Regional Patient Care

Protocols, Policies, and Procedures

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Acknowledgements

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Introduction

PROTOCOLS POLICIES AND PROCEDURES COMMITTEE MISSON STATEMENT

The intent is to provide current, well-researched, and accepted standards with the ultimate goal of minimizing the morbidity and mortality of our patients, and to provide guidelines for the treatment of specific emergency conditions in the pre-hospital setting.

PROTOCOLS, POLICIES AND PROCEDURES COMMITTEE GOALS

1. To establish minimum standards for appropriate patient care.
2. To ensure a structure of accountability for operational medical directors, physician course directors, facilities, agencies, and providers.
3. To establish the knowledge base for certification and recertification in the region.

AUTHORITY

The Peninsulas EMS Council regional medical protocols are developed by consensus of participating agencies under Virginia Emergency Medical Services Regulations *12VAC5- 31* (Performance Standards). Each agency OMD must approve the protocols and has the authority to limit or expand implementation of protocols within their agency. Virginia Emergency Medical Services Regulations *12VAC5-31* (Responsibilities of Operational Medical Directors) grants authority to establish and enforce protocols, policies and procedures. All prehospital medical care is carried out with the express written authority of the operational medical directors and under their supervision. Virginia Emergency Medical Services Regulations *12VAC5-31* (Operational Medical Director Authorization to Practice) states “EMS personnel may only provide emergency medical care while acting under authority of the operational medical director for the EMS agency with which they are affiliated and within the scope of the EMS agency license”.

INTRODUCTION

The following protocols were developed as a collective effort by a group of dedicated and knowledgeable EMS providers, EMS educators, and operational medical directors of the EMS agencies of Peninsulas EMS Council (PEMS). These individuals, who recognized a need for a "Standard of Excellence," volunteered for the PEMS Protocols, Policies, and Procedures *(PPP)* Committee, a sub-committee of the PEMS Medical Advisors Committee *(MAC)*. This committee researched and reviewed the following patient care guidelines.

Introduction

This collaborative effort provides a dynamic document that is based on national and state standards of care that include but are not limited to:

- Virginia Department of Health
- American Heart Association - Advanced Cardiac Life Support and Pediatric Advanced Life Support
- American Academy of Pediatrics - Pediatric Education for Prehospital Professionals American College of Surgeons Committee on Trauma - Advanced Trauma Life Support
- National Association of Emergency Medical Technicians

These protocols are reviewed continuously and updates provided to the MAC for deliberation and approval as national, state, and regional standards change and are supported by scientific research and literature.

The primary purpose of these protocols is to establish a foundation and a minimum standard of care for the pre- hospital care delivered in our region. This is best served by active EMS operational medical directors and dedicated EMS providers supported by continued education, review, quality improvement and continuous pursuit of excellence.

Although no document can specifically address every possible variation of injury or disease, this manual provides a foundation for the care of the patients we serve. The education, experience, and judgment of the pre-hospital provider should be recognized as the paramount part of sound clinical decision-making processes regarding pre- hospital care. The complexity of emergency medicine and the pre-hospital setting requires a team approach using every appropriate, accepted and available resource to provide optimal patient care. In many cases, that resource is on-line medical control for consultation, advice, guidance, and authorization or modification of treatment not specifically addressed in this manual. The specific handling of these situations is determined by the operational medical director responsible for that particular EMS agency and the EMS providers they oversee, and for that reason is intentionally not addressed in this manual.

The departmental policies are the responsibility of each agency and operational medical director. All are encouraged to support the premise of regional care and the collective effort on which these guidelines were founded.

The provision of emergency care does not, and should not, occur in isolation. It requires many individuals and organizations working together towards a common goal - optimizing our patients' clinical outcomes. The efforts provided by the PPP Committee while working in conjunction with the MAC will provide a basis for the development of a regional EMS approach to the "Standard of Excellence".

How to Read the Protocols

LEVELS OF CERTIFICATION (KEY)	
EMR	**Emergency Medical Responder**
EMT	**Emergency Medical Technician**
A	**Advanced Emergency Medical Technician**
I	**Intermediate**
P	**Paramedic**
[ ]	**Medical Control**
	Caution

These items in the provider's scope of practice have the following special requirements:

1. Documentation of EMS agency (post-affiliation) training, to the specific skills and medications, must be present and maintained in the providers personnel file, **and**

2. EMS agency Operational Medical Director must provide specific written authorization, to include and/or limit, these specific skills and medications, in the provider's scope of practice. Written authorization must be kept and maintained in the provider's personnel file.

How to Read the Protocols

The following are your new protocols. These have been formatted in a way that is different from what you have seen in the Peninsulas EMS (PEMS) Council previously. The new layout accomplishes several things including minimizing space, thus saving paper, as well as proactively mirroring a proposed statewide protocol format. Though different, with a brief explanation you will find these protocols to be straightforward and easy to use.

The protocols are color-coded in addition to having the level of care beside each possible treatment. The levels of care are reflective of the Office of EMS' (OEMS) changes to the titles of certification. First Responders will from here on be known as **Emergency Medical Responders (EMR)**, the former EMT-Basic is now the **EMT**, the EMT-Enhanced is now the **Advanced EMT (A)**, EMT-Intermediate will now be **Intermediate (I)** and EMT- Paramedic will now be **Paramedic (P)**. As in the previous revisions, brackets [ ] indicate a need for medical control to be contacted at the bracketed level of care (e.g. Intermediate intervention requiring medical control is shown as **[I]**).

The major change in this format is that rather than listing each level of care which can perform an action, simply **the most basic certification which can perform an action is listed**. For example, if an action shows the code EMR beside it, anyone of the Emergency Medical Responder, EMT, Advanced EMT, Intermediate, or Paramedic levels of care can perform the task whereas a step showing [A] beside it means EMR and EMT providers may **not** perform the action, Advanced EMTs must call for orders and Intermediate or Paramedic providers may perform it as a standing order. Any action with the code MC beside it means that any level of care **must call for orders before performing this action.**

ALS and BLS Protocols for adults and pediatrics have been combined into one set of tasks. Also in this version of the protocols is the **PEARLS** section of each protocol. This section provides important considerations and points for taking your patient care from mediocre to exceptional! Cautions to be considered for each step are listed next to an **alarm bell**.

Administrative Policies Table of Contents

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Abuse Recognition & Mandatory Reporting

PURPOSE

To identify and comply with mandatory reporting requirements of the Commonwealth of Virginia to the degree they impose requirements on EMS providers to report specific situations or circumstances.

Guidelines

- Child abuse and/or neglect **800-552-7096** *§ 63.2-1509*
- Elder abuse/neglect/exploitation **888-83-ADULT (888-832-3858)** *§63.2-1606(A)*
- Hunting Accidents **804-367-1258** or **804-367-2251** *§29.1-100* & *§29.1-530.4*

CHILD ABUSE OR NEGLECT

Virginia EMS providers are identified as mandated reporters. Mandated reporters must report the situation immediately to the local department of social services in the locality where the child resides or where the abuse is believed to have occurred or make reports to the 24-hour, toll-free Virginia Department of Social Services (VDSS) Child Protective Services (CPS) hotline. Failure to do so shall lead to monetary penalties. If transporting the child in question it is also acceptable to report to the attending physician at the hospital. Provide appropriate documentation on the PCR "made notification to Dr.____." For more details, see *§63.2-1509*.

- Physical abuse - the use of physical force that may result in bodily injury, physical pain, or impairment
- Neglect - the refusal or failure to fulfill any part of a person's obligations or duties to a child such as abusing dependence
    - Neglect may also include failure of a person who has fiscal responsibilities to provide care for a child (e.g., pay for necessary home care services.
    - The failure on the part of an in-home service provider to provide necessary care
- Sexual abuse - non-consensual sexual contact of any kind; sexual contact with any person incapable of giving consent is also considered sexual abuse
- Sexual exploitation - can involve the following: possession, manufacture and distribution of child pornography, online enticement of children for sexual acts, child prostitution, child sex tourism, and child sexual molestation
- Emotional/mental injury - the infliction of anguish, pain, or distress through verbal or nonverbal acts such as ridiculing values or spiritual beliefs, threats, intimidation, guilt and blame
- Abandonment - the desertion of a minor child by an individual who has assumed responsibility for providing care for the child, or by a person with physical custody of the child

Assessment Guidelines

- Assess for and document psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders
- Assess for and document physical signs of abuse, including any injuries inconsistent with the reported mechanism of injury, or do to non-age-appropriate activities
- Assess for and document symptoms or signs of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregivers, or indications of malnutrition

Abuse Recognition & Mandatory Reporting

ELDER ABUSE OR NEGLECT

Virginia EMS providers are identified as mandated reporters. *§63.2-1606(A)*

- Mandated reporters must report the following to Adult Protective Services and law enforcement:
  - Physical abuse – the use of physical force that may result in bodily injury, physical pain, or impairment
  - Sexual abuse - non-consensual sexual contact of any kind. Sexual contact with any person incapable of giving consent is also considered sexual abuse
  - Emotional or psychological abuse - the infliction of anguish, pain, or distress through verbal or nonverbal acts such as ridiculing values or spiritual beliefs, threats, intimidation, guilt and blame
  - Neglect - the refusal or failure to fulfill any part of a person's obligations or duties to an elder such as abusing dependence
    - Neglect may also include failure of a person who has fiscal responsibilities to provide care for an elder (e.g., pay for necessary home care services)
    - The failure on the part of an in-home service provider to provide necessary care
  - Abandonment - the desertion of an elderly person by an individual who has assumed responsibility for providing care for an elder, or by a person with physical custody of an elder
  - Financial or material exploitation - the illegal or improper use of an elder's funds, property, or assets
  - Self-neglect - the behavior of an elderly person that threatens his/her own health or safety. Self-neglect generally manifests itself in an older person as a refusal or failure to provide himself/herself with adequate food, water, clothing, shelter, personal hygiene, medication (when indicated), and safety precautions
- Suspected sexual abuse, death, serious bodily injury or disease believed to be the result of abuse or neglect; applies to an adult 60 years of age or older or an adult 18 years of age or older who is incapacitated and is being abused, neglected or exploited
  - Mandated reporters must report the situation immediately to the local department of social services in the locality where the adult resides or where the abuse is believed to have occurred.
  - Report to the 24-hour, toll-free VDSS APS hotline.
- Any other criminal activity involving abuse or neglect that places the adult in imminent danger of death or serious bodily injury
  - Mandated reporters must report to the appropriate medical examiner and law enforcement agency when there is reason to suspect that a vulnerable adult died as a result of abuse or neglect.

Assessment Guidelines

- Assess for and document psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders
- Assess for and document physical signs of abuse, including any injuries inconsistent with the reported mechanism of injury
- Assess for and document symptoms or signs of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentative caregivers, or indications of malnutrition

MANDATED REPORTING OF HUNTING ACCIDENTS

§29.1-530.4 requires *"that any emergency medical service provider that receives a report [that a person engaged in hunting] as defined in §29.1-100 has suffered serious bodily injury or death, shall immediately give notice of the incident to the Department of Game and Inland Fisheries."*

- EMS providers are required to report the event to the Department of Game and Inland Fisheries within five days of the incident
- It is a Class 4 misdemeanor to fail to report this information
- Call the Department of Game and Inland Fisheries 24-hour law enforcement dispatch center.

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ALS Release to BLS

PURPOSE

To permit the transfer of patients not requiring Advanced Life Support (ALS) care to Basic Life Support providers when ALS is not medically necessary.

POLICY

This policy applies to all patients where patient contact has been made and the ALS provider desires to release the patient to a BLS provider. An ALS provider may transfer care of a patient to a BLS provider according this the following procedure:

PROCEDURE

- A complete, pertinent patient history and physical assessment, **including a full set of vital signs**, must be completed.
- If it is deemed that the patient does not require ALS, the Basic Life Support (BLS) provider can operate as the Attendant in Charge (AIC) when the following criteria are met:
    - ALS care is not currently medically necessary and will likely not in the near future be necessary (to include pain management)
    - The BLS provider is willing to accept responsibility for the patient
    - BLS provider is capable of providing a level of care that meets the assessed and documented needs of the patient's condition
- The BLS provider must complete a Patient Care Report.
- The ALS provider must contact Medical Control when there is a concern of the appropriateness of the release of patient care to a BLS provider.
- The ALS provider must complete documentation in, or as an addendum to, the Patient Care Report. Documentation will include physical findings, transfer of care, and physician consultation on the Patient Care Report when necessary.
- Any ALS Release to BLS must be reviewed by the agency Quality Assurance/Quality Improvement process.
- A determination of inappropriate release by the Quality Assurance/Quality Improvement review should be reported, quarterly, to the PEMS PI Committee.

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Communications

PURPOSE

To effectively communicate with Medical Control

POLICY

The HEAR (Hospital Emergency Administrative Radio) system is used to notify hospitals of basic and advanced life support patients NOT requiring on-line physician intervention. The HEAR system may be used for physician consultation only when COR (Consultation, Order, Refusal) access is not available. HEAR system reporting should be brief; a detailed patient report should be given to the receiving hospital staff upon arrival. The COR system shall be used for direct contact with Medical Control in any situation where physician consultation is appropriate, and shall be used to provide the patient's name and date of birth for potential Stroke, Trauma or STEMI alerts. Reports should follow the recommended regional format. When Medical Control authorization is needed for medication administration or procedures, as required by PEMS Patient Care Protocols, Policies and Procedures, authorization may only be given by a licensed Physician, Physician Assistant (PA), or Nurse Practitioner (NP).

Proper uses of the HEAR or COR include but are not limited to:

- providing the pre-arrival report.
- any unstable/unsecured airway patient needing transport to the closest hospital.
- patients requiring activation of specialized care teams (i.e. Rape, Burn, STEMI).
- consultation regarding patient refusal.
- authorization for ALS release to BLS.
- obtaining medical control consultation.

PROCEDURE

Mass-casualty or disaster incidents:

Once communication has been established with the coordinating emergency department, a request to follow Regional Medical Protocols as written can be granted by Medical Control. This allows providers to provide patient care approved for their level of certification without having to contact Medical Control again during the MCI.

During an MCI, routine ambulance-to-emergency department communications are suspended. The transport group supervisor/unit leader will communicate patient information directly to the coordinating emergency department. The coordinating emergency department will relay the information to the receiving emergency departments.

For further information, see the *Hampton Roads Mass Casualty Incident Response Guide*

Communications

THE PRE-ARRIVAL REPORT SHOULD INCLUDE THE FOLLOWING:

- ☐ Provider agency/unit/technician ID/estimated time of arrival (ETA)
- ☐ Patient age, gender, and chief complaint
- ☐ History of present illness or injury
- ☐ Pertinent medical history
- ☐ Significant physical findings
- ☐ Vital signs
- ☐ Treatment

COMMUNICATIONS FAILURE

CRITERIA

Provider is unable to make contact with medical control after two attempts by each of two different methods (i.e. twice via radio and twice via cell phone for a total of four attempts).

PROTOCOL

Follow the most appropriate protocol from your PEMS Regional Patient Care Protocols, Policies and Procedures. Proceed with treatments listed in the protocol based on the clinical situation, and as appropriate for your level of certification. All orders within your scope of practice are considered standing orders in this situation.

Carefully document events including:

- ☐ time of the call.
- ☐ nature and location of the communication problem.
- ☐ clinical status of the patient.
- ☐ protocol(s) used.
- ☐ Complete and submit a copy of the Medical Control Incident Form.

The Medical Incident Form and the PCR must be provided to your Operational Medical Director (OMD) within 48 hours of the occurrence. The OMD may require additional information and/or a personal meeting with the provider(s) to review the incident.

The OMD may suspend use of this protocol in the event of inappropriate actions, compliance failures, or abuse of the procedure. The OMD will notify the appropriate agency's administration regarding problem incidents as soon as possible

The OMD may also review such incidents with the Medical Advisors Committee in order to evaluate system performance and improvement needs.

Communications

REGIONAL RESOURCES & TELEPHONE NUMBERS

Air Transport		
Nightingale Air Ambulance (Norfolk, VA)	(800) 572-4354	(757) 388-5597
Med-Flight Air Ambulance (Richmond, VA)		(800) 468-8892
LifeEvac VCU Health Air Ambulance (Richmond, VA)	(877) 902-7779	(804) 652-0171
LifeEvac VCU Health (West Point, VA)	(877) 902-7779	(804) 785-2463
Air-Care Air Ambulance (Fredericksburg, VA & Fairfax, VA)	(800) 258-8181	(703) 698-2980
UVA Pegasus Air Ambulance (Charlottesville, VA)	(800) 552-1826	(434) 978-4426
COR		
Sentara Careplex	(757) 224-4188	
Children's Hospital of King's Daughters	(757) 668-8000	
Riverside Regional	(757) 594-2057	
Sentara Williamsburg	(757) 984-7185	
Mary Immaculate	(757) 875-5202	
Riverside Walter Reed	(804) 693-4600	
Riverside Doctors	(757) 903-2138	
Rappahannock General	(804) 259-3015	
VCU Children's Hospital	(804) 828-3989	
VCU Tappahannock	(804) 442-6297	
Critical Incident Stress Management		
PEMS CISM Team	(757) 220-4356	
Haz-Mat		
Virginia Department of Emergency Management (VDEM)	(804) 674-2400	
Regional Hazardous Materials Officer		
Metropolitan Medical Resposne System (MMRS)		
York County Dispatcher	(757) 890-3621	
	(757) 890-3622	
Poison Control	(800) 222-1222	
Terrorism		
VA State Police Terrorism Hotline	(866) 488-8554	

Communications

Water & Technical Rescue

Divers Alert Network	Emergencies:	(919) 684-8111
	Information:	(919) 684-2948
Sentara Leigh Hyperbaric Medicine		(757) 466-2325
U.S. Coast Guard – Small Boat Requests Group Hampton Roads Command Center		(757) 483-8567
U.S. Coast Guard – Helicopter Requests Fifth District & Atlantic Area Command Center		(757) 398-6231
Peninsula Regional Technical Rescue Team		(757) 890-3621
(York Dispatcher)		(757) 890-3622
Tidewater Regional Technical Rescue Team		(757) 427-5033
(Virginia Beach Dispatcher)		(757) 427-5943

Death & Criteria for Withholding Resuscitation

TERMINATION CRITERIA

When cardiac arrest is refractory to appropriate and available prehospital interventions based on provider certification level, Medical Control may direct EMS providers to cease resuscitation efforts.

Termination Protocol		
EMT	Provide full basic life support care including AED, pulse ox, EtCO2, and supraglottic airway.	**EMT**
I	Provide full advanced life support level care. This includes defibrillation (as indicated), advanced airway, IV/IO access, and medication administration in accordance with ACLS.	**I**
MC	***Contact Medical Control*** Provide a thorough report of patient history, condition, and treatment. If resuscitation efforts are terminated at the scene, document time and physician name on the PCR.	**MC**
EMT	Follow agency protocols/policies concerning notification of law enforcement and/or medical examiner. Remain on scene until proper authorities arrive.	**EMT**
EMT	Be attentive to the emotional needs of any family members or bystanders present.	**EMT**

PEARLS

- Termination of resuscitation efforts is a Medical Control decision only.
- Resuscitation efforts and transport to the emergency department are indicated for any patient having suspected hypothermia.
- Consider patient's previously diagnosed medical condition.

WITHHOLDING RESUSCITATION CRITERIA

In accordance with Commonwealth of Virginia law, full resuscitation measures shall be undertaken for all victims of cardiopulmonary arrest except in the presence of one or more of the indications of death:

- The presence of one of the following:
  - An actual valid Virginia DDNR form
  - An actual valid DDNR from any State
  - A copy of a valid Virginia DDNR form (a digital copy is permitted)
  - A copy of a valid DDNR form from any State (a digital copy is permitted)
  - A Virginia approved DDNR ALERT bracelet or necklace
  - For reference, see the *Code of Virginia §54.1-2987.1, § 54.1-2982*
- Decapitation or other obvious mortal injury
- Rigor mortis
- Dependent lividity
- Decomposition

During mass-casualty incidents, resources must be directed toward viable patients

Death & Criteria for Withholding Resuscitation

Withholding Protocol		
MC	When treating cardiac arrest victims who possess a "living will" or an advanced directive (other than a valid DDNR order/POST), full resuscitative efforts should be initiated and **Medical Control consulted as quickly as possible** regarding the continuation or termination of treatment. Be prepared to review the reason(s) why resuscitation efforts may not be indicated (i.e. terminal illness).	**MC**
EMT	Providers shall honor any form issued or approved by the VA Department of Health to include: Alternate DDNR Jewelry" and "other" DNR Orders including out of state DNR forms; this document must accompany the patient to the hospital. An original or a copy of a DDNR form must be in a patient's chart when responding to a call from a nursing home or hospice. A photocopy is acceptable.	**EMT**
EMT	Providers shall honor a physician order when a patient is in a licensed health care facility. The form must include the patient's full legal name, physician's signature, and date issued, and can be a photocopy. A patient who is travelling outside his home or between healthcare facilities should have an original or photocopy DDNR or other DNR or alternate jewelry accompanying him. *12 VAC 5-6640*	**EMT**
EMT	EMS providers shall honor a direct verbal order from a physician who is present and in the attendance of the patient at the time of death. Record physician's name and time of order on PCR.	**EMT**
EMT	If resuscitation efforts were discontinued at the scene per Medical Control, document the time and physician's name on the PCR form.	**EMT**
EMT	Document physical findings and patient history on the PCR form.	**EMT**
EMT	If the patient is DOA or resuscitation efforts were ended before transport from the scene, follow department policies/protocols concerning the notification of law enforcement and/or medical examiner.	**EMT**
EMT	Be attentive to the emotional needs of family members and bystanders.	**EMT**

PEARLS

- For POST (Physician Orders for Scope of Treatment) forms, Section A qualifies as a DDNR
- If you have any questions regarding the orders, ask Medical Control
- Providers are reminded they are still not to exceed their Scope of Practice

Helicopter EMS (HEMS)

INDICATIONS

- Patients meeting specialty care criteria including but not limited to:
  - STEMI
  - Stroke
  - Trauma
  - Burns
  - Critical Pediatrics
  - Ventricular Assist Device (LVAD/BiVAD/VAD as directed per VAD Coordinator or Medical Control)
- The air ambulance service can provide needed medical capability at the scene.
- Difficult-access situations:
  - Wilderness rescue
  - Ambulance egress or access impeded at the scene by road conditions, weather, or traffic

POLICY

Technicians can request HEMS without authorization by medical control.

PROCEDURE

1. Establish a safe and logistically feasible landing zone.
2. Request air ambulance standby/response according to department procedure.
3. Establish number of patients, primary injuries/medical condition, and approximate patient weight(s). Forward this information to the responding air medical service.
4. Trauma patients should be fully immobilized. IV/IO access should be established as time allows.
5. On scene one individual should be responsible for providing the patient report(s) to the flight crew upon arrival.
6. Ensure PCR is provided to receiving facility as per *12 VAC 5-31*

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Infant Abandonment

PURPOSE

To identify the circumstances under which a parent may surrender an infant under the Virginia Safe Haven Law. Reference *§18.2-371, §18.2-371.1, §40.1-103*

POLICY

Providers in the PEMS region will follow all laws.

PROCEDURE

- A parent may leave an infant (within the first 30 days of the child's life) at a hospital that provides 24-hour emergency services or to an attended rescue squad that employs emergency medical servicespersonnel.
- The child must have been delivered in a manner reasonably calculated to ensure the child's safety.
- Providers receiving an infant under these circumstances should contact Child Protective Services or local law enforcement resources and, if indicated, transport to an appropriate facility.

IMMUNITY

Personnel of a hospital or rescue squad receiving a child under the circumstances previously described shall be immune from civil liability or criminal prosecution for injury or other damage to the child unless such injury or other damage is the result of gross negligence or willful misconduct by such personnel. Reference *§ 8.01-226.5:2*

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Patient Refusal of Treatment/Transport

CRITERIA

- Any patient or surrogate decision maker refusing or declining treatment of a condition for which treatmentwould be otherwise indicated and/or transport via ambulance to an appropriate receiving facility

PROTOCOL

EMT	Conduct a thorough assessment of the patient including vital signs and physical exam in accordance with relevant patient care protocols.	**EMT**
EMT	Assess right to refuse/consent: • Patient must be at least 14 years of age to consent to or refuse care / transport. • Patient must not be subject to a court decree of incapacity or incompetence pertaining to healthcare decisions to refuse otherwise indicated care/transport.	**EMT**
EMT	Assess clinical decision-making capacity: • Ensure the patient is fully oriented (person, place, time, events) • Ensure the patient does not pose a foreseeable risk of harm to self or others • Ensure the patient understands the current clinical situation and proposed plan for treatment and/or transport, as well as any reasonable alternatives. • Ensure the patient understands the potential risks and benefits of accepting or refusing the proposed plan and any reasonable alternatives. • Ensure the patient is not under undue external influence. Consider discussion in private. • Assess for and take into consideration any condition which may impair decision making capacity such as acute or chronic psychiatric illness, acute drug or alcohol intoxication, CVA, hypotension, hypoglycemia, hypoxia, head trauma, or any other condition with similar effect. If a patient cannot express his/her wishes, either verbally or non-verbally, and no surrogate decision maker is available (see below), treatment should follow standard protocols.	**EMT**
EMT	**Only if the patient is determined to lack capacity or competence,** the following individuals may act as a surrogate decision maker, in descending order of authority: • Legal agent, guardian, or committee (appointed by a court of law) • Medical power of attorney (appointed by the patient) • Patient's spouse – except in cases where divorce has been filed. • Adult child of the patient • Parent of the patient • Adult sibling of the patient • Other adult relative of the patient in descending order of blood relationship. Ensure the surrogate decision maker has clinical decision-making capacity (see above)	**EMT**

Patient Refusal of Treatment/Transport

EMT	Clearly document the information provided to the patient/surrogate decision maker regarding potential risks and benefits of any proposed treatment and alternatives. If treatment and/or transport are refused, obtain signatures from the patient or authorized surrogate decision maker and at least one adult witness, when possible.	**EMT**
EMT	For patients in **cardiac arrest**: • A DNR/DDNR/DNAR (Do Not Resuscitate) is applicable ONLY if the patient is in cardiac arrest. • Order such as POST, POLST, and MOLST forms may or may not include a specific DNR/DNI order and are valid if signed by a physician. • A valid DNR (original or unaltered physical or electronic copy issued in any state) or alternative DDNR jewelry is required to withhold resuscitation of patients not within a qualified health care facility or receiving hospice/home health care services. • Other DNR orders (e.g. electronic patient record) can be honored when a patient is within a qualified health care facility, during transfer between health care facilities, or receiving hospice or health care services at home. • A valid living will or other advanced directive may be used to guide therapy and discussions with surrogate decision makers/Medical Control, but is generally applicable only to terminal illness and should not be used to withhold attempts at resuscitation in the event of cardiac arrest. • A DNR can be revoked at any time by the patient or authorized decision maker (if the decision maker initiated the DNR) by physically destroying the DNR order form or oral expression of intent to revoke.	**EMT**
EMT	**If there is any doubt as to the applicability or validity of a DNR or other advanced directive belonging to a patient in cardiac arrest, begin CPR and contact Medical Control immediately for guidance.**	**EMT**
EMT	For patients with **acute psychiatric emergencies** who present a significant risk of harm to themselves or others and are refusing treatment or transport, contact law enforcement regarding issuance of an Emergency Custody Order (ECO) for psychiatric evaluation.	**EMT**
MC	For patients with **acute medical emergencies** who lack decision-making capacity or competence and are refusing treatment or transport, contact Medical Control regarding issuance of an Emergency Custody Order (ECO) for medical evaluation. See Pearls. Medical ECO requires MC to petition a magistrate. * Contact law enforcement to assist, as needed.	**MC**
MC	Contact Medical Control for assistance in situations including but not limited to: • The EMS provider strongly believes the patient would benefit from or suffer without further medical attention which is being refused against the advice of providers on-scene. • The EMS provider believes the patient lacks capacity or competence but is unwilling to be treated or transported (see above). * • The EMS provider is unsure of the patient's or surrogate's decision-making capacity. • The EMS provider is unsure as to the validity or applicability of an advanced directive or the authority of an available surrogate decision maker. Whenever possible, allow the Medical Control physician to speak directly with the patient or surrogate decision maker.	**MC**

Patient Refusal of Treatment/Transport

PEARLS

- For medical emergencies, issuance of an emergency custody order (ECO) for medical evaluation requires a licensed physician to petition a magistrate or special justice. Early discussion with Medical Control to provide a detailed description of the current clinical situation and concerns, assessment of decision-making capacity, and any pertinent clinical information is critical.
- Medical power of attorney only comes into effect when a patient lacks decision-making capacity.
- Attempt to obtain a copy of any documentation assigning guardianship or medical power of attorney. If unavailable, you may accept the individual's assertion as long as you do so in good faith and do not have any evidence or knowledge that the person is misrepresenting himself/herself as a guardian or medical power of attorney.
- In the absence of available parents, an adult in whose care a minor has been entrusted, such as a teacher or caregiver, may act as a surrogate decision maker in the place of a parent ("in loco parentis").
- A minor shall be deemed an adult for the purpose of consenting to:
    - Services needed to determine the presence of or to treat venereal disease of any infectious or contagious disease that the State board of Health requires to be reported
    - Services required in case of birth control, pregnancy or family planning
    - Services required in the case of outpatient care, treatment, or rehabilitation for substance abuse
    - Services required in the outpatient care, treatment, or rehabilitation for mental or emotional disturbance
- A pregnant minor shall be deemed an adult for the sole purpose of giving consent for herself and her child to surgical and medical treatment relating to the delivery of her child. Thereafter, the minor mother shall be deemed an adult for the purpose of giving consent to surgical and medical treatment for her child.
- Treatment and/or transport of a minor is authorized if delay may adversely affect the minor's recovery and no authorized person is available to provide consent. If the minor is 14 years of age or older and physically capable of giving consent, such consent shall be obtained first.

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Patient Restraint

PURPOSE

To ensure the safety of patients and responders: patient restraint should be utilized only if the patient is exhibiting behavior that is an immediate danger to self or others

Restraint Guidelines

- Use the minimum level of physical restraint required to accomplish patient care and ensure safe transportation (soft restraints may be sufficient).
    - If law enforcement or additional staff is needed, call for assistance prior to attempting restraint procedures.
    - Do not endanger yourself or other responders or the patient.
- Avoid placing restraints in such a way as to prevent evaluation of the patient's medical needs.
- Consider and treat medical causes of combativeness (hypoxia, head injury, hypoglycemia).
- Consider whether the patient is exhibiting any other signs or symptoms of potential mental incapacity, including signs of drug or alcohol use, unsteady gait, slurred speech, etc.

PHYSICAL RESTRAINT PROCEDURE

- Evaluate the personnel needed to safely restrain the patient.
- Place the patient face up on a long backboard – NEVER PRONE.
- Secure all extremities to the backboard- check circulation in restrained extremities every 15 minutes.
- Attempt to restrain lower extremities first, using soft restraints around both ankles.
- Restrain the patient's arms at their sides.
- If necessary, utilize cervical spine precautions (tape, foam blocks, CID, etc.) to control violent head or body movements.
- Secure the backboard to the stretcher using the straps on the stretcher, particularly the over-the-shoulder straps.
- Evaluate the patient's respiratory and cardiac status to assure no airway compromise exists; attempt to place SpO2 device and apply supplemental oxygen if indicated.
- DO NOT tighten chest straps to the point of impeding respiratory function.

CHEMICAL RESTRAINT PROCEDURE

- Assess vital signs within the first 5 minutes and thereafter as appropriate (at least every 10 minutes and prior to any repeat dose of medication), or document reason for lack of vital signs assessment.
- Monitor ECG, obtain 12-Lead, consider IN medications and establish IV/IO if possible.
- Sedative agents may be needed to restrain the violently combative patient. If chemical restraint is required, see Behavioral Emergencies Protocol

Patient Restraint

RESTRAINT DOCUMENTATION PROCEDURE

Document a response to each of the following questions:

- In what manner was your patient violent? Record patient's comments verbatim.
- Did you feel threatened? Why?
- Were you concerned about your patient's outcome without emergency medical interventions? Why?
- Could you treat your patient appropriately without the use of restraints?
- Which law enforcement officer was present? If patient was transported in handcuffs, which officer accompanied patient to ED in ambulance? If no law enforcement officer accompanied patient, why?
- What kind of restraints did you use?
- Where on your patient were these restraints used?
- Document the frequency of respiratory and mental status change assessments. Constant evaluation of your patient's airway status is extremely important.

Safe Transport of Pediatric Patients

PURPOSE

To identify the “best practice” for ambulance transportation of ill or injured pediatric patients. Ambulances are **NOT EXEMPT** from state child safety laws.

POLICY

Safety measures should be used to provide safe transport for all patients.

PROCEDURE

- Drive cautiously and at safe speeds, observing applicable traffic laws.
- Attempt to arrange for transportation of adults and children who are not patients by alternative means.
- Secure all monitoring devices and other equipment to prevent injury.
- Ensure pediatric patients under 40 kg (88 lbs) are restrained with approved child restraint devices secured per the manufacturer’s instructions.
- Ensure that all EMS providers use available restraining devices or systems during transport.
- For pediatric patients having medical conditions aggravated by stress, make every reasonable attempt to maximize safety while comforting the child.
- **DO NOT** allow parents, caregivers or any passenger to be unrestrained during transport.
- **DO NOT** hold, attempt to hold, or permit parents or caregivers to hold the patient during transport; parents or caregivers should be secured using safety belts.
- Infants and children meeting Trauma Triage criteria should be transported in a child restraint device unless requiring relocation to or placement on an immobilization device.

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STEMI Field Triage

PURPOSE

To rapidly identify patients experiencing acute myocardial infarction and transport them safely to definitive care.

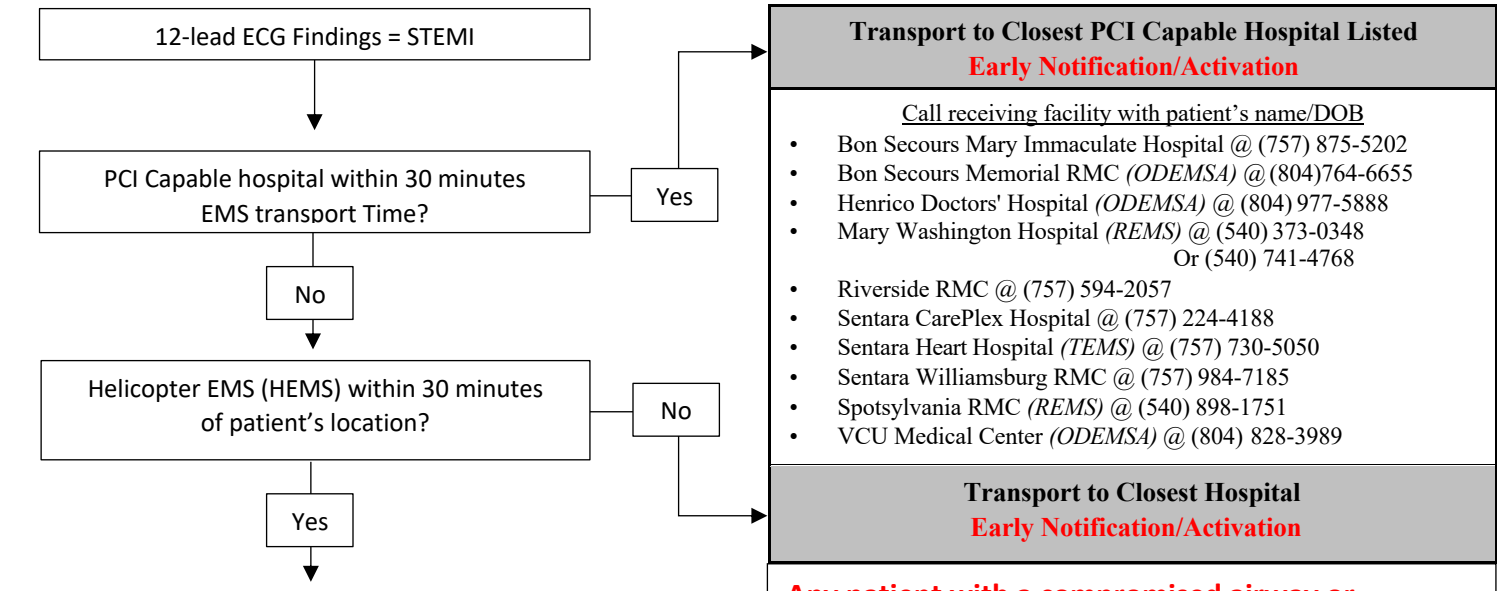
PROCEDURE

When executing the Acute Coronary Syndromes Protocol, acquire a 12-lead ECG within 5 minutes of arrival at patient. If interpretation by a qualified provider or machine is that of STEMI, activate the STEMI alert system by notifying the closest PCI center within 30 minutes EMS transport time. Use the STEMI Triage Decision Scheme to decide method of transport and appropriate facility. When in doubt, contact local medical control.

Field STEMI Triage Decision Scheme

Cardiac symptoms **AND**

- ☐ 12-lead ECG criteria of 1 mm (or more) ST elevation in 2 (or more) contiguous leads **OR**
- ☐ 12-lead ECG interpretation with an "ACUTE MI" statement



Any patient with a compromised airway or impending circulatory collapse should be taken to the closest Emergency Department.

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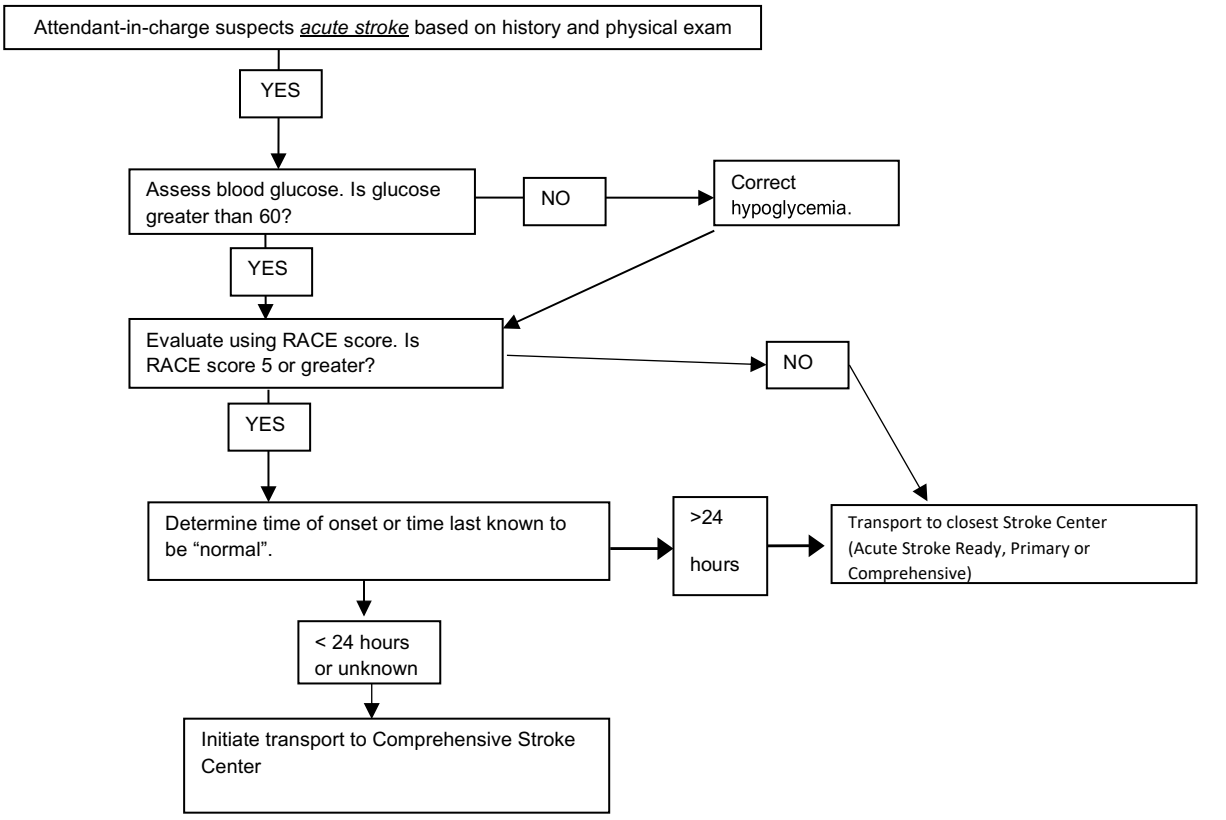
Stroke Field Triage

PURPOSE

To rapidly get patients experiencing a stroke to definitive care.

PROCEDURE

When executing the stroke protocol, evaluate the patient using the RACE exam. If any part of the test returns positive (RACE Score ³ 1), activate the stroke alert system by notifying the appropriate facility. Use the stroke triage decision algorithm below to decide method of transport and appropriate facility. If you have questions contact local medical control. Once the patient is in transport call the receiving facility's COR with the patient's Name/DOB.



Provide early notification to on-line medical control and/or the certified Stroke Center of patient with acute stroke presentation. Provide care during transport as directed by protocols or on-line medical control.

If transport to Comprehensive Stroke Center increases transport time by 30 minutes or greater, transport to nearest Primary Stroke Center.

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Transportation & Destination Determination

PURPOSE

To assure respect for patient decision-making capacity, while still providing safe, appropriate medical transportation.

