MetroCare Services

Abilene Fire Department

City of Abilene
Texas

Treatment Protocols

Version 4.6

Adult and Pediatric Protocols

Effective 03/31/2020

First Responder and Transport Protocols

Introduction

This document serves as the method DSHS-registered first responder and transport entities under the medical direction of Robert Lawson, MD provide innovative and cutting-edge pre-hospital patient care. These protocols incorporate evidence-based guidelines and proven medical practices for patient care. While it is impossible to address every possible variation of disease and/or trauma injury, these policies, procedures, and protocols do provide a foundation for treatment of the vast majority of patients we encounter. Certainly, education, experience, and clinical judgment will assist us while we provide the highest quality of pre-hospital patient care. As always, on-line medical control is available for those patients with a chief complaint or condition that does not fall within the scope of this document. Although our practices will continue to evolve in the years to come, we should always keep the patient's outcome as the main focus.

Acknowledgements

These protocols have largely been adopted from UMC EMS and Lubbock Fire Rescue in Lubbock, TX and used with permission. Updates and changes have been made with the following committee members:

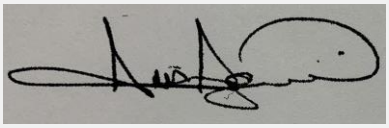
Robert Lawson, MD
Will B. Hendon, LP
Derek Briggs EMT-P

Basic design based on Wake County, North Carolina Emergency Medical Service protocols. Used with permission.

These protocols have been approved for credentialed providers of MetroCare and the Abilene Fire Department.

Robert Lawson, MD
Medical Director

Candelario Flores
Fire Chief, Abilene Fire Department



Luis Aguilar, LP
Operations Manager, MetroCare

Effective date: July 15th, 2019

Foundation of Practice

Definition of a Patient

A patient is an individual requesting or potentially needing medical evaluation and/or treatment. It is the provider's responsibility to ensure that all potential patients, regardless of the size of the event, will be offered an opportunity for a medical evaluation, treatment and/or transport. A pediatric patient is one who has not reached puberty.

Rights of a Patient

Once we have begun collecting information regarding a patient encounter, it is important for us to take every precaution to protect the patient's **confidentiality**. While we certainly have HIPAA issues to be considered, we also have a ethical obligation to protect the patient's confidential information. This applies not only to sharing written information, but also requires us to monitor our speech so as not to inadvertently share patient information in conversations.

These are situations regarding **consent** that deserve special consideration:

1. **Minors:**
   a. Patient under the age of 18 may not consent to or refuse medical treatment or transport unless special circumstances exist (outlined below). The following groups may consent for the treatment of a minor:
      i. Mother, father, legal guardian, or step-parent.
      ii. The leader of a group of children who is in possession of written permission from the parent authorizing emergency medical treatment.
   b. In the State of Texas, no consent is required prior to medical treatment under any of the following circumstances:
      i. The parent, legal guardian or step-parent cannot be contacted with reasonable effort.
      ii. The identity of the child is unknown and a delay in medical treatment may endanger the life of the child.
      iii. The effort in attempting to contact the parent, legal guardian or step-parent will delay medical care and endanger the life of the child.
   c. In the State of Texas and under the following circumstances, a minor may consent to or refuse medical treatment without the knowledge of the parent if he or she is:
      i. Pregnant
      ii. Emancipated minor

2. **Life-threating situations without an ability to communicate:**
   a. ***Implied Consent*** -A patient of any age who is unable to effectively communicate due to injury, accident, illness or unconsciousness AND is suffering from a possible life-threatening event.
      i. The principle of implied consent presumes that if the individual with the injury or illness was conscious and able to communicate, he or she would consent to emergency treatment.
      ii. In these situations, the patient may be transported without consent. Law enforcement, physical and/or chemical restraint may be required.

3. **Potentially life-threatening situations:**
   a. Patients in this category generally fall into two groups:
      i. The alert and oriented patient who has a concerning presentation and refused treatment and/or transport (e.g. chest pain patient showing signs of an AMI on the 12-lead ECG).
      ii. The intoxicated patient who does not have what reasonable appears to be a life-threatening condition (e.g. intoxicated patient with a laceration to the head).

   These patients should be treated as follows:
      i. Determine the patient's orientation to person, place, and time. Document this finding in the PCR.
      ii. Determine the factor(s) influencing the patient's refusal of medical care. Resolve the one in your power, if possible. For example, if the patient does not want an IV, offer transport without attempting venipuncture.
      iii. Attempt to communicate with spouse / family / significant other, if available.
      iv. If the patient still refuses treatment and/or transport, consider contacting law enforcement and/or on-line medical control, if applicable.
      v. If patient continues to refuse, clearly explain the risks of refusal, risks associated with delayed medical evaluation by a physician, and have the patient repeat their concerns to you. Document the outcome.

Automatic Notification of the Medical Director

As we work together to provide the highest level of patient care possible, any incident that has a potentially negative or adverse effect on the patient or EMS system must be immediately reported to the Medical Director or, in his absence, his designee as soon as the response has been completed. Notification includes contact with a shift supervisor and email notification to the Medical Director. Urgent notification also includes calling the Medical Director by phone as soon as feasible. Events requiring notification include:

i. Cardiac and/or respiratory arrest secondary to administration of a narcotic.
ii. Cardiac arrest after administration of an antiarrhythmic medication to a previously stable patient.
iii. Incorrect medication administration with complications that developed as a result.
iv. Any cardiac or respiratory arrest secondary to a patient being physically or chemically restrained.
v. System provider operating outside of his or her scope of practice . The scope of practice not only includes the State of Texas, but our EMS system's scope of practice as well.
vi. Unrecognized misplacement of an advanced airway.
vii. Any EMS vehicle wreck that involves injury of EMS personnel, first responders, and/or patients.
viii. Any significant injury to EMS personnel, first responders, or patients while delivering patient care (example: hit by a vehicle while on an accident scene).

Disaster Situations:

Any time a mass casualty incident (MCI) has been declared, the Medical Director should be contacted immediately. The Medical Director should also be given early notification of any special situations including (but not limited to): bomb threats, multiple alarm fires, building collapses with possible entrapments, health care facility blackouts, and AMBUS deployment for patient care/transport. The Medical Director will make a reasonable effort to be on scene for such calls to not only be instrumental in patient care on scene, but to also help coordinate care at local hospitals.

Guidelines for Protocol Use

In general, the protocols are divided into adult and pediatric sections as well as medical, trauma, and other special groups. For the pediatric patients, the appropriate pediatric protocol should be used if one exists. Unless otherwise specified in the protocol, a "pediatric patient" is a patient ranging from newborn to before puberty (early to mid teenage years). If a pediatric protocol is not available for a situation, use the adult protocol for guidance and contact on-line medical control for any medical orders. Never exceed the adult dose for medication administration.

The protocols are divided into three sections:

i. The upper section includes "Medical History", "Signs and Symptoms", and "Differential" areas. This information helps guide treatment for a specific chief complaint.
ii. The center section describes the essentials of patient care in a flow chart style.
iii. The lower section contains "PEARLS", which offer additional guidance and advice for patient care based on experience and common medical knowledge.

These protocols are intended for on-duty personnel at MetroCare and Abilene Fire Department only. If a provider provides mutual aid to other EMS or first responder agencies, these protocols will be used for patient care by the above personnel. This will ensure that each patient will receive the most advanced and progressive patient care. In a mass casualty / regional / state or national response situation, these protocols will be used by credentialed staff.

In summary, these protocols are the foundation of our pre-hospital medical care. Your experience, education, and guidance from these protocols will provide appropriate and timely treatment for our patients. We are proud of our unique practice of pre-hospital medicine and patient care. Thank you for providing prompt, compassionate, and clinically excellent care. **These protocols may have procedures and equipment listed that are not authorized or available to all system units and personnel. All personnel are expected to operate to their level of training and their available equipment.**

Sincerely,

Robert Lawson, MD
EMS Medical Director

Effective date: July 15th, 2019

Abilene Fire Department/MetroCare Services

Treatment Protocols – Community Spread COVID-19 Policy

Due to the community spread of COVID-19 in the Abilene area, the following procedures are not to be performed due to increased risk of aerosolization of the SARS-CoV-2 virus in both symptomatic and asymptomatic individuals:

Any nebulized medication administration (including nebulized saline)

CPAP

BiPAP

Intubations should be performed with one attempt utilizing VL ONLY. If this fails move to iGel placement. Direct Laryngoscopy SHALL NOT be performed.

In addition:

Patient on ventilators must have viral filter on ventilator set prior to EMS assuming care.

Albuterol treatments shall be replaced with Terbutaline 0.25mg SQ (if available.)

Albuterol, Nebulizers, and CPAP equipment may be removed from apparatus while this notice is in effect. Also, when available, each unit shall carry at least one vial containing 1mg of Terbutaline and appropriate SQ needles.

Robert Lawson M.D.
Medical Director
Abilene Fire Department/MetroCare Services

3/31/20
Date

Table of Contents

Medical Standard Policies	
Air Transport	Policy 1
Baby Moses Law	Policy 2
Criteria for Death / Withholding Resuscitation	Policy 3
DNR and Advanced Directives	Policy 4
Documentation of the Patient Care Report (PCR)	Policy 5
Helmet Removal (Sport / Motorcycle)	Policy 6
Non-Paramedic Transports	Policy 7
Patients Without a Protocol	Policy 8
Physician on Scene	Policy 9
Poison Center	Policy 10
Safe Transport of the Pediatric Patient	Policy 11
Scope of Practice	Policy 12
Suspected Patient Neglect / Abuse Reporting	Policy 13
Vital Signs	Policy 14
Crime Scene	Policy 15
Emergency Medical Dispatch	Policy 16
Interfacility Transfers	Policy 17
Memorandum of Transfer	Policy 18
On Scene Authority	Policy 19
Patients with Special HC Needs	Policy 20
Provider Credentialing	Policy 21
Refusal of Treatment and/or Transport	Policy 22
Transport Destination Decision	Policy 23
Clinical Event Review	Policy 24
Online Medical Control	Policy 25

Table of Contents

Standard Procedure (Skill)	
Airway: BIAD	Procedure 1
Airway: CPAP	Procedure 2
Airway: Endotracheal Tube Introducer (Bougie)	Procedure 3
Airway: Orotracheal Intubation	Procedure 4
Airway: Cricothyrotomy – Needle (Pediatric)	Procedure 5
Airway: Cricothyrotomy – Surgical (Adult)	Procedure 6
Airway: Suctioning - Basic	Procedure 7
Airway: Suctioning - Tracheal	Procedure 8
Airway / Breathing: Capnography - Waveform	Procedure 9
Airway / Breathing: Nebulizer Inhalation Therapy	Procedure 10
Airway / Breathing: Pulse Oximetry	Procedure 11
Assessment: Adult	Procedure 12
Assessment: APGAR Scoring	Procedure 13
Assessment: Blood Glucose Analysis	Procedure 14
Assessment: Cincinnati Stroke Scale	Procedure 15
Assessment: ECG and 12-Lead Placement	Procedure 16
Assessment: GCS and RTS Graphs	Procedure 17
Assessment: Orthostatic Blood Pressure Measurement	Procedure 18
Assessment: Pain Assessment and Documentation	Procedure 19
Assessment: Pediatric	Procedure 20
Assessment: Temperature Measurement	Procedure 21
Cardiac: 12-Lead ECG and Code STEMI Activation	Procedure 22
Cardiac: Defibrillation: Automated	Procedure 23
Cardiac: Double Sequential External Defibrillation	Procedure 24
Cardiac: Defibrillation: Manual	Procedure 25
Cardiac: External Pacing	Procedure 26
Cardiac: Synchronized Cardioversion	Procedure 27
Injections: Subcutaneous and Intramuscular	Procedure 28
Restraints: Physical and Chemical	Procedure 29
Treatment: Chest Decompression	Procedure 30
Treatment: Childbirth	Procedure 31
Treatment: CPR Standards	Procedure 32
Treatment: Deceased Body	Procedure 33
Treatment: Transport of the Decontaminated Patient	Procedure 34
Treatment: Discontinuation of Pre-Hospital Medical Resuscitation	Procedure 35
Treatment: Gastric Tube Insertion	Procedure 36

Table of Contents

Standard Procedure (Continued)

Treatment: Medication Administration	Procedure 37
Treatment: Spinal Immobilization	Procedure 38
Treatment: Splinting	Procedure 39
Venous Access: Blood Draw	Procedure 40
Venous Access: Central Line Maintenance	Procedure 41
Venous Access: External Jugular Access	Procedure 42
Venous Access: Existing Catheters	Procedure 43
Venous Access: Extremity	Procedure 44
Venous Access: Intraosseous	Procedure 45
Wound Care: Cleaning of General Wounds	Procedure 46
Wound Care: Taser Probe Removal	Procedure 47
Wound Care: Tourniquet	Procedure 48
Treatment: Ventilator Management	Procedure 49
Treatment: LUCAS CPR Device	Procedure 50
Treatment: ResQPOD Impedance Threshold Device	Procedure 51
Treatment: ResQPUMP CPR Compression Device	Procedure 52

Adult Table of Contents

Adult Cardiac Section Protocols

Cardiac Arrest	Protocol 1
Adult Asystole / Pulseless Electrical Activity	Protocol 2
Ventricular Fibrillation / Pulseless Ventricular Tachycardia	Protocol 3
Post Arrest Resuscitation	Protocol 4
Targeted Temperature Management	Protocol 5
Chest Pain / STEMI	Protocol 6
Bradycardia	Protocol 7
Narrow Complex Tachycardia (SVT) and Atrial Fibrillation with RVR	Protocol 8
Wide Complex Tachycardia (V-Tach)	Protocol 9
LVAD	Protocol 10

Adult Medical Section Protocols

Universal Patient Care	Protocol 1
Adult Basic Airway	Protocol 2
Adult Failed Airway	Protocol 3
Delayed Sequence intubation	Protocol 4
Altered Mental Status	Protocol 5
Overdose / Toxic Ingestion	Protocol 6
Carbon Monoxide / Cyanide Exposure	Protocol 7
Diabetic Adult	Protocol 8
Fever / Sepsis	Protocol 9
Emerging Infectious Disease (suspected EVD)	Protocol 10
Emerging Infectious Disease (suspected COVID-19) No Transport Policy	Protocol 10B
Allergic Reaction	Protocol 11
Suspected Stroke	Protocol 12
Seizure	Protocol 13
Non-Traumatic Abdominal Pain	Protocol 14
Vomiting and Diarrhea	Protocol 15
Hypertension	Protocol 16
Hypotension / Shock	Protocol 17
Hypothermia / Frostbite	Protocol 18
Hyperthermia	Protocol 19
Combative Patient	Protocol 20
Pain Management	Protocol 21

Adult Table of Contents

Adult Respiratory Section Protocols	
Asthma / COPD	Protocol 1
Congestive Heart Failure / Pulmonary Edema	Protocol 2
OB / GYN	
Obstetrical Emergency	Protocol 1
Childbirth / Labor	Protocol 2
Adult Trauma Section Protocols	
General Trauma	Protocol 1
Traumatic Event with Entrapment	Protocol 2
Traumatic Arrest	Protocol 3
Extremity Trauma	Protocol 4
Bites and Envenomations	Protocol 5
Drowning / Submersion Injuries	Protocol 6
Eye Injury / Complaint	Protocol 7
Adult Burn	Protocol 8
Chemical Burn	Protocol 9
Electrical Burn	Protocol 10
Spinal Immobilization Clearance	Protocol 11
SALT Triage	Protocol 12

Pediatric Table of Contents

Pediatric Cardiac Section Protocols	
Pediatric Pulseless Arrest	Protocol 1
Pediatric Asystole/PEA	Protocol 2
Pediatric Ventricular Fibrillation / Pulseless Ventricular Tachycardia	Protocol 3
Pediatric Post Resuscitation	Protocol 4
Pediatric Bradycardia	Protocol 5
Pediatric Tachycardia	Protocol 6
Pediatric LVAD	Protocol 7
Pediatric Medical Section Protocols	
Pediatric Universal Patient Care	Protocol 1
Pediatric Airway	Protocol 2
Pediatric Delayed Sequence Intubation	Protocol 3
Pediatric Altered Mental Status	Protocol 4
Pediatric Overdose / Toxic Ingestion	Protocol 5
Pediatric Carbon Monoxide / Cyanide Exposure	Protocol 6
Pediatric Diabetic	Protocol 7
Pediatric Fever / Sepsis	Protocol 8
Pediatric Emerging Infectious Disease (suspected)	Protocol 9
Pediatric Allergic Reaction	Protocol 10
Pediatric Seizure	Protocol 11
Pediatric Non-Traumatic Abdominal Pain	Protocol 12
Pediatric Vomiting and Diarrhea	Protocol 13
Pediatric Hypotension / Shock	Protocol 14
Pediatric Hypothermia / Frostbite	Protocol 15
Pediatric Hyperthermia	Protocol 16
Pediatric Combative Patient	Protocol 17
Pediatric Pain Management	Protocol 18
Pediatric Respiratory Section Protocols	
Pediatric Pulmonary Edema / CHF	Protocol 1
Pediatric Reactive Airway Disease	Protocol 2
Pediatric Newborn Section Protocols	
Newly Born	Protocol 1

Pediatric Table of Contents and Appendix

Pediatric Trauma Section Protocols	
Pediatric General Trauma	Protocol 1
Pediatric Traumatic Event with Entrapment	Protocol 2
Pediatric Traumatic Arrest	Protocol 3
Pediatric Extremity Trauma	Protocol 4
Pediatric Bites and Envenomations	Protocol 5
Pediatric Drowning / Submersion Injuries	Protocol 6
Pediatric Eye Injury / Complaint	Protocol 7
Pediatric General Burns (All types)	Protocol 8
Pediatric Spinal Immobilization Clearance	Protocol 9
Appendix	
Dopamine Infusion	Appendix 1
Epinephrine / Levophed Infusion	Appendix 2
List of Approved Abbreviations	Appendix 3
Drug Formulary	Appendix 4
EMS Ambulance Equipment and Medication List	Appendix 5
Quick Reference: Age-Based Treatment	Appendix 6
Reference: Proper Personal Protective Equipment (PPE) Use	Appendix 7
CDC Instructions on Donning and Doffing PPE (Ebola Use)	Appendix 8
Central Venous Catheters	Appendix 9
Protocol Tip Sheet	Appendix 10
CCT TRANSPORTS	Appendix 11
Medication Shortage Protocols	Appendix 12

Criteria for clinically-appropriate use of medical helicopter transport

Decision-making criteria for on-scene air transport should be based on the standards set by the Trauma System Plan, Regional Cardiac Plan, and the Regional Stroke Plan.

Air medical transport may be appropriate if transport time will exceed 25 minutes and the patient meets any of the following criteria:

1. Trauma patients who meet Trauma activation criteria.
2. Suspected stroke patients with positive Cincinnati Stroke Scale findings and the onset of symptoms was less than 3 hours upon EMS arrival.
3. Suspected STEMI patients with code STEMI activation.

Other indications for helicopter transport:

1. Hazardous or impassible road conditions resulting in significant ground transport delays.
2. MCI with a high number of RED/priority one patients overwhelming the available ground EMS units.
3. A combination of lengthy extrication and extended ground transport time.

The provider should consider all of the following when deciding on the need for air transport:

1. Time for helicopter response.
2. On scene time:
   a. Distance from patient to landing zone.
   b. Patient turnover process.
   c. Need for invasive procedures before helicopter liftoff.
3. Transport time to the appropriate facility.

Total helicopter time should be significantly less than ground transport time in order to be clinically beneficial to the patient.

"No Fly" patient conditions:

1. Medical or traumatic arrest patients.
2. Unstable post-ROSC patients.
3. HazMat situations.

If the helicopter does not arrive prior to extrication of the patient, the patient should be immediately placed in the ambulance and transport initiated.

Under NO circumstances will transport of a patient be delayed to use the helicopter.

Air Transport

Guidelines for the use of air transport based on distance

10 mile radius from the medical center

As a general rule, patients within a 10 mile radius from the medical center will not benefit clinically from air transport.

15 mile radius from the medical center

Except under extreme circumstances, transports within the 15 mile radius will rarely exceed 25 minutes.

20 mile radius from the medical center

Transports between the 15 mile and 20 mile radius are most likely to be impacted by poor driving conditions and difficult access to highway systems that can result in extended transport times.

Patients outside of the 20 mile radius are most likely to benefit from air transport.

Baby Moses Law

Policy:

To provide guidance for the Baby Moses Law issued by the State of Texas.

Purpose:

- Provide guidelines for accepting and providing care to protect an unwanted infant.
- Allows parents who are unable to care for the infant a safe and legal way to assure the baby's continued care and safety.

Procedure:

1. The baby must be 60 days old or younger.*
2. The infant must be unharmed and safe.*
3. The infant may be taken to any hospital, fire station, or EMS station in the State of Texas.
4. The employee is to ask (not demand) for family and/or medical information to provide any care that the infant may need.
5. If the infant is brought to a fire station, EMS should be contacted to respond to that location. EMS will receive report and assume care and custody of the infant.
6. EMS will transport the infant to the hospital for a full evaluation and medical clearance, even if he or she appears uninjured and in good health.
7. The local police will be contacted by the receiving facility.
8. All encounters and conversations will be documented in the EMS patient care report.

* If any pediatric individual over 60 days old is delivered to an EMS or fire station and/or appears to have been harmed, personnel will take possession of the child. If brought to a fire station, EMS should be immediately dispatched to the location to receive report and assume medical care of the individual. Local law enforcement must be notified immediately by the fire station or EMS personnel who made initial contact with the pediatric individual. EMS must immediately notify their supervisor if not already done so through dispatch.

Texas Baby Moses Hotline: 1-877-904-SAVE (7283)

Criteria for Death / Withholding Resuscitation

Policy:

CPR and ALS treatments are to be withheld only if the patient is obviously dead (per criteria below) or a valid State of Texas Do Not Resuscitate form is present. A Texas Out of Hospital DNR bracelet or necklace found on the patient's body is considered as valid as the DNR form and will be honored by responders. The DNR and Advanced Directives policy offers specific information about the Out of Hospital DNR form, bracelet, and necklace.

Indications:

To withhold resuscitation, one or more of the following must be present:

- Rigor mortis and/or dependent lividity.
- Decapitation.
- Incineration.
- The patient's family or Medical Power of Attorney requests termination of resuscitation. In this case, continue BLS resuscitative efforts and contact medical control for guidance. Medical control will decide whether resuscitative efforts should be continued or terminated.

If the arrest is traumatic in origin, refer to the Traumatic Arrest protocol.

Procedure:

Do not begin resuscitation on any patient who meets the first three criteria listed above. If resuscitative efforts have already begun and one or more of these criteria apply, consider discontinuing resuscitation (paramedic decision only).

Notify law enforcement of the patient's death. In a medical facility with physician presence, notify the patient's physician as well.

If you are unsure whether the patient meets any of the criteria above, begin full resuscitation and follow the appropriate protocol(s). Consider contacting Medical Control for guidance.

DNR and Advanced Directives

Policy:

A patient presenting to any component of the EMS system with a completed original or photocopied State of Texas Out of Hospital Do Not Resuscitate Order (OOH-DNR) shall have the form honored, with CPR and ALS therapy withheld in the event of a cardiac arrest. An approved Texas OOH-DNR bracelet or necklace worn by the patient upon first responder arrival is as valid as the paper OOH-DNR form and must also be honored. Out of state OOH-DNR forms may also be honored if they appear to be complete and only after contacting medical control for authorization to terminate resuscitation.

Therapies that **must** be withheld include:

- Cardiopulmonary resuscitation (CPR)
- Transcutaneous cardiac pacing
- Defibrillation
- Advanced airway management
- Artificial ventilation

An example of an approved Texas OOH-DNR necklace and bracelet. The State of Texas requires either a plastic bracelet or a metal bracelet/ necklace with either the word "Texas", or a representation of the geographical shape of Texas and the word "STOP" imposed over the shape. The phrase, "Do Not Resuscitate" must also be inscribed on the device.

Purpose:

To honor the terminal wishes of the patient and to prevent the initiation of unwanted resuscitation.
Other treatment for reversible conditions and comfort measures should not be withheld.

Procedure:

1. When presented with an OOH-DNR cardiac arrest patient, **all** of the following conditions below must be met in order to honor the DNR. If any one of the criteria below is not met, begin CPR and contact Medical Control immediately:

   - Original State of Texas OOH-DNR form is complete and signed by the patient's physician. The patient's family, Medical Power of Attorney, or the patient's signature must also be on the form. Or, in lieu of the form, the patient is wearing an approved OOH-DNR necklace or bracelet.
   - The patient is not pregnant.
   - There are no suspicious or suspected unnatural circumstances contributing to the patient's death.

2. An OOH-DNR may be overridden by the request of the patient, the patient's guardian, or the patient's on-scene physician. In the state of Texas, at least one family member, the patient's guardian, or the patient's Medical Power of Attorney must be present and request to overrule the OOH-DNR, allowing for the initiation/continuation of resuscitation. The person's name/relationship to patient requesting resuscitation must be documented in the patient care report (PCR).

3. If family members are present and ask that resuscitative efforts be withheld in the absence of an advanced directive or OOH-DNR, determine their relationship to the patient and the patient's history. Begin BLS resuscitation based on appropriate protocol(s) and contact medical control for permission to terminate resuscitative efforts. Document names/relationships in the PCR.

The following documents will not be accepted unless approval has been obtained from on-line Medical Control:

- Advanced directives or living wills
- Directive to physician

A valid DNR directive is to be honored in the following circumstances:

- Inpatient resident of a medical facility (including nursing homes) whose chart includes a written DNR order signed by the patient's physician.
- Outpatient client of a clinic, dialysis center, or home health service whose chart contains written DNR order signed by the patient's physician.
- A patient whose family wishes no resuscitative measures be taken and present a valid original DSHS out-of-Hospital DNR form, or a valid, "Directive to Physician" which states patient does not wish resuscitative measures.
- A patient who is wearing an official DSHS out-of-hospital DNR identification device around their wrist or neck.
- Patients that present out-of-hospital DNR directives or identification devices, where there is no reason to question their authenticity.

A blank Texas OOH-DNR form is provided on the next page as a reference.

Figure: 25 TAC §157.25 (h)(2)

STOP DO NOT RESUSCITATE

OUT-OF-HOSPITAL DO-NOT-RESUSCITATE (OOH-DNR) ORDER

TEXAS DEPARTMENT OF STATE HEALTH SERVICES

This document becomes effective immediately on the date of execution for health care professionals acting in out-of-hospital settings. It remains in effect until the person is pronounced dead by authorized medical or legal authority or the document is revoked. Comfort care will be given as needed.

Person's full legal name _____ Date of birth _____ ☐ Male ☐ Female

A. Declaration of the adult person: I am competent and at least 18 years of age. **I direct that none of the following resuscitation measures be initiated or continued for me: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Person's signature _____ Date _____ Printed name _____

B. Declaration by legal guardian, agent or proxy on behalf of the adult person who is incompetent or otherwise incapable of communication:

I am the: ☐ legal guardian; ☐ agent in a Medical Power of Attorney; OR ☐ proxy in a directive to physicians of the above-noted person who is incompetent or otherwise mentally or physically incapable of communication.

Based upon the known desires of the person, or a determination of the best interest of the person, **I direct that none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Signature _____ Date _____ Printed name _____

C. Declaration by a qualified relative of the adult person who is incompetent or otherwise incapable of communication: I am the above-noted person's:

☐ spouse, ☐ adult child, ☐ parent, OR ☐ nearest living relative, and I am qualified to make this treatment decision under Health and Safety Code §166.088.

To my knowledge the adult person is incompetent or otherwise mentally or physically incapable of communication and is without a legal guardian, agent or proxy. Based upon the known desires of the person or a determination of the best interests of the person, **I direct that none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Signature _____ Date _____ Printed name _____

D. Declaration by physician based on directive to physicians by a person now incompetent or nonwritten communication to the physician by a competent person: I am the above-noted person's attending physician and have:

☐ seen evidence of his/her previously issued directive to physicians by the adult, now incompetent; OR ☐ observed his/her issuance before two witnesses of an OOH-DNR in a nonwritten manner.

I direct that none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

Attending physician's signature _____ Date _____ Printed name _____ Lic# _____

E. Declaration on behalf of the minor person: I am the minor's: ☐ parent; ☐ legal guardian; OR ☐ managing conservator.

A physician has diagnosed the minor as suffering from a terminal or irreversible condition. **I direct that none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Signature _____ Date _____

Printed name _____

TWO WITNESSES: (See qualifications on backside.) We have witnessed the above-noted competent adult person or authorized declarant making his/her signature above and, if applicable, the above-noted adult person making an OOH-DNR by nonwritten communication to the attending physician.

Witness 1 signature _____ Date _____ Printed name _____

Witness 2 signature _____ Date _____ Printed name _____

Notary in the State of Texas and County of_____. The above noted person personally appeared before me and signed the above noted declaration on this date:_____.

Signature & seal: _____Notary's printed name:_____ *Notary Seal*

[Note: Notary cannot acknowledge the witnessing of the person making an OOH-DNR order in a nonwritten manner]

PHYSICIAN'S STATEMENT: I am the attending physician of the above-noted person and have noted the existence of this order in the person's medical records. **I direct health care professionals acting in out-of-hospital settings, including a hospital emergency department, not to initiate or continue for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Physician's signature _____ Date _____

Printed name _____ License # _____

F. Directive by two physicians on behalf of the adult, who is incompetent or unable to communicate and without guardian, agent, proxy or relative: The person's specific wishes are unknown, but resuscitation measures are, in reasonable medical judgment, considered ineffective or are otherwise not in the best interests of the person. **I direct health care professionals acting in out-of-hospital settings, including a hospital emergency department, not to initiate or continue for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.**

Attending physician's signature _____ Date _____ Printed name _____ Lic# _____

Signature of second physician _____ Date _____ Printed name _____ Lic# _____

Physician's electronic or digital signature must meet criteria listed in Health and Safety Code §166.082(c).

All persons who have signed above must sign below, acknowledging that this document has been properly completed.

Person's signature _____ Guardian/Agent/Proxy/Relative signature _____

Attending physician's signature _____ Second physician's signature _____

Witness 1 signature _____ Witness 2 signature _____ Notary's signature _____

This document or a copy thereof must accompany the person during his/her medical transport.

Documentation of the Patient Care Report (PCR)

Policy:

The following describes the minimum documentation for patients with a suspected acute injury or illness.

1. A clear history of the present illness or injury with a chief complaint, onset time, associated complaints, pertinent negatives, mechanism of injury, etc. This should be included in the subjective portion of the PCR. The section should be sufficiently detailed to refresh the clinical situation after it has faded from memory.
2. An appropriate physical assessment that includes all relevant portions of a head-to-toe physical exam. Transported patients require at least two assessments and at any time a significant condition change occurs.
3. At least two complete sets of vital signs for transported patients or one complete set for non-transported patients. The Vital Signs policy outlines specific requirements. For children under 3 years old, a blood pressure measurement is not required but should be measured if possible, especially in critically ill patients where a blood pressure measurement may guide treatment decisions.
4. Only protocol-approved medical abbreviations may be used. A list is provided in the Appendix.
5. The CAD-to-PCR interface embedded within the PCR system should be used to populate all PCR data fields it addresses. If the 911 center times were improperly recorded, these may be edited by the crew for accuracy.
6. During patient care, if the cardiac monitor's automated vital sign values do not correlate with manually obtained values or are not consistent with the patient's clinical condition, providers should manually check vital signs and document the manually-obtained results in the PCR.
7. All drug administration dose, route, administration time, and patient responses shall be documented.
8. All treatments/interventions must be documented in chronological order and should include the patient's response. Document the need for each intervention in the treatment section of the PCR.
9. Extremity injuries: Neurovascular status must be assessed and documented before and after immobilization.
10. Spinal immobilization and/or spinal clearance: Document motor function and sensation before spinal immobilization or clearance, and include these assessments post-spinal immobilization.
11. Intravenous access: Document the catheter size, site, number of attempts, type of fluid, and flow rate.
12. Any requested medical control orders, whether approved or denied, should be documented clearly and include the physician's name in the PCR.
13. The primary care giver is responsible for, and should review, the content of the PCR for accuracy.
14. Once the call has been completed, patient care information may not be modified for any reason. Corrections or additions should be submitted as an addendum to the PCR.
15. All PCRs must be completed and sent to the server before leaving your shift. If a PCR cannot be completed by this time, the Shift Chief/Supervisor must be contacted before the end of shift for authorization and guidance.
16. Patient refusal of transport: Documentation must include the specific risks explained to the patient and/or family for delayed medical evaluation by a physician. Documentation needs to include the patient education given by EMS about the critical signs and symptoms to observe for that warrants immediate medical evaluation. Use the Universal Patient Care protocol as your guideline for any treatment.

Policy (continued):

17. Any Dead on Arrival patients must be assessed and documented by the paramedic.

18. Accepts treatment/refuses transport. A patient who receives any advanced life support therapy and refuses EMS transport to the hospital must be cleared by medical control. Therapy includes any intervention within the scope of practice of an AEMT or paramedic, including an IV or injectable medication.

    Cardiac monitoring in itself is only a diagnostic tool. If the ECG reveals a suspect rhythm that may be contributing to the patient's signs or symptoms, the paramedic should make all attempts to explain the findings to the patient and the need for hospital evaluation. In this case, the paramedic should document the ECG interpretation and refusal. On the other hand, if the ECG is not concerning and no ALS interventions were performed, an EMT or AEMT may document the report.

    The ALS patient care report must include the interventions performed and the name of the physician who allowed clearance or gave orders to transport. As with any refusal, the risks of delayed medical evaluation by a physician must be relayed to the patient and family (if present) and these specific risks documented in the patient care report. Obtain witnessed refusal signatures and document mental capacity in the patient care report.

19. ALS interventions performed by first responders. If an AEMT or paramedic from a first responder agency performs an intervention above an EMT-Basic's scope of practice, the responder's first and last name must be documented in the intervention itself.

Helmet Removal (Sport / Motorcycle)

Policy:

Provide guidance on the appropriate time and need to remove a helmet.

Purpose:

To offer guidelines for the decision-making process of removing a protective helmet.

Procedure:

1. Helmets should **only** be removed to:
    - Control an unstable airway, or
    - If the cervical spine/airway cannot be effectively managed due to a loose or severely-damaged helmet.
2. The face mask portion of the sporting helmet should always be removed prior to EMS transport.
3. If the face mask cannot be removed, the paramedic may use his or her judgment for removing the helmet based on airway control needs.
4. If the helmet has been removed prior to EMS arrival, it must be transported with the patient to assist the hospital medical teams with their evaluation of the patient.
5. Removal of a football helmet requires the simultaneous removal of both shoulder pads to prevent hyperextension of the cervical spine.

Non-Paramedic Transport of Patients

Policy:

BLS Unit

- Two EMT-B/I and or one paramedic will staff the BLS unit for interfacility transports. The BLS unit may be utilized for 911 emergencies if no ALS unit is available to respond.

ALS Unit

- At least one paramedic will be onboard the ambulance during transport of all patients unless a natural disaster or other exceptions exist as approved by policy or the Medical Director.
- The paramedic on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine their chief complaint and level of distress. If the paramedic determines that the patient is stable and all patient care can be managed by a lower level provider, patient care can be transferred by EMS personnel of this lower certification prior to transport. All personnel are encouraged to participate in patient care while on scene, regardless of who "attends" the patient while enroute to the hospital.
- The paramedic must convey his or her assessment/findings to the lower-level provider if patient care will be transferred before transport. If the patient's condition or chief complaint changes and now requires advanced assessment or interventions during transport, the paramedic will be notified immediately and will assume care of that patient until transfer to hospital staff. Documentation will be the paramedic's responsibility.

The following patients must be attended by a paramedic and cannot be transferred to a lower-level Provider on a 911 call:

1. Any patient who is 65 years old or older. The geriatric patient tends to have a complex medical history that should be monitored by a paramedic-level provider, regardless of the initial complaint.
2. Any patient who requires or might reasonably require additional or ongoing medications, procedures, and/or monitoring beyond the scope of practice of the lower-level provider. This includes any critically ill or unstable patient since immediate advanced airway management may be required if the patient's condition declines.
3. Any patient for whom ALL EMT-certified responders on scene do not agree can be safely transported unless a paramedic is in the patient care compartment. As a general rule, if providers are questioning who should care for the patient, the paramedic should attend to the patient.
4. Any patient suffering from chest pain of suspected cardiac origin, cardiac arrhythmia, moderate-to-severe respiratory distress, significant traumatic injury/injuries, acute altered mental status, acute stroke, or imminent childbirth.
5. Postictal seizure patients due to the possibility of seizure reoccurrence.
6. Any patients whose primary illness meets the criteria of any treatment protocol that requires IV intervention or cardiac monitoring.
7. Any patient with an IV or central line accessed for medication or fluid administration prior to EMS arrival.

