  - Air embolism

HEAR REPORT

OVERVIEW:

Communication between field providers and hospital emergency room staff is a vital component of any modern EMS system. There are two main methods to establish communication, cell phone and radio. Radio communications are typically used for standard communications between the ER and field providers. Any non- PHI (protected health information) may be transmitted over the HEAR radio frequency. If the patients name, DOB, or other identifying information needs to be relayed to hospital staff, attempt to utilize means other than the HEAR radio system. The content of a typical HEAR report is shown below. If a provider needs clarification or assistance in patient care he/she is encouraged to contact the ER physician and relate whatever information is necessary. Every provider should be comfortable with the hear system and broadcasting a hear report as shown below.

INDICATIONS:

- Patient transport to hospital.

CONTRAINDICATIONS:

- None

PROCEDURE:

EMR

- Report the following to the receiving hospital as soon as practical:
  - Unit Number & mode of transport (emergent vs. non-emergent)
  - Patient age, sex
  - Chief complaint and/or mechanism of injury
  - If trauma activation, list criteria
  - If Cath Lab activation, list 12 lead results
  - Blood pressure, pulse, respirations, SpO2
  - Interventions completed and response as appropriate.
  - Estimated time until arrival at hospital

EMR

CONSIDERATIONS:

- Keep your reports short and to the point!

HELMET REMOVAL

OVERVIEW:

Whenever possible trauma patients should be transported to the hospital with the helmet in place

INDICATIONS:

- When spinal injury is suspected, removal of the helmet is indicated only when there is a compelling reason for removal such as:
  - Airway control or ventilation, which cannot be adequately accomplished with the helmet in place
  - Life-threatening hemorrhage under the helmet
  - Fit or design on the helmet prevents adequate spinal immobilization or axial alignment of the spine

CONTRAINDICATIONS:

- None noted

PROCEDURE:

EMR

- When a helmet must be removed the method taken from the Pre-Hospital Trauma Life Support manual describing a two-person method for helmet removal without disturbing the alignment of the cervical spine is recommended.
- Kneel above patient's head and press palms to sides of helmet and curl fingertips under margin of helmet to hold the head in manual cervical spine stabilization.
- Have someone kneel alongside the patient and open or remove face shield if one is present
- Have them grasp the mandible between the thumb and fingers at the angle of the jaw on both sides
- Wrap remaining fingers around the occiput of the skull and take over manual cervical spine stabilization.
- Pull sides of the helmet apart and rotate the lower end of the face piece until it clears patient's nose
- Carefully pull the helmet straight until helmet is almost completely out from under patient
- Have second provider slide hands under head
- Remove helmet

EMR

CONSIDERATIONS:

- Conduct a physical exam with emphasis on assessing neurological status frequently
- Football helmet and shoulder pads **SHOULD NOT** be removed from patient
  - Maintain neutral inline stabilization by securing helmet and pads to backboard
  - Remove the facemask by cutting side and top attachments at loops

INTRAOSSEOUS INFUSION - EZIO

OVERVIEW:

Alternative technique for establishing vascular access in critical patients (both pediatric and adult) when peripheral IV access may be difficult and/or time consuming.

INDICATIONS:

- ❑ Situations where time critical fluids or medications need to be administered and peripheral IV access attempts have failed or are deemed likely to lead to significant treatment delay.

CONTRAINDICATIONS:

- ❑ Fracture of the tibia or femur involving vascular compromise
- ❑ Previous orthopedic procedures (Example – knee replacement)
- ❑ An extremity that is compromised by a pre-existing medical condition (Example – tumor or peripheral vascular disease).
- ❑ Cellulitis or infection at the insertion site
- ❑ The inability to locate anatomical landmarks

PROCEDURE:

AEMT

- ❑ Palpate the landmarks to locate the access site
  - Adult
    - Proximal tibial site: Medial to the tibial tuberosity
    - Distal tibial site: Two fingers above the medial malleolus
  - Pediatric
    - Proximal tibial site: One finger below and medial to tibial tuberosity
    - Distal tibial site: One finger above the medial malleolus
- ❑ For the adult patient, may consider proximal humerus as an alternative insertion site.
  - The insertion site is located directly on the most prominent aspect of the greater tubercle. Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site.
  - Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body).
- ❑ Cleanse the site
- ❑ Prepare the EZ-IO Driver & select the appropriately sized needle for patient (usually 15mm – "Pink" or 25mm – "blue" needle)
- ❑ Open the plastic cover containing the IO needle and attach the needle set to the driver (you should hear and feel a "click" as the small magnet connects to the driver). Remove safety cap from needle.
- ❑ Begin insertion
  - Holding the driver in one hand while stabilizing the leg near the insertion site with the opposite hand
  - Position the driver at the insertion site with the needle at a 90-degree angle to the surface of the bone.
  - Without activating the driver, insert the needle through the skin at the insertion site until you feel the needle tip encounter the bone.
    - Verify that the 5 mm marking on the needle is visible. If this most proximal black line is not visible on the needle, you will either need to use a longer needle (e.g., 25mm) or change insertion sites – distal tibia.
  - Activate driver trigger & Apply light and steady pressure on the driver and power through the cortex of the bone, ensuring the driver is maintained at a 90-degree angle at all times.
  - Stop when the needle flange touches the skin or a sudden decrease in resistance is felt

(Continued)

AEMT

INTRAOSSEOUS INFUSION - EZ IO CONT.

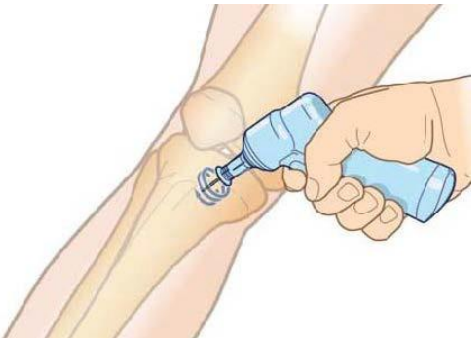
AEMT

- Remove driver from the needle set
- Remove the stylet from the needle by grasping the hub gently with one hand, and unscrewing the stylet counter clockwise - place it in a sharps container (do not replace or attempt to "recap" the stylet)
- Attach the extension set to the EZ-IO hub and then SYRINGE FLUSH the IO with a minimum of 10cc saline.
- Consider administration of Lidocaine – IO, to facilitate anesthesia at the IO site when performing the procedure on the conscious patient. Lidocaine should be administered 1 to 2 minutes prior to the administration of any fluid.
  - Adult Lidocaine: 40 mg
  - Pediatric Lidocaine: 0.5mg/kg
- Aspiration of a small amount of bone marrow with a syringe may be completed as a means to confirm placement. Use caution not to aspirate marrow past the extension set 90-degree elbow as occlusion may occur.
- Secure IV extension tubing only, not EZ-IO needle
- Initiate fluid administration under moderate pressure.

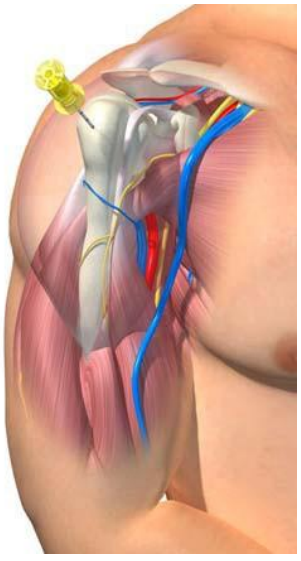
AEMT

CONSIDERATIONS:

- Proximal tibial site (Adult): Medial to the tibial tuberosity
- Proximal tibial site (Peds): One finger below and medial to tibial tuberosity
- Distal tibial site (Adult): Two fingers above medial malleolus
- Distal tibial site (Peds): One finger above medial malleolus
- Do not use blood or bone marrow drawn from IO site for blood glucose determination.
- Distal Femur site (Peds): Identify patella by palpation. The insertion site is just proximal to the patella (Maximum 1cm) and approximately 1-2 cm medial to midline.
- Do not allow IO procedures to delay transport
- Potential complications include
  - Fracture
  - Growth plate injury
  - Infiltration
  - Complete insertion



Distal femur insertion site- Neonates/Infants/Children



PATIENT RESTRAINT

OVERVIEW:

The decision to use physical or chemical restraint in the out of hospital setting presents issues of civil rights and liberties. However, there are circumstances when the use of restraints is in the best interest of the patient, staff, or the public. The two primary methods of patient restraint utilized in the out of hospital setting include physical and chemical restraints.

INDICATIONS:

- Patient restraint should be considered when a careful assessment establishes that the patient is a danger to self or others by virtue of a medical or psychiatric condition.

CONTRAINDICATIONS:

- Presence of pharmacological contraindications Ketamine

PROCEDURE:

EMR

PHYSICAL RESTRAINT GUIDELINES

- Perform the Broset Violence Assessment
  a) If Broset is ≥1, consider physical restraint.
  b) If Broset is ≥3 or if attacks against objects/individuals are present, patient must be either sedated or restrained or both prior to transport.
  c) DO NOT initiate transport unless safety to patient and responders are insured.

PHYSICAL RESTRAINT PROCEDURE:

- Use the minimum level of physical restraint required to accomplish patient care and ensure safe transportation.
- Avoid placing restraints in such ways that impede physical exam, patient care activities, or cause further harm.
  - The patient shall **not** be restrained in a face-down or prone position, nor shall a backboard or scoop stretcher be placed on top of him/her.
- Soft restraints may be sufficient. However, if not, may consider placing patient supine on long backboard and securing all extremities to backboard with leather restraints, soft restraints or carefully placed flex restraints.
- If necessary, utilize cervical spine precautions to control violent head movements
- Place padding under the patient's head and in voids to prevent patient from harming him/herself
- Secure backboard to stretcher
- Document circulatory status on all extremities every 15 minutes

EMR

PARAMEDIC

CHEMICAL RESTRAINT PROCEDURE:

Obtain initial Richmond Agitation Sedation Score (RASS) (see below)

- Sedative agents may be used to provide a safe method of restraining violently combative patients.
- Physically restrained patients who are violently fighting their restraints and combative head injury patients are good candidates for chemical restraints.
- If RASS score is +3, patient is an immediate threat to responders, bystanders or patient.
  - Administer Midaolam 2.5mg-5mg IV/IO/IM/IN may repeat as needed q 5 minutes to maintain sedation.
    -OR-
  - Administer Ketamine 2.0mg/kg IV/IO or 4.0mg/kg IM. Patients who receive Ketamine should also receive 2.5-5mg Midazolam to help maintain sedation and reduce potential for re-emergent complications. In the event the combination of Ketamine and Midazolam does not maintain adequate does not maintain adequate sedation, may repeat Ketamine at 0.5mg/kg IV/IO or 1mg/kg IM to maintain sedation.
    -OR-

PARAMEDIC

PARAMEDIC

CHEMICAL RESTRAINT CONTINUED:

- Administer **Inapsine 2.5mg-5mg IM/IVP/IO may repeat at half dose q 5 minutes to maintain sedation.**

- ❑ Assess vital signs within the first 5 minutes, if possible and thereafter as appropriate (at least every 10 minutes and before additional medication).
- ❑ Monitor patients ECG, obtain 12-lead and start IV, if possible.
- ❑ Repeat RASS score every 10 minutes and at patient hand off to hospital. Goal is RASS score of 0 to -1.

PARAMEDIC

CONSIDERATIONS:

- ❑ Anytime a patient is restrained it must be documented on a PHCR
- ❑ Call OLMC for pediatric patients.

Broset Violence Assessment checklist

Attacks on objects	0 point 1 point
Physical Threats	0 point 1 point
Verbal Threats	0 point 1 point
Boisterousness	0 point 1 point
Irritability	0 point 1 point
Confusion	0 point 1 point

Score 0 = Low risk of violence

Score 1-2 = Moderate risk of violence (preventative measures should be taken)

Score ≥ 3 = High risk of violence (preventative measures are required)

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description
+4	Combative	Overtly combative and violent; immediate danger to EMS.
+3	Very agitated	Aggressive; verbally and physically uncooperative towards EMS.
+2	Agitated	Frequent non-purposeful movement; agitated when touched or moved.
+1	Restless	Anxious but movements not aggressive or dangerous to EMS or self.
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening (eye opening/eye contact) to voice (> 10 seconds).
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds).
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact).
-4	Deep sedation	No response to voice but movement or eye opening to physical stimulation.
-5	Unarousable	No response to voice or physical stimulation.

PATELLAR DISLOCATION

OVERVIEW:

A dislocation occurs when the patella slides laterally out of position. This can happen from severe twisting of the knee, usually in young people doing athletic events. It can also occur from a direct blow to the knee, but his is rare. With a patella dislocation, you will see an obvious lateral deformity; the patient will experience considerable pain and be unable to bear weight.

INDICATIONS:

- Clinical lateral patella dislocation

CONTRAINDICATIONS:

- Patella dislocation other than lateral

PROCEDURE:

PARAMEDIC

- Assess the injury:
  - Remove clothing from the limb;
  - Assess distal CMS status and exclude open injury; and
  - Assess direction of patella dislocation, confirming lateral dislocation and suitability for pre-hospital reduction.
- Explain the procedure to the patient.
- This procedure is limited to **one attempt**.
- Provide appropriate pain management.
- Provide constant verbal reassurance to facilitate relaxation; decreasing quadriceps muscle spasm and increasing the likelihood of successful reduction.
- While applying firm medial pressure to the lateral aspect of the patella, extend the knee slowly. If required, gently lift the lateral patella edge to encourage movement over the lateral femoral condyle.
- Confirm correct positioning of the patella.
- Reassess and document CMS of the affected limb post reduction.
- Place the leg in a supported anatomical position and determine if transportation is necessary.

PARAMEDIC

CONSIDERATIONS:

- It is important to distinguish patella dislocation from the more serious knee dislocation, which is a high mechanism injury involving tibio-femoral dislocation and a high incidence of popliteal artery injury.

- If there is suspicion of patella in a direction other than lateral, reduction should be deferred until at hospital, as radiographic evaluation will likely be required before attempted reduction.

PELVIC SLING

OVERVIEW:

Pelvic slings should be used to control pain and possible hemorrhage in patients with suspected pelvic fractures.

INDICATIONS:

- Suspected pelvic fracture

CONTRAINDICATIONS:

- None noted

PROCEDURE:

EMR

- Consider the potential need for spinal immobilization.
- Remove objects from the patient's pockets or pelvic area.

SAM SLING

- Place the SAM sling printed side down under the patient at the level of the buttocks (greater trochanters/ symphysis pubis)
- Wrap the non- buckle side of the sling around the patient
- **Firmly wrap** the buckle side of the sling around the patient, positioning the buckle at the midline. Secure it in place by velcroing the blue flap to the sling.
- Lift the **black strap** away from the sling by pulling upward.
- Firmly pull the orange and black straps in opposite directions until you hear and feel the buckle click. **Maintain tension!**
- **Immediately** press the black strap onto the blue flap on the sling to secure it. *Do not be concerned if you hear a second click after the sling is secure*

SHEET OR BLANKET METHOD

- Place sheet or blanket under patient at the level of the buttocks (greater trochanters/ symphysis pubis)
- Wrap the sheet tightly around the patient's pelvis to gradually compress the pelvis at this level.
- Cross sheet ends and twist from opposing sides, applying adequate pressure.
- Secure sheet ends.

EMR

CONSIDERATIONS:

- This can easily be done in conjunction with spinal immobilization.
- Assess pulse, motor, and sensation after splinting.

PICC Line Access

OVERVIEW:

A Peripherally Inserted Central Ine (PICC) is a common method of maintaining long-term venous access in select patients. PICC lines are typically inserted into the antecubital fossa, and then threaded into central circulation. PICC lines are flushed with heparin to maintain patency and therefore it is imperative to aspirate 5 mL of blood from the line prior to use.

INDICATION:

- PICC lines may be accessed when there is a need for drug or fluid administration and traditional means of venous access are unsuccessful.
- Patient or patient's caregiver requests use of PICC line.

CONTRAINDICATIONS:

- Inability to aspirate or infuse through the catheter.
- Catheter located in any place other than the patient's upper arm.
- Need for rapid fluid resuscitation.