PROCEDURE

1. Patients with decision-making capacity are to be transported to the hospital emergency department of their choice within the policies of the transporting agency* with the following exceptions:
    a. The patient exhibiting the symptoms and/or clinical criteria consistent with an ST elevation MI (STEMI); the patient destination should be consistent with the *PEMS Regional STEMI Plan*, i.e. a STEMI Receiving Center.
    b. The patient exhibiting the symptoms and/or clinical criteria consistent with a Stroke/CVA; the patient destination should be consistent with the *PEMS Stroke Triage Plan*, to a designated stroke center.
    c. Th patient exhibiting symptoms and/or clinical criteria consistent with the *PEMS Regional Prehospital and Interhospital Trauma Plan*, i.e. a trauma center
    d. The patient exhibiting the symptoms and/or clinical criteria such that the patient should be transported to a burn center.
    e. The patient requires EMERGENT transport to the closest hospital when, in the judgment of the AIC, the patient is unstable due to one or more of the following conditions:
        i. Inability to establish or maintain a protected airway
        ii. Severe respiratory distress unresponsive to prehospital therapies
        iii. Circulatory failure with an inability to achieve hemodynamic stability
        iv. Abnormal delivery (e.g., breech, shoulder, or prolapsed cord)
        v. Post cardiac arrest
        vi. Continuing seizures unresponsive to midazolam
        vii. Patient presenting in non-trauma related shock
        viii. Any other life-threatening condition the AIC believes to be time critical

2. If the patient has no hospital preference, transport should be to the closest most appropriate hospital.

3. Any time a patient is transported to the most appropriate facility other than the one requested, the reason for the change and destination the most appropriate facility shall be documented on the Patient Care Report.

4. Certified providers may contact HEMS (Medical Control permission not necessary) if HEMS can provide transportation more beneficial to the patient than the resources on scene. **If the patient is ready for transport AND air ambulance is delayed for more than 10 minutes, initiate ground transport to the closest hospital, or helispot/helipad.**

5. If approved by agency Operational Medical Director/Emergency Physician, alternate destinations may be established.

* Agencies shall have an internal policy explaining the destination poliy specific to that agency (i.e., the agency will not transport further than a specified hospital due to the extended time away from the community).

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Behavioral Health Transport Decision Algorithm

PURPOSE

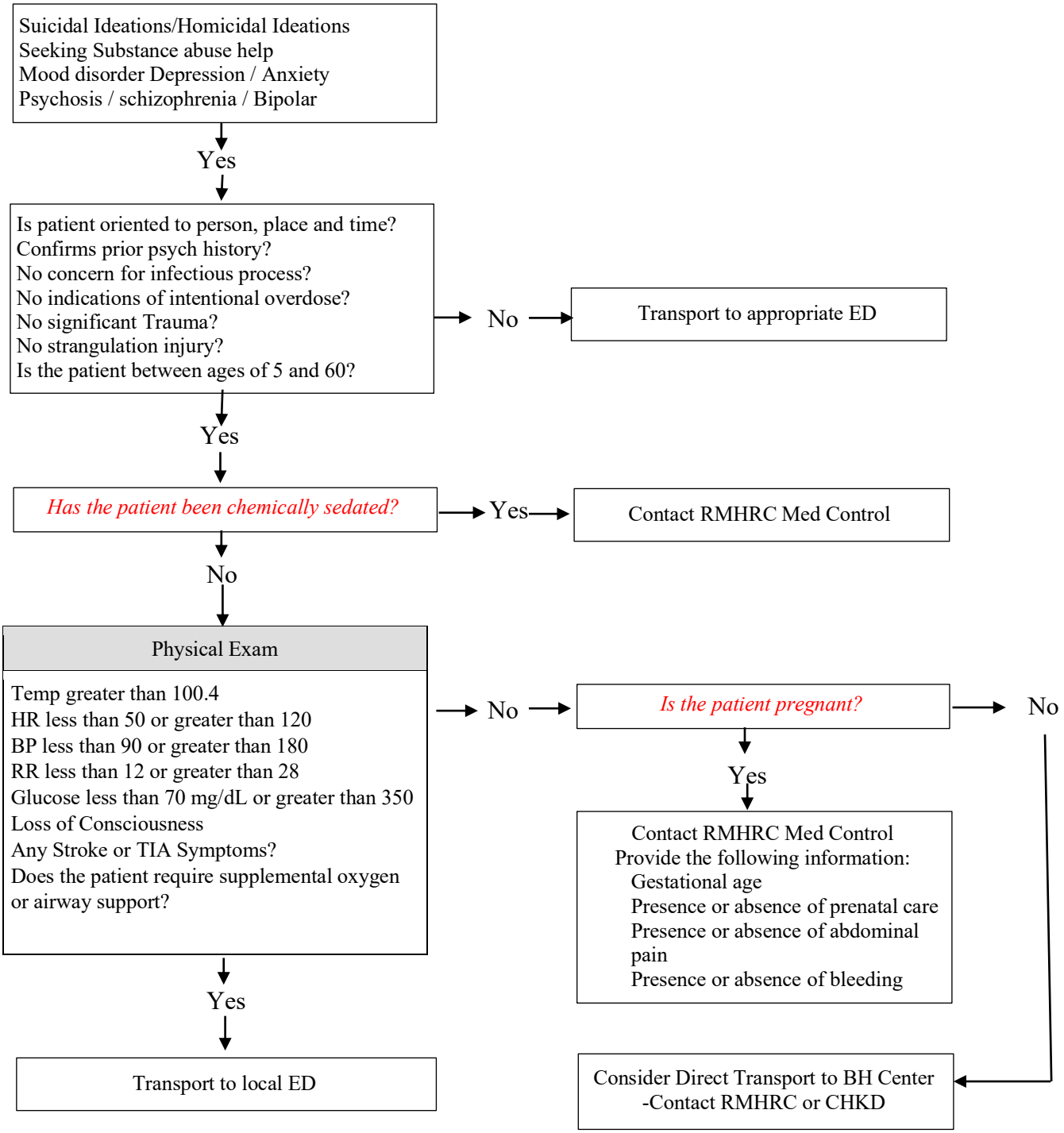
Appropriately identify patients experiencing mental health crisis that can benefit from direct transport to Behavioral health facility.

PROCEDURE

Once a patient in crisis has been identified the Field Triage Decision protocol will be used to consider direct transport to a Mental Health Facility. When in doubt, contact Medical Control.

FIELD TRIAGE DECISION SCHEME

Patient's complaint



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Trauma Field Triage

PURPOSE

To rapidly get trauma victims to definitive care.

PROCEDURE

A trauma patient who meets any of the following criteria shall be transported to the **closest appropriate** trauma center within a 30-minute ground transport time. Trauma victims who are not within 30 minutes ground transport radius to a trauma center should be transported to the closest hospital unless they can be delivered to a trauma center more rapidly by helicopter EMS (HEMS).

Physiologic Criteria

- Glasgow Coma Scale of less than 14, or
- Systolic blood pressure of less than 90 mmHg, or
- Respiratory rate of less than 10 or greater than 29 breaths per minute (less than 20 breaths per minute in infants less than 1 year old)

Anatomic Criteria

- Penetrating injury to head, neck, torso or extremities proximal to elbow and knee
- Flail chest
- Two or more proximal long-bone fractures
- Crushed, degloved, or mangled extremity
- Amputation proximal to wrist and ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis

Mechanism of Injury

- **Falls**
  - Adults – greater than 20 feet
  - Children less than 15 years old – greater than 10 feet, or two to three times child's height
- **High-risk auto crash**
  - Intrusion – more than 12 inches into occupant site or more than 18 inches into any site
  - Ejection (partial or complete) from automobile
  - Death in same passenger compartment
- **Auto versus pedestrian/bicyclists -** thrown, run over, or with significant impact (greater than 20 mph)
- **Motorcycle crash** at speed greater than 20 mph

Special Considerations

The following situations should increase your index of suspicion for injury:

- **Burns -** absent other trauma, burns that meet burn center criteria should be transported to a burn center

- **Pregnancy** – injured women who are more than 20 weeks pregnant should be considered for transport to trauma center or a hospital with obstetrical resources.
- **Age** – greater than 55 years
  - **Age and Injury-** Severely injured pediatric patients should be transferred to a trauma center or pediatric trauma center.
  - **Anticoagulation and bleeding disorders** – EMS should contact medical control and consider transport to a trauma center.
  - **End-Stage Renal Disease** – Patients with end-stage renal disease requiring dialysis
  - **Time-sensitive extremity injury** – open fracture(s) or fracture(s) with neurovascular compromise
  - **EMS provider judgement** – EMS providers have the experience and expertise to make judgments regarding atypical patient presentation

Procedure:

Agencies operating ***within a 30-minute ground transport radius*** of a trauma center (e.g. Riverside Regional Medical Center, Sentara Norfolk General Hospital, Mary Washington Hospital, and Virginia Commonwealth University Medical Center)

1. Provide appropriate care and initiate immediate transport (scene time less than 10 minutes) towards trauma center.
2. Establish early radio contact to alert trauma center staff.
3. Transport immediately; otherwise document the reason for the

delay. Agencies operating ***outside a 30-minute ground transport time***

to a trauma center:

1. Field transports of trauma patients by helicopter (HEMS) should be considered:
   a. if patient meets the clinical triage criteria for transport and should be transported to a Level I or Level II trauma center.
   b. if patient requires a level of care greater than can be expected from the local ground provider **AND** HEMS can be on scene in a time shorter than the ground unit can transport to the closest hospital.
2. Technicians can request HEMS transport without authorization by medical control.
3. If HEMS is delayed or unavailable, transport patients meeting trauma center criteria to the closest hospital keeping in mind the on-scene time should be 10 minutes or less.
4. Establish early contact with the destination hospital. A facility may divert patients to a trauma center en route or expedite transfer after arrival.
5. For patients that meet mechanism of injury criteria, but ***do not*** meet anatomic and physiologic criteria, the technician should **contact medical control** to determine the destination hospital.

Trauma Field Triage

PEARLS

- Transport all patients with unmanageable/uncontrolled airway or uncontrolled hemorrhage to the **closest**
- hospital emergency department.
- ***Traumatic cardiac arrest***– if transporting, transport to the **closest** hospital emergency department.

- Consider transport to a pediatric center (CHKD or VCU Medical Center) for pediatric patients meeting the above trauma triage criteria.
- Consider transport to a burn center (Sentara Norfolk General Hospital or VCU Medical Center) for patients with burn injuries meeting the following criteria:
  - Partial-thickness burn of greater than 10% BSA
  - Electrical burns, including lightning injury
  - Full-thickness burns
  - Circumferential burns
  - Chemical burns

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Universal Patient Care / Initial Patient Contact

CRITERIA

- The Universal Patient Care / Initial Patient Contact protocol applies to all patients and is the foundation for all patient care. A universal patient care protocol allows other protocols to focus on their specific goals for patient management.
- While the steps listed below may occur in order, the dynamics of an emergency scene may dictate a change to the order in which they occur.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	**Scene Safety / PPE / Patient Contact** - Utilize appropriate agencies and resources as needed to ensure patient and provider safety including lift assistance, personnel, ALS, or law enforcement. - Bring all necessary equipment to the patient's side.	**EMR**
EMR	**Initial Assessment** - Perform Primary and Secondary Survey as indicated by patient status. - Consider spinal motion restriction if indicated by mechanism of injury or history from patient or witness. Refer to *Spinal Motion Restriction* procedure.	**EMR**
EMR	**Ensure Adequate Airway, Oxygenation, and Ventilation** - Manage airway by the least invasive means necessary. - Home oxygen should be maintained unless the patient's oxygen saturation and/or symptoms indicate need for it to be increased. - Administer up to 15 LPM oxygen through an appropriate delivery device for the patient's condition. - Refer to *Airway Management and Ventilatory* support procedure.	**EMR**

EMR	**Vital Signs**
	- Obtain blood pressure, pulse rate, respirations, and Glasgow Coma Scale.
	- Consider obtaining blood glucose level and temperature.
	- Closely monitor the patient, paying specific attention to their condition immediately before or after an intervention.
	  - Stable: Reassess vital signs at least every 15 minutes
	  - Unstable: Reassess vital signs at least every 5 minutes
		EMR

EMR	Refer to relevant and appropriate protocols. If no protocol applies, or for clinical guidance at any time, consider contacting Medical Control.	**EMR**
EMT	Assess SpO2. Consider assessing EtCO2 and/or SpCO as indicated.	**EMT**

Universal Patient Care / Initial Patient Contact

EMT	Consider 12-Lead ECG. Refer to *Chest Pain (Cardiac)* protocol. ☐ Acquire within 5 minutes of patient contact. ☐ Transmit to receiving facility within 10 minutes of patient contact.	**EMT**
EMT	**Medication Administration** ☐ Confirm all medication administration "Rights": ○ Right patient ○ Right medication ○ Right dose ○ Right route ○ Right time ☐ Ensure medications are not expired. ☐ Assess for drug-drug interactions and contraindications. ○ Refer to Pharmacology section and/or agency approved standard reference.	**EMT**
A	Establish IV / IO access when indicated. Refer to *Intraosseous (IO) Access* procedure, as needed.	**A**
I	Consider continuous cardiac monitoring.	**I**
EMT	Transport ☐ Transport decisions should be based on patient's clinical condition. Refer to relevant regional *Field Triage* policies regarding transport to specialty centers (*Stroke, STEMI, Trauma*). ☐ Deliver a pre-arrival report to the receiving facility as soon as practical. ☐ Consult with Medical Control regarding most appropriate destination or for clinical guidance whenever necessary. ☐ Refer to *Patient Refusal of Treatment / Transport* policy, as needed.	**EMT**

PEARLS

Glasgow Coma Scale						
	1	**2**	**3**	**4**	**5**	**6**
Eye Opening	Does not open	Opens to Pain	Opens to voice	Spontaneous Eye opening		
Verbal	Makes no sound	Incomprehensible sounds	Inappropriate words	Confused, disoriented	Oriented and converses normally	
Motor	Makes no movement	Extension to pain (Decerebrate)	Abnormal flexion to pain (Decorticate)	Flexion or withdrawal to pain	Localizes pain	Obeys commands

Infant Age Guidelines	
Newborn	Up to 48 hours following birth
Neonates	Up to 28 days following birth

Altered Mental Status Differential Diagnosis (AEIOU TIPS)	
A	Alcohol
E	Endocrine, Encephalopathy, Electrolytes
I	Insulin (hypoglycemia / hyperglycemia)
O	Oxygen (hypoxia), Opiates (drugs of abuse)
U	Uremia
T	Toxins, Trauma, Temperature (hyperthermia / hypothermia)
I	Infection
P	Psychiatric, Porphyria
S	Stroke, Shock, Subarachnoid/Intracranial Hemorrhage, Space-occupying CNS Lesion, Seizure

Altered Mental Status Differential Diagnosis (SMASHED 2)		
S	Substrates	Glucose (high/low), thiamine deficiency
	Sepsis	
M	Meningitis	CNS infection, dementia, encephalitis
	Mental illness	Acute psychosis, medication noncompliance, mania, depression

Universal Patient Care / Initial Patient Contact

A	Alcohol	Intoxication, withdrawal
	Accident	Head trauma, CVA, cerebral contusion, intracranial hemorrhage
S	Seizure	Active seizure or post-ictal state
	Stimulants	Cocaine, amphetamines, PCP, LSD, ketamine,
H	Hyper -	Hypertension, hyperthyroidism, hypercarbia, hyperthermia
	Hypo -	Hypotension, hypothyroidism, hypoxia, hypothermia
E	Electrolytes	Sodium, calcium, potassium
	Encephalopathy	Hepatic, uremic, hypertensive
D	Drugs	Intoxication or withdrawal
	Don't forget other drugs	

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Sedation Post Advanced Airway

CRITERIA

- ☐ Any patient receiving invasive ventilatory support following endotracheal intubation or placement of an advanced airway including supraglottic airway devices.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	Confirm and monitor airway placement with continuous SpO2 and box-waveform EtCO2.	**EMT**
I	Administer: **ADULT:** Fentanyl (Sublimaze) 25 – 50 mcg IV/IO over 2 minutes or IN/IM **PEDIATRIC:** Fentanyl (Sublimaze) 0.5 – 1 mcg/kg IV/IO over 2 minutes or IN/IM Maximum dose 25 mcg. Repeat every 10 – 15 minutes *as needed* for patient safety and comfort.	**I**
I	If Fentanyl is not sufficient, administer: **ADULT:** Midazolam (Versed) 2.5 mg IV/IO over 2 minutes or 5 mg IN/IM **PEDIATRIC:** Midazolam (Versed) 0.1 mg/kg IV/IO over 2 minutes or 0.2 mg/kg IN/IM Maximum dose 2.5 mg IV/IO or 5 mg IN/IM Repeat every 10 - 15 minutes *as needed* for patient safety and comfort.	**I**
MC	Contact Medical Control for guidance if unable to adequately manage patient agitation or discomfort.	**MC**

PEARLS

- ☐ Adjust ventilation rate or volume to maintain EtCO2 of 35 – 45 mmHg following advanced airway placement.
- ☐ Closely monitor for hypotension following intubation and sedation. Positive pressure ventilation increases the risk of pneumothorax and reduced preload, both of which can result in sudden drops in mean arterial pressure.
- ☐ Use suction to remove blood, secretions and vomitus as needed.
- ☐ Use lower doses of Fentanyl for opiate naïve, frail, low weight, hypotensive, hemodynamically labile, or elderly (> 65 years) patients.

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Cardiac Arrest: Asystole / PEA

CRITERIA

- ☐ Any patient without a palpable pulse or respiration, and with Asystole or Pulseless Electrical Activity (PEA) evidence on the cardiac monitor (check two leads), or AED advising not to shock.
- ☐ Patients with a valid durable DNR, rigor mortis, lividity, decomposition, or injuries inconsistent with survival are excluded.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Determine DNR status. Refer to *Death and Criteria for Withholding Resuscitation* protocol.	**EMR**
EMR	Begin chest compressions. Refer to *Adult / Pediatric Cardiopulmonary Resuscitation (CPR)* procedure.	**EMR**
EMR	Identify and treat potentially reversible causes. See Pearls below.	**EMR**
EMT	Consider spinal motion restriction.	**EMT**
A	Obtain IV/IO access (humeral IO preferred if IV unavailable).	**A**
A	Administer: **ADULT:** Epinephrine 1 mg IV/IO [0.1 mg/mL concentration] **PEDIATRIC:** Epinephrine 0.01 mg/kg IV/IO [0.1 mg/mL concentration] Repeat every 3-5 minutes during cardiac arrest.	**A**
I	For cardiac arrest in renal dialysis patients, patients with crush injuries, suspected calcium channel blocker overdose, or suspected hyperkalemia **only**, also administer: **ADULT:** Calcium Chloride 1 g IV/IO slow push Followed by 20 mL 0.9% sodium chloride flush **ADULT:** Sodium Bicarbonate 50 mEq IV/IO slow push **PEDIATRIC:** Calcium Chloride 20mg/kg (max dose 1g) IV/IO slow push Followed by 20 mL 0.9% sodium chloride flush **PEDIATRIC:** Sodium Bicarbonate 1 mEq/kg (max dose 50 mEq) IV/IO slow push Repeat in 5 minutes if no change.	**I**
MC	Contact Medical Control for guidance as needed. See Pearls below regarding Termination of Resuscitation.	**MC**

Cardiac Arrest: Asystole / PEA

PEARLS

Compressions:

- **Push hard and fast: rate 100 – 120 bpm. Allow complete chest recoil.**
- Minimize interruptions in chest compressions.
- Change compressors every 2 minutes or sooner if fatigued
- Give continuous compressions with advanced airway
- Use quantitative EtCO2 monitoring with BVM
  - If EtCO2 is less than 10 mmHg, improve chest compressions
  - If sudden increase in EtCO2 is noted (above 30-40 mmHg), check pulse and rhythm for ROSC.

Airway:

- Use of advanced airways have not been shown to improve outcomes for children with out-of-hospital cardiac arrest. Focus on high quality BLS airway management.
- Studies to date have not shown a clear improvement in outcomes with SGA vs intubation – **do not compromise chest compressions for intubation.**
- Avoid excessive ventilation. Maximize preload.
- Use EtCO2 to confirm and monitor placement of any advanced airway.
- Continually monitor EtCO2 with target above 10 mmHg during CPR and 35-45 mmHg once ROSC is achieved.
- In post ROSC patients, if EtCO2 falls below 20 mmHg or signal is lost, immediately reassess pulses and airway.

Reversible causes:

- **Ensure IV/IO patency.**
- Identify and treat per appropriate protocol and scope of practice:
  - Hypoxia
  - Hyperkalemia or Hypokalemia
  - Hyperthermia or Hypothermia
  - Hypovolemia
  - Hydrogen ion (acidosis)
  - Hyperglycemia or Hypoglycemia
  - Tension pneumothorax/hemothorax
  - Tamponade (Cardiac)
  - Thrombosis (Cardiac, Pulmonary)
  - Toxins
  - Trauma
  - Tablets (Overdose)

Termination of Resuscitation (TOR):

- Refer to *Death & Criteria for Withholding Resuscitation* protocol.
- Termination of resuscitative efforts is a Medical Control decision **only**.
- Consider contacting Medical Control to request TOR if the arrest was not witnessed by EMS and after 20 minutes of continuous CPR:
  1. There has been no return of spontaneous circulation (ROSC)
     AND
  2. No shocks were delivered.

Cardiac Arrest: Post ROSC Care

CRITERIA

- ☐ Any patient with return of spontaneous circulation (ROSC) following cardiac arrest.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Follow *Airway Management and Ventilatory Support* procedure.	**EMR**
EMT	Assess blood glucose. If less than 60 mg/dL, refer to *Hypoglycemia* protocol.	**EMT**
EMT	Obtain and transmit a 12-Lead ECG. If STEMI is identified, follow *Administrative Policy - STEMI Field Triage.*	**EMT**
A	Obtain IV/IO access (humeral IO preferred if IV unavailable).	**A**
A	Consider: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
I	Maintain mean arterial pressure (MAP) above 65 mmHg. Consider: **ADULT:** Norepinephrine (Levophed) infusion 5 – 20 mcg/min IV/IO (Add 4 mg of Norepinephrine to 250 mL 0.9% Sodium chloride = 16 mcg/mL) OR **ADULT:** Epinephrine infusion 2 – 10 mcg/min IV/IO (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**)	**I**
[I]	Maintain age adjusted SBP. Consider: **PEDIATRIC:** Epinephrine 0.1 - 1 mcg/kg/min IV/IO infusion. Max dose: 10 mcg/min. Under 1 year old: Titrate to SBP > 70 mmHg Over 1 year old: Titrate to SBP > 90 mmHg (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**) Note: Infusion via IV pump is preferred is available. Monitor closely for signs of extravasation.	**[I]**
P	To maintain MAP > 65 until a vasopressor infusion is prepared, consider: **ADULT:** Push dose Epinephrine 5-10 mcg IV/IO every 2-3 minutes (Add 100 mcg Epinephrine (1mL of 0.1 mg/mL) to 9mL of 0.9% Normal Saline **= 10 mcg / mL**)	**P**

Cardiac Arrest: Post ROSC Care

PEARLS

- **Most patients will require at least some vasopressor support to maintain a MAP > 65 following cardiac arrest.**
- Push dose Epinephrine may be administered as a “bridge” while establishing a drip, but does not replace a drip.
- Administer vasopressor through the largest, most proximal IV site available (AC or higher is preferable) or IO. Verify patency prior to initiating infusion and monitor closely for extravasation.
- Maintain normal ventilation rate. Continually monitor EtCO2 with target range being 35 – 45 mmHg.
- Identify and treat potentially reversible causes of cardiac arrest:
    - Hypoxia
    - Hyperkalemia or hypokalemia
    - Hyperglycemia or hypoglycemia
    - Hypovolemia
    - Hydrogen Ion (acidosis)
    - Tension pneumothorax/hemothorax
    - Tamponade (Cardiac)
    - Thrombosis (Cardiac/pulmonary)
    - Toxins
    - Trauma
    - Tablets (overdose)

Cardiac Arrest: Traumatic

CRITERIA

- Any patient who has experienced blunt or penetrating trauma and is pulseless with apnea/agonal respirations.
- Patients with obvious signs of death are **excluded**.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Control sites of major active external bleeding. Refer to *Hemorrhage Control* procedure.	**EMR**
EMR	Begin chest compressions. Refer to *Cardiopulmonary Resuscitation (CPR)* procedure. Consider immediate transport to the closest Emergency Department or Trauma Center.	**EMR**
EMT	Open the airway. Refer to *Airway Management and Ventilatory Support* procedure.	**EMT**
EMT	Apply AED or cardiac monitor. Assess rhythm **(I / P):** For **Asystole at the time of EMS arrival**: Consider withholding / terminating resuscitation. For **PEA/Witnessed Asystole**: Continue CPR. For **VF/VT:** Continue CPR and defibrillate.	**EMT**
A	Obtain IV/IO access. Establish secondary IV/IO access if possible. If blood products are not available, administer: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
I	Secure airway with endotracheal intubation. Refer to *Endotracheal Intubation* procedure. **Note:** Intubation of children under 12 years old is a Paramedic "red dot" skill only.	**I**
I	If signs or suspicion of thoracoabdominal trauma are present (blunt or penetrating), perform bilateral chest decompression. Follow *Chest Decompression* procedure. **Note:** CPR should NOT impede procedural interventions when treating traumatic cardiac arrest.*	**I**
A	If ROSC is not achieved, and rhythm remains **PEA**, administer: **ADULT:** 1 mg Epinephrine 0.1 mg/mL IV/IO **PEDIATRIC:** 0.01 mg/kg Epinephrine IV/IO Single dose only.	**A**
MC	If there are no signs of life after 15-20 minutes of resuscitation, or at any time for additional guidance including optimal destination determination, contact Medical Control. **If transporting and the patient is in cardiac arrest, transport to the closest Emergency Department.**	**MC**

Cardiac Arrest: Traumatic

PEARLS

- ☐ Unless loss of pulses is witnessed by EMS with immediate intervention, survival following traumatic cardiac arrest with an initial rhythm of asystole is very low (<1%). Providers must weigh the risks of resuscitation and transport (injury, infectious exposure etc.) against the potential benefit prior to initiating resuscitation.
- ☐ When possible, assess rhythm prior to initiating CPR. If the rhythm is asystole on arrival of EMS, consider withholding resuscitation.
- ☐ *Unlike non-traumatic cardiac arrest, the efficacy of CPR in trauma resuscitation is unclear. Prioritize addressing immediate reversible causes of hypotension/cardiac arrest such as chest decompression, volume expansion (preferably with whole blood), and airway management. CPR is needed, however, to circulate transfused blood and any medications or fluids administered.
- ☐ If available, blood products should be used rather than sodium chloride for treatment of hemorrhagic shock.
- ☐ Assess the scene and patient closely. If the degree of sustained trauma appears disproportionately minor, consider the possibility a medical incident may have preceded or been induced by the injury. If there is suspicion for a medical event, refer to the appropriate patient care protocol.

Cardiac Arrest: V-Fib / Pulseless V-Tach

CRITERIA

- ☐ Any patient unresponsive, without palpable pulse or respiration, and Ventricular Fibrillation (V-Fib) or Ventricular Tachycardia (V-Tach) apparent on the cardiac monitor (check 2 leads), or AED advising to shock.
- ☐ Patients with a valid durable DNR or injuries inconsistent with survival are excluded.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Determine DNR status. Refer to *Death and Criteria for Withholding Resuscitation* protocol.	**EMR**
EMR	Begin chest compression. Follow *Adult/Pediatric Cardiopulmonary Resuscitation (CPR)* procedure.	**EMR**
EMR	Identify and treat potentially reversible causes. See Pearls below.	**EMR**
EMT	Consider spinal motion restriction.	**EMT**
A	Obtain IV/IO access (humeral IO preferred is IV unavailable).	**A**
A	Administer: **ADULT:** 0.9% Sodium Chloride IV/IO up to 1 L in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium Chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
I	If VF or VT is present, or AED is advising to shock [EMR], immediately defibrillate: **ADULT:** 200 joules Biphasic / 360 joules Monophasic, or manufacturer's recommendation. **PEDIATRIC:** 2 joules/kg initial, 4 joules/kg subsequent After each defibrillation, perform 2 minutes of CPR, followed by rhythm assessment. If VF / VT persists, defibrillate again, then consider medication therapy as listed below.	**I**
A	Administer: **ADULT:** Epinephrine 1 mg IV/IO [0.1 mg/mL concentration] **PEDIATRIC:** Epinephrine 0.01 mg/kg IV/IO [0.1 mg/mL concentration] Repeat every 3-5 minutes during cardiac arrest.	**A**

Cardiac Arrest: V-Fib / Pulseless V-Tach

I	If VF / VT persists, administer: **ADULT:** Amiodarone (Cordarone) 300 mg IV/IO slow push **PEDIATRIC:** Amiodarone (Cordarone) 5 mg/kg IV/IO slow push. Maximum dose 300 mg. OR, if Amiodarone is unavailable, administer: **ADULT:** Lidocaine (Xylocaine) 1 mg/kg IV/IO slow push. Maximum dose 100 mg. **PEDIATRIC:** Lidocaine (Xylocaine) 1 mg/kg IV/IO slow push. Maximum dose 50 mg.	I
I	If VF / VT persists, ensure optimal defibrillator pad placement, then administer: **ADULT:** Amiodarone (Cordarone) 150 mg IV/IO slow push **PEDIATRIC:** [Contact Medical Control] Amiodarone (Cordarone) 5 mg/kg IV/IO slow push. Maximum dose 150 mg. OR, if Amiodarone is unavailable, administer: **ADULT:** Lidocaine (Xylocaine) 0.5 mg/kg IV/IO slow push. Maximum dose 100 mg. **PEDIATRIC:** Lidocaine (Xylocaine) 1 mg/kg IV/IO slow push. Maximum dose 50 mg.	I
I	If VF / VT persists, administer: **ADULT:** Magnesium Sulfate 2 g IV/IO slow push **PEDIATRIC:** [Contact Medical Control] Magnesium Sulfate 40 mg/kg IV/IO slow push. Maximum dose 2 g.	I
I	For cardiac arrest in renal dialysis patients, patients with crush injuries, suspected calcium channel blocker overdose or hyperkalemia **only**, also administer (preferably via separate lines): **ADULT:** Calcium Chloride 1 g IV/IO slow push Followed by 20 mL 0.9% sodium chloride flush **ADULT:** Sodium Bicarbonate 50 mEq IV/IO slow push **PEDIATRIC:** Calcium Chloride 20mg/kg (max dose 1g) IV/IO slow push Followed by 20 mL 0.9% sodium chloride flush **PEDIATRIC:** Sodium Bicarbonate 1 mEq/kg (max dose 50 mEq) IV/IO slow push Repeat in 5 minutes if no change.	I
EMR	If return of spontaneous circulation (ROSC) is achieved, refer to *Cardiac Arrest: Post ROSC Care.*	**EMR**
MC	Contact Medical Control for guidance as needed. See Pearls below regarding Termination of Resuscitation.	**MC**

Cardiac Arrest: V-Fib / Pulseless V-Tach

PEARLS

Compressions:

- **Push hard and fast: rate 100 – 120 bpm. Allow complete chest recoil.**
- **A common cause of refractory VF / VT is incorrect defibrillator pad placement. Ensure optimal initial placement and consider adjustment is multiple shocks are delivered without a change in rhythm.**
- Minimize interruptions in chest compressions.
- Change compressors every 2 minutes or sooner if fatigued
- Give continuous compressions with advanced airway
- Use quantitative EtCO2 monitoring with BVM
    - If EtCO2 is less than 10 mmHg, improve chest compressions
    - If sudden increase in EtCO2 is noted (above 30-40 mmHg), check pulse and rhythm for ROSC.

Medications:

- Medications should be given without interruption of CPR.
- Magnesium Sulfate should be considered for: Torsades de pointes, long QT, digitalis toxicity, or suspected hypomagnesemia.
- If there is no Epinephrine 0.1 mg/mL preloaded syringe, combine 1 mg of Epinephrine 1 mg/mL with 9 mL of 0.9% sodium chloride in a 10 mL syrine.

Airway:

- Use of advanced airways have not been shown to improve outcomes for children with out-of-hospital cardiac arrest. Focus on high quality BLS airway management.
- Studies to date have not shown a clear improvement in outcomes with SGA vs intubation – **do not compromise chest compressions for intubation.**
- Avoid excessive ventilation. Maximize preload.
- Use EtCO2 to confirm and monitor placement of any advanced airway.
- Continually monitor EtCO2 with target above 10 mmHg during CPR and 35-45 mmHg once ROSC is achieved.
- In post ROSC patients, if EtCO2 falls below 20 mmHg or signal is lost, immediately reassess pulses and airway.

Reversible causes:

- Identify and treat per appropriate protocol and scope of practice:
    - Hypoxia
    - Hyperkalemia or Hypokalemia
    - Hyperthermia or Hypothermia
    - Hypovolemia
    - Hydrogen ion (acidosis)
    - Hyperglycemia or Hypoglycemia
    - Tension pneumothorax/hemothorax
    - Tamponade (Cardiac)
    - Thrombosis (Cardiac, Pulmonary)
    - Toxins
    - Trauma
    - Tablets (Overdose)

Cardiac Arrest: V-Fib / Pulseless V-Tach

Termination of Resuscitation (TOR):

- Refer to *Death & Criteria for Withholding Resuscitation* protocol.
- Termination of resuscitative efforts is a Medical Control decision **only**.
- Consider contacting Medical Control to request TOR if the arrest was not witnessed by EMS and after 20 minutes of continuous CPR:
    1. There has been no return of spontaneous circulation (ROSC)
       AND
    2. No shocks were delivered.

Cold Exposure

Environmental

CRITERIA

Patient exposed to extreme environmental conditions with symptoms that might include, but are not limited to:

- CNS depression
- Cardiac dysrhythmias
- Abnormal vital signs
- Suspect hypothermia in:
  - High-risk patients: very young or old patients, immobilized patients (e.g. prolonged entrapment), alcohol use, trauma/significant burns
  - High-risk environment: cold, windy environments, acute immersion incident

PROTOCOL

EMR	Follow *General – Universal Patient Care/Initial Patient Contact Protocol*. Use warmed and humidified O_2 if available.	**EMR**
EMR	Place patient in a warm environment and prevent further heat loss	**EMR**
EMR	Remove all wet clothing and replace with warm blankets. Handle the patient gently and avoid excessive movement (risk of cardiac arrest)	**EMR**
EMR	In the event of cardiac arrest, make persistent attempts at resuscitation for victims of prolonged cold exposure. Perform CPR and continuous warming procedures.	**EMR**
EMT	Transport patient immediately with resuscitation efforts continued en route	**EMT**
	Localized Cold Injury	
EMR	Follow *General – Universal Patient Care/Initial Patient Contact Protocol.*	**EMR**
EMR	Apply loose, sterile dressings to affected part	**EMR**

PEARLS

- Hypothermia patients are fragile: Rough handling, IV insertion, intubation, etc. might cause VF that is refractory to defibrillation and antiarrhythmic agents- use AHA guidelines for hypothermic arrest.
- **DO NOT** place heat packs, hot water bottles, IV bags, or other heat-retaining devices directly on skin
- Contact Medical Control prior to use of AED
- *If cardiac arrest occurs*, start CPR. Do not delay transport waiting for ALS
- *If the patient is alert and responsive*, use active external rewarming with heat packs, warm blankets, etc
- Assess pulse and respiratory rate for at least 60 seconds.
- *In Localized injuries **DO NOT***:
  - Allow patient to use the affected part
  - Rub the affected part
  - Expose the part to direct dry heat
  - Immerse the part in snow or hot water
  - Attempt to debride blisters
- Remove jewelry and constricting items
- During cardiac arrest, medications should be spaced at longer intervals

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Heat Exposure

Environmental

CRITERIA

Patient exposed to extreme environmental conditions with symptoms that might include but are not limited to:

- CNS depression
- Cardiac dysrhythmias
- Abnormal vital signs

PROTOCOL

EMR	Follow *General – Universal Patient Care/Initial Patient Contact protocol.*	**EMR**
EMR	Place patient in cool environment.	**EMR**

EMT	• Remove excess clothing.
	• ***If skin temperature is normal to touch***:
	  ○ Apply cool compresses.
	• ***If skin temperature is hot to touch***:
	  ○ Treat as life-threatening emergency.
	  ○ Immediately start cooling process:
	  ▪ Fan the patient with cool mist if available.
	  ▪ Place ice packs in armpits, groin, and neck areas.
	  ▪ Place cool wet sheet over the patient.
	  ▪ If patient begins to shiver, slow cooling process.
		EMT

A	**Suspected heat stroke or hypovolemia: *20 mL/kg 0.9% Normal Saline up to 1000 mL bolus***, continuously reassessing need for further fluid administration.	**A**
EMT	Continuously reassess patient.	**EMT**

PEARLS

Consider cold IV fluids, if available, in heat stroke patient **only**. Use caution in the conscious patient

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Behavioral Emergencies

CRITERIA

- ☐ Any patient with signs and/or symptoms of a psychiatric, medical, or traumatic emergency with agitated, aggressive, or combative behavior which poses a significant risk of harm to himself/herself or others.
- ☐ For patients **less than 25 kg** who cannot be safely managed with de-escalation techniques (see below), contact medical control for guidance.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Assess decision making capacity. Refer to administrative policy *Patient Refusals*.	**EMR**
EMR	Restrain patient by least restrictive means necessary. Refer to administrative policy *Patient Restraint*.	**EMR**
EMR	Assess and treat potential causes of agitation / altered mental status. See Pearls (*) below.	**EMR**
EMR	For **mild agitation**, follow de-escalation guidelines. See Pearls (**) below.	**EMR**
EMT	**As soon as feasible**, assess blood glucose and initiate continuous monitoring of respiratory effort and vital signs including HR, SpO2, and EtCO2. Assess and record blood pressure every 5 minutes.	**EMT**
I	**As soon as feasible**, assess and initiate continuous monitoring of cardiac rhythm.	**I**
I	For **moderate agitation**, consider: **ADULT:** Haloperidol (Haldol) 5 mg IV/IO slow push or IM **PEDIATRIC:** Haloperidol (Haldol) 0.02 mg/kg IV/IO slow push or 0.05 mg/kg IM. Maximum dose: 1 mg IV/IO, 2.5 mg IM AND **ADULT:** Diphenhydramine (Benadryl) 50 mg IV/IO slow push or IM **PEDIATRIC:** Diphenhydramine (Benadryl) 1 mg/kg IV/IO slow push or IM. Maximum dose 50 mg. Use half dose Haloperidol (2.5 mg IV/IO slow push or IM) for frail, hypotensive, underweight (< 50kg) and elderly (> 65 years) adult patients.	**I**

Behavioral Emergencies

I	For **severe agitation** that does not respond to the above therapy, administer: **ADULT:** Midazolam (Versed) 5 mg IV/IO slow push or 10 mg IM **PEDIATRIC:** Midazolam (Versed) 0.05 mg/kg IV/IO slow push or 0.1 mg/kg IN/IM. Maximum dose: 2.5 mg IV/IO, 5 mg IN/IM Use half dose Midazolam (2.5 mg IV/IO or 5 mg IM) for frail, hypotensive, underweight (< 50kg) and elderly (> 65 years) adult patients. Do not mix Haloperidol and Midazolam in the same syringe.	I
P	Only if the patient is severely agitated with imminent risk of harm to self or others, consider: **ADULT:** Ketamine (Ketalar) 4 mg/kg IM Be prepared to manage airway and support ventilation as needed.	P
MC	If unable to safely restrain or transport the patient, contact Medical Control for guidance.	MC

PEARLS

- Mild agitation = anxious, apprehensive demeanor but non-aggressive.
- Moderate agitation = pulling at tubes/catheters or aggressive behavior without violence.
- Severe agitation = overt combativeness, violence or self-harm / immediate danger to self or staff.

- "Persons who lack decision-making capacity are assessed and treated with implied consent. EMS practitioners must maintain the patient's dignity to the extent possible, including use of the least restrictive method of restraint that protects the patient, the public, and emergency responders from harm. The use of appropriate de-escalation techniques should take precedence over physical restraint or pharmacologic management whenever possible." – National Association of EMS Physicians, Clinical Care and Restraint of Agitated or Combative Patients by EMS Practitioners, October 2020.

- * Consider potential medical or traumatic causes of altered mental status. These include head injury, hypoxia, delirium, stroke, seizure, toxic ingestion/overdose, medication reactions, CNS infection, hyperthermia, and endocrine emergencies such as hypoglycemia and thyrotoxicosis.

- ** De-escalation guidelines:
  - Remain calm and friendly. Be aware of your emotions.
  - Be mindful of body language. Allow space and assume a non-threatening posture.
  - Position yourself between the patient and exit. o Maintain a safe distance.
  - Ideally, one provider should establish rapport and communicate with the patient.

- Maintain a soothing tone of voice.
- Listen to the patient's concerns.
- Empathize and use positive feedback.
- Be reassuring but do not reinforce delusional beliefs.
- Provide clear and consistent direction – be flexible and adaptive to the patient's needs.
- Be patient and willing to slow down when clinically appropriate.
- Calmly set boundaries of acceptable behavior.
- Make every attempt to not aggravate or worsen existing injuries or medical conditions.