Patient Without a Protocol

Policy:

Anyone requesting EMS service will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's chief complaint or condition.

Purpose:

To ensure the provision of appropriate medical care for every patient regardless of the patient's chief complaint or condition.

Procedure:

1. A protocol should be initiated for all patient encounters.

2. When confronted with a chief complaint or condition that does not fit into an existing patient care protocol, the patient should be initially treated with the Universal Patient Care protocol. The patient's care may continue using only the Universal Patient Care protocol or may divert into a more appropriate protocol for the patient's condition.

3. If needed, Medical Control should be contacted for further instruction at any point of time during patient care.

Physician on Scene

Policy:

Pre-hospital medical direction at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the State of Texas.

Purpose:

- To identify a chain of command allowing field personnel to adequately care for the patient.
- To assure the patient receives the maximum benefit from pre-hospital care.
- To minimize the liability of the EMS/first responder system as well as any on-scene physician.

Procedure:

1. When a physician offers assistance at a scene or a patient is being attended to by a physician at the physician's office or clinic, the physician may continue care if the following criteria are met:

   - The name and physician's specialty must be documented in the PCR.
   - The physician MUST accompany EMS to the hospital in the ambulance.
   - The physician must sign the PCR under the signatures section to document the fact that the physician is assuming care of the patient.
   - Personnel may follow orders given by the physician if the orders conform to current protocol guidelines. If the orders do not conform with the current guidelines, Medical Control must be contacted prior to initiating the order.

2. Orders received from an accompanying physician may be followed, even if they conflict with existing local protocols, provided the orders for a skill and/or medications is approved by both the Medical Director or Medical Control for a provider's credential level. Under no circumstances shall personnel perform procedures or give medications that are outside their scope of practice and/or credential, as per the this document and the State of Texas. The physician will be required to perform the procedure or administer the medication themselves if the request falls outside the scope of practice for the EMT.

Safe Transport of Pediatric Patients

Policy:

Without taking special precautions, children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection for pediatric patients during EMS transport.

Purpose:

- To provide a safe method of transporting pediatric patients within an ambulance.
- Protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

Procedure:

1. Unless immobilized to an appropriate spine board, ensure that all pediatric patients under 50 lbs (23 kg) are restrained with an approved child restraint device that has been secured to the stretcher or captain's chair. The captain's chair itself has a built-in child restraint system that may be used for patients ranging from 20 to 50 lbs (9 to 23 kg) who can sit upright unassisted.

   As a rule of thumb, the average 1 to 7 year old child may be secured in the captain's chair child restraint system. Infants should be secured in an infant car seat properly seatbelted into the captain's chair or the ambulance's stretcher using appropriate straps.

2. Ensure that all EMS personnel use the available restraint systems.

3. Whenever possible, adults and children who are not patients should be transported in an alternate passenger vehicle. If needed, request an available Supervisor unit for non-patient transport.

4. A parent or legal guardian of a pediatric patient may ride in the ambulance if all conditions listed below have been met:

   - The parent agrees to remain secured with seat belts at all times.
   - The parent is cooperative and there is no suspicion that crew or patient safety may be jeopardized.
   - Patient care will not be adversely affected by the parent's presence.
   - Child abuse is not suspected.
   - The patient appears to be hemodynamically-stable and there is no indication that the ambulance will need to travel with lights and sirens ("Code 3") at any point of patient care.

5. All patients need to be secured during transport. Unless absolutely necessary for patient care, do not hold the patient during travel. For patients with medical conditions that may be aggravated by stress, make every attempt to optimize safety when comforting the child.

Scope of Practice

Policy:

Provide personnel with guidance on their medical scope of practice.

Purpose:

Define the specific psychomotor skills that may be performed by personnel at the basic (EMT / ECA), advanced EMT (AEMT), and paramedic (EMT-P) levels.

Provider Level Protocol Refrence		
B	EMT / ECA	B
A	AEMT	A
P	EMT- P	P
	Medical Control	

Procedure:

Higher certification levels may perform all lower-level skills in addition to those specific to their scope.

Basic – EMT / ECA

- Airway adjuncts (OPA and/or NPA).
- Bag-Valve-Mask ventilation.
- Automatic transport ventilator use.
- Upper airway suctioning.
- Supplemental oxygen therapy
- Auto-injector / intramuscular epinephrine
- Apply cardiac monitor leads.
- Apply capnography devices.
- Manual stabilization of the cervical spine.
- Manual stabilization of extremity fractures.
- Hemorrhage control including tourniquet, and wound packing with hemostatic gauze.
- Oral glucose administration.
- Aspirin administration for suspected ischemic chest pain.
- AED use.
- Blood glucose analysis.
- Manage CPAP is already in place

Advanced - AEMT

- Tracheobronchial suctioning of an intubated patient.
- Establish and maintain a peripheral INT/IV.
- Establish and maintain an IO.
- Access indwelling catheters and central IV ports for fluid/medication administration.
- Administer non-medicated IV fluid.
- Administer IV medications as indicated by protocol.
- Perform endotracheal intubation.
- Perform gastric decompression.
- Perform pleural decompression.

Paramedic

- Perform cardioversion, manual defibrillation, and transcutaneous pacing.
- Spinal clearance
- Interpret and monitor cardiac rhythms
- Interpret and monitor capnography.
- Discontinue prehospital resuscitation.
- Initate CPAP
- Perform percutaneous cricothyrotomy

Suspected Patient Neglect / Abuse Reporting

Policy:

Provide the means for detecting and reporting suspected patient neglect, exploitation, and / or abuse of persons over the age of 65 years, children, or adults with disabilities.

Purpose:

To provide a safe method for first responders to fulfill their legal obligation of reporting patient neglect and/or abuse on pediatric and adult patients.

Procedure:

Abuse, neglect, and exploitation as defined by the Texas Department of Family and Protective Services:

- Abuse is mental, emotional, physical, or sexual injury to a child or person 65 years or older or to an adult with disabilities or failure to prevent such injury.
- Neglect of a child includes failure to provide a child with food, clothing, shelter and/or medical care, and/or leaving a child in a situation where the child is at risk of harm.
- Neglect of a person 65 years or older or an adult with disabilities that results in starvation, dehydration, over- or under-medication, unsanitary living conditions, and lack of heat, running water, electricity, medical care, and personal hygiene.
- Exploitation is misusing the resources of a person 65 years or older or an adult with disabilities for personal or monetary benefit. This includes taking Social Security or SSI (Supplemental Security Income) checks, abusing a joint checking account, and taking property and other resources.

Report Child/ Adult Abuse

By Phone: 1-800-252-5400

or

https://www.txabusehotline.org/Login/Default.aspx

The State of Texas **requires** that the person(s) who discovers neglect, abuse, and/or exploitation must report the finding within 48 hours. Failure to report abuse, neglect, and/or exploitation may result in a Class A misdemeanor. The name of the reporting person is confidential.

For more information, visit: http://www.dfps.state.texas.us/documents/contact Us/documents/swiflyer.pdf

Poison Center

Policy:

The Poison Center may be used by 911 centers and responding EMS/first responder services to obtain assistance with the pre-hospital triage and treatment of patients who have a suspected or actual poisoning.

Purpose:

- Improve the care of patients with poisoning, envenomation, or environmental/biochemical terrorism exposure in the pre-hospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on scene.
- Integrate the Poison Center into the pre-hospital response for hazardous materials and biochemical terrorism responses.

Procedure:

1. The 911 call center will identify and complete key questions for the overdose/poisoning, animal bites/ attacks, or carbon monoxide/inhalation/HazMat emergency medical dispatch complaints. Dispatch will send the appropriate services and may directly contact the Poison Center for consultation.

2. If no immediate life threat has been identified, personnel may conference the patient/caller with the Poison Center Specialist at the **Poison Center at 800-222-1222**.

3. The Poison Center Specialist at the Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner.

4. If the patient is determined to need EMS transport, EMS may contact medical control for further instructions or to discuss transport options. EMS should notify the Emergency Department of the information provided by Poison Control.

5. If the informed/oriented patient refuses EMS transport, personnel will give the phone number of the patient or caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.

6. At a minimum, the information that should be obtained for the Poison Center includes:

- Name and age of patient
- Time of exposure
- Signs and symptoms
- Substance(s) involved
- Any treatment given

7. The information below should be provided to the Poison Center for mass poisonings, including biochemical terrorism and HazMat:

- Substance(s) involved
- Signs and symptoms
- Time of exposure
- Any treatment given

Vital Signs

Policy:

The policy addresses the requirements set by both the State of Texas and these protocols for obtaining and recording patient vital signs while on scene and/or transported by ambulance.

Indications:

This policy applies to all patients who are evaluated and found to have illness or injury, or who are transported by EMS for any reason. The patient's initial vital signs from the primary assessment must be documented in the PCR even if a numeric value from the blood pressure was not obtained. The first complete set of vital signs must be obtained manually and not by NIBP. If a large discrepancy is noted in manual BP and NIBP, the manual values must be obtained again prior to any further treatment. A complete set of vital signs includes:

- Blood pressure in patients over 3 years old.
- Pulse rate (palpated strength and rhythm at the radial, femoral, brachial, or carotid site).
- Respiratory rate and quality of respirations.
- Pulse oximetry.
- GCS (Glasgow Coma Score) and AVPU (Alert/Verbal/Painful/Unresponsive).
- Suspected altered mental status patients requires a documented blood glucose measurement.
- Suspected stroke patients require pupillary evaluation/response and Cincinnati Stroke Scale.
- Suspected sepsis patients require a temperature to be measured and recorded.
- Suspected environmental emergencies: record patient temperature and environmental conditions.
- All patients with significant respiratory complaints must have pulse oximetry and $ETCO_2$.
- All advanced airways requires $ETCO_2$ measurements documented for the duration of intubation.
- All trauma patients are required to have a Revised Trauma Scale (RTS) documented.
- APGAR score is required for all newborn patients at the first and fifth minute of life.

Vital signs may also include capillary refill, lung sounds, pain level, skin color/moisture, pupillary response, and extremity movements. If waveform capnography is required by protocol, it will also be documented.

Procedure:

- All vitals signs will be recorded in the PCR. The State of Texas requires at least two (2) individual completed sets of vital signs recorded for every patient transport.
- A complete set of vital signs will be obtained and documented every 15 minutes for all patients with an extended transport time.
- If medications are administered, a complete set of vital signs must be obtained prior to administration of the medication, and then repeated within 5 minutes after administration.
- Critically ill or injured patients may require more than the required number of vital signs.
- Any acute change in the patient's condition must be documented and followed by a complete set of vital signs.

Crime Scene

Policy:
To establish guidelines for conducting patient care on a potential crime scene.

Purpose:

When prehospital care or resuscitation efforts are no longer appropriate it is every Provider's responsibility to assist law enforcement by preserving evidence at potential crime scene. Any scene involving a patient that is pulseless and apneic is to be considered a crime scene and treated accordingly. In such situations Provider's should also maintain a heightened awareness for the presence of weapons

General principles of crime scene management:

1. The first arriving Credentialed Provider on-scene must make patient access to determine whether resuscitative efforts are indicated or not. If law enforcement prevents entry, additional responding units should be reduced to non-emergent response. All law enforcement refusal of access to patients by Providers will be retrospectively reviewed with law enforcement.
2. Weapons should not be handled by a Provider unless necessary to ensure a safe patient care environment. If weapons must be handled, the Provider must wear gloves, clearly document the items original and new location, and inform on-scene Law Enforcement.
3. Never use anything (phones, sink, bathroom, towels, sheets, blankets, pillows, etc.) from an incident scene.
4. Victims of suspected assault should be strongly discouraged against "cleaning up," washing or showering prior to arrival of Law Enforcement or transport.
5. Providers should not touch anything in the crime scene unless required for patient care activities. Patient demographic information should be obtained from law enforcement when possible.
6. Any ligature(s) involved should be left as intact as possible and should be cut rather than untied. All cuts made should be in an area well away from any knots.
7. Containers of any substance which may have been ingested by the patient/victim should be left in the position found unless needed for ongoing patient care. If the container must be touched, use gloved hands and limit handling to a minimum in order to preserve any fingerprints that may be present.
8. Disposable items used during resuscitation efforts are to be left in place. Sharps used during the resuscitation should be stored in an appropriate container with the container being left in the area.
9. Intravenous/IO lines, airways and all other disposable equipment used, successfully or unsuccessfully, are to remain in place and/or on-scene.
10. Pronouncement should be made in accordance with the standards outlined in the Criteria for Death or Withholding Resuscitation/Discontinuation of Resuscitation Standards. The existence of a possible crime scene should not influence the decision to initiate resuscitative efforts.
11. Providers are not to cover a body, even if requested to do so by Law Enforcement. A top sheet may be provided to the officer on-scene. All efforts should be made to protect the dignity of the patient and block the public view of the body.
12. Once a pronouncement time is obtained the body becomes the property of the Medical Examiner. It may not be touched or altered in any way without authorization from the Medical Examiner's Office It is acceptable to share Patient Care information with appropriate on-scene law enforcement if the patient has been pronounced dead

Crime scene management where no resuscitation is initiated:

1. Any Responder, who is not properly Credentialed to seek pronouncements of an obvious Dead on Scene (DOS), should immediately leave the area without touching anything via the path of entry.
2. When confirmation of death is required, only one properly Credentialed Provider should make entry to the area.

Crime scene management with unsuccessful resuscitation:

1. Once resuscitation efforts have ceased and a pronouncement has been obtained Providers should immediately vacate the area.
2. The Medical Examiner must be able to differentiate between punctures originating from resuscitation efforts and those present prior to arrival. All unsuccessful IV/IO or pleural decompression attempts should be marked on the body by circling with a marker or pen.

Crime scene management with patient transport:

1. Clothing, jewelry or other objects removed from the patient should be left on-scene. Clearly document any items left and inform on-scene Law Enforcement of the items original and current locations.
2. When cutting clothing for the purpose of assessment and/or treatment avoid cutting through existing defects in the clothing (tears, entry or exit points) whenever possible.
3. If the patient has been placed on a sheet, notify the receiving facility that the sheet and all personal effects may be considered evidence until arrival of law enforcement. An effort should be made to keep all individuals out of the area.

Emergency Medical Dispatch

Policy:

This standard establishes a uniform level of response for the EMS System and provide for the safest and most appropriate level of response to the patient(s)

Purpose:

- EMS Units and First Responders will be dispatched in accordance to the standards developed by the Medical Director and the Emergency Medical Dispatch (MPD) Protocols
- EMS Units and First Responders will respond Emergent or Non-emergent in accordance to EMD standards. As more information from EMS Communications or on scene medical responders becomes available, the response may be upgraded to Non-emergent or downgraded to Emergent

Application:

1. EMS Units and First Responders dispatched for Emergent response, will not down grade to a Non-emergent response unless:
- The EMS Communications personnel determine that the patient's condition has changed and downgrades the incident to a Non-emergent response
- Public Safety personnel on-scene requests a Non-emergent response

2. EMS Units and First Responders may be diverted from a lower priority incident (e.g., Priority 3, 4 or 5) to a higher priority incident (e.g., Priority 1 or 2) based on EMD Protocol, if the diversion provides a significant time savings.

3. The EMS unit or First Responder may divert their response if they come upon what appears to be a higher priority incident (e.g., en route to a Priority 3, 4 or 5 incident and comes upon an MVC with high potential for patients in need of trauma activation).

4. EMS Units and First Responders may by-pass what appears to be a lower priority incident and continue to the originally assigned incident. EMS Communications should be notified so that another EMS resource may be assigned to the lower priority incident.

Policy:

Establish direction for cancelling or altering an initial response to a request for service.

Purpose:

To give the providers in the AMR System guidance on when they may be able to alter or cancel an initial response based on patient or scene presentation.

Application:

1. Resources will be initially dispatched to a 9-1-1 request for service based on the currently approved Medical Priority Dispatch (MPD) standards.
2. After assessing the patient(s) and making a determination of needed resources any on-scene Credentialed Provider may modify or cancel the response mode of any other System Provider not already on-scene.
3. If cancelled, responders may, at their discretion, reduce their response to non-lights and sirens and continue to the scene in order to provide other assistance deemed appropriate by their organization or department. This does not apply to responses for responsibilities other than patient care (scene safety, fluids, etc).

Interfacility Transfers

Policy:

Establish a process for guidance on Critical-Care (SCT/CCT), Hospital-to-Hospital transfers (ALS/MICU)

Purpose:

The transport of a patient who requires Advanced Life Support care during their transport from one medical facility to another. These patients often present on multiple medications and infusion pumps and may have medical devices in use which are unfamiliar to EMS personnel.

Application:

1. The transporting paramedic should ensure that all appropriate documentation accompanies the patient. Known STEMI patients are an exception to this rule. An MOT must be obtained but all other records may be faxed to the receiving facility if not presented at time of transfer.

2. While in transit to the new facility, all appropriate standing orders shall remain in place.

3. If the patient deteriorates, the transferring facility should be notified via radio or cellular phone. Additional orders if needed should be obtained from the receiving physician or facility whenever possible.

4. For any medication not included in the AMR System Clinical Operating Guidelines, specific orders must be provided by the sending facility for MICU calls.

5. The attending EMS crew is responsible for ensuring that they are familiar with all medications, pumps, or devices prior to departure. Medication or equipment questions should be discussed with the transferring nurse or physician prior to transport.

6. When transporting Non-EMS certified medical personnel, both the transport crew and accompanying staff are responsible for management of the patient.

7. All EMS rendered treatments must comply with the AMR System Clinical Operating Guidelines and/or instructions from the transporting or receiving physician.

8. An AMR patient care record will be completed in accordance with the Documentation of the Patient Care Report Standard.

9. All medications/procedures approved by the AMR System Clinical Operating Guidelines are approved for ALS transfer regardless of the method of administration.

10. All patients that fall within the intent of this Standard should, at a minimum receive:

- Continuous ECG and oxygen saturation monitoring
- Non-invasive hemodynamic monitoring (auscultated blood pressure, palpated pulse rate, $EtCO_2$)

11. Non-EMS certified medical personnel may accompany the EMS crew on interfacility transfers for patients that require specialized care, i.e. neonatal transports, team transports, specialty care and critical care transports.

Memorandum of Transfer

Policy:

To establish the expectations that AMR transporting crews will review Memorandum of Transfers (MOT) in order to transfer the patient to the appropriate receiving facility as ordered in the MOT.

Purpose:

A Memorandum of Transfer (MOT) is a medical order written for the transfer of care of a patient between one hospital/ facility to another hospital. The transport providers will honor the MOT unless there is a change in patient condition that necessitates transport to a closer facility for the purpose of stabilization.

Application:

1. Ensure that there is an MOT for every patient that is being transferred from one hospital to another that it includes the signature of the sending physician, the name of a receiving physician and a destination that is an approved transport destination as outlined in the protocols. If the transport providers perceive a conflict with the existing AMR destination policy and the indicated destination this must be clarified with the sending physician or his designee before transport is initiated.

2. Review the MOT to ensure the intended destination is listed on the MOT. If it is not indicated or there is a change in destination this must be modified by the sending facility prior to transport. The transport providers shall not modify or document on the MOT.

3. The patient is to be transported to the intended destination unless there is a change in the patient status that can not be managed through existing treatment protocols or through contact with the sending/receiving physician. In such cases the provider may divert to a closer appropriate facility for immediate stabilization. The reasons for diversion should be thoroughly documented in the PCR.

4. Treat the patient in accordance with the protocols or medical orders provided by the transferring physician. Providers must ensure that the orders from the transferring physician are within their defined scope of practice according to the protocols.

5. A patient with present mental capacity who has not had this capacity removed by physician or court order and who is not in custody retains the rights of consent and refusal outlined in the Refusal of Treatment/Transport Standard. If the patient wishes to refuse care or alter the prescribed destination this should be discussed with the sending physician.

6. A copy of the MOT should be made and placed in envelope to be turned into the PBS representative for inclusion with the patient's medical record.

On-Scene Authority

Policy:

Establish the clinical hierarchy of authority for on-scene patient care.

Purpose:

Credentialed Providers within the EMS System are responsible for providing patient care in accordance with the prescribed protocols, standards and procedures. However there may be times when providers disagree about the care being delivered. Patient safety is the responsibility of every provider and any concerns should be immediately brought to the attention of other caregivers at the scene. In ANY disagreement regarding circumstances relating to patient care a professional demeanor and focus on the best interest of the patient is paramount. In order to maintain an orderly scene and allow rapid resolution of conflict a hierarchy of clinical responsibility must be established.

Application:

1.In the event of conflicting approaches to providing patient care, extraction, or transport, it is the responsibility of the on-scene Credentialed Providers to reach consensus as to the most appropriate care for the patient(s). In the event of unresolved conflict, the Senior Credentialed Provider on-scene has final authority and responsibility for decisions regarding patient care. If there is a conflict involving a supervised provider (Cadet/Student) the assigned training officer has authority (at their level of Credential) and should be consulted.

2. Seniority of Credentials (in ascending order) is:

- System Responder
- Emergency Medical Technician — Basic
- Advanced Emergency Medical Technician
- Paramedic First Responder
- In-Charge Paramedic on the Transporting Unit
- On-scene Physician (In accordance with the Physician on Scene Standard)
- EMS Supervisor or Manager
- On-Line Medical Consultation (MOD, CES)
- EMS System Medical Director or designee

3. All significant or unresolved conflicts regarding on-scene management of patients should be reported via the appropriate chain of command and will be retrospectively reviewed in accordance to each organization's Event Review Process.

4. If any provider, regardless of credential, feels the conflict negatively impacted patient care the incident should be reported to the Clinical Manager as soon as practical without causing an additional impediment to care.

Patients with Special HC Needs

Policy:

This standard is established to provide quality patient care and EMS services to patients with special health care needs. It is also important for the EMS providers to understand the need to communicate with the patients, family and caregivers regarding health care needs and devices that EMS may not have experience with.

Purpose

Medical technology, changes in the health care industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to patients with special health care needs.

Application:

1. Emergencies involving special needs patients may involve equipment (e.g. LVAD or vagus nerve stimulation device, etc.) that is unfamiliar to the provider. To familiarize themselves with the equipment providers may:

- ask the family, caregiver or patient for any documentation or specific information regarding the condition and/ or device;
- utilize Just in Time Training aides/information regarding devices where available;
- contact the patient's primary care physician or OLMC for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport specific to the patients condition.

2. Transportation will be to the hospital appropriate for the specific condition of the patient. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

Provider Credentialing

Policy:

Define credentialing and the credential levels of providers within the AMR medical responder System.

Definitions:

Certification or Licensure: an individual who is certified or licensed by a regulatory body as minimally proficient to perform emergency prehospital care at a particular level that is defined by a regulatory body (e.g., ECA, EMT-B, AEMT, EMT-P or LP).

Credential to Practice: a process that is defined by the Clinical Education Specialist that requires a certified or licensed individual to demonstrate competency to practice at a specified level of prehospital care. The credential to practice does not necessarily match the individual's certification or license.

Purpose:

Every Provider that delivers medical care within the AMR System must be "Credentialed to Practice" in addition to holding a current State of Texas Certification or Licensure. All Credentialed Providers within the AMR System are allowed to provide care under the delegated authority of the Medical Director in accordance with the rules of the Texas Department of State Health Services and the Texas Medical Board. Credentialing is the final approval by the System Medical Director that ensures an individual's competency to care for patients as part of the Emergency Medical Services System. An individual is "Credentialed to Practice" when he or she successfully meets and maintains the defined Credentialing requirements. The levels of Credentialing are:

- System Responder
- Emergency Medical Technician - Basic (EMT-B)
- Advanced Emergency Medical Technician (AEMT)
- Emergency Medical Technician - Paramedic (EMT-P, LP)
- Critical Care Paramedic

Credentialing Requirements defines what is required to obtain and maintain credentials to practice within the AMR System and can be found within the policy and procedure manual for the organization.

Refusal of Treatment and/or Transport

Policy:

To establish guidelines for Providers when addressing issues of consent or for patients who wish to refuse the treatment and/or transportation offered.

Purpose:

Adult patients with present mental capacity retain the right to refuse care and/or transport against medical advice.

Definitions:

Informed Consent

Informed consent is based on an individual's appreciation and understanding of the facts, implications and future consequences of an action. In order to provide informed consent or refusal a patient must have adequate reasoning faculties(capacity) and be provided with information (risks/benefits) relevant to the decision making process. They should also be aware of the options available to them if they choose not to accept evaluation and/or treatment.

Implied Consent

In potentially life-threatening emergency situations where a patient is unable to give informed consent the law presumes that the patient would give consent if able. In potentially life-threatening emergency situations, consent for emergency care is implied if the individual is:

- Unable to communicate because of an injury, accident, illness, or unconsciousness and suffering from what reasonably appears to be a life-threatening injury or illness

OR

- Suffering from impaired present mental capacity

OR

A minor who is suffering from what reasonably appears to be a life-threatening injury or illness and whose parents, managing or possessory conservator, or guardian is not present

Substituted (Surrogate) Consent

In some circumstances an individual with legal standing may give consent for a patient when the patient does not have the ability to do so because they are a minor, incarcerated or have been determined by courts to be legally incompetent. Parents or guardians are entitled to provide permission because they have the legal responsibility, and in the absence of abuse or neglect, are assumed to act in the best interests of the child.

The following person(s) may consent to, or refuse, the evaluation, treatment, and/or transportation of a minor:

- Parent
- Grandparent
- Adult (> 18) sibling
- Adult (> 18) aunt or uncle
- Educational institution in which the child is enrolled that has received written authorization to consent/refuse from a person having the right to consent/refuse.
- Adult who has actual care, control, and possession of the child and has written authorization to consent/refuse from a person with the power to consent /refuse (i.e., daycare camps, soccer moms, carpools, etc.)

- Adult who has actual care, control, and possession of a child under the jurisdiction of a juvenile court
- A court having jurisdiction over a lawsuit affecting the parent-child relationship of which the child is the subject
- A peace officer who has lawfully taken custody of minor, if the peace officer has reasonable grounds to believe the minor is in need of immediate medical treatment.
- A managing or possessory conservator or guardian.

Application:

1. All patients refusing treatment and/or transport must :

- Be at least 18 years of age or an Emancipated Minor;
- Be able to demonstrate present mental capacity in accordance with the Determination of Capacity Procedure.
- NOT have been declared legally incompetent by a court of law. (If a patient has been declared legally incompetent, his/her court appointed guardian has the right to consent to, or refuse, evaluation, treatment, and/ or transportation for the patient.)
- NOT be suicidal or homicidal. (A law enforcement officer may arrest a patient who threatens or attempts suicide under Texas Health and Safety Code Section 573.001. The statute also covers other mentally ill patients and a similar statute allows an arrest for chemical dependency. Only a law enforcement officer can make these arrests.)

2. Patients meeting the above criteria who demonstrate present mental capacity retain the right to refuse any or all treatment and/or transportation. All patients should be encouraged to seek care. Additional resources may be employed including but not limited to involving the patients physician, additional providers such as a Commander, DMO, or On-line Medical Control.
3. Under no circumstances will AMR System providers refuse or deny treatment or EMS transportation to any patient (or legal patient representative) who requests medical assistance from the provider or agency. The initiation of treatment should not be dependent on the patient's willingness to accept transport. (eg Hypoglycemia, Asthma, etc.) This does <u>not</u> include the administration of narcotic pain medications or sedative agents.
4. AMR System providers shall not discourage any patient (or legal patient representative) from seeking medical care from a physician or from accepting EMS transport to a hospital.
5. When a patient with present mental capacity wishes to refuse care:

- The patient will be instructed that the evaluation and/or treatment is incomplete due to the limitations of the pre-hospital care environment;
- The providers will attempt to identify any patient perceived obstacles to treatment/transport and make reasonable efforts to address these obstacles. This includes but is not limited to the offer of transportation without treatment, or the offer of transportation to a facility not recommended by protocol. These should be offered only for the purpose of facilitating additional evaluation and/or treatment which would otherwise be refused.

The provider will inform the patient of the risks of refusal and benefits of treatment/transport in accordance with their presenting complaint. It should be explained that the risks described are not comprehensive due to the diagnostic limitations of the pre-hospital environment and that their refusal may result in worsening of their condition, serious disability or death

- The patient will be advised that they should seek immediate medical care at an Emergency Department or with their own physician and that they may call 911 again at <u>any</u> time if they wish to be transported to the hospital or if their condition changes or worsens.

Documentation:

1. The provider must document facts sufficient to demonstrate the patient's present mental capacity and understanding of his/her condition and the consequences of refusing treatment and/or transport to include those mentioned above.

2. If a patient wishes to refuse assessment, treatment and/or transport, have the patient sign the AMA form relating to the refusal of specific assessment, treatment, destination recommendation, or transport and have a third party witness the signature.

3. If the patient refuses to sign the refusal form, the provider will document the circumstances under which the patient refused to sign.

Transport Destination Decision

Policy:

Define how a transport destination decision is reached taking into consideration the specialized care needs of specific conditions and the needs and preferences of our patients.

Purpose

Patients treated by AMR may have complex clinical conditions that require care at facilities with specialized capabilities or expertise in treating these conditions. In the absence of the need for specialized care patients may want to be transported to facilities based on their personal preference or the location of their physician and records. Whenever possible the providers of the AMR will provide transport to a prescribed medical facility or their preference as a patient.

Application:

1. The following assumes the patient or the patient's guardian (in the case of a minor) has decision making capacity in accordance with the Refusal of Treatment/Transportation Standard and the Determination of Capacity Procedure. In the absence of decision making capacity or in cases where consent is implied the patient should be transported to the closest appropriate facility. If a patient wishes to refuse treatment/transport but has been determined to lack the capacity to do so providers should consult their supervisor in accordance with the Refusal of Treatment/Transportation Standard.

2. When a patient presents with a clinical condition requiring specialized care the transporting providers will transport the patient to the closest facility that offers the specialized care for that patient's condition. (STEMI, Stroke, Trauma, Resuscitation Center, Pediatric care, etc).

3. If a patient refuses to go to the recommended facility transport providers will explain the benefit of transport to the recommended facility and the risk of transport to another facility. If the patient still refuses transport to the recommended facility transport providers will recommend transport to the next closest appropriate facility for their condition.

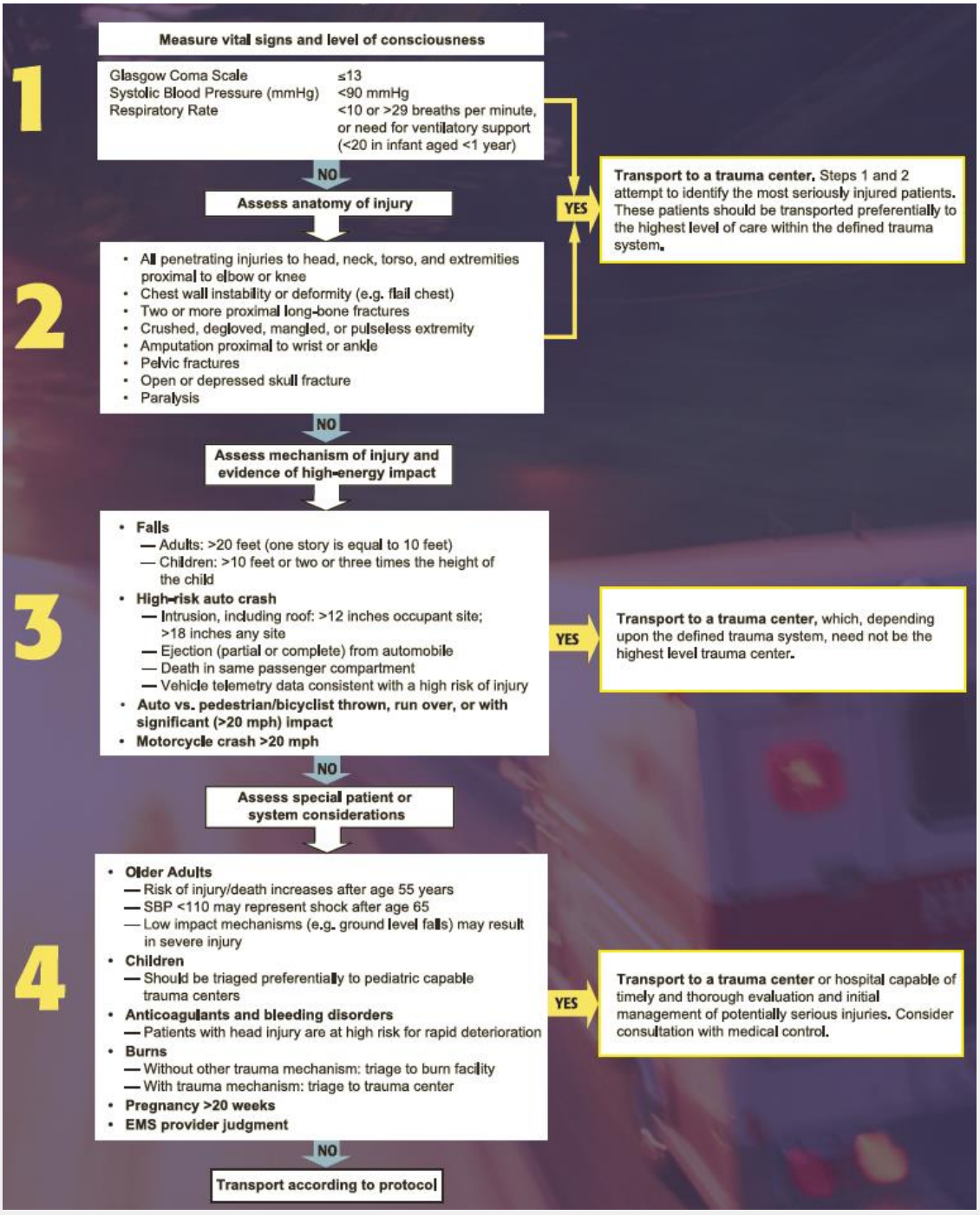
4. If a patient continues to refuse transport to the alternative specialty care facility or requests transport to a facility that lacks the ability to care for the patient condition the transport provider will make every effort to explain the need for the specialty care facility. These efforts may include but are not limited to contacting the patient's physician, a supervisor, online medical direction at the facility the patient wishes to be transported to.

5. If after the efforts described above the patient continues to request transport to a facility not recommended for the patient's condition the transport providers will transport the patient to the facility of the patients choosing. They should notify their supervisor and the receiving facility of their transport. On arrival at the facility the crew should consult with the attending physician to determine if the patient will be transferred. If such a transfer is imminent the provider should contact their supervisor and remain immediately available to transfer the patient after the required screening examination by the receiving facility. The duration of this availability is to be determined by the supervisor based on the patient's condition and the anticipated time to transfer.

6. If a patient does not have a condition that requires transport to a specialized facility as prescribed by protocol the providers will transport the patient to an approved system facility of the patient's choosing as system status allows. When a patient requests transport to a facility other than an approved system facility the transport decision should be made in consultation with a supervisor. If in the provider's opinion the patient's condition warrants transport to a closer facility for rapid stabilization the need for this destination should be explained to the patient and every effort made to deliver the patient to the closest appropriate facility. These efforts may include but are not limited to contacting a supervisor or online medical control. If the patient continues to refuse the recommended destination the patient will be advised of the associated risks and transported to the destination of their choosing.

Transport Destination Decision

7. If the patient has an MOT or if transport has been arranged by another healthcare provider the transport provider should transport the patient to the destination indicated by the MOT or sending healthcare provider in accordance with the MOT Standard.
8. If the patient does not have a condition that requires specialty care as prescribed by protocol and does not have an expressed preference the transport provider may transport the patient to the closest appropriate facility.
9. In the event multiple patients from the same event are to be transported in one unit the patient with higher acuity determines the transport destination. Where the need for different facilities can be anticipated reasonable efforts should be made to split the patients at the scene as long as doing so does not place either patient in danger.
10. Any refusal of treatment or recommended transport destination should be performed and documented in accordance with the Refusal of Treatment/Transport Standard and Determination of Capacity Procedure.
11. Trauma Triage Chart (CDC Guidelines)



Clinical Event Review

Policy:

When clinically related concerns meeting the indicated criteria are identified, AMR Performance/Quality Improvement process will perform a systematic evaluation of the actions and omitted actions associated with the specific event or situation to identify opportunities for improvement. A clinical event review does not require actual harm or a negative patient outcome to have occurred.

Purpose:

To establish a standardized process for AMR and the Office of the Medical Director to review clinical concerns and/or reports of suboptimal clinical performance with the primary objective focused on the identification of individual and system improvements to clinical care.