PROCEDURE:

PARAMEDIC

- Use clean gloves and maintain sterility as much as possible.
- If there is a needleless type of port on the distal end of the catheter, perform the following:
  - Scrub the port with an alcohol pad and allow it to dry for 5 seconds.
  - Attach a 10 mL syringe (without saline) to the port.
  - Unclamp if necessary (needless port may not have a clamp).
  - Attempt to aspirate at least 5 mL of blood. Blood should draw freely. If it does not, remove the syringe and DO NOT use the catheter for access.
  - If blood aspirates freely, remove the 10 mL syringe with blood and discard.
  - Attach a 10 mL syringe with NS and gently flush the line. Never use a smaller syringe. If the line does not flush, remove the syringe and DO NOT use the catheter for access.
  - If the line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of NS. Adjust the rate to the needs of the patient within the limits of the catheter.
  - Administer medications though IV tubing port if indicated.

PARAMEDIC

PICC Line Access

PARAMEDIC

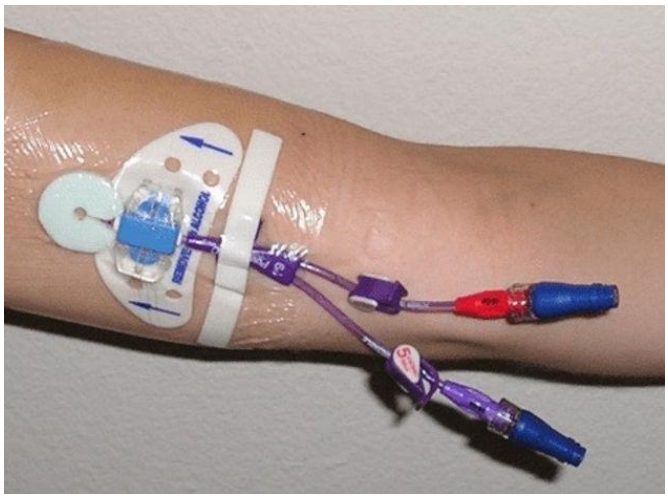
- If there is a capped needle-type port on the distal end of the catheter, perform the following:
  - Scrub the cap with an alcohol pad and allow it to dry for 5 seconds.
  - Clamp the catheter tubing using ONLY the existing clamp on the catheter and then remove the cap. Never allow a central line to be open to air.
  - Attach a 10 mL syringe to the catheter end.
  - Unclamp the catheter.
  - Attempt to aspirate at least 5 mL of blood. Blood should draw freely. If it does not, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
  - If blood aspirates freely, clamp the catheter again.
  - Remove the 10 mL syringe with blood and discard.
  - Attach a 10 mL syringe with NS.
  - Unclamp and gently flush the line. Never use a smaller syringe. If the line does not flush, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
  - If the line flushes, re-clamp and remove the syringe.
  - Attach the catheter to the end of the IV tubing.
  - Unclamp the catheter and begin infusion of NS. Adjust the rate according to the needs of the patient within the limits of the catheter.
  - Administer medications though IV tubing port if indicated.

PARAMEDIC

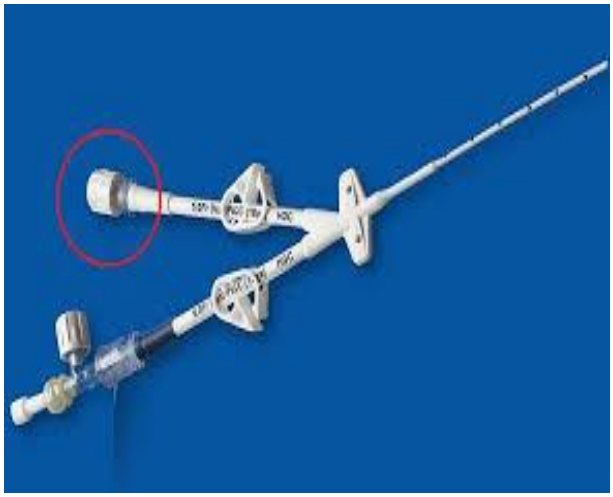
CONSIDERATIONS:

- Do not administer medications, flush or aspirate with less than a 10-cc syringe. Smaller size syringes generate too much pressure and can damage the catheter.
- Do not attempt to reinject aspirated blood as it may contain clots.
- The maximum flow rates for a PICC line is 125 mL/hr for less than size 2.0 French, and 250 mL/hr for catheters over 2.0 size French.
- Keep patient's arm straight to avoiding kinking the PICC line and obstructing flow.
- Ensure all line connections are secure.
- PICC lines access the patient's central circulation, and the risk of infection is high. Avoid contamination to ports and connections while accessing.
- Do not administer the following medications through a PICC line:
  - Adenosine – The line may rupture during rapid infusion due to over pressurization.
  - Dextrose 50% – The catheter can be damaged due to the viscosity of the fluid.

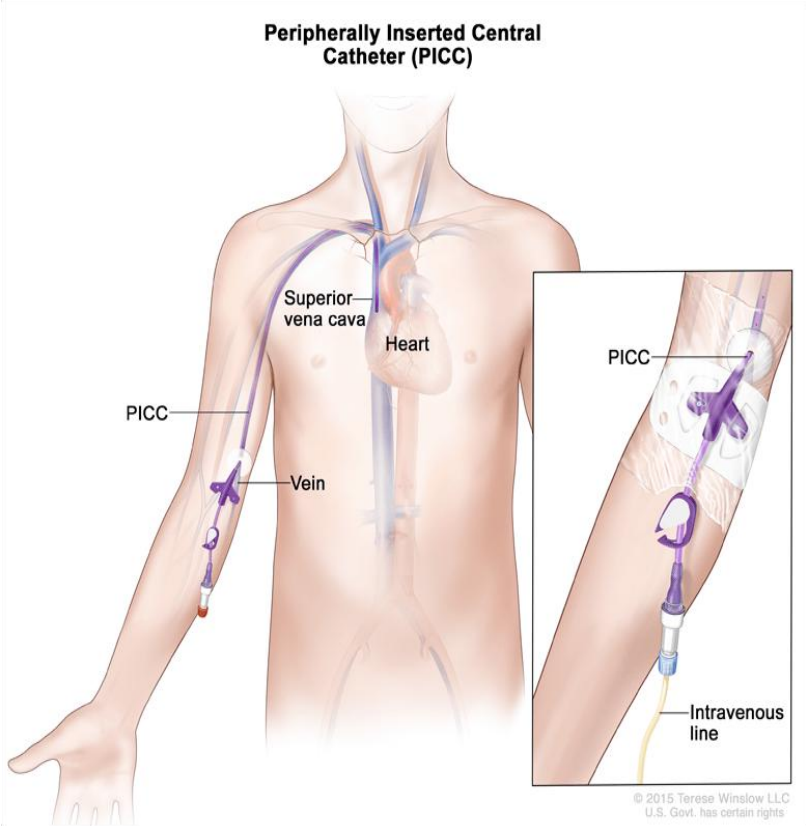
PICC Line Access



Needless Port



Needle type



RAPID SEQUENCE INTUBATION

OVERVIEW:
Rapid Sequence Intubation (RSI) is used to control/protect the airway of patients who cannot or soon will not be able to control/protect their own airway. RSI combines the use of sedative and paralytic medications with standard endotracheal intubation. RSI is applicable to both trauma and medical patients under the correct circumstance. RSI is complicated by the administration of several different medications, each with their own indications and contraindications. While the skill is authorized for Paramedic providers only, all providers will be involved in the preparation and implementation of this skill.

INDICATIONS:
- ❑ Patient is unable to protect/maintain own airway. ***-OR-***
- ❑ Patient's expected course indicates orotracheal intubation will be necessary and will be more safely established in the out of hospital setting. ***-OR-***
- ❑ Patient is expected to exhibit muscle tone, especially laryngeal tone (active gag reflex).

CONTRAINDICATIONS:
- ❑ Extreme caution should be used in situations where intubation is expected to be difficult.
  - If unable to ventilate via BVM, do not intubate, consider placement of "rescue" airway first line.
  - Always consider proximity to definitive care (risk vs. benefit)
- ❑ The use of Succinylcholine as a paralytic is contraindicated in patients with:
  - Major unhealed burn injuries greater than 24 hrs old
  - Crush injuries, or missed dialysis sessions.

NOTE: In cases where Succinylcholine is contraindicated, Vecuronium should be used as the primary paralytic.

PARAMEDIC

- ❑ Prepare intubation equipment as per Standard Intubation Procedure.
- ❑ Fentanyl can be used as a pre-induction agent for hypertensive patients.
  - **Fentanyl, 2mcg/kg IV/IO**
- ❑ **Etomidate, 20-30mg IV/IO**
  - For patients weighing between 140-200 lbs, providers can administer **20mg IV/IO**.
  - Pediatric dose **0.2-0.3mg/kg IV/IO**.

  -OR- **Ketamine 2.0mg/kg IV/IO Fast Push or 4.0mg/kg IM**
- ❑ **Succinylcholine,** Adult dose **1-1.5mg/kg IV/IO or 2mg/kg IM** (Max. dose 150mg).
  - Pediatric dose **2mg/kg IV/IO** or **4mg/kg IM**.
- ❑ If Succinylcholine is unavailable or contraindicated; use **Vecuronium, 10mg IV/IO** (repeat prn) for adults or pediatric dose of **0.1mg/kg IV/IO.**
- ❑ Wait for fasciculation. (if using Vecuronium, there will be no fasciculation)
- ❑ Perform Intubation
  - Ensure that SpO_2 does not fall below 90% during intubation attempt
  - A maximum of 2 attempts (defined as attempting to visualize cords with laryngoscopy) is permitted prior to the utilization of alternative airways (e.g., King airway).
- ❑ If intubation is unsuccessful then move immediately to "rescue" airway.
- ❑ Secure & Confirm ETT/"Rescue" airway device
  - Auscultation, no epigastric sounds, misting in tube, chest rise/fall, equal breath sounds, $ETCO_2$, and etc.
- ❑ Sedation and/or Cont. Paralysis: if SBP > 100, **Midazolam 2.5-5mg IV/IO/IM** *-OR-* **Ketamine 0.5-1.0mg/kg IV/IO,** repeat q 5 minutes as needed to maintain sedation, refer to Midazolam or Ketamine guidelines
  - If not able to maintain adequate sedation with versed ***-and-*** transport time is > than 15 mins:
    - **Vecuronium, Adult 10mg IV/IO** (repeat prn)
    - **Vecuronium,** Pediatric dose **0.1mg/kg IV/IO**

PARAMEDIC

RAPID SEQUENCE INTUBATION (CONT.)

CONSIDERATIONS:

- An attempt at ETI is defined as any laryngoscopy with the intent of visualizing airway anatomy and/or passing an endotracheal tube.
- Ketamine is the preferred induction medication for patients with Bronchospasm, COPD, and Asthma.
- When faced with a difficult airway situation, providers should consider the use of the following techniques: BURP (back, up, right, pressure); Eschmann catheter; two provider laryngoscopy.

SELECTIVE SPINAL IMMOBILIZATION

OVERVIEW:

The impact of a spinal injury on a patient is immeasurable. For this reason, it should be our goal to ensure that every patient who has or may have a spinal injury is properly immobilized and transported. It should also be noted that the act of spinal immobilization itself can be detrimental - increased pain, increased decubitus ulcers, increased hospital stay times, and increased hospital bills all contribute to a need to reduce unnecessary spinal immobilizations. The best care for your patients is to immobilize those who need immobilization and to defer those who do not.

INDICATIONS:

- Spinal immobilization will be initiated in any patient who has experienced a mechanism with the potential of causing spinal injury (MVA, fall, etc.) and who displays ANY of the following:
  - Altered mental status
  - Presence of intoxicants by history or assessment.
  - Distracting injuries (fractures, drowning, large lacerations, burns >1%, pain which distracts the patient from your line of questioning).
  - Neurological deficit or complaint (weakness is the most common neurological sign of spinal injury).
  - Spinal pain or tenderness.
  - Comorbid age factors (< 12 or > 65 yrs) may impact the EMS Provider's ability to assess the patient's perception and communication of pain. A conservative approach to immobilizing these patients is strongly recommended.
  - Distracting situation (communication barrier, emotional distress, etc.)

CONTRAINDICATIONS:

- None

PROCEDURE:

EMR

- Initiate manual spinal immobilization.
- Determine if spinal immobilization is necessary.
- Apply appropriately sized cervical collar
- Extricate as needed while maintaining in-line spinal stabilization.
- Immobilize on long back board using spider straps or equivalent and appropriate head immobilizer.
- Patients should be immobilized in the following order: torso, head, and then legs.
- Discontinue manual stabilization.
  - Reassess sensation, circulation, and motor function during transport.
  - Treat for pain as needed per Pain Management Guideline.

EMR

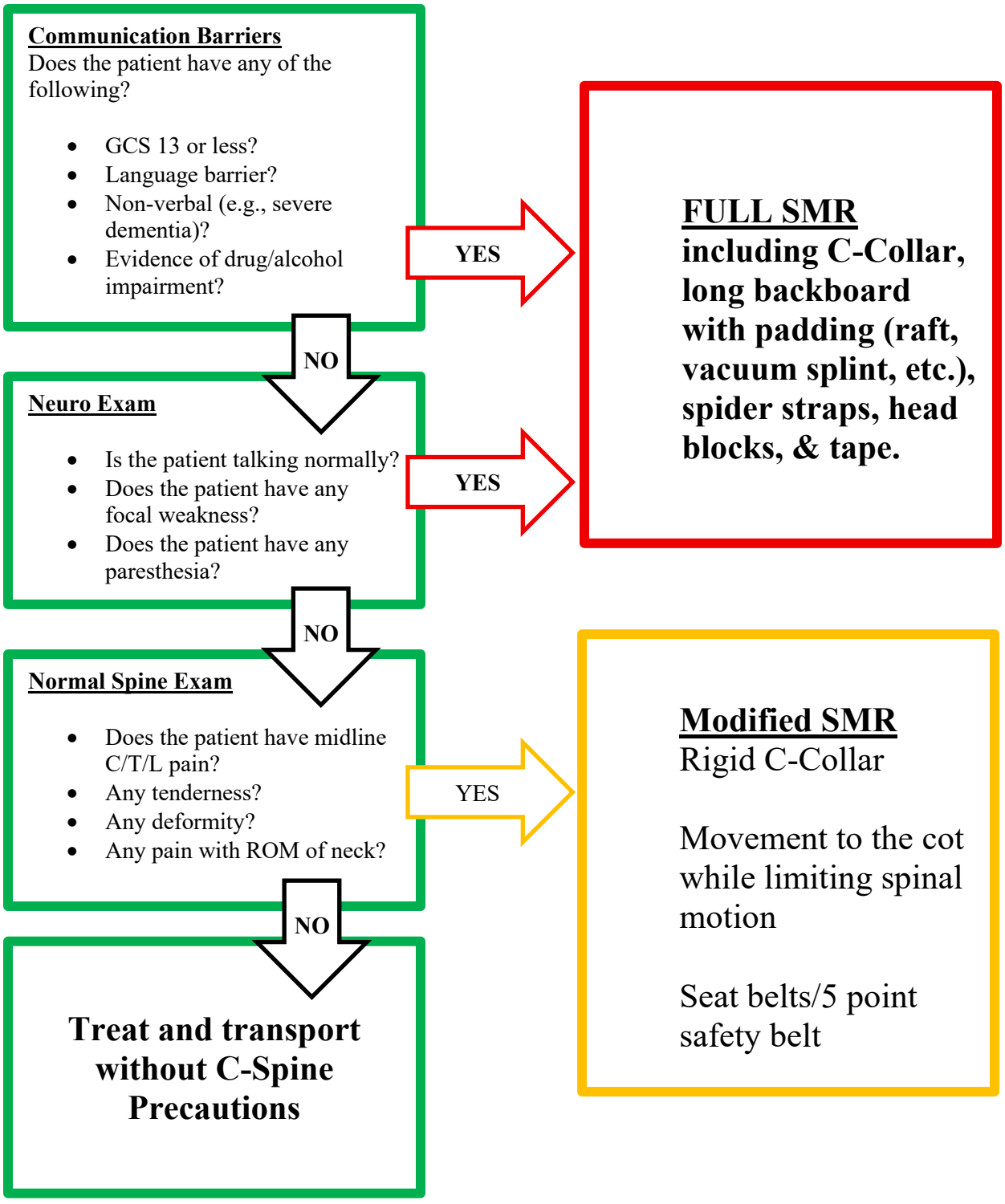
CONSIDERATIONS:

- Use your judgment! If you feel a patient should be immobilized, then immobilize regardless of the above criteria.
- For isolated penetrating head, neck, or torso trauma, immobilization of the cervical spine is unnecessary unless there is overt neurologic deficit or an adequate physical examination cannot be performed.
- For patients who are awake and alert and who do not have neurological deficits, spinal precautions can be maintained by **application of a rigid cervical collar and securing the patient firmly to the EMS stretcher**, and may be most appropriate for:
  - Patients who are found to be ambulatory at the scene
  - Patients who must be transported for a protracted time, in particular inter-facility transfers
- Pad backboards for all inter-facility transports. If feasible, especially in prolonged scene transports, pad backboards
- Some patients cannot be spinally immobilized using standard techniques. These patients must be immobilized to the best of your ability, but may require innovation.
- Pregnant patients in spinal immobilization need to be transported in left lateral recumbent position

SELECTIVE SPINAL IMMOBILIZATION

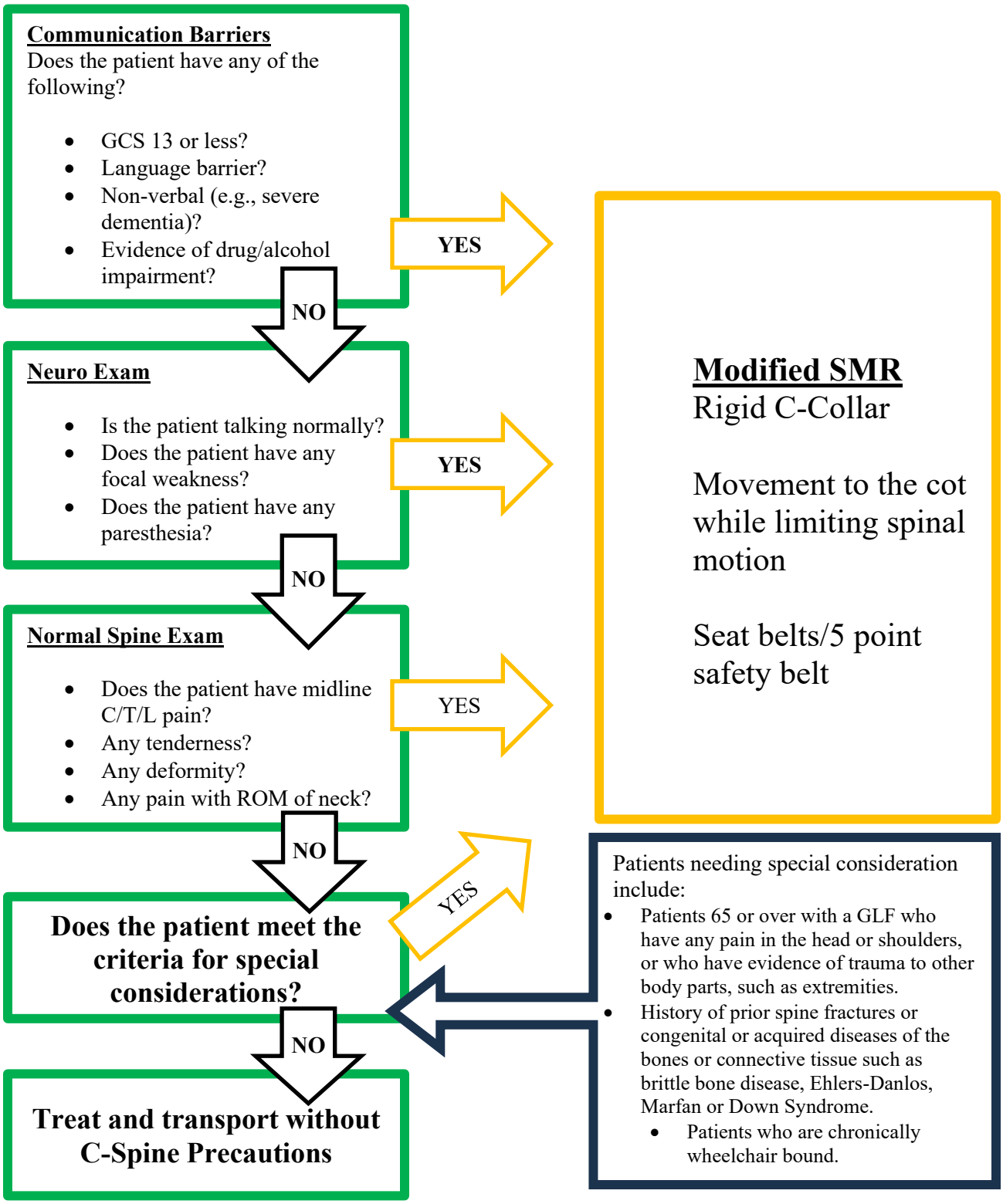
Significant Mechanism of Injury:

Meets state trauma system entry criteria under mechanism: fall from height (more than 3feet or 5 stairs), axial load (e.g. diving, football leading with helmet), motorized vehicle crash > 50 mph, non-motorized vehicle crash > 20 mph, ejection, co-occupant death, auto vs. pedestrian.



SELECTIVE SPINAL IMMOBILIZATION

Non-Significant Mechanism of Injury:
Includes ground -level fall, penetrating trauma, fist fight, and other low-velocity impacts.



STEMI ALERT

OVERVIEW:

A "STEMI Alert" allows a provider in the field to notify the receiving hospital of an incoming acute myocardial infarction. Early notification of a STEMI and preparation by the receiving facility allows a reduction in overall time between onset of symptoms and definitive treatment. This protocol is a guideline to follow when deciding which facility to transport patients who may have an MI or other cardiac complaints. It should be noted that the receiving hospital can determine the level of response it implements for a "Cath Alert." The hospital may choose to direct admit to the cath lab or evaluate the patient further in the ER. This skill is authorized for Paramedic providers only.

INDICATIONS:

- STEMI alert is indicated if patient has chest pain or VF/VT which has been converted, with no LBBB **AND**:
  - >1 mm ST elevation in 2 contiguous lateral leads (I, aVL, V4, V5, & V6) **OR**
  - >1 mm ST elevation in 2 contiguous inferior leads (II, III, & aVF) **OR**
  - >2 mm ST elevation in two contiguous chest leads (V1, V2, & V3)
- If LBBB is present consider Sgarbossa Criteria. **If score is ≥ 3 points STEMI Alert is indicated**:
  - Concordant ST elevation > 1mm in leads with a positive QRS complex (score 5)
  - Concordant ST depression > 1 mm in V1-V3 (score 3)
  - Excessively discordant ST elevation > 5 mm in leads with a negative QRS complex (score 2)

CONTRAINDICATIONS:

- None

PROCEDURE:

PARAMEDIC

- Follow "Chest Pain" Protocol as appropriate
- Acquire 12 Lead EKG for all patients suspected of having a cardiac problem
- Initiate rapid packaging of patient
- Determine appropriate facility to receive patient
- If no STEMI noted, patient may be transported to AGH
- Consult OLMC for patient's that you have a gut feeling about
- Code 3 transport
- Notify receiving hospital ASAP with standard hear report plus:
  - "STEMI Alert"
  - 12 lead results – amount of ST elevation and in which leads
  - Patient's cardiologist if known
- Receiving facility will determine, based on your assessment and resource availability, whether the patient will bypass the ER or not.
- Leave a copy of your pre-hospital 12 lead or serial 12 leads with the ED or cath lab staff

PARAMEDIC

CONSIDERATIONS:

- Early notification of and preparation by the receiving hospital allows a reduction in overall time between onset of symptoms and definitive treatment.

STROKE ALERT

OVERVIEW:

When the blood supply to the brain is interrupted or blocked for any reason, the consequences are usually dramatic. Control over movement, perception, speech, or other mental or bodily functions is impaired, and consciousness itself may be lost. Disruptions of blood circulation to the brain may result in a stroke -- a disorder that occurs in two basic forms, Embolic and Hemorrhagic, both potentially life-threatening. A "Stroke Alert" allows a provider in the field to notify the receiving hospital of an incoming suspected CVA/Stroke. Early notification of and preparation by the receiving facility allows a reduction in overall time between onset of symptoms and definitive treatment. It should be noted that, as with a Trauma Entry or STEMI Alert, the receiving hospital will determine the level of response it implements for a "Stroke Alert." The hospital may choose to direct admit to CT or evaluate the patient further in the ER.

INDICATIONS:

- Suspected Stroke/CVA with onset of symptoms < 24 hours.
- Patient showing no signs of improvement.
- In order to go directly to CT, patient must not have a compromised airway.

CONTRAINDICATIONS:

- None

PROCEDURE:

EMT

- Initiate rapid packaging of patient.
- Code 3 transport **to closest receiving emergency room.**
- Notify receiving hospital ASAP with standard HEAR report plus:
  - "Stroke Alert"
  - Time of onset of symptoms
  - Cincinnati Stroke Scale or BEFAST results.
  - Focal deficits present
  - Blood Glucose results
- Receiving facility will determine, based on your assessment and resource availability, whether the patient will bypass the ER and go directly to CT.

EMT

CONSIDERATIONS:

SUCTIONING

OVERVIEW:

A procedure for clearing the airway quickly of secretions via a vacuum pump or some other mechanical device.

INDICATION:

- When patient is exhibiting respiratory difficulty secondary to secretions in airway or the potential for aspiration exists.

CONTRAINDICATIONS:

- N/A

PROCEDURE:

EMR

***ORAL SUCTIONING*:**

- Pre-oxygenate patient with 100% oxygen.
- Assemble equipment: Suction unit with tonsil tip or dental tip, personal protective equipment (gloves, goggles, etc).
- Attach required monitoring equipment.
- Turn suction unit on and confirm mechanical suction is present.
- Insert tip without suction – if equipment allows.
- Apply suction for no more than 15 seconds.
- Monitor patient's oxygen saturation.
- Re-oxygenate patient for at least 2 – 3 minutes between suction attempts if possible.

EMR

EMT

TRACHEAL SUCTIONING ON INTUBATED PATIENT:

- Pre-oxygenate patient with 100% oxygen.
- Assemble equipment: Suction unit, correct size suction catheter, sterile rinse, personal protective equipment (gloves, goggles, etc).
- Attach required monitoring equipment.
- If patient is being ventilated with BVM prior to suctioning, have someone else remove the bag from end of ET tube prior to suction attempt.
- Insert catheter into the ET tube without applying suction.
- Advance catheter as far as possible.
- Withdraw slowly using **intermittent** suction while rotating catheter.
- Do not suction more than 15 seconds.
- Monitor patient's oxygen saturation. Re-oxygenate patient for at least 2 – 3 minutes between suction attempts.

EMT

CONSIDERATIONS:

- Oral and tracheal suctioning can cause trauma to the oropharynx and airway, bradycardia, or hypoxia. It should not delay other resuscitation.

SYNCHRONIZED CARDIOVERSION

OVERVIEW:

Synchronized electrical cardioversion causes a rapid and complete depolarization of cardiac tissues. Under many circumstances synchronized electrical cardioversion is the quickest and most effective method of correcting a life-threatening dysrhythmia.

INDICATIONS:

- Patients who are exhibiting hemodynamically unstable tachycardias (wide or narrow complex).
  - Patients are unstable if they display one or more of the following:
    - Altered mental status
    - Chest pain
    - Syncope
    - Dyspnea
    - Hypotension
    - Pulmonary congestion
    - CHF
    - AMI
  - In most situations, synchronized cardioversion is usually reserved for those adult patients with heart rates over 150 beats/minute.

CONTRAINDICATIONS:

- ❑ Supraventricular tachycardia induced by non-cardiac conditions (medication – digitalis toxicity, hypovolemia, hyperthermia, hypoxia, etc.).

PROCEDURE:

PARAMEDIC

- ❑ Explain procedure and reassure patient
- ❑ Initiate sedation with **Midazolam 2.5mg – 5mg IV/IO/IN/IM**
  - May defer sedation if patient's level of consciousness is significantly diminished and the patient is hemodynamically unstable – administering after procedure is acceptable
- ❑ Place defib/cardioversion pads on patient in accordance with manufacture's recommendation for cardiac device being used.
  - Anterior/Lateral or Anterior/Posterior
- ❑ Set cardiac device to Synchronize with QRS complexes
- ❑ Select appropriate initial energy setting per manufacture's recommendation for cardiac device being used:
  - Wide Complex Tachycardias (e.g., 100J for Physio 75J for Zoll etc.)
  - Narrow Complex Tachycardias (e.g., 50J for Physio 70J for Zoll etc.)
- ❑ Clear the patient and deliver shock
- ❑ Re-assess patient and repeat procedure as required

PARAMEDIC

CONSIDERATIONS:

- If energy is delivered without synchronization, ventricular fibrillation could result
- ❑ Depending upon the cardiac device being used, synchronization may be required following each counter shock – refer to the operational materials for your specific device.
- Ensure synchronization is turned OFF if defibrillation becomes necessary.

TOURNIQUETS

OVERVIEW:

Tourniquets are an effective means of arresting life-threatening external hemorrhage from limb injury. Their use has not previously been accepted practice for pre-hospital civilian trauma care because of significant concerns regarding the potential complications. However, in a few rare situations tourniquet application will be necessary and life-saving.

INDICATION:

- Life threatening bleeding from an extremity wound that is not controllable by direct pressure
- Life threatening bleeding from a complete or nearly complete amputation proximal to the hand or foot.

CONTRAINDICATIONS:

- N/A

PROCEDURE:

EMR

- Remove clothing to expose the extremity and bleeding site.
- Apply tourniquet just proximal to the bleeding wound.
- Tighten tourniquet via manufacturer's procedure just tight enough to occlude arterial blood flow.
- Note time of tourniquet application
- Monitor for return of significant bleeding.

EMR

CONSIDERATIONS:

- Only firm, wide band commercial tourniquets should be used.
- Document the time of tourniquet application and the application site.
- Notify the receiving hospital as soon as possible that a tourniquet has been applied.
- Do Not loosen a Tourniquet after application.
- The tourniquet is to be removed only under the supervision of a physician.

TRANSCUTANEOUS PACING

OVERVIEW:

Transcutaneous Pacing is a method of applying electrical energy to a patient's chest and through the patient's heart in order to stimulate contraction. Many paramedic providers prefer TCP to other medication-based treatments of bradycardia because of the amount of control provided to the provider. Providers should never forget that TCP is very painful and patients should be sedated before or soon after TCP is initiated.

INDICATIONS:

- ❑ Patients who are exhibiting hemodynamically unstable bradycardia (heart rate <60)
  - Patients are considered unstable if they display one or more of the following:
    - Altered mental status
    - Syncope
    - Hypotension
    - CHF
  - In most situations, transcutaneous pacing is usually reserved for patients unresponsive to pharmacologic intervention (e.g., Atropine)

CONTRAINDICATIONS:

- ❑ Patients presenting in Asystole/PEA
- ❑ Patient with penetrating or blunt trauma

PROCEDURE:

PARAMEDIC

- ❑ Explain procedure and reassure patient
- ❑ Initiate sedation with **Midazolam 2.5mg – 5mg IV/IO/IN/IM**
  - May defer sedation if patient's level of hemodynamic instability requires immediate intervention – administering after initiating procedure is acceptable.
- ❑ Place EKG electrodes and pacing pads on patient in accordance with manufacture's recommendation for the cardiac device being used.
  - Anterior/Lateral or Anterior/Posterior
- ❑ Activate the pacing mode and ensure the device is sensing patient's intrinsic rhythm.
- ❑ Set pacer rate for 80 beats/minute or 120 beats/minute for pediatric patient
- ❑ Begin recording rhythm
- ❑ Gradually increase the current until 'electrical' capture is recognized
- ❑ Once electrical capture is achieved, check for mechanical capture
  - Observe patient for changes
    - Palpable pulses
    - Improved Mental status
    - Improvements in Blood pressure

PARAMEDIC

CONSIDERATIONS:

- ❑ Document EKG rhythm before and after pacing
- ❑ Pacing is not indicated in severe generalized hypothermia
- ❑ If you are unable to gain capture, consider placing pads in the anterior and posterior positions.