- Never place the patient prone or in any position which compromises breathing, circulation or constricts the neck or chest.
- If the patient has decision making capacity and does not wish to be treated or transported, documentation should include a descriptions of the patient's mental status and the rationale for obtaining a refusal.
- Consider empiric use of high-flow oxygen by mask if unable to monitor SpO2 due to agitated behavior.
- If law-enforcement restraints have been utilized (for example handcuffs or flex-cuffs), a law enforcement officer should accompany the patient. Consider exchanging law enforcement restraints for EMS-sanctioned restraints.
- Patients in law enforcement custody (including emergency custody orders) or under arrest must have a law enforcement officer present at all times.
- This protocol is approved for use only with patients exhibiting signs and/or symptoms of psychiatric, medical, or traumatic emergencies and agitated, aggressive or combative behavior which poses a significant risk of harm to themselves or others. Use of chemical restraint or sedating medications solely to facilitate an arrest by law enforcement is prohibited.

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Hemorrhage Control

CRITERIA

- Any patient with uncontrolled or profuse external bleeding.
- For general management of injured patients, refer to *Trauma* protocol.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	**Head** Apply direct pressure to the injury if there is no depressed skull fracture. If direct pressure is ineffective, hemostatic dressing may be applied. Follow manufacturer's recommendations. Do not place over or near eyes, nose, or mouth.	**EMR**
EMR	**Neck** Apply occlusive dressing and direct pressure. Do not pack the wound.	**EMR**
EMR	**Extremity** Apply direct pressure, pack with roller gauze (use hemostatic dressing if available), and pressure dressing. If direct pressure/pressure dressing is ineffective or impractical: • Apply commercial tourniquet 2-3 inches above the wound, not over a joint. Apply circumferential pressure by a method recommended by the manufacturer. Tighten until distal pulse is no longer palpable. Continually reassess. • If hemorrhage is not controlled – Apply second tourniquet proximal to initial tourniquet leaving no space in between tourniquets. • If tourniquet(s) are not controlling bleeding continuously maintain direct pressure to wound over packing.	**EMR**
EMR	**Junctional injury (Axilla or femoral)** Pack dressing with roller gauze (use hemostatic dressing if available) tightly into wound and directly onto the source of bleeding. More than one gauze may be required to stem blood flow. Hemostatic dressing may be re-packed or adjusted in the wound to ensure proper placement. Hold pressure for at least 3 minutes. Secure dressing for transport.	**EMR**
EMR	**Thoracoabdominal Injury** Apply direct pressure. Do not pack thoracoabdominal wounds. Cover sucking chest wounds with a vented or three-sided occlusive dressing or chest seal.	**EMR**
EMR	**Assess pelvic stability.** If unstable and pelvic hemorrhage is suspected, apply pelvic binder, either commercial or improvised.	**EMR**
EMR	Monitor airway and breathing. Reassess bleeding after treatments performed.	**EMR**

Hemorrhage Control

PEARLS

- Hemodialysis access sites may result in life threatening hemorrhage. Direct pressure/pressure dressing should be used first; followed by tourniquet in the setting of life-threatening hemorrhage.
- Ensure date/time/location of placement is written on tourniquet.
- Do not release tourniquet once applied.
- If a tourniquet is placed, an alert patient may require analgesia to manage tourniquet-associated discomfort. See *Pain Control* protocol.
- If extremity wound is not accessible, a tourniquet may be placed high on the extremity. Follow manufacturer's recommendations.

Pain Control

CRITERIA

- ☐ Any patient with discomfort/pain caused by injury or illness.
- ☐ Ensure the patient is not hypotensive or at significant risk of hypotension.
  - ○ Infants 0 – 12 months: SBP greater than 70 mmHg
  - ○ Children 1 – 10 years: SBP greater than 80 mmHg
  - ○ Children and adults over 10 years: SBP greater than 100

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Assess baseline pain level using scale below. See Pearls.	**EMR**
EMT	Assess and monitor blood pressure. Ensure patient is not hypotensive. See Criteria.	**EMT**
A	Consider treatment for nausea prior to administering an opiate: **ADULT:** Ondansetron (Zofran) 4 mg IV/IO slow push, IM, or PO **PEDIATRIC [> 1 year]:** Ondansetron 0.15 mg/kg IV/IO slow push, IM or PO Maximum dose: 4 mg	**A**
A	For mild to moderate pain (2 - 5), consider: **ADULT:** Ketoralac (Toradol) 15 mg IV/IO or 30 mg IM	**A**
[A]	For moderate to severe pain (6 – 10), consider: **ADULT:** Fentanyl (Sublimaze) 25 – 50 mcg IV/IO over 2 minutes or IN/IM Maximum total dose: 100 mcg **PEDIATRIC:** Fentanyl (Sublimaze) 0.5 mcg/kg IV/IO over 2 minutes or 1 mcg/kg IN/IM Maximum dose: 25 mcg, Maximum total dose: 100 mcg OR **ADULT:** Morphine Sulfate 2.5 – 5 mg IV/IO over 2 minutes or IM Maximum total dose: 10 mg **PEDIATRIC:** Morphine Sulfate 0.1 mg/kg IV/IO over 2 minutes or IM Maximum dose: 2.5 mg, Maximum total dose: 10 mg May repeat dose as needed every 10 – 15 minutes titrated to pain relief. Use lower opiate doses (25 mcg Fentanyl or 2.5 mg Morphine) for frail, low weight (<50 kg), opiate naïve, or elderly (> 65 yr) adult patients.	**[A]**

Pain Control

MC	If unable to adequately control pain or safely and humanely extricate/transport a stable patient, contact medical control for guidance.	MC

FLACC Score			
CATEGORY	**0 POINTS**	**1 POINT**	**2 POINTS**
Face	Disinterested	Occasional grimace, withdrawn	Frequent frown, clenched jaw
Legs	No position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Normal position	Squirming, tense	Arched, rigid, or jerking
Cry	No crying	Moans or whimpers	Constant crying, screams or sobs
Consolability	Content, relaxed	Distractible	Inconsolable
SCORES ADD UP IN RANGE FROM 0–10			

Pain Control

PEARLS

- **Administer Narcan (Naloxone) respiratory depression occurs.** Refer to *Overdose / Poisoning / Toxic Ingestions* protocol.
- Both the Wong-Baker (FACES) chart and FLACC scale can be used to assess pain in non-verbal patients including infants and children.
- Even at therapeutic doses, opiates may cause respiratory/CNS depression, bradycardia and/or hypotension. Monitor vitals closely following any administration.
- Associated factors which may affect hemodynamics and/or respiratory sufficiency including trauma, intoxication or illness must be considered when determining whether to administer opiates for pain control and, if so, at what dose.
- The goal of analgesia is not to completely alleviate pain, but to reduce pain to a manageable level which allows for safe and humane treatment and transport.
- Consider non-pharmacologic options such as reassurance, distraction, positioning, splinting and/or cold therapy when drug therapies are either contraindicated or as an adjunct to drug therapy.

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Spinal Immobilization/Clearance

CRITERIA

- Blunt trauma and distracting injury
- Altered mental status or suspected intoxication with possible spinal injury
- Neurological complaint associated with trauma (numbness or weakness present)
- Trauma patients with spinal pain, tenderness, or deformity
- High energy mechanism of injury with the patient unable to communicate
- Any clinical suspicious of injury
- Age greater than or equal to 18 years

PROTOCOL

EMR	Follow *General - Universal Patient Care/Initial Patient Contact protocol*.	EMR
	Spinal Immobilization	
EMR	• Explain the spinal immobilization procedure to the patient • Assess pulses, sensation and movement, before and after the spinal immobilization procedure • Apply appropriate sized C-collar or equivalent to the patient while maintaining manual stabilization of the C-spine • If indicated, place the patient on a long spine board and secure to the board • Secure torso and legs with securing straps • Secure head to long spine board • Place immobilized patient supine on ambulance stretcher for transport and secure board from movement on the stretcher • Documentation of all assessments and findings whether selecting to immobilize the spine or not shall be recorded on the PCR.	**EMR**
	Spinal Clearance	

EMR	• Neurological examination is normal, no focal deficits
	  ○ Patient denies midline spine or neck pain
	  ○ Absence of spinal or neck tenderness, no deformity on palpation/step offs
	  ○ Absence of spine or neck tenderness with Range of Motion (ROM)
	• No significant Mechanism of Injury (MOI)
		EMR

EMR	• Patient is Alert, Awake & Oriented to Person, Place, Time & Event • No language barrier • Patient is a reliable historian • No intoxication or provider suspiscion of intoxication by drugs or alcohol • No distracting injury	**EMR**

Spinal Immobilization/Clearance

PEARLS:

- Any time the EMS provider is unsure whether spinal immobilization is appropriate or not, the EMS provider should consult with online Medical Control to determine appropriate therapy.
- The long spine board should be used as an extrication device and may not be required for all patients.
- The long spine board is beneficial for providing a firm surface to perform CPR on.
- Utilization of the long spine board should take into consideration the risks versus the benefits for specific patient care and should be documented on the PCR.
- Patients who are ambulatory at the scene of blunt trauma generally do not require spinal immobilization, however careful assessment and consideration must be evaluated.
- Whether or not a long spinal board is utilized, spinal precautions are still very important in patients at risk for spinal injury. Adequate spinal precautions may be achieved by placement of a C-collar (or similar device) and securing the patient firmly to the ambulance stretcher, ensuring minimal movement.
- Self-extrication of patients from vehicles involved in motor vehicle accidents may best be achieved with guidance by the EMS provider. This may, in some cases, lessen the amount of movement that may occur to the patient during an extrication when the patient is not entrapped.
- Spinal immobilization may be achieved by multiple appropriate methods. Some patients, due to size or age may not be able to be immobilized by traditional spinal immobilization procedures.

Trauma

CRITERIA

- Any patient who has experienced blunt or penetrating traumatic injury.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Control major bleeding. Refer to *Hemorrhage Control* protocol.	**EMR**
EMR	Consider spinal motion restriction. Refer to *Spinal Motion Restriction* procedure.	**EMR**
EMR	If shock or potential for shock is present, keep the patient warm.	**EMR**
EMR	Immobilize, secure in place, and do not remove any impaled object unless impeding CPR.	**EMR**
EMR	Acutely deformed /dislocated extremities: - Assess distal perfusion. Contact Medical Control for direction if distal pulse is absent. - Splint or immobilize suspected long bone fractures. - Assess distal perfusion before and after splinting.	**EMR**
EMR	Complete amputation of any part: - Wrap the amputated part in a dry, sterile dressing - Place the part in a dry, sealed plastic bag - Place the plastic bag with the part in an ice water filled container - Mark the container with date, patient name, and name of the part	**EMR**
EMT	Transport all patients with unmanageable/uncontrolled airway or uncontrolled hemorrhage to the closest emergency department.	**EMT**
EMT	**Manage airway by the least invasive means possible.**	**EMT**
A	Consider pain management/analgesia. Refer to *Pain Control* protocol.	**A**
A	If hypovolemia is suspected, consider: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250-500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO. Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total. If bleeding is suspected (internal or external), IV fluids should be used judiciously to maintain adequate perfusion and normal mentation (SBP 80-90).	**A**

Trauma

I	If considering intubation, assess Shock Index (Heart Rate / Systolic Blood Pressure).* If Shock Index is greater than 1, consider resuscitation prior to intubation. Refer to *Endotracheal Intubation* procedure.	I
I	**Tension pneumothorax:** Decompress the affected side(s). Refer to *Chest Decompression* procedure.	I
I	**Traumatic Cardiac Arrest:** Refer to *Cardiac Arrest: Traumatic* protocol.	I
EMT	If the patient meets the trauma triage criteria according to *Administrative Policy – Trauma Field Triage*, transport immediately to a Level 1 or Level II Trauma Center. Goal scene time: Less than 10 minutes.	EMT
MC	Contact Medical Control for guidance and/or optimal destination determination as needed.	MC

PEARLS

- ***Shock Index =** Heart Rate / Systolic Blood Pressure. Higher shock indices correlate with increased risk of post-intubation hypotension and cardiac arrest. Shock Index > 1.0 in an injured patient suggests the need for resuscitation prior to positive-pressure ventilation.
- Do not delay transport to establish IV lines or wait for ALS.
- Any patient who is cool/diaphoretic and tachycardic is considered to be in shock until proven otherwise.
- When possible, obtain two large bore IV access sites.
- Stable patients with isolated spinal injuries: handle with the utmost care. Rapid transport is not indicated.
- All pregnant patients who have suffered blunt trauma should be encouraged to be evaluated in an emergency department, preferably at a facility with L&D capability for patients >20 weeks gestation. Pregnant patients in the third trimester should be transported with the backboard angled to the left and slightly elevated.
- Vasopressors worsen hemorrhage and are generally not indicated for the management of trauma.
- BLS care is generally preferred in the prehospital management of major trauma. Safe and rapid transport to an appropriate hospital is indicated with ideal scene-time less than 10 minutes. Consider the benefit/risk of performing ALS interventions during transport.
- Consider HEMS if the patient meets one or more of the applicable trauma triage criteria. HEMS is best utilized when the expected level of care exceeds available capabilities AND the patient can be transported by air in a similar or shorter time than the patient could be transported by ground. Be sure to consider the additional time required for rendezvous and patient transfer when considering HEMS.

Glasgow Coma Score (GCS)

[Minimum: 3 Maximum: 15]

Eyes:

1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:

1. No sounds
2. Incomprehensible sounds
3. Inappropriate words
4. Confused, disoriented
5. Oriented

Motor:

1. No movement
2. Extension to painful stimuli
3. Flexion to painful stimuli
4. Withdrawal to painful stimuli
5. Localizes painful stimuli
6. Obeys commands

Pediatric
Glasgow Coma Score (GCS)

[Minimum: 3 Maximum: 15]

Eyes:

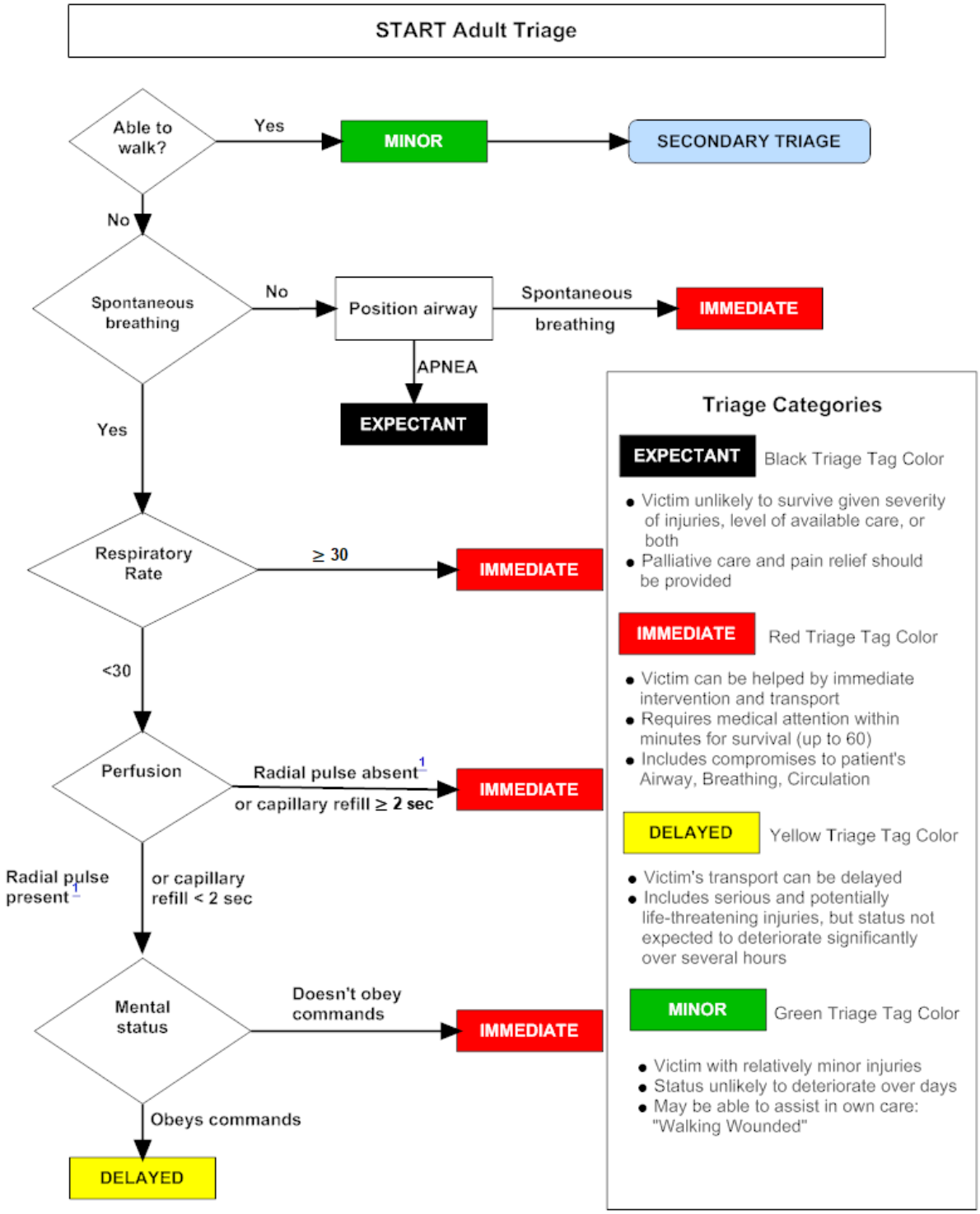
1. Does not open eyes
2. Opens eyes to pain
3. Opens eyes to voice
4. Opens eyes spontaneously

Verbal:

1. No sounds
2. Incomprehensible sounds
3. Inappropriate words
4. Confused, disoriented
5. Oriented

Motor:

1. No movement
2. Extension to painful stimuli
3. Flexion to painful stimuli
4. Withdrawal to painful stimuli
5. Localizes painful stimuli
6. Obeys commands


START Adult Triage
Able to walk?
Yes
MINOR
SECONDARY TRIAGE
No
Spontaneous breathing
No
Position airway
Spontaneous breathing
IMMEDIATE
APNEA
EXPECTANT
Yes
Respiratory Rate
≥ 30
IMMEDIATE
<30
Perfusion
Radial pulse absent[1]
or capillary refill ≥ 2 sec
IMMEDIATE
Radial pulse present[1]
or capillary refill < 2 sec
Mental status
Doesn't obey commands
IMMEDIATE
Obeys commands
DELAYED
Triage Categories
EXPECTANT
Black Triage Tag Color
Victim unlikely to survive given severity of injuries, level of available care, or both
Palliative care and pain relief should be provided
IMMEDIATE
Red Triage Tag Color
Victim can be helped by immediate intervention and transport
Requires medical attention within minutes for survival (up to 60)
Includes compromises to patient's Airway, Breathing, Circulation
DELAYED
Yellow Triage Tag Color
Victim's transport can be delayed
Includes serious and potentially life-threatening injuries, but status not expected to deteriorate significantly over several hours
MINOR
Green Triage Tag Color
Victim with relatively minor injuries
Status unlikely to deteriorate over days
May be able to assist in own care: "Walking Wounded"

Burns Injuries

CRITERIA

- Any patient with radiation, chemical, or thermal burns.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Safely remove patient from source of the burn. Fully expose the injured area. Remove constricting items including clothing.	**EMR**
EMR	Assess airway and respiratory effort. Refer to *Airway Management and Ventilatory Support* protocol.	**EMR**
EMT	Estimate depth of burns and body surface area involved using the chart provided below and/or estimated by 1% BSA = the area of the patient's palm. Only partial thickness (2nd degree) and full thickness (3rd degree) burns are counted towards TBSA.	**EMT**
EMT	Apply clean, dry dressings to burns. Prevent loss of body heat. Keep the patient warm.	**EMT**
A	Establish IV/IO access on a non-burned extremity, if possible (preferably obtain two sites of access).	**A**
A	For an adult patient with SBP less than 90 and TBSA greater than 20%, administer: **ADULT:** 0.9% Sodium chloride at 500 mL/hr IV/IO **PEDIATRIC, 6 to 12 years old:** 0.9% Sodium chloride at 250 mL/hr IV/IO **PEDIATRIC, 5 years old and younger:** 0.9% Sodium chloride at 125 mL/hr IV/IO	**A**
I	Consider endotracheal intubation vs immediate transport to the nearest emergency department if any signs of symptoms of airway injury develop: - Singed facial or nasal hairs - Burns or soot on the face, nose, or mouth - Hoarse voice or stridor - Carbonaceous sputum - Difficulty breathing / respiratory distress - Hypoxia - Tachypnea Follow *Endotracheal Intubation* procedure if proceeding with intubation. **Note:** Intubation of spontaneously breathing patients without rapid sequence induction (RSI) is generally not recommended. RSI is a Paramedic only skill and not addressed in PEMS regional protocols – refer to agency specific protocols for guidance. **Note:** Intubation of children under 12 years old is a Paramedic "red dot" skill only.	**I**

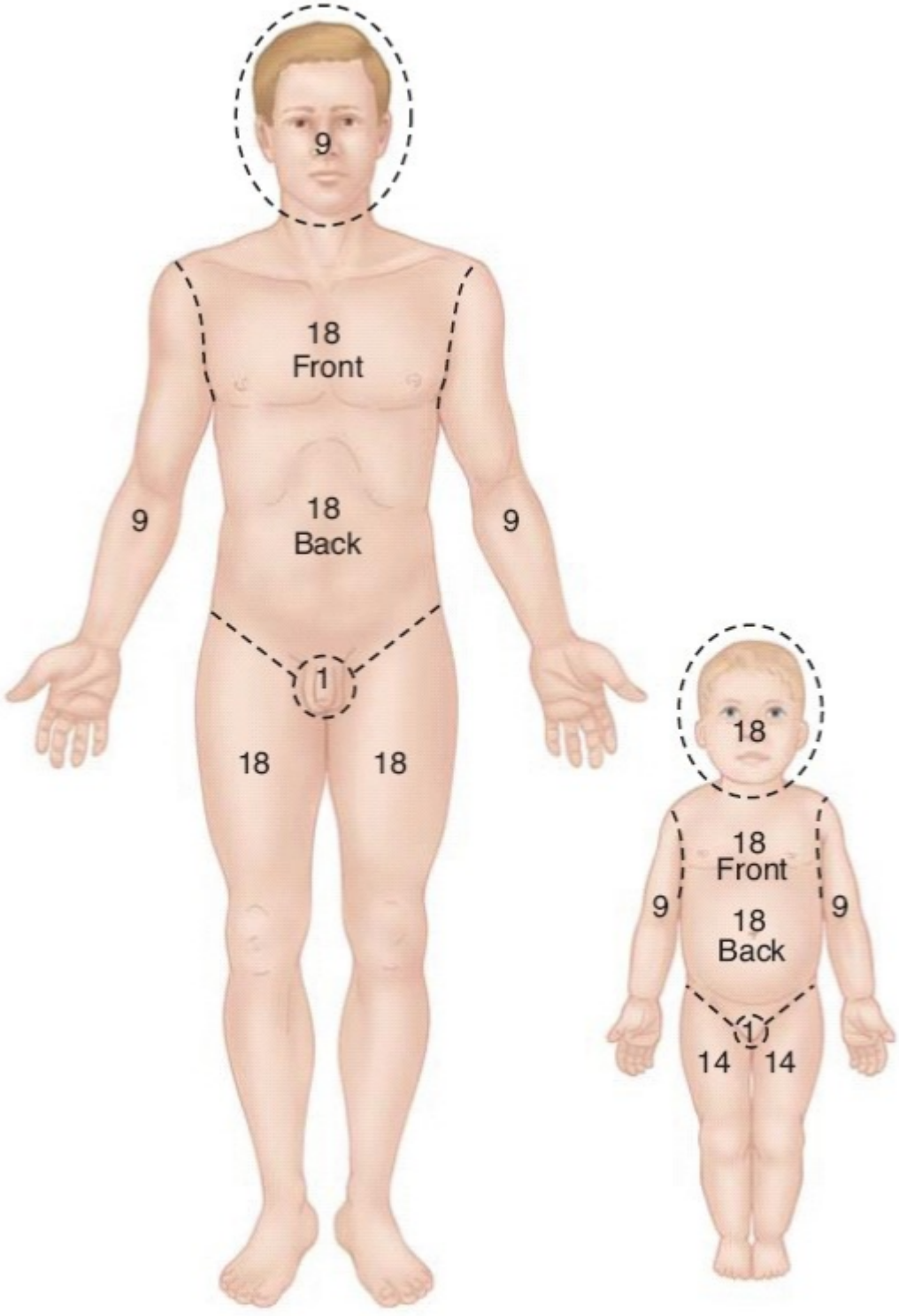
Burns Injuries

I	For altered mental status, seizures, hypotension, and/or cardiac arrest following exposure to combustion products in an enclosed space or suspected cyanide poisoning, administer (if available): **ADULT:** Hydroxocobalamin (CYANOKIT) 5 g IV/IO, infuse over 15 minutes **PEDIATRIC:** Hydroxocobalamin (CYANOKIT) 70 mg/kg IV/IO, infuse over 15 minutes To reconstitute for infusion: Add: 200mL of 0.9% Sodium Chloride to Hydroxocobalamin (CYANOKIT) vial using the transfer spike included in the kit. Fill to the line. Mix: Repeatedly invert or rock the vial for at least 60 seconds. Do not shake.	I
MC	Contact Medical Control if most appropriate transport destination is unclear: Cardiac arrest, impending arrest, or airway compromise → Closest emergency department Major or multisystem trauma → Trauma Center (Level I or II) None of the above AND any of the following → Consider transport to a Burn Center ☐ Any full thickness burns ☐ Partial thickness burns > 10 % TBSA ☐ Circumferential burns ☐ Electrical or chemical burns ☐ Inhalation injuries ☐ Burns to the face, eyes, ears, hands, feet, genitalia, perineum or skin overlying major joints	MC

PEARLS

- ☐ Assess for airway / inhalation injury. Consider early definitive airway management for patients with respiratory distress, hoarse voice or stridor, carbonaceous sputum and/or facial burns. Prompt assessment by a qualified RSI paramedic, when available, is preferred.
- ☐ Immediate (pre-hospital) hypotension solely due to burns < 20% TBSA is unlikely. Assess patients with hypotension/AMS in the setting of limited burns for concomitant trauma or other medical conditions (e.g. cardiac emergency or cyanide poisoning).
- ☐ Only if necessary (i.e. no other accessible site), obtain IV/IO access through a burned area.
- ☐ Utilize reverse triage (i.e. treat pulseless/apneic patients first) in the case of lightning strike with multiple patients. Cardiac arrest is likely to be due to airway obstruction or shockable arrhythmia (VF/VT).
- ☐ Treat road-rash as a burn injury. Assess closely for concomitant blunt trauma.
- ☐ Hydrofluoric Acid (HF) – binds and rapidly reduces serum calcium leading to circulatory collapse. Treat hypotension with 1 g Calcium Chloride IV/IO over 3 minutes. Repeat in 5 minutes as needed.
- ☐ Addressing hemodynamic instability, airway compromise and/or major traumatic injuries takes priority over direct transport to a burn center. **Do not bypass a trauma center to transport to a burn center if the patient is unstable.**

Burns Injuries



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Crush Injuries

CRITERIA

- Any patient with a trapped/crushed extremity or torso for more than 30 minutes.
- Any patient who has experienced a crush injury or prolonged entrapment and is in cardiac arrest or has one or more of the following ECG change suggestive of hyperkalemia:
  - Peaked T waves
  - Prolonged PR segment (>200 ms)
  - Flattening or loss of P waves
  - Wide QRS complex
  - Ectopic beats
  - Arrhythmia (e.g. ventricular tachycardia)

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Refer to Trauma, Hemorrhage Control, and Pain Control protocols as needed.	**EMR**
EMT	If possible, obtain an ECG prior to and after release of the crushed part.	**EMT**
A	Administer (when able, initiate prior to release): **ADULT:** 0.9% Sodium chloride 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO	**A**
[A]	Administer (when able, initiate prior to release): **ADULT:** Continuous Albuterol Sulfate (Proventil) 0.083% solution via nebulizer or BVM **PEDIATRIC:** Continuous Albuterol Sulfate (Proventil) 0.083% solution via nebulizer or BVM	**[A]**
[I]	Administer, preferably via separate lines (when able, initiate prior to release): **ADULT:** Sodium bicarbonate 1 mEq/kg IV/IO slow push. Maximum dose 50 mEq. Followed by 20 mL 0.9% sodium chloride flush. **ADULT:** Calcium Chloride 1g IV/IO over 3 minutes **PEDIATRIC:** Sodium bicarbonate 1 mEq/kg IV/IO slow push. Maximum dose 50 mEq. Followed by 20 mL 0.9% sodium chloride flush. **PEDIATRIC:** Calcium Chloride 20 mg/kg IV/IO over 3 minutes. Maximum dose 1,000 mg (1g). For persistent ECG changes suggestive of crush syndrome or cardiac arrest, repeat once.	**[I]**
I	Assess and continuously monitor cardiac rhythm.	**I**
EMT	Extricate patient from entrapment and transport per *Administrative Policy – Trauma Field Triage.*	**EMT**
MC	If it is anticipated the patient will not be able to be promptly and safely extricate, contact Medical Control at a regional trauma center for additional resources.	**MC**

Crush Injuries

PEARLS

- Crush syndrome involves the release of toxins, particularly large amounts of potassium, from skeletal muscle cells following blunt trauma and prolonged soft tissue ischemia. Prehospital treatment is focused on preventing or treating life-threatening arrhythmia due to hyperkalemia. Crush injuries are not limited to heavy weights applied to extremities for a prolonged time and can occur in a variety of situations such are after prolonged suspension in a harness or following a prolonged time laying on a hard surface.
- Sodium bicarbonate and Calcium Chloride are preferably given via separate IV lines to avoid precipitation into Calcium Carbonate. If separate IV sites cannot be obtained, flush with at least 20 mL saline between drugs.
- Continuous albuterol is given to treat suspected hyperkalemia in the setting of persistent ECG changes.
- IV fluids may worsen bleeding. Use clinical judgement when administering fluids to patients with crush injuries, balancing risk of hemorrhage vs benefit in treating crush syndrome.
- Widened QRS: Adult > 120 ms, Pediatric > 90 ms

Drowning and Diving Injuries

CRITERIA

- Any patient who has suffered an acute submersion / non-fatal drowning event.
- Any patient with one or more of the following symptoms of decompression injury after breathing compressed air at depth:
  - Altered mental status
  - Seizures
  - Vision changes
  - Respiratory distress
  - Hemoptysis
  - Chest pain
  - Headache
  - Focal neurologic signs
  - Ataxia
  - Pain in joints / extremities

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Remove the patient from the water. Consider spinal motion restriction. Refer to *Spinal Motion Restriction* procedure.	**EMR**
EMR	Assess airway and ventilation. Refer to *Airway Management and Ventilatory Support* protocol.	**EMR**
EMR	Remove wet clothing and dry the skin. Keep the patient warm.	**EMR**
EMR	If hypothermia and hemodynamically unstable, focus effort on rewarming as well as resuscitation.	**EMR**
EMR	Diving emergencies: Consider pulmonary barotrauma, decompression sickness, and/or arterial gas embolism. Refer to appropriate protocols as needed.*	**EMR**
MC	Contact Medical Control for transport destination guidance if decompression injury is suspected. Hyperbaric Centers: Sentara Leigh Hospital ED (Norfolk, VA): 757 261 – 6804 Diver Alert Network: (919 684 – 9111 Do not initiate transport to a hyperbaric center without first confirming availability of the chamber.	**MC**

Drowning and Diving Injuries

PEARLS

- Caution: rewarming the extremities before the trunk may lead to vasodilation, resulting in a drop in blood pressure.
- Trauma very commonly occurs along with submersion / drowning. Maintain a high suspicion for blunt trauma, particularly involving the head and spine.
- Patients in cardiac arrest following cold-water submersion have been reported to survive neurologically intact even following prolonged resuscitation. Contact Medical Control for guidance regarding continued on-scene resuscitation vs transport to the closest emergency department.
- Handle patients with hypothermia gently – rough handling may precipitate arrythmias including lethal VF.
- Pulmonary edema may develop hours after a submersion event. Transport of all patients who have experienced nonfatal drowning for assessment and observation is encouraged.
- * Rapid ascent after breathing compressed air at depth may lead to barotrauma including injury to the lungs (pneumothorax). Evaluate and treat as you would any other trauma patient, beginning with a complete head-to-toe assessment.
- * Rapid ascent may also lead to the formation of gas bubbles in the soft tissues, causing pain (i.e. “the bends”). These bubbles may also form within the vasculature (arterial gas emboli) which can present as a variety of emergencies including seizure, stroke, MI or PE. Initial treatment is centered on identification, stabilization, and transport to an appropriate facility.

Electrical Injuries

I	Consider endotracheal intubation vs immediate transport to the nearest emergency department if any signs of symptoms of airway injury develop: ☐ Singed facial or nasal hairs ☐ Burns or soot on the face, nose, or mouth ☐ Hoarse voice or stridor ☐ Carbonaceous sputum ☐ Difficulty breathing / respiratory distress ☐ Hypoxia ☐ Tachypnea Follow *Endotracheal Intubation* procedure if proceeding with intubation. **Note:** Intubation of spontaneously breathing patients without rapid sequence induction (RSI) is generally not recommended. RSI is not addressed in regional protocols – refer to agency specific protocols for guidance. **Note:** Intubation of children under 12 years old is a Paramedic "red dot" skill only.	I
MC	Contact Medical Control if most appropriate transport destination is unclear: Cardiac arrest, impending arrest, or airway compromise → Closest emergency department Major or multisystem trauma → Trauma Center (Level I or II) None of the above AND any of the following → Consider transport to a Burn Center ☐ Any full thickness burns ☐ Partial thickness burns > 10 % TBSA ☐ Circumferential burns ☐ Electrical or chemical burns ☐ Inhalation injuries Burns to the face, eyes, ears, hands, feet, genitalia, perineum or skin overlying major joints	MC

Electrical Injuries

CRITERIA

Any patient exhibiting signs of symptoms of electrical contact injury or who may have been struck by lightning.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Ensure scene safety and that the patient is not energized. Do not become a second victim. Fully expose the injured area. Remove constricting items including clothing.	**EMR**
EMR	If multiple patients are present, patients in cardiac arrest should be treated first.	**EMR**
EMR	Assess airway and respiratory effort. Refer to Airway Management and Ventilatory Support procedure. Manage airway by the least invasive means necessary.	**EMR**
EMT	Estimate depth of burns and body surface area involved using the chart provided below and/or estimated by 1% BSA = the area of the patient's palm. Only partial thickness (2nd degree) and full thickness (3rd degree) burns are counted towards TBSA.	**EMT**
EMT	Apply clean, dry dressings to burns. Prevent loss of body heat. Keep the patient warm.	**EMT**
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
A	Establish IV/IO access on a non-burned extremity, if possible (preferably obtain two sites of access).	**A**
A	For an adult patient with SBP less than 90 and TBSA greater than 20%, administer: **ADULT:** 0.9% Sodium chloride at 500 mL/hr IV/IO **PEDIATRIC, 6 to 12 years old:** 0.9% Sodium chloride at 250 mL/hr IV/IO **PEDIATRIC, 5 years old and younger:** 0.9% Sodium chloride at 125 mL/hr IV/IO	**A**
I	Assess and continuously monitor cardiac rhythm.	**I**

Electrical Injuries

PEARLS

- Assess for airway / inhalation injury. Consider early definitive airway management for patients with respiratory distress, hoarse voice or stridor, carbonaceous sputum and/or facial burns. Prompt assessment by a qualified RSI paramedic, when available, is preferred.
- Immediate (pre-hospital) hypotension solely due to burns < 20% TBSA is unlikely. Assess patients with hypotension/AMS in the setting of limited burns for concomitant trauma or other medical conditions (e.g. cardiac emergency or cyanide poisoning).
- Only if necessary (i.e. no other accessible site), obtain IV/IO access through a burned area.
- Utilize reverse triage (i.e. treat pulseless/apneic patients first) in the case of lightning strike with multiple patients. Cardiac arrest is likely to be due to airway obstruction or shockable arrhythmia (VF/VT).
- Addressing hemodynamic instability, airway compromise and/or major traumatic injuries takes priority over direct transport to a burn center. **Do not bypass a trauma center to transport to a burn center if the patient is unstable.**

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Allergic Reaction / Anaphylaxis

CRITERIA

- ☐ Any patient with signs or symptoms of an acute allergic reaction (mild - moderate).
- ☐ Any patient with signs or symptoms of an **anaphylactic reaction** (severe).
  - Two or more of the following that occur rapidly after exposure to a likely allergen:
    - Involvement of the skin or mucosal tissue
    - Respiratory distress
    - Hypotension of syncope
    - Persistent gastrointestinal symptoms (abdominal cramps, diarrhea, vomiting)
  - OR hypotension after exposure to a known allergen for the patient.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	Remove stinger if present. Do not squeeze stinger. Scrape it away with a flat surface.	**EMT**
	Acute Allergic Reaction (non-Anaphylaxis)	
A	Administer: **ADULT:** Diphenhydramine (Benadryl) 50 mg IV/IO slow push or IM **PEDIATRIC:** Diphenhydramine (Benadryl) 1 mg/kg IV/IO slow push or IM. Maximum dose: 50 mg.	**A**
A	If wheezing is present, administer: **ADULT:** Albuterol sulfate (Proventil) 3 mL of 0.083% solution, nebulized **PEDIATRIC:** Albuterol sulfate (Proventil) 3 mL of 0.083% solution, nebulized Repeat as needed for wheezing.	**A**
A	If wheezing is present, administer: **ADULT:** Ipratropium bromide (Atrovent) 3 mL of 0.02% solution, nebulized, once. **PEDIATRIC:** Ipratropium bromide (Atrovent) 3 mL of 0.02% solution, nebulized, once.	**A**
A	Consider: **ADULT:** Methylprednisolone Succinate (Solu-Medrol) 125 mg slow IV push. **PEDIATRIC:** Methylprednisolone Succinate (Solu-Medrol) 2 mg/kg slow IV push. Maximum dose 125mg.	**A**

Allergic Reaction / Anaphylaxis

Anaphylaxis		
EMT	Administer: **ADULT:** Epinephrine autoinjector or 0.3 mg [1 mg/mL] IM **PEDIATRIC (< 30 kg):** Pediatric Epinephrine autoinjector or 0.15 mg [1 mg/mL] IM **PEDIATRIC (> 30 kg):** Epinephrine autoinjector or 0.3 mg [1 mg/mL] IM EMT must use either dose-specific clearly marked or color-coded syringe. Repeat every 5-15 minutes for up to 3 injections as needed.	**EMT**
A	Obtain IV/IO access.	**A**
A	If the patient is hypotensive, administer: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses. **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO. Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
A	Administer: **ADULT:** Diphenhydramine (Benadryl) 50 mg IV/IO slow push or IM **PEDIATRIC:** Diphenhydramine (Benadryl) 1 mg/kg IV/IO slow push or IM. Maximum dose: 50 mg.	**A**
A	If wheezing is present, administer: **ADULT:** Albuterol sulfate (Proventil) 3 mL of 0.083% solution, nebulized **PEDIATRIC:** Albuterol sulfate (Proventil) 3 mL of 0.083% solution, nebulized May repeat as needed.	**A**
A	If wheezing is present, administer: **ADULT:** Ipratropium bromide (Atrovent) 3 mL of 0.02% solution, nebulized, once. **PEDIATRIC:** Ipratropium bromide (Atrovent) 3 mL of 0.02% solution, nebulized, once.	**A**
A	Administer: **ADULT:** Methylprednisolone succinate (Solu-Medrol) 125 mg IV/IO slow push **PEDIATRIC:** Methylprednisolone succinate (Solu-Medrol) 2 mg/kg IV/IO slow push Maximum dose: 125 mg	**A**

Allergic Reaction / Anaphylaxis

I	Maintain mean arterial pressure (MAP) above 65 mmHg. If the patient has not responded to repeat IM Epinephrine injections, consider: **ADULT:** Epinephrine infusion 2 – 10 mcg/min IV/IO (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**)	**I**
[I]	Maintain age adjusted SBP. If the patient has not responded to repeat IM Epinephrine injections, consider: **PEDIATRIC:** Epinephrine 0.1 - 1 mcg/kg/min IV/IO infusion. Max dose: 10 mcg/min. Under 1 year old: Titrate to SBP > 70 mmHg Over 1 year old: Titrate to SBP > 90 mmHg (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**) Note: Infusion via IV pump is preferred is available. Monitor closely for signs of extravasation.	**[I]**
P	To maintain MAP > 65 until a vasopressor infusion is prepared, consider: **ADULT:** Push dose Epinephrine 5-10 mcg IV/IO every 2-3 minutes (Add 100 mcg Epinephrine (1mL of 0.1 mg/mL) to 9mL of 0.9% Normal Saline **= 10 mcg / mL**)	**P**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- Remove, decontaminate, or separate the patient from the allergic trigger whenever possible.
- **If the patient is experiencing anaphylaxis with hemodynamic instability or respiratory distress, administer IM epinephrine before any other medications**.
- EMTs may administer intramuscular epinephrine for anaphylaxis via color-coded or clearly marked syringe only.
- Monitor patients closely following the administration of Epinephrine, particularly patients with significant cardiopulmonary comorbidities. Obtain an ECG immediately for any patient who develops chest discomfort or other signs of cardiac ischemia following the administration of IM Epinephrine or during an Epinephrine infusion.
- Administer Epinephrine via infusion through the largest, most proximal IV access site that can be obtained, preferably antecubital fossa. Monitor closely for signs of extravasation including changes in skin color, pain, swelling, numbness, or tingling. Stop the infusion immediately if extravasation is suspected and resume, if needed, on the contralateral site.
- Close monitoring during fluid administration should include frequent reassessment of respiratory effort, lung sounds and edema.