Application:

1. AMR as well as the OMD will foster an environment that encourages reporting of clinical concerns and errors including self reporting
2. At a minimum, a clinical event review will be conducted when events are identified as defined in the Clinical Event Review Process document.
3. Reporting of events will be provided to the On-Call Medical Director within the prescribed time intervals.
4. Each Organization's Performance/Quality Improvement staff will conduct an initial review to:
    a. gather pertinent facts, documentation and data
    b. analyze the facts, data and related information
    c. identify the cause(s) of the less than optimal performance
    d. draft a plan for clinical improvement for review by the Medical Director
5. A report of the above findings will be drafted and submitted to the Office of the Medical Director within the prescribed time frame based on the event
6. AMR will maintain copies of the Clinical Event Review report for future review by authorized persons only.
7. The OMD will store electronic and/or paper records of the Clinical Event Review reports submitted to the OMD by AMR.
8. All aspects of the Clinical Event Review including the proceedings, recordings and documents are considered confidential under the Texas Health and Safety Code Section 773.095.
9. All persons involved in the Review follow all requirements for confidentiality as described in the Clinical Performance Review Process document.
10. AMR will ensure its identified performance/quality improvement staff is appropriately trained in the current methods of performance review and analysis.
11. The OMD will provide professional development to System performance/quality improvement staff on the topics of performance review and analysis.
12. AMR and Individual Provider(s) will fully participate in the Clinical Event Review process as requested by the CES, any FTO or the Office of the Medical Director.

Online Medical Control

Policy:

Give direction for providers who encounter complicated, unusual, and atypical patients. Further establish an orderly method by which clinical issues can be rapidly addressed.

Purpose:

- Clinical encounters requiring use of this Guideline may be divided into two types: Those whose clinical situation is covered by existing Guideline but who are presenting a clinical/administrative challenge (e.g., clarification of a protocol, patient destination, other healthcare provider issues, etc.) and require non-medical control guidance or
- Those whose clinical situation is not covered by existing Guideline (e.g., modification of drug dosage, patient medication not addressed in Guideline or unfamiliar to a provider, termination of resuscitation not covered in current policy) and thus require medical control orders via on-line medical consultation (OLMC).

Application:

- If OLMC consultation is required the request should be via a physician at the intended receiving hospital (radio or recorded telephone line through the Communications Center).
- Please note that only physicians at receiving hospitals can provide medical direction; other staff, including nurses, may not provide online medical direction.
- In the PCR, the name of the individual providing OLMC or administrative direction will be documented in the narrative section.

Local Receiving Facilities:

Hendrick Medical Center – 325-670-3393
Abilene Regional Medical Center – 325-428-1100

Standard Procedure (Skill)

Airway: BIAD

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances that require a more advanced airway.
- Intubation is impossible or impractical due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex and where at least two failed intubation attempts have occurred.
- Patient must be unconscious.
- WARNING: This airway may not prevent aspiration of stomach contents!

Procedure:

1. Preoxygenate the patient.
2. Select the appropriate sized tube for the patient per the manufacturer's recommendations.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw and pull forward, or place the laryngoscope blade into the patient's mouth and lift in order to place the patient into an anatomically correct position.
5. Gently insert the tube and rotate 45 to 90 degrees so that the black orientation line is touching the corner of the mouth. Once the tip has been advanced to the base of the tongue, rotate the tube back to conform to the patient's anatomy. Insert the airway until the base of the connector is in line with the teeth or gumline.
6. Inflate the pilot balloon (if applicable) with air following the manufacturer's recommendations for that size tube.
7. Auscultate for epigastric and bilateral breath sounds and watch for the chest to rise and fall.
8. The large oropharyngeal cuff (balloon) secures the tube. A commercial endotracheal tube holder or tape should also be used to further secure and stabilize the blind insertion airway device.
9. **Confirm tube placement using end-tidal CO_2 detector.**
10. **The airway must be monitored continuously through waveform capnography and pulse oximetry.**
11. Some BIADs include a separate gastric port that will allow accommodate an 18 Fr. suction catheter.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: CPAP

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use: P EMT-P P

CPAP is indicated for all adult patients where inadequate ventilation is suspected and who have adequate mental status and respiratory drive to allow the CPAP to function. The need for CPAP could arise from pulmonary edema, pneumonia, asthma, COPD, etc.

Clinical Contraindications for Continuous Positive Airway Pressure (CPAP) Use:

- Decreased mental status, language barrier, or unable to follow commands.
- Facial features or deformities that would prevent an adequate mask seal.
- Excessive respiratory secretions and emesis that could lead to aspiration.
- Patients under 12 years old.
- Unstable patients (systolic BP below 90 mmHg), chest trauma, or suspected pneumothorax.

Procedure:

1. Ensure an adequate oxygen supply to the ventilation device.
2. Explain the procedure to the patient.
3. Consider placing a nasopharyngeal airway, if indicated.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point. If equipped with a head harness, make sure that it is positioned appropriately.
5. Starting with the lower straps, secure the mask until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device, start the PEEP at the lowest recommended pressure and slowly titrate to achieve clinical effect or the maximum allowable:
   - 5 cmH_20 to a maximum of 10 cmH_20 for pulmonary edema/congestive heart failure.
   - Maximum of 5 cmH_20 for COPD and asthma.
7. Evaluate the patient's response by auscultating breath sounds, monitoring oxygen saturation/ capnography, and by assessing the patient's general appearance.
8. Encourage the patient to allow forced ventilation to occur. Closely observe for any signs of complications. The patient must be breathing for optimal use of the CPAP device.
9. Document the application time and patient response on the patient care report.

Only a Paramedic can initiate CPAP. However, an EMT can manage a patient with CPAP or BiPAP in place.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Endotracheal Tube Introducer (Bougie)

A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Patient meets clinical indications for oral intubation.
- Initial intubation attempt(s) were unsuccessful.
- Predicted difficult intubation.

Contraindications:

- Three attempts at orotracheal intubation. In this case, use the Failed Airway protocol instead.
- Endotracheal tube size less than 4 mm. A pediatric Bougie can be used with 4.0 to 6.0 mm tubes.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% oxygen. Select the proper ET tube without a stylet, test the cuff for patency, and prepare suction.
2. Lubricate the distal end and cuff of the endotracheal tube (ETT) along with the distal half of the Endotracheal Tube Introducer (Bougie). The endotracheal tube may not pass through a dry Bougie.
3. Using laryngoscopic techniques, visualize the vocal cords (if possible) using Sellick's/BURP as needed.
4. Introduce the Bougie with curved tip pointed anteriorly and visualize the tip passing the vocal cords. If the cords cannot be visualized, direct the tip above the arytenoids.
5. Gently advance the Bougie until you meet resistance or feel vibration from the tracheal rings.
6. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie.
7. Gently advance both the Bougie and loaded ET tube until you feel resistance again. This assures tracheal placement and minimizes the risk of accidental displacement of the Bougie.
8. While maintaining a firm grasp on the proximal end of the Bougie, introduce the ET tube over the Bougie, passing the tube to its appropriate depth.
9. If you are unable to advance the ETT into the trachea and know that both the Bougie and ETT have been adequately lubricated, withdraw the ETT slightly and rotate the tube 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT, you may attempt direct laryngoscopy while advancing the ETT. This maneuver will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT.
10. Once the ETT has been correctly placed, hold the ET tube securely and remove the Bougie. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 0.5 to 10 mL of air (depending on cuff needs), auscultate for equal breath sounds, and reposition tube accordingly.
11. When the final position has been determined, secure the endotracheal tube, reassess breath sounds, apply end tidal capnography, and monitor readings to assure continued tracheal intubation.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Knowledge assessment may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Orotracheal Intubation

Clinical Indications:

A	AEMT	A
P	EMT-P	P

- Unable to adequately ventilate a patient with a bag-valve-mask (BVM), or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% oxygen. Place and maintain a nasal cannula at 8 to 10 Lpm throughout intubation procedure, or use high flow blow-by for infants/small children.
2. Select the proper ET tube (and stylette, if needed) and have suction ready.
3. Using a laryngoscope or video scope, visualize vocal cords. Use the Sellick maneuver/BURP if needed.
   A video laryngoscope should be utilized and the procedure should be recorded if available
4. Limit each intubation attempt to 30 seconds with BVM ventilation in-between attempts.
5. Visualize the tube passing through the vocal cords.
6. Confirm and document tube placement using end-tidal CO_2 monitoring with capnography.
7. Inflate the cuff with 0.5 to 10 mL of air, depending on tube size. Secure the tube with a commercial device. Silk tape may be used if the device will not accommodate the patient or a smaller tube size.
8. Auscultate for equal breath sounds bilaterally and absence of sounds over the epigastrium. If you are unsure of placement, remove the tube and ventilate the patient with a BVM.
9. Monitor waveform capnography. After 3 ventilations, the $ETCO_2$ should be >10 or comparable to pre-intubation values. If $ETCO_2$ is < 10 without physiologic explanation, remove the endotracheal tube and ventilate by BVM.
10. Consider using a Blind Insertion Airway Device (BIAD) if intubation efforts are unsuccessful.
11. Record waveform capnography readings on scene, enroute to the hospital, and at the hospital.
12. Document the ETT size, time, result (success), and placement location by the centimeter marks at the patient's teeth or lips on the patient care report (PCR). Document all devices used to confirm initial tube placement and any positive or negative breath sounds before and after each patient move.
13. Place an orogastric tube to clear stomach contents after the airway has been secured.
14. The airway must be monitored continuously with waveform capnography and pulse oximetry.
15. The PCR report should be signed by the receiving physician to confirm ET tube placement upon hospital arrival.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Cricothyrotomy - Needle

Clinical Indications:

P EMT-P P

Surgical airway for patients under 8 years old, as indicated by the Failed Airway Protocol.

Procedure:

1. Pre-oxygenate patient, if possible.
2. Assemble all equipment and available additional personnel.
3. Locate the cricothyroid membrane at the inferior portion of the thyroid cartilage.
4. Have an assistant hold the skin taunt over the membrane and locate the midline.
5. Prep area with betadine or chlorhexidine. Select a 14 g angiocatheter and attach either a 3 or 5 mL syringe for aspiration.
6. Hold the angiocatheter at a 90 degree angle with the bevel up and aim inferiorly as you approach the skin.
7. Puncture the skin with the needle and continue to slowly advance with firm, steady pressure while aspirating for air with the syringe.
8. As soon as air aspirates freely, stop advancing the needle assembly.
9. Modify the angle to 60 degrees from the head and advance only the catheter to level of the skin.
10. Remove the syringe/needle assembly while an assistant holds the catheter hub in place.
11. Remove the connector from a 3.5 mm endotracheal tube and secure the narrow-diameter end to the angiocatheter hub. This will transition the small diameter catheter hub to a standard BVM connector.
12. While the catheter hub remains secured by an assistant, attach a BVM and ventilate the patient. Ventilate only until chest rise is seen.
13. Secure the cannula hub to the neck with commercial ties or with cloth tape.
14. Apply the inline infant/pediatric capnography sensor between the BVM and the hub assembly.
15. Confirm and document placement with breath sounds, pulse oximetry, and capnography readings.
16. Continuous pulse oximetry and capnography measurement is required, and must be documented in the patient care report.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Cricothyrotomy - Surgical

Clinical Indications:

Management of an airway when standard airway procedures cannot be performed or have failed in a patient ≥ **8** years old.

Failed Airway Protocol; cannot maintain pulse oximetry above 90% with other methods.

P	EMT-P	P

Procedure:

Option 1

1. Make a puncture with #10 scalpel, with the blade point extending to the far side of the Cricothyroid membrane and handle held at a45 degree angle. There should be little to no slicing due to angle of blade and puncture

2. Leave the scalpel blade in the puncture, and slide the trach hook with the curved hook flat against the scalpel(to keep the sharp point from catching on tissue)

3. Once inside the trachea remove the scalpel and rotate Trach hook caudad lift the trach hook as you would for an intubation as the puncture opens slide the tube into opening bevel side toward hook and pointed slightly caudally

4. Pass endotracheal tube about 3" into trachea. Inflate cuff (if cuffed tube).

5. Once Tube in place lay the trach hook flat onto pt. neck and rotate horizontally and remove hook carefully to prevent damage to the tube or cuff.

6. Ventilate patient with high flow oxygen. Check for breath sounds bilaterally, and secure tube correctly.

7. Control bleeding and dress wound.

The airway must be monitored continuously through waveform capnography and pulse oximetry.

Option 2

1. Have suction and the prepackaged surgical airway kit ready. The person performing the procedure should wear the protective mask/face shield to prevent exposure from blood.

2. Locate the cricothyroid membrane utilizing anatomical landmarks.

3. Prep the area with an antiseptic swab (Betadine or chlorhexidine). Have an assistant available.

4. Make a 1 inch vertical incision through the skin and subcutaneous tissue above and below the cricothyroid membrane with the scalpel.

5. Use the Trousseau tracheal dilator (looks like curved hemostats) to expand the skin opening and expose the cricothyroid membrane.

6. Once the cricothyroid membrane can be seen, carefully puncture through it with the scalpel. Widen this incision horizontally to a total length of 1 cm through the membrane.

7. Using the tracheal dilator to maintain the surgical opening, insert the tracheal hook through the inferior membrane. Once the opening has been secured with the tracheal hook, remove the dilator.

8. Re-insert the tracheal dilator into the membrane's opening to better facilitate endotracheal tube passage. The tracheal hook should be held by an assistant to help maintain the opening.

9. Insert a cuffed 5.5 to 6.5 endotracheal tube into the surgical opening. The depth should only be a few inches; just far enough to allow the cuff to pass beyond the tracheal wall.

10. Inflate the cuff with 5 to 10 mL of air and ventilate the patient while manually stabilizing the tube.

11. Perform all of the standard assessment techniques to ensure correct tube placement. This includes bilateral lung auscultation, chest rise and fall with ventilation, waveform capnography, and pulse oximetry. Waveform capnography and pulse oximetry must be continuously monitored during care.

12. Secure the tube with the commercial device included in the kit.

13. Document endotracheal tube size, time, result (success), and placement location by the centimeter marks at the patient's neck. Document all devices used to confirm initial tube placement and after each patient move. Capnography readings and pulse oximetry must be documented in the PCR.

14. After the airway has been secured, consider placing an orogastric tube to clear stomach contents.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Knowledge assessment may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Suctioning - Basic

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Obstruction of the airway secondary to secretions, blood, or any other substance in a patient who cannot maintain or keep their own airway clear.

Procedure:

1. Ensure the suction device is in proper working order with an appropriate suction tip in place.
2. Pre-oxygenate the patient, if possible.
3. Explain the procedure to the patient.
4. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
5. Remove any oropharyngeal airway adjuncts if needed to access the oral cavity.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reinsert any removed airway adjuncts, attach the ventilation device (example: bag-valve-mask), and ventilate or assist the patient, if indicated.
9. Record the time and result of suctioning in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway: Suctioning - Tracheal

A	AEMT	A
P	EMT-P	P

Clinical Indications:

Obstruction of the airway secondary to secretions, blood, or any other substance in a patient currently assisted with an airway device such as endotracheal tube, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure that the suction device is in proper working order.
2. Pre-oxygenate the patient, if possible.
3. Open the sterile suction kit and don the enclosed gloves using appropriate technique.
4. Attach the suction catheter to the suction device while keeping the catheter itself sterile. An assistant's help would be recommended for this step.
5. Using the suprasternal notch as a guide, measure the depth needed for the catheter. Judgment must be used regarding suctioning depth with cricothyrotomy and tracheostomy tubes.
6. If applicable, remove ventilation devices from the airway.
7. Insert the catheter through the airway device, leaving the thumb port uncovered.
8. Once the desired depth has been reached, occlude the thumb port and remove the suction catheter slowly with a twisting motion.
9. A small amount of sterile normal saline (up to 10 mL) may be used to loosen secretions, if needed.
10. Reattach the ventilation device (example: bag-valve-mask) and ventilate the patient. Ventilate between suction attempts if the first one does not clear the airway adequately.
11. Document the time and suctioning result in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway / Breathing: Capnography - Waveform

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Capnography shall be used with all invasive airway procedures including endotracheal intubation, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography will be used with CPAP and/or for any patients with respiratory distress that requires treatment by EMS.
- Capnography is required for any patient receiving ketamine.

Procedure:

1. Attach an inline capnography sensor to a BIAD, endotracheal tube, or bag-valve-mask (BVM). Use a cannula-style capnography sensor with high-flow oxygen masks, hand-held nebulizers, and nasal cannulas. If a seal can be maintained with a CPAP or BVM mask over the small tubing, the cannula-style sensor will provide more accurate readings. If the mask leaks, an inline sampler can be used instead, but be aware that carbon dioxide measurements may read artificially low.

2. Note the exhaled carbon dioxide measurement and waveform changes. These need to be documented with each respiratory failure, cardiac arrest, or respiratory distress patient.

3. Capnography devices shall remain in place with the airway and measurements will be monitored throughout prehospital care and transport.

4. Any loss of CO_2 detection or waveform indicates an airway problem and should be addressed immediately and documented.

5. Capnography should be monitored while procedures are performed to verify or correct any airway problems.

6. Document the procedure and results on the Patient Care Report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway / Breathing: Nebulizer Inhalation Therapy

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Patients experiencing bronchospasm.

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 6 to 8 liters per minute or at an adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should continue until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in aerosolizing all of the solution.
7. Monitor the patient for medication effects. This should include assessment of the patient's response to the treatment and reassessment of vital signs, ECG, capnography measurements, pulse oximetry, and breath sounds.
8. Document the treatment, dose, and route on the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Airway / Breathing: Pulse Oximetry

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

All patients accepting or refusing transport by EMS.

Procedure:

1. Apply the probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow the machine to register the saturation level.
3. Record the time and initial saturation percent on room air (if possible) on the patient care report (PCR).
4. Verify the pulse rate on the machine with the actual pulse of the patient.
5. Monitor critical patients continuously throughout EMS care. If recording a one-time reading, monitor the patient for a few minutes as oxygen saturation measurements may vary.
6. Document oxygen saturation percent every time a full set of vital signs are recorded and in response to any therapy that corrects hypoxemia.
7. In general, normal saturation ranges from 92 to 99%. If below 92%, suspect a respiratory compromise that may or may not be from a chronic condition (example: COPD).
8. Use pulse oximetry as a tool for every patient evaluation. Treat the patient, not just the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is ≥ 92%. If there are obvious signs of ischemia, heart failure, dyspnea, or hypoxia, the goal is to maintain saturation between 92 to 99%, depending on the patient's condition.
10. Factors that may reduce the pulse oximetry's reliability include, but are not limited to:
    - Poor peripheral circulation (blood volume, hypotension, hypothermia).
    - Excessive pulse oximeter sensor motion.
    - Fingernail polish. This may be removed with an acetone pad or instead, rotate the finger sensor by 90 degrees.
    - Carbon monoxide bound to hemoglobin will provide inaccurate readings.
    - Irregular heart rhythms that affect pulse quality/strength (atrial fibrillation, SVT, etc.)
    - Jaundice.
    - Placing the blood pressure cuff on same extremity as the pulse oximeter sensor.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Assessment: Adult

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Any patient consenting to a medical evaluation who is too large to be measured with a Broselow-Luten Resuscitation Tape. According to the Center for Disease Control growth rate data, the average 10 year old may reach the upper limits of the Broselow-Luten Resuscitation tape.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, bystander safety, and patient/caregiver interaction.

2. Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.

3. Assess mental status (AVPU) and disability (GCS).

4. Control major hemorrhage and assess overall priority of the patient.

5. Perform a focused history and physical based on the patient's chief complaint.

6. Assess need for critical interventions.

7. Complete critical interventions and perform a complete secondary exam (including a baseline set of vital signs) as directed by protocol.

8. Maintain an on-going assessment throughout transport that includes the patient response and possible complications to interventions, the need for additional interventions, and assessment of evolving patient complaints/conditions.

9. The body survey must be completed for all ill or injured patients regardless if the patient is transported by ambulance.

10. Document all findings and information associated with the assessment, procedures, and any medication administration on the PCR.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Assessment: APGAR Scoring

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Policy:

To provide personnel with a visual reference for the APGAR scoring of a newborn patient.

Procedure:

The APGAR scoring system must be used on all newborns to evaluate status. The newborn needs to be evaluated at the first and fifth minute of life and this score must be documented in the patient care report (PCR).

APGAR Score

Evaluate at 1 and 5 minutes postpartum

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

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Assessment: Blood Glucose Analysis

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Patients with suspected hypoglycemia or hyperglycemia. Indications may include altered mental status, decreased responsiveness, vomiting, bizarre behavior, illness in diabetics, or any other signs/ symptoms suggesting abnormal blood glucose levels.

Procedure:

1. Gather and prepare equipment. Scrub the puncture site with an alcohol pad and allow to air dry.

2. Blood samples for performing glucose analysis can be obtained through a fingerstick, lateral heel stick in infants, or when possible, simultaneously with intravenous access.

3. Place the correct amount of blood on the glucometer's reagent strip per the manufacturer's instructions.

4. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.

6. Repeat the glucose analysis per protocol to reassess treatment and patient response.

7. Perform quality assurance tests on glucometers at least once every 7 days and document in the glucometer log. Quality assurance checks should also be completed if any clinically suspicious readings are found and this information should also be documented.

8. Glucometer strips, the testing solution, and/or the glucometer itself should be replaced if quality assurance checks fall outside of acceptable ranges.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Assessment: Cincinnati Stroke Scale

Policy:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

To provide EMS personnel with a visual reference guide to assessing and identifying a stroke patient.

Procedure:

The Cincinnati Stroke Scale must be used on all patients who are evaluated for a possible CVA (stroke). This assessment needs to be recorded at least twice in the patient care report if the stroke protocol is indicated.

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: *Have the patient show teeth or smile*

Normal: Both sides of the face move equally.

Abnormal: One side of the face does not move as well as the other side.

2. ARM DRIFT: *Patient closes eyes and holds both arms out for 10 seconds.*

Normal: Both arms drift the same or both arms do not drift at all.

Abnormal: One arm does drift compared to the other arm.

3. ABNORMAL SPEECH: *Have the patient say, "you can't teach an old dog new tricks".*

Normal: Patient uses the correct words without slurring.

Abnormal: Patient slurs words, uses the wrong words, or cannot speak.

INTERPRETATION: If any ONE of these three signs is abnormal, the probability of a stroke is 72%.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Assessment: ECG and 12-lead Placement

Policy:

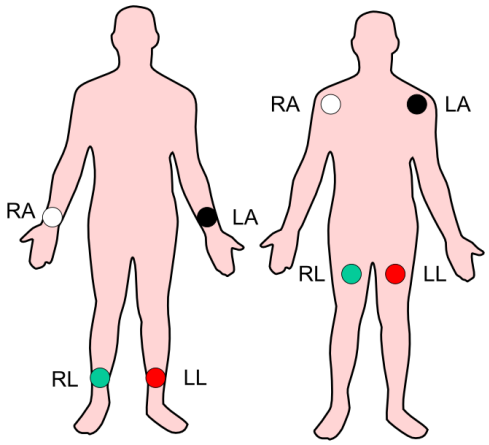
Provide EMS personnel a visual reference guide for placing ECG limb leads and the 12-Lead ECG.

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Cardiac monitor limb lead placement
- 12-lead ECG lead placement
- 15-lead ECG should be considered

Limb Lead Placement



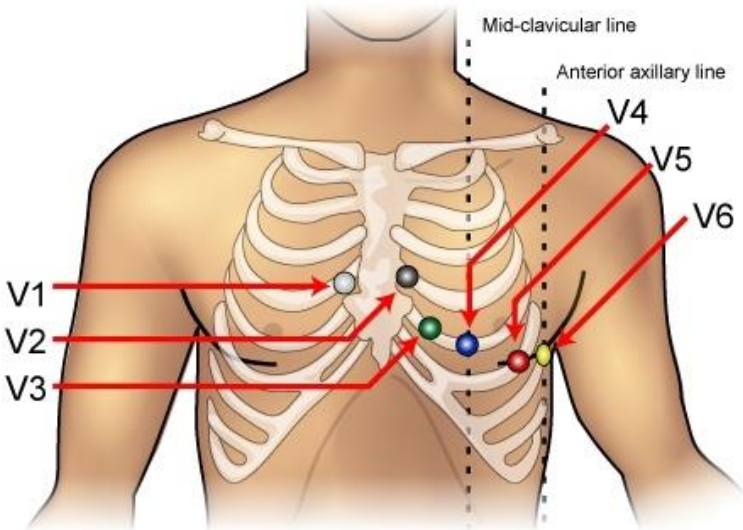
RA = Right Arm
LA = Left Arm
RL = Right Leg
LL = Left Leg

Electrode Placement:

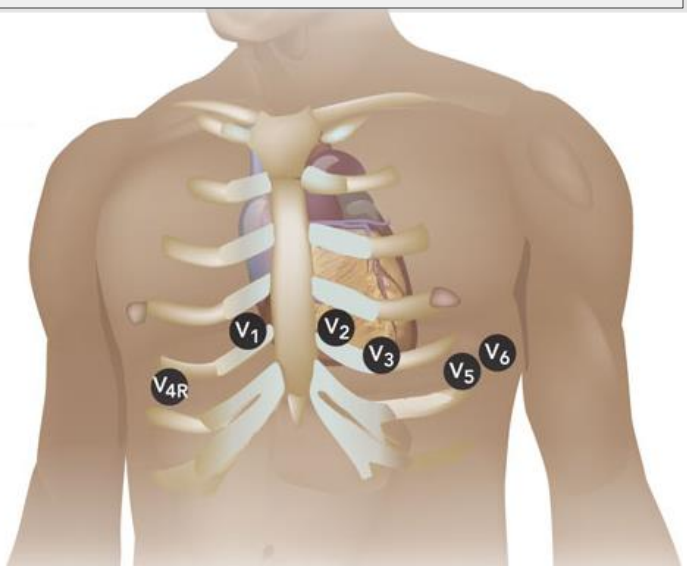
V1 - 4th intercostal space to the right of the sternum
V2 - 4th intercostal space to the left of the sternum
V3 - Midway between V2 and V4
V4 - 5th intercostal space at the mid-clavicular line
V5 - Anterior axillary line at the same level as V4
V6 - Mid-axillary line at the same level as V4 and V5

RL - Anywhere above the ankle and below the torso
RA - Anywhere between the shoulder and the elbow
LL - Anywhere above the ankle and below the torso
LA - Anywhere between the shoulder and the elbow

Standard 12-lead ECG placement



Quick V4R 12-lead placement to assess for posterior involvement



Standard Procedure (Skill)

Assessment: GCS and RTS Graphs

Policy:

To provide EMS personnel with a visual guide for calculating the Glasgow Coma Scale and the Revised Trauma Score.

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Procedure:

- The Glasgow Coma Scale is required for all patients in order to evaluate the level of consciousness. This score must be documented at least twice for transported patients, and at least once for patients who refuse EMS transport.

- The Revised Trauma Score is required for evaluating a trauma patient's mortality risk. This score must be documented at least twice for transported trauma patients, and at least once for trauma patients who refuse transport.

Adult Glasgow Coma Score

Eye Opening (E)	Verbal Response (V)	Motor Response (M)
4 = Spontaneous 3 = To voice 2 = To pain 1 = None	5 = Normal conversation 4 = Disoriented conversation 3 = Words spoken, but not coherent 2 = No words; only sounds 1 = None	6 = Normal; responds to commands 5 = Localizes to pain 4 = Withdraws to pain 3 = Decorticate posturing 2 = Decerebrate posturing 1 = None
Total = E + V + M		

Pediatric Glasgow Coma Score

Eye Opening (E)	Verbal Response (V)	Motor Response (M)
4 = Spontaneous 3 = To voice or shout 2 = To pain 1 = None	5 = Coos or smiles appropriately; older are oriented 4 = Cries but consolable; disoriented conversation 3 = Cries/screams persistently; inappropriate words 2 = Grunts/agitated/restless; sounds only 1 = None	6 = Spontaneous or obeys commands 5 = Localizes to pain 4 = Withdraws to pain 3 = Decorticate posturing 2 = Decerebrate posturing 1 = None
Total = E + V + M		

Adult Revised Trauma Score

Glasgow Coma Scale		Systolic Blood Pressure		Respiratory Rate	
GCS	Points	Systolic BP	Points	Respiratory Rate	Points
15 to 13 12 to 9 8 to 6 5 to 4 3	**4** **3** **2** **1** **0**	> 89 mmHg 76 to 89 50 to 75 1 to 49 0	**4** **3** **2** **1** **0**	10 through 29 > 29 6 to 9 1 to 5 0	**4** **3** **2** **1** **0**
Total = GCS + Blood Pressure + Respiratory Rate					

Standard Procedure (Skill)

Assessment: Orthostatic Blood Pressure Measurement

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Adult patients with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization or other restrictions with positioning.
- An orthostatic vital sign assessment is not sensitive or specific for volume loss / dehydration, and may induce syncope in some cases. As such, it is not routinely recommended.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 20 mmHg while sitting upright, the diastolic measures 10 mmHg or less, or the pulse rises more than 20 bpm, the patient is considered to have a positive orthostatic finding.
6. If a patient experiences dizziness upon sitting, standing, or is obviously dehydrated based on history or physical exam, a formal orthostatic examination should be omitted and fluid resuscitation initiated.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Assessment: Pain Assessment and Documentation

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Any patient reporting pain or appearing to be in pain.

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective. It is whatever the patient says it is.

Procedure:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report, or if unavailable, the patient's appearance and reaction.
2. Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vital signs.
3. Pain should be assessed using one of the appropriate approved scales below.
4. Three pain scales are available: The 0 to 10 pain scale, the Wong - Baker "FACES", and the FLACC.
   - <u>0 to 10 Scale</u>: The most familiar scale used by EMS for rating pain with patients. It is used primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale of 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
   - <u>Wong – Baker "FACES" scale</u>: This scale is primarily used with pediatrics, but may also be used with geriatric patients or any patient with a language barrier. The illustrated faces correspond to numeric values from 0 to 10. This scale can be documented with the numeric value.

0	2	4	6	8	10
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

   - <u>FLACC pain scale:</u> This scale is suitable for any patient who cannot communicate their pain level.

FLACC Pain Score for Adult and Pediatric Patients

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

Standard Procedure (Skill)

Assessment: Pediatric

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Any pre-pubescent patient who can be measured with the Broselow-Luten Resuscitation Tape. A neonate patient is defined as birth through 28 days of age. Neonatal patients will be treated under the infant and/or pediatric guidelines.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, bystander safety, and patient/caregiver interaction.
2. Assess patient using the pediatric triangle of ABCs:
   - Airway and appearance: speech/cry, muscle tone, interactiveness, look/gaze, movement of extremities.
   - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning.
   - Circulation to skin: pallor, mottling, cyanosis.
3. Establish spinal immobilization if there is any suspicion of spinal injury.
4. Establish the patient's level of responsiveness that is appropriate for age (AVPU, GCS, etc.).
5. Color code the patient' approximate weight using the Broselow-Luten Resuscitation tape.
6. Assess disability (pulse, motor function, sensory function, pupillary reaction).
7. Perform a focused history and physical exam. Recall that pediatric patients experience hypothermia easily and should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs. For young children, the need for a blood pressure measurement should be determined on a case-by-case basis and take in consideration the healthcare provider's rapport with the child and the child's clinical condition. Blood pressure measurement is not required for all pediatric patients, but should be measured if possible and particularly with any child over 3 years old. This measurement is important with critically ill patients where blood pressure may guide treatment decisions.
9. Include immunization history, allergies, medications, past medical history, last meal, and events leading up to the injury or illness, where appropriate.
10. Treat the chief complaint, per protocol.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Assessment: Temperature Measurement

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Monitor body temperature in a patient with a suspected infection, hypothermia, hyperthermia, fever, or for post-resuscitation induced hypothermia needs.

Methods:

Temperatures can be obtained by temporal, tympanic, oral, and rectal routes.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: 12 Lead ECG and CODE STEMI Activation

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Suspected cardiac patient
- Suspected medication overdose
- Electrical injuries
- Syncope
- Acute altered mental status
- Any condition where a 12-lead ECG may help determine patient status or guide treatment needs.

Procedure:

1. Assess the patient and monitor his or her cardiac status.
2. Administer oxygen as the patient's condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12-lead ECG.
4. Prepare the ECG monitor and connect the patient cable to the electrodes.
5. Enter the required patient information (patient's last name, age, and gender) into the cardiac monitor.
6. Expose the chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest and extremity leads as indicated in the Assessment: ECG and 12-Lead Placement procedure.
8. Instruct the patient to remain still.
9. Press the appropriate button to acquire the 12-lead ECG.
10. Once obtained, transmit the ECG data to the appropriate hospital for ALL PTs showing S/S of a STEMI or other concerning cardiac event.
11. Contact the receiving hospital to notify them that a 12-lead ECG has been sent along with the patient's initials.
12. Monitor the patient while continuing with the treatment protocol.
13. Download the data per guidelines and attach the 12-lead to the electronic patient care report (PCR).
14. Document the procedure, time, and results along with the paramedic's interpretation of the ECG in the comments section of the 12-lead intervention.
15. Notify the ED early if there is a suspected or confirmed AMI along with an early transmission of the 12-lead ECG.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: Defibrillation: Automated

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

- Patients in cardiac arrest (pulseless, non-breathing).
- For age < 8 years, AED use is indicated. Use pediatric pads, if available.

Contraindication:

Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. **If multiple rescuers are available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per the manufacturer's recommendations. Based on the current ACLS guidelines, place pads in apex/lateral or anterior/posterior position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over the device. Use caution with pad placement on LVAD patients.
3. Remove any medication patches on the chest and wipe off any residue to prevent burning.
4. Activate/power on the AED for rhythm analysis. Follow the voice prompts.
5. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
6. If the AED advises defibrillation, **assertively state "CLEAR" and ensure that no one, including yourself, is in contact with the patient prior to defibrillation.** Press the "shock" button. Biphasic defibrillators will determine the correct joules accordingly.
7. **Begin CPR immediately after defibrillation. Do not check a pulse if a shock was given.** If the AED advises that no shock was needed, a pulse check should be performed.
8. After 2 minutes of CPR, analyze the rhythm and defibrillate, if indicated. Repeat this step every 2 minutes.
9. Continue treatment as indicated by protocol.
10. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is the key to successful resuscitation.**
12. **If pulse returns, refer to the Post Resuscitation Protocol for adults or pediatric patients.**

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: Double Sequential External Defibrillation

Clinical Indications:

P EMT-P P

- Any patient who has remained in persistent ventricular fibrillation or ventricular tachycardia without even a transient interruption of the rhythm.
- All other indicated treatment modalities have been implemented.
- A paramedic has verified the persistence of the arrhythmia.

Contraindications:

- Any cardiac rhythm that is not pulseless ventricular tachycardia or ventricular fibrillation.
- Ventricular assist device (VAD, LVAD, or RVAD) patient.
- Pediatric patients (no signs of puberty and the patient is below the expected age for it).

Procedure:

1. Ensure that the quality of CPR is not compromised.
2. If two appropriate sets of external defibrillation pads are not already on the patient, prepare the second site by drying the skin and removing excess hair to assure good pad adhesion. Remove transdermal patches to prevent the skin from burning.
   a. Apply the second set of external defibrillation pads adjacent to (but not touching) the pad set already in place. Avoid placing pads directly over any implanted devices.
   b. Recommended: An anterior-lateral placement of one set of pads and an anterior-posterior placement of the second set.
3. Assure that controls for the second cardiac monitor are accessible to the paramedic.
4. Upon rhythm check, the paramedic will confirm the rhythm.
5. If a shockable rhythm is detected, CPR must resume immediately while the devices charge. The paramedic will verify that both cardiac defibrillators/AEDs are attached to the patient, that all pads are well-adhered to the skin, and he or she will direct the simultaneous charging of both attached cardiac monitors.
   a. When both monitors are charged to maximum energy and all persons are clear, the paramedic will push both shock buttons as synchronously as possible. Chest compressions should resume immediately.
6. If a non-shockable rhythm is present, care will resume according to the appropriate protocol.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: Defibrillation: Manual

P EMT-P P

Clinical Indications:

Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

Procedure:

1. **Ensure that chest compressions are adequate and interrupted only when absolutely necessary.**

2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.

3. Apply hands-free defibrillation pads during chest compressions. When available, apply the defibrillation pads that have the compression-quality sternal pad in order to monitor compression depth and rate during CPR. For patients with implanted pacers/defibrillators, the pads can be placed in the anterior/posterior or anterior/lateral positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Use caution with pad placement on VAD patients.

4. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**

5. **When charged, hold compressions, assertively state "CLEAR", and assure that no one, including yourself, is in contact with the patient.**

6. Press the **shock button**.

7. Immediately resume chest compressions for 2 minutes. After 2 minutes of CPR, analyze the rhythm and check for a pulse only if appropriate for the rhythm.

8. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.

9. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is the key to successful resuscitation.**

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: External Pacing

Clinical Indications:

P EMT-P P

Patients with symptomatic bradycardia (less than 60 beats per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:

- Chest pain
- Hypotension
- Pulmonary edema
- Acute altered mental status suggesting poor perfusion
- Ventricular ectopy with signs of poor perfusion

Procedure:

1. Attach the cardiac monitor using the limb leads. The leads are internally protected from the pacing energy.
2. Apply defibrillation/pacing pads to the anterior/posterior or anterior/lateral positions.
3. Select the pacing option on the cardiac monitor.
4. Adjust the heart rate to **60 bpm for an adult, 80 bpm for a 1 year old to 8 year old child, and 100 bpm for an infant below 1 year old.**
5. Note pacer spikes on the ECG and cardiac monitor screen.
6. Begin at 10 mAmps and slowly increase output until capture of electrical rhythm on the monitor. Electrical capture is usually present when there is a widened QRS complex followed by an ST segment and T wave.
7. If unable to capture while at the maximum current output, stop pacing immediately.
8. If capture is observed on monitor (electrically), check for a corresponding right radial or femoral pulse (mechanically) and assess vital signs. Avoid assessing the pulse in the carotid and left radial arteries because muscular contractions from the pacing pulse may cause misinterpretation.
9. Strongly consider the use of sedation or analgesia. Transcutaneous pacing is painful.
10. Document the dysrhythmia and the response to external pacing in the PCR.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Cardiac: Synchronized Cardioversion

P EMT-P P

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia with a pulse).
- Patient has a pulse. The pulseless patient requires unsynchronized cardioversion (defibrillation).

Procedure:

1. Ensure that the patient is properly attached to a cardiac monitor capable of synchronized cardioversion.

2. Have all of the equipment available for unsynchronized cardioversion/defibrillation in case the patient cannot be cardioverted and his or her condition worsens.

3. Consider the use of pain or sedating medications, per the specific protocol.

4. Set the energy selection as indicated by the specific protocol.

5. Set the monitor to the synchronized cardioversion mode. Confirm synchronization with the patient's rhythm by the arrow (or other appropriate mark) located above each and every electrical complex.

6. Assure that all personnel are clear of the patient.

7. Depress the "charge" button.

8. Once charging is complete, stay clear of the patient and **hold** the "shock" button down until the energy has been delivered. It may take the monitor several cardiac cycles to synchronize before delivering the energy, so a delay may exist between pressing the "shock" button and the actual energy delivery.

   a. Perform immediate unsynchronized cardioversion (defibrillation) if the patient's rhythm deteriorates into pulseless ventricular tachycardia or ventricular fibrillation. Follow the procedure for Defibrillation-Manual.

9. If the patient's condition remains unchanged, repeat steps 5 through 8 above, using escalating energy settings as indicated by protocol.

10. Repeat synchronized cardioversion until maximum settings have been reached or until efforts succeed.

11. Note procedure, response, and time of each cardioversion attempt in the patient care report.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)
Injections: Subcutaneous and Intramuscular

A	AEMT	A
P	EMT-P	P

Clinical Indications:

Medication administration is necessary and the medication must be given via the subcutaneous or intramuscular route. It may be given as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform procedure according to standing orders.
2. Prepare equipment and medication, expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for a subcutaneous injection is in the abdomen or arm.*
   - Injection volume should not exceed 1 mL.
   - Abdominal site: Do not inject within 1 inch of the umbilicus, the "belt line", or previous injection sites.
   - Humerus (arm): Do not inject within 1 inch of previous injection sites. If the patient does not have adequate adipose tissue for the injection, choose the abdomen instead. Avoid injections near joints.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.*
   - Injection volume should not exceed 1 mL for the humerus (arm).
   - Injection volume should not exceed 5 mL in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients, and injection volume should not exceed 1 mL.
7. Expose the selected area and scrub the injection site with alcohol or chlorhexidine.
8. Use the smallest diameter needle appropriate for the injection and medication. Insert the needle into the skin with a smooth, steady motion. Subcutaneous injections should be made into pinched up skin at a 45 degree angle to prevent medication from entering the muscle. Intramuscular injections should be made with the skin flat or drawn back ("Z-track" method) with the needle at a 90 degree angle. Make appropriate adjustments if the patient does not have enough muscle mass.
9. Aspirate for blood with IM injections only.
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply direct pressure to the site with a sterile gauze. Do not massage site.
13. Monitor the patient for the desired therapeutic effects as well as any possible adverse effects.
14. Document the medication, dose, route, and time on the patient care report.

*An EMT-Basic may administer Epinephrine by these routes.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Restraints: Physical and Chemical

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be used in a humane manner and only as a last resort. Other means to prevent injury to the patient or crew must be attempted first if the crew's or patient's safety is not immediately in jeopardy. These efforts could include reality orientation, distraction techniques, or other less-restrictive therapeutic means. Physical or chemical restraint should be considered as a "last resort" option.

Procedure:

1. Attempt less restrictive means of managing the patient if safe to do so. Verbal altercation in itself is not an indication for any restraint procedures. An immediate physical threat or attempt of harm to self or others may be an acceptable indication for restraint.
2. Request law enforcement assistance.
3. Ensure that there are sufficient personnel available to physically restrain the patient safely.
4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other equipment will be placed on top of the patient. The patient will never be restrained in the prone position.
5. The patient must be under constant observation and care by a paramedic at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
6. All of the restrained extremities will have an individual circulation assessment at least every 15 minutes and upon emergency department arrival. The first assessment should occur soon after placement of the restraints, as possible. This assessment **MUST** be documented on the patient care report, and should include skin color, temperature, distal pulse quality, and capillary refill (if applicable for patient's age).
7. Documentation on the patient care report should include the reason for the use of restraints, the type of restraint(s) used, and the time the restraint(s) were placed.
8. In general, chemical restraints (i.e. medications given under the Combative Patient protocol) should be used whenever physical restraints have been applied. Chemical restraints should be considered to prevent the patient from any harm if he or she is physically fighting against the restraints. Chemical restraints should be administered early to prevent patient injury.
9. If a patient is restrained by law enforcement personnel with handcuffs or other devices that EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Treatment: Chest Decompression

Video

Clinical Indications:

A	AEMT	A
P	EMT-P	P

- Patients with a suspected simple or tension pneumothorax, have clinical signs of shock, and at least one of the following signs:
    - Jugular vein distention
    - Tracheal deviation away from the side of the injury (often a late sign)
    - Absent or decreased breath sounds on the affected side
    - Hyper-resonance to percussion on the affected side
    - Increased resistance when ventilating a patient with a BVM
- Patients in traumatic arrest with chest or abdominal trauma where resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Gather personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
    - Locate the second or third intercostal space in the mid-clavicular line on the same side as the pneumothorax.
    - Prepare the site with iodine, chlorhexidine, or alcohol pads.

4. Insert the device into the skin into the second intercostal space. Direct the needle over the top of the third rib to avoid the vessels and nerves that line the inferior portion of the rib.

5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter. Advance the catheter hub to the chest wall; do not advance the needle itself.
6. Remove the needle, leaving the plastic catheter in place.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)
Treatment: Childbirth

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Imminent delivery with crowning.

Procedure:

1. Delivery of the infant should be slow and controlled. This will prevent injury to both the mother and infant.
2. Support the infant's head as it presents. Avoid direct pressure over the fontanels.
3. Check the umbilical cord to see if it is surrounding the neck. If present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe starting with the mouth first, then the nares.

For normal cephalic presentation: *(follow the **Childbirth/Labor protocol** for breech and any complications)*

5. Grasp the head with your hands over the infant's ears. Gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the infant's abdomen with two clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for care of the newborn.
11. The placenta will deliver spontaneously. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding through uterine contractions.
13. Continue transport to the hospital.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Treatment: CPR Standards

Clinical Indications:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Basic life support for the patient in cardiac arrest.

Procedure:

1. Assess the patient's level of consciousness ("shake and shout").
2. If no response, open the patient's airway with a head-tilt-chin-lift. If cervical spine injury is suspected, perform a modified jaw-thrust instead and maintain neutral alignment of the cervical spine. Observe for any effective respiratory effort; agonal respirations or occasional gasping is not effective.
3. Check pulse (carotid pulse for adults and older children, brachial for infants) for no more than 10 seconds. If no pulse, begin chest compressions as indicated by the AHA BLS 2010 standards.
4. Go directly to the age-appropriate **Adult Cardiac Arrest** or **Pediatric Pulseless Arrest** protocol and begin passive airway procedures (adults) or early airway interventions (pediatrics).
5. Chest compressions shall be performed with the ResQPUMP device if available.
6. Chest compressions should be performed in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis and defibrillation and not for establishing an airway or intravenous access. Rate should be kept to a metronome device at 110 bpm (or 80 bpm if using ResQPUMP device) or through the cardiac monitor's display.
7. Document the time, procedure, and note the rotation of rescuers at 2 minute intervals in the patient care report.

Age	Location	Depth	Rate
Infant (0 to 1 year)	Over sternum just below nipple line. Two fingers or thumbs and encircling hands	1.5 inches or ⅓ the depth of the anterior/posterior chest.	110 / minute
Child (1 year to puberty)	Over sternum and above the xyphoid. Heel of one hand.	2 inches or ⅓ the depth of the anterior/posterior chest.	110 / minute
Adult	Over sternum and above the xyphoid. Both hands with interlocked fingers.	2 to 2.5 inches	110 / minute

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom

Standard Procedure (Skill)

Treatment: Deceased Body Procedure

Policy:

The responding unit on scene of a deceased person(s) will notify the Police Department if they are not already on scence.

P EMT-P P

Purpose:

Allows the responding unit on scene of a deceased body to notify the Police Department. This procedure is intended for EMS field termination cardiac arrests **and** found deceased bodies.

Procedure:

1. The responding unit will request Police Department via radio.

2. When the Police Department arrives on scene, the following information should be shared:

   A. Patient's name and date of birth

   B. Address and location of deceased body

   C. Suspected medical or trauma-related death

   D. Last time the patient was seen alive (if known)

   E. List of past medical history and medications (if known)

   F. Patient's primary care physician (if known)

   G. Next of kin and contact information (if known)

3. Once the Police Department is comfortable, the responding unit may clear the scene.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report.

Standard Procedure (Skill)

Treatment: Transport of the Decontaminated Patient

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

1. In coordination with HazMat and other Emergency Management personnel, recognize hot, warm, and cold zones of operation.

2. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident and will be accomplished by appropriate responders trained in HazMat operations.

3. EMS triage, treatment, and transport must adhere to policies established for HazMat and/or mass casualty incidents.

4. EMS will not transport patients who are “gassing off” in an enclosed ambulance. Other forms of transportation must be used.

5. Air medical transport should not be requested by EMS to transport patients exposed to a HazMat situation.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Treatment: Discontinuation of Pre-hospital Medical Resuscitation

P EMT-P P

Policy:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued by an EMS paramedic if certain criteria have been met. EMS will not transport a patient where discontinuation of resuscitation has been elected and all criteria have been met.

Purpose:

Allow for discontinuation of pre-hospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

1. CPR and ALS interventions may be discontinued without contacting Medical Control if ALL of the following criteria have been met:

- All adult family members on scene must be in agreement that resuscitation efforts should be stopped. If one or more adult family members requests continuation of efforts and/or transport to the hospital, EMS should honor this request if safe to do so. Contact medical control for assistance, if needed.
- Adequate CPR has been administered with recorded $ETCO_2$ readings.
- Airway has been successfully managed with verification of device placement. Acceptable management techniques include endotracheal intubation, adjunct airway device, or a cricothyrotomy.
- IV or IO access has been achieved.
- Rhythm-appropriate medications and defibrillation (if indicated) have been administered according to protocol.
- Persistent asystole or a pulseless agonal rhythm (below 20 bpm) is present at the time and no reversible causes are identified after a minimum of 25 minutes of resuscitation.
- All EMS and first responder personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate.
- No ROSC was achieved at any point of resuscitation.

2. **If ANY of the above criteria are not met and discontinuation of pre-hospital resuscitation is possibly indicated or desired, contact Medical Control.**

After termination, the patient's location will be left to the supervisor's discretion. Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report.

Standard Procedure (Skill)

Treatment: Gastric Tube Insertion

Clinical Indications:

A	AEMT	A
P	EMT-P	P

Gastric decompression in intubated patients.

Procedure:

1. Estimate insertion length by superimposing the tube over the body from the lips to the stomach.

2. Place the head (if not contraindicated) into a neutral or “sniffing” position to facilitate esophageal passage.

3. Oral insertion of the tube is preferred for intubated patients in the prehospital setting.

5. Lubricate the distal end of the tube and insert through the oral cavity. Continue to advance the tube gently until the appropriate distance is reached. If the tube is unable to be advanced to the expected distance, remove completely and attempt once again.

6. Confirm placement by injecting 20 mL of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.

7. Secure the tube.

8. Decompress the stomach of air and food either by connecting the tube to suction or by manually-aspirating with a large Luer slip syringe. Salem sump tubes are designed with the extra port holes that allows for continuous suction.

9. Document the procedure, time, and result on the patient care report.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Treatment: Medication Administration

Policy:

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Allows EMS to administer mediations via multiple routes. For intramuscular injections, subcutaneous injections, and nebulizer therapy, refer to the specific treatment policy.

Procedure:

Preparation for Administration

Medication is checked for:

1. Right medication for the patient's needs
2. Right dose/amount
3. Right time
4. Right route for administration
5. Expiration date
6. Patient allergies to the medication

Administration

A. **Oral Medications** (PO or SL)

1. Confirm appropriate swallow reflex and mentation to prevent aspiration. Provide medication to the patient with clear direction on the administration (chewed, swallowed, held under the tongue).

B. **Rectal Medications**

1. Attach a teflon catheter (from an angiocath) to the end of a syringe that contains medication to be administered. Gently insert catheter into rectum and instill medication.

C. **Endotracheal Administration**

1. When vascular access is delayed and an endotracheal tube is in place, specific medications can be administered down the endotracheal tube. Double the dose of the medication.
2. The medication is rapidly injected down the tube in a bolus that is diluted or followed by normal saline to flush the tube. Do not exceed 10 mL in one fluid bolus.
3. Medications that may be given down the endotracheal tube:
   a. Epinephrine
   b. Atropine
   c. Naloxone (Narcan)
   d. Lidocaine

D. **Mucosal Atomization Device (MAD)**

1. Assure that there is no trauma to the nares, perforations from illicit drug use, or excessive nasal secretions that would contradict intranasal medication use.
2. Draw up half of the volume of medication required to treat the patient in a 1 or 3 mL syringe. An extra 0.1 ml of medication may be drawn up to account for the dead space within the atomizer. A maximum of 1 mL (plus dead space allowance) may be infused per nostril. The medication is divided in half in order to infuse medication into each nostril, which effectively doubles the absorption area.
3. Remove the blunt fill or filter needle from the syringe.
4. Attach the atomizer tip.
5. Using your free hand, occlude one of the patient's nostrils. Place the tip of the atomizer snugly into the other nostril while aiming slightly up and inward (towards the top of the opposite ear).
6. Briskly compress the syringe plunger to deliver the medication into the nostril.
7. Draw up the remaining volume required for the patient. Do not draw up an additional 0.1 mL for dead space, as that area of the device is now filled with fluid. Move the device over to the opposite nostril and administer the remaining medication.
8. Medications that can be utilized in the MAD are Ativan, Fentanyl, Narcan, Versed, and Glucagon

E. **Intravenous Medications: Bolus Dose**

1. Medication is prepared in a Luer lock syringe.
2. All air must be cleared from the syringe and any excess medication expelled.
3. The port should be cleaned with an alcohol pad ("scrub the hub"). Using aseptic technique, twist the syringe onto the IV line port or use the medication port of the fluid bag (accessed by the appropriate means, such as a blunt needle, etc.).
4. Patency of the IV is checked by aspirating blood or by monitoring fluid flow with no signs of infiltration present.
5. The IV line should be clamped proximal to the infusion port to occlude flow. This allows the medication to flow into the vein and not back up into the IV bag instead.
6. The time needed to administer the medication is specific to the medication itself. Refer to the protocol or drug formulary for guidance. Flush the IV line thoroughly to assure complete medication administration.
7. Monitor the IV catheter site for any signs of infiltration. Monitor the patient for response.
8. Dispose of the syringe into the sharps container.

F. **Intravenous Medications: Continuous Drip**

1. Pre-mixed intravenous medications are selected or appropriate dose of medication is added to an intravenous fluid bag. If the medicated fluid was prepared by EMS by adding medication, affix a label to the fluid bag listing the added medication(s), amount or concentration, and date/time.
2. Drip rates calculations need to be completed before administering the medication. Confirm the drip rate with another paramedic or by using a drug reference (protocols, for example).
3. Gently roll the bag to distribute the medication. Insert the administration line and prime.
4. Connect the medication bag to the closest port available. Main-line fluid will be turned off during the piggyback drip administration.
5. Control the flow rate for the desired drops per minute or mL per hour and monitor for consistency.

Post Medication Assessment

Assess the patient for condition changes following medication administration.

1. Medications should be discontinued (when possible) if serious adverse effects occur or as directed by Medical Control.

Documentation

Documentation on the patient care report will include:

1. Name of medication and who administered it.
2. Dose and concentration of medication.
3. Time of administration.
4. Route/site of administration.
5. Documentation of narcotic waste with an appropriate witness signature.
6. Patient response to the medication.

Pediatric Considerations:

When the actual weight is unknown, a length based/color coded resuscitation tape (Broselow-Luten Pediatric Tape) should be used for pediatric dosing. Do not rely on a parent's estimate of the patient's weight.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Treatment: Spinal Immobilization

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Policy:

The use of spinal motion restriction is necessary in any patient with the potential for spinal compromise. This potential is based on mechanism of injury AND patient presentation. While it may be indicated in some situations, it is also important to understand that there is very little proven benefit to the use of a long spine board. Additionally, there is potential for harm with the use of the long spine board. While these EMS protocols encourage applying SMR to only those patients likely to benefit from it, it is important to understand that this will most likely best be accomplished by using only a cervical collar and forgoing the use of the long spine board. This practice is supported by both the National Association of EMS Physicians and the American College of Surgeons in their 2013 joint position statement (EMS Spinal Precautions and the Use of the Long Backboard. PEC 2013;17:392-393).

Procedure:

The SMR Decision Algorithm outlines the decision support process to determine if SMR is indicated. For patients who cannot be cleared under SMR decision algorithm:

- Stabilize head and neck in neutral position unless movement causes pain, deformity, or resistance. If so, stabilize the head and neck in the position found.
- If the patient is ambulatory, place an appropriately sized cervical collar and position the patient directly on the cot in the position of comfort, limiting movement of the spine during the process.
- Patients that are stable, alert, and without neurological deficits may be allowed to self-extricate to the cot after placement of a cervical collar. Limit movement of the spine during the process.
- Most patients should be transported with a cervical collar in place, seated or lying on the stretcher without a backboard.

In general, backboards should only be used for the following patients:

- Multi-system trauma patients where the backboard is to be a whole body splint.
- Unconscious / unresponsive patients
- Patients that require backboards for movement / extrication and it is not safe to remove patients from the backboard once on the stretcher.

If a patient is to remain on a backboard, appropriate padding must be placed under their head and/or shoulders to maintain their spinal column in a neutral inline position. Their head should also be secured to the backboard with a cervical immobilization device.

“Standing take-downs” of ambulatory patients should not be performed. Patients with penetrating traumatic injuries should NOT have SMR applied unless a focal neurologic deficit is noted upon physical exam. ALWAYS use your clinical judgement and err on the side of spinal precautions.

Standard Procedure (Skill)
Treatment: Splinting

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Extremity immobilization for transport due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically-necessary devices such as IV catheters.

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint.
2. Remove all clothing from the extremity, including jewelry.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (such as Coban, Kerlex, cloth bandage, etc.) depending on the splint design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these three parameters, remove the splint and reassess.
7. If a proximal third or midshaft femur fracture is suspected and there is no evidence of pelvic fracture or instability or lower extremity fracture distal to the femoral injury, the procedure below may be followed for placement of a femoral traction splint (Sager):
    - Assess neurovascular function as mentioned in the first line. Cut away clothing on the extremity.
    - Remove the patient's shoe and place the ankle device over the ankle.
    - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Any instability may suggest a pelvic fracture, which is a contraindication to the traction splint.
    - Extend the distal end of the splint at least 6 inches beyond the foot.
    - Attach the ankle device to the traction crank.
    - Apply traction as recommended by manufacturer. The Sager splint is listed below:

      <u>Adult</u>: 15 lbs per extremity or 30 lbs for a bilateral femur fracture.

      <u>Infant/pediatric</u>: 10% of body weight up to 7 lbs per extremity or 15 lbs for a bilateral fracture.
    - Secure both legs together using the Velco bands. Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction/reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: Blood Draw

A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Collection of a patient's blood for laboratory analysis.
- Blood draws may be requested from time to time by law enforcement, but this will not be done by AMS or AFD personnel. Alert your supervisor if this is requested of you.
- Patient is an ACUTE STROKE or AMI patient. The pre-hospital blood draw will help facilitate expeditious care at the hospital. Blood draws are encouraged for other medical conditions where beneficial.

Procedure:

This procedure is currently in place for **NWTH** Code Stroke only.

1. Blood specimen vial order:
   Blue
   Green
   Purple

2. Record date, time, and initials of person obtaining blood draw on each vial as well as patient's name and DOB.

3. Place specimen in stat bag and label outside of bag.

4.Stroke patient blood specimens will be hand delivered to expedite results.

5. Document all procedures in ePCR.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: Central Line Maintenance

P EMT-P P

Clinical Indications:

Transport of a patient with a central line already in place.

Procedure:

1. Ensure that the line has been secured prior to transport.

2. Medications and IV fluids may be administered through a central venous pressure line if that line has already been accessed and the patient is currently receiving medications or fluids through it.

3. Do not manipulate the central venous catheter.

4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, stop the infusion and contact Medical Control. Do not use the line.

5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: External Jugular Access

A	AEMT	A
P	EMT-P	P

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and an extremity vein is not obtainable. Consider IO access in addition to or instead of an EJ attempt.

- External jugular cannulation may be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine, head down position. This helps distend the vein and prevents air embolism.

2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.

3. Prep the site by cleansing with alcohol or chlorhexidine.

4. Align the catheter with the vein and aim toward the same side shoulder.

5. Compressing the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.

6. Due to possibility of airway compromise from infiltration or hematoma formation at the site, venipuncture attempts can only be made to one side of the neck.

7. Attach the IV and secure the catheter, avoiding circumferential dressing or taping.

8. Document the procedure, time, and result on the patient care report.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: Existing Catheters

Clinical Indications: P EMT-P P

- Medications or fluid are needed by the patient and there are no signs of infection/swelling/drainage from the insertion site.
- Dialysis catheters can only be used during cardiac arrest situations. Other treatment needs require peripheral IV access or medical control authorization.

Procedure:

1. Scrub the distal port of the catheter with an alcohol wipe.
2. Using sterile technique, withdraw 10 mL blood and discard the syringe in the sharps container. This prevents the patient from receiving a heparin bolus if the central line is not a closed-end or valve-tip catheter.
3. Access the port with sterile technique and gently attempt to flush the line with 10 mL of normal saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 5. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If any difficulties are encountered, stop the infusion and reassess.
6. Record procedure, any complications, and fluids/medications administered in the patient care report.

Refer to Appendix 9 for a visual reference and information about various central venous catheters, including dialysis catheters.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: Extremity

Clinical Indications:

A	AEMT	A
P	EMT-P	P

Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

Peripheral IV access is preferred. If IV access is not obtainable in a timely fashion move to Intraosseous procedure.

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Paramedics and AEMTs can use intraosseous access where threat to life exists, as provided for in the Venous Access-Intraosseous procedure.
3. Use the most appropriate catheter bore size needed based upon the patient's condition vein size.
4. Fluid and setup choice is preferably:
   - Lactated Ringers with a macro drip set for burns and trauma.
   - Normal Saline with a macro drip set for medical conditions or hypotension.
   - Normal saline with a micro drip (60 gtts/mL) for most medication infusions and pediatrics.
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect the IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then prime the tubing with fluid.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Select a vein and an appropriate gauge catheter for the vein/patient's condition.
9. Prep the skin with an antiseptic solution and allow to air dry.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Draw blood samples when appropriate.
13. Remove the tourniquet and connect the IV tubing or saline lock.
14. Open the IV to assure free flow of the fluid and adjust the flow rate per protocol or as clinically indicated.
15. Cover the site with a sterile dressing or tape and secure the IV and tubing.
16. Document the procedure, time, and result on the patient care report. All unsuccessful attempts must also be documented in the PCR.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Venous Access: Intraosseous

Clinical Indications:

A	AEMT	A
P	EMT-P	P

Patients with any of the following conditions where rapid, regular IV access is unavailable:

- Cardiac arrest.
- Multisystem trauma with severe hypovolemia and/or a significantly-burned patient with no IV access.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / respiratory arrest.
- Any other immediately life-threatening, pre-arrest clinical condition in which IV access is unobtainable.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta.
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion (48 hours or less) or joint replacement at the selected site.

Procedure:

1. Gather personal protective equipment (gloves, eye protection, etc.).
2. The proximal humerus is the manufacturer preferred IO site and required to give adenosine or hydroxocobalamin. The humeral IO site is located at the lateral aspect of the humerus, 2cm distal to the greater tuberosity. A 45mm needle must be utilized for the humeral insertion. The proximal and distal tibia are also acceptable insertions sites. Identify the anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be a flattened area 1-2cm (2 finger widths) below this.
3. Prep the selected site with providone-iodine, alcohol, or chlorhexadine.
4. <u>For the EZ-IO intraosseous device:</u> Hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate. Power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Use the larger 45 mm needle for the proximal humerus. The smallest needle (15 mm) is only intended for use with neonatal patients at the anteromedial aspect of the proximal tibia.
5. Remove the stylette and place in an approved sharps container.
6. Attach a syringe filled with at least 5 mL of normal saline and inject to clear the lumen of the needle.
7. Attach the primed IV line and adjust the flow rate. A pressure bag may assist with achieving desired flows.
8. Stabilize and secure the needle with the EZ-Stabilizer device.
9. <u>Anesthesia</u>: 1 mg/kg of 2% lidocaine (maximum 50 mg) may be administered to adult patients for infusion-related pain as long as there are no allergies to lidocaine, bradycardia, or AV heart blocks on the ECG. Pediatric patients may receive lidocaine at 0.5 mg/kg to a maximum of 40 mg per dose. As with adults, assure there are no drug allergies to lidocaine, bradycardia, or AV heart blocks on the ECG. Do not flush, run any fluids, or give any medications for at least 60 seconds after administration to allow the lidocaine to exert its effect on the local tissues of a conscious patient.
10. Flush the IO line with 10 mL of normal saline after every medication infusion for adults.
11. Document the procedure, time, and result on the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Wound Care: Cleaning of General Wounds

Policy:

To provide EMS personnel with a means of addressing open and/or closed wounds.

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Purpose:

Identify, clean, and dress open wounds for transport or refusal patients.

Procedure:

1. Always clean open wounds with sterile water or normal saline. **Never use pure hydrogen peroxide on wounds. It may be diluted to a 50% hydrogen peroxide and 50% sterile water/saline solution, if needed.**

2. If the patient is refusing transport, assure all active bleeding has been controlled prior to dressing the wound.

3. Dress the injury site with a clean and dry gauze, dressing, and/or Band-aid. Coban, Kerlix, or tape may be used to secure the gauze or other dressing. Do not apply Kerlix, Coban, or other securing material directly to the wound bed.

4. Document the control of bleeding, pulse/motor/sensory assessment, and patient response both before and after dressing the wound. Range of motion should also be documented in the patient care report where applicable.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)
Wound Care: Taser Probe Removal

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Patient with uncomplicated and conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm deep into the skin.

Contraindications:

- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported to the emergency department for further evaluation and probe removal:

  Probes embedded in skin above:

  - Level of clavicles,
  - Female breasts, or
  - Both sex genitalia

- Suspicion that probe might be embedded in bone, a blood vessel, or other sensitive structure.

Procedure:

1. Ensure all wires are disconnected from the weapon and that the patient will not pose a safety risk to EMS.
2. Stabilize the skin around the probe using your non-dominant hand.
3. Grasp the probe by the metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
4. Remove the probe in single, quick motion. Ensure that the probe is still intact. If not, the patient will need to be transported to the emergency department for removal of the embedded piece.
5. Clean the wound with sterile saline and apply dressing.
6. If probe is unable to be removed after one attempt, do not make any further attempts and instead transport the patient to the emergency department.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (Skill)

Wound Care: Tourniquet

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Clinical Indications:

- Life threatening extremity hemorrhage that can not be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.
- Partial or complete amputation where resuscitative efforts may restore bleeding.

Contraindications:

- Non-extremity hemorrhage.
- Proximal extremity location where tourniquet application is not practical.
- Bleeding dialysis shunts or grafts.

Procedure:

1. Cut away clothing at wound site and place tourniquet as high as possible proximal to wound.
2. Tighten per manufacturer's instructions until hemorrhage stops and distal pulses in the affected extremity disappear.
3. Secure the tourniquet per manufacturer's instructions.
4. If a lower extremity is affected, automatically apply two tourniquets.
5. Note time of tourniquet application and communicate this to receiving care providers. Write the time on the tourniquet itself.
6. Dress wounds per standard wound care protocol.
7. If delayed or prolonged transport and tourniquet application time is greater than 45 minutes: Contact medical control for guidance on reattempting standard hemorrhage control techniques and removing tourniquet.
8. If one tourniquet is not sufficient enough to control hemorrhage, consider the application of a second tourniquet more proximal to the first.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Medical Director.

Standard Procedure (skill)

Ventilator Management

P EMT-P P

Continuous monitoring of Pulse Oximetry, Waveform Capnography, EtCo2 is required

Clinical Indications:
This protocol only applies during interfacility specialty care or critical care transports for patients requiring ventilatory support. Otherwise, the standard AMS protocols should be followed.

Procedure:
1.Review current SpO2 and EtCO2 or ABG to ensure that ventilator settings are adequately ventilating/oxygenating the patient. Consult transferring hospital or Medical Control for any questions or concerns before making any changes.

2.This applies to any ventilator alarms or problems with oxygen saturations or CO2 levels. Goal levels are EtCO2 35 - 45 and SpO2 over 95% (if able)

3.Evaluate patient for pneumothorax, bronchospasm, proper ETT placement

4.Check ventilator settings, including tubing and connections

5.Do not increase PEEP above 10 without contacting Medical Control. Consider BVM ventilation and re-intubating with persistent hypoxia

6. For abnormal EtCO2 levels, make small changes to respiratory rate to gradually change readings. TV (Tidal volume) may also be changed to alter EtCO2 - again, make small changes and try not to exceed 6-8 mL/kg ideal body weight when increasing TV.

7.With high pressure alarms, ensure appropriate patient sedation (no coughing, fighting vent), treat bronchospasm, and consider manual ventilation.

8.Hypoxia-Increase FiO2 to 100%. May increase PEEP.

9.High EtCO2- Increase Resp Rate. Increase TV.

10. Low EtCO2- Decrease Resp Rate. Decrease TV

11. High Pressure Alarm -Consider Sedation. Manually Ventilate

12. Maintain adequate sedation of mechanically ventilated patients:
Procedural Sedation*Adult and Pediatrics
Fentanyl 1 mcg/kg IV Max 50 mcg
+
Versed 0.5 - 2.5 mg IV
May repeat Versed x 1(Max 5 mg total)

Ventilator Management

Advisory: It is important to note that there is not a "one size fits all" vent settings for patients, however the following is a guideline for patients requiring mechanical ventilation. For interfacility transports it is important to utilize the prior vent settings and adjust if necessary.

Adults:

AC mode

Volume control

Vt: IBW(typically 500 ml in healthy adults)

RR: 15 bpm

I:E ratio: 1:3 (4secs)

PEEP: 5

FiO2: 50% (titrate to ABG PaO2 80-100 if available, otherwise use SpO2 as a guide;maintain sats above 90%)

Pediatrics:

AC or SiMV

Volume control

Vt: 6-8 ml/kg

RR: infant 20-30, child 16-20, teen 12-16

I:E ratio: 0.5 secs, 1:2

PEEP:5

FiO2: 100% (titrate to ABG/SPO2)

IDEAL BODY WEIGHT/TIDAL VOLUME FORMULA AND QUICK REFERENCE CHART

Male: 50 + (2.3-2.7 x every inch over 60)

Female: 45(45.5*) + (2.3 x every inch over 60)

Tidal volume: 6-8ml/kg of ideal body weight

Height	Male Tidal vT	Female vT	Male IBW	Female IBW
5'0"	300-400	237-364	50	45.5
5'1"	318-418	287-382	52.3	47.8
5'2"	327-436	301-401	54.6	50.1
5'3"	341-474	314-419	56.9	52.4
5'4"	355-474	328-438	59.2	54.7
5'5"	369-492	342-456	61.5	57.0
5'6"	382-510	356-474	63.8	59.3
5'7"	397-529	370-493	66.1	61.6
5'8"	410-547	383-511	68.4	63.9
5'9"	424-566	397-530	70.7	66.2
5'10"	438-584	411-548	73.0	68.5
5'11"	452-602	425-566	75.3	70.8
6'0"	466-621	439-585	77.6	73.1

Standard Procedure (Skill)

Treatment: LUCAS Mechanical CPR Device

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

PURPOSE: The LUCAS device is designed to provide automated mechanical external chest compressions.

INDICATIONS: Patients requiring mechanical chest compression in cardiac arrest that the device will fit appropriately.

CONTRAINDICATIONS:
• Patients who do not fit within the device.
o Patients who are too large and with whom you cannot press the pressure pad down 2 inches.
o Patients who are too small and with whom you cannot pull the pressure pad down to touch the sternum

PROCEDURE:
1. Manual chest compressions should be initiated immediately while the LUCAS device is being prepared and placed on the patient.
2. Remove clothing from chest to ensure skin contact with pressure pad.
3. Turn the device on and remove from the case.
4. Place the yellow back plate under the patient, just below the patients arm pits.
5. Continue manual compressions while attaching the Lucas to the back plate.
6. Limit interruptions of compressions to less than 7 seconds.
7. Ensure that defibrillation pads will be clear of the location of the suction pad.
8. Press the adjust mode button to position the compression arm to the chest. Align the lower edge of the pressure pad so that the suction cup is immediately above the end of the sternum.
9. Press the pause button to lock in the start position.
10. Press the Active continuous button to begin compressions.
11. Utilize the pause button as necessary during rhythm or pulse checks or upon ROSC.
12. Place the neck roll behind the patient's head and attach the straps to the LUCAS device.
    a. This will prevent the LUCAS from migrating toward the patient's feet.
13. Place the patients arms in the straps provided.
14. One crew member should be assigned to monitor the device and ensure that it remains in the correct position throughout the resuscitation.
15. Defibrillation can and should be performed with the LUCAS device in place and in operation
16. If disruption or malfunction of the LUCAS device occurs, immediately revert to manual compressions.

Treatment: ResQPOD Impedance Threshold Device

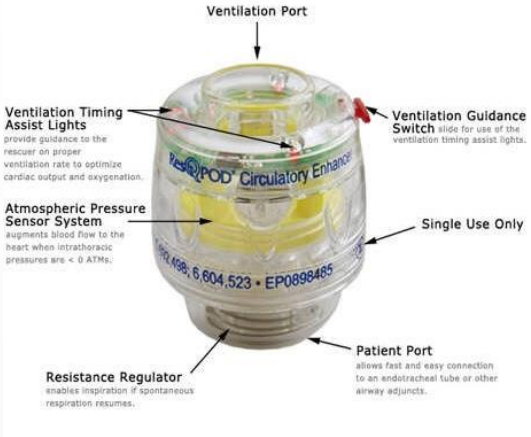
B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Introduction:

ResQPOD® is an impedance threshold device (ITD) that enhances the vacuum formed in the chest during the chest recoil phase of CPR. Studies have shown that this process draws more blood back to the heart (increases preload), and increases cardiac output, blood pressure, perfusion to vital organs and survival rates.

Indications:

To be used on all patients 20 pounds or 10 kg in cardiac arrest.



Contraindication:

- Where cardiopulmonary resuscitation (CPR) is not indicated
- Patient WITH a pulse or spontaneous breathing
- If CPR is discontinued remove ResQPOD immediately from ventilation circuit.
- Patients under <20 pounds or 10 kg
- Patients with a flail chest

Procedure:

Used with either basic or advanced life support during cardiac arrest, with a bag-valve mask attached to a face mask, an endotracheal (ET) tube, or BIAD.

1. Select airway adjunct (tube or mask).
2. Attach bag-valve to air intake port on ResQPOD.
3. Slide the Ventilation Timing Assist Light switch to on when using the ResQPOD.
4. Begin CPR

- Allow for complete chest release/recoil after each compression.
- Follow recommended ventilation rates.
- DO NOT hyperventilate.