TRANSTRACHEAL JET INSUFFLATION

OVERVIEW:

Transtracheal Jet Insufflation can be used as a temporizing oxygenation measure while preparing for cricothyrotomy in adults or as a temporizing measure throughout transport in pediatric patients who are too small for cricothyrotomy. Providers should note that patient will be supplied with a limited volume of 100% oxygen but will not be ventilated at a sustainable volume. This skill is authorized for EMT-P providers only.

INDICATIONS:

- ❑ Failure to control airway by any other available means.
- ❑ Standard airway control methods are not possible or contraindicated.
- ❑ As a temporizing measure while preparing for cricothyrotomy.
- ❑ Pediatric patients <12y/o.

CONTRAINDICATIONS:

- ❑ None when performed as a life saving measure.

PROCEDURE:

PARAMEDIC

- ❑ Prep site with antiseptic wipe.
- ❑ Insert 13-gauge transtracheal needle through cricothyroid membrane.
- ❑ Aspirate air once in trachea.
- ❑ Slide catheter over needle until resting against skin.
- ❑ Connect jet ventilator to oxygen source (via quick connect) and luer lock on needle.
  - ○ 0 to <5 years old- only ventilate with a Bag-Valve Mask
  - ○ 5 to 12 years old - <30 mm/Hg
- ❑ Use valve to ventilate patient – quick 1-2 second ventilations; stop when chest rises.
- ❑ Monitor closely for passive exhalation; complete obstruction can lead to tension pneumothorax.

PARAMEDIC

CONSIDERATIONS:

- ❑ Passive exhalation is expected to be extremely slow. Allow 5-10 sec for exhalation.

TRAUMA SYSTEM ENTRY

OVERVIEW:

The Oregon Trauma System is designed to provide patients of multi-system trauma with the care they need at the earliest time possible. Activating the trauma system early hinges on EMS personnel determining which patient meets entry criteria and early hospital notification. Every provider should be comfortable utilizing this procedure.

INDICATIONS:

EXHIBIT 2
OAR chapter 333, division 200

National Guideline for the Field Triage of Injured Patients

RED CRITERIA
High Risk for Serious Injury

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

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

YELLOW CRITERIA
Moderate Risk for Serious Injury

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

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

TRAUMA SYSTEM ENTRY CONT.

PROCEDURE:

EMR

- Patients meeting RED High Risk for serious injury criteria and/or YELLOW Moderate Risk criteria should be entered into the trauma system by EMS personnel.
- The destination facility for ground transport of identified trauma patients shall be determined by the following general criteria:
    - The stable, conscious, oriented trauma system patient will be allowed input in determining patient destination and mode of transport. The patient should be informed of the closest trauma hospital.
    - Patients meeting the RED criteria should be transported to the closest Level II Trauma Center.
        - Patients with unstable and/or compromised airway will be taken to the closest hospital for initial airway management.
        - OLMC shall be consulted prior to direct transport to a level I facility for special circumstances (e.g., burns, amputation etc).
    - Patients meeting only YELLOW criteria may be transported to the closest level III or IV Trauma facility
- If patient is transported by helicopter, OLMC shall be consulted to determine closest appropriate facility.
    - Consult with air provider to determine distances to facilities from exact GPS coordinates.
- Communication to the receiving hospitals regarding any trauma patient should occur as early as possible to allow for appropriate resources to be summoned.
- HEAR information should be short and precise so the ED staff has a good idea about patient condition and type of injury. Information should include:
    - Medic unit number
    - Approximate location of incident
    - Number of patients with approximate Age and sex of each patient.
    - General mechanism of injury
    - Exact criteria for patient entry into trauma system
    - Clinical vital signs and brief synopsis of care being rendered
    - Approximate ETA

EMR

CONSIDERATIONS:

- PHCR documentation shall be completed as soon as possible and sent to the receiving facility.
- Good Samaritan Regional Medical Center, Sacred Heart at River Bend, and Salem Hospital are all level II Trauma Centers serving the Linn-Benton County area.
- Albany General Hospital is a level IV Trauma Center
- Lebanon Community Hospital is a level IV Trauma Center.

ADENOSINE (ADENOCARD)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Antiarrhythmic
- Slows conduction through the AV node
- Can interrupt re-entry pathways through the AV node, which are causing a rapid atrial response, restoring normal function.
- Can restore normal sinus rhythm in patients with paroxysmal supraventricular tachycardia (PSVT), including PSVT associated with Wolff-Parkinson-White Syndrome.
- Half-life estimated to be less than 10 seconds (onset 5-20 seconds and duration of 30-40 seconds)
- Adenosine can also produce coronary artery vasodilatation

INDICATIONS:

- Adult: Heart rates ≥150 bpm to convert stable narrow complex tachycardia (including Wolff-Parkinson-White Syndrome) to normal sinus rhythm.
- Children: Heart rates ≥180 bpm
- Infants: Heart rates ≥220 bpm

CONTRAINDICATIONS:

- Allergy to Adenosine
- Second- or third-degree AV block, except in patients with functioning artificial pacemaker.
- Sick sinus syndrome, except in patients with a functioning artificial pacemaker
- Recognized Atrial Fibrillation or Atrial Flutter
- Ventricular Fibrillation
- Ventricular Tachycardia
- Pregnancy (relative) – contact OLMC

ADMINISTRATION:

ADULT	PEDIATRIC
PARAMEDIC ▢ 12 mg rapid IV bolus (less than 5 seconds), followed by a 20 mL NS flush ▢ If no change, may be repeated once more for a total of 2 doses.	▢ 0.1 – 0.2 mg/kg IV/IO bolus, max first dose 6 mg, followed by a 10 mL NS flush. ▢ If no change, may increase to 0.2-0.4mg/kg rapid IV/IO bolus followed by a NS flush. May be repeated once more for a total of 3 doses. PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- May produce short lasting first, second, or third-degree heart block, or transient Asystole
- Patients who develop high level of block with one dose of Adenosine should not be given additional doses.
- Additional side-effects may include: Hypotension, Dyspnea, Palpitations & Chest pressure, Nausea, Metallic taste in mouth, Tightness in throat or groin, Back pain, Heaviness in arms or neck, Numbness, Apprehension, and Blurred vision.

ADENOSINE (ADENOCARD) CONT.

SPECIAL NOTES:

- Many of these adverse reactions are usually minor and of brief duration, and resolve without treatment. Many patients may be intensely uncomfortable for a short period.
- Pregnancy Category C.
- Effects are antagonized by methylxanthines such as caffeine and Theophylline, larger doses may be required or Adenosine may not be effective.
- Administration of Adenosine with Dipyridamole (Persantine) may result in prolonged asystole.
- In the usual doses range, Adenosine has no systemic hemodynamic effects. Larger doses can decrease blood pressure by decreased peripheral vascular resistance, but this is transient.
- Adenosine is not effective in converting atrial fibrillation, atrial flutter, or ventricular tachycardia.
- Adenosine effects are potentiated by Persantine and may create higher degrees of heart block if patient is taking Tegretol. As a result, patients taking these medications should receive ½ the normal dose. Patients taking Tegretol may go into refractory asystole and may need a pacemaker.
- Asthmatic patients with active bronchospasm should receive ½ the normal dose of Adenosine as bronchoconstriction may be produced with its administration.
- At the time of conversion to NSR, a variety of new rhythms may appear on the EKG. They usually only last a few seconds and do not require intervention.
- Digitalis, calcium channel blockers, and benzodiazepines can augment the activity of Adenosine.

ALBUTEROL

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Sympathomimetic
- Aqueous solution administered by oral inhalation with the aid of a nebulizer system
- Primary effect is to relax bronchial smooth muscles with resultant relief of bronchospasm
- Pharmacological effects partly due to stimulation through beta-adrenergic receptors of intra-cellular adenyl cyclase that catalyzes the conversion of ATP to cyclic-AMP.
- Increased cyclic-AMP levels are associated with relaxation of bronchial smooth muscles and inhibition of release of mediators of immediate hypersensitivity from cells.
- Very selective $Beta_2$ agonist with very little $beta_1$ stimulation

INDICATIONS:

- Bronchospasm secondary to respiratory distress
- Treatment of hyperkalemia (excess potassium) in renal failure patients
- Crush Injury patients with suspected hyperkalemia

CONTRAINDICATIONS:

- Known hypersensitivity to adrenergic amines
- Cardiac dysrhythmias (relative)

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT	***ASTHMA/BRONCHOSPASM:*** ❑ 2.5mg in 3cc 'pearl' administer by small volume nebulizer @ 6 to 8 LPM oxygen flow ❑ Dose may be repeated as needed q 20 minutes	❑ SAME AS ADULT	EMT
PARAMEDIC	***DIALYSIS EMERGENCY (HYPERKALEMIA)/ CRUSH INJURIES*** ❑ 2.5mg/3ml 'pearl' administered by nebulizer @ 6 to 8 LPM oxygen flow. ❑ Repeat x 3 in rapid succession		PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Tremor; Palpitations; Tachycardia; Nervousness; Dizziness; Hypertension; Nausea; Vomiting; Angina; Headache; Drying of oropharynx
- As with other adrenergic aerosols, the potential for paradoxical bronchospasm exists.
- Use with caution for patients being treated with monoamine oxidase inhibitors (e.g. Nardil®, Parnate®) or tricyclic antidepressants (e.g. Elavil®, Sinequan®), since the action of albuterol may be potentiated on the vascular system
- Discontinue if pulse increases by 20 bpm, onset of frequent PVCs, or onset of tachydysrhythmias.

AMIODARONE (CORDARONE)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Antiarrhythmic
- Effects sodium, potassium, calcium channels, as well as alpha and beta adrenergic blocking properties
- Prolongs the action potential and refractory period in myocardial tissue
- Depresses automaticity of the sinoatrial node
- Increases atrial and ventricular refractoriness and prolongs QT interval
- Rapidly distributed
- Half-life up to 40 days

INDICATIONS:

- Cardiac arrest (shockable rhythm: V-Fib, V-Tach)
- Refractory V-fib or V-tach in cardiac arrest
- Stable, perfusing Ventricular Tachycardia

CONTRAINDICATIONS:

- 2nd and 3rd degree heart block
- Bradycardia
- Hypersensitivity to Amiodarone

ADMINISTRATION:

ADULT	PEDIATRIC
EMT-I	EMT-I
V - FIB OR V - TACH IN CARDIAC ARREST	***V - FIB OR V - TACH IN CARDIAC ARREST***
▪ 300 mg diluted in 20 mL NS IV/IO ▪ May repeat in 5 minutes x 1at 150 mg diluted in 20 mL NS IV/IO	▪ 5 mg/kg IV/IO diluted in NS (max. dose 300 mg) ▪ Contact OLMC for additional dosing
STABLE PERFUSING V - TACH	***STABLE PERFUSING V - TACH***
▪ 150 mg IV/IO drip @ 15mg/min ▪ Follow with 1mg/min maintenance drip.	▪ 5 mg/kg over 20 to 60 minutes after OLMC consultation ▪ Max. single dose 150 mg

PRECAUTIONS & SIDE EFFECTS:

- Hypotension
- Prolonged QT interval
- Proarrhythmic (Torsades, V-Fib)
- Severe bradycardia
- Atrioventricular block
- Use with caution in patients with CHF.
- Adverse effects may be long lasting because the half-life is up to 40 days.

AMIODARONE (CORDARONE) CONT.

SPECIAL NOTES:

- Pregnancy Category D.
- Peripheral vein IV infusion concentrations should not exceed 3 mg/ml. Can cause phlebitis if greater than 3 mg/ml.
- Amiodarone should be administered slowly to a patient with a pulse but may be given rapidly to a patient in cardiac arrest.

ASPIRIN

PHARMACOLOGY &MECHANISM OF ACTIONS:

- Aspirin is a platelet aggregator inhibitor/anti-inflammatory. Therapeutic actions of aspirin are the prevention of blood clot formation (specifically in coronary arteries), decrease of inflammation, pain control, and decrease of fever.
- Prevention of platelet clumping and blood clot formation by irreversible changes in platelet shape and function.
- The analgesic, anti-inflammatory, and antipyretic effects are due to blocking prostaglandins
- Onset of actions expected in 5-30 minutes, with peak effect in 2-4 hours

INDICATIONS:

- Suspected cardiac related chest discomfort

CONTRAINDICATIONS:

- Suspected aortic dissection
- Aspirin allergy (history of hives, angioedema, or asthma induced by aspirin)
- Current ulcer or GI bleeding as evidenced by frank hematemesis or coffee ground emesis, or melena per rectum

ADMINISTRATION:

ADULT	PEDIATRIC
EMR - Have patient chew and swallow four (4) x 81 mg chewable tablets (total 324 mg) of baby aspirin.	EMR

PRECAUTIONS & SIDE EFFECTS:

- High doses of aspirin may cause ringing in the ears
- Heartburn
- Nausea
- Vomiting
- Pregnancy Category D.
- Use caution with patient's with asthma

SPECIAL NOTES:

- Adverse reactions and effects may be increased by concomitant use of other NSAIDs
- If patient states, "My doctor said I can't take aspirin" Question as to why. Unless patient describes and allergic type reaction, patient most likely can have dose. Consider OLMC
- It is OK to administer even if the patient has taken their daily ASA

ATROPINE SULFATE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Parasympatholytic & Muscarinic-cholinergic blocking agent
- Increases heart rate (by blocking vagal influences)
- Increases conduction through AV node (i.e., increases ventricular sensitivity to atrial impulses). Enhances the rate of discharge of the sinus node.
- Reduces motility and tone of G.I. tract
- Reduces action and tone of the urinary bladder (may cause urinary retention)
- This drug blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal.

INDICATIONS:

- Symptomatic bradycardia or pacemaker failure
- Insecticide exposures (anti-cholinesterase, e.g., organophosphates) and nerve gases

CONTRAINDICATIONS:

- Allergy to Atropine
- Tachycardia
- A-fib-flutter – may cause increased ventricular response
- High degree AV block (relative) – likely to be ineffective

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT	❑ May assist with auto-injector for organophosphate poisoning and nerve gas exposure.	❑ SAME AS ADULT	EMT
EMT-I	***SYMPTOMATIC BRADYCARDIA:*** ❑ 1.0 mg IV/IO ❑ May repeat q 5 to 10 minutes to max of 3mg ***ORGANOPHOSPHATE/NERVE AGENT:*** ❑ 2.0 mg IV/IO ❑ May repeat q 5 minutes to max of 6mg	***SYMPTOMATIC BRADYCARDIA:*** ❑ 0.02 mg/kg IV/IO (min dose of 0.1mg) IV/IO. ❑ May repeat x 1 ***ORGANOPHOSPHATE/NERVE AGENT:*** ❑ 0.05 mg/kg IV/IO slowly ❑ Contact OLMC for additional dosing.	EMT-I

PRECAUTIONS & SIDE EFFECTS:

- Dilated pupils in cardiac arrest situations
- Bradycardias in the setting of an acute MI are common and probably beneficial. Don't treat them unless there are signs of poor perfusion (low blood pressure, mental confusion).
- Atropine will not have an effect on transplanted hearts due to no vagal nerve connection to the heart.
- Pregnancy Category C.
- Use with caution in atrial fibrillation and atrial flutter because increased conduction may speed ventricular rate excessively.
- Chest pain could be due to an MI or to poor perfusion caused by the bradycardia itself.
- People walk around doing well with chronic second- and third-degree block. Symptoms occur mainly with acute change. Treat the patient, not the EKG monitor.
- Doses of less than 0.5 mg and those given slowly may be parasympathomimetic.
- SLUDGE: Salivation, Lacrimation, Urination, Defecation, Gastric Upset, Emesis

CALCIUM GLUCONATE 10%

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Electrolyte salt
- Antidote
- Calcium is essential for nervous, muscular and skeletal system functions. Calcium in its ionic (dissolved) state carries a very positive charge. This charge causes the cell membrane to be stable. If the calcium is too low neurons and cardiac cells have a decreased threshold for activation resulting in tetany. Therefore, Calcium causes a significant increase in myocardial contractile force and appears to increase ventricular automaticity. It also increases excitability of muscle fibers. Calcium Gluconate is less potent and less irritating to veins than Calcium Chloride.