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Bradycardia

CRITERIA

Any patient with a sustained ventricular rate less than 60 beats per minute AND one or more of the following signs or symptoms despite adequate oxygenation and ventilation (ie **UNSTABLE Bradycardia**):

- ☐ Hypotension (age based)
- ☐ Signs of shock
- ☐ Altered mental status
- ☐ Pulmonary Edema
- ☐ Dyspnea
- ☐ Chest pain

Patients with asymptomatic/STABLE bradycardia are excluded. Monitor closely for any change in status.

Note: For neonates (less than 28 days of age), refer to *Neonatal Resuscitation* protocol.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Ensure adequate oxygenation. Refer to *Airway Management and Ventilatory Support* procedure.	**EMR**
EMR	**Children/Infants ONLY:** If unconscious and hypotensive, with HR less than 60, **begin chest compressions**. Follow *Pediatric Cardiopulmonary Resuscitation (CPR)* procedure. If pulselessness develops, follow *Cardiac Arrest: Asystole / PEA* protocol.	**EMR**
EMR	Identify and treat potentially reversible causes. See Pearls below.	**EMR**
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
A	Obtain IV/IO access.	**A**
A	**Children/Infants ONLY:** If unconscious and hypotensive, with HR less than 60, administer: **PEDIATRIC:** Epinephrine 0.01 mg/kg IV/IO [0.1 mg/mL] every 3 – 5 minutes, as needed.	**A**
I	Assess and continuously monitor cardiac rhythm.	**I**
I	Consider: **ADULT:** Atropine sulfate 1 mg IV/IO **PEDIATRIC:** Atropine sulfate 0.02 mg/kg IV/IO. Minimum dose: 0.1mg, Maximum dose: 0.5 mg May repeat once after 5 minutes, if needed.	**I**

Symptomatic Bradycardia

I	If hypotensive or in shock, initiate transcutaneous pacing. Follow *Transcutaneous Pacing* procedure.	I
I	Maintain mean arterial pressure (MAP) above 65 mmHg. If pacing is ineffective, administer: **ADULT:** Epinephrine infusion 2 – 10 mcg/min IV/IO (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**)	I
[I]	Maintain age adjusted SBP. If pacing is ineffective, administer: **PEDIATRIC:** Epinephrine 0.1 - 1 mcg/kg/min IV/IO infusion. Max dose: 10 mcg/min. Under 1 year old: Titrate to SBP > 70 mmHg Over 1 year old: Titrate to SBP > 90 mmHg (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**) Note: Infusion via IV pump is preferred if available. Monitor closely for signs of extravasation.	[I]
P	To maintain MAP > 65 until a vasopressor infusion is prepared, consider: **ADULT:** Push dose Epinephrine 5-10 mcg IV/IO every 2-3 minutes (Add 100 mcg Epinephrine (1mL of 0.1 mg/mL) to 9mL of 0.9% Normal Saline **= 10 mcg / mL**)	P
MC	Contact Medical Control for guidance as needed. Consider contacting Medical Control at a pediatric specialty center (VCU CHoR or CHKD) for children and infants with symptomatic bradycardia.	MC

Children's Hospital of the King's Daughters, COR: (757) 668 – 8000

VCU Children's Hospital of Richmond, Communications Room: (804) 828 – 3989

PEARLS

- Close monitoring during fluid administration including frequent reassessment of respiratory effort, lung sounds, and edema.
- Do not delay pacing to obtain IV/IO access if the patient is hemodynamically unstable.
- Refer to manufacturer recommendations for device specific optimal pad placement.
- Administer vasopressors through the largest, most proximal IV site available (AC or higher preferable) or IO. Verify patency prior to initiating infusion and monitor closely for extravasation.

Symptomatic Bradycardia

Compressions:

- **Push hard and fast: rate 100 – 120 bpm. Allow complete chest recoil.**
- Minimize interruptions in chest compressions.
- Change compressors every 2 minutes or sooner if fatigued
- Give continuous compressions with advanced airway
- Use quantitative EtCO2 monitoring with BVM
  - If EtCO2 is less than 10 mmHg, improve chest compressions
  - If sudden increase in EtCO2 is noted (above 30-40 mmHg), check pulse and rhythm for ROSC.

Airway:

- Hypoxia is the most common cause of pediatric symptomatic bradycardia. **Ensure adequate oxygenation.**
- Use of advanced airways have not been shown to improve outcomes for children with out-of-hospital cardiac arrest. Focus on high quality BLS airway management.
- Studies to date have not shown a clear improvement in outcomes with SGA vs intubation – **do not compromise chest compressions for intubation.**
- Avoid excessive ventilation. Maximize preload.
- Use EtCO2 to confirm and monitor placement of any advanced airway.
- Continually monitor EtCO2 with target above 10 mmHg during CPR and 35-45 mmHg once ROSC is achieved.
- In post ROSC patients, if EtCO2 falls below 20 mmHg or signal is lost, immediately reassess pulses and airway.

Reversible causes:

- Identify and treat per appropriate protocol and scope of practice:
  - Hypoxia
  - Hyperkalemia or Hypokalemia
  - Hyperthermia or Hypothermia
  - Hypovolemia
  - Hydrogen ion (acidosis)
  - Hyperglycemia or Hypoglycemia
  - Tension pneumothorax/hemothorax
  - Tamponade (Cardiac)
  - Thrombosis (Cardiac, Pulmonary)
  - Toxins
  - Trauma
  - Tablets (Overdose)

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Chest Pain (Cardiac)

CRITERIA

- Any patient reporting chest pain or discomfort
- Any patient reporting symptoms which are unexplained and consistent with an atypical presentation of cardiac ischemia, such as:
  - Abdominal pain
  - Nausea / vomiting
  - Syncope
  - Dyspnea
  - Back pain
  - Neck or jaw pain / discomfort
  - Arm pain / discomfort

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Maintain SpO2 94 – 98%. Refer to *Airway Management and Ventilatory Support* protocol.	**EMR**
EMR	If hypotensive, refer to *Hypotension and Shock* protocol.	**EMR**
EMT	Obtain and transmit 12 – Lead ECG within 5 minutes of patient contact.	**EMT**
EMT	If 12-Lead ECG reads "STEMI" or "ACUTE MI", initiate transport to the nearest PCI capable hospital. Notify the receiving facility of a **"Pre-Hospital STEMI Alert."*** Refer to PEMS Administrative Policy: *STEMI Field Triage.*	**EMT**
EMT	Administer: **ADULT:** Aspirin 324 mg PO chewed	**EMT**
EMT	If systolic blood pressure remains above 100 mmHg and MAP ≥ 65, consider: **ADULT:** Nitroglycerine 0.4 mg SL. May repeat every 5 minutes as needed for relief of chest pain, up to three doses.	**EMT**
I	Monitor cardiac rhythm. Refer to *Tachyarrhythmias* or *Bradycardia* protocol, as needed.	**I**
I	Consider analgesia. Refer to *Pain Control* protocol.	**I**
MC	Contact Medical Control for guidance as needed. If 12-Lead ECG is indeterminate or there is high suspicion for cardiac ischemia, obtain serial ECGs at 10-minute intervals and contact Medical Control for guidance.	**MC**

Chest Pain (Cardiac)

PEARLS

- Intermediate and Paramedic providers may interpret a 12-Lead ECG as STEMI if diagnostic criteria is met:
  - Symptoms consistent with an acute coronary syndrome or myocardial ischemia **AND**
  - ≥ 1 mm ST segment elevation in two or more contiguous leads
- *Contact the receiving facility via COR and provide notification of a "**Pre-Hospital STEMI Alert**" as well as the patient's name and date of birth to facilitate rapid registration. Do not provide patient identifiers over the HEAR.
- Consider right-sided 12-Lead or 15-Lead ECG.
- Minimize scene time. Goal ≤ 15 minutes.
- If transport to a PCI capable hospital will not be possible within 30 minutes, consider HEMS.
- With prompt response, initial ECGs often do not show ischemia. When there is high suspicion for cardiac ischemia, obtain serial ECGs to assess symptoms with recent onset (< 1 hour).
- Do not administer Nitroglycerine (Nitrostat) to patients who have taken any long-acting nitrate-based medications within the past 48 hours. These include: Sildenafil (Viagra / Revatio), Vardenafil (Levitra) and Tadalafil (Cialis). Record 12-Lead ECG prior to nitroglycerine administration.
- Any unstable patient not expected to survive transport to a PCI capable hospital should be transported immediately to the nearest Emergency Department.

Hypertension

CRITERIA

- Any patient with systolic blood pressure greater than 240 mmHg and/or diastolic greater than 120 mmHg.
- Any patient with chronic essential hypertension and sudden, unexplained, significant increase in blood pressure.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	If stroke is suspected, refer to *Stroke / TIA* protocol.	**EMR**
EMR	If the patient is experiencing chest pain / discomfort, or symptoms consistent with an acute coronary syndrome, refer to *Chest Pain (Cardiac)* protocol.	**EMR**
EMR	If the patient is experiencing respiratory distress, refer to *Airway Management and Ventilatory Support* procedure and *Respiratory Distress* protocol.	**EMR**
EMR	Check blood glucose level. Refer to *Hyperglycemia / Hypoglycemia* protocol.	**EMR**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- Generally, prehospital treatment of hypertension is unnecessary. Monitor for deterioration in patient condition.
- Patients with extremely high blood pressure may experience epistaxis (nose bleeding). If present, manage with direct pressure with the patient leaning forward.

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Hypoglycemia / Hyperglycemia

CRITERIA

- ☐ Any patient with symptomatic hyperglycemia (blood glucose **greater than 300 mg/dL**)
- ☐ Any infant, child, or adult with symptomatic hypoglycemia (blood glucose **less than 60 mg/dL**)
- ☐ Any newborn (less than 72 hours) with symptomatic hypoglycemia (blood glucose **less than 40 mg/dL**)

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
	Hypoglycemia	
EMT	If the patient is conscious, and able to swallow, administer: **ADULT:** Oral glucose, 1 tube, PO **PEDIATRIC (> 1 year):** Oral glucose, 1 tube, PO Repeat dose in 5 minutes if no response.	**EMT**
A	Administer: **ADULT:** Dextrose 10% 125 mL (12.5 g) IV/IO **PEDIATRIC:** Dextrose 10% 5 mL/kg IV/IO. Maximum dose 125 mL (12.5 g) Repeat dose in 5 minutes if no response.	**A**
A	If unable to obtain IV/IO access, administer*: **ADULT:** Glucagon 1 mg IM **PEDIATRIC (< 25 kg):** Glucagon 0.2 mg/kg IM. Maximum dose 1 mg. Repeat dose in 10 minutes if no response.	**A**
	Hyperglycemia	
A	Consider: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**

Hypoglycemia / Hyperglycemia

PEARLS

- Blood glucose must be assessed for any patient with altered mental status.
- *Response to Glucagon requires adequate stores of glycogen in the liver. Patients with liver disease, malnourishment, and some newborns/children with congenital metabolic disease may not adequately respond. If IV access cannot be obtained and there is no response to Glucagon within 5-10 minutes (or if emergent therapy is required), obtain IO access and administer Dextrose as above.
- Asymptomatic hyperglycemia does not require prehospital intervention. Use caution when administering IV fluids to patients with congestive heart failure, ESRD or pulmonary edema.
- The risk of recurrent hypoglycemia following appropriate treatment is higher in the following situations:
  - No clear explanation for hypoglycemia.
  - Nausea or vomiting that prevents adequate PO intake.
  - Signs/symptoms of acute illness such as infection or ACS.
  - Use of long-acting oral anti-hyperglycemic medications such as Sulfonylureas and SGLT2 inhibitors.
  - The patient is unaware of symptoms when hypoglycemic or the patient will be left alone.
  - Persistent vital sign abnormalities or altered mental status.

Weight	D10	D25	D50
1 kg	5 mL		
2 kg	10 mL		
3 kg	15 mL		
4 kg	20 mL		
5 kg	25 mL	10 mL	
7.5 kg	37.5 mL	15 mL	
10 kg	50 mL	20 mL	
12.5 kg	62.5 mL	25 mL	
15 kg	75 mL	30 mL	15 mL
20 kg	100 mL	40 mL	20 mL
25 kg	125 mL	50 mL	25 mL
30 kg	150 mL	60 mL	30 mL
40 kg	200 mL	80 mL	40 mL
≥ 50 kg	250 mL	100 mL	50 mL

Hypotension and Shock

CRITERIA

- Under 1 year of age: SBP less than 70 mmHg or MAP less than 55 mmHg
- Over 1 year of age: SBP less than 90 mmHg or MAP less than 65 mmHg
- No evidence of acute traumatic injury (Refer to *Trauma* protocol for patients with injuries)
- Signs and/or symptoms of inadequate perfusion, such as:
  - Altered mental status
  - Diaphoresis
  - Chest pain or discomfort
  - Syncope
  - Dyspnea
  - Pulmonary edema

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Obtain relevant history and perform a focused assessment to determine the potential cause.*	**EMR**
EMR	Maintain SpO2 94 – 98%. Refer to *Airway Management and Ventilatory Support* procedure.	**EMR**
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
A	Obtain IV/IO access. Administer:** **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
I	Assess and continuously monitor cardiac rhythm. Refer to *Tachyarrhythmias and Symptomatic Bradycardia* protocols as needed.	**I**
I	Maintain mean arterial pressure (MAP) above 65 mmHg. Consider: **ADULT:** Norepinephrine (Levophed) infusion 5 – 20 mcg/min IV/IO (Add 4 mg of Norepinephrine to 250 mL 0.9% Sodium chloride = 16 mcg/mL) OR **ADULT:** Epinephrine infusion 2 – 10 mcg/min IV/IO (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**)	**I**

Hypotension and Shock

[I]	Maintain age adjusted SBP. Consider: **PEDIATRIC:** Epinephrine 0.1 - 1 mcg/kg/min IV/IO infusion. Max dose: 10 mcg/min. Under 1 year old: Titrate to SBP > 70 mmHg Over 1 year old: Titrate to SBP > 90 mmHg (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**) Note: Infusion via IV pump is preferred if available. Monitor closely for signs of extravasation.	[I]
P	To maintain MAP > 65 mmHg until a vasopressor infusion is prepared, consider: **ADULT:** Push dose Epinephrine 5-10 mcg IV/IO every 2-3 minutes (Add 100 mcg Epinephrine (1mL of 0.1 mg/mL) to 9mL of 0.9% Normal Saline = 10 mcg / mL)	P
MC	Contact Medical Control for guidance as needed.	MC

PEARLS

- This protocol is not intended for the management of patients with hypotension due to major trauma.
- * There are many potential causes of hypotension. Generally, the causes fall into one of four categories: cardiogenic, distributive, hypovolemic or obstructive. Alternatively, hypotension can be rapidly assessed as a:
  - **Pump problem:** Cardiac issues such as dysrhythmia, ischemia, or tamponade
  - **Tank problem:** Hypovolemia (intravascular) due to hemorrhage, vomiting, diarrhea, dehydration, sepsis or anaphylaxis
  - **Pipe problem:** Large vessel injury or obstruction such as aortic dissection or pulmonary embolism
- Hypotension is a late sign of shock in pediatric patients. Children with tachycardia should be assessed closely for signs of compensated shock and providers must maintain a high index of suspicion that they may progress into decompensated shock with little warning.
- When administering fluids to an infant or child, use a three-way stopcock and syringe to pull/push the desired volume.
- ** Use caution when administering IV fluids to patients with known or suspect congestive heart failure or decreased ejection fraction. Large volumes of rapidly administered fluids may lead to pulmonary edema and respiratory distress. Administer smaller boluses (250 mL then reassess) and consider early administration of vasopressors to patients unlikely to tolerate large volumes of IV fluids.
- Administer vasopressors through the largest, most proximal IV site available (AC or higher preferable) or IO. Verify patency prior to initiating infusion and monitor closely for signs of extravasation.
- Use caution when considering positive pressure ventilation for patients with hypotension, particularly due to intravascular hypovolemia (reduced pre-load). Intubation and positive pressure ventilation may lead to a sudden drop in blood pressure or circulatory collapse / cardiac arrest.

Hypotension and Shock

Norepinephrine (Levophed) Drip Chart To mix, add 4 mg Norepinephrine to 250 mL 0.9% Sodium Chloride Final Concentration: 16 mcg/mL	
Dose	Drops per minute with **60-drop** set
5 mcg/min	19
6 mcg/min	23
7 mcg/min	26
8 mcg/min	30
9 mcg/min	34
10 mcg/min	38
12.5 mcg/min	47
15 mcg/min	56
17.5 mcg/min	65
20 mcg/min	75

Hypotension and Shock

Epinephrine Drip Chart To mix, add 1 mg (1 mg/mL) Epinephrine to 100 mL 0.9% Sodium Chloride Final Concentration: 10 mcg/mL	
Dose	Drops per minute with **60-drop** set
1 mcg/min	6
2 mcg/min	12
3 mcg/min	18
4 mcg/min	24
5 mcg/min	30
6 mcg/min	36
7 mcg/min	42
8 mcg/min	48
9 mcg/min	54
10 mcg/min	60

Nausea / Vomiting

CRITERIA

Any patient with persistent nausea or vomiting.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Place patient in a position of comfort. If unresponsive, place in recovery position and provide suctioning. Refer to *Airway Management and Ventilatory Support* procedure, as needed.	**EMR**
EMR	Refer to *Hypotension and Shock* protocol, as needed.	
EMT	Consider: **ADULT:** Ondansetron (Zofran) 4 mg ODT. May repeat in 10 - 15 minutes, as needed.	**EMT**
A	Consider: **ADULT:** Ondansetron (Zofran) 4 mg IV/IO slow push, IM or PO. **PEDIATRIC:** Ondansetron (Zofran) 0.15 mg/kg IV/IO slow push, IM or PO. Maximum dose: 4 mg May repeat in 10 - 15 minutes, as needed. Ondansetron solution may be given orally (PO) to patients who can swallow if IV/IO/IM is not desired.	**A**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- **Caution:** Administer IV Ondansetron (Zofran) via **slow push** – at least 30 seconds, but preferably 2 minutes.
- **Caution:** Ondansetron is safe and effective at low doses but known to prolong the cardiac QT interval, increasing the risk of potentially lethal arrhythmia in patients taking other drugs which prolong the QT interval (e.g. Amiodarone, Haloperidol) and patients with pre-existing prolonged-QTc (≥ 500 ms). Assess and consider risk prior to administration.
- Anti-emetic medications are often more effective when given prophylactically or for nausea prior to vomiting.
- Maximum total dose of Ondansetron is 8 mg (Adult) or 0.3 mg/kg (Pediatric).

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Overdose / Poisoning / Toxic Ingestions

CRITERIA

- Any patient with signs of symptoms of drug / medication overdose or report of toxic ingestion
- For chemical / biological / radiological exposures, refer to *CBRNE* protocols.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Remove patient from the source of exposure. Decontaminate if necessary. Brush of powders. Irrigate / dilute liquids.	**EMR**
EMR	Ensure adequate ventilation. Provide supplemental oxygen as needed to maintain SpO2 94 – 98%. Refer to *Airway Management and Ventilatory Support* procedure.	**EMR**
EMR	If seizing or a seizure has occurred, refer to *Seizure* protocol.	**EMR**
EMT	Assess blood glucose. Refer to *Hypoglycemia / Hyperglycemia* protocol as needed.	**EMT**
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
	Opiate	
EMT	If apneic/bradypneic, provide respiratory support and administer: **ADULT:** Naloxone (Narcan) 1 – 2 mg IN **PEDIATRIC:** Naloxone (Narcan) 1 -2 mg IN Repeat at double the initial dose if no response in 5 minutes.	**EMT**
A	If apneic/bradypneic, provide respiratory support and administer: **ADULT:** Naloxone (Narcan) 0.5 – 2 mg IV/IO slow push or IM/IN **PEDIATRIC:** Naloxone (Narcan) 0.1 mg/kg IV/IO slow push or IM/IN. Maximum dose 2 mg. Repeat at double the initial dose if no response in 5 minutes.	**A**

Overdose / Poisoning / Toxic Ingestions

Calcium Channel Blocker / Beta Blocker

I	If hypotensive with signs of poor perfusion, administer: **ADULT:** Calcium chloride 1 g IV/IO slow push Followed by a 20 mL 0.9% sodium chloride flush **PEDIATRIC:** Calcium Chloride 20mg/kg (max dose 1g) IV/IO slow push Followed by 20 mL 0.9% sodium chloride flush **AND** **ADULT:** Glucagon 1 mg IV/IO slow push **PEDIATRIC (< 25 kg):** Glucagon 0.5 mg IV/IO slow push **PEDIATRIC (≥ 25 kg):** Glucagon 1 mg IV/IO slow push If no response, refer to *Hypotension and Shock* protocol.	I

Organophosphate / Cholinergic

I	For respiratory distress due to bronchorrhea, administer: **ADULT:** Atropine sulfate 2 mg IV/IO/IM **PEDIATRIC (< 40 kg):** Atroprine sulfate 1mg IV/IO/IM **PEDIATRIC (≥ 40 kg):** Atropine sulfate 2 mg IV/IO/IM Repeat every 5 minutes until respiratory secretions reduce and work of breathing improves.	I

Anti-Cholinergic & Tricyclic Antidepressant (TCA)

EMR	Begin active cooling if temperature is greater than 104F / 40C. Refer to *Heat stroke / Hyperthermia* protocol.	EMR
I	Assess and monitor cardiac rhythm. For wide QRS (Adult: > 120 ms, Ped: > 90 ms) or arrhythmia, administer: **ADULT:** Sodium bicarbonate 50 mEq IV/IO slow push **PEDIATRIC:** Sodium bicarbonate 1 mEq/kg IV/IO slow push. Maximum dose 50 mEq. Repeat once in 5 – 10 minutes for cardiac arrest or persistent ECG changes.	

Overdose / Poisoning / Toxic Ingestions

Cyanide		
I	For altered mental status, seizures, hypotension, and/or cardiac arrest following exposure to combustion products in an enclosed space or suspected cyanide poisoning, administer (if available): **ADULT:** Hydroxocobalamin (CYANOKIT) 5 g IV/IO, infuse over 15 minutes **PEDIATRIC:** Hydroxocobalamin (CYANOKIT) 70 mg/kg IV/IO, infuse over 15 minutes To reconstitute for infusion: Add: 200mL of 0.9% Sodium Chloride to Hydroxocobalamin (CYANOKIT) vial using the transfer spike included in the kit. Fill to the line. Mix: Repeatedly invert or rock the vial for at least 60 seconds. Do not shake.	I
MC	Contact Medical Control for guidance as needed.	MC

PEARLS

- ☐ **Contact the Poison Control Center at 1-800-222-1222 with any questions.**
  Note: Although Poison Control can provide invaluable expert guidance, it is *not* online medical control. If recommendations fall outside of protocols, contact medical control for guidance.
- ☐ Ensure the patient is decontaminated and appropriate PPE is worn if there is any concern for dermal exposure (particularly organophosphates).
- ☐ Even small amounts of some drugs / medications can lead to permanent disability or death in small children. Some or all of the effects may be delayed. Maintain a low threshold to transport even well-appearing children following possible toxic ingestions and consider contacting Poison Control and/or Medical Control for guidance.
- ☐ Hydroxocobalamin (Cyanokit) is not provided as part of the PEMS regional drug box exchange program. Availability may vary between agencies. Dosing guidelines are provided here for reference only – refer to agency specific protocols prior to administration, if applicable.

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Respiratory Distress

CRITERIA

- Any patient who exhibits signs or symptoms of respiratory distress including abnormal respiratory rate or effort, increased work of breathing, abnormal breath sounds, cyanosis, or complains of dyspnea, shortness of breath or difficulty breathing.
- For respiratory distress due to an allergic reaction, refer to the *Allergic Reaction / Anaphylaxis* protocol.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Perform a focused evaluation including pertinent history and assessment of airway and lung sounds. Refer to *Airway Management and Ventilatory Support* procedure (includes airway foreign body).	**EMR**
EMR	Provide supplemental oxygen to maintain SpO2 > 94%.	**EMR**
EMT	Consider non-invasive (CPAP) or invasive (SGA) ventilatory support.	**EMT**
I	Consider invasive ventilatory support via endotracheal intubation. Refer to *Endotracheal Intubation* procedure. **Note:** Intubation of spontaneously breathing patients without rapid sequence induction (RSI) is generally not recommended. RSI is not addressed in PEMS regional protocols – refer to agency specific protocols for guidance.	**I**
Asthma, COPD, Reactive Airway Disease		
EMT	Administer: **ADULT:** Albuterol Sulfate 3 mL of 0.083% solution, nebulized. Repeat as necessary. **ADULT:** Ipratropium Bromide 3 mL of 0.02% solution, nebulized. Once. **PEDIATRIC:** Albuterol Sulfate 3 mL of 0.083% solution, nebulized. Repeat as necessary. **PEDIATRIC:** Ipratropium Bromide 3 mL of 0.02% solution, nebulized. Once.	**EMT**
A	For moderate to severe symptoms, also administer: **ADULT:** Methylprednisolone (Solu-Medrol) 125 mg IV/IO slow push. **PEDIATRIC:** Methylprednisolone (Solu-Medrol) 2 mg/kg IV/IO slow push. Maximum dose: 125 mg	**A**

Respiratory Distress

I	For severe symptoms, also administer: **ADULT:** Magnesium Sulfate 2 g IV/IO infusion over 15 minutes **PEDIATRIC:** Magnesium Sulfate 40 mg/kg IV/IO over 15 minutes. Maximum dose: 2,000 mg (2 g)	I
	Stridor	
A	Administer: **ADULT:** Epinephrine 3 mg [1 mg/mL] nebulized **PEDIATRIC:** Epinephrine 3 mg [1 mg/mL] nebulized May repeat once, if needed.	A
A	For moderate to severe symptoms, also administer: **ADULT:** Methylprednisolone (Solu-Medrol) 125 mg IV/IO slow push. **PEDIATRIC:** Methylprednisolone (Solu-Medrol) 2 mg/kg IV/IO slow push. Maximum dose: 125 mg	A
	Bronchiolitis	
A	Provide suctioning as needed and consider: **PEDIATRIC:** 0.9% Sodium Chloride, 6 mL nebulized. Repeat as needed for increased work of breathing due to secretions.	A
	Pulmonary Edema	
A	Administer: **ADULT:** Nitroglycerine 0.4 mg SL If SBP remains greater than 100 mmHg (MAP 65 mmHg), may repeat every five minutes as needed, up to three doses.	A
I	Administer: **ADULT:** Furosemide (Lasix) 40 mg IV/IO slow push	I

MC	Contact Medical Control for guidance as needed.	MC

Respiratory Distress

PEARLS

- Appropriate treatment of patients experiencing respiratory distress relies on careful consideration of the underlying cause. During the initial evaluation, first assess for conditions requiring immediate action such as airway obstruction, respiratory failure requiring ventilatory support, cardiac ischemia, or tension pneumothorax/hemothorax. Refer to the condition specific protocols, as necessary.
- Use all available data to make an informed decision as to the most likely cause of the patient's respiratory distress, including known recent and chronic medical history, medications and physical exam via lung assessment, presence or absence of pulmonary/peripheral edema, JVD, productive cough etc.
- Use caution when administering epinephrine to patients with suspected asthma/COPD/reactive airway disease who ALSO have a history or signs of congestive heart failure. Contact medical control immediately for guidance if there is any doubt as to whether epinephrine is indicated.
- Early use of non-invasive positive pressure ventilation (CPAP) to support work of breathing has been shown to reduce the need for intubation and improve outcomes. **Positive pressure ventilation does not replace the need for treatment of the underlying cause of respiratory distress**. Close monitoring for the development of hypotension and/or pneumothorax is required.
- In severe cases of asthma/COPD/reactive airway disease, wheezing may be slight or absent if air movement is minimal. As bronchodilator therapy takes effect and air movement increases, wheezing may paradoxically worsen before improving. In all cases, judge the effectiveness of therapy and escalate / de-escalate based on the patient's comfort, work of breathing and vital signs.
- Prior to administering nitroglycerin to any patient: obtain IV access, ensure blood pressure is acceptable (SBP ≥ 100 mmHg and MAP ≥ 65), and assess for the recent use of PDE inhibitors (eg. Sildenafil, Vardenafil, Tadalafil). Note: these medications are routinely prescribed to both men and women for a variety of conditions.

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Seizure

CRITERIA

- Any patient with witnessed or reported seizure-like activity
- If the patient is pregnant at greater than 20 weeks gestation or up to 8 weeks post-partum AND has no known history of seizures or epilepsy, refer to *Eclampsia* protocol.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Prevent the patient from sustaining injury, but do not restrain while actively seizing.	**EMR**
EMR	Provide supplemental oxygen. Refer to *Airway Management and Ventilatory Support* procedure.	**EMR**
EMR	Refer to Overdose / Poisoning / Toxic Ingestion protocol, as needed.	**EMR**
EMT	Assess blood glucose level. Refer to *Hypoglycemia / Hyperglycemia* protocol, as needed.	**EMT**
[A]	If actively seizing for over 5 minutes, administer: **ADULT:** Midazolam (Versed) 5 mg IV/IO or 10 mg IM **PEDIATRIC (< 40 kg):** Midazolam (Versed) 2.5 mg IV/IO or 5 mg IM **PEDIATRIC (> 40 kg):** Midazolam (Versed) 5 mg IV/IO or 10 mg IM Repeat the initial dose once in 5 minutes if seizure activity continues. Use half dose Midazolam for frail, hypotensive, underweight, and/or elderly (> 65 years) patients.	**[A]**
MC	If seizure activity continues for more than 5 minutes following administration of the second dose of Midazolam, initiate transport to the closest emergency department and contact medical control for guidance.	**MC**

PEARLS

- Seizures have a multitude of causes including epilepsy, hypoglycemia, trauma, stroke, infection and a variety of chemical overdose and withdrawal conditions.
- Status epilepticus (two or more seizures without a return to baseline, or a single seizure lasting > 5 minutes) is an emergency requiring rapid treatment. Patients experiencing seizures refractory to benzodiazepine therapy may require airway management. Immediate transport to the closest Emergency Department is warranted.
- Pediatric febrile seizures are common, but transport to an emergency department for close monitoring and further evaluation is recommended.
- **Caution:** Both seizures and benzodiazepines may lead to significant respiratory depression. Monitor airway and breathing closely. Refer to *Airway Management and Ventilatory Support* for treatment guidelines.

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Sepsis

CRITERIA

- Suspected infection with measure temperature greater than 38°C / 100.4°F or less than 36°C / 96.8°F
- **AND** two or more of the following criteria

	< 1 month	1 mo – 1 yr	2 – 5 years	6 – 12 years	13 years +
Mentation	Lethargic, Altered Mental Status				
High Risk	Immunocompromised, Malignancy, Indwelling catheters/tech, Sickle Cell Disease				
Bradycardia	< 100	< 90	N/A		
Systolic BP	Less than 70 mmHg		Less than 90 mmHg		
MAP	Less than 55 mmHg		Less than 65 mmHg		
Respiratory Rate	> 60			> 30	
Capillary Refill	Greater than 3 seconds				
EtCO2	Less than 25 mmHg				

PROTOCOL

EMR		EMR
A	Obtain IV/IO access. Administer:* **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	A
I	Maintain mean arterial pressure (MAP) above 65 mmHg. Consider: **ADULT:** Norepinephrine (Levophed) infusion 5 – 20 mcg/min IV/IO (Add 4 mg of Norepinephrine to 250 mL 0.9% Sodium chloride = 16 mcg/mL) OR **ADULT:** Epinephrine infusion 2 – 10 mcg/min IV/IO (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**)	I

Sepsis

[I]	Maintain age adjusted SBP. Consider: **PEDIATRIC:** Epinephrine 0.1 - 1 mcg/kg/min IV/IO infusion. Max dose: 10 mcg/min. Under 1 year old: Titrate to SBP > 70 mmHg Over 1 year old: Titrate to SBP > 90 mmHg (Add 1 mg of Epinephrine [1mg/mL] to 100 mL of 0.9% Sodium chloride **= 10 mcg/mL**) Note: Infusion via IV pump is preferred is available. Monitor closely for signs of extravasation.	[I]
P	To maintain MAP > 65 mmHg until a vasopressor infusion is prepared, consider: **ADULT:** Push dose Epinephrine 5-10 mcg IV/IO every 2-3 minutes (Add 100 mcg Epinephrine (1mL of 0.1 mg/mL) to 9mL of 0.9% Normal Saline **= 10 mcg / mL**)	P
MC	Contact Medical Control for guidance as needed, and advise of a **"Prehospital Sepsis Alert."**	MC

PEARLS

- *Use caution when administering IV fluids to patients with known or suspect congestive heart failure or decreased ejection fraction. Septic patients may be at higher risk of developing pulmonary edema and acute respiratory distress. Monitor closely for fluid overload. Large volumes of rapidly administered fluids may lead to pulmonary edema and respiratory distress. Administer smaller boluses (eg 250 mL then reassess) and consider early administration of vasopressors to patients unlikely to tolerate large volumes of IV fluids. If risk vs benefit of either therapy is in doubt or unclear, contact medical control for guidance.
- High risk patients for sepsis and septic shock include: Age < 56 days (8 weeks), presence of an indwelling catheter, malignancy, asplenia/sickle cell disease, use of immunosuppressant medications and any other immunocompromised condition.
- Administer vasopressor through the largest, most proximal IV site available (AC or higher preferable) or IO. Verify patency prior to initiating infusion and monitor closely for signs of extravasation such as pain, skin pallor, absent distal pulses, and/or swelling at the infusion site.
- Prehospital sepsis screening and notification have been shown to reduce time to treatment in Emergency Departments and improve mortality.

- Refer to Hypotension / Shock protocol for vasopressor drip reference charts.

Stroke / TIA

CRITERIA

- Any patient presenting with new neurologic symptoms indicative of stroke (BEFAST) including:
  - Altered mental status
  - Abnormal or slurred speech
  - Facial droop
  - Unilateral weakness
  - Balance of gait instability
  - Vision changes.
- BEFAST = Balance, Eyes, Face, Arms, Speech, Time

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Assess probability of large vessel occlusion (LVO) using RACE stroke scale. See table below.	**EMR**
EMR	Record time the patient last seen normal and family contact information, if available.* Provide this information to the receiving facility.	**EMR**
EMT	Obtain blood glucose level. If less than 60 mg/dL, refer to *Hypoglycemia* protocol.	**EMT**
EMT	Initiate transport. Goal scene time < 15 minutes: **Symptoms less than 24 hours (or unknown) AND suspected LVO (RACE = 5 - 9) :** Transport to the closest comprehensive stroke center as long as transport time is not increased by greater than 30 minutes. **Symptoms greater than 24 hours OR low suspicion for LVO (RACE = 0 - 4):** Transport to the closest stroke center.	**EMT**
MC	Contact Medical Control for guidance as needed.	**MC**

Stroke / TIA

PEARLS

- It is critical to determine, whenever possible, the time of onset of any acute neurologic symptoms. These include headache, weakness, slurred speech, dizziness, altered mental status or any other symptoms that may be consistent with acute stroke.
- Bring any medications or medication list, if available, with the patient.
- To expedite assessment in the ED, be prepared to answer questions regarding anticoagulant use, recent surgeries or trauma, bleeding disorders, or prior stroke.
- To facilitate rapid imaging, **an 18g IV in the right antecubital (AC) site is preferred.**
- Approximately 85% of patients diagnosed with a large vessel occlusion have a RACE score ≥ 5. Approximately 69% of patients with a RACE score ≥ 5 will be diagnosed with an LVO. For these patients, endovascular therapy (available only at comprehensive/thrombectomy capable stoke centers) has been shown to lead to better long-term outcomes.
- Any patient with an immediate life-threat (e.g. uncontrolled airway, cardiac arrest) that cannot be addressed during transport should be transported to the nearest emergency department.
- Call COR at the receiving facility to inform of the patient's name and date of birth for rapid registration.

Stroke / TIA

Rapid Arterial oCclusion Evaluation (RACE)			
Assessment	**Instruction**	**Severity**	**Score**
Facial palsy / droop	Ask patient the smile / show teeth	Absent (symmetric movement)	**0**
		Mild (slightly asymmetric)	**1**
		Moderate to severe (completely asymmetrical)	**2**
Arm weakness	Extend each arm at 90 degrees (if sitting) or 45 degrees (if supine).	Normal to mild (holds > 10 seconds)	**0**
		Moderate (holds < 10 seconds)	**1**
		Severe (drops immediately)	**2**
Leg weakness	Raise each leg to 30 degrees (in supine position).	Normal to mild (holds > 5 seconds)	**0**
		Moderate (holds < 5 seconds)	**1**
		Severe (drops immediately)	**2**
Head / Gaze Deviation	Observe for eye or head deviation to one side.	Absent (eyes move to both sides, no head deviation)	**0**
		Present (eyes and/or head deviated to one side)	**1**
Aphasia (If RIGHT hemiparesis)	Ask the patient to: 1. "Close your eyes." 2. Make a fist."	Normal (performs both tasks correctly)	**0**
		Moderate (performs one task correctly)	**1**
		Severe (performs neither task correctly)	**2**
Agnosia (If LEFT hemiparesis)	Ask the patient: 1. "Whose arm is this?" while showing the left arm. 2. "Can you lift both arms and clap?"	Normal (Recognizes own arm AND deficit)	**0**
		Moderate (Recognizes own arm OR deficit)	**1**
		Severe (Cannot recognize own arm or decifit)	**2**
		Total score:	**0 – 9**

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Supraventricular Tachycardia

CRITERIA

- Any patient with sustained supraventricular tachycardia (SVT).
- SVT: Narrow complex (Adult < 120 ms, Ped < 90 ms), rate usually > 150 bpm, no P waves
- Patients with chest pain, dyspnea, altered mental status, pulmonary edema, or other signs/symptoms of shock should be considered *unstable*.
- For wide complex tachycardias, refer to *Ventricular Tachycardia with a Pulse.*

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
	Stable Supraventricular Tachycardia	
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
A	Obtain IV access. Consider: **ADULT:** 0.9% Sodium chloride up to 1 L IV/IO in 250 – 500 mL boluses **PEDIATRIC:** 0.9% Sodium chloride 20 mL/kg IV/IO Repeat as needed to maintain adequate perfusion, up to 60 mL/kg total.	**A**
I	If the rhythm is regular, consider: **ADULT:** Adenosine (Adenocard) 6 mg IV/IO followed by a 20 mL 0.9% Sodium chloride flush. **PEDIATRIC:** Adenosine (Adenocard) 0.1 mg/kg IV/IO followed by a 10 – 20 mL 0.9% Sodium chloride flush. Maximum dose 6 mg. If no conversion within 2 minutes, consider repeating one time at double the initial dose.	**I**
I	If the rhythm is irregular/atrial fibrillation, initiate transport to an appropriate facility. Monitor for signs of poor perfusion.	**I**
	Unstable Supraventricular Tachycardia	
I	For light sedation, if time and patient condition permit, consider: **ADULT:** Midazolam (Versed) 2.5 mg IV/IO or 5 mg IN/IM **PEDIATRIC:** Midazolam (Versed) 0.05 mg/kg IV/IO or 0.1 mg/kg IM. Maximum dose 2.5 mg IV/IO or 5 mg IM. Monitor SpO2 and EtCO2.	**I**

Supraventricular Tachycardia

I	Perform synchronized cardioversion. **ADULT:** 100 joules initial dose If cardioversion is unsuccessful, check pad placement and repeat at 200 joules. **PEDIATRIC:** 1 joule/kg initial dose If cardioversion is unsuccessful, check pad placement and repeat at 2 joules/kg. If cardioversion is unsuccessful after two attempts, contact Medical Control for guidance.	I
MC	Contact Medical Control if uncertain regarding rhythm, most appropriate therapy, and for guidance as needed. Ensure a 12-Lead ECG is transmitted.	MC

PEARLS

- **Unstable vs stable**: Unstable patients are those with signs/symptoms consistent with poor or inadequate perfusion (chest pain, AMS, hypotension, diaphoresis, respiratory distress etc). Compensated vs decompensated tachycardia is another way of describing this difference. Stable/compensated patients may be symptomatic (palpitations or mild shortness of breath with exertion, for example) but are not in extremis.
- There are many potential causes for tachyarrhythmias including heart disease, fever, sepsis, trauma, pain, hypoxia, hypovolemia, hypoglycemia, toxic ingestion, myocardial infarction, pulmonary embolism, electrolyte abnormalities and many others. Prehospital therapy is based on early identification and treatment of unstable arrythmias and those at risk of rapid deterioration as well as the inciting factor.
- Many patients who experience tachyarrhythmias have concurrent congestive heart failure or decreased ejection fraction. Exercise caution when providing IV fluids – give only enough to improve perfusion and monitor for signs of pulmonary edema.
- In rare cases, electrical cardioversion to sinus rhythm can result in embolization of small blood clots from the heart, leading to stroke. Following emergent cardioversion, monitor closely for changes in mental status or physical exam and reassess destination choice as appropriate.
- Dosing of electrical therapy described above serves as a guideline only. Confirm agency dosing for cardioversion and defibrillation with device specific manufacturers recommendations.
- Ensure the device is set to SYNC prior to any attempted cardioversion of a patient with a palpable pulse. Unsynchronized cardioversion/defibrillation may lead to ventricular fibrillation and cardiac arrest.