PEEP Valves MUST be removed while using the ResQPOD Device.

Ventilate patients 8-10 breaths/minute with each breath lasting 1.5 seconds (maximum) to optimize CPR and ResQPOD efficacy.

Excessive ventilation rates will reduce the effectiveness of the ResQPOD.

*Clean or suction vomit and secretions from the ResQPOD by removing it from the airway adjunct and shaking or blowing debris out, using a ventilation source.

NOTE: After pulse and/or spontaneous respirations have been restored, immediately remove ResQPOD from ventilation circuit and help patient breath as needed.

Standard Procedure (Skill)

Treatment: ResQPUMP ACD-CPR Device

B	EMT-B	B
A	AEMT	A
P	EMT-P	P

Introduction:

The ResQPUMP ACD-CPR Device is used to perform active compression decompression CPR (ACD-CPR), which is intended to promote complete and active chest wall recoil to further enhance the vacuum. .

Indications:

The device shall be utilized on all patients in cardiac arrest whose chest is large enough to accommodate the device. The ResQPUMP shall be utilized for a minimum of 10 minutes before switching to the LUCAS device.

Contraindication:

- The ResQPUMP should not be used in patients who have had a recent sternotomy.
- Do not use the ResQPUMP if the patient's chest is not large enough for its suction cup to provide adequate compressions/decompressions during use.

Procedure:

Before beginning CPR with the ResQCPR System (ACD-CPR with an ITD), assess the patient for signs of circulation (e.g., consciousness, breathing, coughing, movement, pulse). If no signs of life are present, begin performing ResQCPR as soon as possible, but do not delay chest compressions while preparing the ResQCPR devices.

1. Perform active compression decompression CPR (ACD-CPR):

- Position the ResQPUMP's suction cup on the patients bare chest in the middle of the sternum, between the nipples (mid-nipple line). Make sure that the edge of the suction cup does not extend below the xiphoid process, as this could result in inadequate suction and/or rib injury.
- Turn on the metronome and begin performing compressions at a rate of 80/min:
- Perform chest compressions at the recommended compression to ventilation ratio. Use a 50% duty cycle, spending equal time compressing and lifting. Avoid interruptions.
- Compression: Compress to recommended depth (e.g. 2" or 5 cm).
  - Observe the force required to achieve that depth, as it will vary according to how compliant the chest is. The tip of the red arrow indicates the force being applied. Once the amount of force required is known, use that target as a guide for continued compressions. The approximate amount of force required to compress the chest 2 inches is as follows:
    - o 30 kg: soft/supple chest
    - o 40 kg: chest of average compliance
    - o 50 kg: stiff/rigid chest
  - Compress with elbows locked and shoulders directly over the sternum. Bend at the waist, using the entire upper body and large thigh muscles to compress and lift.
  - Compress at a rate of 80/min using the metronome (push button) as a guide (compress on one tone, lift on the other tone). Use the force gauge to monitor forces and rescuer fatigue.
- Decompression: To fully achieve the benefits of ACD-CPR, attempt to actively pull up until the tip of the red arrow on the force gauge registers ≈10 kg. Lift using the upper body and large thigh muscles, and bend at the waist. If the suction cup dislodges, then pull up with slightly less force on the subsequent compression. It is not necessary to lift with more than 10 kg of force.

Cardiac Arrest: Adult

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Medical versus trauma
- V-fib versus V-tach
- Asystole
- PEA
- Primary cardiac event versus respiratory arrest or drug overdose

Criteria for Death / No Resuscitation? DNR present and signed?

Yes →
- **Decomposition**
- **Rigor mortis**
- **Dependent lividity**
- **Injury incompatible with life**

Do not begin resuscitation if any one of these criteria have been met. If CPR has already begun, you may terminate CPR efforts.

Follow the Criteria for Death / Withholding Resuscitation policy

No ↓

Cold exposure patients

See Pearls for medication and defibrillation guidelines

B	**Begin continuous CPR compressions using ResQPUMP at 80 BPM** **If ResQPUMP unavailible –** **Push hard (2-2.5 inches) and push fast (110 per min)** **Change compressors every 2 minutes** **(*Limit changes / pulse checks ≤ 5 seconds*)**
B	AED Procedure, if available
B	Passive oxygenation: Nasopharyngeal / oropharyngeal airway inserted with a NC @ 15LPM
B	As personnel available: 2 person BVM Ventilations (1 every 10 seconds) Attach ResQPOD and $ETCO_2$

AT ANY TIME

Return of spontaneous circulation (ROSC)

Go to the Post Resuscitation protocol

ALS available?

No →
- B Call for ALS
- Place AED. Shockable rhythm?
  - Yes →
    - B Clear patient and deliver shock
    - B Continue CPR for 2 minutes AED analysis Repeat and reassess
  - No ↓
    - B Continue CPR for 2 minutes. AED analysis. Repeat and reassess

Yes →
- B Cardiac Monitor
- Shockable rhythm?
  - No → Follow Asystole / PEA protocol
  - Yes → Follow VF / VT protocol

Advanced Airway Placement
ET preferred
DO NOT interrupt compressions

If patient shows signs of awareness during CPR:

Ketamine
2mg/kg q 30 minutes PRN

Transition to LUCAS after at least 10 minutes of CPR with ResQPUMP

A **IV / IO Access** → **Medications per Protocol**

ETCO2 > 15 after 20 minutes?

Yes → **Resucitate for a minimum of 40 minutes**

No → **Discontinuation of Resuscitation Procedure**

Adult Cardiac Section Protocols

Cardiac Arrest: Adult

SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis, with early and aggressive treatment of possible causes.

• Use Pit-Crew Approach; assign incoming responders to pit crew positions in order.
• Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.

• Utilize passive oxygenation (nasal cannula @ 15 LPM) as resources arrive. Breathing / Airway management should occur after 2 rounds of compressions (2 minutes each round.)

• DO NOT HYPERVENTILATE: Ventilate 1 breath every 10 seconds with continuous, uninterrupted compressions.
• Do not interrupt compressions to place endotracheal tube.

• Reassess and document ET and / or BIAD placement and EtCO2 frequently, after every move, and at transfer of care.

• **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.

• **End Tidal CO2 (EtCO2)**
If EtCO2 is < 10 mmHg, improve chest compressions.
If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)

• Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest. Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.

• **Special Considerations**
Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to post cardiac arrest center that is also an obstetrical center. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient 's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
Renal Dialysis / Renal Failure – Consider - Sodium bicarbonate 50mEq IV / Calcium chloride 1 gram IV/IO
Sodium bicarbonate - no longer recommended as a standard cardiac arrest drug. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq IV / IO.
Opioid Overdose – If early in arrest, consider Naloxone 2 mg IM / IV / IO / IN. EMT may administer naloxone via IN route only. May give from EMS supply.
Drowning / Suffocation / Asphyxiation / Hanging / Lightening Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.

• **Transcutaneous Pacing:** Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival

•Success is based on proper planning and execution. Procedures require space and access. Make room to work.

• Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Adult Asystole / Pulseless Electrical Activity

History
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
  - Tricyclic
  - Digitalis
  - Beta blockers
  - Calcium channel blockers
- DNR

Signs and Symptoms
- Pulseless
- Apneic
- No heart tones upon auscultation

Differential
- Hypovolemia (trauma, AAA, other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (tricyclic, digitalis, beta blockers, calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia

Cardiac Arrest Protocol
(Review Criteria for Death / No Resuscitation)
(Review DNR)

Shockable Rhythm?

Yes → Follow Rhythm Appropriate Protocol

No ↓

B	Search for potential causes →
A	IV Procedure / A / IO Procedure
	Normal saline bolus 1 Liter IV / IO
P	**Epinephrine 0.1mg/ml (1:10,000) 1 mg IV / IO** Repeat every 5 minutes

B — **Continuous CPR compressions**
Push hard (2 to 2.5 inches) and push fast (110 per min)
Change compressors every 2 minutes
(*Limit changes / pulse checks ≤ 5 seconds*)

Suspected respiratory-caused arrest?
Consider sodium bicarbonate
(50 mEq) after 3rd epinephrine

Criteria for discontinuation?

Yes → Discontinuation of Pre-Hospital Medical Resuscitation procedure

No ↓

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Potential Causes:

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / **H**yperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Consider Early:

1. Repeated normal saline boluses for possible hypovolemia to a maximum of 2 L.
2. Obtain BGL. Give 25 grams $D_{10}W$ by IV/IO if BGL < 70 mg/dL.
3. Naloxone 2 mg IV/IO/IN.
4. Sodium bicarbonate 50mEq IV/IO for possible overdose, hyperkalemia, or renal failure. Consider for prolonged downtime greater than 20 minutes.
5. Calcium chloride 1 gram IV/IO for suspected hyperkalemia, renal/dialysis patients.

Adult Asystole / Pulseless Electrical Activity

Pearls:

- **SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and addressing the CAUSE: consider a broad differential diagnosis with early and aggressive treatment of possible causes.**
- **Efforts should be directed at high quality, continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and/or difficult IV access is anticipated.**
- **DO NOT HYPERVENTILATE: If an advanced airway is in place, ventilate 8 to 10 breaths per minute with continuous, uninterrupted compressions, or as guided by $ETCO_2$.**
- **Unless there is a suspected respiratory or traumatic cause of arrest, passive oxygenation by a high flow oxygen non-rebreather mask should be done for at least 6 minutes prior to any advanced airway. An advanced airway should be placed early if there is an immediate risk for aspiration of fluid. Do not interrupt compressions to place an endotracheal tube. This directs our focus on high quality chest compressions and early defibrillation, which are the keys to successful resuscitation.**
- **Suspected respiratory cause of arrest: A definitive airway should be established early, with no interruption of chest compressions for intubation attempts. Consider BIAD, if needed. The six minute passive ventilation minimum does not apply in this case.**
- **Consider BIAD on all cardiac arrest intubations to prevent interruption in compressions.**
- Success is based on proper planning and execution. Procedures require space and patient access; make room to work.
- If an IV / IO cannot be established, drugs that can be given down an endotracheal tube should have the dose doubled and then flushed. Total fluid volume should not exceed 10 mL per dose. IV/IO is the preferred route when available.
- PEA caused by sepsis or severe volume loss may benefit from a higher volume of normal saline administration.
- Return of spontaneous circulation after asystole or PEA requires a continued search for the underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from asystole or PEA.
- Asystole is commonly an end-stage rhythm following prolonged ventricular fibrillation or PEA and offers a poor prognosis.
- Discussion with medical control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Other potential protocols used during resuscitation include Overdose/Toxic Ingestion and/or Diabetic Adult.

Adult Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR

Signs and Symptoms
- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on ECG

Differential
- Asystole
- Artifact / device failure
- Cardiac
- Endocrine / medicine
- Drugs
- Pulmonary

Cardiac Arrest Protocol

P — Defibrillate 360 Joules

B — Resume CPR without a pulse check with continuous CPR compressions. Change compressors every 2 minutes (*Limit changes/pulse checks ≤ 5 seconds*)

A — IV Procedure | A — IO Procedure

P — Epinephrine 0.1mg/ml (1:10,000) 1 mg IV / IO
Repeat every 5 minutes

P — Add second set of pads at different vector
Defibrillate 360 Joules from new vector

Resume continuous CPR compressions
Continue CPR up to point where you are ready to defibrillate with device charged.

P — Amiodarone 300 mg IV / IO
Or
Lidocaine 1 mg/kg IV/IO(max 100 mg)
Defibrillate 360 Joules

B — High quality, continuous compressions

P —
- Consider amiodarone 150 mg IV/IO. Maximum of 450 mg total.
- Consider sodium bicarbonate 50 mEq IV/IO.
- Consider calcium chloride 1 gram IV/IO if hyperkalemia is suspected.

Return of spontaneous circulation? — Yes → Exit to Post Resuscitation Protocol

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to the Post Resuscitation Protocol

Cold Exposure Patients

Severe hypothermia: If core temperature is less than 86°F, only one defibrillation attempt may be made and the only medication that may be administered is 1 mg of epinephrine 0.1mg/ml (1:10,000) IVP/IO. No repeat doses.

Moderately hypothermic: If the core temperature is between 86 to 93.2°F, the protocol may be followed as indicated, but there should be longer intervals between repeated doses of medications.

Refer to the Hypothermia/ Frostbite protocol concurrently with other appropriate cardiac protocols.

Consider:

1. Sodium bicarbonate 50mEq IV/ IO for possible overdose, hyperkalemia, or renal failure.
2. Calcium chloride 1 gram IV/IO for suspected hyperkalemia and/or renal/dialysis patients.
3. Mag Sulfate 2gm IV/IO for Wide Complex Polymorphic Tacycarda / Torsades de Pointes

After 3 to 5 defibrillations with persistent V-Fib or V-Tach:

Consider DSED (Double Sequential External Defibrillation) with two defibrillators/AED.

(Maximum of 3 DSED)

Double Sequential External Defibrillation

- Any patient who has remained in persistent ventricular fibrillation/tachycardia without even a transient interruption of the rhythm.
- All other indicated treatment modalities have been implemented.
- A paramedic has verified the persistence of the arrhythmia.
- The patient does not have a ventricular assist device.

Procedure:

1. Ensure that the quality of CPR is not compromised.
2. If two appropriate sets of external defibrillation pads are not already on the patient, prepare the second site by drying the skin and removing excess hair to assure good pad adhesion. Remove transdermal patches.
   a. Apply the second set of external defibrillation pads adjacent to (but not touching) the pad set already in place. Avoid placing pads directly over any implanted devices.
   b. Recommended: An anterior-lateral placement of one set of pads and an anterior-posterior placement of the second set.
3. Assure that controls for the second cardiac monitor are accessible to the paramedic.
4. Upon rhythm check, the paramedic will confirm the rhythm.

   Part A. If a shockable rhythm is detected, CPR must resume immediately. The paramedic will verify that both cardiac defibrillators/AEDs are attached to the patient, that all pads are well-adhered to the skin, and he or she will direct the simultaneous charging of both attached cardiac monitors. When both monitors are charged to maximum energy and all persons are clear, the paramedic will push both shock buttons as synchronously as possible. Chest compressions should resume immediately.

   Part B. If a non-shockable rhythm is present, care will resume according to the appropriate protocol.

Pearls:

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement (if available) and a difficult IV is anticipated.**
- **DO NOT HYPERVENTILATE: If an advanced airway is in place, ventilate 8 to 10 breaths per minute or as guided by $EtCO_2$, with continuous, uninterrupted chest compressions.**
- **Passive oxygenation by high flow NRB should be done for at least 6 minutes prior to any advanced airway placement unless a suspected respiratory arrest, traumatic arrest, or immediate risk of aspiration. Do not interrupt compressions to place an endotracheal tube. Our focus should be directed towards high quality chest compressions and early defibrillation, which are the keys to successful resuscitation.**
- **Consider using the LMA and/or BIAD for all cardiac arrest intubations to prevent interruptions in compressions.**
- If no IV / IO can be established (example: bariatric patients), drugs that can be given down the endotracheal tube should have the dose doubled and then flushed with normal saline. Total maximum volume per dose: 10 mL. The preferred route is by IV / IO.
- Reassess endotracheal tube placement and $EtCO_2$ frequently, after every move, and at transfer of care. Document the findings.
- Do not stop chest compressions to check endotracheal tube placement or to give medications.
- Return of spontaneous circulation: Heart rate should be greater than 60 bpm when initiating anti-arrhythmic infusions.

Post-Arrest Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of spontaneous circulation (ROSC)

Differential
- Continue to address specific differentials associated with the original dysrhythmia.

Ensure ITD is removed once ROSC is obtained.

Repeat primary assessment; obtain vital signs

B — **Optimize ventilation and oxygenation**
- Maintain SpO_2 = 90 to 99%
- Advanced airway, ***if indicated***
- Respiratory rate: 8 to 10 per minute for $ETCO_2$ of 35 to 45 mmHg

DO NOT HYPERVENTILATE

A — IV Procedure | A — IO Procedure

B — Cardiac monitor with 12-lead ECG

Monitor vital signs / reassess

Hypotension? Systolic BP < 90 mmHg

Yes → P: **Levophed 8 to 12 mcg/min IV/IO** Consider: **Push Dose Epi 5-20mcg** every 2-5 minutes as needed.

Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL.

No ↓

Comatose?

Yes → Induced Hypothermia Protocol, if not already begun

No ↓

P — Consider sedation with midazolam only with a definitive airway in place

Midazolam 2.5 mg IVP/IO. Systolic BP must be > 90 mmHg. May repeat in 10 minutes as needed - watch for hypotension

And / Or

Fentanyl 100 mcg IVP/IO
May repeat 100 mcg in 10 minutes, if needed.

Maximum 300 mcg. May use if systolic BP < 90 mmHg.

STEMI or suspicion of AMI?

Yes → **Early facility notification**

No ↓

Symptomatic bradycardia?

Yes → Bradycardia Protocol

No ↓

ROSC with antiarrhythmic given?

No → P: If **NO** antiarrhythmic has been given after VT / VF, administer **Amiodarone** 150 mg over 10 minutes. Heart rate must be greater than 60 bpm.

Yes → P: If 300 mg of **Amiodarone** was given, start drip at 150 mg over 10 minutes. Heart rate must be greater than 60 bpm.
Or
If **Lidocaine** was given, start drip at 2-4 mg/min

Yes ↓

Notify Destination or Contact Medical Control

Arrhythmias are common and usually self eliminating after ROSC and may not need further medication.

If the arrhythmia persists, follow the rhythm appropriate protocol

Targeted Temperature Management - Adult

History
- Non-traumatic cardiac arrest
- All presenting rhythms are permissible in this protocol

Inclusion Criteria
- ROSC
- Age 18 years or above
- No current pregnancy
- MAP > 60 mmHg
- Weight > 50 kg
- ETCO2 > 20 mmHg
- Comatose with lack of purposeful movement

Exclusion Criteria
- Chronic renal failure / dialysis patient
- Pregnancy
- Hypotension with MAP < 60 mmHg
- Hypoxia with pulse oximetry of less than 85%
- Significant trauma with possible level activation
- Weight < 50 kg
- Arrest caused from bleeding
- DNR
- Ventricular assist device patient

Post cardiac arrest with return of spontaneous circulation (ROSC)

Meets criteria for induced hypothermia and the initial core temperature is ≥ 93.2 F (34C) via rectal thermometer?

No → Exit to Post Resuscitation Protocol

Yes ↓

Advanced airway (includes BIAD) in place with EtCO2 > 20 mmHg?

No → Airway Protocol(s) (if indicated)

Mean arterial pressure (MAP):

$$\frac{(2 \times \text{diastolic BP}) + \text{systolic BP}}{3}$$

MAP must be > 60 mmHg for induced hypothermia therapy.

P	Perform neurological assessment and **12-lead ECG**
B	Expose and apply ice packs to axilla and groin areas.
P	**IF hypotensive, systolic <90** **Levophed 8 to 12 mcg/min by IV/IO** Titrate to systolic BP ≥ 90 mmHg Consider: **Push Dose Epi 5-20mcg** every 2-5 minutes as needed.

Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL.

Reassess patient's temperature

Target: 92 °F (33 °C)

≤ 91.4 F (33 C) → Stop cooling measures until temperature increases. Reassess temperature every 10 minutes. Continue post resuscitation care.

≥ 92 °F (33.3 °C) → Continue cooling → Exit to Post Resuscitation protocol

Shivering noted?

No → Exit to Post Resuscitation protocol

Yes ↓

P: **Midazolam 2.5 to 5 mg IV/IO** if systolic BP is above 90 mmHg. May repeat in 3 to 5 minutes as needed; watch for hypotension.

And / Or

Fentanyl 100 mcg IV/IO
May repeat 100 mcg every 10 minutes as needed. **Maximum 300 mcg**

Notify Destination or Contact Medical Control

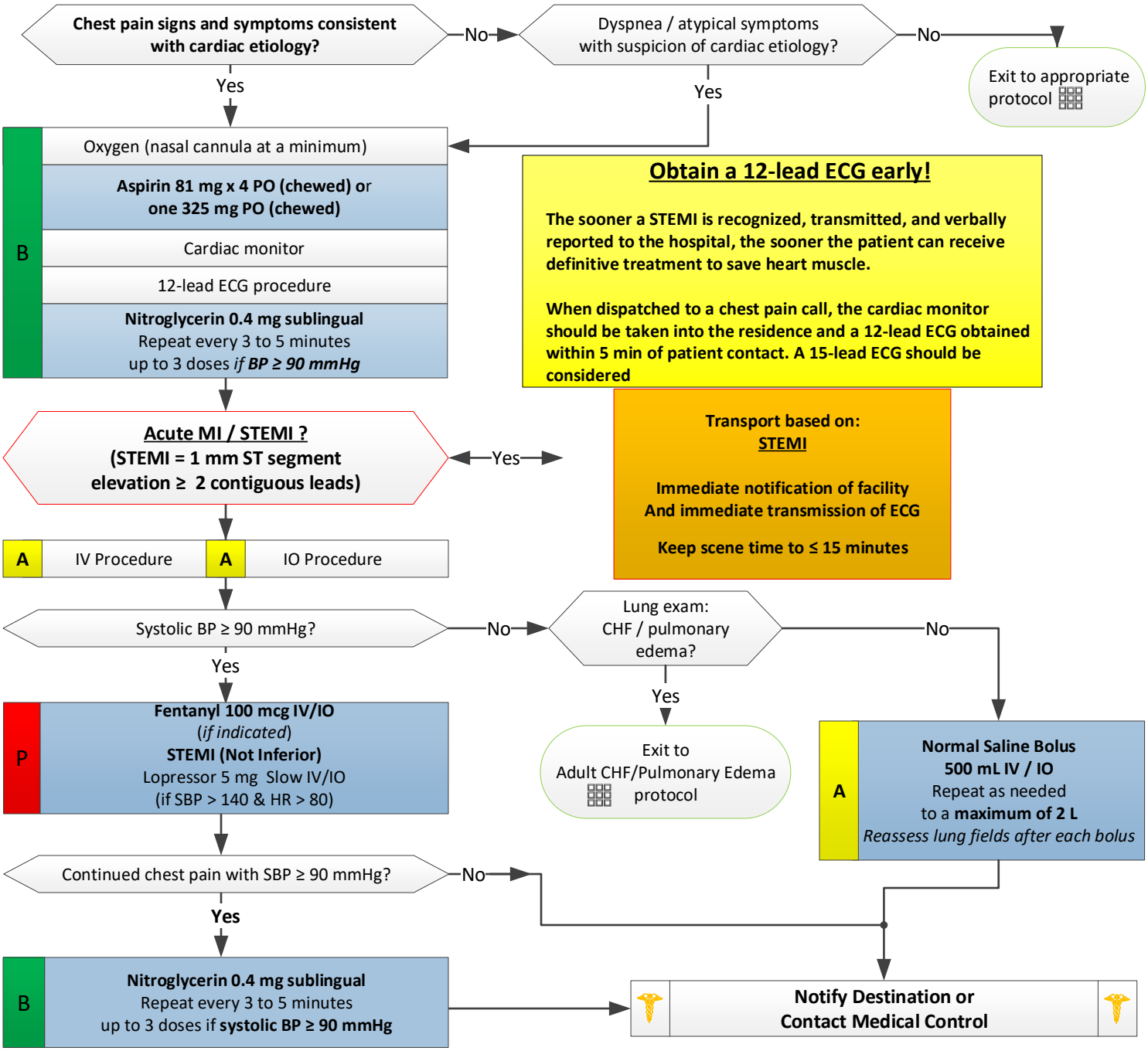
Continue Hypothermia Protocol even if ROSC is lost.

Chest Pain: Cardiac and STEMI

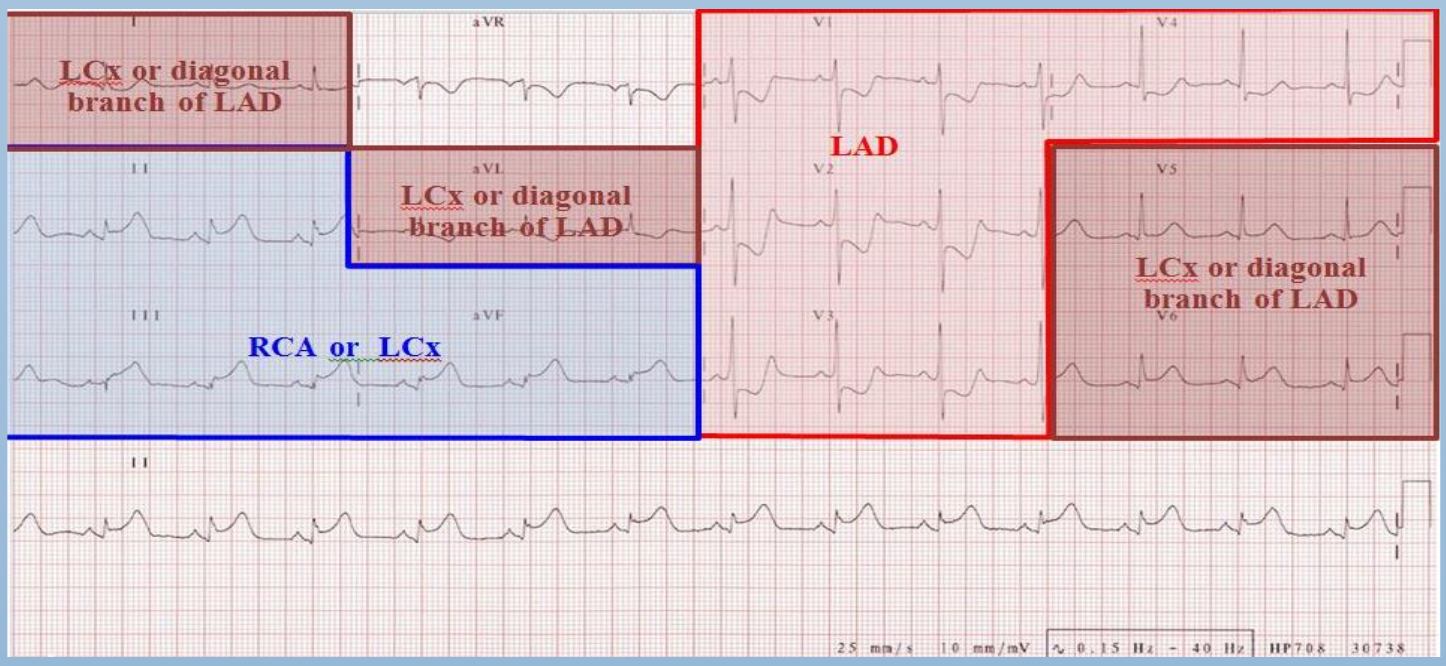
History
- Age
- Medications, noting: Viagra (sildenafil), Levitra (vardenafil), Cialis (tadalafil)
- Past medical history (MI, angina, diabetes, post-menopause, CVA, HTN, dysrhythmia)
- Allergies
- Recent physical exertion
- **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1 to 10)
- **T**ime (onset/duration/repetition)

Signs and Symptoms
- Chest pain (pain, pressure, heaviness, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoretic
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**

Differential
- Trauma versus medical
- Angina versus myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- Gastric reflux or hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (cocaine) or methamphetamine



STEMI Vessel Localization Aid:



ST elevation in 2 or more leads: II, III, aVF = Inferior wall MI (vessel likely RCA or LCx)

ST Elevation in 2 or more leads: I, aVL, V5, V6 = Lateral wall MI (vessel likely LCx or LAD branch)

ST Elevation in 2 or more leads: V1, V2, V3, V4 = Septal/anterior wall MI (vessel likely LAD)
Look for ST DEPRESSION in reciprocal leads (opposite wall) to confirm diagnosis. In this example ECG, there is ST elevation in the inferior leads with ST depression in the antero-septal leads, suggesting an inferior AMI.

Note: Isolated ST elevation in aVR with ST depression EVERYWHERE ELSE should raise concern for a possible proximal LAD or left main coronary artery lesion or stenosis. Not STEMI criteria, but the ECG should be transmitted for consultation and the emergency department needs to be notified early.

Pearls:

- **Avoid nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours, or Cialis (tadalafil) in the past 36 hours due to the potential of developing severe hypotension.**
- **Patients with a STEMI (ST-Elevation Myocardial Infarction) should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.**
- **If there is CHF/cardiogenic shock that results from an inferior (II, III, aVF) AMI, consider obtaining a right sided ECG. If ST elevation is noted in the transposed V3R or V4R, nitroglycerin and/or opioids may cause hypotension requiring fluid boluses.**
- If patient has taken his own nitroglycerin without relief, consider the potency of his or her medication.
- Monitor for hypotension after administration of nitroglycerin or narcotics.
- An IV may be established before giving nitroglycerin if there is a suspected potential for hypotension.
- Diabetic, geriatric, and female patients often have atypical pain or only generalized complaints. Consider performing a 12 lead ECG in these patients.
- Document the time of the 12-lead ECG in the patient care report along with the paramedic's interpretation in the comments.
- Unstable angina patients needs to be treated the same as those with an acute myocardial infarction.
- A cocaine-induced AMI will receive aspirin and nitroglycerin.
- Avoid Lopressor with inferior STEMI patients and with known cocaine/amphetamine use. Use caution with nitrates in inferior STEMI.

Bradycardia

History
- Past medical history
- Medications
  Beta-blockers
  Calcium channel blockers
  Clonidine
  Digoxin
- Pacemaker

Signs and Symptoms
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or shock
- Altered mental status
- Syncope
- Lethargic

Differential
- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Athletes
- Head injury (elevated ICP) or stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose

Heart Rate < 60 bpm and symptomatic with: Hypotension, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia?

No → Exit to Appropriate Protocol

Yes ↓

Dyspnea / increased work of breathing, especially with hypoxia? Place O_2 via appropriate device

Yes → Also use Airway and/or appropriate respiratory distress protocol

B 12-lead ECG procedure → STEMI? → Also use the Chest Pain: Cardiac and STEMI Protocol and consider pacing

B Cardiac monitor

A IV / IO procedure

Suspected beta-blocker or calcium channel blocker overdose?

Follow the Overdose /Toxic Ingestion Protocol

A **Normal saline bolus 500 mL IV/IO**
May repeat as needed to a maximum of 2 Liters

Resolved

Not resolved or no clinical response to first fluid bolus:

P **Atropine 0.5 mg IV/IO**
Repeat every 3 to 5 minutes to a maximum of 3 mg
Do not administer if 2nd or 3rd degree heart block

Resolved

Not resolved

P **Transcutaneous Pacing at 60 bpm**
If not responsive to atropine or if unavailable. Pacing may be considered a first line therapy for severe symptoms.
(Consider implementing early with 2nd or 3rd degree AV block)

Also consider
Levophed 8 to 12 mcg/min IV/IO

Resolved

Not resolved

P **Discontinue the levophed infusion.**
Initiate an epinephrine infusion of 2 to 4 mcg/min by IV/ IO *(titrate to effect)*

P

Consider for pacing:

Midazolam 2.5 mg
IV/IO if BP > 90 mmHg
May repeat in 10 min.
Maximum dose of 5 mg
if BP remains > 90mmHg

Or

Fentanyl 100 mcg
May repeat dose in 10 minutes.
Maximum total of 300 mcg

Or

Ketamine 0.3 mg/kg
IV / IO
To max of 50 mg.
Repeat once in 15 minutes if needed
NOT TO EXCEED MAX DOSAGE

Notify Destination or Contact Medical Control

Bradycardia

Pearls:

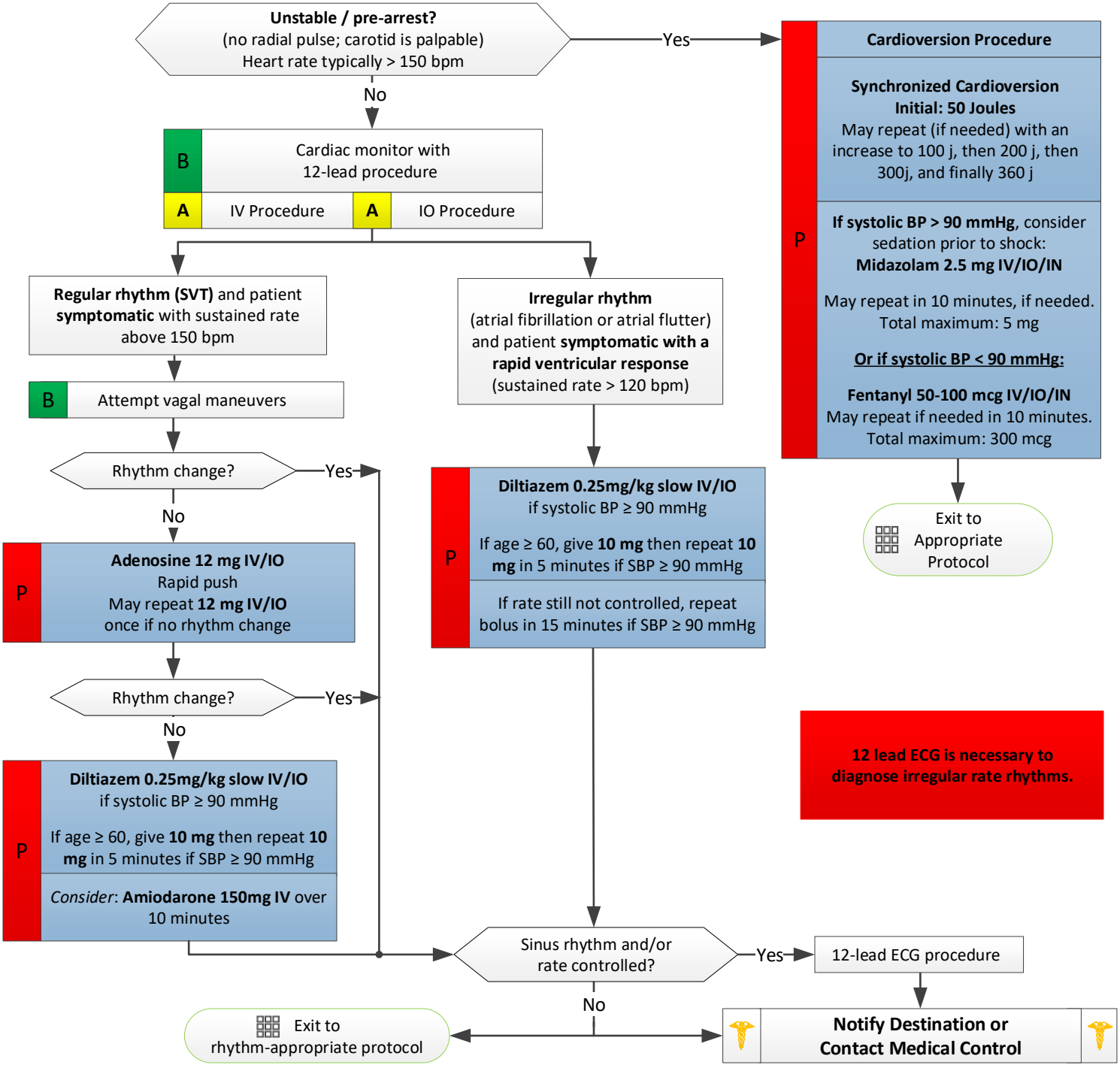
- **Recommended exam: Mental status, neck, heart, lungs, neurological.**
- **Rhythm should be interpreted in the context of symptoms. Pharmacological treatment should only be given when symptomatic, otherwise monitor and reassess the patient.**
- **It is paramount to identify the signs and symptoms of poor perfusion that was caused by the bradycardia.**
- **Atropine versus pacing**: **Providers should NOT DELAY transcutaneous pacing for patients with poor perfusion in the setting of an acute MI, 2nd degree AV block, or 3rd degree AV block. Atropine is ineffective with cardiac transplantation.**
- Patients not in a 2nd or 3rd degree AV block: Either levophed or pacing (or both) may be considered for bradycardia that is not responsive to atropine. Prepare for early implementation of transcutaneous pacing if there is no response to atropine. Levophed may be an effective treatment for hypotensive patients.
- Wide, bizarre appearance of the QRS complexes with a slow rate: Consider hyperkalemia.
- Consider treatable causes for bradycardia, which may include beta-blocker overdoses, calcium channel blocker overdoses, etc.
- Hypoxemia is a common cause of bradycardia. Be sure to oxygenate the patient and support their respiratory effort.