INDICATIONS:

- Cardiac arrest with suspected hyperkalemia (Dialysis patient).
- A renal failure/dialysis patient presenting with marked weakness, respiratory insufficiency, widened QRS complex, and small or absent P waves. Sine waves may also be present.
- Patients suffering from calcium channel blocker overdose
- Patients exposed to hydrogen fluoride (hydrofluoric acid)

CONTRAINDICATIONS:

- Allergy to calcium chloride
- Hypercalcaemia
- Digitalis toxicity
- Patient taking digoxin
- Bradycardia
- Ventricular Fibrillation

ADMINISTRATION:

ADULT	PEDIATRIC
PARA MEDIC ***CARDIAC ARREST/ DIALYSIS HYPERKALEMIA IN RENAL FAILURE/DIALYSIS PATIENT:*** ❑ 2 gram IV/IO push over 5-10 minutes ***OVERDOSE*** ***CALCIUM CHANNEL BLOCKER OVERDOSE*** ❑ 10 mL of 10% solution IV over 5 minutes ***HYDROGEN FLUORIDE OPTICAL EXPOSURE*** ❑ Flush eyes with 10 mL of 10% Calcium Gluconate in 1000 mL NS in 60 mL Syringe via Morgan Eye Lens (irrigate with 500 mL NS). ***HYDROGEN FLUORIDE INHALATION EXPOSURE*** ❑ Mix 1 mL of 10% Calcium Gluconate with 3 mL NS (sterile water) in nebulizer and administer to patient	***OVERDOSE*** ❑ 60mg/kg (0.6mL/kg) IV/IO push over 5-10 minutes ***HYDROGEN FLUORIDE INHALATION EXPOSURE*** ❑ Mix 1 mL of 10% Calcium Gluconate with 3 mL NS in nebulizer and administer to patient ***MILD TO MODERATE HYDROGEN FLUORIDE SKIN EXPOSURE*** ❑ Mix 2 mLof 10% Calcium Gluconate per 1 ounce KY jelly and coat and massage affected area PARAMEDIC

CALCIUM GLUCONATE 10% (CONTINUED)

PRECAUTIONS & SIDE EFFECTS:

- Cardiac arrest
- Bradycardia
- Arrhythmias
- Syncope
- Nausea
- Vomiting
- Diaphoresis
- Tingling sensations
- Local irritation in injection site
- Associated with rapid rate of injection:
  - Peripheral vasodilatation
  - Hypotension
  - Bradycardia

SPECIAL NOTES:

- Calcium is indicated for treatment of acute hyperkalemia (elevated potassium) and acute hypocalcaemia (decreased calcium), both of which can occur in patients with renal failure and those receiving dialysis treatment.
- Can cause necrosis at the IV site. Use in a patent, well flowing IV line.
  •Do not mix with Sodium Bicarbonate.
- May produce vasospasm in coronary and cerebral arteries.
- If the heart is beating, rapid administration may cause bradycardia or cardiac arrest. Push slowly in patients with a pulse.

CARDIZEM (DILTIAZEM)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Calcium channel blocker
- Decreases the sinoatrial node automaticity
- Increases AV node refractory
- May terminate re-entrant arrhythmias that require AV nodal conduction for their continuation
- Causes coronary and peripheral vasodilatation
- Metabolized by the liver and excreted by kidneys
- Onset of action 2-5 minutes
- Slows AV node conduction making it an excellent agent for slowing Atrial Fibrillation or Atrial Flutter, and the conversion of PSVT. It will achieve these goals in less than 7 minutes in over 80-90% of patients.

INDICATIONS:

- Symptomatic but hemodynamically stable rapid response Atrial Fibrillation or Flutter- greater than 120 bpm

CONTRAINDICATIONS:

- Acute atrial fibrillation in a patient with known history of WPW.
- Any patient with a history of sick sinus syndrome, or second- or third-degree heart block, who does not have a pacemaker in place. Conversion in these patients can cause severe bradycardia.
- Pregnancy
- Hypotension. Results may be variable, and hypotension will occur in <4% of patients who receive this drug. It should not be given to a patient whose blood pressure is less than 100 mmHg.
- Wide complex tachycardia. This drug can be dangerous in VT. Unless previously known to be PSVT by history from the patient don't use it in this situation. Adenosine or cardioversion will be first line treatments.
- Children under 15 years of age without Med. Consult.
- Allergy or sensitivity to Diltiazem
- Poison or drug induced tachycardia

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	❑ 0.25 mg/kg slow IVP (over 2 min) ❑ Repeat after 15 min at 0.35 mg/kg slow IVP (over 2 min) 30mg max per dose ❑ Consult Medical Control for additional dosing	***CONTACT OLMC***	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Hypotension
- Transient PVCs after administration, consider benign
- Heart block
- Bradycardia
- Chest pain
- Itching/burning

CARDIZEM (DILTIAZEM) CONT.

- Flushing
- In the rare patient who experiences sustained hypotension (SBP<90mmHg) after administration of Cardizem, place patient in supine position, if not already, and try small trial of IV fluid. If pulmonary edema presents, defer fluid challenge and contact OLMC.
- Drug interactions can be seen with Cyclosporin and Tegretol by increasing their levels. This will not be a problem in the pre-hospital phase, but should be passed on to the receiving facility.

SPECIAL NOTES:

- Pregnancy Category C
- Shelf life of one month without refrigeration.
- Diltiazem will rarely convert PSVT, but will slow the rate, which will improve cardiac output.

DEXTROSE

PHARMACOLOGY &MECHANISM OF ACTIONS:

- Carbohydrate
- Glucose is the body's fuel
- Its use is regulated by insulin, which transports glucose from the bloodstream into cells, and glucagon, which mobilizes stored glucose into the bloodstream.
- It produces most of the body's quick energy

INDICATIONS:

- Hypoglycemic states usually associated with insulin shock, or oral hypoglycemic medications in diabetics.
  - Adult: <60mg/dL
  - Child: <45mg/dL
  - Infant: <30mg/dL

CONTRAINDICATIONS:

- Suspected CNS bleeding

ADMINISTRATION:

ADULT	PEDIATRIC
A - EMT - 12.5 to 25 g IV/IO - Repeat as needed	- Administer Dextrose D50 1 ml/kg in IV/IO should be diluted 50% in NS. A - EMT

PRECAUTIONS & SIDE EFFECTS:

- Higher concentrations of Dextrose should be administered through an IV-line flowing NS, and a minimum of 250cc's of fluid infused to prevent irritation to the vascular system.
- Effect is delayed in elderly patients with poor circulation.
- Even $D_{25}W$ is very hyperosmolar and may be sclerosing to peripheral veins, especially small veins. In addition, repeated administration may result in a hyperosmolar state, which has been associated with intra ventricular hemorrhage in the premature infant.
- If extravasation of IV dextrose occurs, stop administration. Place cold compress, and look for alternative site, or consider glucagon. IV should be secure and free return of blood into the syringe or tubing should be checked 2-3 times during administration.

SPECIAL NOTES:

- Glucose is an important agent in the resuscitation of infants and children. During cardiac resuscitation of an infant or child, a rapid field glucose test should be obtained, and glucose administered if hypoglycemia is present. It may also be indicated in infants and children who fail to respond to the usual resuscitation measures. Infants suffering traumatic injuries should also receive glucose testing and appropriate treatment.

DILAUDID (HYDROMORPHONE)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Hydromorphone Hydrochloride is a pure opioid agonist with the principal therapeutic activity of analgesia. A significant feature of the analgesia is that it can occur without loss of consciousness. Opioid analgesics also suppress the cough reflex and may cause respiratory depression, mood changes, mental clouding, euphoria, dysphoria, nausea, vomiting and electroencephalographic changes. Many of the effects described below are common to this class of mu-opioid agonist analgesics which includes Morphine, Oxycodone, Hydrocodone, codeine and Fentanyl.

INDICATIONS:

- Pain relief

CONTRAINDICATIONS:

- Allergy to opioids or sulfites
- BP<100
- Respiratory depression
- Pregnancy
- Known hypersensitivity
- Altered level of consciousness

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	❑ 1-2 mg IV, IO, or IM contact OLMC for additional doses. ❑ half dose for patients >70 years old	❑ 0.015mg/kg IV, IO or IM	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Schedule II opioid agonist – **HIGH ABUSE POTENTIAL**
- Respiratory depression risk; associated alcohol, other opioids and CNS depressants may increase risk of potentially fatal respiratory depression
- May cause circulatory depression
- Head injury/increased intercranial pressure
- Severe hypotension
- Renal/hepatic disease

DIPHENHYDRAMINE (BENADRYL)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Antihistamine
- Diphenhydramine acts to block the histamine effects in an allergic reaction
- Anticholinergic, antiparkinsonian effects are used to treat acute dystonic reactions to antipsychotic drugs (ex: Haldol, Thorazine, Compazine). These reactions include oculogyric crisis (fixation of the eyeballs), acute torticollis (spasmodic contraction of the neck muscles), and facial grimacing and to treat extrapyramidal reactions (tremors, tics, changes in muscle tone and posture).
- May stimulate or depress CNS depending on individual response and dose given.

INDICATIONS:

- Second line drug as an adjunct to epinephrine in the treatment of anaphylactic shock and severe allergic reactions.
- In mild to moderate allergic reactions, meaning they do not involve respiratory or cardiovascular compromise, given without epinephrine.
- Acute dystonic reactions to antipsychotic and antiemetic drugs

CONTRAINDICATIONS:

- Allergy to Diphenhydramine
- Acute asthma attack (relative)
- Pregnancy (relative)

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT-I	❑ 25-50 mg deep IM or slow IV/IO push ❑ In severe anaphylaxis the dosage can be repeated once	❑ 1.0 mg/kg deep IM or slow IV push. ❑ In severe anaphylaxis the dosage can be repeated once	EMT-I

PRECAUTIONS & SIDE EFFECTS:

- Hypotension when given IV
- Headache
- Drowsiness
- Paradoxical excitation (in children)
- Palpitations
- Wheezing (thickening of bronchial secretions)
- Blurred vision
- Pregnancy or asthma attack should not prohibit use of this medication in significant allergic reactions.
- May have synergistic effect when combined with alcohol or other CNS depressants.

SPECIAL NOTES:

- Although useful in acute dystonic reactions, it is not an antidote to phenothiazine toxicity or overdose.
- Benadryl is indicated without epinephrine when there are signs/symptoms of allergic reactions not having cardiovascular compromise or significant respiratory distress. Commonly this will be in patients that c/o less serious hives, itching, difficulty swallowing, feeling like a lump is in their throat, and no shortness of breath, have good skin condition, no hypotension or any significant tachycardia.

DROPERIDOL

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Major tranquilizer
- Is a potent neuroleptic agent that is available in either an intravenous or intramuscular injection.
- Produces marked tranquilization and sedation; it allays apprehension and provides a state of mental detachment and indifference while maintaining a state of reflex alertness.
- Potentiates other CNS depressants.
  - It produces mild alpha-adrenergic blockade, peripheral vascular dilation, reduction of the pressor effect of epinephrine, and has an anti-emetic effect.
  - It can produce hypotension and decreased peripheral vascular resistance.
- The onset of action of a single IV dose is from 3 to 10 minutes following administration, and the peak effect may not be apparent for up to 30 minutes. Duration is generally from 2 to 4 hours.

INDICATIONS:

- Nausea retractable to Zofran
- Sedation of combative patients to facilitate restraint.

CONTRAINDICATIONS:

- Known allergy to droperidol
- Known cardiac Q-T abnormality
- Age over 70

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	❑ Sedation - 2.5-5 mg IV/IM/IO, may repeat x 1 ❑ Nausea/Vomiting – 2.5 mg IV, repeat dose after 5 min.	❑ Consult **OLMC**	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Hypotension may occur; IV fluids and other measures to manage hypotension should be readily available.
- Use caution when administering Droperidol to patients who have taken other CNS depressant drugs (barbiturates, tranquilizers, alcohol). Droperidol may have additive or potentiating effects - the dosage should be reduced.
- Droperidol may induce Torsades de Pointes. Monitor the patient's ECG Q-T interval following administration
- Common side effects are hypotension and tachycardia; these effects usually subside without treatment. If hypotension is severe or persists, give fluids.
- Droperidol should be used with caution in patients with a seizure disorder or condition that causes seizures; other similar neuroleptics are known to lower the seizure threshold.

SPECIAL NOTES:

- Extrapyramidal symptoms (acute dystonic reactions) have occurred following administration. These are not life threatening and generally do not require treatment.
  - Diphenhydramine may be considered if treatment deemed necessary.

DUO-NEB (ALBUTEROL & IPRATROPIUM)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Albuterol Sulfate 2.5mg/Ipratropium Bromide 0.5 mg in 3mL vial
- Albuterol Sulfate is adrenergic B2-agonist bronchodilator
- Ipratropium Bromide (Atrovent) is an anticholinergic bronchodilator
- Aqueous solution administered by oral inhalation with the aid of a nebulizer system
- Duo-Neb combines Albuterol (a very selective Beta-2 agonist) with Atrovent which is an anticholinergic agent, which inhibits vagally mediated reflexes by antagonizing acetylcholine.
- Onset of action 5-15 minutes. Duration of action 3-6 hours.
- Primary effect is to dilate bronchioles with resultant relief of bronchospasm
- Simultaneous administration of Atrovent and Albuterol is designed to benefit the patient by producing a greater bronchodilator effect than when either drug is used alone at its recommended dosage.

INDICATIONS:

- Acute asthma attack
- Bronchospasm associated with emphysema or bronchitis
- Wheezing in croup or bronchiolitis
- ***Contact OLMC for patients with HR above 160***

CONTRAINDICATIONS:

- Patients exhibiting signs of MI
- Cardiac arrhythmias associated with tachycardia
- Patients taking Spiriva (Tiotropium Oral Inhalation)
- Allergy to peanuts or soy products
- Stop treatment if:
  - Pulse rate increases by 20 beats/min
  - Frequent PVC's develop
  - Any tachydysrrhymias other than sinus tachycardia develop.

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT	❑ One pearl containing –Albuterol Sulfate 2.5mg/Ipratropium bromide 0.5mg in 3ml NS ❑ Can repeat twice more for total of 3 doses	❑ SAME AS ADULT	EMT

PRECAUTIONS & SIDE EFFECTS:

- Tachycardia, Hypertension, Palpitations, Agitation, Nausea, Vomiting, Tremors, Dizziness, Nervousness Use with caution in patients with history of CAD, HTN, CHF, or MI
- As with other adrenergic aerosols, the potential for paradoxical bronchospasm exits.
- Use with caution in individuals with narrow angle glaucoma
- Use with caution for patients being treated with monoamine oxidase inhibitors (e.g. Nardil Parnate), or tricyclic antidepressants (e.g. Elavil, Sinequan), since the action of Albuterol may be potentiated on the vascular system.