Ventricular Tachycardia with a Pulse

CRITERIA

- Any patient with **sustained ventricular tachycardia** with a palpable pulse.
- Ventricular tachycardia: Wide complex (Adult > 120 ms, Ped > 90 ms), no P waves, usual rate > 150 bpm
- Patients with chest pain, dyspnea, altered mental status, pulmonary edema, or other signs/symptoms of shock should be considered *unstable*.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
	Stable Ventricular Tachycardia with a Pulse	
EMT	Obtain and transmit a 12-Lead ECG.	**EMT**
I	If the rhythm is monomorphic and regular, consider: **ADULT:** Adenosine (Adenocard) 6 mg IV/IO followed by a 20 mL 0.9% Sodium chloride flush. **PEDIATRIC:** Contact Medical Control for guidance. If no conversion within 2 minutes, consider repeating one time at double the initial dose.	**I**
I	If the rhythm is irregular/polymorphic, or there is no improvement with Adenosine, consider: **ADULT:** Amiodarone (Cordarone) 150 mg IV/IO in 100 mL 0.9% Sodium chloride. Infuse over 10 minutes. **PEDIATRIC:** Contact Medical Control for guidance.	**I**
	Unstable Ventricular Tachycardia with a Pulse	
I	For light sedation, if time and patient condition permit, consider: **ADULT:** Midazolam (Versed) 2.5 mg IV/IO or 5 mg IN/IM **PEDIATRIC:** Midazolam (Versed) 0.05 mg/kg IV/IO or 0.1 mg/kg IM. Maximum dose 2.5 mg IV/IO or 5 mg IM. Monitor SpO2 and EtCO2.	**I**
I	If wide complex and regular, perform synchronized cardioversion. **ADULT:** 100 joules initial dose If cardioversion is unsuccessful, check pad placement and repeat at 200 joules. **PEDIATRIC:** 1 joule/kg initial dose If cardioversion is unsuccessful, check pad placement and repeat at 2 joules/kg. If cardioversion is unsuccessful after two attempts, contact Medical Control for guidance.	**I**

Ventricular Tachycardia with a Pulse

I	If wide complex and irregular/polymorphic, perform defibrillation: **ADULT:** 100 joules initial dose If defibrillation is unsuccessful, check pad placement and repeat at 200 joules. **PEDIATRIC:** 1 joules/kg initial dose If cardioversion is unsuccessful, check pad placement and repeat at 2 joules/kg.	I
I	Administer: **ADULT:** Amiodarone (Cordarone) 150 mg IV/IO in 100 mL 0.9% Sodium chloride. Infuse over 10 minutes. **PEDIATRIC:** Contact Medical Control for guidance.	I
MC	Contact Medical Control if uncertain regarding rhythm, most appropriate therapy, and for guidance as needed. Ensure a 12-Lead ECG is transmitted.	MC

PEARLS

- **Unstable vs stable**: Unstable patients are those with signs/symptoms consistent with poor or inadequate perfusion (chest pain, AMS, hypotension, diaphoresis, respiratory distress etc). Compensated vs decompensated tachycardia is another way of describing this difference. Stable/compensated patients may be symptomatic (palpitations or mild shortness of breath with exertion, for example) but are not in extremis.
- There are many potential causes for tachyarrhythmias including heart disease, fever, sepsis, trauma, pain, hypoxia, hypovolemia, hypoglycemia, toxic ingestion, myocardial infarction, pulmonary embolism, electrolyte abnormalities and many others. Prehospital therapy is based on early identification and treatment of unstable arrythmias and those at risk of rapid deterioration as well as the inciting factor.
- Many patients who experience tachyarrhythmias have concurrent congestive heart failure or decreased ejection fraction. Exercise caution when providing IV fluids – give only enough to improve perfusion and monitor for signs of pulmonary edema.
- In rare cases, electrical cardioversion to sinus rhythm can result in embolization of small blood clots from the heart, leading to stroke. Following emergent cardioversion, monitor closely for changes in mental status or physical exam and reassess destination choice as appropriate.
- Dosing of electrical therapy described above serves as a guideline only. Confirm agency dosing for cardioversion and defibrillation with device specific manufacturers recommendations.
- Ensure the device is set to SYNC prior to any attempted cardioversion of a patient with a palpable pulse. Unsynchronized cardioversion/defibrillation may lead to ventricular fibrillation and cardiac arrest.
- If the rhythm is *polymorphic* ventricular tachycardia, synchronization may not be possible.
  This is the only time a patient with a palpable pulse is treated with unsynchronized defibrillation.

Ventricular Tachycardia with a Pulse

- The incidence of wide complex tachyarrhythmias in children is very low, and many of these patients have complex, rare conditions. Additionally, many pediatric patients can compensate well for tachycardia and may remain stable without major intervention. Consultation with a Medical Control physician is recommended prior to administering medication for wide complex tachycardia in children. When possible, consider contacting Medical Control at a pediatric specialty center for guidance.
    - Children's Hospital of the King's Daughters COR: 757-668-8000
    - VCU Children's Hospital of Richmond communications: 804-828-3989

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Childbirth / Labor / Delivery

CRITERIA

- Any patient with known or suspected pregnancy and symptoms of term or pre-term labor (contractions, loss of fluid, vaginal bleeding and/or urge to push)

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol. Don appropriate PPE including gloves (sterile if available), gown, and eye protection.	**EMR**
EMR	Remove all clothing below the waist. Visualize perineum and assess for crowning or presenting part.	**EMR**
EMR	If significant bleeding, refer to *Hemorrhagic Shock* protocol.	**EMR**
EMR	If breech presentation or cord prolapse, refer to guidance below.	**EMR**
EMR	If crowning, apply gentle pressure on the bony part of the skull (not fontanel) for controlled delivery.	**EMR**
EMR	Once head is delivered, assess for nuchal cord. Unwrap if possible. Clamp and cut if necessary.	**EMR**
EMR	Support the head while delivering the shoulders and torso. **Shoulder Dystocia** If unable to deliver the anterior shoulder, place the patient in McRobert's position (see image below) and apply suprapubic pressure. If no progress, contact Medical Control immediately for guidance.	**EMR**
EMR	Once delivery is complete, dry and stimulate the neonate. Assess heart rate, respirations, and oxygen saturation. Follow *Neonatal Resuscitation* protocol.	**EMR**
EMR	Routine suctioning is no longer recommended. Only perform pharyngeal/tracheal suctioning if thick meconium is present or when the airway is obstructed.	**EMR**
EMR	If the neonate does not require immediate resuscitation, consider delayed cord clamping until 1 – 3 minutes after birth. When pulsation of the cord has ceased, place clamps at approximately 4" and 6" from the neonate. Cut between them. Keep the baby warm and monitor closely.	**EMR**
EMR	Assess for additional pregnancies. If none, apply *gentle* traction to the umbilical cord and perform fundal massage until the placenta delivers and bleeding stops. Transport the placenta with the mother. If possible, allow skin to skin contact for the mother and baby.	**EMR**
EMR	Apply direct pressure to any visible sites of bleeding. If bleeding continues, refer to *Hemorrhagic Shock* protocol and initiate transport, preferably to a facility with Obstetric capability if condition allows.	**EMR**

Childbirth / Labor / Delivery

EMR	**UMBILICAL CORD PROLAPSE** Immediately transport to a facility with obstetric capability. Do not attempt vaginal delivery. Maintain a pulse in the cord by gently lifting the presenting part and relieving pressure on the cord. Wrap the prolapsed cord in saline soaked gauze. Avoid excessive manipulation of the exposed cord. Consider transport in Trendelenburg position, with the hips elevated. Contact Medical Control as soon as feasible for guidance.	**EMR**
EMR	**BREECH DELIVERY** Initiate transport, preferably to a facility with obstetric capability. If delivery is imminent: Contact Medical Control as soon as feasible for guidance. Allow controlled spontaneous delivery with contractions to the level of the umbilicus. Deliver the legs, if possible. Wrap a towel around the baby's legs/hips for better traction. Gently rotate the torso so the baby is face down in the birth canal. Once the scapula is visible, gently rotate a few degrees and swipe across the chest to deliver the arms. Have a second provider apply firm but gentle suprapubic pressure. Maintain flexion of the neck (chin to chest) with downward traction by two fingers on the maxilla. Follow standard post-delivery care, as above.	**EMR**
MC	**All patients must be secured with appropriate safety restraints for transport.** Do not transport the baby in the mother's arms. Transport to the closest appropriate facility while closely monitoring the mother and neonate(s). Contact Medical Control at any time for guidance.	**MC**

PEARLS

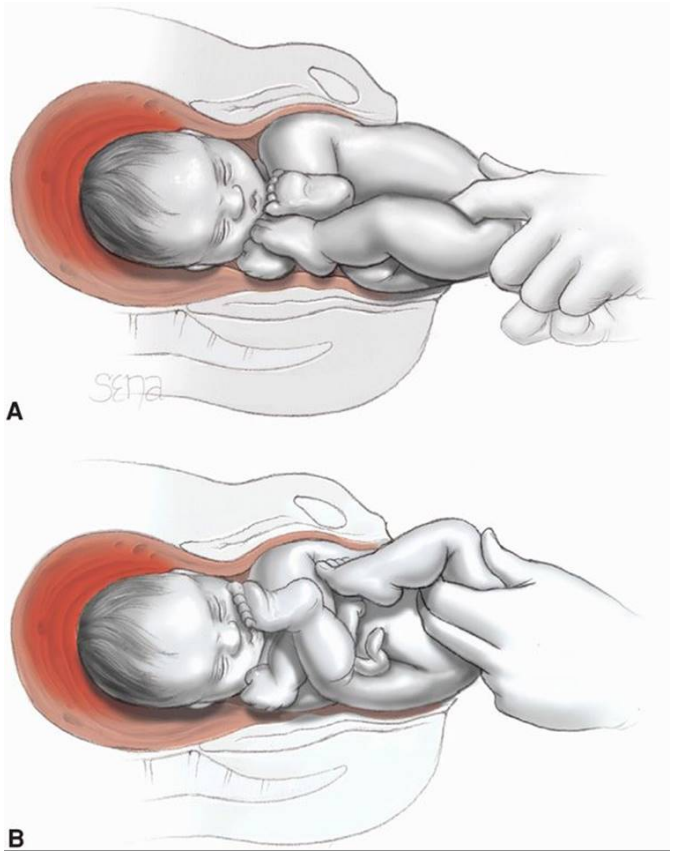
- Patients who are known or suspected to be pregnant and are experiencing profuse vaginal bleeding should be transported to a facility with obstetric capability if patient condition and geographic constraints allow.
    - Conditions such as uterine rupture and placental abruption are rare but cannot be managed effectively in the field and will most likely present with severe abdominal pain and symptoms consistent with hemorrhagic shock.
- Gestational age can be approximated by the palpable height of the uterine fundus, with 20 weeks being roughly the height of the umbilicus. Resuscitation should be attempted for any fetus born after 22 weeks gestational age. If unsure of gestational age or viability, initiate resuscitative efforts by following the *Neonatal Resuscitation* protocol and contact medical control for guidance.
- Rupture of membranes (loss of fluid) prior to 37 weeks gestation is considered premature. These patients are at an increased risk of umbilical cord prolapse and need for resuscitation of the neonate.
- Hypotension not associated with blood loss should be addressed with IV fluids and, if possible, relieving weight on the IVC by placing the patient in a left lateral recumbent position.
- Consider requesting an additional transport unit to the scene to care for the neonate if delivery is imminent.
- No NOT apply pressure to the uterine fundus. Suprapubic pressure is used to guide the fetus under the pubic symphysis.
- Normal newborn SpO2 is 60-70% in the first minute of life, 80-85% at five minutes, and 85-95% at ten minutes.

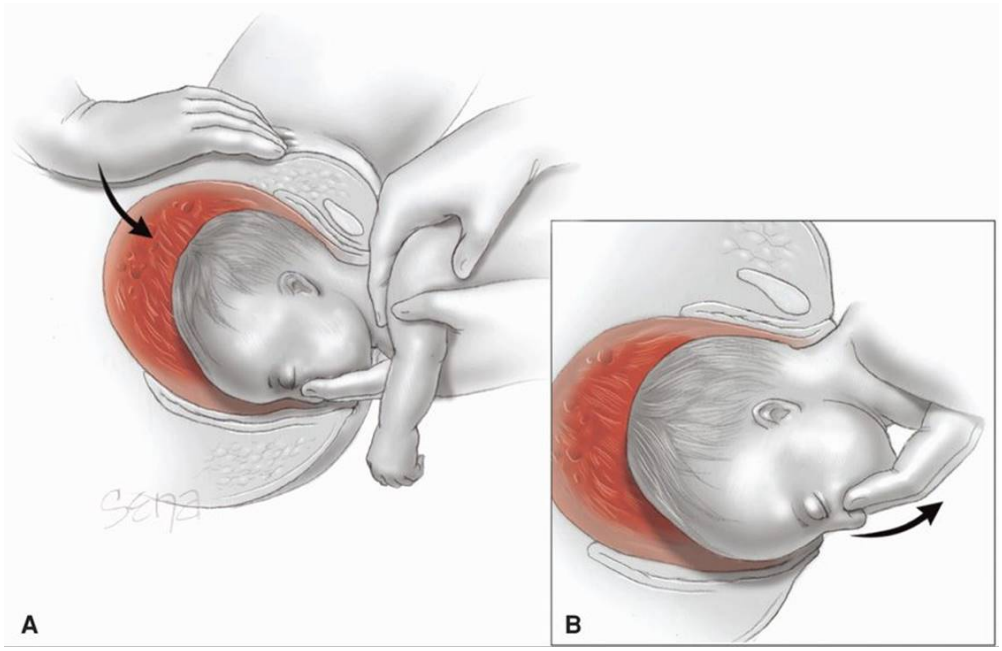
McRobert's position for shoulder dystocia

(anterior shoulder unable to pass the pubic symphysis)

Childbirth / Labor / Delivery

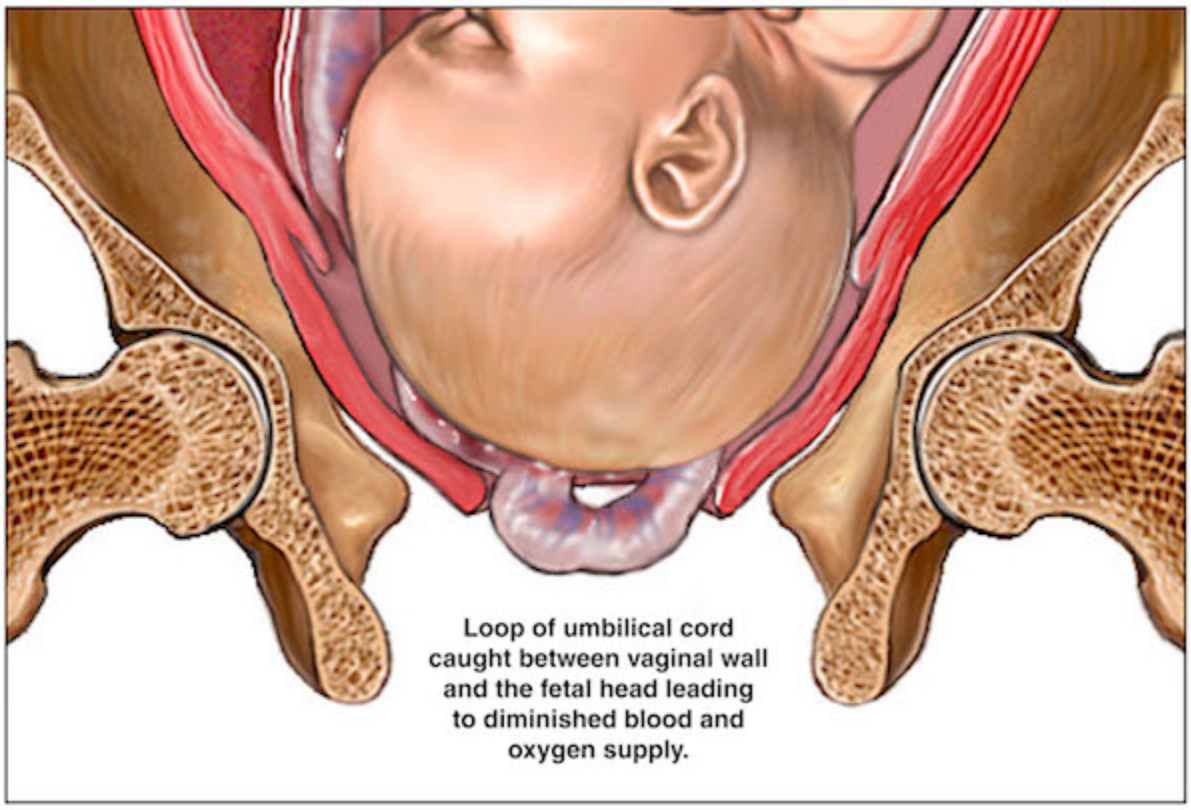
Breech Delivery



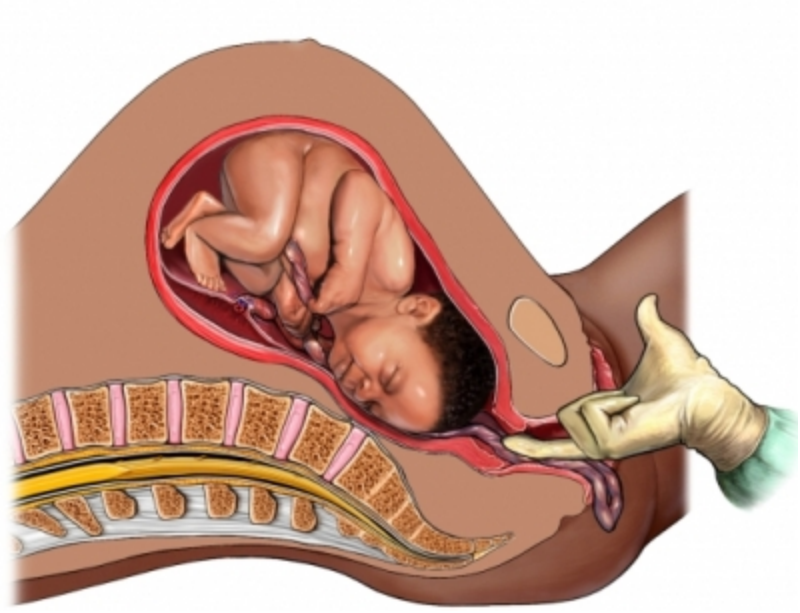


Childbirth / Labor / Delivery

Prolapsed umbilical cord



Relieving pressure on the prolapsed umbilical cord



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Eclampsia

CRITERIA

- **Pre-eclampsia** with severe features: Any pregnant (or recently pregnant) patient over 20 weeks gestational age presenting with one or more of the following:
  - Systolic blood pressure greater than 160 mmHg or diastolic blood pressure greater than 110 mmHg
  - Severe and/or persistent headache
  - Right upper quadrant or epigastric abdominal pain
  - New onset of visual disturbance
  - Pulmonary edema
- **Eclampsia**: Any pregnant or recently pregnant patient over 20 weeks gestational age experiencing ***seizures***.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	Transport to a facility with labor and delivery capability.	**EMT**
I	If actively seizing or a seizure has occurred (Eclampsia), administer: **ADULT:** Magnesium Sulfate 4 g IV/IO infusion over 10 minutes.	**I**
I	If seizure continues for more than five minutes, also administer: **ADULT:** Midazolam (Versed) 5 mg IV/IO or 10 mg IM Use half dose Midazolam for frail, hypotensive, and/or underweight patients.	**I**
MC	If seizures continue or reoccur, contact medical control for guidance including transport destination.	**MC**

PEARLS

- **Pre-Eclampsia and Eclampsia can occur up to 8 weeks AFTER delivery of the baby.**
- The primary goal of therapy is to prevent or limit seizures, and rapid intervention is warranted. If administration of Magnesium will be delayed due to lack of IV/IO access or need for reconstitution, consider early IM administration of midazolam followed by Magnesium infusion as soon as feasible.
- For the patient who presents with pre-eclampsia and deteriorates to eclampsia (seizes), the *total* maximum dose is 4g Magnesium Sulfate.
- Provide early notification to the hospital as non-ED care teams such as OBGYN and anesthesia may need to be mobilized.
- Caution: Administration of Magnesium and Benzodiazepines may lead to respiratory/CNS depression.
- Caution: rapid administration of Magnesium may cause vasodilation and hypotension – monitor vitals at least every 5 minutes during infusion and stop infusion immediately if hypotension develops.

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Pregnancy Related Emergencies

OB/GYN

Uterine Rupture

Criteria

Uterine Rupture - Severe vaginal bleeding in the second half of pregnancy.

PROTOCOL

EMR	Follow *General – Universal Patient Care/Initial Patient Contact protocol.*	**EMR**
EMR	Support life threatening problems associated with airway, breathing and circulation.	**EMR**
EMR	Administer oxygen as needed per patient assessment.	**EMR**
EMR	Place patient in left lateral recumbent position and transport immediately.	**EMR**
A	Establish IV access and ***administer 20 mL/kg 0.9% Normal Saline bolus up to 1,000 mL***; continuously reassessing need for further fluid administration.	**A**

PEARLS

Should be suspected in the pregnant trauma patient who has lost the palpable uterine contour, has easily palpated fetal parts, and who has severe abdominal pain.

ABRUPTIO PLACENTA

CRITERIA

Premature separation of the placenta from the uterine wall after the 20th week of gestation and prior to birth.

EMR	Follow *General – Universal Patient Care/Initial Patient Contact protocol.*	**EMR**
EMR	Support life threatening problems associated with airway, breathing and circulation.	**EMR**
EMR	Administer oxygen as needed per patient assessment.	**EMR**
EMR	If patient exhibits signs of shock, *see Medical – Hypotension/Shock (Non-trauma).*	**EMR**
EMR	Place patient in left lateral recumbent position and transport immediately.	**EMR**
A	Establish IV access and ***administer 20 mL/kg 0.9% Normal Saline bolus up to a total of 1,000 mL***; continuously reassess need for further fluid administration.	**A**

PEARLS

Patients younger than 20 and greater than 35 years of age are at greater risk for placental abruption.

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CBRNE Table of Contents

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CBRNE: Airway / Inhalation Irritants

CRITERIA

- Any patient with likely exposure to a choking agent / airway irritant and one or more of the following symptoms:
  - Difficulty breathing / respiratory distress
  - Throat pain / burning
  - Wheezing
  - Laryngospasm
  - Non-cardiogenic pulmonary edema
- For respiratory distress due to nerve agents / organophosphates, refer to *Nerve Agents* protocol.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	Consider gross decontamination.	**EMT**
EMT	Follow *Airway Management and Ventilatory Support* procedure.	**EMT**
A	Administer: **ADULT:** Albuterol Sulfate 3 mL of 0.083% solution, nebulized. Repeat as necessary. **PEDIATRIC:** Albuterol Sulfate 3 mL of 0.083% solution, nebulized. Repeat as necessary.	**A**
A	Administer: **ADULT:** Methylprednisolone (Solu-Medrol) 125 mg IV/IO slow push. **PEDIATRIC:** Methylprednisolone (Solu-Medrol) 2 mg/kg IV/IO slow push. Maximum dose: 125 mg	**A**
	For suspected Chlorine gas exposure, consider: **ADULT:** Sodium bicarbonate 2 mL diluted with 2 mL 0.9% Sodium chloride, nebulized. Once. **PEDIATRIC:** Sodium bicarbonate 2 mL diluted with 2 mL 0.9% Sodium chloride, nebulized. Once.	
MC	Contact Medical Control for guidance as needed.	**MC**

CBRNE: Airway / Inhalation Irritants

PEARLS

- The decision to enter a contaminated area to rescue and/or provide patient care rests with the incident commander and organizational policy.
- Victims that have been decontaminated and/or confirmed “clean” are safe for treatment and transportation to a health care facility.

Examples of common choking agents:

- Chlorine
- Ammonia
- Phosgene
- Fuming Sulfuric Acid
- Hydrogen Sulfide
- Hydrochloric Acid
- Hydrofluoric Acid

Concept of treatment protocol:

- Reduce the dose
  - Rescue from environment
  - Decontamination
- Optimize airway / ventilation
- Administer treatments / antidotes
- Support cardiovascular system / perfusion

Contact the Poison Control Center at 1-800-222-1222 with any questions.

Note: Although Poison Control can provide invaluable expert guidance, it is *not* online medical control. If recommendations fall outside of protocols, contact medical control for guidance.

CBRNE: Biological / Infectious

CRITERIA

- Any patient with likely exposure to a biological / infectious agent and one or more of the following otherwise unexplained symptoms:
  - Fever
  - Shortness of breath
  - Gastrointestinal symptoms
  - Rash
- Any patient with close contact with a person with a confirmed or suspected diagnosis of an infectious biological agent such as:
  - Anthrax
  - Plague
  - Smallpox
  - Hemorrhagic Fever (e.g. Ebola, Marburg)

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	Consider gross decontamination.	**EMT**
EMT	Follow *Airway Management and Ventilatory Support* procedure.	**EMT**
EMT	Refer to *Sepsis* protocol, as needed.	**EMT**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- Responders should wear a minimum of N-95 respirators with airborne and contact PPE (Level C) when responding to non-specific flu-like symptoms in the setting of a suspected biological incident. Higher levels of PPE may be warranted depending on the suspected biological / infectious agent.
- A surgical mask may be placed on the patient with suspected infection, under a non-rebreather mask if necessary.
- Contact the local health department to determine whether antibiotic prophylaxis is required for first responders and/or close contacts.

CBRNE: Biological / Infectious

Common Biological / Infectious Agents

- **Anthrax**
  A nonspecific prodrome (i.e., fever, dyspnea, cough, and chest discomfort) follows inhalation of infectious spores. Approximately 2 to 4 days after initial symptoms, sometimes after a brief period of improvement, respiratory failure and hemodynamic collapse ensue.
- **Plague**
  Clinical features of pneumonic plague include fever, cough with purulent sputum, hemoptysis, and chest pain.

- **Smallpox (Variola)**
  The acute clinical symptoms of smallpox resemble other acute viral illnesses, such as influenza, beginning with a 2 to 4 day nonspecific prodrome of fever and myalgias before rash onset. Several clinical features can help clinicians differentiate varicella (chickenpox) from smallpox. The rash of varicella is most prominent on the trunk and develops in successive groups of lesions over several days, resulting in lesions in various stages of development and resolution. In comparison, the vesicular/pustular rash of smallpox is typically most prominent on the face and extremities and lesions develop at the same time.

- **Viral hemorrhagic fever**
  The acute clinical symptoms of smallpox resemble other acute viral illnesses, such as influenza, beginning with a 2 to 4 day nonspecific prodrome of fever and myalgias before rash onset. Several clinical features can help clinicians differentiate varicella (chickenpox) from smallpox. The rash of varicella is most prominent on the trunk and develops in successive groups of lesions over several days, resulting in lesions in various stages of development and resolution. In comparison, the vesicular/pustular rash of smallpox is typically most prominent on the face and extremities and lesions develop at the same time.

- **Botulinum toxin**
  Clinical features include symmetric cranial neuropathies (i.e., drooping eyelids, weakened jaw clench, and difficulty swallowing or speaking), blurred vision or diplopia, symmetric descending weakness in a proximal to distal pattern, and respiratory dysfunction from respiratory muscle paralysis or upper airway obstruction **without sensory deficits.** Inhalational botulism would have a similar clinical presentation as foodborne botulism; however, the gastrointestinal symptoms that accompany foodborne botulism may be absent.

- **Ricin**
  Symptoms are specific to individual route of exposure. Severe exposure may lead to multiorgan failure and death within 3 days.

CBRNE: Blistering Agents

CRITERIA

- Any patient with suspected exposure to a blistering agent (including asymptomatic exposure)
- Any patient with possible exposure to a blistering agent and signs or symptoms of skin or mucous membrane irritation and/or respiratory distress.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Consider gross decontamination. Remove clothing and copiously irrigate exposed areas.	**EMR**
EMR	Follow *Airway Management and Ventilatory Support* procedure. Refer to *Respiratory Distress* protocol, as needed.	**EMR**
EMR	If chemical burns are present, follow *Burn Injuries* protocol.	**EMR**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- Blistering agents pose a significant risk of exposure to first responders. They are difficult to remove during decontamination and often do not provide immediate signs of contamination. Ensure appropriate PPE is worn during patient contact and maintain a low threshold for gross decontamination.
- Skin penetration is rapid. Mustard agents cause both localized cellular damage and systemic damage. A large liquid or vapor exposure causes immune system failure and pulmonary damage. Sepsis and pulmonary damage the major causes of death.
- Blister agents are powerful skin and mucous membrane irritants and vesicants, produce corrosion and necrosis of the skin, eyes, and respiratory tract. While the chemical reaction with biological tissue occurs rapidly, **symptoms are typically delayed by several hours**. Systemic poisoning occurs more easily in warm climates.
- **DERMAL exposure:** Signs and symptoms typically occurs within 2 – 24 hours of exposure. Itching and erythema occur 2 to 3 hours after dermal exposure to gas or liquid; erythema spreads over the next 24 hours and yellowish blisters appear and can become ulcerated. Thinner skin (neck, axillae, and groin) is more susceptible than thicker skin (soles, palms).
- **INHALATION exposure:** Cough, hemoptysis, dyspnea, and possible pulmonary edema may occur up to 24 hours after inhalation of the gas. Ulceration of airway mucose may occur. Mild pulmonary exposure produces rhinorrhea, sneezing, epistaxis, hoarseness, and cough within 12 to 24 hours of exposure. Severe exposure produces additional symptoms of productive cough and shortness of breath (mild to severe) 2 to 4 hours after exposure.

CBRNE: Blistering Agents

- **Variations of Blister Agents:**
  - Mustard (Sulfur and Nitrogen)
  - Lewisite (causes immediate pain on skin contact)
  - Dimethyl Sulfate
- Blister agents are chemical burns (including inhalation injuries) and should be managed as such.
  - Chelating agents (e.g. British Anti-Lewisite/BAL) have been used to reduce the effects of exposure. However, no chelating agents are readily available out of hospital in the PEMS region.
  - Sodium thiosulfate may be available in regional HAZMAT drug caches and has been used to prevent systemic injury. In the event of such a deployment, coordination with VA Poison Control **(1-800-222-1222)** and receiving facilities is necessary.

Nerve Agents

CRITERIA

- Any patient with suspected exposure to a chemical nerve agent or organophosphate
  AND
- Signs / symptoms of exposure, including:
  - SLUDGE: Excessive salivation, lacrimation, urination, defecation, gastrointestinal distress, or emesis
  - DUMBBELS: Diarrhea, urinary, miosis, bronchorrhea, bradycardia, emesis, lacrimation, or salivation.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Don appropriate PPE and decontaminate the patient. Do not proceed until it is reasonably safe to do so.	**EMR**
EMR	Follow *Airway Management and Ventilatory Support* procedure.	**EMR**
EMR	Refer to *Nausea / Vomiting*, *Seizure*, and/or *Hypotension and Shock* protocols, as needed.	**EMR**
EMT	If available, administer: **ADULT:** DuoDote Autoinjector IM **PEDIATRIC (≥ 40 kg):** DuoDote Autoinjector IM If symptoms persist, repeat in 5 minutes up to three doses.	**EMT**
I	If symptoms persist, or if DuoDote Autoinjector is unavailable, administer: **ADULT:** Atropine sulfate 2 mg IV/IO/IM **PEDIATRIC (< 40 kg):** Atropine sulfate 1 mg IV/IO/IM **PEDIATRIC (≥ 40 kg):** Atropine sulfate 2 mg IV/IO/IM If symptoms persist, repeat every 5 minutes up to three doses.	**I**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- Each DuoDote Autoinjector contains 2.1 mg of Atropine sulfate and 600 mg of Pralodoxime chloride.
- Nerve agents include both common organophosphate/carbamate pesticides and military grade toxins. Examples include: Azinphos-methyl, Malathion, Methyl parathion, Aldicarb, Sevin, Bendiocarb, Sarin, Somen, Tobun, VX, and Novichok.

Nerve Agents

- Victims who have ingested nerve agents may off-gas (exhale) dangerous vapors, even after skin decontamination is complete. Care should be provided by appropriate trained providers wearing respiratory protection that protects against nerve agents including Self Contained Breathing Apparatus (SCBA) and chemical protective clothing to avoid physical contact.
- Symptoms following exposure: Depending on the agent, even a very small drop on the skin (1 mL or less) or inhaled amount can cause sweating, muscle twitching, nausea, vomiting and/or diarrhea. Severely affected casualties will experience loss of consciousness, seizures, bradycardia, bronchospasm/bronchorrhea leading to respiratory distress and flaccid paralysis. Effects may begin in a few minutes following exposure or up to 18 hours later.
- Atropine is the antidote of choice for drying respiratory secretions to treat respiratory distress. Otherwise, care of these patients is generally supportive in nature.
- To allow respiratory secretions to drain, victims who are non-ambulatory should be placed in the recovery position if not being transported immediately.

- Depending on the available medication cache, Atropen autoinjectors may be available in lieu of DuoDote and are weight based:
    - Yellow Pen: Less than 7 kg, 0.25 mg/dose
    - Blue Pen: 7 to 18 kg, 0.5 mg/dose
    - Red Pen: 18 to 41 kg, 1 mg/dose
    - Green pen: Over 41kg, 2mg/dose

CBRNE: Radiologic Agent

CRITERIA

- Any patient with confirmed or suspected exposure to harmful radiation.

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Follow Airway Management and Ventilatory Support protocol.	**EMR**
EMR	If there is a life-threatening illness or injury, treat the patient without regard for contamination.*	**EMR**
EMR	If there is no life-threatening condition, determine if the patient is contaminated. See Pearls below.	**EMR**
EMR	Consider gross decontamination.	**EMR**
MC	Contact Medical Control for guidance as needed.	**MC**

PEARLS

- ***Treatment of seriously injured or ill radiologically contaminated patients takes priority over decontamination. Do not delay advanced life support to assess contamination status.**
- Contaminated patients from a Radiation Dispersal Device present a low risk of exposure to healthcare providers.
- Patients with open wounds should have the wound dressed and bandages without cleaning.
- Responders should wear a minimum of N-95 respirators when responding to non-specific explosions to reduce the change of internal contamination.

- The mother likely isotopes used for Radiation Dispersal Devices will emit Gamma radiation, in addition to Alpha and Beta particles. Therefore, most available detectors will identify contamination. However, the dispersal of a source reduces the level of radioactivity, and therefore detection above background levels may be difficult.
- When monitoring for patient contamination (external), use of the portal monitors (found at several hospital emergency departments and available through the Hampton Roads Metropolitan Medical Strike Team) and/or the use of hand-held ratemeters with a “pancake” probe is suggested. When using a hand-held ratemeter, a quick “triage” of contamination should focus on the head (hair) and feet (shoes), with a more extensive survey on those found to be contaminated.

CBRNE: Radiologic Agent

- Once radiological contamination has been identified, the following resources may be of assistance:
  - **Radiation Emergency Assistance Center/Training Site (REACT/TS)**
    - **Weekday phone: 865 – 576 – 3131**
    - **Weekend/Afterhours phone: 865 – 576 – 1005**
  - **Armed Forced Radiobiology Research Institute, Medical Radiobiology Team**
    - **Phone: 301 – 295 – 0530**
- Other antidotes are available in the region and are co-located with the Stategic National Stockpile Chempacks.

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Pharmacology Table of Contents

Adenosine (Adenocard)

CLASS:	Antidysrhythmic
ACTIONS:	Decreases conduction through the AV node
INDICATIONS:	Tachyarrhythmia – Stable Supraventricular Tachycardia (SVT)
CONTRAINDICTATIONS:	Second or third degree AV block Wolf-Parkinson White Syndrome (WPW) Sick sinus syndrome Known hypersensitivity Use of Dipyridamole products including Persantine and Aggrenox
PRECAUTIONS:	Extremely short half-life – use proximal IV site (eg. Antecubital) May precipitate AV block or lethal arrhythmia (asystole, VF, VT)
SIDE EFFECTS:	Brief facial flushing, chest discomfort, bradycardia

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Albuterol Sulfate (Proventil)

CLASS:	Inhaled Beta agonist
ACTIONS:	Bronchodilator Decreases serum potassium
INDICATIONS:	Allergic reaction Crush injury Respiratory Distress
CONTRAINDICTATIONS:	Hypersensitivity/allergy
PRECAUTIONS:	May cause tachycardia. Monitor closely, especially when used in combination with other sympathomimetic agents such as Epinephrine.
SIDE EFFECTS:	Tremor, nervousness, headache, dizziness, hypertension tachycardia, nauseua

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Amiodarone (Cordarone)

CLASS:	Antidysrhythmic
ACTIONS:	Sodium and potassium channel blocker Prolongs cardiac action potential and repolarization time
INDICATIONS:	Cardiac Arrest: VT/VF refractory to defibrillation Wide Complex Tachycardia (VT with a pulse)
CONTRAINDICTATIONS:	2^{nd} or 3^{rd} degree AV block, known hypersensitivity
PRECAUTIONS:	Caution in use with patients taking Beta blocker, Calcium channel blockers
SIDE EFFECTS:	Hypotension, Bradycardia, nausea/vomiting, flushing

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Aspirin

CLASS:	Nonsteroidal anti-inflammatory drug (NSAID)
ACTIONS:	Inhibits the action of platelets preventing clot formation
INDICATIONS:	Acute coronary syndromes (ACS)/STEMI
CONTRAINDICTATIONS:	Allergy to Aspirin/NSAIDs
PRECAUTIONS:	History of GI bleeding/peptic ulcers Chronic kidney disease Trauma
SIDE EFFECTS:	Indegestion

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Atropine Sulfate

CLASS:	Anticholinergic/Parasympathetic bloker
ACTIONS:	Blocks acetylcholine receptors Accelerates atrial pacemaker cells Increases heart rate Inhibits secretions
INDICATIONS:	Symptomatic Bradycardia Organophosphate/nerve agent poisoning
CONTRAINDICTATIONS:	None
PRECAUTIONS:	Use with caution in acute MI Bradycardia due to hypothermia (warm first) Heart transplant 2nd Degree Type II or 3rd Degree heart block (ineffective) Glaucoma
SIDE EFFECTS:	Palpitations Headache Dry mouth Blurred vision

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Calcium Chloride

CLASS:	Electrolyte
ACTIONS:	Necessary for muscle contraction, particularly in the heart. Stabilizes the cardiac cell membrane in hyperkalemia.
INDICATIONS:	Cardiac Arrest Crush injury Symptomatic Calcium channel blocker/Beta Blocker overdose
CONTRAINDICTATIONS:	Digoxin use
PRECAUTIONS:	May cause tissue necrosis. Use only large bore, easily flushing IV/IO to avoid extravasation Given in combination with IV/IO sodium bicarbonate, calcium may precipitate into calcium carbonate – give via separate IV/IO sites or flush thoroughly (at least 20 mL) between medications.
SIDE EFFECTS:	Bradycardia Hypotension Dysrhythmias

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Dextrose 10%, 25% and 50%

CLASS:	Carbohydrate
ACTIONS:	Rapidly elevates blood glucose level
INDICATIONS:	Hypoglycemia
CONTRAINDICTATIONS:	None
PRECAUTIONS:	May cause tissue necrosis with extravasation. Use appropriate concentration (see below) and largest, most proximal IV access available. Ensure patency prior to infusion.
SIDE EFFECTS:	Local irritation

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Diphenhydramine(Benadryl)

CLASS:	Antihistamine, anticholinergic
ACTIONS:	Blocks histamine receptors Causes mild sedation/drowsiness
INDICATIONS:	Allergic reaction Sedation Dystonic reaction
CONTRAINDICTATIONS:	None
PRECAUTIONS:	May cause sedation
SIDE EFFECTS:	Drowsiness Chest tightness Numbness at injection site (IM) Palpitations Blurred vision

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Epinephrine (Adrenaline)

CLASS: Vasopressor, Sympathomimetic, Catecholamine

ACTIONS:
Increases cardiac contractility
Increases heart rate
Increases peripheral vascular resistance Bronchodilation
Reduces bronchial edema

INDICATIONS:
Anaphylaxis
Cardiac arrest
Respiratory distress & Stridor
Hypotension
Bradycardia (pediatric)

CONTRAINDICTATIONS: None

PRECAUTIONS:
May induce tachyarrhythmias and/or ACS. Continuous monitoring of vitas is required. Monitoring of cardiac rhythm is also preferred.

Protect from exposure to light

May cause tissue ischemia / necrosis with extravasation. Use proximal IV site (Antecubital or higher) and verify patency prior to IV administration/infusion.