Adult Tachycardia
Narrow Complex (≤ 0.11 sec)

History
- Medications:
  (Aminophylline, diet pills, thyroid supplements, decongestants, digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms
- Heart rate > 150 bpm
- Systolic BP < 90 mmHg
- Dizziness, CP, SOB, diaphoresis
- CHF
- Potential presenting rhythm:
  - Atrial/sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial tachycardia
  - Ventricular tachycardia

Differential
- Heart disease (WPW, valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia or anemia
- Drug effect / overdose (see history)
- Hyperthyroidism
- Pulmonary embolus



Adult Cardiac Section Protocols

Adult Tachycardia
Narrow Complex (≤ 0.11 sec)

Pearls:

- **The most important goal is to differentiate the type of tachycardia and if it is STABLE or UNSTABLE.**
- **If at any point patient becomes unstable, move to unstable portion of the algorithm.**
- **An unstable patient is defined as one with abnormal vital signs (suggesting poor perfusion) along with altered mental status.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and with a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrhythmic medication. A patient's "usual" atrial fibrillation, for example, may not require emergent treatment.**
- **Search for an underlying cause of tachycardia, such as fever, sepsis, dyspnea, stimulant use, pain, trauma, etc.**
- **If a stable patient has history or 12-lead ECG suggesting Wolff-Parkinson-White (WPW) syndrome and has evidence of SVT, adenosine and/or diltiazem should not be administered. Aggressive fluid management and transport is suggested.**
- Monitor for hypotension after administration of calcium channel blockers (diltiazem).
- Monitor for respiratory depression and hypotension associated with midazolam.
- Continuous pulse oximetry is required for all SVT, atrial fibrillation, and atrial flutter patients.
- Document all ECG rhythm changes and the rhythm after each therapeutic intervention in the patient care report.

Regular narrow-complex tachycardias:

- Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25% of all SVT.
- Adenosine should be rapidly pushed into a proximal IV site followed by an immediate 20 mL normal saline flush.

Irregular tachycardias:

- First line agents for rate control are calcium channel blockers.
- Adenosine may not be effective with atrial fibrillation or atrial flutter, yet is not usually harmful and may help identify the rhythm.

Synchronized cardioversion:

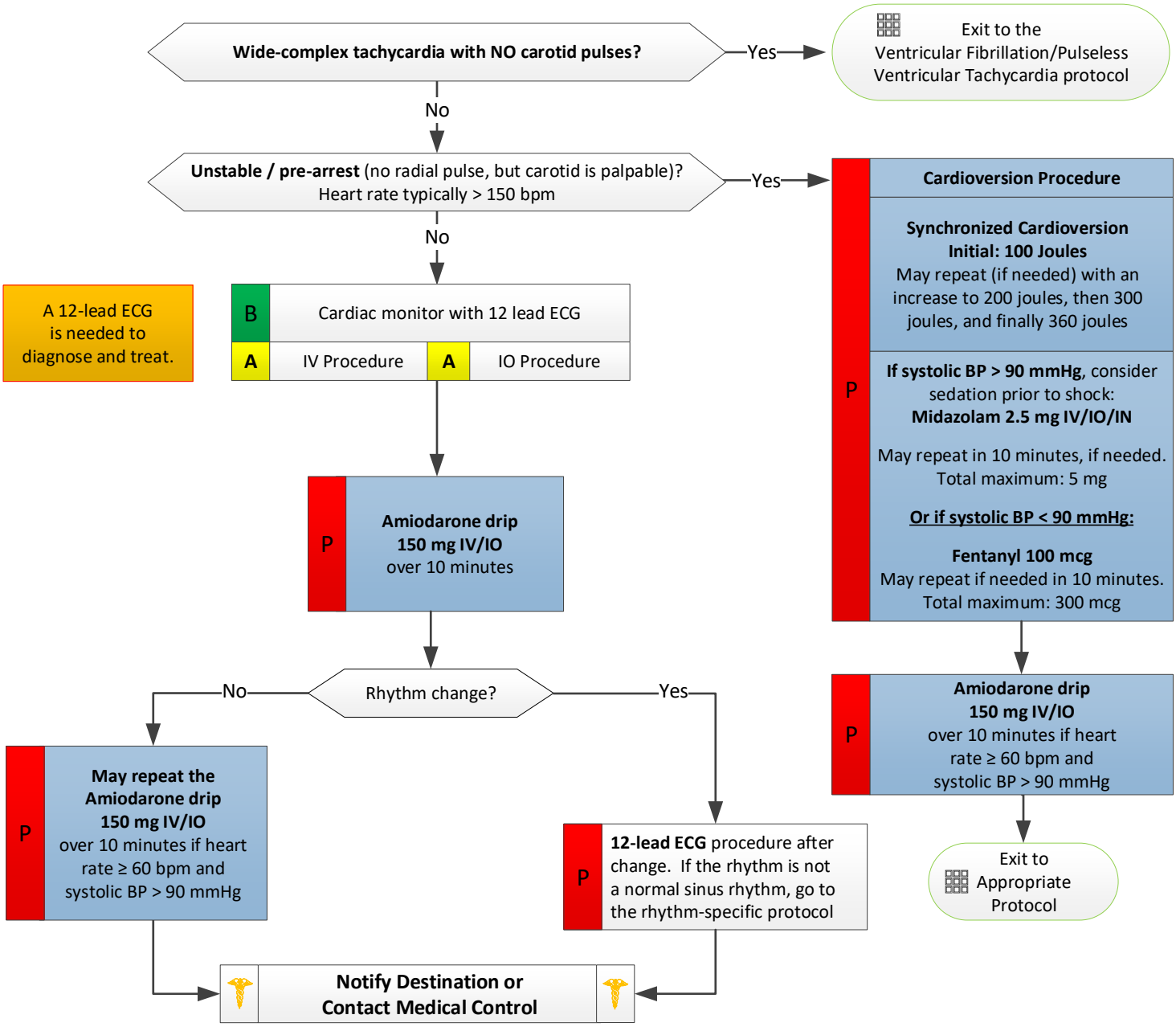
- Recommended to treat UNSTABLE atrial fibrillation, atrial flutter and monomorphic regular supraventricular tachycardia (SVT).
- An unstable patient is defined as one with abnormal vital signs (suggesting poor perfusion) along with altered mental status.

Adult Tachycardia
Wide Complex (≥0.12 sec)

History
- Medications:
  (Aminophylline, diet pills, thyroid supplements, decongestants, digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms
- Heart rate usually > 150 bpm
- Systolic BP usually < 90 mmHg
- Dizziness, CP, SOB, AMS, diaphoresis
- CHF
- Potential presenting rhythm:
  - Atrial/Sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial tachycardia
  - Ventricular Tachycardia

Differential
- Heart disease (WPW, valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia or anemia
- Drug effect / overdose (see history)
- Hyperthyroidism
- Pulmonary embolus



Adult Cardiac Section Protocols

Adult Tachycardia
Wide Complex (≥0.12 sec)

Pearls:

- **The most important goal is to differentiate between the types of tachycardia and whether the patient is STABLE or UNSTABLE.**
- **If at any point patient becomes unstable, move to the unstable arm of the algorithm or the most appropriate protocol.**
- **An "unstable patient" is one who has abnormal vital signs (suggesting poor perfusion) with altered mental status.**
- **Search for the underlying cause of tachycardia, such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12-lead ECG suggesting Wolff-Parkinson-White (WPW) syndrome and has evidence of a rapid, symptomatic tachycardia, adenosine and/or diltiazem should not administered.** Aggressive fluid management and transport is suggested. Amiodarone may be acceptable for these stable patients, but those with WPW-associated tachycardia are usually unstable due to the rapid rate of depolarization and may need cardioversion.
- Monitor for respiratory depression and hypotension associated with midazolam.
- Continuous pulse oximetry is required for all wide complex tachycardia patients.
- Document all ECG rhythm changes and the rhythm after each therapeutic intervention in the patient care report.

Regular wide-complex tachycardias:

- **Unstable condition:** Immediate cardioversion.
- **Stable condition:** Arrhythmias with suspicion of WPW syndrome should be treated with amiodarone.

Irregular wide-complex tachycardias:

Do not administer calcium channel, beta blockers, or adenosine as these drugs may cause paradoxical increase in ventricular rate. This patient will usually require cardioversion. Consider contacting medical control.

Polymorphic / Irregular Wide- Complex Tachycardia:

- This situation is usually unstable and immediate cardioversion or defibrillation is warranted.
- When associated with a prolonged QT interval: Consider torsades de pointes.
  Administer Mag Sulfate 2 grams IV/IO

LVAD

History
- End-stage heart failure
- Patient has surgically-implanted pump that assists the action of one or both ventricles.
- Patient may or may not be on a list for cardiac transplantation.

Signs and Symptoms
- The flow through most of these devices is not pulsatile, therefore THE PATIENT MAY NOT HAVE A PULSE AT BASELINE. For this reason, pulse oximetry readings may also be inaccurate.
- Altered mental status may be the only indicator of a problem.
- Consider both LVAD-related and non-LVAD-related problems.

Differential
- Stroke
- Cardiac arrest
- Dysrhythmia different from patient's baseline
- Infection
- Bleeding (VAD patients are anti-coagulated)
- Dehydration
- Cardiac tamponade
- Device problem such as low battery or a disconnected cable

B

Auscultate the left upper abdominal quadrant.
If there is a humming sound, the pump is functioning.

Oxygen via NRB device and monitor $ETCO_2$ with nasal capnography sensor.

If the LVAD pump is not functioning, refer to the caregiver and operation book.

Notify the LVAD coordinator

Is the patient conscious?

Yes

A IV / IO procedure with 250 to 500 mL fluid bolus *(if indicated)*

B

Supportive care

Cardiac monitor and 12-lead ECG

$ETCO_2$ with nasal waveform capnography sensor

Blood glucose analysis
Treat if BGL ≤ 70 or ≥ 400 mg/dL.
Refer to the Adult Diabetic protocol

P

Pain management:
Fentanyl 2 mcg/kg by IV/IO/IM/IN
Maximum of 100 mcg per dose, which may be repeated every 10 minutes to a total of 300 mcg.

Respiratory (if wheezing is present):
DuoNeb HHN. EMT-B may assist.
Maximum of one dose.

Chest pain:
Fluid bolus only.

Nausea:
Ondansetron (Zofran) 4 mg SIVP/IM

SVT (heart rate > 150 bpm):
Adenosine 12 mg RIVP. May repeat once.
Do not administer amiodarone or diltiazem.

Other chief complaints:
Follow protocols as indicated. **Any medications that reduce cardiac preload, vasoconstrict, vasodilate, or otherwise will cause a drop in systolic blood pressure must be avoided in the non-cardiac arrest patient.** See Pearls and consult with Medical Control, if needed.

No

A IV / IO procedure with 250 to 500 mL fluid bolus

B

Cardiac monitor and 12-lead ECG

$ETCO_2$ with nasal capnography sensor

Blood glucose analysis
Treat if BGL ≤ 70 or ≥ 400 mg/dl.
Refer to Adult Diabetic protocol.

Respirations ≥ 8?

Yes

P

Follow protocols as indicated. **Any medications that reduce cardiac preload, vasoconstrict, vasodilate, or otherwise will cause a drop in systolic blood pressure must be avoided in the non-cardiac arrest patient.** See Pearls and consult with Medical Control, if needed.

Initiate emergent transport with early ED notification.

No

A

Narcan 2 mg IV/IO/IN
Consider 0.2 mg increment doses for chronic pain patients.
Maximum total dose of 2 mg

P

If no response to Narcan:

Confirm ECG as V-tach, V-fib, or asystole. If one of these rhythms is present, initiate the Adult Cardiac Arrest protocol and begin CPR. Limit compression depth to no greater than 2 inches to prevent LVAD dislodgement.

Do **not** initiate CPR for all other cardiac rhythms. Continue ventilations, consider intubation with PAI, and emergent transport with early ED notification.

Notify Destination or Contact Medical Control

LVAD

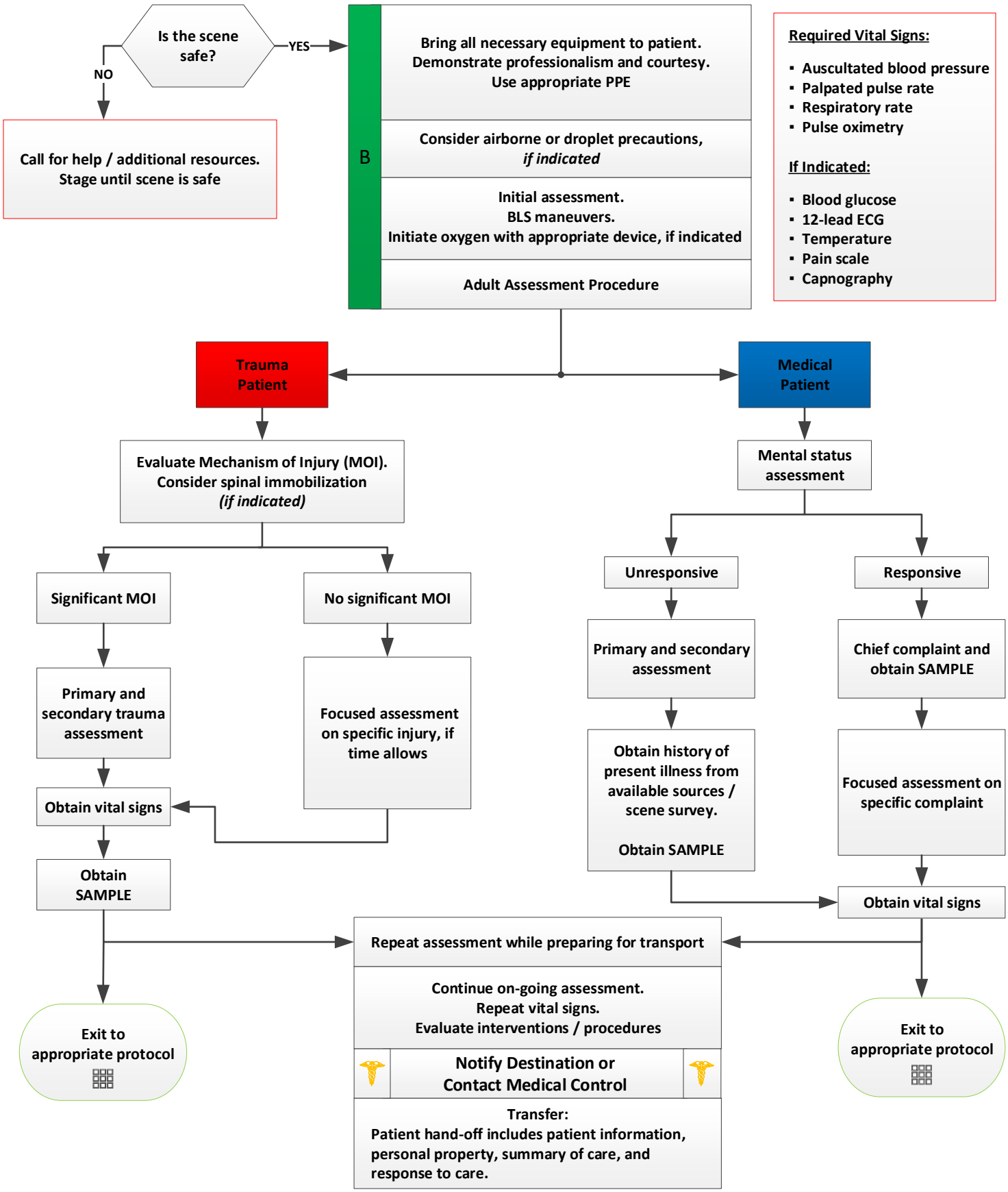
Prehospital Medications to Avoid with Ventricular Assist Device (VAD) Patients	
Anti-arrhythmics - May be used only if patient is in cardiac arrest	
Amiodarone Diltiazem (Cardizem) and other calcium channel blockers Lidocaine	Amiodarone and lidocaine may be used in cardiac-arrest. Calcium channel blockers should not be administered due to the negative inotropic effect and potential to develop hypotension.
Anti-coagulants / anti-platelet properties	
Aspirin	Patient is already very anti-coagulated, and adding aspirin may increase bleeding risks or delay healing.
Anti-hypertensives	
Enalapril (Vasotec) Labetalol (Normodyne)	Peripheral vasodilation or significant reduction in blood pressure may decrease preload. The VAD patient is dependent on preload for optimal pump function.
Benzodiazepines	
Diazepam (Valium) Lorazepam (Ativan) Midazolam (Versed)	May result in peripheral vasodilation that can reduce preload to the heart. For continuous seizures, the safest drug choice may be lorazepam (Ativan) since it remains primarily in the CNS and is not well-distributed to the periphery compared to other benzodiazepines.
Elementals	
Magnesium sulfate	Risk for developing hypotension and cardiac dysrhythmias.
Sympathomimetic medications - May be used only if patient is in cardiac arrest	
Epinephrine Dopamine Repeated doses of nebulized beta-agonists	Drugs that stimulate the sympathetic response may increase myocardial oxygen demands to the portion of the heart not supported directly by the VAD.
Vasodilatory medications	
Nitroglycerin Morphine	Peripheral vasodilation will decrease preload. The LVAD patient is dependent on preload for optimal pump function.

CPAP, DSED, and induced hypothermia <u>cannot</u> be used with ventricular assist device patients

Pearls:

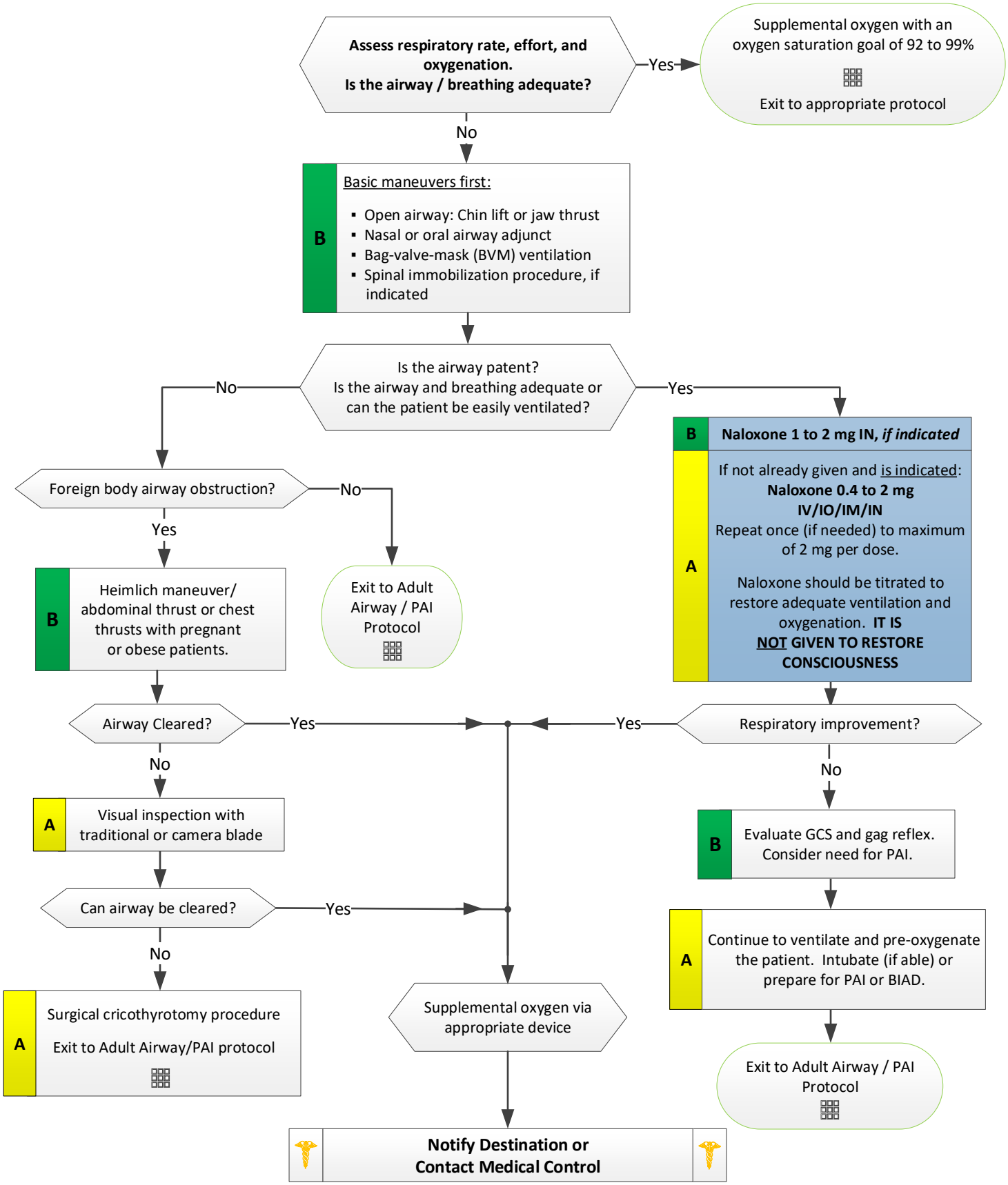
- **ALWAYS talk to family / caregivers since they will have specialized training and knowledge about the device. An appropriate knowledgable/ trained family member should accompany the patient to the hospital. CALL THE VAD COORDINATOR EARLY per patient/family instructions or as listed on the device. The VAD coordinators are available 24/7 and should be an integral part of the treatment plan.**
- **QUESTIONS TO ASK: DOES THE PATIENT HAVE A DNR? Can the patient be cardioverted or defibrillated if needed? Can CHEST COMPRESSIONS be performed in case of pump failure?**
- **Deciding when to initiate chest compressions is very difficult. Consider that chest compressions <u>may cause death by exsanguination</u> if the device becomes dislodged. However, if the pump has stopped, the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and medical control for further guidance.**
- Common complications in VAD patients include stroke and TIA (incidence up to 25%), bleeding, dysrhythmias, and infection.
- The cardiac monitor and 12-lead ECG are not affected by the VAD and will provide important information.
- VAD patients are preload dependent. Consider that a FLUID BOLUS can often reverse hypoperfusion.
- Transport patients with ALL device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers. Most patients will have a “go bag” available.
- Remember that it is unlikely an auscultated or palpated blood pressure can be measured. Pulse oximetry may be inaccurate.
- Unconscious with no respiratory effort and ECG shows ventricular fibrillation/ventricular tachycardia: Defibrillation is appropriate.

Universal Patient Care



Adult Medical Section Protocol

Adult Basic Airway



Adult Basic Airway

Difficult Airway Assessment

Difficult BVM Ventilation – "MOANS": Difficult **M**ask seal due to facial hair, anatomy, blood, secretions, or trauma. **O**bese or late pregnancy. **A**ge > 55. **N**o teeth (roll gauze and place between gums and cheeks to improve seal). **S**tiff or increased airway pressures (asthma, COPD, obese, pregnant).

Difficult Laryngoscopy – "LEMON": **L**ook externally for anatomical distortions (small mandible, short neck, large tongue). **E**valuate "3-3-2 Rule" (the opened mouth should accommodate 3 patient fingers, mandible to neck junction should accommodate 3 patient fingers, and the chin-neck junction to the thyroid prominence should accommodate 2 patient fingers). **M**allampati (this is difficult to assess in the field). **O**bstruction / **O**bese or late pregnancy. **N**eck mobility.

Difficult BIAD – "RODS": **R**estricted mouth opening. **O**bstruction / **O**bese or late pregnancy. **D**istorted or disrupted airway. **S**tiff or increased airway pressures (asthma, COPD, obese, pregnant).

Difficult Cricothyrotomy / Surgical Airway – "SHORT": **S**urgery or distortion of airway. **H**ematoma overlying the neck. **O**bese or late pregnant. **R**adiation treatment skin changes. **T**umor overlying the neck.

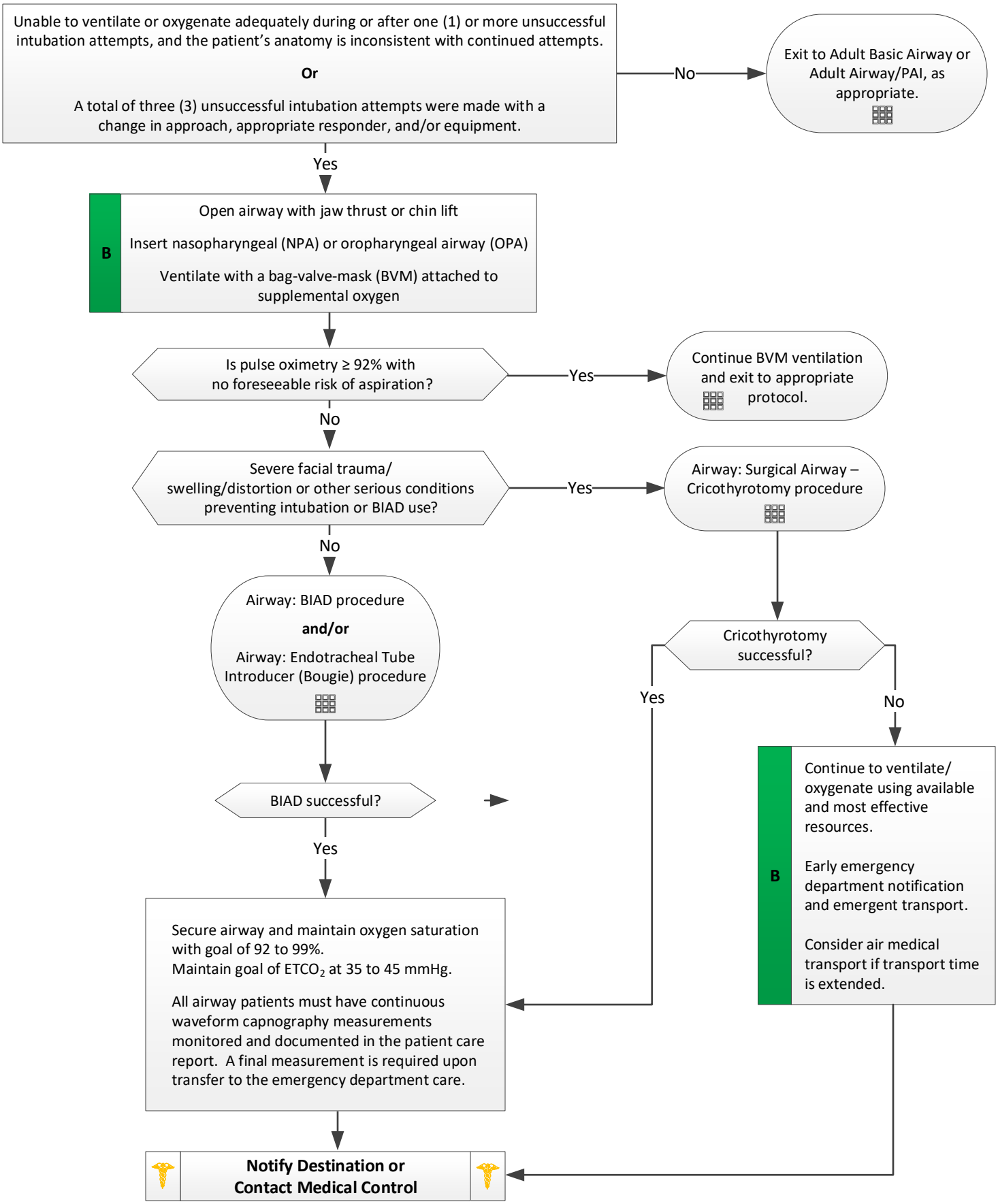
Trauma

Use inline cervical stabilization during intubation, BIAD, or BVM use. To facilitate translation of the mandible/mouth opening during intubation or BIAD, the cervical collar front should be exposed with manual stabilization of the cervical spine.

Pearls:

- **The Adult Basic Airway protocol is intended for patients who have reached puberty or who are longer than the Broselow-Luten Tape (over 36 kg in weight).**
- **Continuous waveform capnography is required for all methods of intubation, BIADs, or surgical airways. Document results.**
- **Basic airway maneuvers (including BVM ventilation) may be maintained if continuous pulse oximetry measurements ≥ 92%. A lower pulse oximetry measurement may be acceptable if expected for the patient's pathological condition along with otherwise reassuring or significantly-improving vital signs.**
- **An advanced airway (intubation, BIAD) must be considered if the patient cannot be reasonably expected to protect his or her own airway from aspiration of emesis or secretions due to an acute injury or illness.**
- **For the purposes of this protocol, an adequate airway exists when the patient is appropriately oxygenation, ventilated, and has no foreseeable risk of aspiration.**
- **An intubation attempt is defined as passing the endotracheal tube past the teeth.**
- **An appropriate ventilatory rate is one that maintains the $EtCO_2$ between 35 to 45 mmHg, or at a level appropriate for the patient's condition (example: higher measurements expected for patients with emphysema). Avoid hyperventilation, particularly with head trauma patients.**
- All rescuers should use a BIAD if orotracheal intubation is unsuccessful.
- Maintain cervical spine immobilization for patients with suspected spinal injury.
- Cricoid pressure and BURP maneuvers may assist with difficult intubations. They may also worsen the view in some cases.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well and consider padding/CID use to limit head movement during care. The endotracheal tube should have additional manual stabilization during all patient moves and transfer to the hospital bed.
- Succinylcholine should never be used AFTER an advanced airway has been secured. Only a long-acting, non-depolarizing paralytic may be considered if sedation efforts are inadequate.

Adult Failed Airway



Delayed Sequence Intubation - Adult

E

- Maintain high flow oxygen with a non rebreather mask or nasal cannula (8-10 Lpm)
- Cardiac Monitor
- Apply waveform EtC02
- Ensure BVM has PEEP and EtCO2 attached
- Position patient in ear-to-sternal-notch alignment unless contraindicated due to suspected cervical spine injury. Head of stretcher at 30 degrees

I

IV or IO procedure, if not already done.

P

Address hypotension – Epinephrine 5-20 mcg Push Dose
(Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL)

Suspected Head Injury: Lidocaine 1 mg/kg IV/IO to a maximum of 100mg. Do NOT administer if EKG shows a 2nd or 3rd degree heart block or bradycardia.

ALL PATIENTS: Ketamine 2mg/kg SLOW IV/IO to a maximum of 500mg (note time given)

ETT placement note: If unable to obtain $EtCO_2$ readings even after sensor replacement, consider it as a failed airway and remove the endotracheal tube. Consider re-insertion after 3 minutes of oxygenation above 94% SpO_2, maintain BLS airway ventilation, and/or proceed with the Failed Airway protocol.

Suspected airway edema or SEVERE airway compromise from fluid?

No

E

Insert NPA if no contraindications. Maintain SP02 of 94% or better for 3 minutes before proceeding to the next intervention. See sidebar to right.

Three minutes of preoxygenation has passed at an SP02 of 94% or greater

Apply a nasal cannula at 8-10 LPM if not already done.

P

Administer Rocuronium 1 mg/kg by IV/IO

Yes

If SpO_2 drops below 94% on oxygen:

- Reposition patient
- Readjust seal of BVM
- Confirm PEEP

If SpO_2 cannot be maintained at 94% or better despite interventions, do not intubate. Use a BVM and/or BIAD and transport to the hospital.

Do not intubate unless waveform capnography is immediately available.

If unavailable, use a BIAD or maintain BLS airway management instead.

I

Intubate with video laryngoscopy, or traditional laryngoscopy if video unavailible, and/or Bougie adjunct using the SALAD procedure. Ventilate with a BVM between attempts. Do not reattempt intubation if SP02 drops below 94%; in this case, continue ventilating until SP02 reached 94% or better for 3 minutes. Afterwards allowing a second appropriate responder to attempt intubation once. If still unsuccessful, maintain BLS airway with BVM ventilations and BIAD.

E

- Secure airway and maintain oxygen saturation with goal of 92 to 99% Maintain EtC02 to goal of 35 to 45 mmHg
- Ventilate at 1 breath per 6 seconds or if available and not contraindicated, use a ventilator.
- All intubated patients must have ETC02 monitoring immediately after intubation and continued until transfer of care at ED

P

Sedation/Analgesia. Option 1: Midazolam 0 .1 mg/kg by IV/IO to a maximum of 10mg. Systolic BP must be >90mmHg. Watch for hypotension.
AND/OR
Fentanyl 50-100 mcg by IV/IO. My repeat every 10 minutes as needed for continued sedation. Maximum of 300 mcg
Or Option 2:
Ketamine 2 mg/kg by IV/IO to a maximum of 500mg.

Always provide sedation and/or pain management, even if the patient is unresponsive. Consider how long your paralytics will last, and never allow your patient to remain chemically paralyzed without pain management and sedation.

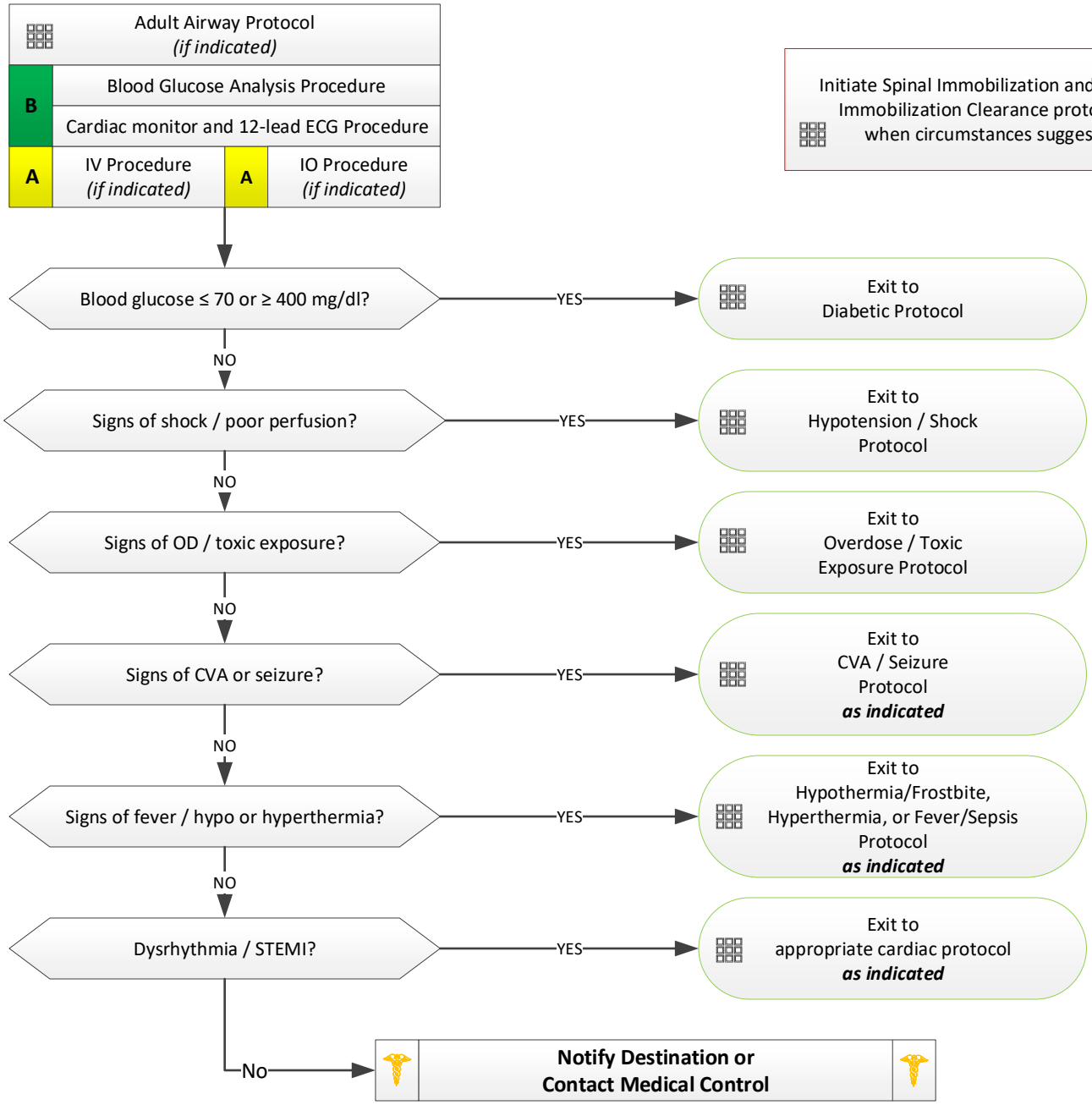
Notify Destination or Contact Medical Control

Altered Mental Status

History
- Known diabetic; medical alert tag
- Drugs or drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or ingestion
- Acidosis / alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder



Altered Mental Status

Pearls:

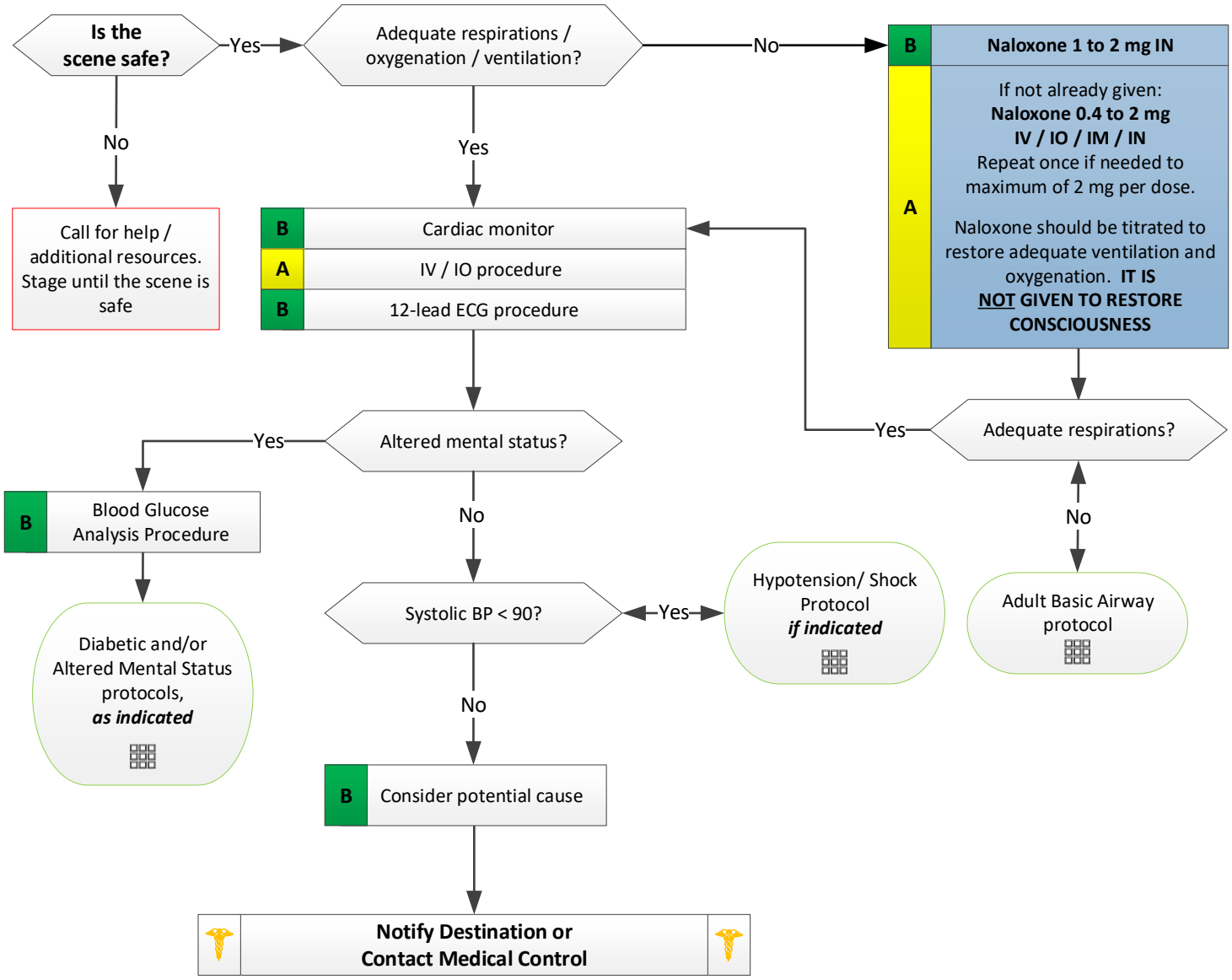
- **Recommended Exam: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neurologic.**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after dextrose or glucagon.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider restraints (if necessary) for the patient's and/or personnel's protection, per the restraint procedure.