EPINEPHRINE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- ❑ Catecholamine with alpha and beta effects
- ❑ Due to alpha and beta effects, you will see increased:
  - •Heart rate
  - •Myocardial contractile force
  - •Systemic vascular resistance
  - •Arterial blood pressure
  - •Myocardial oxygen consumption
  - •Automaticity
  - •Diastolic pressure, which increases coronary perfusion pressure (doses above 5 mg)
- ❑ In addition, epinephrine is a potent bronchodilator, and has applications in allergic and asthmatic conditions

INDICATIONS:

- ❑ Cardiac Arrest: Asystole, Ventricular Fibrillation or pulseless V-Tach
- ❑ Systemic allergic reactions
- ❑ Severe Hypotension not responsive to Normal Saline
- ❑ Severe asthma, bronchospasm with croup, or bronchiolitis
- ❑ Pediatric bradycardia not responsive to oxygenation and ventilation

CONTRAINDICATIONS:

- ❑ None for patient in cardiac arrest
- ❑ Allergy to Epinephrine
- ❑ Tachydysrhythmia
- ❑ Hypertension
- ❑ Severe cardiovascular disease
- ❑ Hypersensitivity

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMR	***ACUTE SYSTEMIC ANAPHYLACTIC REACTIONS*** ❑ Adult Auto-injector (Epi-Pen) for patients over 66 lbs – Dose automatically 0.3mg	***ACUTE SYSTEMIC ANAPHYLACTIC REACTIONS*** ❑ Pediatric Auto-injector (Epi-Pen Jr) for patients over 33 to 66 lbs – Dose automatically 0.15mg	EMR
EMT	***ACUTE SYSTEMIC ANAPHYLACTIC REACTIONS*** ❑ 0.3 mg **1:1,000** IM	***ACUTE SYSTEMIC ANAPHYLACTIC REACTIONS*** ❑ 0.01 mg/kg **1:1,000** SQ	EMT
A - EMT		***ACUTE SYSTEMIC ANAPHYLACTIC REACTIONS*** ❑ 0.1 mg **1:1,000** IM ❑ Max. dose 0.3 mg	A - EMT
EMT-I	***ASTHMA IN PATIENTS UNDER 40 YEARS*** ❑ 0.3mg **1:1,000** IM/SQ ***VF/AYSYTOLE/PEA*** ❑ 1mg 1:10,000 IV/IO q 3 to 5 minutes	***VF/PEA/ASYSTOLE -OR- BRADYCARDIA UNRESPONSIVE TO OXYGENATION*** ❑ 0.01 mg/kg 1:10,000 IV/IO every 3-5 minutes ***SEVERE BRONCHIOLITIS OR CROUP*** ❑ 0.01 mg/kg **1:1,000** SQ/IM ❑ 0.5 mg/kg **1:1,000** nebulized ❑ Max. dose 5 mg	EMT-I

PARAMEDIC

ANAPHYLAXIS
- ❑ Epi Drip 0.5 mcg/min to max of 10 micrograms/min

BRADYDYSRHYTHMIAS
- ❑ Epi Drip 2-10 mcg/min IV/IO

BRONCHOSPASM/COPD:
- ❑ Epi Drip 0.5 mcg/min to max of 10 micrograms/min

SEVERE HYPOTENSION NOT RESPONSIVE TO FLUIDS
- ❑ 1 mL of epi 1:10,000 drawn up in 9 mL of normal saline SLOW IVP. May repeat every 1-5 minutes as needed.

REFRACTORY HYPOTENSION:
- ❑ Epinephrine drip – 0.1 to 0.5 mcg/kg/min titrate to a systolic BP ≥100 mmHg

SEVERE BRONCHIOLITIS OR CROUP
- ❑ 0.01 mg/kg **1:1,000** SQ/IM
- ❑ 0.5 mL/kg 1:1,000 nebulized

Max. dose 5 mL

ANAPHYLAXIS
Epi Drip 0.5 micrograms/min to max of 10 micrograms/min
CONTACT MEDICAL CONTROL

PARAMEDIC

Precautions and Side Effects

- ❑ Anxiety
- ❑ Tremor
- ❑ Palpitations
- ❑ Tachycardia
- ❑ Angina
- ❑ HTN
- ❑ Headache
- ❑ Vomiting in children
- ❑ PVC's
- ❑ Pregnancy Category C.
- ❑ When used for anaphylaxis, increased cardiac work can precipitate angina or MI in susceptible individuals. Can induce major arrhythmia.
- ❑ Due to peripheral vasoconstriction, use with caution in patients with peripheral vascular insufficiency.

SPECIAL NOTES:
- ❑ Epinephrine should not be given in allergic reactions without signs and symptoms of cardiovascular collapse and/or significant respiratory distress. Do not rely on history alone.
- ❑ Wheezing in an elderly person with no history of asthma/COPD is pulmonary edema, Acute MI, or pulmonary embolus until proven other

ETOMIDATE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Etomidate is a short acting sedative-hypnotic agent with no analgesic effects
- Etomidate is a preferred RSI induction agent as it is fast acting and does not compromise hemodynamic stability.
- Produces hypnosis rapidly causing CNS depression
- Thought to act on GABA receptors to produce effects similar to those with barbiturate administration
- Causes hypnosis within 10 seconds and can last up to 5 minutes (longer when combined with other CNS depressants).
- Rapidly metabolized in the liver

INDICATIONS:

- Induction of anesthesia for intubation in RSI administered immediately prior to Succinylcholine administration.

CONTRAINDICATIONS:

- Known allergy to Etomidate

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	20 to 30 mg IV/IO	0.2-0.3 mg/kg IV	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Fairly frequent observation of myoclonic muscle twitching
- Pregnancy Category C.
- Reduces cerebral blood flow and blunts ICP, reduces cerebral metabolic rate of oxygen consumption, therefore it is considered a good choice for head injury patients.
- Etomidate has minimal effect on cardiovascular function, so it has a low incidence of clinically significant hypotension.

SPECIAL NOTES:

- Effects may be prolonged in patients with liver failure.
- Post- operatively, the most common side effect is vomiting.
- Ensure alternate airway devices and suction is present in case intubation is not successful.

FENTANYL CITRATE (SUBLIMASE)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Opiate Analgesic 10 times more potent than Morphine Sulfate and Demerol
- Principal actions of therapeutic value are analgesia and sedation
- Alterations in respiratory rate and alveolar ventilation, associated with narcotic analgesics, may last longer than the analgesic effect.
- Fentanyl appears to have less emetic activity than morphine
- Onset 2-3 minutes
- Duration variable, usually 15-60 minutes
- Metabolized in the liver, protein bound, redistributed after initial dose
- Combines with opioid receptor sites in the brain to produce potent analgesic effects.

INDICATIONS:

- Severe pain associated with medical and/or traumatic situations.

CONTRAINDICATIONS:

- Allergy to Fentanyl
- Use of MAOI inhibitors (Phenelzine sulfate= Nardil, Tranylcypromine= Parnate) up to two weeks prior to Fentanyl administration.
- Bradyarrhythmia
- Altered mental status/head injury
- Myasthenia gravis
- SBP <100 mmHg

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT-I	***ACUTE PAIN RELIEF*** ❑ 50-100 mcg IV/IO/IM/IN ❑ Can repeat in 5-10 minutes ***ACUTE CORONARY SYNDROME/CHEST PAIN (UNRELIEVED BY NTG)*** 50-100 mcg IV/IO/IM/IN	***ACUTE PAIN RELIEF*** ❑ 1 mcg/kg IV/IO/IM/IN Can repeat every 5 minutes, max. dose 4 mcg/kg (any pediatric patient)	EMT-I
EMT-P	***RSI Pre-Induction for Hypertensive Patients*** ❑ 2mcg/kg IV/IO		

SPECIAL NOTES:

- Check and document vital signs and patient response after each dose.
- The action of Fentanyl is prolonged and its elimination slower in the elderly. Smaller maintenance doses are advisable
- Fentanyl must be used cautiously in patients that have already received morphine
- Less likely to cause nausea and hypotension than Morphine.
- Pregnancy Category C.

PRECAUTIONS & SIDE EFFECTS:

- Fentanyl can cause respiratory depression that is reversible with Narcan. This respiratory depression is exacerbated by underlying lung disease and use of the other respiratory depressant drugs (benzodiazepines, alcohol, cyclic antidepressants)
- Bradycardia
- Excessive sedation
- Occasional skeletal muscle rigidity

GLUCAGON

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Anti-hypoglycemic agent
- Glucagon is a hormone, which causes glucose metabolization in the body
- It works opposite of insulin, which causes glucose storage, and it is present normally in the body
- It is released at times of insult or injury when glucose is needed, and mobilizes glucose from body glycogen stores.
- Return to consciousness should be within 20 minutes of IM dose if patient is hypoglycemic
- Stimulates cardiac activity independent of usual pathways in beta-blocker and calcium channel blocker overdoses.

INDICATIONS:

- Useful in counteracting severe hypoglycemic reactions in known diabetic patients, where administration of oral sugar or IV Dextrose is impossible or impractical
- Beta-blocker and Calcium channel blocker overdoses

CONTRAINDICATIONS:

- None noted

ADMINISTRATION:

	ADULT	PEDIATRIC	
AEMT	***HYPOGLYCEMIA*** ▫ 1mg IM, may be repeated once after 20 min	***HYPOGLYCEMIA*** ▫ 0.1 – 0.2 mg/kg (max single dose 1mg) IM may be repeated 1 time after 20 min	AEMT
PARAMEDIC	***BETA & CALCIUM CHANNEL BLOCKER OVERDOSE*** ▫ 1 - 3 mg IM or slow IV	***BETA & CALCIUM CHANNEL BLOCKER OVERDOSE*** ▫ 0.5 mg IM	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Nausea
- Vomiting
- Patients developing symptoms of hypoglycemia after a dose of Glucagon should be given glucose orally or intravenously immediately, if possible
- Pregnancy Category B

SPECIAL NOTES:

- IV dextrose is the treatment of choice for insulin shock
- Persons with little or no glycogen stores (juvenile type diabetes, chronic hypoglycemia, malnutrition, adrenal insufficiency, hepatic dysfunction, alcoholism) may not be able to mobilize any glucose in response to glucagon.

IV SOLUTIONS

PHARMACOLOGY & MICHANISM OF ACTIONS:

- Electrolytes
- These are solutions which consist of balanced electrolytes in water
  - Normal saline (NS) contains sodium chloride.
- They provide water and electrolytes for replacement of acute extracellular fluid losses and they do not disturb the normal electrolyte balance since the electrolyte composition and tonicity approach that of normal plasma.
- NS does not contain calcium and will not lead to precipitation when mixed with blood or pre-hospital medications.

INDICATIONS:

- Replacement of fluid volume losses such as in trauma, burns, dehydration, or shock
- Facilitate IV medication administration

CONTRAINDICATIONS:

- None noted

ADMINISTRATION:

ADULT	PEDIATRIC
A - EMT - Doses vary	- SAME AS ADULT - Recommended Max Dose 20 ml/kg. A - EMT

PRECAUTIONS & SIDE EFFECTS:

- Varies depending on dose
- Normal saline should be used with caution with patients with renal impairment (hyperkalemia) and cardiac and respiratory disorders (fluid overload), or extremes of age.

SPECIAL NOTES:

- Where IVs are used to maintain venous access, an IV lock may be substituted. After placement, these lines should be flushed with normal saline. The line should also be flushed after each administration of medication.

KETAMINE HCL (KETALAR)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Sedative, Analgesic
- Ketamine is a dissociative anesthetic characterized by profound amnesia and some analgesia while retaining protective airway reflexes. This results in patients who do not appear to be anesthetized and can swallow and open eyes while being unable to process information or pain.
- Sympathomimetic effects cause an increase in HR and cardiac output.
- Also acts as a bronchodilator, thus may be beneficial in patients with bronchospasm requiring intubation.
- Onset of action IV/IO: rapid 1-2 minutes with a duration of 15-30 minutes, IM: 3-4 minutes with a 12-25minute duration.

INDICATIONS:

- Alternative induction agent for rapid sequence intubation
- Alternative chemical restraint agent (hyperactive delirium)
- Pain Management
- Sedation Consciousness induced CPR during Mechanical CPR and Post Intubation Sedation

CONTRAINDICATIONS:

- Late-term pregnancy or active labor
- Infants under 3 months
- Acute globe injury or Glaucoma
- Hypersensitivity
- Known history of Schizophrenia

ADMINISTRATION:

ADULT	PEDIATRIC
PARAMEDIC ***CHEMICAL RESTRAINT:*** ▪ 2.0 mg/kg IV/IO slow push or 4.0mg/kg IM. May repeat as needed at 0.5-1.0 mg/kg for continued sedation. ***INDUCTION AGENT FOR RSI:*** 2.0 mg/kg IV/IO fast push or 4.0mg/kg IM. ***ANALGESIC:*** ▪ 0.2 mg/kg IV/IO/IM slow push. May repeat x 1 after 30 minutes. ***SEDATION DURING MECHANICAL CPR:*** ▪ 2.0 mg/kg IV/IO ***POST-INTUBATION SEDATION*** ▪ 2.0 mg/kg IV/IO	***CHEMICAL RESTRAINT:*** ▪ Same as an adult ***INDUCTION AGENT FOR RSI:*** ▪ Same as adult ***ANALGESIC:*** ▪ **NOT APPROVED IN PEDIATRIC PATIENTS** PARAMEDIC

KETAMINE HCL (KETALAR)

PRECAUTIONS & SIDE EFFECTS:

- May induce transient laryngospasm (0.1%), transient apnea or respiratory depression (0.8%), emesis (usually well into recovery 8.4%), Recovery agitation (mild - 6.3%, clinically significant 1.4%).
- Emergence reaction can occur in 5-30% of patients.
- Suspected CVA

SPECIAL NOTES:

- All chemically-restrained patients require continuous $EtCO_2$ monitoring.
- Administration of Ondansetron (Zofran) may reduce the incidence of vomiting.
- IV/IO are the preferred routes in adults.
- Patients receiving Ketamine should also receive 1-2.5 mg Midazolam to reduce potential negative emergence reactions.

LABETALOL

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Labetalol combines both selective, competitive alpha 1-adrenergic blocking and nonselective, competitive beta-adrenergic blocking activity in a single substance. These actions decrease blood pressure without reflex tachycardia and without a significant reduction in heart rate.

INDICATIONS

- The treatment of uncontrolled and sustained hypertension in pregnant and postpartum women.
- The treatment of uncontrolled and sustained hypertension with symptomatic hypertension (e.g. vision disturbance, headache, chest pain, ataxia, or any acute neurological change).

CONTRAINDICATIONS

- Bronchial Asthma
- Overt cardiac failure
- Greater than first-degree heart block
- Cardiogenic Shock
- Severe bradycardia

ADMINISTRATION

For sustained elevation in BP> 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either one or both) that persists for at least 15 minutes or more in pregnant or post-partum women.

For sustained elevation in BP> 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either one or both) that persists for at least 15 minutes or more.

ADULT	PEDIATRIC
PARAMEDIC ***HYPERTENSIVE CRISIS:*** - 10 mg IV/IO slow push over 1-2 minutes. - May be repeated twice (3 doses total) every 15 minutes. - Depending on the effect of the preceding dose, double remaining doses (e.g., 1st dose 10mg, 2nd dose 20 mg, 3rd dose 40 mg. Maximum total dose 70 mg). Target systolic BP 140-150 mmHg and diastolic BP 90-100 mmHg. Stop administration if HR < 60 bpm or other adverse effects.	- **No indication for pediatric patients** PARAMEDIC

Side Effects:

- Cardiovascular: Symptomatic postural hypotension, ventricular dysrhythmia, syncope, bradycardia, and heart block.

LIDOCAINE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Antiarrhythmic
- Lidocaine depresses the automaticity of Purkinje fibers; therefore, raises stimulation threshold in the ventricular muscle fibers (makes ventricles less likely to fibrillate).
- Lidocaine causes CNS stimulation including: tremors, restlessness and clonic convulsions (rare) followed by depression and respiratory failure at higher doses.
- Cardiovascular effect: Decreased conduction rate and force of contraction, mainly at toxic levels. The effect on the heart of a single bolus disappears in 10-20 minutes.
- Metabolic half-life is about 2 hours; toxicity develops with repeated doses.

INDICATIONS:

- Anesthetic for IO placement
- Shockable Rhythms (VF/VT)
- Stable Wide Complex Tachycardia

CONTRAINDICATIONS:

- Hypersensitivity
- Second and third-degree AV block

ADMINISTRATION:

	ADULT	PEDIATRIC	
AEMT	***ANESTHETIC FOR IO PLACEMENT*** ❑ 40 mg IO ❑ Wait 1-2 minutes prior to other fluid administration	***ANESTHETIC FOR IO PLACEMENT*** ❑ 0.5 mg/kg IO ❑ Wait 1-2 minutes prior to other fluid administration	AEMT
EMT-I	***STABLE WIDE COMPLEX TACHYCARDIA*** ❑ 1.0 mg/kg SLOW IV – Follow with 1-4 mg/min maintenance drip. ***SHOCKABLE RHYTHMS (VF/VT)*** ❑ 1.5 mg/kg IVP, repeat 0.75 mg/kg every 3-5 min to a max dose of 3 mg/kg.		EMT-I

PRECAUTIONS & SIDE EFFECTS:

- Tremors
- Restlessness
- Clonic convulsions

LIDOCAINE CONT.