SIDE EFFECTS:
Anxiety
Palpitations
Tachycardia
Hypertension

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Etomidate (Amidate)

CLASS:	General anesthetic
ACTIONS:	Rapidly induces anesthesia (30 – 60 seconds)
DURATION OF ACTION:	Five to ten minutes
INDICATIONS:	Rapid sequence induction
CONTRAINDICTATIONS:	Known hypersensitivity / allergy
PRECAUTIONS:	Adrenal insufficiency May increase the risk of post-intubation hypotension Has no analgesic properties
SIDE EFFECTS:	Hypotension Myoclonus Nausea/ vomiting Nystagmus Local irritation

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Furosemide (Lasix)

CLASS:	Diuretic
ACTIONS:	Inhibits reabsorption of sodium, chloride and water within the renal tubules, increasing urine output (diuresis).
INDICATIONS:	Respiratory distress with pulmonary edema
CONTRAINDICTATIONS:	Pregnancy Hypovolemia / dehydration Hypotension: SBP <110, MAP<65
PRECAUTIONS:	Protect from exposure to light Monitor vital signs closely for signs of over diuresis (worsening tachycardia, hypotension)
SIDE EFFECTS:	Lightheadedness, dizziness, muscle cramps, dry mouth

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Glucagon

CLASS:	Hormone
ACTIONS:	Breaks down stored glycogen to glucose, raising blood glucose level Increases heart rate/cardiac contractility (CCB overdose)
INDICATIONS:	Hypoglycemia Symptomatic Calcium channel blocker (CCB) overdose Symptomatic Beta blocker (BB) overdose
CONTRAINDICTATIONS:	None in emergency use
PRECAUTIONS:	Requires adequate glycogen stores to be effective. May be less effective or ineffective in patients with a history of alcoholism, chronic liver disease, and/or malnutrition as well as low birth weight neonates/infants.
SIDE EFFECTS:	Nausea, vomiting

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Haloperidol (Haldol)

CLASS:	Antipsychotic
ACTIONS:	Dopamine antagonist, sedation
INDICATIONS:	Behavioral emergencies: Psychiatric, medical, or traumatic emergencies with behavior which poses a significant risk of harm to the patient or others
CONTRAINDICTATIONS:	Known allergy/hypersensitivity Parkinson's disease Dementia (including Alzheimer's disease) CNS depression/Coma
PRECAUTIONS:	Patients with dementia-related psychosis who are treated with antipsychotic drugs are at an increased risk of death – Haldol is not approved for use in these patients. Many drug-drug interactions, particularly with medications known to prolong the QT interval May cause hypotension. Use with caution in patients with cardiac disease, ≥65 years old, or taking anti-arrhythmic medications. May lower seizure threshold – use only when benefit outweighs risk in patients with known seizure disorder. May cause dystonic reactions (abnormal involuntary movements) or muscle rigidity. May block the activity of epinephrine – use Norepinephrine if vasopressor is required.
SIDE EFFECTS:	Hypotension, bradycardia, flushing, dystonic reactions, drowsiness

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Hydroxocobalamin (CYANOKIT)

CLASS:	Cyanide Antidote
ACTIONS:	Binds Cyanide ions for excretion in urine
INDICATIONS:	Exposure to combustion products / fire in an enclosed space with altered mental status, seizures, hypotension and/or cardiac arrest
CONTRAINDICTATIONS:	None in emergency use
PRECAUTIONS:	Requires reconstitution (200mL 0.9% Sodium Chloride) Use vented IV tubing May increase blood pressure: Caution in patients with severe hypertension.
SIDE EFFECTS:	Hypertension, deep red/purple discoloration of urine

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Ipratropium Bromide (Atrovent)

CLASS:	Anticholinergic, Inhaled parasympatholytic
ACTIONS:	Causes bronchodilation Dries respiratory secretions
INDICATIONS:	Respiratory Distress (Asthma/COPD), Inhalation Irritants
CONTRAINDICTATIONS:	Known hypersensitivity/allergy
PRECAUTIONS:	May exacerbate glaucoma–use only when benefit outweighs risk May cause tachycardia – use with caution in patients with cardiac disease or ≥ 65 years old.
SIDE EFFECTS:	Cough, dry mouth, anxiety, palpitations, nausea, dizziness, headache, hypertension

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Ketamine (Ketlar)

CLASS:	Dissociative anesthetic
ACTIONS:	Analgesic, Dissociative / amnestic (sedation, induction of anesthesia)
INDICATIONS:	Behavioral emergencies: Psychiatric, medical, or traumatic emergencies with behavior which poses a significant risk of harm to the patient or others Rapid sequence induction
CONTRAINDICTATIONS:	Know hypersensitivity/allergy. Pre-induction shock index (HR/SBP) ≥ 1.
PRECAUTIONS:	May cause tachycardia/hypertension – use with caution in patients with cardiac disease or ≥ 65 years old. Do not inject more than 5 mL per IM site. Use multiple sites simultaneously if necessary. Emergence reactions (bizarre, agitated behavior) may occur as dissociation lifts. Benzodiazepines are generally effective. Sudden death following administration for behavioral emergencies has been reported. Close monitoring, including cardiac monitor, HR, blood pressure, and SpO2 should be initiated as soon as feasible. Laryngospasm or apnea may occur, particularly with rapid IV push – administer slowly (over 1-2 minutes) and monitor airway closely following any administration May increase the risk of post-intubation hypotension.
SIDE EFFECTS:	Tachycardia, hypersalivation, dizziness, vision changes, nausea, disorientation, drowsiness, hallucinations

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Ketorolac (Toradol)

CLASS: Nonsteroidal anti-inflammatory drug (NSAID)

ACTIONS:
General pain contrl/analgesia
Inhibits platelet function
Antipyretic

INDICATIONS: General Pain Management

CONTRAINDICTATIONS:
Known hypersensitivity / allergy
Bleeding disorders or history of internal bleeding (GI/CVA)
Peptic ulcer disease
Chronic kidney disease
Pregnancy

PRECAUTIONS: Anaphylaxis has been reported in patients with a history of Asthma.

May increase risk of bleeding – avoid use in patients with known or suspected active bleeding. Contact Medical Control before administering to patients with multisystem trauma.

SIDE EFFECTS: Local reaction/irritation, indigestion, nausea

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Lidocaine 2% (Xylocaine)

CLASS:	Antidysrhythmic, Anesthetic
ACTIONS:	Binds neuron sodium channels, prevention conduction(anesthetic) Slows cardiac action potential, reducing ectopy (antidysrhythmic)
INDICATIONS:	Cardiac arrest: VT/VF refractory to defibrillation Pain control: Intraosseous access
CONTRAINDICTATIONS:	Known hypersensitivity /allergy Dysrhythmia due to local anesthetic toxicity 2^{nd} or 3^{rd} degree heart block PVCs with bradycardia (ventricular escape beats) Wolff-Parkinson-White Syndrome Stokes-Adams Syndrome
PRECAUTIONS:	Monitor for CNS toxicity. Symptoms include slurred speech, facial numbness, decreased LOC, muscle twitches, seizure
SIDE EFFECTS:	Nausea, widening of QRS, seizure, hypotension

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Magnesium Sulfate

CLASS: Electrolyte

ACTIONS:
Antidysrhythmic (refractory VT/VF)
Anticonvulsant/CNS Depressant (Eclampsia)
Smooth Muscle Relaxant (COPD/Asthma)

INDICATIONS:
Respiratory Distress (Asthma/COPD)
Pre-eclampsia with severe features
Eclampsia
VT/VF refractory defibrillation
Torsades de Pointes

CONTRAINDICTATIONS: None in emergency use

PRECAUTIONS:
Rapid administration may lead to hypotension, respiratory depression and/or pulmonary edema. Administer no faster than 1g/min.

Magnesium reduces cardiac contractility, use with caution in patients with decreased ejection fraction/CHF

Note: If not premixed for infusion, add 4g Magnesium Sulfate to 100mL 0.9% Sodium Chloride or D5W.
Final concentration = 40mg/mL.

SIDE EFFECTS: Vision changes, headache, flushing, breathing difficulty, bradycardia

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Methylprednisolone (Solu-Medrol)

CLASS:	Synthetic corticosteroid
ACTIONS:	Reduces inflammation/bronchial edema
INDICATIONS:	Allergic reaction / Anaphylaxis Respiratory distress
CONTRAINDICTATIONS:	Known hypersensitivity / allergy Recent myocardial infarction Sepsis/septic shock
PRECAUTIONS:	May exacerbate glaucoma, myasthenia gravis, hyperglycemia, and fluid retention due to CHF, kidney or liver disease. Use with caution in these patients and only when benefit outweighs risk.
SIDE EFFECTS:	Indigestion, nausea/vomiting (particularly with rapid administration) Headache, hypertension, fluid retention

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Midazolam (Versed)

CLASS: Benzodiazepine

ACTIONS: CNS depressant

INDICATIONS:
Seizure
Synchronized cardioversion (Mild sedation)
Behavioral Emergencies (Moderate sedation)
Post-intubation management (Moderate sedation)

CONTRAINDICTATIONS: Known Hypersensirivity/allergy

PRECAUTIONS:

Benzodiazepines are associated with a high risk of respiratory depression, coma, and death. Monitor airway, breathing and vital signs closely following any administration.

Due to the risk of apnea and respiratory arrest, use in combination with opioids only after an airway has been definitively secured and ability to ventilate adequately has been confirmed.

May cause or exacerbate hypotension, particularly in pediatric, underweight (<50kg), frail, elderly (≥65 years), or hemodynamically unstable patients.
Use minimum dose necessary and only when potential benefit outweighs the risk.

Paradoxical reactions (agitated/aggressive behavior) have been reported.

Half-life may be prolonged in patients with renal impairment.

SIDE EFFECTS: Respiratory depression, hypotension, drowsiness, headache, hiccups, vomiting

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Morphine Sulfate

CLASS:	Opioid analgesic
ACTIONS:	General Analgesia Respiratory/CNS depression
INDICATIONS:	Analgesia/pain control
CONTRAINDICTATIONS:	Systolic BP < 100mmHg Known allergy/hypersensitivity.
PRECAUTIONS:	Use lower doses and longer spacing between doses in frail, hypotensive, underweight, opiate naïve and elderly patients (>65 years). Due to the risk of apnea and respiratory arrest, use in combination with benzodiazepines only after an airway has been definitively secured and ability to ventilate adequately has been confirmed. May cause respiratory depression, bradycardia, hypotension – monitor vitals closely.
SIDE EFFECTS:	Dizziness, nausea, respiratory depression, hypotension

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Naloxone (Narcan)

CLASS:	Opiate/Opioid antagonist
ACTIONS:	Reverses opiate effects
INDICATIONS:	Opiate/Opioid Overdose
CONTRAINDICTATIONS:	Allergy/hypersensitivity
PRECAUTIONS:	May induce immediate opiate withdrawal (nausea, vomiting, diaphoresis, generalized pain, tachycardia, agitation) Support respirations while administering Naloxone.
SIDE EFFECTS:	Body aches, sweating, nervousness, diarrhea, nausea, abdominal cramps, tachycardia, hypertension, pulmonary edema

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Nitroglycerin (Nitrostat)

CLASS:	Vasodilator
ACTIONS:	Dilates coronary arteries Systemic vasodilator
INDICATIONS:	Acute Coronary Syndromes (Pain management) Respiratory distress due to pulmonary edema
CONTRAINDICTATIONS:	Hypotension: SBP <100mmHg or MAP <65 Use of PDE inhibitors (eg. Sildenafil, Vardenafil, Tadalafil) Allergy/Hypersensitivity Children less than 12
PRECAUTIONS:	May cause significant drop in blood pressure.
SIDE EFFECTS:	Headache, dizziness, nausea, flushing, hypotension

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Norepinephrine (Levophed)

CLASS: Vasopressor

ACTIONS: Increase cardiac contractility
Increased peripheral vascular resistance.

INDICATIONS: Hypotension/Shock

CONTRAINDICTATIONS: None in emergency use

PRECAUTIONS: May cause tissue ischemia/necrosis with extravasation. Use largest, most proximal IV access site available (antecubital or higher) and ensure patency prior to infusion. Monitor closely for signs of extravasation.

Trauma: use of vasopressors increases bleeding. Consider only as a last resort when permissive hypotension and IV fluids have failed.

Correct non-sinus tachyarrhythmias prior to considering vasopressor.

SIDE EFFECTS: Tachyarrhythmias, hypertension, bradycardia

Adult Norepinephrine IV Infusion

Add 4 mg of norepinephrine to 250 mL of NS (final concentration 16 mcg/mL). Dosing 5 -20 mcg/min. Maximum 20 mcg/min = 75 gtt/min	
mcg/min	**Gtt/min** **60 drop set**
5 mcg/min	19
6 mcg/min	22
7 mcg/min	26
8 mcg/min	30
9 mcg/min	34
10 mcg/min	37
12.5 mcg/min	47
15 mcg/min	56
17.5 mcg/min	65
20 mcg/min	75

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Ondansetron (Zofran)

CLASS:	Antiemetic
ACTIONS:	Relieves nausea and vomiting
INDICATIONS:	Nausea and vomiting Pain management (prophylactic)
CONTRAINDICTATIONS:	Allergy/hypersensitivity Prolonged QTc (>500ms)
PRECAUTIONS:	Less effective if used after vomiting has begun
SIDE EFFECTS:	QT prolongation Headache Drowsiness

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Rocuronium (Zemuron)

CLASS:	Non-depolarizing neuromuscular blocker / paralytic
ACTIONS:	Rapidly binds to acetylcholine receptors leading to reversible paralysis (30 – 60 seconds)
DURATION OF ACTION:	30-60 MINUTES
INDICATIONS:	Rapid sequence induction
CONTRAINDICTATIONS:	Known hypersensitivity / allergy.
PRECAUTIONS:	**PARALYZING AGENT. PATIENT MUST BE VENTILATED.** *Anesthetic / induction agent must be given prior to paralytic when performing RSI.* Duration of action may be prolonged in patients with severe hypocalcemia/hypokalemia/hypermagnesemia, cachexia, acidosis, or myasthenia gravis. Duration of action is longer than that of available sedatives / induction agents. Provide adequate analgesia / sedation to ensure patient safety and comfort.
SIDE EFFECTS:	Hypertension Tachycardia

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Sodium Bicarbonate

CLASS:	Alkalinizing Agent, Electrolyte
ACTIONS:	Buffers excess hydrogen ions (acidosis) Stabilizes cardiac membrane (hyperkalemia) Shifts potassium into cells (hyperkalemia) Alkalinizes urine (crush syndrome)
INDICATIONS:	Hyperkalemia: Cardiac arrest / Crush injury Anti-cholinergic / TCA overdose Severe metabolic acidosis
CONTRAINDICTATIONS:	None in emergency use
PRECAUTIONS:	Sodium bicarbonate administration during cardiac arrest is not associated improved long-term survival and may be associated with *higher mortality*. Per the American Heart Association, it is not indicated for routine use during cardiac arrest. Given in combination with IV/IO calcium, bicarbonate may precipitate into calcium carbonate – give via separate IV/IO sites or flush thoroughly (at least 20 mL) between medications.
SIDE EFFECTS:	Pulmonary edema Hypokalemia

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Fentanyl (Sublimaze)

CLASS:	Synthetic opiate analgesic
ACTIONS:	Analgesia and sedation
INDICATIONS:	Pain control Post-advanced airway analgesia/sedation
CONTRAINDICTATIONS:	Systolic BP < 100 Hypersensitivity/allergy
PRECAUTIONS:	Use lower doses (0.5 mcg/kg or less) and longer spacing between doses in frail, hypotensive, underweight, opiate naïve and elderly patients (> 65 years). Due to the risk of apnea and respiratory arrest, use in combination with benzodiazepines only after an airway has been definitively secured and ability to ventilate adequately has been confirmed. Rare cases of muscle/chest wall rigidity have been reported. Use lowest dose necessary and administer slowly.
SIDE EFFECTS:	Hypotension, respiratory depression, nausea

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Succinylcholine (Anectine)

CLASS:	Depolarizing neuromuscular blocking agent / paralytic
ACTIONS:	Rapidly depolarizes skeletal muscle cells, causing them to briefly contract, followed by flaccid paralysis (30 – 45 seconds)
DURATION OF ACTION:	Five to ten minutes
INDICATIONS:	Rapid sequence induction
CONTRAINDICTATIONS:	Hypersensitivity / allergy Prior malignant hyperthermia Muscular dystrophy Myopathies Hyperkalemia (including up to 21 days after burn or crush injuries) Stroke / spinal cord injury / denervation syndromes
PRECAUTIONS:	**PARALYZING AGENT. PATIENT MUST BE VENTILATED.** Anesthetic / induction agent must be given prior to paralytic when performing RSI. May induce hyperkalemia leading to ventricular dysrhythmia and cardiac arrest. Does not provide analgesia or amnesia.
SIDE EFFECTS:	Fasciculations / myoclonus Increased intraocular / intracranial pressure Dysrhythmias Malignant Hyperthermia

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Vecuronium (Norcuron)

CLASS:	Non-depolarizing neuromuscular blocker / paralytic
ACTIONS:	Rapidly binds to acetylcholine receptors leading to reversible paralysis (75-90 seconds)
DURATION OF ACTION:	30-60 MINUTES
INDICATIONS:	Rapid sequence induction
CONTRAINDICTATIONS:	Known hypersensitivity / allergy.
PRECAUTIONS:	**PARALYZING AGENT. PATIENT MUST BE VENTILATED.** *Anesthetic / induction agent must be given prior to paralytic when performing RSI.* Duration of action may be prolonged in patients with severe hypocalcemia/hypokalemia/hypermagnesemia, cachexia, acidosis, or myasthenia gravis. Duration of action is longer than that of available sedatives / induction agents. Provide adequate analgesia / sedation to ensure patient safety and comfort.
SIDE EFFECTS:	Bradycardia (rare)

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Ziprasidone (Geodon)

CLASS:	Anti-psychotic, sedative
ACTIONS:	Inhibits synaptic reuptake of serotonin and norepinephrine – potent sedative
INDICATIONS:	Behavioral Emergencies – severe agitation
CONTRAINDICTATIONS:	Known hypersensitivity / allergy. Recent history of cardiac arrhythmia / dysrhythmia Recent MI Severely reduced cardiac ejection fraction / heart failure Dementia-related psychosis
PRECAUTIONS:	Cardiovascular disease Hypotension or use of anti-hypertensive medications Hypovolemia Cerebrovascular disease Pregnancy
SIDE EFFECTS:	Hypotension, dizziness, syncope, QT-prolongation, Torsades de Pointes, nausea
NOTE:	Will be provided as a substitute medication if Haloperidol (Haldol) is unavailable. For intramuscular (IM) use only. May cause QT prolongation – monitor cardiac rhythm following any administration.

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Procedures Table of Contents

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12-Lead Electrocardiogram (ECG)

INDICATIONS

- ☐ As indicated by any of the following protocols:
  - Allergic Reaction / Anaphylaxis
  - Bradycardia (Symptomatic)
  - Chest Pain (Cardiac)
  - Crush Injuries
  - Hypotension and Shock
  - Overdose / Poisoning / Toxic Ingestion
  - Post-Cardiac Arrest Care (ROSC)
  - Seizure
  - Tachyarrhythmias
- ☐ Any witnessed or reported syncope, altered mental status, respiratory distress, and/or any condition or presentation which raises suspicion for an acute coronary syndrome, cardiac ischemia, or dysrhythmia.

PROCEDURE

EMT	Prepare and power on the cardiac monitor, connect 12-Lead cables, and attach electrodes.	**EMT**
EMT	Apply extremity leads: ☐ RA (white) to right arm ☐ LA (red) to left arm ☐ RL (green) to right leg ☐ LL (black) to left leg	**EMT**
EMT	Expose the chest and apply precordial leads (see image below): ☐ V1 to 4th intercostal space at right sternal border ☐ V2 to 4th intercostal space at left sternal border ☐ V3 midway between V2 and V4 ☐ V4 to 5th intercostal space at left midclavicular line ☐ V5 level with V4 at left anterior axillary line ☐ V6 level with V5 at left midaxillary line	**EMT**
EMT	Input the patient's age and sex, instruct the patient to remain still, and acquire the ECG.	**EMT**
EMT	If no EMT-I or Paramedic is available to assess the ECG, or if it is interpreted by an EMT-I or Paramedic to represent an acute cardiac emergency (e.g. acute dysrhythmia), transmit the ECG to the most appropriate facility and notify Medical Control that an ECG has been transmitted.	**EMT**
EMT	If the 12-Lead ECG reads "STEMI" or "ACUTE MI," transmit the ECG to the closest PCI capable hospital. Notify the receiving facility of a **"Pre-Hospital STEMI Alert."** Follow *Chest Pain (Cardiac)* protocol.	**EMT**
EMT	Provide a copy (printed or electronic) of the ECG(s) to the receiving facility or HEMS crew. Ensure patient name, DOB, and time acquired are provided on the printed ECG. Attach a digital copy of the ECG to the patient care report.	**EMT**
MC	If the 12-Lead ECG is atypical or indeterminate, there is high suspicion for cardiac ischemia, or there is concern for an acute cardiac emergency, transmit the ECG to the most appropriate facility and contact Medical Control for guidance.	**MC**

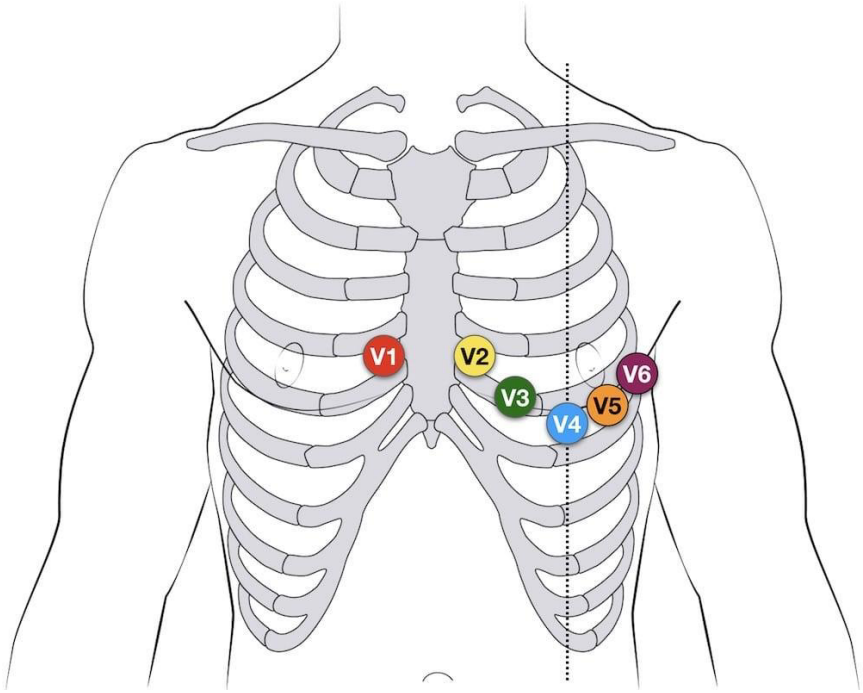
12-Lead Electrocardiogram (ECG)

PEARLS

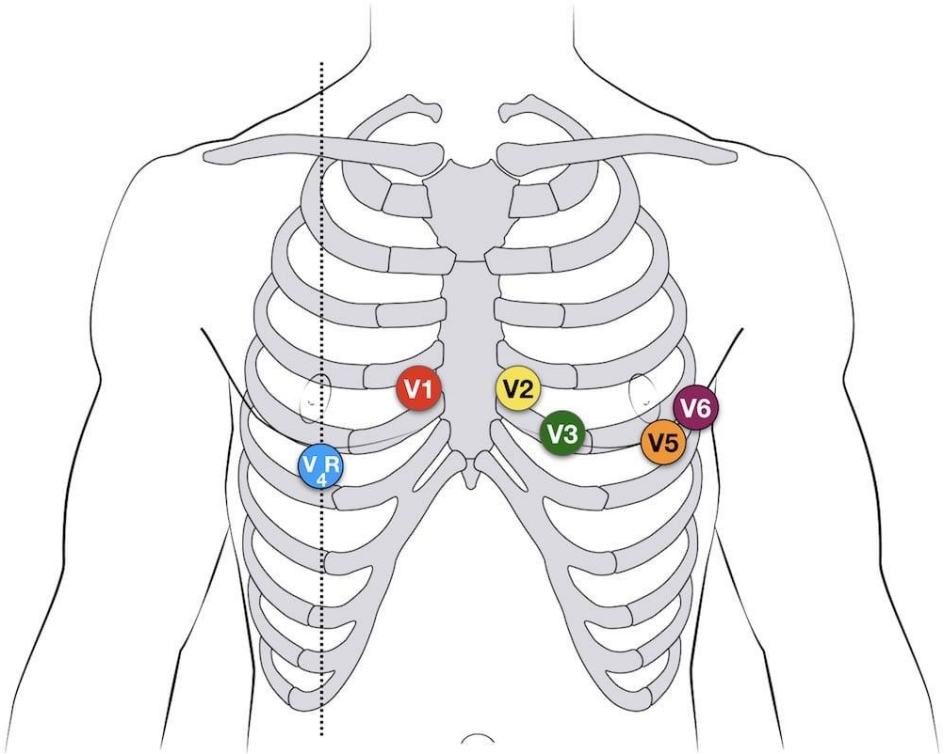
- Dry with a towel or shave the chest as needed if electrodes will not adhere or signal cannot be captured.
- Consider patient privacy, modesty, and cultural preferences. Consider moving out of public view prior to removing clothing.
- Signs of ischemia (including S-T elevation) cannot be accurately or adequately assessed via 2- or 4-Lead ECG. A 12-Lead ECG is required to assess for ischemia.
- If a 12-Lead ECG has been transmitted and then a patient refusal is being obtained, consider contacting medical control to ensure there are no additional findings which the patient may require to make an informed decision.
- The initial ECGs may not show ischemia. When there is high suspicion for cardiac ischemia, obtain serial ECGs (approx. 10 minutes apart) to assess for changes and the development of signs of ischemia.
- If possible, obtain a 12-Lead ECG prior to the release of a crush injury followed by serial ECGs once released.
- Intermediate and Paramedic providers may interpret a 12-Lead ECG as STEMI if diagnostic criteria is met:
    - Symptoms consistent with an acute coronary syndrome or myocardial infarction **AND**
    - ≥ 1 mm ST segment elevation in two or more contiguous leads
- **EMT-I and Paramedic:** If there is >1 mm ST elevation in leads **II, III, and/or V1,** and the ECG reads STEMI/ACUTE MI, consider obtaining a right-sided (V4R) ECG. See diagram below for lead placement. Transmit and consult medical control prior to administering Nitroglycerine.
    - ST elevation > 1 mm in lead V4R is highly sensitive for right ventricular infarction.
    - Patients with acute right ventricular infarction are highly preload dependent. Avoid nitrates unless specifically ordered by Medical Control.

- A Right-sided 12-Lead ECG (V4R) & Posterior 12-Lead ECG (V8 & V9) together constitute a 15-Lead ECG:
    - V4R- (formerly V4) 5th intercostal space at midclavicular line on the patient's right side
    - V8 - (formerly V5) 6th intercostal space left posterior at midscapular line
    - V9 - (formerly V6) 6th intercostal space left at paraspinous line
    - Label the second 12-Lead ECG to reflect the new leads: V4 as V4R, V5 as V8, and V6 as V9

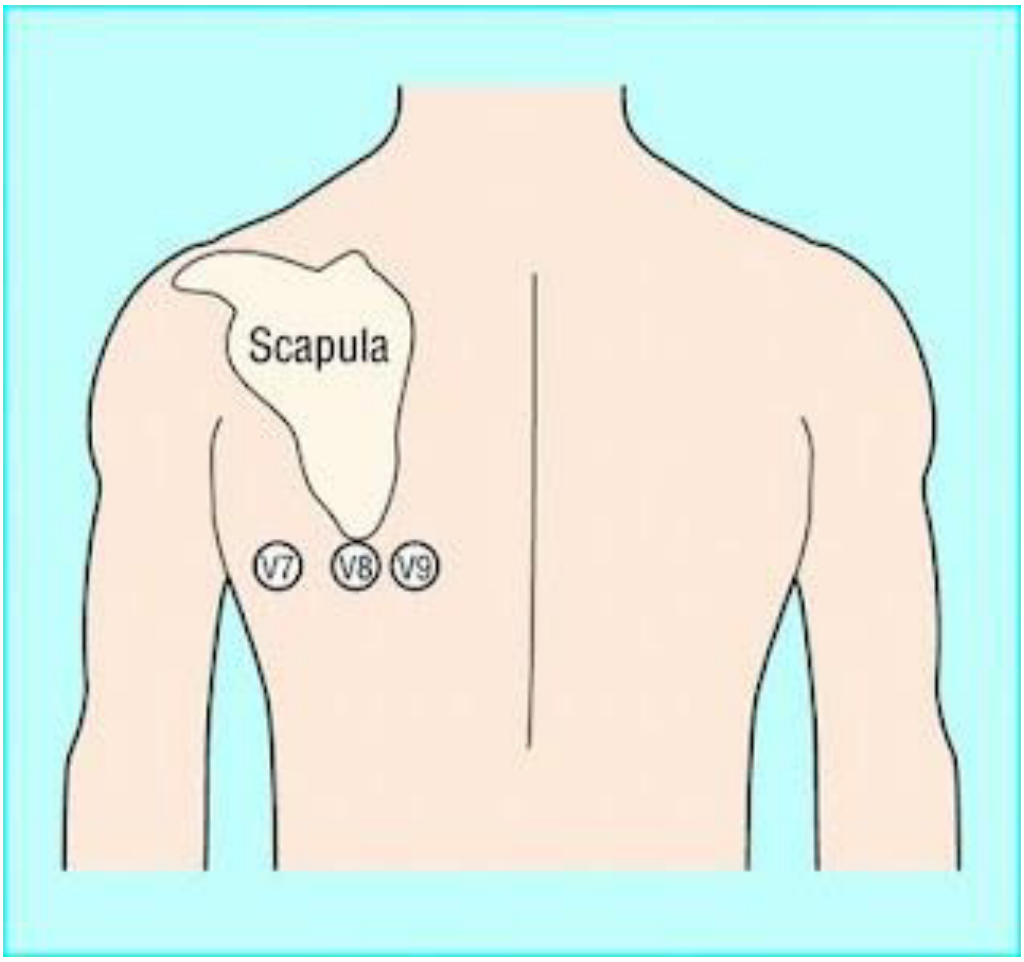
Standard Precordial Lead Placement



V4R Precordial Lead Placement ("Right-sided" ECG)



V4R Precordial Lead Placement ("Posterior" ECG)



ADULT Cardiopulmonary Resuscitation (CPR)

CRITERIA

- Patient unresponsive, without palpable pulse or respiration (excluding agonal breaths).
- Patients with obvious death (rigor mortis, lividity, decomposition, or injuries inconsistent with survival) are excluded.

PROTOCOL

EMR	Follow *General – Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	**Determine DNR status.** Refer to *Death & Criteria for Withholding Resuscitation* protocol.	**EMR**
EMR	**Begin chest compressions.** Push hard and fast. Allow full chest recoil. Limit pauses to <10 sec. Depth: At least 2 inches deep Rate: 100 – 120 bpm Adult: Finger interlocked, mid-chest on the sternum	**EMR**
EMR	**Administer 100% oxygen.** Do not over-ventilate. Maintain compression-ventilation ratio 30:2 until advanced airway is established, then administer one breath every six seconds. If respiratory pathogen is suspected, consider early intubation and HEPA filtered ventilation (I/P only).	**EMR**
EMR	**Apply AED / Assess cardiac rhythm every 2 minutes.** If AED is advising to shock or rhythm is **VF or VT** (as determined by EMT-I or P) defibrillate at maximum joules, then refer to *Cardiac Arrest: Ventricular Fibrillation / Pulseless Ventricular Tachycardia* protocol. If AED is advising no shock or rhythm is **asystole or PEA** (as determined by EMT-I or P), continue CPR then refer to *Cardiac Arrest: Asystole / Pulseless Electrical Activity* protocol.	**EMR**
EMR	**Alternate compressors every 2 minutes or sooner if fatigued.** Consider mechanical CPR device, if available.	**EMR**
EMT	**Monitor ETCO2. If ETCO2 < 10 or dropping, reassess and optimize compression rate, depth, and recoil.**	**EMT**
EMR	If ROSC is achieved, refer to *Post Cardiac Arrest Care (ROSC)* protocol.	**EMR**
MC	If ROSC is not achieved, refer to *Death and Criteria for Withholding Resuscitation* protocol. Note: Once initiated, termination of resuscitative efforts is a Medical Control decision only.	**MC**

PEARLS

Compressions:

- Push hard and fast: rate 100 – 120 bpm. Allow complete chest recoil.
- Minimize interruptions in chest compressions.
- Change compressor every 2 minutes or sooner if fatigued.
- Give continuous compressions with advanced airway.
- Use quantitative ETCO2 monitoring with BVM
  - If ETCO2 < 10 mmHg, improve chest compressions
  - If sudden increase in ETCO2 is noted (above 30-40mmHg), check pulse and rhythm for ROSC.

Airway:

- Avoid excessive ventilation.
  Consider supraglottic airway (BIAD) or endotracheal intubation. (EMT)
- Studies to date have not shown a clear improvement in outcomes with SGA vs intubation – do not compromise chest compressions for intubation.
- Use ETCO2 to confirm and monitor placement of any advanced airway.
- Continually monitor ETCO2 with target above 10 mmHg during CPR and 35 - 45 mmHg if ROSC is achieved.
- In post ROSC patient, if ETCO2 falls below 20 mmHg or signal is lost, immediately reassess pulses and airway.

Defibrillation:

- Ensure pad placement is optimal. Adjust pads if shockable rhythm is refractory to electrical therapy. Consider Anterior/Posterior placement.
- Use maximum joules setting for adult defibrillation.

Reversible causes:

Identify and treat per appropriate protocol and scope of practice:

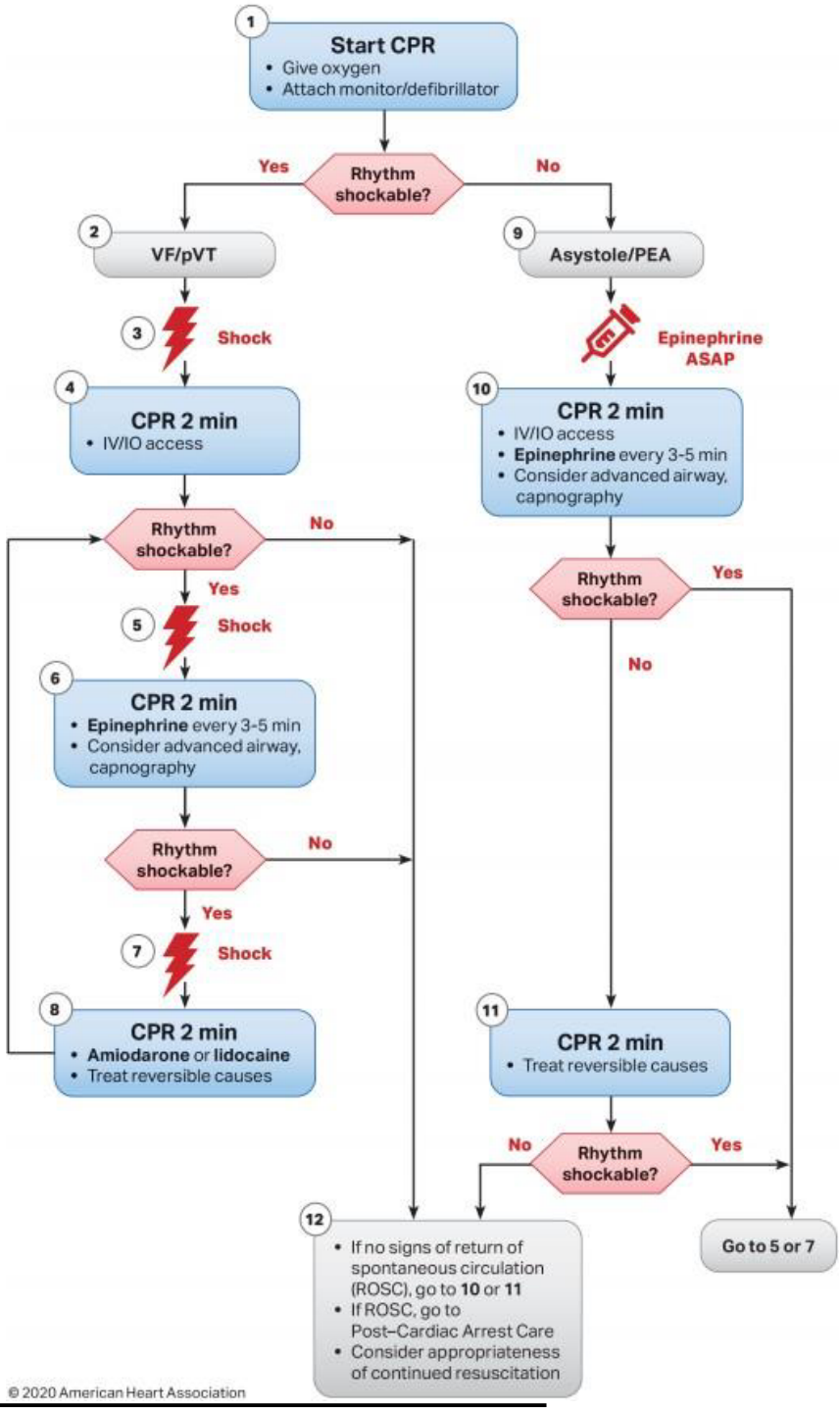
- ☐ Hypoxia
- ☐ Hyperkalemia or Hypokalemia
- ☐ Hypothermia
- ☐ Hypovolemia
- ☐ Hydrogen ion (acidosis)
- ☐ Hypoglycemia or hyperglycemia
- Tension pneumothorax
- Tamponade (Cardiac)
- Thrombosis (Cardiac, Pulmonary)
- Toxins
- Trauma
- Tablets (Drug Overdose)

Termination of Resuscitation (TOR):

- ☐ Refer to *Death & Criteria for Withholding Resuscitation protocol.*
- ☐ Termination of resuscitative efforts is a Medical Control decision only.
- ☐ Consider contacting Medical Control to request TOR if the arrest was not witnessed by EMS and after 20 minutes of continuous CPR:
  1) There has been no return of spontaneous circulation (ROSC).
     AND
  2) No shocks were delivered.

AHA ADULT CPR ALGORITHM

(For reference only)



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Airway Management and Ventilatory Support

CRITERIA

- Hypoxia (SpO_2 < 94%)
- Respiratory distress or failure
- Acute or impending airway obstruction (expanding hematoma, edema, mass or other obstruction)
- Inability to maintain a patent airway (due to secretions, blood, vomit, trauma etc)
- Altered level of consciousness with ineffective / inadequate spontaneous respirations

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	Refer to appropriate protocol (e.g. Respiratory Distress) for condition specific therapy guidelines.	**EMR**
EMR	Provide suctioning as needed to maintain patent airway.	**EMR**
	CONSCIOUS PATIENT	
EMT	Foreign body airway obstruction: * **ADULT:** Perform Heimlich abdominal thrusts. **OBESE / PREGNANT:** Perform chest thrusts. **PEDIATRIC ≥ 1 year:** Perform Heimlich abdominal thrusts. **PEDIATRIC < 1 year:** Alternate 5 back blows/chest thrusts until obstruction clears	**EMT**
EMT	Provide / titrate supplemental oxygen via NC or NRB to maintain SpO_2 94 – 98%. Use EtCO2 monitor to guide therapy. Refer to *Capnography* procedure.	**EMT**
EMT	Consider CPAP (PEEP: 5 cmH2O) for respiratory distress. Refer to *CPAP* procedure. I/P only: Adjust PEEP to support ventilation and work of breathing, up to 10 cmH_2O.**	**EMT**
	UNCONSCIOUS / OBTUNDED PATIENT	
EMT	Position the patient and open the airway. Use BLS airway adjuncts (OPA/NPA/SGA) as necessary.	**EMT**
EMT	Support respirations with BVM. Use in-line EtCO2. Refer to *Capnography* procedure. Adjust tidal volume, respiratory rate, and/or PEEP (if available) to maintain $EtCO_2$ 35 – 45 mmHg.**	**EMT**
I	Foreign body airway obstruction: If unable to ventilate, perform laryngoscopy. Remove with forceps.	**I**
I	If apneic and ≥ 12 years old: Consider endotracheal intubation if unable to ventilate adequately by less invasive means. Follow *Endotracheal Intubation* procedure.	**I**
P	If apneic and < 12 years old: consider endotracheal intubation if unable to ventilate adequately by less invasive means. Follow Endotracheal Intubation procedure.****	**P**

PEARLS

CPAP is a Red Dot Procedure for ALL EMS Certification levels

- **BVM use:** Two-person technique is preferred and generally more effective vs one person technique. Oral and/or nasal airway tools (OPA/NPA) should be used with BVM to improve ventilation and prevent gastric insufflation. An average adult BVM has a capacity of 1,600 mL – more than double the physiologic adult tidal volume. Fully squeezing the bag will over-ventilate the patient. Over-ventilation with BVM significantly increases the risk of aspiration, hypotension, pneumothorax, and other major complications. The AIC may delegate airway management but must keep in mind that appropriate BVM use requires experience and a thorough understanding of cardio-pulmonary physiology. Although the AIC must maintain situational awareness and provide supervision of airway management, ensuring safe and effective airway management is the responsibility of ALL providers caring for the patient.
- *** Foreign body airway obstruction:** Perform Heimlich abdominal thrusts standing behind the patient with fist midline, below xiphoid process and above navel. Perform adult chest thrusts standing behind the patient with fist midline against the sternum or supine with palm against the sternum. Perform back blows and chest thrusts with infant positioned prone or supine, head down, below level of the chest.
- ****Caution: Avoid overventilation** in patients with obstructive airway disease (e.g. COPD, asthma). Allow longer exhalation time and consider permissive hypercapnia (ETCO2 >45 mmHg) to prevent breath stacking.
- **Caution: Sudden or persistent hypotension** in patients receiving positive pressure ventilation may be due to increased intrathoracic pressure due to breath stacking and/or tension pneumothorax. Assess for pneumothorax and perform needle thoracostomy if indicated. Adjust PEEP (low or none), respiratory rate (low) and/or volume (low). Consider IV fluid bolus and/or vasopressor. If breath stacking has occurred in patients with obstructive airway disease, disconnect BVM and allow patient to exhale.
- **Caution: Avoid aspiration** when using CPAP. Use only on conscious and alert patients. Remove the mask immediately if the patient begins to vomit. Consider RSI, if available.
- **Caution: Avoid unrecognized advanced airway dislodgement.** Once an invasive airway (BIAD/SGA, ET tube or surgical airway) is in place, continuous box-waveform ETCO2 signal must be ensured throughout treatment and transport. Any concern for airway dislodgement should immediately be addressed. Immediate re-visualization of endotracheal tube placement (via direct or video laryngoscopy) is required for any loss of box-waveform signal, sudden drop in SpO2, difficulty ventilating or other concern for dislodgement.
- **Caution: Avoid hypoxia and hypotension.** Many conditions result in significantly worse outcomes if even transient episodes hypoxia and/or hypotension occur. Extreme care must be taken to ensure hypoxia and hypotension are not induced during airway management, particularly endotracheal intubation. Positive pressure ventilation has major effects on cardiac preload and may worsen or induce hypotension in patients suffering or at risk of preload reduction. Similarly, pneumothorax may be worsened or induced by use of positive pressure ventilation. Close monitoring for deterioration and rapid intervention are required for patients at risk of lung injury.
- ***** Note:** Pre-hospital endotracheal intubation of pediatric patients is poorly supported by the available scientific literature and should be reserved for life-threatening situations in which less invasive means of oxygenation / ventilation have been attempted or considered and found to be not feasible. In all cases, the provider with the most experienced with pediatric airway management should perform the procedure. A robust training and skill maintenance program with involvement of the agency Medical Director and an agency-level system of continuous quality improvement (CQI)/quality assurance (QA) are highly recommended for agencies electing to include pediatric intubation as a procedure.