Overdose / Toxic Ingestion

History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Abnormal respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)



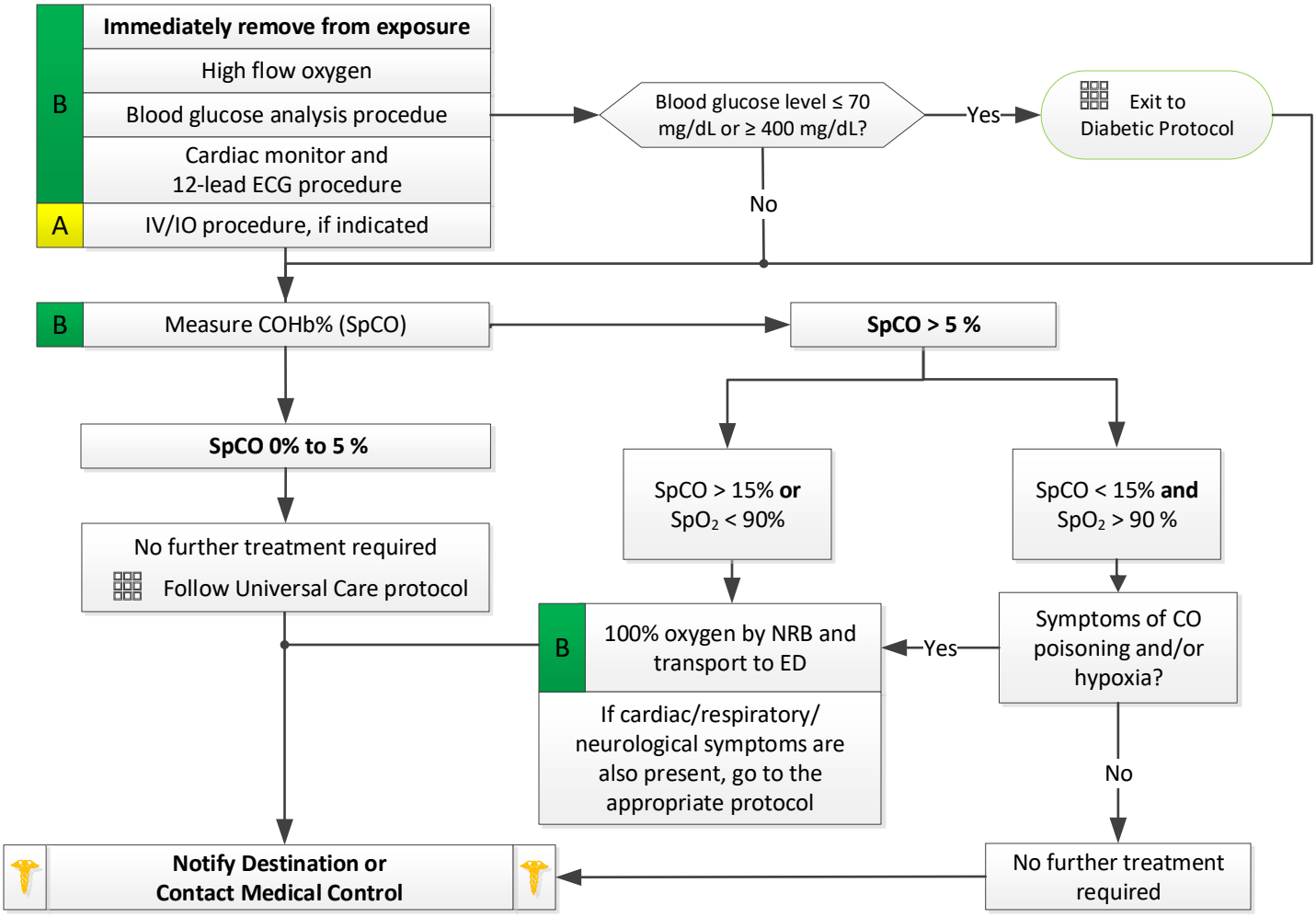
Poison Control Center: 1-800-222-1222

Carbon Monoxide Exposure

History
- Firefighter / fire victim
- Suspected CO exposure
- Suspected source/duration exposure
- Age, possible pregnancy
- Reason (accidental, suicidal)
- Measured atmospheric levels
- Past medical history, medications

Signs and Symptoms
- Altered mental status/dizziness
- Headache, nausea/vomiting
- Chest pain / respiratory distress
- Neurological impairments
- Vision problems / reddened eyes
- Tachycardia / tachypnea
- Dysrhythmias, seizures, coma

Differential
- Effects of other toxic fire byproducts
- Acute cardiac event
- Acute neurological event
- Flu / gastrointestinal illness
- Acute intoxication
- Diabetic ketoacidosis
- Headache of a non-toxic origin



Pearls:

- **Recommended exam: Neurologic, skin, heart, lungs, abdomen, extremities.**
- **Scene safety is priority.**
- Consider carbon monoxide (CO) with any product of combustion.
- A normal environmental CO level does not exclude CO poisoning. The absence (or low detected levels) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire.
- **Fetal hemoglobin has a greater affinity for CO than maternal hemoglobin. Females who are known to be or possibly pregnant should be advised that EMS-measured SpCO levels reflect the adult's level only, and that fetal COHb levels may be higher. Recommend hospital evaluation for any CO-exposed pregnant person.**
- The differential list for CO toxicity is extensive. Attempt to evaluate other correctable causes when possible.

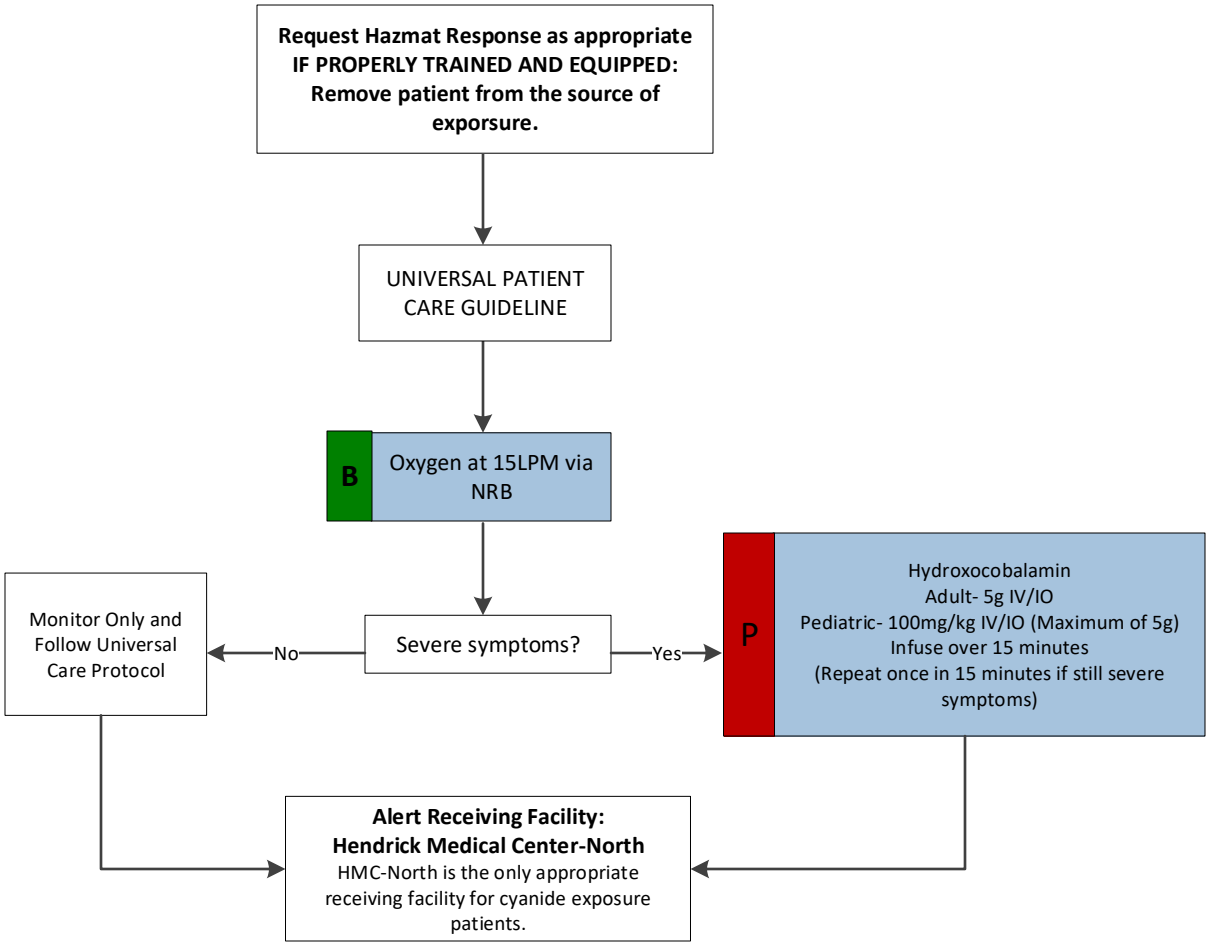
Cyanide Exposure

History
- Suspected source/duration exposure
- Products of Combustion
- M44 Predator Trap
- Chemical Suicides
- Eating large quantity of fruit pits

Signs and Symptoms
- Headache, weakness, vertigo
- Nausea/vomiting
- Tachycardia/tachypnea

Severe
- Cardiac Arrest
- Seizures
- Altered Mental Status/Coma

Differential
- Effects of other toxic fire byproducts
- Acute cardiac event
- Acute neurological event
- Flu / gastrointestinal illness
- Acute intoxication
- Diabetic ketoacidosis
- Headache of a non-toxic origin



Pearls:

- **Recommended exam: Neurologic, skin, heart, lungs, abdomen, extremities.**
- **Scene safety is priority.**
- Consider carbon monoxide (CO) and Cyanide with any product of combustion
- A normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse oximetry readings.

Diabetic Adult

History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.

Some diabetic patients may require a higher blood glucose level to return to their normal mental status.

B Blood Glucose Analysis Procedure
Cardiac monitor *(if indicated)*
12-lead ECG procedure *(if indicated)*
A IV / IO procedure *(if indicated)*

Blood glucose ≤ 70 mg/dL

Altered LOC / unconscious?
- No → **B** **Consider Oral Glucose Solution**
  - Improving?
    - Yes → Continue to monitor and re-check glucose every 15 minutes. More frequent checks should be made if patient's mental status / responsiveness begins to decline.
      Repeat treatment, if indicated.
    - No → **A** **$D_{10}W$ wide open IV / IO**
      Or
      $D_{50}W$ 25g IV / IO
      Or
      If blood glucose ≤ 70 mg/dL and patient is symptomatic with unobtainable venous access:
      Glucagon 1 to 2 mg IM *
      Repeat in 15 minutes, if needed
  - Blood glucose improving?
    - Yes → Continue to monitor and re-check glucose every 15 minutes. More frequent checks should be made if patient's mental status / responsiveness begins to decline.
      Repeat treatment, if indicated.
    - No → **A** If BGL remains ≤ 70 mg/dL, repeat **$D_{50}W$ 25g by IV /IO**. Check BGL every 10 minutes.
- Yes → **A** **$D_{10}W$ wide open IV / IO**
  Or
  $D_{50}W$ 25g IV / IO
  Or
  If blood glucose ≤ 70 mg/dL and patient is symptomatic with unobtainable venous access:
  Glucagon 1 to 2 mg IM *
  Repeat in 15 minutes, if needed

Blood glucose ≥ 400 mg/dL

A If no history of renal disease:
Normal saline bolus
500 mL IV / IO
May repeat as needed if lungs remain clear to auscultation.
After bolus, infuse at 150 mL/hr

Hypotension?
- Yes → Exit to Hypotension / Shock Protocol
- No → Respiratory distress?
  - Yes → Exit to Appropriate Protocol
  - No → **Notify Destination or Contact Medical Control**

*** Glucagon:**
- Even if the BGL returns to normal, oral glucose needs to be administered to the patient once mental status returns to baseline and patient can swallow effectively.
- Patients should be transported to the ED for monitoring after glucagon administration. If patient refuses, contact medical control.

Adult Medical Section Protocols

Adult Fever / Sepsis

History
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Time of last acetaminophen or ibuprofen

Signs and Symptoms
- Warm
- Flushed
- Diaphoretic
- Chills
- Hypotension
- Tachycardia

Differential
- Infections / sepsis
- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat stroke
- Meningitis

Contact, droplet, and/or airborne precautions, *if indicated*

B Obtain temperature

Temperature ≥ 100.4 F?

No → Exit to appropriate protocol

Yes →

B **Ibuprofen 400 to 800 mg PO**

Or

Acetaminophen 1000 mg PO
(See Pearls regarding appropriate choice)

B Vital signs and cardiac monitor

A IV / IO Procedure, *If indicated*

A **Fluid bolus of 20 mL/kg up to 3 Liters**, *if indicated.* May repeat once if lungs clear.

Hypotension (BP < 90 mmHg)?

No → **Notify Destination or Contact Medical Control**

Yes →

P If no improvement in hypotension from fluid: **Consider norepinephrine at 0.5 to 20 mcg/min** → **Notify Destination or Contact Medical Control**

SIRS (Systemic Inflammatory Response Syndrome) Criteria:

- Temperature < 96.3°F or > 100.4°F
- Heart rate > 90 bpm
- Respiratory rate > 20 per min
- WBC > 12,000 mm^3

If two or more criteria have been met and the patient has a suspected infection, notify the ED of "Code Sepsis".

Adult Fever / Sepsis

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neurologic.**
- Patients with a history of liver disease or liver transplant should not receive acetaminophen.
- **Do not** give aspirin to a child.
- Do not give NSAIDs to a pregnant woman or renal transplant patient.
- Rehydration with fluids increases the patient's ability to sweat and improves temperature control.
- Removal of clothes is recommended for rapid cooling measures.
- An allergy to NSAIDs (non-steroidal anti-inflammatory drugs) is a contraindication to Ibuprofen.
- Consider whether elevated temperature is due to "fever" (and suspected infection) or a possible environmental heat emergency. NSAIDs should not be used in the setting of environmental heat emergencies.
- If the patient has received one medication for fever, an additional medication may be administered of another type after two hours.
- Maximum dose of acetaminophen is 4000 mg per 24 hour period.
- Maximum dose of ibuprofen is 40 mg/kg per 24 hour period.

Emerging Infectious Disease (suspected EVD)

History
- Flu-like illness
- Recent overseas travel within 21 days.

Signs and Symptoms
- Fever greater than 100.4°F
- Severe headache
- Diaphoretic
- Chills
- Weakness and/or flu-like symptoms
- Muscle pain
- Diarrhea
- Abdominal pain
- Unexplained bleeding

Differential
- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat-related emergency
- Meningitis
- Food poisoning

Contact, droplet, and/or airborne precautions

B — Obtain temperature and thorough travel and contact history

Positive contact or travel history?

No → Exit to appropriate protocol

Yes →

Universal precautions with proper PPE required.
No exposed skin.
N95 mask, impermeable gown,
double glove, full-face shield.
Patient should wear an N95 mask.

B — Vital signs and cardiac monitor

A — IV / IO Procedure, *if indicated*

If Ebola is suspected, minimize the number of providers who directly contact the patient.

A — **Fluid bolus of 20 mL/kg up to 2 Liters** (*if indicated*). May repeat once.

Hypotension (BP < 90 mmHg)?

No → **See Destination Guidelines**

Yes →

P — If no improvement in hypotension from fluid: **Consider Levophed at 8 to 12 mcg/min**

See Destination Guidelines

Destination Guidelines

- Upon arrival to the destination, the driver will make contact with the hospital staff while the patient remains in the unit with attendant.
- Provide a full report to appropriate hospital personnel and wait for further instructions.
- Once patient has been cleared from the ambulance, carefully remove PPE and discard in the red container in the patient's room by the door.
- Re-suit with a new set of PPE and carefully clean/disinfect the ambulance and any surfaces the patient contacted, as instructed.
- Once the ambulance and equipment have been thoroughly cleaned, carefully remove and bag the PPE. Take the bagged contaminated items and dispose in a red container in a soiled utility room or as indicated by the emergency department.

Pearls:
- Most Ebola patients need supportive care only. Do not administer aspirin or NSAIDs; these medications will affect platelet function/ coagulation.
- Aggressive fluid management may be needed due to severe diarrhea and vomiting.
- Proper PPE required to ensure **no** exposed skin, utilizing impermeable gown , boot covers, full face shield, N95 mask, surgical hood, and double glove.
- Ebola is a direct contact disease. Use droplet/splatter precautions. One must have contact with a symptomatic patient's bodily fluids in order to contract Ebola. Ebola has a 21 day incubation period, and patients are not contagious unless symptomatic.
- Deceased Ebola patients are still considered contagious.
- If you come in contact with a suspected Ebola patient's direct body fluid without PPE, wash/flush area and isolate yourself. Contact the shift supervisor for further instruction.

Emerging Infectious Disease (suspected COVID-19)

Non-Transport guidance to reduce exposure and spread

History
- Flu-like illness
- Contact with CoVID-19

Signs and Symptoms
- Fever greater than 100.4°F
- Rhinorrhea / nasal congestion
- Productive cough
- Chills
- Weakness and/or flu-like symptoms
- Body Aches

Differential
- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat-related emergency
- Meningitis
- Bacterial Infection

Communications Center indicates risk of CoVID-19
Or
High suspicion of CoVID-19

No → Exit to appropriate protocol

Yes ↓

PPE must protect from droplet/fluid contamination

Universal precautions with proper PPE required.
- **N95 mask, impermeable gown, gloves, eye protection.**
- **Limit pt contact to one provider only if at all possible.**
- **All providers should attempt to maintain a distance of 6 feet or more from the patient when feasible and does not interfere with indicated patient care.**

B

Perform assessment :
- **Age less than 60 years old, and older than 18**
- **Respiratory rate between 8 and 20 bpm**
- **Pulse oximetry greater than 94% on room air**
- **Heart rate less than 120 bpm**
- **Systolic BP greater than 100 mmHg**
- **Fever greater than 100.4°F, documented by EMS or confirmed by patients own testing**
- **One or more viral symptoms present (cough, fever, nasal/chest congestion, sore throat, body aches)**

↓

Do ALL criteria above apply? → No → Exit to appropriate protocol

Yes ↓

Does the patient report :
- Chest pain, or
- Shortness of breath, or
- Syncope

Yes ↓

Exit to appropriate protocol

Destination Guidelines

If the patient is transported to a facility:
- **Radio report: Proceed with normal report to receiving facility including using plain language.**
- **Once patient has been cleared from the ambulance, carefully remove PPE and discard in the waste container in the patient's room by the door.**
- **Ambulance cleaning: Carefully clean/ disinfect the ambulance and any surfaces contacted by the patient or provider before returning to service.**

Patient meets no transport criteria:
- Highest EMT certification must assume care.
- Hand COVID-19 packet to patient.
- Discuss non-transport, self-quarantine, and when to seek care following checklist (see PEARLs).
- Patient must make this decision on own, appears to be competent to make this decision, and has a appropriate support system in place in case EMS needs to be called on patient's behalf (see PEARLs).

Transport or contact Medical Control if patient does not meet criteria.

Emerging Infectious Disease (suspected COVID-19)

Non-Transport guidance to reduce exposure and spread

EMS Checklist: Safe to leave at home?
The patient is stable enough to receive care at home.
The patient meets all inclusion criteria in the protocol.
Appropriate caregivers are available at home.
Recommended: There is a separate bedroom where the patient can recover without sharing immediate space with others.
Resources for access to food, phone, and other necessities are available.
The patient and other household members have access to appropriate, recommended personal protective equipment (at a minimum, gloves and facemask) and are capable of adhering to precautions recommended as part of home care or isolation (e.g., respiratory hygiene and cough etiquette, hand hygiene).
Source: Centers for Disease Control and Prevention. Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID-19). Updated on February 12, 2020. Access at https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html?

PEARLs:

- Recommended Exam: Mental status, skin, HEENT, heart, lungs, and neurological.
- Extremes of age are more prone to heat emergencies (the very young or elderly).
- Common signs and symptoms of COVID-19: Fever; cough, sore throat/body aches, fatigue, shortness of breath/difficulty in "catching my breath". Rhinorrhea (runny/stuffy nose) is uncommon for COVID-19, but may be present or usually found with other viral or bacterial upper respiratory infections.
- Non-transport requirement. The patient is fully alert and oriented to his or her normal baseline and not intoxicated, to your knowledge.
- There are no obvious indications that this patient is experiencing an exacerbation of a chronic illness, such as COPD, CHF, asthma, etc.
- If the patient's temperature remains greater than 104°F and NSAIDs or acetaminophen have been used within the last 6 hours, transport should be highly encouraged.
- The patient must be able to contact 911 if needed again: functional phone, an adult who will be with the patient for most of the time, a LifeAlert type system, or other appropriate means of communication.
- COVID-19 is considered as a droplet-precaution viral disease. However, droplets may be aerosolized by coughing, sneezing, or nebulized medication use (home nebulizer) and remain in the air for several hours. Use an N95 mask on yourself when making patient contact. If the patient is transported, apply a surgical mask to the patient to protect others. Do NOT use an N95 mask on these patients.

Adult Allergic Reaction

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms
- Itching and/or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea/vomiting

Differential
- Rash without hives
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

Symptom severity?

MILD
Flushing, hives, itching, erythema with normal BP and perfusion.

B
- **Diphenhydramine 50 mg PO**
- Cardiac monitor

A
- IV Procedure, if indicated
- **Diphenhydramine 50 mg PO / IV / IM / IO** *(If not already given)*

P
- **Famotidine 40 mg slow IV, if indicated**

MODERATE
Mild symptoms with respiratory findings (*wheezing, dyspnea, hypoxia*) or GI symptoms (*nausea, vomiting*). Normal BP.

B
- Oxygen as appropiate
- **Diphenhydramine 50 mg PO**
- **Albuterol 2.5 mg or Xopenex 1.26 mg +/- ipratropium 0.5 mg nebulized** if respiratory findings are present. Repeat as needed to a maximum of 6 doses.
- Cardiac monitor

A
- **Consider Epinephrine 1mg/ml (1:1000) 0.3 -0.5 mg IM (AVOID in age > 50 for only moderate symptoms)**
- IV/IO Procedure
- **Diphenhydramine 50 mg IV / IM / IO** *(if not already given)*

P
- **Dexamethasone 20 mg slow IV/IO** *or* **Methylprednisolone 125 mg slow IV/IO**
- **Famotidine 40 mg slow IV/IO**

SEVERE
Skin symptoms may or may not be present. Decreased perfusion, hypotension, and impending or severe respiratory compromise.

B
- **Epinephrine 1mg/ml (1:1000) 0.3-0.5 mg IM (0.15 mg IM if age > 50, HR > 130 bpm, or history of heart disease)**
  Consider using autoinjector
  Repeat in 5 minutes if no improvement.
  Obtain 12-lead ECG if 0.15 mg dose was administered.
- Oxygen as appropiate
- **Albuterol 2.5 mg or Xopenex 1.26 mg +/- ipratropium 0.5 mg nebulized** if respiratory findings are present. Repeat as needed to a maximum of 6 doses.
- Cardiac monitor

A
- IV/IO Procedure
- **Diphenhydramine 50 mg IV / IM / IO**
- **Normal saline bolus 500 mL IV / IO**
  Repeat as needed – **Maximum 2 L**

P
- **Dexamethasone 20 mg slow IV/IO** *or* **Methylprednisolone 125 mg slow IV/IO**
- **Famotidine 40 mg slow IV/IO**

Consider an advanced airway if there is no improvement

IM medication should be administered in the lateral thigh.

Continuous waveform capnography is required for any respiratory signs or symptoms.

Monitor and reassess.
Observe for worsening signs and symptoms.

Notify Destination or Contact Medical Control

Adult Medical Section Protocols

Adult Allergic Reaction

Pearls:

- *Mild Symptoms*: Flushing, hives, itching, and/or erythema with normal BP and perfusion.
- *Moderate Symptoms*: Mild symptoms plus respiratory findings (wheezing, dyspnea, hypoxia) or GI Symptoms (nausea, vomiting) and normal BP.
- *Severe Symptoms*: Skin symptoms may/may not be present. Likely to present with decreased perfusion/hypotension and impending/severe respiratory failure.
- Albuterol or Xopenex (with or without ipratropium) may be used if there is any wheezing or difficulty breathing present.
- The most important medication for a patient having a severe allergic reaction is epinephrine! It should be given in the THIGH.
- In patients who are older than 50, have a history of cardiac disease, or have a heart rate > 130 bpm, epinephrine may precipitate cardiac ischemia. Epinephrine SHOULD NOT be withheld when these patients are in true severe distress. In this case, a half dose (0.15 mg) should be administered and a 12 lead ECG obtained after the medication has been administered.
- The Epi-Pen autoinjector should be used in severe cases where there may be a delay when using the ampule.

Adult Allergic Reaction (During COVID-19 Pamdemic)

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms
- Itching and/or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea/vomiting

Differential
- Rash without hives
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

Symptom severity?

MILD
Flushing, hives, itching, erythema with normal BP and perfusion.

B
- **Diphenhydramine 50 mg PO**
- Cardiac monitor

A
- IV Procedure, if indicated
- **Diphenhydramine 50 mg PO / IV / IM / IO** *(If not already given)*

P
- **Famotidine 40 mg slow IV, if indicated**

MODERATE
Mild symptoms with respiratory findings (*wheezing, dyspnea, hypoxia*) or GI symptoms (*nausea, vomiting*). Normal BP.

B
- Oxygen as appropiate
- **Diphenhydramine 50 mg PO**
- Cardiac monitor

A
- **Consider Epinephrine 1mg/ml (1:1000) 0.3 -0.5 mg IM (AVOID in age > 50 for only moderate symptoms)**
- IV/IO Procedure
- **Diphenhydramine 50 mg IV / IM / IO** *(if not already given)*

P
- **Dexamethasone 20 mg slow IV/IO** *or* **Methylprednisolone 125 mg slow IV/IO**
- **Famotidine 40 mg slow IV/IO**

SEVERE
Skin symptoms may or may not be present. Decreased perfusion, hypotension, and impending or severe respiratory compromise.

B
- **Epinephrine 1mg/ml (1:1000) 0.3-0.5 mg IM (0.15 mg IM if age > 50, HR > 130 bpm, or history of heart disease)**
- ***Consider using autoinjector***
- Repeat in 5 minutes if no improvement.
- Obtain 12-lead ECG if 0.15 mg dose was administered.
- Oxygen as appropiate
- Cardiac monitor

A
- IV/IO Procedure
- **Diphenhydramine 50 mg IV / IM / IO**
- **Normal saline bolus 500 mL IV / IO**
- Repeat as needed – **Maximum 2 L**

P
- **Dexamethasone 20 mg slow IV/IO** *or* **Methylprednisolone 125 mg slow IV/IO**
- **Famotidine 40 mg slow IV/IO**

Consider an advanced airway if there is no improvement

IM medication should be administered in the lateral thigh.

Continuous waveform capnography is required for any respiratory signs or symptoms.

Monitor and reassess.
Observe for worsening signs and symptoms.

Notify Destination or Contact Medical Control

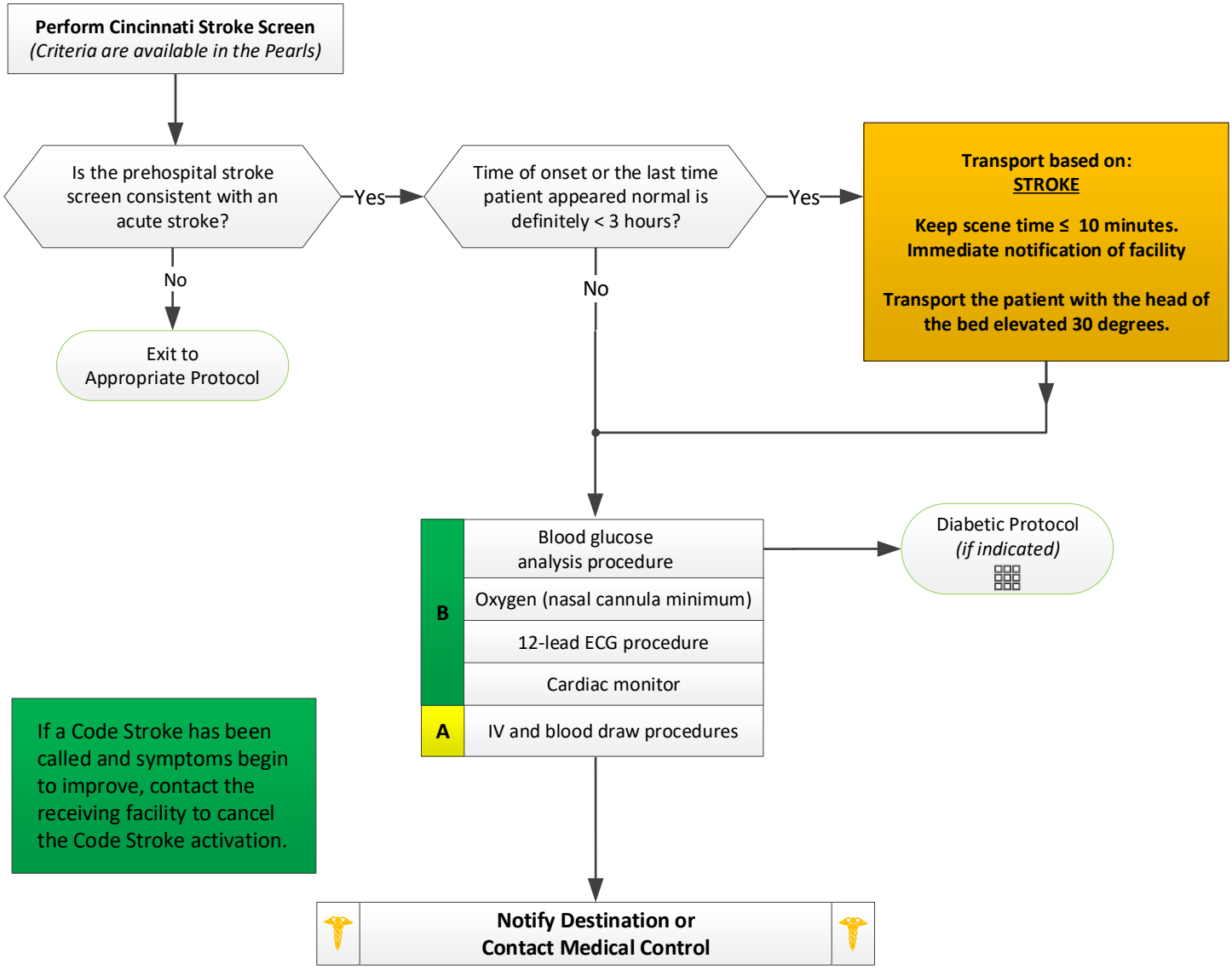
Adult Medical Section Protocols

Suspected Stroke

History
- Previous CVA or TIA
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (anticoagulants)
- History of trauma

Signs and Symptoms
- Altered mental status
- Weakness / paralysis
- Blindness or other sensory loss
- Aphasia / dysarthria
- Syncope
- Vertigo / dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

Differential
- See Altered Mental Status protocol
- TIA (transient ischemic attack)
- Seizure
- Todd's paralysis
- Hypoglycemia
- Stroke:
  - Thrombotic or embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / renal Failure



If a Code Stroke has been called and symptoms begin to improve, contact the receiving facility to cancel the Code Stroke activation.

Suspected Stroke

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: *Have the patient show teeth or smile*

Normal:

Both sides of the face move equally.

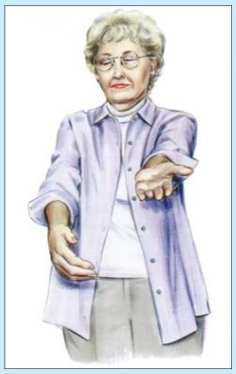
Abnormal:

One side of the face does not move as well as the other side.

2. ARM DRIFT: *Patient closes eyes and holds both arms out for 10 seconds.*

Normal:

Both arms drift the same or both arms do not drift at all.



Abnormal:

One arm does drift compared to the other arm.

3. ABNORMAL SPEECH: *Have the patient say, "you can't teach an old dog new tricks".*

Normal: Patient uses the correct words without slurring.

Abnormal: Patient slurs words, uses the wrong words, or cannot speak.

INTERPRETATION: If any ONE of these three signs is abnormal, the probability of a stroke is 72%.

For additional information regarding current recommendations for stroke care, including the rationale to treat or not treat hypertension in the setting of possible stroke, see the current version of:

"Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association".