SPECIAL NOTES:

- Use with extreme caution in presence of advanced AV block unless artificial pacemaker is in place.
- In atrial fibrillation or flutter, Quinidine-like effect may cause alarming ventricular acceleration
- Lidocaine is not recommended for treatment of supraventricular arrhythmia.
- Do not administer with heart rate less than 50; you may suppress the heart completely. The same is true for hypotension in which case caution is advised. However an arrhythmia is often the cause of the hypotension. In this situation the arrhythmia is considered "unstable", and should be cardioverted.
- CNS disturbance: Sleepiness, dizziness, disorientation, confusion, and convulsions.
- Hypotension: Decreased myocardial contractility and increased AV block at toxic levels can lead to hypotension.
- Toxicity is more likely in elderly patients.
- Doses should be halved for patients with the following conditions:
  - CHF
  - Hypotension
  - Hepatic dysfunction
  - >70 years old
- The effect of a single bolus on the heart disappears in 10-20 minutes due to redistribution in the body. Metabolic half-life is 2 hours, therefore toxicity develops with repeated doses.
- Toxic levels have a decreased conduction rate and force on cardiovascular muscle.
- In rare instances, sudden cardiovascular collapse and death may occur.

MAGNESIUM SULFATE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Antiarrhythmic
- Anticonvulsant
- Magnesium is a cation that is present in human cells and intracellular fluid
- The effects of hypomagnesaemia in cardiac arrest are well known
- Hypomagnesaemia is associated with a high frequency of cardiac arrhythmias (particularly refractory V. Fib.), cardiac insufficiency and sudden cardiac death.
- Magnesium sulfate may be effective in the treatment of torsades de pointes, even in the absence of hypomagnesaemia.

INDICATIONS:

- Recurrent or refractory ventricular fibrillation and pulseless ventricular tachycardia following initial measures with defibrillation, epinephrine and antiarrhythmic.
- Cardiac arrest associated with Torsades de points or suspected hypomagnesemic state (e.g. alcoholics).
- Eclampsia (seizures accompanying pregnancy): active seizure after 20$^{th\ week}$ of pregnancy, or within 48 hrs. post-partum.
- Severe asthma in prolonged transports

CONTRAINDICATIONS:

- Any patient with heart block
- Patient in active labor

ADMINISTRATION:

ADULT

PARAMEDIC

CARDIAC INDICATIONS/HYPOMAGNESEMIC STATE:

- Mix 2.0 g in 20 mL NS for 10% solution; administer over 2 minutes IV

ECLAMPSIA:

Active seizure after 20th week of pregnancy or within 48 hours post-partum.

- Mix 4 g in 20 mL NS for 10% solution administer over 2 to 3 minutes.

SEVERE ASTHMA:

- 2 grams in 20 mL NS for 10% solution, administer over 2-3 mins.

PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Flushing
- Sweating
- Mild bradycardia
- Hypotension
- Severe hypomagnesaemia may produce depressed reflexes, flaccid paralysis, circulatory collapse, respiratory paralysis and diarrhea. This would not be expected unless unrecognized preexisting hypermagnesemia is present.

METHYLPREDNISOLONE (SOLU-MEDROL)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Corticosteroid
- Suppresses acute and chronic inflammation
- Potentiates beta-adrenergic relaxation of smooth muscle
- Suppresses immune system by binding to intracellular corticosteroid receptors

INDICATIONS:

- COPD/Anaphylaxis after epinephrine administration
- Mild to severe asthma
- Acute Adrenal Insufficiency

CONTRAINDICATIONS:

- Known hypersensitivity to corticosteroids

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	**ASTHMA/ANAPHYLAXIS/COPD** - 125 mg IV/IO/IM slow over 2 minutes **ACUTE ADRENAL INSUFFICIENCY** - 20 mg IV/IM/IO	**ASTHMA/ANAPHYLAXIS/COPD** - 2mg/kg IV/IO/IM to max of 125mg **ACUTE ADRENAL INSUFFICIENCY** - 0.5 mg/kg IV/IO/IM to max of 20mg	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- None noted

SPECIAL NOTES:

- None noted

MIDAZOLAM (VERSED)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Midazolam is a short-acting benzodiazepine CNS depressant with significant beneficial amnesia effects, making it especially useful for cardioversion.
- Causes sedation or unconsciousness, depending on the dose
- Decreases anxiety and agitation
- Causes anterograde amnesia
- Has an anti-convulsant effect
- With IV administration, onset is 2-3 minutes, and duration is 30-60 minutes
- With IM/IN administration, onset is 15 minutes, and duration is 2-4 hours
- Conjugated by the liver, then eliminated by the kidneys

INDICATIONS:

- Status epilepticus (generalized seizure which has lasted longer than 5 minutes or seizure recurs before patient returns to consciousness. Do not give unless patient is actively seizing.
- Sedation and amnesic effect prior to pacing, cardioversion
- Sedation post-cardiac arrest/RSI management to maintain ETT placement.
- Chemical restraint of combative, uncontrollable patients
- May be used in conjunction with pain management
- May be used for severe anxiety with carpal pedal spasms and agitation.

CONTRAINDICATIONS:

- Allergy to Versed or other benzodiazepines
- Coma
- Profound hypotension
- Acute narrow-angle glaucoma
- Severe alcohol intoxication

ADMINISTRATION:

	ADULT	PEDIATRIC	
PARAMEDIC	***SEDATION, CHEMICAL RESTRAINT, STATUS SEIZURE.*** - 2.5 – 5 mg IV/IO/IM/IN q 5 minutes ***IN CONJUNCTION WITH PAIN MEDICATIONS.*** - 1 - 3 mg IV/IO/IM/IN ***SEVERE ANXIETY/AGITATION*** - 1 - 2 mg IV/IO/IM/IN	***SEDATION, CHEMICAL RESTRAINT, STATUS SEIZURE.*** - 0.1 mg/kg IV/IO **-OR-** 0.2 mg/kg IM/IN ***IN CONJUNCTION WITH PAIN MEDICATIONS.*** 0.1 mg/kg IV/IO **-OR-** 0.2 mg/kg IM/IN	PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Apnea
- Respiratory depression
- Hypotension - Consider using a lower dose of Midazolam (1-2mg) in patients with BP ~ 100 mm/hg.
- Consider using a lower dose of Midazolam in patients over 70 years old.
- Occasional paradoxical agitation, involuntary movements, or combativeness (consider cerebral hypoxia or incorrect dose).
- Hypersensitivity reactions (itching, hives)
- Pregnancy Category D—use only in life-threatening situations with pregnant patients.

MIDAZOLAM (VERSED) CONT.

SPECIAL NOTES:

- Sedation can last up to several hours.
- COPD patients are extremely sensitive to the respiratory-depressant effect and may develop prolonged depressed respirations and hypoxia.
- Congestive heart failure patients may have delayed onset of action, prolonged duration, unexpected arrhythmias or hypotension.
- Renal failure patients may have an altered response. May have unpredictable onset and prolonged duration.
- Chronic liver failure patients may have altered effect due to altered metabolism, slow elimination with prolonged duration of action.
- Acute severe illness, dehydration, or electrolyte disturbance patients may develop severe hypotension.
- Will have an additive effect with concurrent use of narcotics, benzodiazepines, alcohol or other legal/illegal CNS depressants.
- Control of seizures with IM use may be rapid however, onset of action for agitation control may be delayed.
- When used as a single agent, respiratory depression and even apnea is the greatest concern and can occur in up to 20% of patients who receive it intravenously. In combination with narcotics this complication is far more frequent.
- Always watch for respiratory depression (most common side effect), the patient must be monitored closely with pulse oximetry when possible. Prior to the IV administration of Midazolam in any dose, the immediate availability of oxygen, resuscitative equipment, and personnel for airway management must be ensured.
- Most likely to produce respiratory depression in elderly and young patients and in patients who have taken other depressant drugs, especially alcohol, narcotics, and barbiturates.
- The effective dosage will generally be reduced in elderly or debilitated patients, so start with lower doses in patients over the age of 60.
- Additional uncommon side effects that have been reported after the administration of Midazolam include hiccoughs, ventricular ectopy, arrhythmias, and bronchospasm.
- Paradoxical excitement or stimulation sometimes occurs and may be manifested as agitation, involuntary movements, hyperactivity or combativeness.
- IV incompatible with Lasix and sodium bicarbonate. Flush tubing well.

NALOXONE(NARCAN)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Narcotic/opioid antagonist
- Competitively binds to narcotic sites
- Exhibits almost no pharmacological activity of its own
- Onset of action is 2 minutes
- Duration of action is 1-4 hours, depending on the dose and route of Narcan administration, the amount, type and route of administration of the narcotic being antagonized.

INDICATIONS:

- Diagnostically in coma of unknown etiology to rule out narcotic depression
- Reversal of narcotic effects, particularly respiratory depression, due to narcotic drugs ingested, injected or administered in the course of treatment. Narcotic drugs include Morphine Sulfate, Demerol®, heroin, Dilaudid®, Percodan®, and Percocet® (oxycodone), codeine, Lomotil®, Darvocet® and Darvon® (propoxyphene), Vicodin® (hydromorphone), Stadol®, and Talwin® (pentazocine).

CONTRAINDICATIONS:

- Allergy to Narcan

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMR	❑ 2-4 mg IN or auto injection, may repeat to max of 10mg ❑ Chronic pain med pt: 0.1 mg titrate to effect ❑ Titrate to level of consciousness	❑ 0.1 mg/kg IN or auto injection ❑ Max. 0.4 mg per dose	EMR
AEMT	❑ 0.4-2 mg IV/IO injection, may repeat to max of 10mg ❑ 2-4 mg IM/IN ❑ Chronic pain med pt: 0.1 mg titrate to effect ❑ Titrate to level of consciousness	❑ 0.1 mg/kg IV/IO/IN/IM ❑ Max. 0.4 mg per dose	AEMT

PRECAUTIONS & SIDE EFFECTS:

- Abrupt reversal of narcotic depression may cause:
  - Dysrhythmia
  - Nausea
  - Projectile vomiting
  - Hypertension
  - Diaphoresis
  - Tremulousness

NALOXONE (NARCAN) (CONTINUED)

SPECIAL NOTES:

- Pregnancy Category C.
- Be prepared to restrain the patient. Patient may become violent as the Narcan reverses the narcotic effect. Aim to titrate the dose to reverse respiratory depression but keep patient groggy.
- This drug is remarkably safe and free from side effects.
- The duration of some narcotics is longer than Narcan and the patient MUST be monitored closely. Repeated doses of Narcan may be required. Patients who have received this drug must be transported because coma may reoccur when the Narcan wears off.
- Assess patient for presence of narcotics. Signs and symptoms include: pinpoint pupils, depressed or absent respirations, needle tracks or abscesses on patient, or evidence of drug use at the scene.
- Sudden and occasionally violent withdrawal symptoms may be precipitated in patients physically dependent on narcotics. Large doses are rarely necessary to revive respirations in accidental overdoses and can precipitate a severely agitated patient.

NITROGLYCERIN

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Nitrate
- Antianginal agent
- Generalized smooth muscle relaxation
- Onset of action is approximately 1-3 minutes
- Cardiovascular effects include:
  - Reduced venous tone. This causes pooling of blood in peripheral veins and decreased return of blood to the heart.
  - Decreased peripheral vascular resistance
  - Dilation of coronary arteries (if not already at maximum)
  - Myocardial oxygen consumption/demand decreased

INDICATIONS:

- Cardiac related chest pain (e.g., chest, arm, or neck pain thought to be related to coronary ischemia.) May be used diagnostically or therapeutically.
- Pulmonary edema: to increase venous pooling, lowering cardiac pre-load and after-load.

CONTRAINDICATIONS:

- Known sensitivity to nitroglycerin
- Sildenafil (Viagra) or vardenafil (Levitra) use within the preceding 24 hours.
- Tadalafil (Cialis) use within the preceding 48 hours.

ADMINISTRATION:

	ADULT	PEDIATRIC	
EMT	❑ May assist patient with their own NTG if they have a R_X		EMT
A-EMT	❑ 0.4 mg SL / 1 spray aerosol or 1 tablet SL (if initial SBP ≥100 mmHg) ❑ May repeat every 5 minutes unless SBP drops below 100 mmHg		A-EMT

NITROGLYCERIN (CONTINUED)

PRECAUTIONS & SIDE EFFECTS:

- Headache
- Flushing
- Burning under tongue
- Dizziness
- Marked orthostatic hypotension, particular in patients taking antihypertensive beta-adrenergic blocks and phenothiazines.
- If these side effects are noted, the pills may be assumed potent, and not outdated

SPECIAL NOTES:

- Generalized vasodilation may cause profound hypotension and reflex tachycardia.
- Nitroglycerin loses potency easily; should be stored in dark glass container with tight lid and not exposed to heat. It is seldom effective if it is older than 6 months old.
- Hypotension and bradycardia following nitroglycerin are usually responsive to fluid bolus or atropine sulfate.
- Less common effects: marked hypotension (less than 5% of patients), and more commonly orthostatic hypotension.
- Therapeutic effect is enhanced, and adverse effects are increased when patient is upright.
- Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm, biliary colic, or hiatal hernia.
- Pregnancy Category C.
- NTG may cause a drop in a patient's blood pressure, which may indicate a right-sided MI.
- Excessive patient use may lead to NTG tolerance and a decrease in effectiveness.
- Must take blood pressure before and after every dose.

ONDANSETRON (ZOFRAN)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Anti-emetic, anti-nausea
- Blocks serotonin uptake peripherally and centrally in chemoreceptor trigger zone
- When administered IV, Zofran has an immediate onset of action and plasma concentration peaks at 10 minutes.
- When administered IM, it peaks at 40 minutes
- With both routes, half-life is four hours
- Thought to work by blocking the action of chemicals in the body that initiates the vomiting reflex

INDICATIONS:

- Treatment and prevention of severe nausea and vomiting of any cause

CONTRAINDICATIONS:

- Hypersensitivity
- Recent administration of Apomorphine (a rarely used Parkinson's med which may cause hypotension)

ADMINISTRATION:

	ADULT	PEDIATRIC (over 2 years of age)	
EMT-I	❑ 8 mg IV/IM/IO/PO over 1-2 minutes ❑ Can repeat in 15 minutes for persistent vomiting for a total of two doses	❑ 0.1 mg/kg IV/IO/IM over 1-2 minutes ❑ Can repeat in 15 minutes for persistent vomiting for a total of two doses ***PEDIATRIC*** Less Than 2 Years of Age ❑ Consult OLMC for dose	EMT-I

PRECAUTIONS & SIDE EFFECTS:

- Prolonged QT interval (rare)
- Hypotension
- Chest Pain
- Tachycardia
- Seizures (rare)

SPECIAL NOTES:

- Pregnancy Category B
- Use with caution in patients with hepatic impairment

ORAL GLUCOSE

PHARMACOLOGY &MECHANISM OF ACTIONS:

- Carbohydrate
- The body's primary source of quick energy
- Absorbed into the bloodstream in the small intestine
- Use is regulated by insulin that stimulates storage of excess glucose from the bloodstream and glucagon that mobilizes stored glucose into the bloodstream.
  Glucose is the body's basic fuel

INDICATIONS:

- Hypoglycemic states usually associated with insulin shock, or oral hypoglycemic medications in diabetics
- In patients with any focal or partial neurological deficit or altered state of consciousness felt to be due to hypoglycemia (EMT level and above, confirm with field glucose test).
- Mild to moderate hypothermia (93.2 – 96.8 degrees) and patient is exhibiting signs of re-warming
  Known hypoglycemia when blood glucose level is at or below 60 mg/dl and patient can protect their airway

CONTRAINDICATIONS:

- Significantly reduced level of consciousness
- Patient's inability to protect airway

ADMINISTRATION:

ADULT	PEDIATRIC
EMR ❑ 15 g (1 Tube) PO	❑ 1g/kg up to 15 g (1 Tube) PO EMR

PRECAUTIONS & SIDE EFFECTS:

- Hyperglycemia

SPECIAL NOTES:

- Document patient's blood glucose level before and after glucose administration.
- First Responders are not allowed to collect CBG specimens. Therefore, may give oral glucose as indicated above if hypoglycemia is suspected and the patient is able to protect their own airway.