Capnography

INDICATIONS

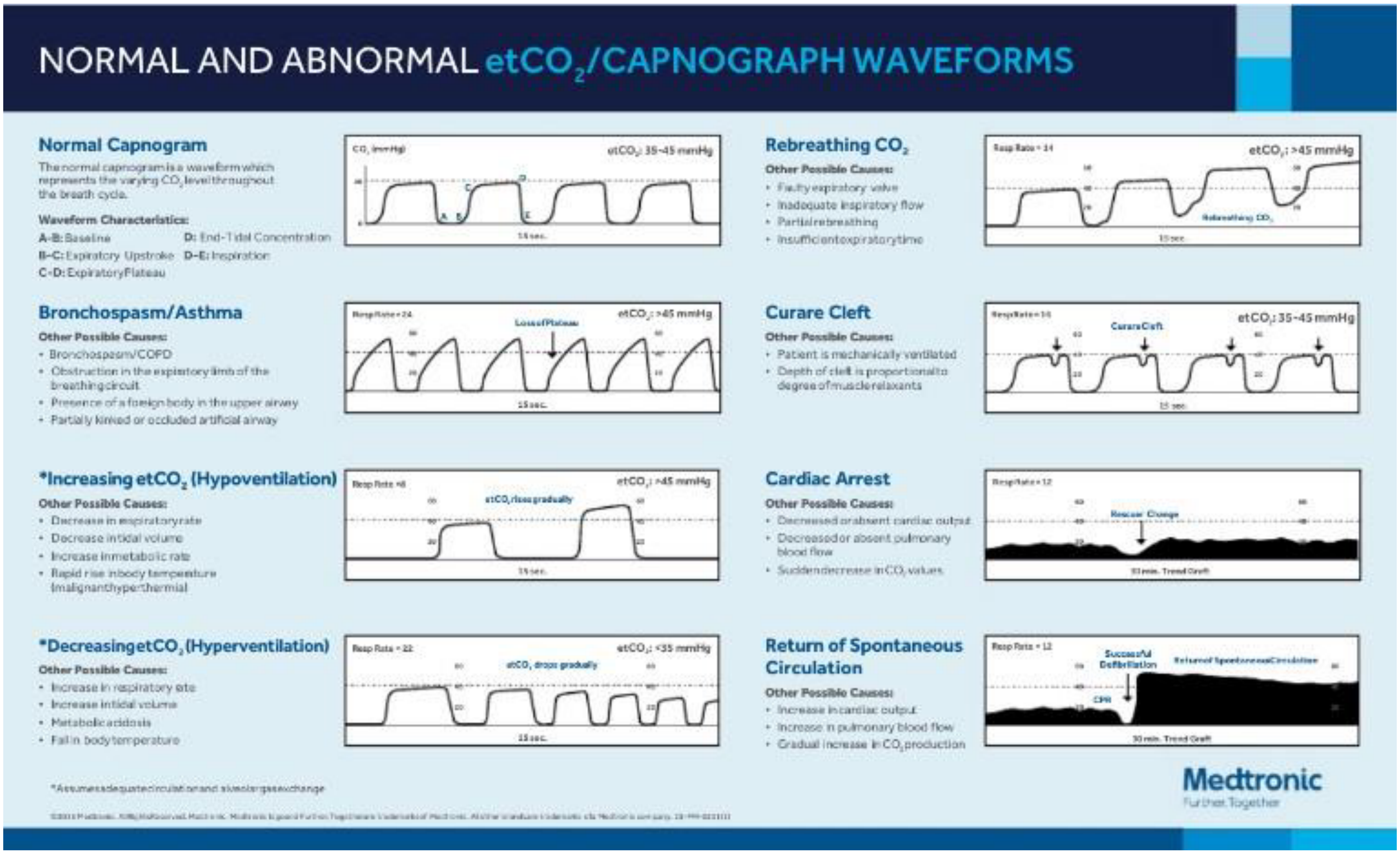
- Any patient for whom continuous monitoring of respiratory effort, ventilation, and/or perfusion is required.
- Continuous monitoring of end-tidal CO2 capnography is mandatory for any patient with an endotracheal tube or supraglottic airway device in place.
  Capnography is a Red Dot Procedure for EMT

PROCEDURE

EMT	Adequate respiratory effort: Apply ETCO2 sampling nasal cannula to patient.	**EMT**
EMT	Inadequate respiratory effort / Apnea: Attach inline ETCO2 sampling device to BVM, CPAP, or ventilator.	**EMT**
EMT	Continuously monitor reading and waveform. Refer to waveform guide below.	**EMT**
EMT	Advanced airway (ETT/SGA): Continuous monitoring ETCO2 waveform is required at all times. Any sudden drop or loss of ETCO2 signal must be addressed immediately, beginning with reverification of airway device placement and adequate ventilation.	**EMT**
EMT	**Cardiac Arrest:** If ETCO2 < 10 or dropping during CPR, optimize compression rate, depth, and recoil. If ROSC is achieved, adjust ventilation to maintain ETCO2 of 35-45 mmHg. Do not hyperventilate.	**EMT**
EMT	**Head Injury / TBI / Stroke:** Adjust ventilation to maintain ETCO2 of 35-45 mmHg. Do not hyperventilate.	**EMT**
EMT	**Obstructive airway disease (Asthma / COPD):** Consider permissive hypercapnia. Prioritize oxygenation.	**EMT**

PEARLS

- In general, an ETCO2 < 20 suggests inadequate pulmonary perfusion (e.g. hypotension / pulmonary embolism) and/or severe metabolic derangement (e.g. diabetic ketoacidosis).
- If using an inline HEPA filter, attach the inline ETCO2 sampling device proximal to the HEPA filter (closer to the patient).
- With high-quality CPR, ETCO2 may consistently be measured in the normal range. Assess for ROSC if a sudden rise in ETCO2 is noted (e.g. 12 mmHg to 35 mmHg).
- Achieving normal ETCO2 levels may not be possible for patients with chronic obstructive airway disease (asthma / COPD), particularly during acute exacerbations. Utilize bronchodilators to improve ventilation when necessary and, if using assisted/mechanical ventilation, consider permissive hypercapnia (up to 90 mmHg) to reduce the risk of breath-stacking.


NORMAL AND ABNORMAL etCO2/CAPNOGRAPH WAVEFORMS
Normal Capnogram
The normal capnogram is a waveform which represents the varying CO2 level throughout the breath cycle.
Waveform Characteristics:
A-B: Baseline
B-C: Expiratory Upstroke
C-D: Expiratory Plateau
D: End-Tidal Concentration
D-E: Inspiration
etCO2: 35-45 mmHg
15 sec.
Rebreathing CO2
Other Possible Causes:
• Faulty expiratory valve
• Inadequate inspiratory flow
• Partial rebreathing
• Insufficient expiratory time
Resp Rate = 14
etCO2: >45 mmHg
15 sec.
Bronchospasm/Asthma
Other Possible Causes:
• Bronchospasm/COPD
• Obstruction in the expiratory limb of the breathing circuit
• Presence of a foreign body in the upper airway
• Partially kinked or occluded artificial airway
Resp Rate = 24
Loss of Plateau
etCO2: >45 mmHg
15 sec.
Curare Cleft
Other Possible Causes:
• Patient is mechanically ventilated
• Depth of cleft is proportional to degree of muscle relaxants
Curare Cleft
etCO2: 35-45 mmHg
15 sec.
*Increasing etCO2 (Hypoventilation)
Other Possible Causes:
• Decrease in respiratory rate
• Decrease in tidal volume
• Increase in metabolic rate
• Rapid rise in body temperature (malignant hyperthermia)
Resp Rate = 8
etCO2 rises gradually
etCO2: >45 mmHg
15 sec.
Cardiac Arrest
Other Possible Causes:
• Decreased or absent cardiac output
• Decreased or absent pulmonary blood flow
• Sudden decrease in CO2 values
Resp Rate = 12
Rescuer Change
*Decreasing etCO2 (Hyperventilation)
Other Possible Causes:
• Increase in respiratory rate
• Increase in tidal volume
• Metabolic acidosis
• Fall in body temperature
Resp Rate = 22
etCO2 drops gradually
etCO2: <35 mmHg
15 sec.
Return of Spontaneous Circulation
Other Possible Causes:
• Increase in cardiac output
• Increase in pulmonary blood flow
• Gradual increase in CO2 production
Resp Rate = 12
Successful Defibrillation
CPR
30 min. Trend Graft
*Assumes adequate circulation and alveolar gas exchange
Medtronic
Further, Together

Chest Decompression

INDICATIONS

- **Unilateral or bilateral needle decompression:** Cardiac arrest, hypotension, clinical signs of shock, or poor perfusion AND absent or decreased breath sounds.
- **Bilateral needle decompression:** Cardiac arrest with evidence of significant blunt or penetrating thoracoabdominal trauma.

PROCEDURE

I	Administer oxygen at 15 LPM (100% FiO2).	I
I	Locate the second intercostal space in the mid-clavicular line on the same side as the suspected pneumothorax. Cleanse the site. Alternate acceptable position: Fourth intercostal space, midaxillary line.	I
I	Attach a 10 mL syringe filled with 0.9% Sodium Chloride to a 14-gauge catheter needle – use longest available. Aspirate the syringe while advancing over the rib, perpendicular to the skin, and into the pleural space until a pop is felt or air/blood/fluid is freely aspirated. Do not advance the needle further.	I
I	Advance the catheter over the needle into the pleural space and remove the needle.	I
I	Reassess the patient, including vital signs and respiratory effort / compliance. Consider repeating the above steps for continued or recurrent hemodynamic instability.	I

PEARLS

- Needle decompression is known to have a failure rate of up to 50% due to kinking of the catheter, displacement, lack of penetration into the pleural space, or obstruction. Use the longest 14-gauge catheter available. If the initial attempt fails to return any air/blood/fluid, consider a second attempt in the same site or at an alternate site (lateral) on the same side.
- If the initial procedure produces transient clinical improvement, followed by clinical deterioration, consider repeating the procedure as air/blood may have reaccumulated.
- Once needle decompression is performed, it must be assumed that the patient has a pneumothorax, regardless of air/blood/fluid return. Use caution when ventilating the patient, as positive pressure ventilation may exacerbate the pneumothorax, leading the hemodynamic instability/collapse.

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CPAP/BiPAP/PEEP

INDICATIONS

- Any adult patient with respiratory distress due to pulmonary edema, infection, near-drowning etc.
- Use with caution for patients experiencing respiratory distress due to asthma / COPD.
- Signs of respiratory distress include:
  - Accessory muscle use / retraction
  - SpO2 less than 94%
  - Respiratory rate greater than 24
  - Inability to speak in complete sentences.

CONTRAINDICATIONS

- Apnea / agonal respirations
- Decreased level of consciousness (GCS ≤ 13)
- Pneumothorax
- Facial trauma, burns, or recent surgery
- Penetrating neck and/or chest trauma
- Active vomiting / severe nausea
- Hypotension (SBP < 90 mmHg, MAP < 65)
- Inability to tolerate tight fitting mask

PROCEDURE

EMT	Ensure adequate oxygen supply to the CPAP device. Explain the procedure and indications to the patient.	**EMT**
EMT	Set positive and expiratory pressure (PEEP) to 5 mmHg	**EMT**
EMT	Place the mask over the mouth and nose with oxygen flowing. Secure with straps, beginning with the lower straps. Tighten until air-leak is minimal.	**EMT**
EMT	Reassess the patient, including the SpO2, ETCO2, and work of breathing.	**EMT**
EMT	Consider titratingPEEP9%-15mmHg) as needed to improve ventilation/work of breathing.	**EMT**

CPAP, BiPAP, and PEEP are RED DOT procedures at all EMS Certification Levels

PEARLS

- Early use of CPAP for patients with respiratory distress has been shown to reduce the need for intubation and improve patient outcomes.
- Positive pressure ventilation generally does not address the underlying cause of respiratory distress. Treatment of the underlying cause is of critical importance, such as bronchodilators for obstructive lung disease or preload reduction for congestive heart failure.
- **Caution: Sudden or persistent hypotension** in patients receiving positive pressure ventilation may be due to increased intrathoracic pressure due to breath stacking and/or tension pneumothorax. Assess for pneumothorax and perform needle thoracostomy if indicated. Adjust PEEP (low or none), respiratory rate (low) and/or volume (low). Consider IV fluid bolus and/or vasopressor. If breath stacking has occurred in patients with obstructive airway disease, disconnect BVM and allow patient to exhale.
- **Caution: Avoid aspiration** when using CPAP. Use only on conscious and alert patients. Remove the mask immediately if the patient begins to vomit. Consider RSI, if available.
- **Caution: Avoid hypoxia and hypotension.** Many conditions result in significantly worse outcomes if even transient episodes hypoxia and/or hypotension occur. Extreme care must be taken to ensure hypoxia and hypotension are not induced during airway management, particularly endotracheal intubation. Positive pressure ventilation has major effects on cardiac preload and may worsen or induce hypotension in patients suffering or at risk of preload reduction. Similarly, pneumothorax may be worsened or induced by use of positive pressure ventilation. Close monitoring for deterioration and rapid intervention are required for patients at risk of lung injury.

Endotracheal Intubation

CRITERIA

- Respiratory failure or respiratory arrest
- Acute or impending airway obstruction
- Inability to maintain a patent airway
- Altered level of consciousness with ineffective or inadequate spontaneous respirations

PROTOCOL

EMR	Follow *Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMT	**Pre-oxygenate the patient:** Provide 100% Oxygen via NRB or BVM for 3 minutes. Monitor SpO_2. Refer to *Airway Management and Ventilatory Support* protocol.	**EMT**
EMT	**Position the patient:** Ear to sternal notch. Maintain in-line cervical spine stabilization if there is concern for trauma.	**EMT**
I	**Prepare equipment:** ○ IV/IO access ○ ET tube of appropriate size + 1 size below ○ Stylet or bougie ○ Oxygen ON ○ Suction ON ○ Laryngoscope ○ Back up airway (e.g. Supraglottic airway device) ○ BVM with $ETCO_2$ monitor attached	**I**
I	**Orally intubate.** Patients 12 years and older. Advance laryngoscope in the midline, identifying airway structures progressively. Ensure tube and cuff are visualized passing through the vocal cords.	**I**
P	Orally Intubate. Patients < 12 years old.	**P**
I	If unsuccessful, reoxygenate between attempts with 100% Oxygen. Adjust positioning/technique/equipment as necessary prior to any further attempt. After two failed attempts, airway must be managed by the most experienced provider available.	**I**
P	If unable to intubate and unable to oxygenate, proceed immediately to *Surgical Airway*.	**P**
I	**Verify placement.** ○ Ensure the presence of continuous box-waveform capnography. ○ Auscultate for bilateral lung sounds & absence of gastric sounds	**I**
I	**Secure the tube.** Use tape or commercial tube holder. Document the depth of placement.	**I**
I	Administer analgesia/sedation, as needed for patient safety and comfort. Refer to the Sedation Post *Advanced Airway* Protocol.	**I**
EMT	Monitor ET tube placement and ventilation with SpO_2 and Continuous box waveform $ETCO_2$	**EMT**

Endotracheal Intubation

PEARLS

- Assume all intubations to be potentially difficult and prepare as such.
- **$ETCO_2$ monitoring with a continuous box-waveform while intubated is the accepted national standard of care. Without exception, after any patient is intubated, continuous monitoring of $ETCO_2$ is expected and is the shared responsibility of <u>everyone</u> caring for the patient.**
- Optimal de-nitrogenation and pre-oxygenation can significantly extend the safe apnea time. Provide at least 3 minutes of 100% FiO_2 via NRB or BVM prior to initiating an intubation procedure.
- Consider apneic oxygenation via nasal canula at 15 LPM throughout the procedure.
- Address unstable vital signs (hypotension or unstable tachycardia / bradycardia) prior to intubation.
- **Non-cardiac arrest patients**: Shock index has been shown to accurately predict post-intubation hypotension (PIH) and cardiac arrest. Shock index is calculated as heart rate divided by systolic blood pressure (HR/SBP). Normal values range from 0.5-0.7. Values greater than 1.0 are suggestive of a low cardiac output state – these patients may require resuscitation prior to endotracheal intubation. Normal shock index does not negate the possibility of PIH.

  Example: Heart rate 70, Blood pressure 120/70. HR/SBP = 70/120 = SI **0.58**
  Example: Heart rate 130, Blood pressure 100/50. HR/SBP = 130/100 = SI **1.3**

  Note: "Permissive hypotension" (SBP 80-90 mmHg, adjusted for mental status) is preferred when managing patients with <u>hemorrhagic shock</u> (trauma, GI bleed, etc). Intubation should be avoided in these patients whenever possible due to high risk of post-intubation hypotension and cardiac arrest.
- Lead with suction: Video laryngoscopes are prone to being obscured by vomit, blood and/or secretions in the airway. "Lead with suction" refers to placing suction into the mouth first, clearing away any such secretions prior to advancing the laryngoscope.
- Caution: Avoid deep placement of the laryngoscope. In general, curved laryngoscopes are designed to be used with the tip in the vallecula. Overly deep placement can result in vomiting and increased risk of aspiration, difficulty passing the bougie/tube through the vocal cords, and unintentional trauma to delicate airway structures such as the vocal cords. If the blade is unintentionally placed below the vallecula, it is recommended to slide back until the epiglottis drops into view and then reposition into the vallecular space.
- Patient hand off: In addition to standard patient hand-off information, inform ED team on arrival of indication for intubation, size of ET tube, depth of tube measured at teeth, current PEEP setting, ETCO2 range post-intubation, medications given and any other pertinent clinical information.
- If performing RSI: Etomidate has minimal intrinsic effect on hemodynamics and is the preferred induction agent in most cases. Ketamine may increase the risk of post-intubation hypotension, particularly in patients with tachycardia. Ketamine does have some effect as a bronchodilator and may be preferred for patients with acute respiratory distress due to asthma, COPD, anaphylaxis etc. In all cases, notify the receiving facility of RSI medications administered, including dose and time given

When exact weight is not known, use of a length-based tape (e.g. Broslow tape) is required for sizing pediatric equipment. Cuffed ET tube size should approximate (Age / 4) + 3.5.

- *** Note:** Pre-hospital endotracheal intubation of pediatric patients is poorly supported by the available scientific literature and should be reserved for life-threatening situations in which less invasive means of oxygenation/ventilation have been attempted or considered and found to be not feasible. In all cases, the provider most experienced with pediatric airway management should perform the procedure. A robust training and skill maintenance program with involvement of the agency medical director and an agency-level system of continuous quality improvement (CQI)/quality assurance (QA) are highly recommended for agencies electing to include pediatric intubation as a procedure .

Intraosseous (IO) Access

INDICATIONS

- Intraosseous access is indicated for any patient in extremis requiring immediate medication administration and IV access cannot be readily obtained (90 seconds or two failed attempts).

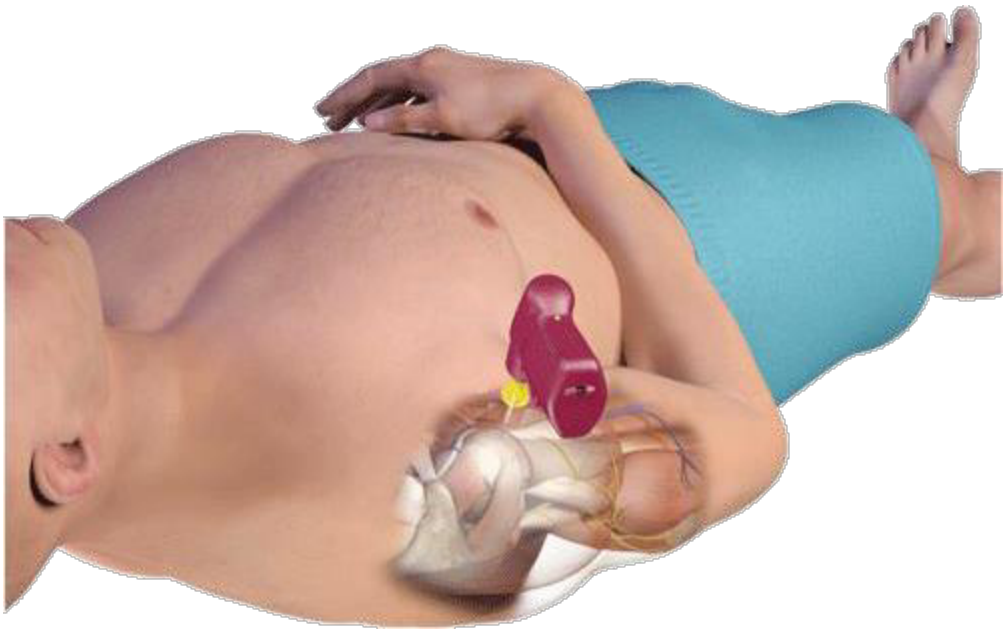
PROCEDURE

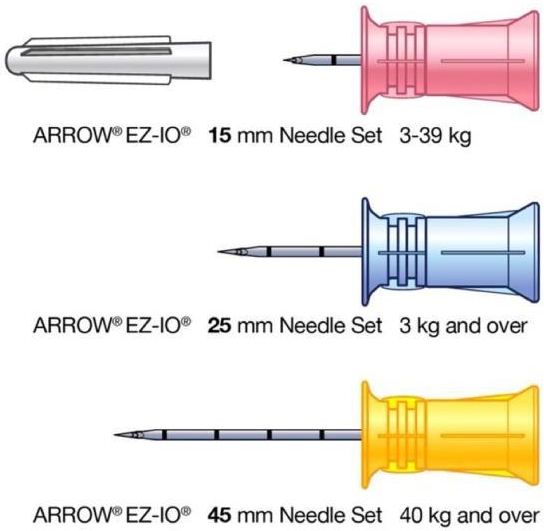
A	Locate an appropriate insertion site. Avoid insertion through infected tissue and into bone suspected to be fractured. Cleanse the site with an alcohol pad or disinfectant swab. • Proximal humerus: Internally rotate the arm and locate the greater tubercle approximately 2 finger breadths above the humeral neck. Approach from the side at a 45° angle. • Proximal tibia: 2-3 finger breaths below the Patella and 2 finger breadths medial along the flat aspect of the Tibia.	**A**
A	Insert the IO needle into the selected site with the needle perpendicular to the bone surface until the needle tip touches the bone. Confirm at least one black line on the needle is visible above the skin.	**A**
A	Penetrate the bone by squeezing the driver's trigger and apply gentle, steady, downward pressure. Release the trigger when a loss of resistance is felt upon entry into the medullary space.	**A**
A	Stabilize the catheter hub and remove the driver from the needle. Remove the stylet by turning counterclockwise. Dispose of the stylet in an appropriate container for sharp biohazards.	**A**
A	Secure the needle and attach primed extension tubing to the Luer-lock. If the patient is unconscious, aspirate to confirm placement then flush with 10 – 20 mL 0.9% Sodium Chloride.	**A**
A	If the patient is conscious, administer: **ADULT:** 2% Lidocaine 1 mg/kg IO slow push. Maximum dose 40 mg. **PEDIATRIC:** 2% Lidocaine 0.5 mg/kg IO slow push. Maximum dose 20 mg. Allow Lidocaine to dwell for one minute, then flush with 0.9% sodium chloride. May repeat once, as necessary for pain control.	**A**
A	Once IO access is obtained and verified, refer to *Medication Administration* procedure.	**A**

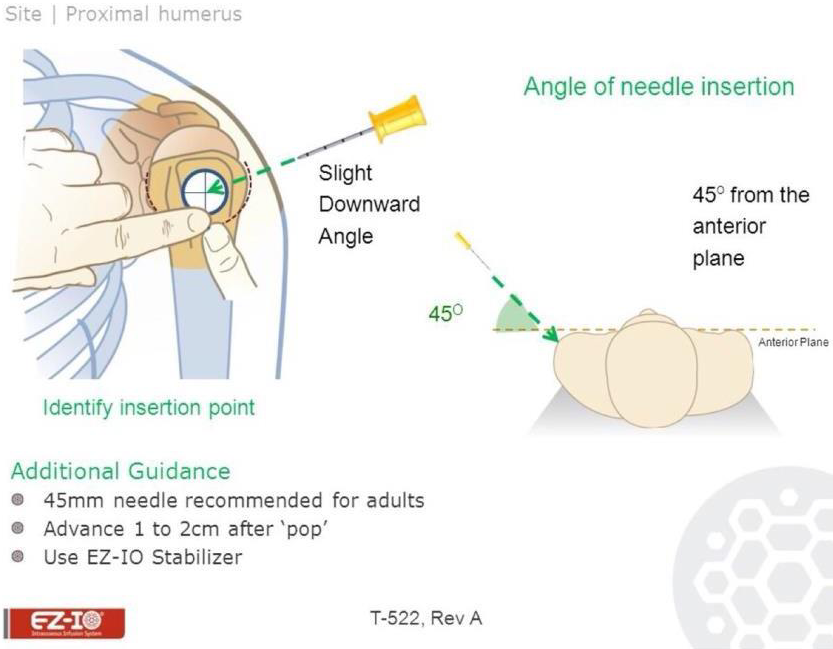
PEARLS

- If two "pops" or losses of resistance are felt, it is likely the needle has passed through the bone completely. Remove the needle.
- To remove a non-functional IO, attach a 10 cc syringe to the Luer-lock then rotate clockwise while pulling straight back. Dispose of the needle in a sharps container.
- IO flow rates: Proximal humerus (~80 mL/min), Tibia (~15 mL/min)
- Any medication routinely administered via the IV route may be administered via the IO route if IV access is not available.

Intraosseous (IO) Access







Medical Devices and Pumps

INDICATIONS

Any patient with an implanted, wearable, or attached medication or cardiac support device or pump.

PROCEDURE

	Ventricular Assist Device (VAD)	
EMR	**Assess VAD.** Look / Listen for alarms. Listen for VAD hum. If batteries are depleted, connect to alternate power source, or replace one battery at a time with the assistance of the patient, a trained family member, or the device coordinator. Do not remove both batteries at the same time.	**EMR**
EMR	Assess perfusion (skin color, skin temperature, capillary refill).	**EMR**
I	Assess cardiac rhythm. Follow protocols for arrhythmias. Cardiovert/defibrillate if indicated.	**I**
	VAD: Conscious Patient	
MC	If hypotensive, perfusion is inadequate, or alarm reads "Low Flow," contact the device coordinator and/or Medical Control for guidance prior to administering IVF or vasopressors.	**MC**
	VAD: Unconscious Patient, VAD Not Functioning	
EMT	**Attempt to restart VAD.** Ensure driveline and power source are connected. Ensure batteries have charge. If still not restarted, replace system controller (See pearls).	**EMT**
EMT	If unable to restart the device: Begin chest compressions. Reassess cardiac rhythm / apply AED, and follow appropriate *Cardiac Arrest* protocols. Defibrillate if indicated. Administer ACLS medications as indicated.	**EMT**
	VAD: Unconscious Patient, VAD Functioning	
EMT	If perfusion is **adequate**, assess for alternate causes of altered mental status (e.g. hypoxia, hypoglycemia, overdose, stroke) and follow standard protocols.	**EMT**
I	If perfusion is **inadequate**, assess MAP and/or intubate and assess ETCO2**. If unable to intubate, SGA may be used. ☐ ETCO2 **above 20 mmHg** or MAP above 50 mmHg: Assess for alternate causes of poor perfusion (e.g. sepsis, hypovolemia, allergic reaction). ☐ ETCO2 **below 20 mmHg** or MAP below 50 mmHg: Begin chest compressions. Reassess cardiac rhythm and follow appropriate *Cardiac Arrest* protocols. Defibrillate if indicated. Administer ACLS medications as indicated.	**I**
MC	For all other device issues contact the device coordinator and/or Medical Control for guidance.	**MC**

Medical Devices and Pumps

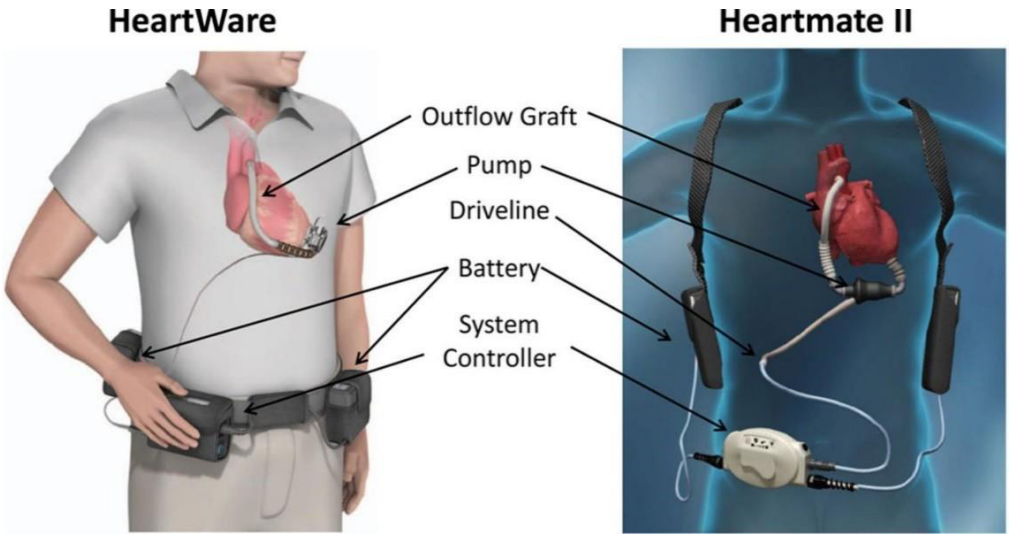
Total Artificial Heart (TAH)		
MC	If hypotensive or showing signs of inadequate perfusion, refer to *Hypotension and Shock* protocol. Contact device coordinator and/or Medical Control immediately for guidance. **Do not** administer vasopressors. **Do not** obtain ECG. **Do not** attempt pacing.	**MC**
MC	If unresponsive and without palpable pulses, assist ventilations. Ensure the drive line and power source are connected. Ensure batteries have charge and replace if necessary. Contact the device coordinator and/or Medical Control for guidance. **Do not** begin chest compressions. **Do not** obtain ECG. **Do not** cardiovert/defibrillate.	**MC**
MC	For all other device issues contact the device coordinator and/or Medical Control for guidance.	**MC**
Automated Implantable Cardioverter Defibrillator (AICD) / Pacemaker		
I	If the patient reports a shock was delivered, assess cardiac rhythm. Follow standard protocols.	**I**
Wearable Defibrillator (LifeVest)		
I	**Do not** remove the vest unless impeding necessary assessment or care. If removed, monitor cardiac rhythm. If a shock is delivered, assess patient and cardiac rhythm.	**I**
Insulin Pump		
EMT	If blood glucose is < 60 mg/dL, ensure the pump is turned completely off or removed.	**EMT**
Continuous Infusion Medication Pump		
MC	**Do not** disconnect or discontinue the pump. Note the medication and dose being infused, then contact Medical Control for guidance.	**MC**
Peripherally Inserted Central Catheter (PICC)		
A	Access only if emergently needed and alternate IV access cannot be obtained (2 attempts).	**A**
Central Venous Catheter / Tunneled Catheter / Medication Port		
A	**Do not** access. Follow *Intraosseous Access* procedure if peripheral access cannot be obtained.	**A**

Medical Devices and Pumps

PEARLS

- * The patient or family will often have extensive experience troubleshooting the device as well as contact information for a device coordinator, particularly for cardiac support devices such as VADs and TAHs. These coordinators can be extremely helpful in troubleshooting device issues and alarms, coordinating resources, and appropriately triaging the patient to definitive care. However, **while device coordinators *can* make suggestions, they *cannot* provide binding online medical control orders based on Virginia Department of Health regulations**. If their recommendations contradict established protocol or scope or practice, contact Medical Control for guidance.
- There are multiple potential causes for hypotension or "Low Flow" alarms with a VAD. While hypovolemia is a frequent issue, large volumes of IV fluids may catastrophically worsen other causes (e.g. pump thrombosis). Given the complexity of these patients, seeking expert consultation prior to initiating therapy is highly recommended.
- ** ETCO2 (EMT) for the purpose of determining adequacy of perfusion should be measured via endotracheal tube or tracheostomy. ETCO2 (EMT) measured via SGA (EMT) is a reasonable alternative in the prehospital environment if endotracheal intubation cannot be rapidly performed.
- Assessment of patients with VADs can be challenging due to differences in exam and available vital signs such as absent pulses, difficulty assessing BP, and the presence of machine noise over the lung fields. Alternate indicators of perfusion state can be extremely helpful such as reported symptoms, mental status, and warmth of extremities. Handheld doppler or ultrasound may allow for assessment of systolic blood pressure, which is equivalent to MAP in the case of a continuous flow VAD.
- **Assume all VAD and TAH patients to be anticoagulated.**
- VAD patients can sometimes maintain consciousness while exhibiting otherwise lethal arrhythmias such as ventricular tachycardia and ventricular fibrillation. Treatment of these conditions follows standard protocols.
- **To replace the VAD system controller**, ensure power is supplied to the backup unit, then quickly transfer the drive line to the new unit. If successful, the unit will power on automatically**. Attempt this ONLY as a last resort** (ideally under telephone guidance from a device coordinator or with help of a trained family member).
- Generally, for patients with VADs and TAHs, vasopressors are reserved for hypotension/shock refractory to volume expansion. When indicated, low dose norepinephrine is the preferred agent. Use only in direct consultation with a device coordinator or Medical Control.
- Total Artificial Hearts (TAHs) do not generate an electrocardiographic rhythm. Do not attempt to obtain a cardiac rhythm or ECG. The result will appear to be asystole regardless of device function.
- Up to 5 defibrillations can be provided by the wearable defibrillator (LifeVest). An audible alarm will sound if an arrhythmia is detected. If the patient is conscious, he/she can inactivate the treatment sequence. If not inactivated, a transcutaneous defibrillation will be delivered, typically within one minute. Stand clear if the alarm is sounding. Once the alarm is no longer sounding, assess the patient and continue treatment as indicated.
- Infection is a major concern for centrally terminating venous catheters and ports. Sterility must be maintained.
- As newer and more complex devices become available to patients in the community, the need increases for clear and timely communication between first responders, receiving facilities, and specialty centers. When in doubt, contact Medical Control for guidance.

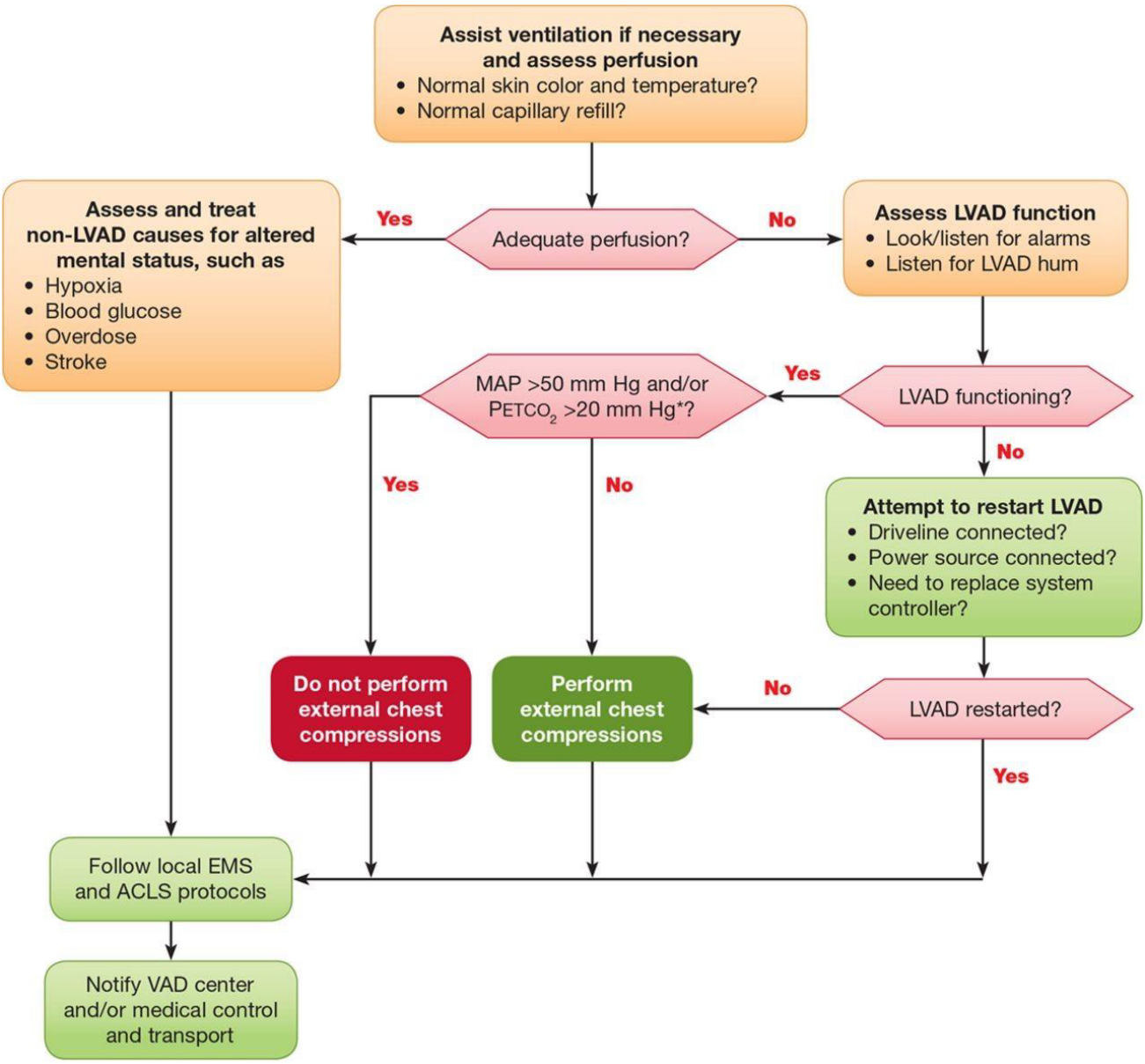
Ventricular Assist Devices



Total Artificial Heart (TAH)

AHA Ventricular Assist Device (VAD) Resuscitation Algorithm

(For reference only)



AHA Total Artificial Heart (TAH) Resuscitation Algorithm

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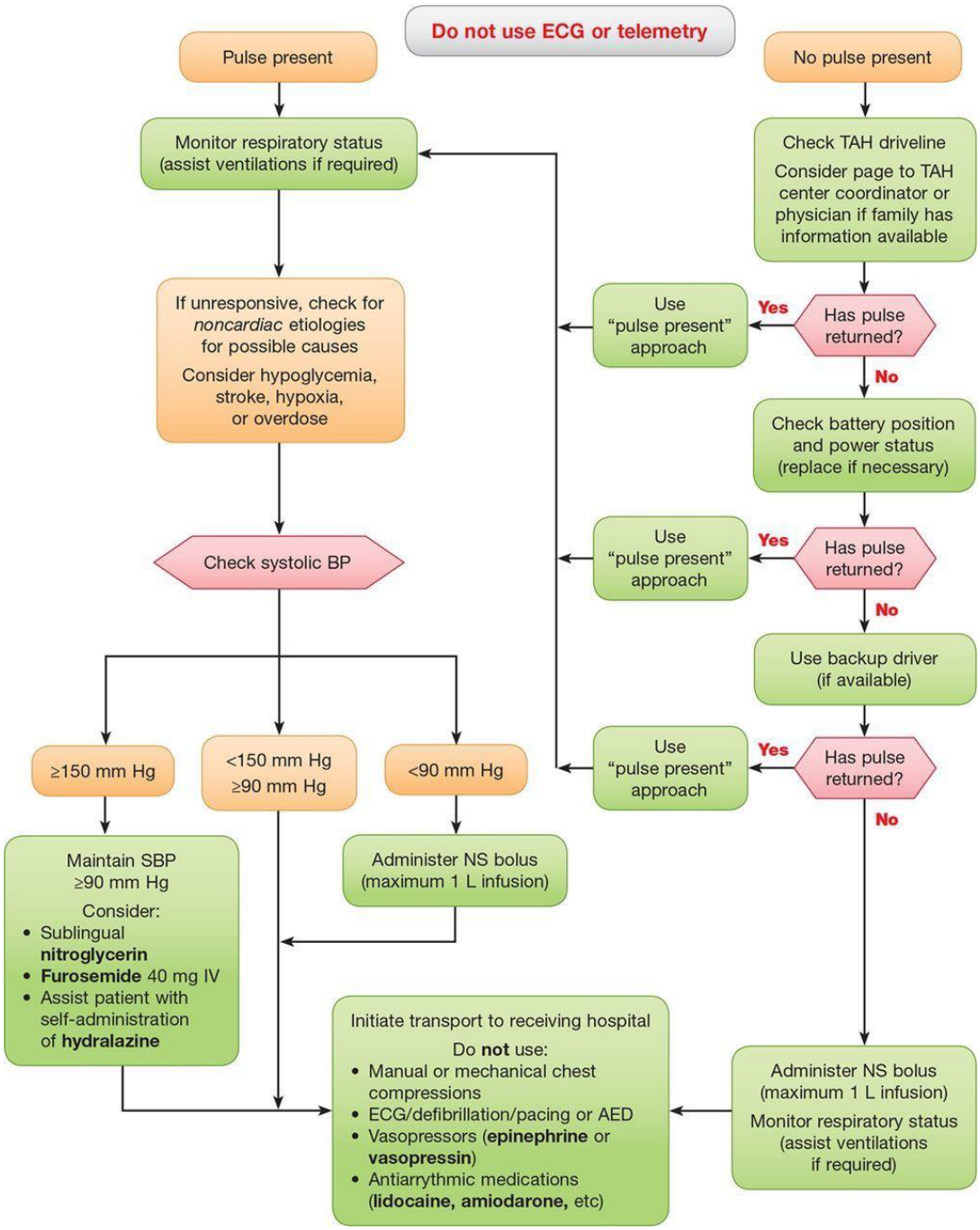


Medication Administration

INDICATIONS

- Any patient requiring pharmacotherapy to treat or facilitate the treatment of an acute illness or injury.
- Intraosseous administration is indicated for patients in extremis requiring immediate medication administration when IV access cannot be readily obtained (90 seconds or two failed attempts).
- Intranasal and intramuscular administration are indicated when immediate medication administration is required, and IV/IO access cannot be readily obtained (e.g. pain control) or for certain conditions in which IN/IM is the preferred route for specific therapy (e.g. IM Epinephrine for anaphylaxis).