OXYGEN

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Medical gas
- Oxygen added to the inspired air raises the amount of oxygen in the blood, and therefore the amount delivered to tissues.
- Breathing in most people is regulated by small changes in acid/base balance and carbon dioxide levels. It takes relatively large drops in blood oxygen concentration to stimulate respiration.

INDICATIONS:

- Suspected hypoxemia or respiratory distress from any cause
- Acute chest pain in which a myocardial infarction is suspected
- Shock (decreased oxygenation of tissues) from any cause
- Major trauma
- Carbon monoxide poisoning
- Cardiopulmonary arrest

CONTRAINDICATIONS:

- Use in an environment with open flame or oxidizing chemicals

ADMINISTRATION:

ADULT	PEDIATRIC
EMR - Low flow 1-2 L/min – patients with chronic lung disease; SpO2 >95% - Moderate flow 4-6 L/min – medical and/or trauma patients with mild to moderate respiratory distress. - High flow 10-15 L/min – medical and/or trauma patients with severe respiratory distress	SAME AS ADULT EMR

PRECAUTIONS & SIDE EFFECTS:

- None noted

SPECIAL NOTES:

- Restlessness may be an important sign of hypoxia.
- Oxygen toxicity (overdose) is not a hazard during acute administration, except in patients with COPD.
- Nasal prongs work equally well on nose and mouth breathers.
- If the patient has a slow ineffective respiratory rate or low ineffective tidal volume, do not use a cannula or mask for oxygen therapy. Assist volume and rate with a bag-valve-mask and high flow oxygen.
- A small percentage of patients with chronic lung disease breathe only when they are hypoxic. Administration of moderate to high flow oxygen may shut off their respiratory drive. Do not withhold oxygen because of this possibility. Be prepared to assist ventilation if needed. $ETCO_2$ is the best indicator if it is functioning appropriately.
- For low-flow and moderate-flow oxygen, use a nasal cannula. For high-flow oxygen administration, use a simple, high flow NC, or non-rebreather mask as necessary.

OXYGEN (CONTINUED)

- **The following general safety precautions should be taken to avoid explosions, tank ruptures and fires from oxygen regulators:**
  - Always "crack" cylinder valves (open the valve just enough to allow gas to escape for a very short time) before attaching regulators in order to expel foreign matter from the outlet port of the valve.
  - Always follow the regulator manufacturer's instructions for attaching the regulator to an oxygen cylinder.
  - Always use the sealing gasket specified by the regulator manufacturer.
  - Always inspect the regulator and seal before attaching it to the valve to ensure that the regulator is equipped with only one clean, new, crush-type gasket (single use, not reusable, typically Nylon ®) that is in good condition.
  - Always be certain the valve, regulator and gasket are free from oil or grease. Oil or grease contamination is widely known to contribute to ignition in oxygen systems.
  - Tighten the T-handle firmly by hand, but do not use wrenches or other hand tools that may over-torque the handle.
  - Open the post valve slowly. If gas escapes at the juncture of the regulatory and valve, quickly close the valve. Verify the regulator is properly attached and the gasket is properly placed and in good condition. If you have any questions or contact your supplier.

OXYTOCIN (PITOCIN)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Hormone
- Oxytocin is a naturally occurring hormone that is produced by the pituitary gland.
- Oxytocin causes contraction of uterine smooth muscle, thereby controlling severe postpartum hemorrhage.
- Oxytocin also exhibits vasopressor and antidiuretic effects.
- The onset of action is immediate.
- Half life is 3-9 minutes.
- Duration approximately 1-hour.

INDICATIONS:

- Postpartum control of severe vaginal bleeding.

CONTRAINDICATIONS:

- Pregnancy (pre-delivery).
- Uterine Rupture

ADMINISTRATION:

ADULT	PEDIATRIC
PARAMEDIC ***POSTPARTUM HEMORRHAGE*** ❑ Mix 20 units in 1000 mL NS ❑ Administer IV, line running wide open ❑ May administer 10 units IM if IV unavailable.	***NOT FOR USE IN PEDIATRICS*** PARAMEDIC

PRECAUTIONS:

- Hypotension
- Arrhythmias
- Tachycardia
- Seizures
- Coma
- Nausea
- Vomiting

SPECIAL NOTES:

- Prior to administration, verify that the baby has been delivered and cord clamped. Confirm, by history, that the patient is not expecting multiple births.
- Breastfeeding by the newborn will stimulate the natural release of oxytocin from the mother's body and should be encouraged, if possible, after every delivery.
- If the placenta appears incompletely expelled, contact OLMC prior to administration.

SODIUM BICARBONATE

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Alkalinizer
- Provides bicarbonate to buffer metabolic or respiratory acidosis, which can accompany several types of disease processes.
- Binds up free tricyclics in the blood to reduce the toxic effects in tricyclic overdoses
- Neutralizes acids found in blood

INDICATIONS:

- Dialysis emergencies
- Major crush injuries: >2 hrs prior to removing the weight.
- Tricyclic overdose with presenting dysrhythmias (QRS>.12 seconds, and/or hypotension, and/or HR >120)
- Cyanide poisoning with suspected acidosis

CONTRAINDICATIONS:

- As an antidote following ingestion of strong mineral acids
- Metabolic or respiratory alkalosis

ADMINISTRATION:

ADULT	PEDIATRIC
PARAMEDIC ***TRICYCLIC OVERDOSS:*** - 1 mEq/kg IV/IO ***CYANIDE POISONING* - OLMC:** - 50 mEq IV/IO ***SEVERE CRUSH INJURY*** - 1 mEq/kg IV/IO contact - Consider repeat doses if significant EKG changes ***DIALYSIS EMERGENCIES*** - 50 mEq IV/IO over 2 minutes - Contact OLMC for repeat dose	***TRICYCLIC OVERDOSE*** - 1 mEq/kg IV/IO ***CYANIDE POISONING* - OLMC:** - 50 mEq IV/IO ***SEVERE CRUSH INJURY*** - 1 mEq/kg IV/IO ***DIALYSIS EMERGENCIES*** - 50 mEq IV/IO over 2 minutes - Contact OLMC for repeat dose PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Alkalosis

SPECIAL NOTES:

- Pregnancy Category D.

SUCCINYLCHOLINE (QUELICIN, ANECTINE)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Depolarizing neuromuscular blocker
- Moves from eyes to toes in one minute, lasts 4-6 minutes
- No effect on consciousness or pain threshold. The patient will be able to hear you, and feel everything if conscious.
- Succinylcholine is a short acting depolarizing skeletal muscle relaxant. Like acetylcholine, it binds to cholinergic receptors in the motor neuron end plate to cause muscle depolarization (contractions and fasciculations). However, this action is sustained and the initial contraction is followed by paralysis. Onset of action 1 minutes IV and 2-4 minutes IM.
- Duration 2 minutes and persists for approximately 2-6 minutes
- Muscle relaxation begins in the eyelids and jaw, and then progresses to the limbs and abdomen, and finally the diaphragm and the intercostal muscles.
- Succinylcholine is excreted by the kidneys (10%) and is hydrolyzed by plasma cholinesterases (pseudocholinesterase and acetylcholinesterase).
- This drug may cause prolonged apnea and paralysis in patients with enzyme deficiency of pseudocholinesterase.

INDICATIONS:

- To achieve temporary paralysis where endotracheal intubation is indicated (in accordance with airway management guidelines).

CONTRAINDICATIONS:

- Allergy to Succinylcholine
- Penetrating eye injury
- History of malignant hyperthermia
- Hyperkalemia will worsen following the administration of succinylcholine and may precipitate ventricular dysrhythmias, or even cardiac arrest. This is especially true in patients with pre-existing long-term paralysis, crush injury, severe burns > 24 hours old, kidney failure, neuromuscular disease, or skeletal muscle myopathy. Its use is contraindicated if those conditions exist. Consider the use of Vecuronium

ADMINISTRATION:

ADULT	PEDIATRIC
PARAMEDIC ***RSI*** - 1-1.5 mg/kg IV/IO - 2 mg/kg IM - Max. dose 150 mg	***RSI*** - 2 mg/kg IV/IO - 4 mg/kg IM PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Bradycardia especially with repeated doses of succinylcholine and in pediatric patients under age 5
- Ventricular dysrhythmias
- Tachycardia
- Hypotension/Hypertension
- Occasional bronchospasm

SUCCINYLCHOLINE (QUELICIN, ANECTINE)

(CONTINUED)

- Cardiac Arrest
- Malignant hyperthermia: rare but life-threatening complication that can occur with administration of paralytic agents. It is a hypermetabolic state of skeletal muscles and may initially present as intractable spasm of the jaw muscles which shows up after use of succinylcholine and is not to be confused with more commonly seen trismus that occurs in head-injured patients.

SPECIAL NOTES:

- Pre-oxygenation prior to RSI is essential; have all equipment, suction unit and alternate airways prepared prior to giving succinylcholine.
- Succinylcholine has no pain-relieving properties. Adequate sedation should be used when succinylcholine is given to a conscious patient. Monitor sedation administration times closely and watch for signs that sedation is wearing off, i.e., signs of patient anxiety.
- Apply cricoid pressure before and after the paralytic has been administered, and continue the procedure until the patient is intubated and the cuff inflated.
- Succinylcholine loses potency in liquid form unless it is refrigerated and must be rotated regularly.
- Once an adequate dose has been administered and paralysis has been achieved, DO NOT administer a second dose. May cause bradycardia with repeated doses or in children under 5 years of age; may be avoided by pre-medicating with atropine sulfate.
- May very rarely cause ventricular dysrhythmias. These can usually be treated with oxygen and lidocaine.
- Other cardiovascular effects include tachycardia, hypotension, hypertension and cardiac arrest.
- Other signs of malignant hyperthermia include: tachycardia, tachypnea, hypercarbia, and hyperthermia.
- Increased intracranial, intraocular and intragastric pressure especially during the fasciculation phase of paralysis.
- Histamine release may occur with administration.
- Pregnancy Category C.

TORADOL (KETOROLAC)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Exhibits analgesic, anti-inflammatory, and antipyretic activity.
- NSAID

INDICATIONS:

- Management of musculoskeletal pain; back pain; flank pain suspected kidney stones, migraine

CONTRAINDICATIONS:

- Age > 70 y/o secondary to possible renal insufficiency/failure
- Pregnancy, active labor, lactating female
- Patients currently using Coumadin, Plavix, ASA, other NSAIDs or anticoagulants
- Patients with bleeding or clotting disorder (e.g. hemophilia)
- Patients with a history of ulcer or GI bleed
- Hypersensitivity to aspirin or other NSAID's
- Those with significant cardiac and/or respiratory disease (e.g. CHF, Asthma)

ADMINISTRATION:

ADULT	PEDIATRIC
EMT-I ❑ 15mg IV/IM/IO (administer over at least 15 seconds). Max 15mg. Do not repeat	❑ 0.5 mg/kg IV (max of 15mg) or 1.0 mg/kg IM (max 15mg). Do not repeat EMT

PRECAUTIONS & SIDE EFFECTS:

- Burning or pain at injection site
- Nausea, vomiting, dizziness, headache
- Edema, HTN, GI bleeding
- Use caution in patients with impaired renal or hepatic function, cardiac decompensation, HTN, COPD, & elderly
- May prolong bleeding time, use caution in patients with coagulation disorders
- Use caution in orthopedic injuries due to risk of bleeding.

TRANSEXAMIC ACID (TXA)

PHARMACOLOGY & MECHANISMS OF ACTION:

- Synthetic analog of the amino acid lysine.
- It reversibly binds to lysine receptor sites on plasminogen to decrease the conversion of plasminogen to plasmin.
- This antifibrinolytic effect reduces the breakdown of fibrin and helps to stabilize clotting to reduce bleeding.
- Has anti-inflammatory properties

INDICATIONS:

- Moderate to severe head trauma, either blunt or penetrating, in patients with a GCS < 12 and with a reactive pupil
- Hemorrhagic shock from blunt or penetrating trauma with a systolic blood pressure < 70 mmHg.
- Postpartum hemorrhage with greater than 1 L of blood loss

CONTRAINDICATIONS:

- Patients less than 15 years old (or weight <50 kg if age unknown)
- > 2 hours from time of injury for hemorrhagic shock or TBI
- GCS of 3 with no reactive pupil
- Any chest compressions (manual or mechanical)
- Patients with clinical concern for epilepsy/seizures, MI, stroke, PE, DVT, renal failure, or dialysis
- Known or suspected pregnancy
- Drowning
- Hanging
- Burns > 20% TBSA
- Other procoagulant (e.g. KCENTRA) drug has already been administered

ADMINISTRATION

	ADULT	PEDIATRIC	
PARAMEDIC	***MODERATE TO SEVERE HEAD TRAUMA/HEMORRHAGIC SHOCK*** - 2 grams IV/IO slow IVP over 10 minutes. - Optional: Mix 2 grams in 100 mL of NS and infuse over 10 minutes. ***POSTPARTUM HEMORRHAGE*** - 1 gram in 100 mL of NS over 10 minutes	- **Not indicated in patients under 15 years of age.**	PARAMEDIC

VECURONIUM BROMIDE (NORCURON)

PHARMACOLOGY & MECHANISM OF ACTIONS:

- Nondepolarizing neuromuscular blocking agent
- There are no fasciculations with this drug or the potential for large rises in serum potassium.
- Vecuronium facilitates ongoing airway management efforts by competing with cholinergic receptors at the motor end plate, which provides skeletal muscle relaxation/paralysis.
- When administered in the context of advanced airway management, Vecuronium can be expected to produce adequate paralysis in 1-2 minutes (maximum of 4 minutes). The paralysis may last up to one hour.
- No analgesic properties.

INDICATIONS:

- To provide paralysis (paralyzing dose) for rapid sequence intubation if succinylcholine is contraindicated.
- To maintain paralysis (maintenance dose) after intubation after adequate sedation is provided for transports greater than 15 minutes.
- To relieve isolated masseter muscle spasm due to succinylcholine.

CONTRAINDICATIONS:

- Allergy to Vecuronium
- Patients < 20 kg

ADMINISTRATION:

Vecuronium (powder form) comes packaged in a vial containing 10mg of Vecuronium. It must be reconstituted using 10 mL of sterile sodium chloride, rendering a concentration of 1.0mg/mL of Vecuronium.

ADULT	PEDIATRIC
PARAMEDIC - 10mg IV repeat prn	- 0.1mg/kg IV/IO for patients weighing ≥ 20 kg. PARAMEDIC

PRECAUTIONS & SIDE EFFECTS:

- Apnea
- Bradycardia
- Tachycardia
- Hypotension

SPECIAL NOTES:

- Pregnancy Category C.
- Conditions associated with slower circulation time in cardiovascular disease, old age, edematous states resulting in increased volume of distribution may contribute to delay in onset time; therefore, dosage should not be increased.

VECURONIUM BROMIDE (NORCURON) (CONTINUED)

- If administered to patients with preexisting neuromuscular disease, even small doses may have profound effects.
- If a patient cannot be intubated, they will remain paralyzed for up to one hour and will require airway maintenance by another means, and BVM ventilation.
- Reminder: While under the influence of Vecuronium, patients will not be responsive, but they could still be conscious. Maintain sedation at appropriate intervals to keep the patient from noticing their temporary paralysis.

APPENDIX A – Medication Drip Calculation

Epinephrine Drip		
Desired Dose	**Drip rate**	**gtt/sec**
2 mcg/min	15 gtt/min	1 drop every 4 seconds
4 mcg/min	30 gtt/min	1 drop every 2 seconds
6 mcg/min	45 gtt/min	1 drop every 1.3 seconds
8 mcg/min	60 gtt/min	1 drop every 1 second
10 mcg/min	75 gtt/min	1 drop every 0.8 second

Mix 0.8mg of Epi 1:1000 in 100ml bag of NS using micro grip set (60 gtt/ml).

Push Dose Epinephrine Concentration

1. Take 10ml Normal Saline Flush
2. Expel 1ml of Normal saline leaving 9 ml of NS
3. Attach a needle to the saline flush.
4. Draw up one ml of Epinephrine 1:10,000
5. This will equal 0.1mg/10ml or 10mcg/ 1ml of Push dose Epinephrine.