PROCEDURE

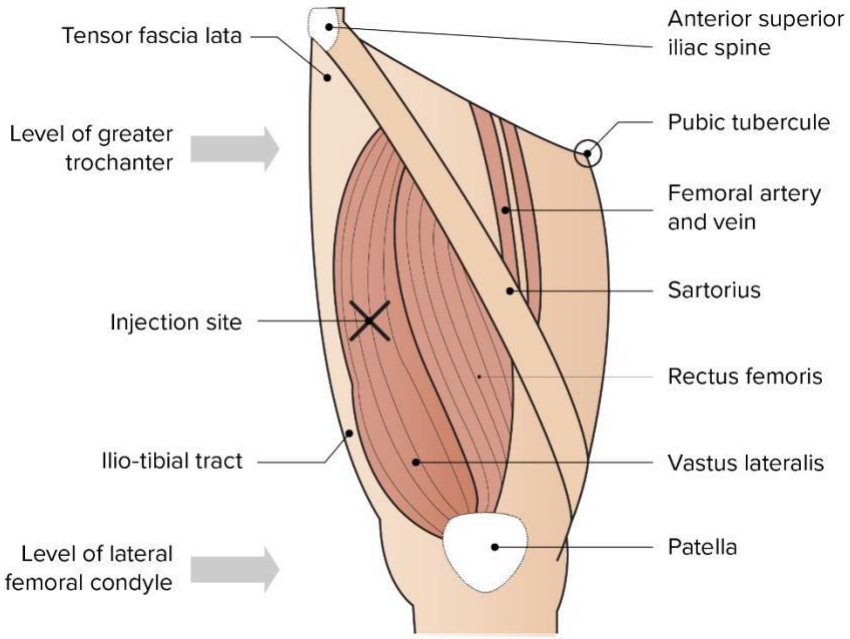
EMT	Prepare the medication to be administered. Refer to protocol specific indications and scope of practice for individual medications. Refer to *Pharmacology* section for drug specific information.	**EMT**
EMT	**CROSS CHECK** with another qualified provider that the correct medication is being administered to the correct patient via an appropriate route at an appropriate dose and that the medication is not expired.	**EMT**
	INTRAVENOUS (IV)	
A	Obtain IV access. Verify patency of the IV access site prior to administering any medication.	**A**
A	Administer the medication at the appropriate rate: • IV push: Rapid administration. • IV slow push: At least 30 seconds. Preferably 1 - 2 minutes. • Over X minutes: Slowly inject over the specified time frame. • Continuous infusion: Establish a drip at an appropriate dose / rate. • Via IV pump only: Establish a continuous infusion utilizing an IV pump.	**A**
A	Periodically reassess the administration site for signs of local reaction and/or infiltration of the IV. Immediately stop any infusion if the IV is no longer patent or becomes infiltrated.	**A**
	INTRAOSSEOUS (IO)	
A	Obtain IO access. Refer to *Intraosseous Access* procedure.	**A**
A	Follow steps above for IV medication administration.	**A**
	INTRANASAL (IN)	
EMT	Attach a syringe containing the full dose of the medication to be administered to the mucosal atomizing device (MAD).	**EMT**
EMT	Insert the MAD into one nostril, orienting the tip posteriorly. Administer half of the dose. Administer the other half of the dose in the second nostril. Do not exceed 1 mL per nostril.	**EMT**

Medication Administration

INTRAMUSCULAR (IM)		
EMT	Locate and expose an appropriate administration site (Deltoid or anterolateral thigh). Cleanse the site with an alcohol pad or disinfectant swab. Avoid any area of injury or infection.	**EMT**
EMT	Attach an appropriately sized needle to a syringe containing the dose of medication to be administered. Hold vertically (needle tip up) and depress the plunger to expel any air in the syringe.	**EMT**
EMT	Insert the needle perpendicular to the skin to the depth of the targeted muscle. Depress the plunger slowly, ensuring the full intended dose is administered, then withdraw and dispose of the needle.	**EMT**

PEARLS

- IO flow rates: Proximal humerus (~80 mL/min), Tibia (~15 mL/min)
- Any medication routinely administered via the IV route may be administered via the IO route if IV access is not available.
- Utilizing both nares maximizes the distribution of medication across the mucosal surface, increasing absorption.
- Do not administer intranasal medications if there is evidence of nasal/facial trauma or bleeding from the nose.
- The anterolateral thigh is the preferred site for IM injection due to larger muscle mass, higher blood flow and more rapid absorption.
- Do not administer more than 3 mL into the Deltoid site or 5 mL into the anterolateral thigh site for adults. If larger volumes are necessary due to available medication concentrations, use multiple sites simultaneously.



Nasogastric Tube Insertion

INDICATIONS

- Gastric decompression in intubated patients (improves ventilation compliance, reduces risk of aspiration)
- Airway management in patients with massive hematemesis
- Persistent large volume emesis refractory to anti-emetics

PROCEDURE

I	Estimate insertion length by superimposing the tube over the body and measuring from nose to ear to xiphoid process. Note the length.	I
I	Lubricate the distal end of the tube with Lidocaine gel and pass it through the patient's nostril posteriorly along the floor of the nasal passage. Do not orient the tip upward.	I
I	Continue to advance the tube gently until the measured length is reached. Ensure the tube is not coiled in the oropharynx.	I
I	**Confirm placement:** Inject 20 cc of air using a Toomey syringe while auscultating over the epigastrium for bubbles.	I
I	Secure the tube to the nose with tape and attach the proximal end of the tube to low/medium suction.	I
I	Document the indication, depth of insertion, and volume of any output.	I

PEARLS

- Caution: NG tube insertion is contraindicated for patients with known esophageal varices without active hemorrhage, recent maxillofacial surgery, and acute maxillofacial trauma.
- In the setting of an unconscious, intubated patient, oral insertion of the tube may be considered.
- For patients with massive upper GI bleeding and persistent hematemesis, placement of a nasogastric tube prior to attempting orotracheal intubation may allow for improved visualization of airway structures.
- If the patient is conscious, swallowing a sip of water may facilitate placement.

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Neonatal Resuscitation

CRITERIA

- Any newborn who is unresponsive or has poor tone or respiratory effort
- Any newborn or neonate (< 28 days) with a heart rate less than 100/min, apnea, or no palpable pulse

PROTOCOL

EMR	Follow *General-Universal Patient Care/Initial Patient Contact* protocol.	**EMR**
EMR	Post delivery - Warm and maintain normal temperature. - Position / open airway (in a sniffing position – ear to sternal notch) - Dry and stimulate the newborn vigorously. - Clear secretions only if needed. Note: Routine suctioning is no longer recommended. ONLY perform tracheal suctioning if thick meconium present or if the airway is obstructed.	**EMR**
	If Labored Breathing or Persistent Cyanosis, in addition to above:	
EMR	Give supplemental oxygen, as required.	**EMR**
EMT	Apply SpO_2 monitor.	**EMT**
A	Assess blood glucose. If < 40 mg/dL during the first 72 hours of life or < 60mg/dL thereafter, administer: ***Dextrose 10% (D10W) 5 mL/kg IV/IO*** Repeat dose in 5 minutes, as needed.	**A**
	If Apneic/Gasping and/or HR is less below 100/min, in addition to above:	
EMR	Begin positive pressure ventilation with BVM and 21% oxygen for 30 seconds, then increase to 100% oxygen. Ensure adequate chest rise. **40-60 breaths per minute.**	**EMR**
EMT	Place supraglottic airway if necessary. Apply ETCO2 monitoring.	**EMT**
I	Apply ECG monitoring.	**I**
P	Intubate if unable to ventilate adequately by less invasive means	**P**
	If HR below 60/min or pulseless, in addition to above:	
EMR	Begin chest compressions. Coordinate with ventilation. 3 compressions for each breath. **30 breaths per minute with chest compressions.**	**EMR**
A	Obtain IV/IO access if not already obtained.	**A**
A	Administer: ***0.9% Normal Saline 10 mL/kg IV/IO*** over 5 minutes Repeat as necessary, up to 30 mL/kg.	**A**
I	Administer: ***Epinephrine (Adrenaline) 0.01mg/kg (0.1mg/mL) IV/IO*** Repeat dose every 3-5 minutes until heart rate is > 60/min and palpable.	**I**
I	Assess for tension pneumothorax. Refer to *Chest Decompression* procedure.	**I**
MC	Contact medical control for guidance and destination determination.	**MC**

PEARLS

For Epinephrine 0.1 mg/mL preloaded syringe, combine 1 mg of Epinephrine 1mg/mL with 9 mL 0.9% Sodium Chloride in a 10 mL syringe.

Expected SpO2 after birth:
1 min – 60-65%
2 min – 65-70%
3 min – 70-75%
4 min – 75-80%
5 min – 80-85%
10 min – 85-95%

Palpating a pulse on a neonate can be extremely difficult. Often, it is easiest to palpate at the umbilical stump. Otherwise, use a stethoscope over the chest to count heartbeats if necessary.

Use a syringe and 3-way stopcock to administer precise fluid amounts to neonates (pull-push method). Do not infuse fluids to neonates via pressure-bag.

Neonates of mothers with poorly controlled diabetes or with a history of poor feeding / low birth weight are at particular risk of early hypoglycemia.

PEDIATRIC Cardiopulmonary Resuscitation (CPR)

CRITERIA

- Pediatric patient who is unresponsive, without palpable pulse or respiration (excluding agonal breaths).
- Pediatric patient with Unstable Bradycardia: sustained ventricular rate less than 60 BPM AND signs of inadequate perfusion (refer to Pediatric Bradycardia protocol).
- Patients with obvious death (rigor mortis, lividity, decomposition, or injuries inconsistent with survival) are excluded.

PROTOCOL

EMR	Follow *General – Universal Patient Care / Initial Patient Contact* protocol.	**EMR**
EMR	**Determine DNR status.** Refer to *Death & Criteria for Withholding Resuscitation* protocol.	**EMR**
EMR	**Begin chest compressions.** Push hard and fast. Allow full chest recoil. Limit pauses to < 10 sec. Depth: 1/3 AP diameter of the chest or 1.5-2" Rate: 100 – 120 bpm. Infant / Neonate : Use 2 fingers or thumbs Child: Use 1 hand	**EMR**
EMR	**Administer 100% oxygen.** Do not over-ventilate. Maintain compression-ventilation ratio 15:2 until advanced airway is established, then administer one breath every 2-3 seconds.	**EMR**
EMR	**Apply AED / Assess cardiac rhythm every 2 minutes.** If AED is advising to shock or rhythm is **VF or VT** (as determined by EMT-I or P), defibrillate at 2 J/kg then refer to *Cardiac Arrest: Ventricular Fibrillation / Pulseless Ventricular Tachycardia* protocol. If AED is advising no shock or rhythm is **asystole or PEA** (as determined by EMT-I or P), continue CPR then refer to *Cardiac Arrest: Asystole / Pulseless Electrical Activity* protocol.	**EMR**
EMR	**Alternate compressors every 2 minutes or sooner if fatigued.**	**EMR**
EMT	If ETCO2 < 10 or dropping, reassess and optimize compression rate, depth, and recoil.	**EMT**
EMR	If ROSC is achieved, refer to *Post Cardiac Arrest Care (ROSC)* protocol.	**EMR**
MC	If ROSC is not achieved, refer to *Death and Criteria for Withholding Resuscitation* protocol. Note: Once initiated, termination of resuscitative efforts is a Medical Control decision only.	**MC**

PEARLS

Compressions:

Push hard and fast: rate 100 – 120 bpm. Allow complete chest recoil.

- Minimize interruptions in chest compressions.
- Change compressor every 2 minutes or sooner if fatigued.
- Give continuous compressions with advanced airway.
- Use quantitative $ETCO_2$ monitoring with BVM
  - If ETCO2 <10 mmHg, improve chest compressions
  - If sudden increase in $ETCO_2$ is noted (above 30-40mmHg), check pulse and rhythm for ROSC.

Airway:

- Avoid excessive ventilation.
- Consider supraglottic airway (BIAD) (EMT). Endotracheal intubation has not been shown to improve outcomes for children with out-of-hospital cardiac arrest.
- Studies to date have not shown a clear improvement in outcomes with SGA vs intubation – do not compromise chest compressions for intubation.
- Use $ETCO_2$ to confirm and monitor placement of any advanced airway.
- Continually monitor $ETCO_2$ with target above 10 mmHg during CPR and 35 – 45 mmHg once ROSC is achieved.
- In post ROSC patient, if $ETCO_2$ falls below 20 mmHg or signal is lost, immediately reassess pulses and airway.

Defibrillation:

- Ensure pad placement is optimal. Adjust pads if shockable rhythm is refractory to electrical therapy. Consider Anterior/Posterior placement.
- Initial defibrillation at 2 joules/kg. Subsequent defibrillations at 4 joules/kg.

Reversible causes:

Identify and treat per appropriate protocol and scope of practice:

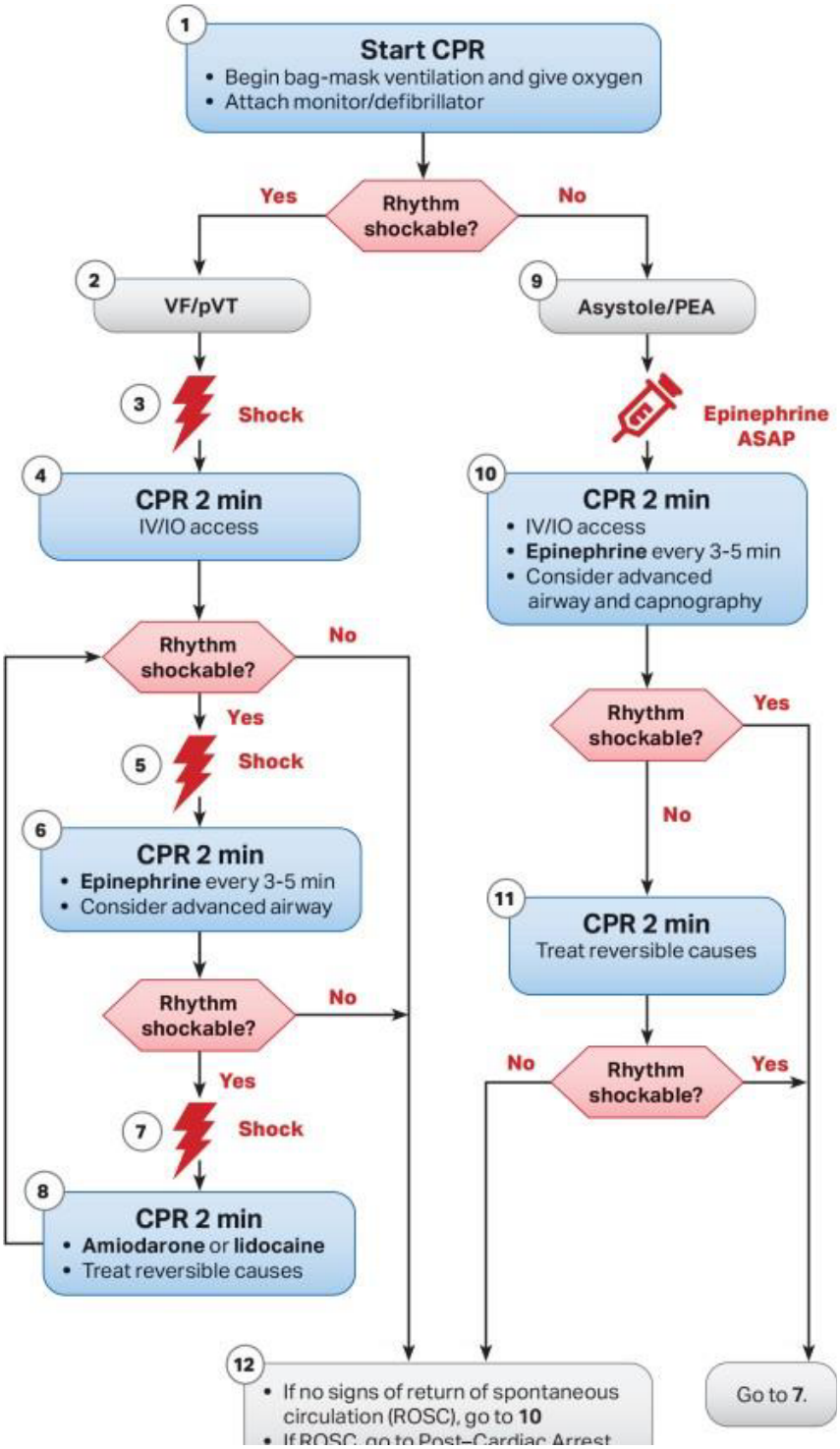
- ☐ Hypoxia
- ☐ Hyperkalemia or Hypokalemia
- ☐ Hypothermia
- ☐ Hypovolemia
- ☐ Hydrogen ion (acidosis)
- ☐ Hypoglycemia or hyperglycemia
- Tension pneumothorax
- Tamponade (Cardiac)
- Thrombosis (Cardiac, Pulmonary)
- Toxins
- ☐ Trauma
- ☐ Tablets (Drug Overdose)

Termination of Resuscitation (TOR):

- Refer to *Death & Criteria for Withholding Resuscitation protocol.*
- Termination of resuscitative efforts is a Medical Control decision only.
- Consider contacting Medical Control to request TOR if the arrest was not witnessed by EMS and after 20 minutes of continuous CPR:
  1) There has been no return of spontaneous circulation (ROSC).
     AND
  2) No shocks were delivered.

AHA PEDIATRIC CPR ALGORITHM

(For reference only)



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Spinal Motion Restriction

INDICATIONS

- Initiate Spinal Motional Restriction (SMR) for any patient with non-penetrating trauma (including falls) **AND** at least one of the following:
  - ADULT:
    - Acutely altered level of consciousness (GCS < 15 or evidence of intoxication)
    - Midline neck or back pain and/or tenderness
    - Focal neurologic signs and/or symptoms (e.g. numbness or motor weakness)
    - Anatomic deformity of the spine
    - Distracting circumstances or injury
  - PEDIATRIC:
    - Complaint of neck pain or apparent discomfort/tenderness
    - Torticollis
    - Acute neurologic deficit
    - Altered mental status (GCS < 15, evidence of intoxication, agitation, decreased respirations, somnolence, etc)
    - High-risk motor vehicle accidents, high-impact diving injuries, or significant torso injuries.
- There is no role for SMR in isolated penetrating trauma.

PROCEDURE

EMR	Maintain a patent airway while manually stabilizing the cervical spine until an appropriately sized cervical collar or alternative is applied. Maintain alignment of the head, neck, and torso at all times.	**EMR**
EMR	Perform a focused neurologic assessment including GCS, motor, and sensory function.	**EMR**
EMR	Assess distal perfusion.	**EMR**
EMR	If necessary to lift/carry/maneuver the patient, utilize a long backboard, scoop stretcher, or extrication device with straps when feasible. Minimize flexion, extension, and rotation of the spine.	**EMR**
EMR	Once on the stretcher, the backboard, scoop stretcher, or extrication device may be removed. Consider leaving the patient on a long backboard to reduce the number of necessary movements if suspicion for injury is high or transport time is short.	**EMR**
EMR	SMR cannot be properly achieved with the patient in a sitting position. If elevation of the head is required, the device used to stabilize the spine should be elevated at the head while maintaining alignment of the neck and torso.	**EMR**
MC	Contact Medical Control for guidance if the need for SMR is unclear.	**MC**

Spinal Motion Restriction

PEARLS

- Apply padding and/or a shoulder roll for pediatric patients to minimize neck flexion.
- Patients in the late 2nd and 3rd trimester of pregnancy should be transported with padding under the right side to displace the uterus from the vena cava (turned slightly to the left).
- Patients who are ambulatory at the scene may or may not require SMR. If the patient is ambulatory and meets the criteria above for SMR, they may be assisted into a supine position on the stretcher while minimizing movement of the spine to the maximum extent possible.
- For patients seated in a vehicle or other confined space, spinal motion restriction may be best achieved through self-extrication with provider assistance, when possible.
- For further information see: Spinal Motion Restriction in the Trauma Patient – A Joint Position Statement by ACS-COT, ACEP, and NAEMSP.

Surgical Airway

INDICATIONS

- Inability to oxygenate by less invasive means.
- Surgical cricothyrotomy: Greater than approximately 12 years old or greater than 35 - 40 kg
- Needle cricothyrotomy: Less than approximately 12 years old or less than 35 - 40 kg

PROCEDURE

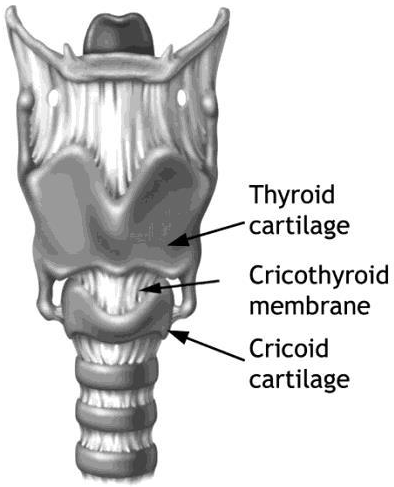
Surgical Cricothyrotomy		
P	Position the patient supine, expose, and cleanse the anterior neck. Use the non-dominant hand to identify and stabilize the thyroid cartilage and use the index finger to palpate the cricothyroid membrane.	P
P	Make a vertical incision (2 – 3 cm) across the cricothyroid membrane.	P
P	Make a horizontal incision through the cricothyroid membrane (1 – 2 cm) and place the non-dominant index finger into the airway.	P
P	Pass an endotracheal tube introducer / bougie into the trachea and withdraw the index finger.	P
P	Pass an endotracheal tube (size 4-0 to 6-0) over the bougie and withdraw the bougie.	P
P	Ventilate the patient and confirm / monitor placement with continuous ETCO2 box-waveform and SpO2. Ensure presence of bilateral breath sounds and secure the tube. Consider continuous manual stabilization.	P
MC	Contact Medical Control and transport to the closest Emergency Department if airway cannot be secured.	MC

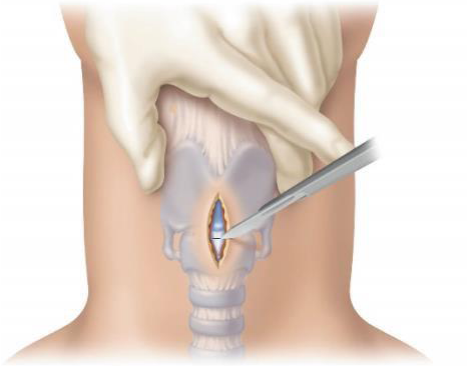
Needle Cricothyrotomy		
P	Position the patient supine, expose and cleanse the anterior neck. Use the non-dominant hand to identify and stabilize the thyroid cartilage and use the index finger to palpate the cricothyroid membrane.	P
P	Attach a syringe filled with 0.9% Sodium Chloride onto a 14-guage catheter-needle. While aspirating the syringe, insert the needle at a 45-degree angle inferiorly through the cricothyroid membrane. When the trachea is entered, air will be aspirated easily. Do not advance the needle any further.	P
P	Advance the catheter over the needle, then withdraw the needle. Do not bend/kink the catheter.	P
P	Attach an adapter to the catheter and connect to an oxygen source. *	P
P	Ventilate the patient and confirm / monitor placement with continuous ETCO2 box-waveform and SpO2. Ensure presence of bilateral breath sounds. Maintain continuous manual stabilization of the catheter.	P
MC	Contact Medical Control and transport to the closest Emergency Department.	MC

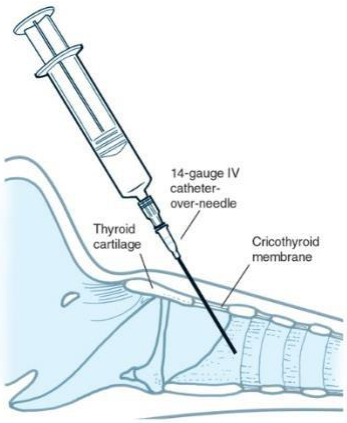
Surgical Airway

PEARLS

- * A variety of options exist to connect a 14-gauge needle to an oxygen source. The best option depends on the size and position of the patient and lung compliance. Given the clinicalcircumstance, the best option is likely to be utilizing whichever tools are most readily and rapidly available. The most readily available adapters are usually:
    - Attach a 3-0 endotracheal tube adaptor directly to the catheter. Ventilate with BVM.
    - Attach a 3 mL syringe to the catheter, remove the plunger, then attach a 7-0 endotracheal tube adaptor to the syringe. Ventilate with BVM.
    - Attach a 10 mL syringe to the catheter, remove the plunger, then insert a 7-0 endotracheal tube into the syringe and inflate the balloon. Ventilate with BVM.
- It is unlikely a patient will be able to be ventilated adequately via needle cricothyrotomy. Prioritize oxygenation while avoiding barotrauma. Do not over-ventilate. A more definitive airway is required – do not delay transport to the closest emergency department.
- If a surgical airway is performed, clearly document consideration of or attempts to manage the airway by less invasive means.
- If a patient cannot be oxygenated by less invasive means, move immediately to surgical airway management.
- Bleeding during or after a surgical airway is common. Utilize in-line suction to clear the airway as necessary.







Taser Barb Removal

INDICATIONS

- Removal of Taser barbs imbedded in the skin of a patient requiring no other treatment and refusing transport to the hospital.

PROCEDURE

EMT	Coordinate with law enforcement to ensure the weapon and patient are rendered safe to proceed. Refer to *Behavioral Emergencies* protocol and *Patient Restraint* policy, as needed.	**EMT**
EMT	Ensure the Taser cartridge is removed from the weapon or wires are cut prior to removing the darts.	**EMT**
EMT	Assess for injuries associated with burns, electrocution, and/or blunt trauma. Consider 12-Lead ECG.	**EMT**
EMT	Locate and expose both darts. If the darts have penetrated the eye, face, neck, breast, axilla, genitals, hands, or feet, leave them in place and transport to an Emergency Department for removal.	**EMT**
EMT	Use one hand to hold the skin around the barb taut. With the other hand, use a hemostat or forceps to grasp the electrode shaft. Pull straight out with a gentle, quick motion. Ensure the barb is intact.	**EMT**
EMT	Safely dispose of the dart in an appropriate container for sharp biohazards.	**EMT**
EMT	Provide wound care, as necessary. Apply a bandage over the wound sites.	**EMT**
EMT	If the barb cannot be safely, easily, and completely removed, transport to an Emergency Department for removal.	**EMT**

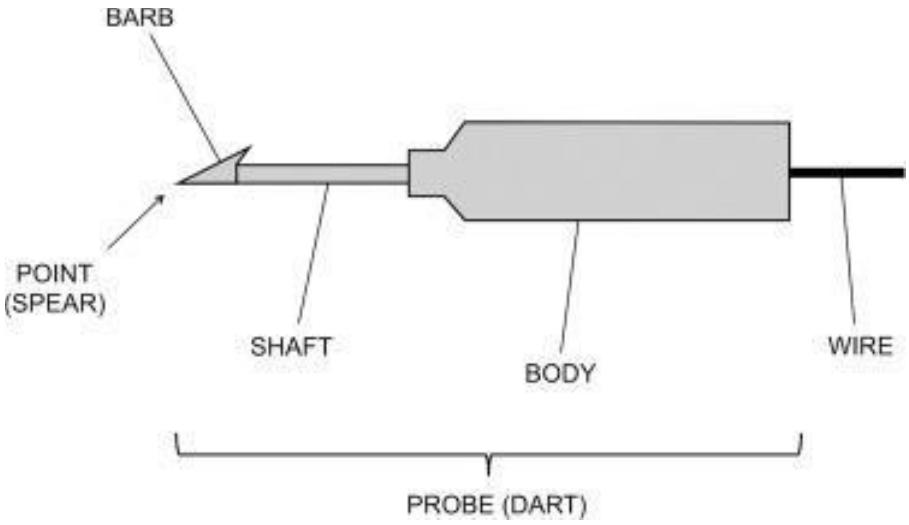
PEARLS

- Consider shallow underlying structures prior to removal of any Taser barb. If removal may cause additional damage to underlying anatomy (e.g. neuro-vascular structures, tendons), do not attempt removal. When in doubt, contact Medical Control for guidance.
- Ensure the patient has capacity to decline further assessment/transport and clearly document the circumstances of that decision.
- Ensure the entire barb is removed. If the barb is broken, the entire barb cannot accounted for, or there is any concern for a retained foreign body, transport for further assessment should be recommended.

Taser Barb Removal

X26 probe

X2 probe



Tourniquet Application

INDICATIONS

- Any patient with life-threatening hemorrhage from an extremity which cannot be controlled by other means, such as wound packing and direct pressure, due to extent of injury or clinical/operational circumstances.

PROCEDURE

EMR	Completely expose the injury and assess for additional injuries.	**EMR**
EMR	Position the tourniquet proximal to the injury. Do not place across a joint or open fracture.	**EMR**
EMR	Tighten the tourniquet until bleeding stops and distal pulses are absent.	**EMR**
EMR	If bleeding is not controlled, apply a second tourniquet proximal and adjacent to the first.	**EMR**
EMR	Clearly indicate the time and date of application. Ensure the tourniquet remains **exposed and visible.**	**EMR**
EMR	Once applied, do not remove or loosen the tourniquet(s). Additional tightening may be required.	**EMR**
EMR	Consider pain control. Refer to *Pain Control* protocol.	**EMR**
MC	If hemorrhage cannot be controlled, transport immediately to the nearest emergency department and contact Medical Control for guidance.	**MC**

PEARLS

- Ensure location and time of application of any tourniquet is provided to the receiving physician during patient turnover.
- For crush/harness/suspension injuries, consider loosely positioning tourniquets prior to release/extrication. Tighten if hemorrhage or hemodynamic collapse (crush syndrome) occur. If, due to ongoing extrication, access to the patient will continue to be limited following release of the crushed extremities rendering patient care impossible (e.g. high angle rescue from a suspended harness), consider applying tourniquets prior to release.
- Use of an approved commercial device is preferred. If one is not available, an appropriately sized blood pressure cuff inflated to a pressure sufficient to stop bleeding is an acceptable alternative. Improvised tourniquets are unreliable and generally not recommended.

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Transcutaneous Pacing

INDICATIONS

- Any adult patient with persistent symptomatic bradycardia (HR < 60 bpm)
- Consider transthoracic pacing for pediatric patients over 28 days old, with persistent symptomatic bradycardia despite adequate ventilation, high-quality chest compressions, and two weight-based doses each of Epinephrine and Atropine.

PROCEDURE

I	Remove any clothing covering the chest. Dry and/or shave the area, if necessary. Apply 4-Lead ECG and confirm rhythm.	I
I	Apply multi-function pads in anterior/posterior position and set cardiac monitor to pacing mode.	I
I	Set pacing rate at 80 beats per minute. Set initial current output to 50 mA. Confirm pacer "spikes" appear on cardiac monitor.	I
I	Slowly increase the pacer output (10 mA / 10 seconds) until electrical capture is achieved. Confirm mechanical capture by palpating femoral pulses. Reassess the patient.	I
MC	If mechanical capture is not achieved despite maximum electrical output, discontinue pacing. Refer to *Symptomatic Bradycardia* protocol and contact Medical Control for guidance.	MC

PEARLS

- Ventricular fibrillation and ventricular tachycardia are rare complications.
- Pacing may stimulate the diaphragm, causing involuntary spasm (hiccups).
- Consider sedation or pain control prior to initiating pacing. Due to the risk of over-sedation, do not administer *both* opiates and benzodiazepines.
- Pacing is rarely needed or indicated for patients under 12 years old. Strongly consider consulting with medical control at a pediatric emergency department (e.g. VCU Children's Hospital or CHKD) for guidance.
    - VCU COR: 804-828-3989, ask to speak with a Medical Control physician in the pediatric Emergency Department.
    - CHKD: 757-668-8000
- Symptomatic bradycardia includes any patient over 28 days old with a sustained ventricular rate less than 60 BPM and one or more of the following signs or symptoms of inadequate perfusion despite adequate oxygenation and ventilation:
    - Hypotension
    - Chest pain
    - AMS/Decreased responsiveness
    - $ETCO_2 < 25$
    - Dyspnea / Pulmonary Edema
    - Diaphoresis

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Vaccination Administration by EMS Providers

PURPOSE:

To provide guidance to Virginia Emergency Medical Services (EMS) Operational Medical Directors (OMD), EMS agencies, and EMS providers within the Peninsulas EMS Regional Council to administer vaccinations for public health and safety by appropriately certified, authorized, and supervised EMS providers.

RESPONSIBILITIES:

OMD

- Ensure the vaccination program includes:
  - management and handling of vaccine.
  - registration with VIIS.
  - development/approval of protocols for training and authorization of vaccinators
  - provision of specific vaccine information/education and informed consent to vaccine recipients.
  - specific procedures for administration of vaccine and management of any vaccination related complications.
  - development and approval of appropriate record keeping.
  - reporting of vaccination information and any adverse events or complications.
  - implementation of an ongoing quality management program for the vaccination program
- Function as the supervising physician for the EMS vaccination program and "prescriber" as identified in the *Code of Virginia* §§ 54.1-3303 and 54.1-3408, if not participating in a local health district, pharmacy, or other health system vaccination program by MOU.

Agency

- Hold current licensure as an ALS agency in Virginia.
- Establish and maintain a MOU with the local health district, pharmacy, or other health system OR be participating in a registered EMS program.
- Maintain proof of competency for each vaccinator.
- Ensure record keeping for all vaccinations conform to VIIS guidelines.
- Report any adverse reactions through the Vaccine Adverse Event Reporting System (VAERS).

EMS Provider

- Hold a valid, unrestricted Advanced Life Support certificate issued by the Virginia Commissioner of Health.
- Must be affiliated with the Virginia EMS agency developing/implementing the vaccination program.
- Must be individually approved by their agency OMD as a vaccinator.
- Must follow protocols approved by their OMD for vaccine administration.

Vaccination Administration by EMS Providers

INDICATIONS

- Patient meets current vaccine criteria.

PRECAUTIONS

- Refer to precautions per vaccine manufacturer's guidelines.

CONTRAINDICATIONS

- Refer to contraindications per vaccine manufacturer's guidelines.

PROCEDURE

- Don PPE per CDC Guidelines, specific vaccine recommendations, and agency guidelines.
- Ensure patient meets current vaccine criteria.
- Obtain patient/patient guardian informed consent.
- Screen patient for vaccine specific precautions and contraindications.
- If patient meets any of the precautions, confirm patient has consulted with their healthcare provider prior to receiving vaccine.
- Explain procedure to the patient.
- Provide vaccine statement.
- Prepare to administer vaccine.
- Administer vaccine per manufacturer guidelines.
- Conduct observation for adverse effects such as allergic reactions and anaphylaxis (at least 15 minutes or as recommended by manufacturer).
- If adverse effect(s) occur, refer to appropriate *PEMS Patient Care Protocol(s)*. Document and report adverse effect(s) to the Vaccine Adverse Effects Reporting System (VAERS).
- Document vaccine administration per the Virginia Immunization Information System (VIIS).

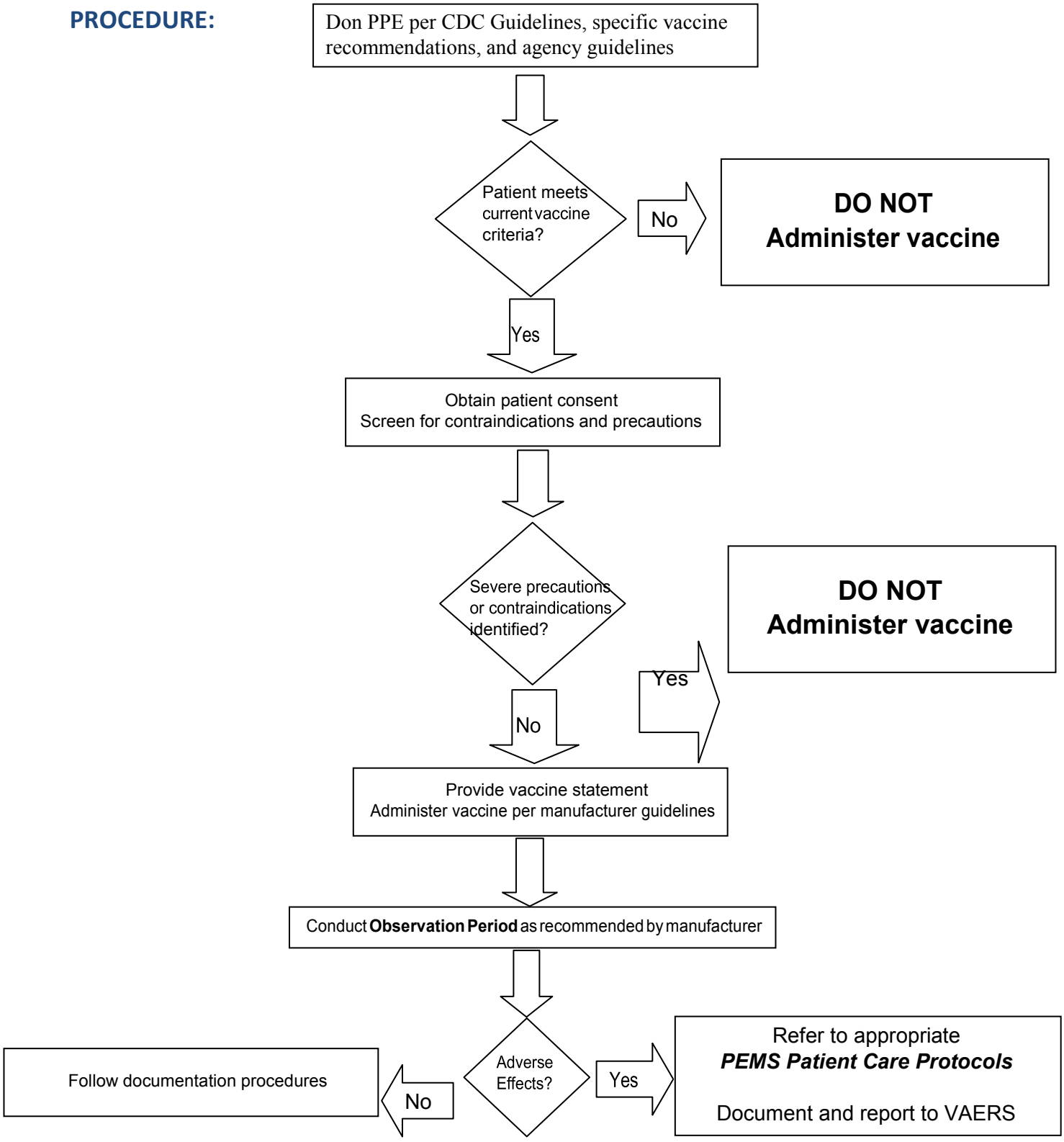
PEARLS

Vaccines provided under an Emergency Use Authorization requires that each recipient receive a vaccine- specific EUA Fact Sheet with the following information:

- Basic information on the disease symptoms, and what to discuss with a healthcare provider before vaccination
- Who should and should not receive the vaccine
- That recipients have the choice to receive or refuse the vaccine
- Dosage and vaccine series information
- Risks and benefits of the vaccine, including common side effects
- Information on reporting side effects to VAERS
- An explanation of what an EUA is and why it is issued
- Any approved available alternatives for preventing the disease
- Additional resources

Vaccination Administration by EMS Providers

PROCEDURE:



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