It is available at: http://stroke.ahajournals.org/content/early/2013/01/31/STR.0b013e318284056a

Pearls:

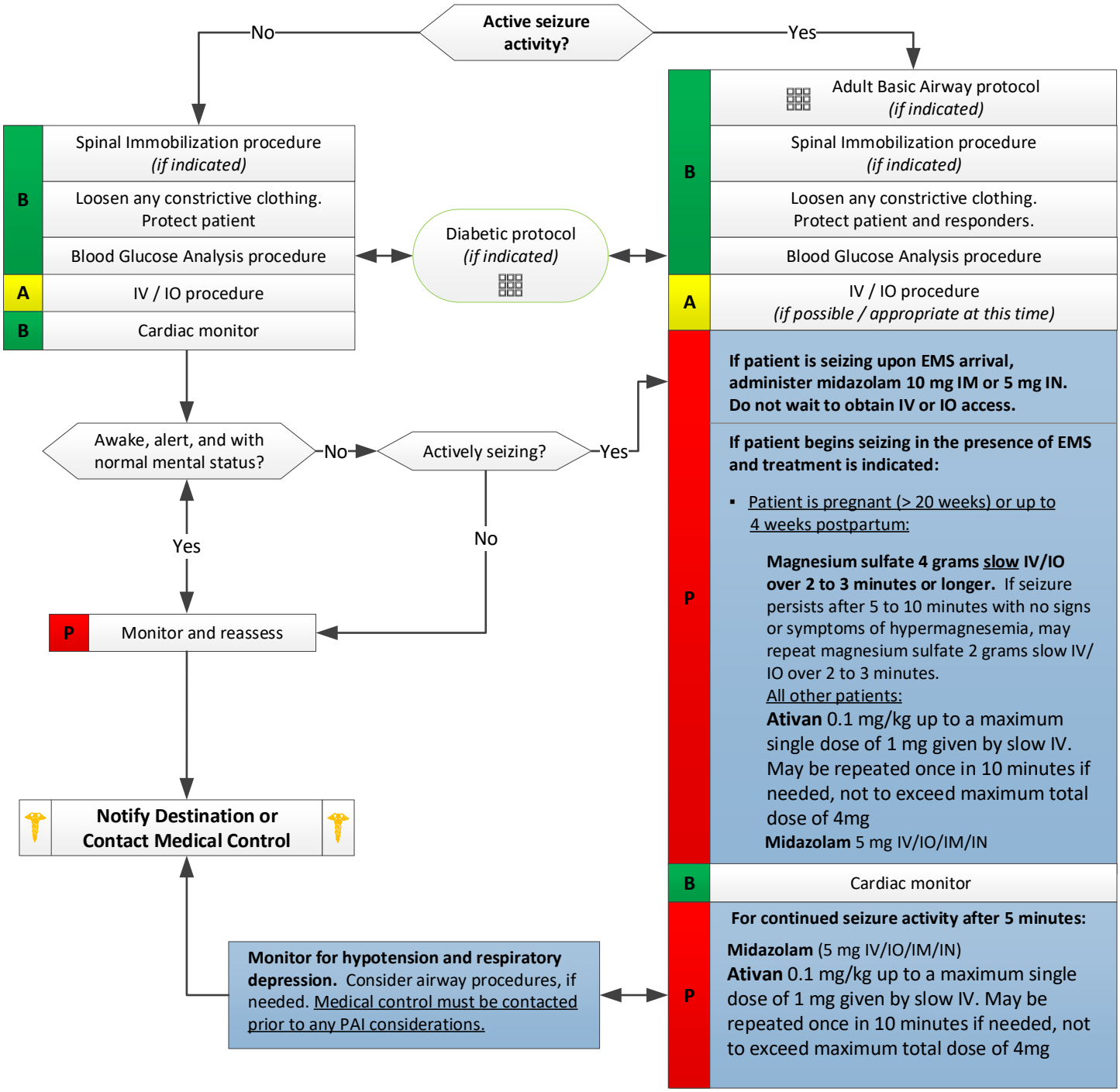
- **Recommended Exam: Mental Status, HEENT, heart, lungs, abdomen, extremities, neurological.**
- **Time of onset or last seen normal: One of the most important items the pre-hospital provider can obtain, which forms the basis for all treatment decisions. Be very precise in gathering data to establish the time of onset and report it as an actual time (example: "13:47" NOT "about 45 minutes ago"). The patient may not be able to receive thrombolytics at facility unless this vital information has been obtained by EMS. For patients who "woke up and noticed the stroke", the time the patient was last awake will be the reported time of onset.**
- "Onset of symptoms" is defined as the last witnessed time the patient was symptom-free. If the patient woke up with stroke symptoms, the time the patient went to sleep or was last seen "normal" would be the time of onset.
- Some types of tissue plasminogen activators (tPA) may be administered within 4.5 hours from time of last seen normal if the risks/benefits are considered acceptable after a neurology consult at the hospital. For prehospital "Code Stroke" activation, the time from last seen normal remains at 3 hours.
- Other causes of altered mental status should also be considered, with reference made to the Altered Mental Status protocol as needed.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration) that may coexist with other stroke symptoms.
- Hypoglycemia can present as a LOCALIZED neurologic deficit, especially in the elderly. Obtain a blood glucose measurement as soon as possible and preferably before activating Code Stroke.
- Document the Cincinnati Stroke Screen results in the patient care report.

Seizure - Adult

History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

Signs and Symptoms
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

Differential
- CNS (head) trauma or stroke
- Tumor
- Metabolic, hepatic, or renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, medications, non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Hyperthermia
- Hypoglycemia



Seizure - Adult

Pearls:

- Pregnant or postpartum patients: Magnesium sulfate is recommended for seizures related to eclampsia that may occur even up to 4 weeks postpartum. Eclampsia usually occurs after the 20th week of gestation, but in rare cases can continue after birth. Even if the patient is pregnant, give midazolam IM or IN if she is found actively seizing upon EMS arrival, and then consider magnesium sulfate.

- Signs of hypermagnesemia: Depressed respiratory rate/depth, depressed reflexes, hypotension, dysrhythmias that can lead to bradycardia, atrioventricular heart blocks, and eventually progressing to asystole. If present, contact Medical Control for orders and advise that calcium chloride is available on the unit for treatment considerations.

- Ativan (Lorezepam): Raises seizure threshold at the neuro-muscular junction, and limits propagation of seizure in brain, while diminishing overall CNS functions.

- Midazolam (Versed): Enters the brain tissue rapidly and exerts a powerful, short-duration action. Midazolam is highly lipophillic. When given intramuscularly, midazolam reaches 80% of peak levels within five minutes of administration by the intramuscular route, and is the preferred choice for IM administration.

- Prolonged seizure activity: It is important to treat prolonged or recurrent seizure activity not only because of the risks for aspiration, brain injury, traumatic injury, and hypoxia, but to also prevent benzodiazepine resistance that may develop due to $GABA_A$ receptor trafficking (down-regulation).

- Consider potential causes of the seizure: Medication/toxin overdose or exposure, alcohol or drug withdrawal, brain injury/ CVA, hypoxia, diabetic emergencies, fever, hyperthermia, sepsis, “water intoxication”, etc.

Non-Traumatic Abdominal Pain

History

- Age
- Past medical / surgical history
- Medications
- Onset
- Palliation / provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / radiation / referred
- Severity (1 through 10)
- Time (duration / repetition)
- Fever
- Last meal eaten
- Last bowel movement / emesis
- Menstrual history (pregnancy)

Signs and Symptoms

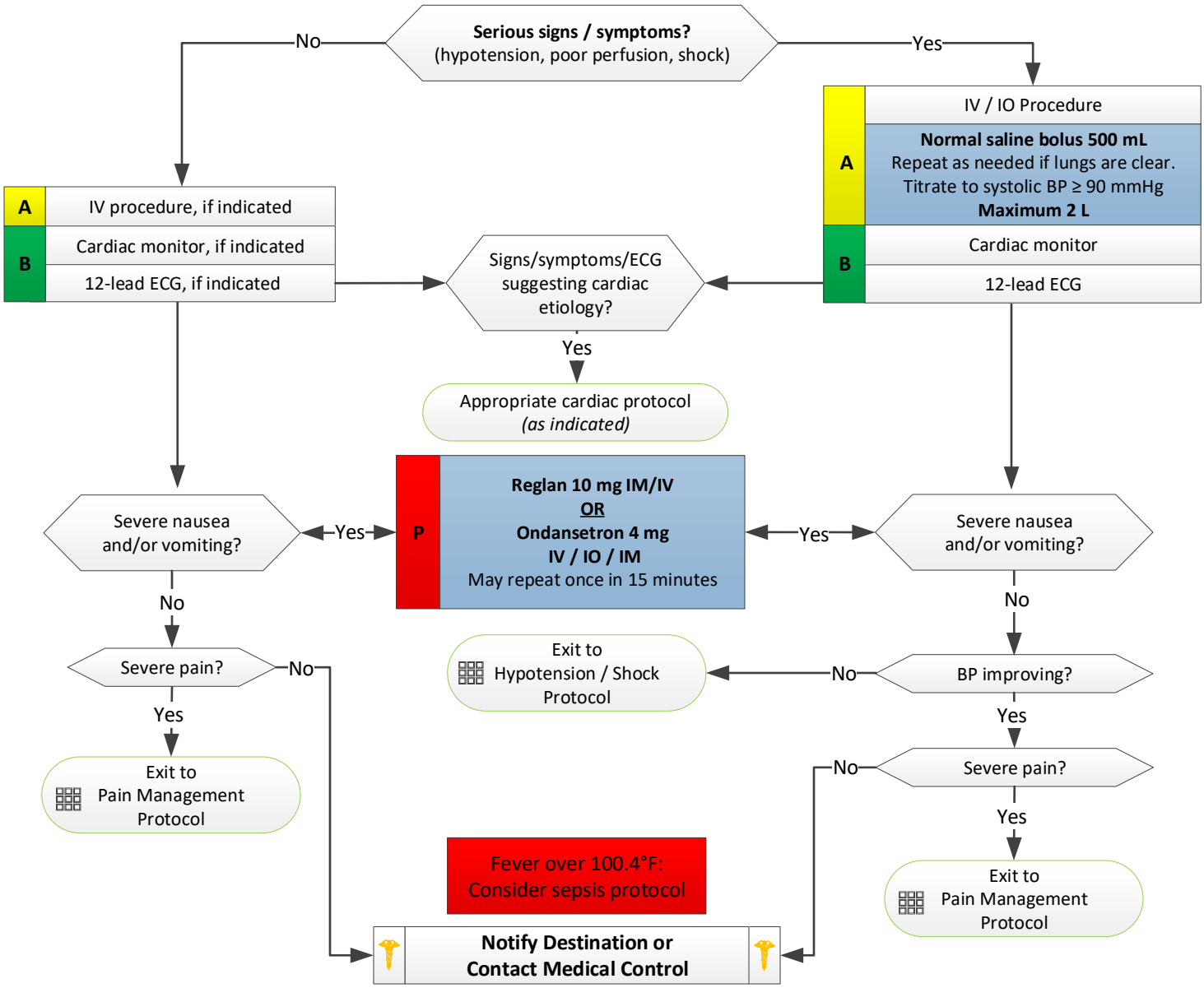
- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding / discharge
- Pregnancy

Associated symptoms (helpful to localize source):

Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash

Differential

- Pneumonia or pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic ulcer disease / gastritis
- Gallbladder
- Myocardial infarction
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder / prostate disorder
- Pelvic (PID, ectopic pregnancy, ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian and testicular Torsion



Non-Traumatic Abdominal Pain

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lung, abdomen, back, extremities, neurologic.**
- IV or INTs are not without complication and could include pain, infection, and infiltration. IVs should only be started in patients with signs/symptoms of severe dehydration, which is typically associated with tachycardia, hypotension, poor skin turgor at the subclavian area, and altered mental status.
- Document the mental status and vital signs prior to administration of anti-emetics and/or analgesics.
- Abdominal pain in women of childbearing age should be treated as pregnancy-related until proven otherwise.
- Oral antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain or back pain, especially in patients over 50 years old and/or patients with shock/poor perfusion.
- Repeat vital signs after each 500 mL fluid bolus.
- Consider cardiac etiology in patients > 35 years old, diabetics, and/or women, especially those with upper abdominal complaints. Have a low threshold to perform a 12-lead ECG on these patients.
- Ondansetron is safe and encouraged for use in pregnancy.
- IV administration of ondansetron has a rare association with causing a prolonged QT interval on the ECG.

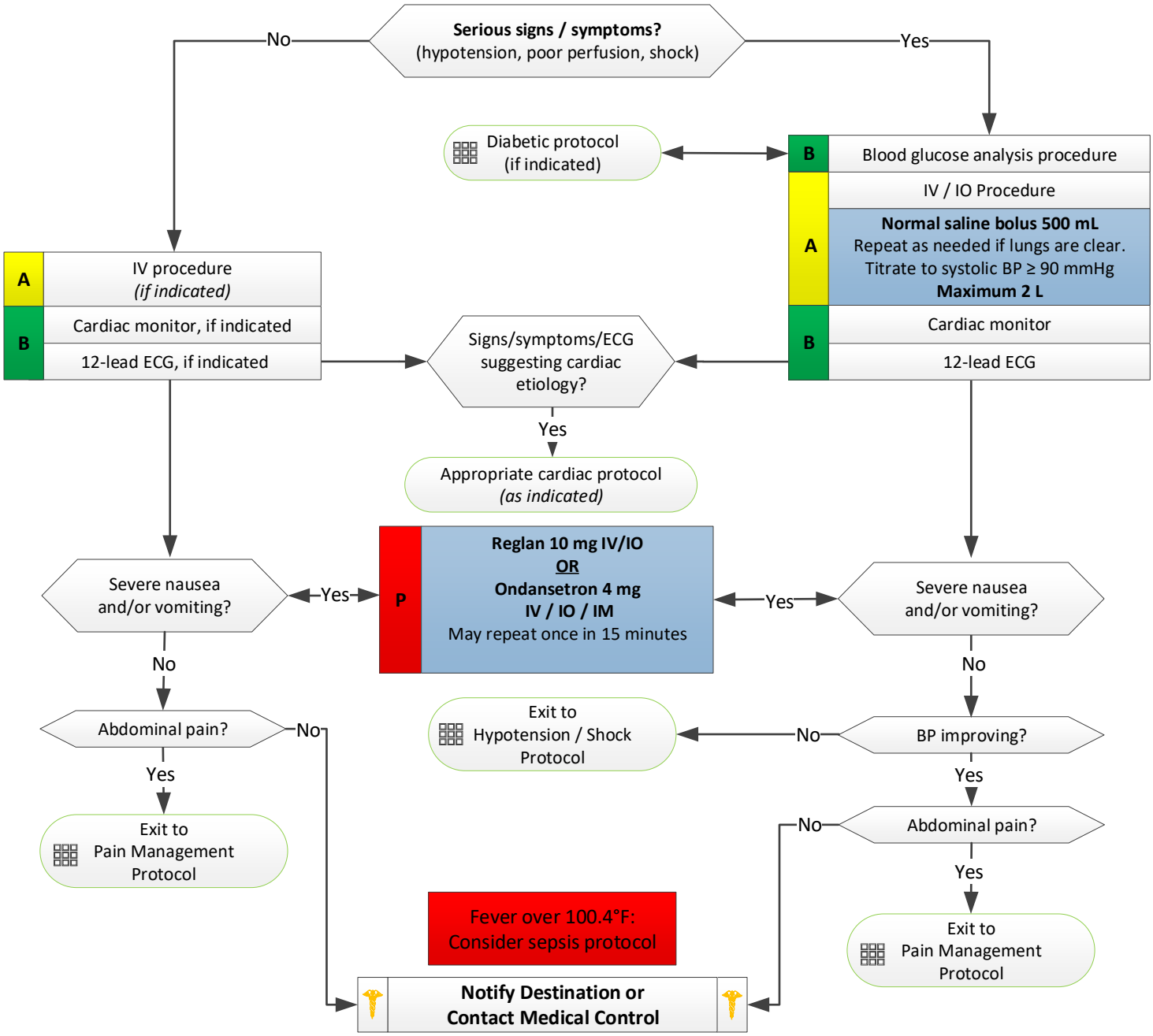
Vomiting and Diarrhea - Adult

History
- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

Signs and Symptoms
- Abdominal Pain?
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated symptoms (helpful to localize source):
Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

Differential
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or substance abuse
- Pregnancy
- Psychological



Vomiting and Diarrhea - Adult

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neurologic.**
- Document mental status and vital signs prior to administration of ondansetron or analgesics.
- Isolated vomiting may be caused by pyloric stenosis (in pediatrics), bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures), or gastroparesis.
- IV or INTs are not without complication and could include pain, infection, and infiltration. IVs should only be started in patients with signs/symptoms of severe dehydration, which is typically associated with tachycardia, hypotension, poor skin turgor at the subclavian area, and altered mental status.
- Ondansetron is safe and encouraged for use in pregnancy.
- Ondansetron does have a rare association with prolonging the QT interval on the ECG.

Hypertension

History

- Documented hypertension
- Related diseases: Diabetes, CVA, renal failure, liver disease, and cardiac history
- Medications for hypertension
- Compliance with hypertensive medications
- Erectile dysfunction medications
- Pregnancy

Signs and Symptoms

One of these:

- Systolic BP 220 or greater
- Diastolic BP 120 or greater

AND at least one of these:

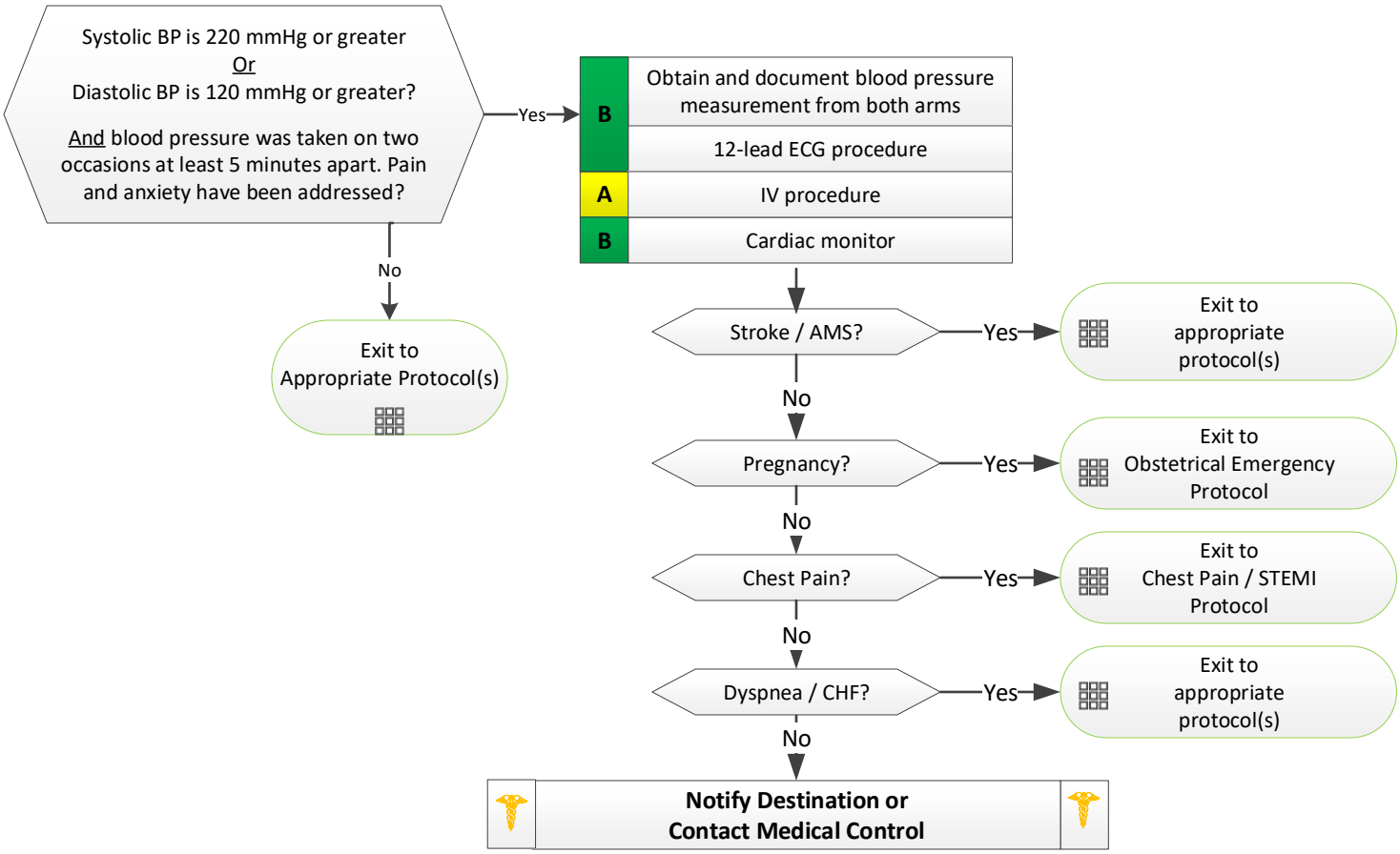
- Severe headache
- Chest pain
- Dyspnea
- Altered mental status
- Seizure
- Stroke-like signs/symptoms

Differential

- Hypertensive encephalopathy
- Primary CNS Injury:
  Cushing's response with bradycardia and hypertension
- Myocardial infarction
- Aortic dissection / aneurysm
- Pre-eclampsia / eclampsia

Hypertension may be common, especially in an emergency setting. Elevated blood pressure is usually transient and typically in response to stress and/or pain. A hypertensive emergency is based on the blood pressure measurements along with symptoms that suggest an organ is suffering damage, such as AMI, CVA, or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Hypertensive Emergency is defined as: Patient symptomatic(headache, vomiting, chest pain, visual disturbance, weakness)

Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



Pearls:

- **Recommended Exam: Mental status, skin, neck, lung, heart, abdomen, back, extremities, neurologic.**
- Elevated blood pressure is based on two to three sets of vital signs, each taken 5 minutes apart. Do **NOT** base treatment on a single BP reading.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS, or renal systems.
- All symptomatic patients with hypertension should be transported with the head of bed elevated at least 30 degrees.
- Ensure that an appropriately-sized blood pressure cuff is used for the body habitus. The inflatable part of the blood pressure cuff should cover about 80 percent of the circumference of the upper arm. The cuff should cover two-thirds of the distance from the elbow to the shoulder.

Hypotension / Shock

History
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential
- Shock:
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)

Diabetic Protocol *(if indicated)*

B
- Blood glucose analysis procedure
- 12-lead ECG procedure
- Cardiac monitor

A
- IV / IO procedure
- Airway Protocol(s) *(if indicated)*

Appropriate cardiac protocol *(if indicated)*

The history, exam, and circumstances often suggest the **Type of Shock:**
Was trauma involved?

Yes

Consider hypovolemic (bleeding), neurogenic (spinal injury), or obstructive (pneumothorax)

B
- Spinal Immobilization Procedure *(if indicated)*
- Wound care, CONTROL HEMORRHAGE *(if indicated)*

A
- **Normal Saline: bolus of 500 mL IV / IO**
  To maintain a SBP ≥ 90 mmHg;
  Do not bolus if normotensive.
  Maximum of 2 Liters.
- Chest Decompression Procedure *(if indicated)*

P
- **Consider vasopressors ONLY after a 2 Liter fluid bolus and patient is peri-arrest:**
  Levophed 8 to 12 mcg/min IV / IO
  to maintain systolic BP ≥ 90 mmHg
  Consider: **Push Dose Epi 5-20mcg** every 2-5 minutes as needed.

Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL.

No

Consider hypovolemic (dehydration, GI bleed), cardiogenic (STEMI, CHF), distributive (sepsis, anaphylaxis), or obstructive (PE, tamponade)

A
- **Normal saline or other crystalloid solution bolus of 500 mL IV / IO**
  Repeat as needed to SBP ≥ 90 mmHg
  Maximum 2 L

P
- **Be cautious of excess fluid administration with cardiogenic shock. Consider the presence of pulmonary edema and use dopamine early.**
  Levophed 8 to 12 mcg/min IV / IO
  to maintain systolic BP ≥ 90 mmHg
- **For non-cardiogenic shock, consider pressors after a 2 Liter fluid bolus:**
  Levophed 8 to 12 mcg/min IV / IO
  to maintain systolic BP ≥ 90 mmHg

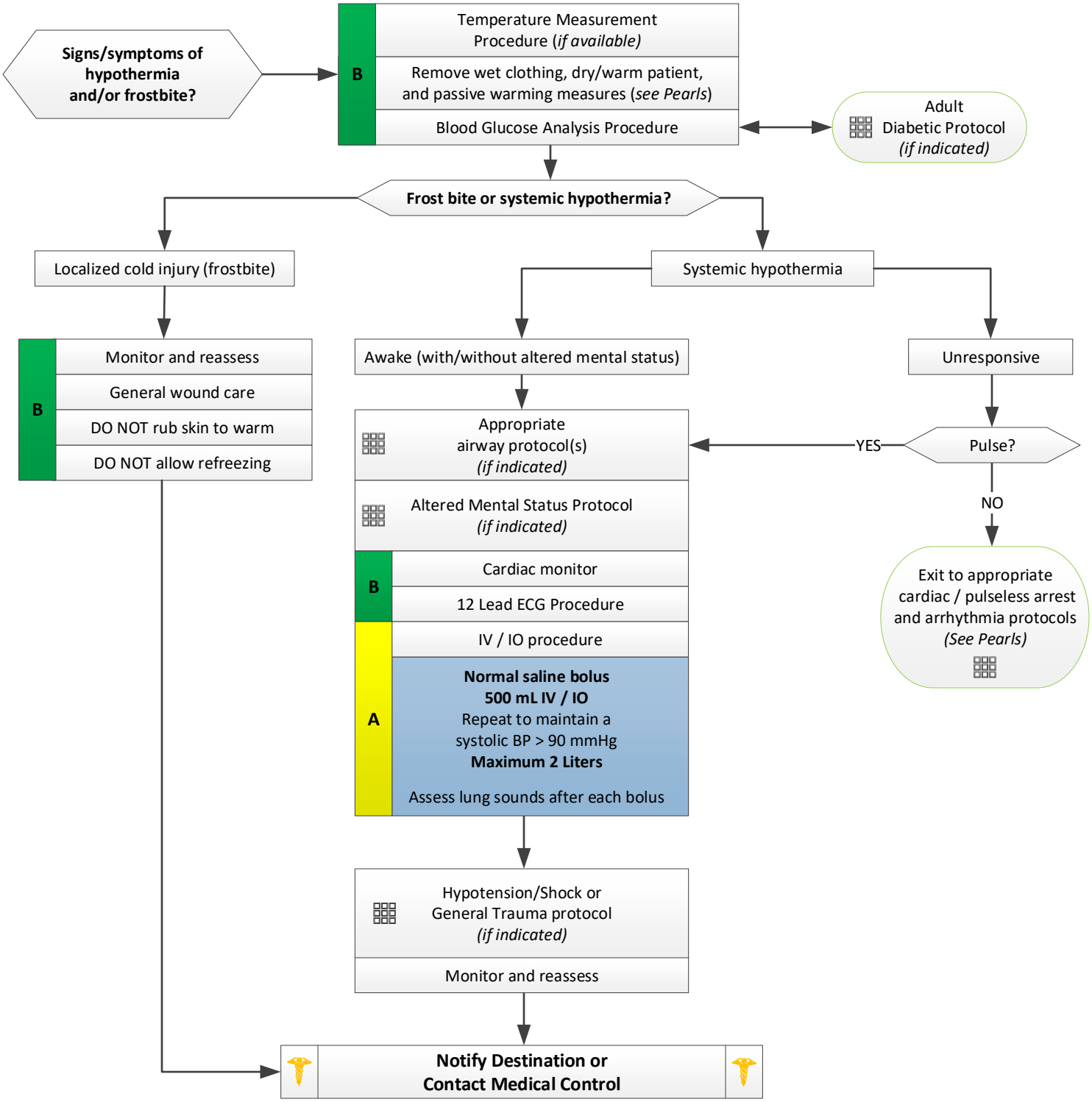
Notify Destination or Contact Medical Control

Hypothermia / Frostbite

History
- Age: very young and old
- Exposure to decreased temperatures, but may also occur in normal temperatures.
- Past medical history / medications
- Drug use: Alcohol, barbituates
- Infections / sepsis
- Length of exposure / wetness / wind chill

Signs and Symptoms
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury



Hypothermia / Frostbite

Pearls:

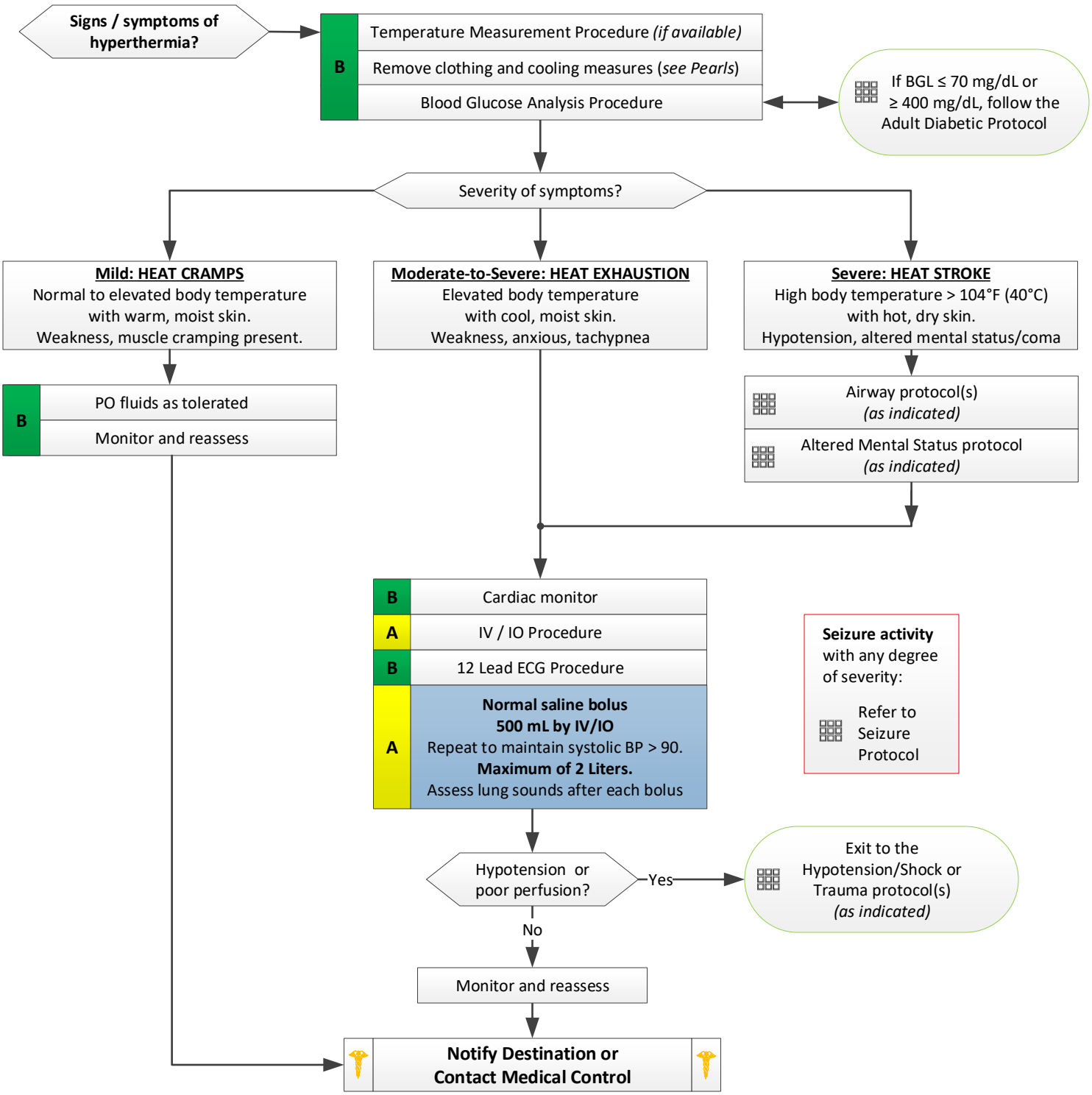
- Recommended Exam: Mental status, heart, lungs, abdomen, extremities, and neurological.
- Contributing factors to hypothermia: Alcohol consumption, age extremes, malnutrition, drug use, water immersion.
- **Only passive warming should be done in the prehospital setting**, which includes:
  - Remove patient's clothing
  - Warm the ambulance
  - Warm, dry blankets
  - Do NOT use hot packs, friction from rubbing, or hot water on skin. Active warming should only be done in the hospital setting.
- **Handle the patient gently** to prevent further injury to freezing/frozen areas and possibly increasing the risk for cardiac dysrhythmias.
- Cardiac arrest: Perform CPR and follow protocols as indicated. Refer to the specific protocol's guidelines for hypothermic patients. Transport to the hospital should begin early (even if CPR must be continued during travel) as the patient will most likely benefit from hospital-based warming procedures.
- Severe hypothermia (below 86° F [30°C]) is more susceptible to cardiac instability. Rough handling of the patient can theoretically cause ventricular fibrillation, but there is not enough evidence to definitely support or refute this concern. Intubation and CPR should be performed if indicated by protocol despite this concern.
- Be aware that levophed/dopamine and other sympathomimetic drugs may increase the risk for dysrhythmias in hypothermic patients.
- Antiarrhythmics and pacing may not work in patients with a core temperature below 86°F (30°C). ACLS guidelines recommend that antiarrhythmics be withheld at this temperature.
- Hypothermia may produce severe bradycardia; the duration of pulse checks may need to be extended.

Hyperthermia

History
- Age: the very young and the elderly are more susceptible.
- Exposure to increased temperatures and / or humidity.
- Past medical history / medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential
- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism ("thyroid storm")
- Delirium tremens ("DTs")
- Heat cramps, exhaustion, or stroke
- CNS lesions or tumors



Hyperthermia

Pearls:

- Recommended Exam: Mental status, skin, HEENT, heart, lungs, and neurological.
- Extremes of age are more prone to heat emergencies (the very young or elderly).
- Medication and/or drug overdose (tricyclic antidepressants, phenothiazines, anticholinergics, salicylates, amphetamines, cocaine, etc.) and alcohol may contribute directly to hyperthermia or to the patient's prolonged exposure to a hot environment. Consider the Overdose/Toxic Ingestion protocol as well, if indicated.
- Sweating generally disappears as the body temperature rises above 104°F (40°C).
- Appropriate cooling measures in the pre-hospital setting:
  - Remove patient's clothing (maintain modesty where feasible).
  - Air conditioning to cool ambulance with maximum airflow.
  - Cold packs to axilla (armpits) and groin. Always have a cloth barrier between the cold pack and skin to prevent skin injury. NO cold packs will be applied to the neck.
  - Room temperature (cabinet stock) IV fluids only. Do NOT use chilled fluids in the pre-hospital setting.
- Intense shivering may occur as the patient is cooled.

Combative Patient

History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Substance abuse / overdose
- Diabetes

Signs and Symptoms
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts
- Violent nature

Differential
- Altered mental status differential
- Alcohol intoxication / toxin / substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Always consider abnormal blood glucose levels. Refer to the Adult Diabetic Protocol if BGL ≤ 70 mg/dL or ≥ 400 mg/dL

Violent and combative patient?
(Obtain blood glucose measurement, if possible)

No → Exit to appropriate protocol

Yes → Mild / Severe

Mild

Consider Physical Restraint Procedure and verbal de-escalation techniques

Improvement / patient calming?
- Yes → Notify Destination or Contact Medical Control
- No ↓

A IV / IO Procedure (*if possible*)

B Cardiac monitor and oxygen via appropriate device

P **Midazolam (Versed) 0.1 mg/kg by IV/IO/IN/IM to a maximum of 5 mg**

Improvement / patient calming?
- Yes → Notify Destination or Contact Medical Control
- No ↓

Potential for harm to patient or EMS staff?
- No → Notify Destination or Contact Medical Control
- Yes ↓

P **Repeat midazolam (Versed) IV/IO/IN/IM**
Or
Consider contacting Medical Control for ketamine. Monitor for hypotension and respiratory depression. Use the Adult Basic Airway protocol, if indicated.

→ Notify Destination or Contact Medical Control

Severe

Excited Delirium Syndrome
Paranoia, disorientation, hyper-aggression, hallucinations, tachycardia, increased strength and / or hyperthermia?

Aggressive, violent, or agitated patient is a threat to self or others, or with possible psychosis?

A IV / IO procedure (*if possible*)

P **Ketamine 2 mg/kg by slow IV/IO**
Or
Ketamine 4 mg/kg IM
to a maximum of 500 mg.
(IM may require multiple injections. Max of 5 mL per injection and can only be administered in the thigh)

B
- Consider Restraint Procedure
- Cardiac monitor
- External cooling measures are needed if temperature ≥ 104.7°F by applying cooling packs to axillary and groin (avoid the neck)

A IV fluid bolus of 500 mL normal saline or LR

B
- Monitor ABCs post-sedation
- High flow oxygen via non-rebreather mask
- **Capnography is required**
- *If needed*, provide suction and respiratory support with a BVM

→ Notify Destination or Contact Medical Control

Adult Medical Section Protocol

Combative Patient

Pearls:

- **Recommended Exam: Mental status, skin, heart, lungs, neurologic.**
- **Crew / responders' safety is the main priority.**
- **Any patient who is handcuffed and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **The necessity for ketamine use must be documented in the patient care report.**
- **All patients who receive either physical and/or chemical restraint must be continuously observed by ALS personnel.**
- **Due to the rapid onset and prolonged duration of action, ketamine administered by the intramuscular route (IM) may be more suitable for suspected toxin/drug use patients who are an immediate threat to responders and the patient's own safety.**
- Be sure to consider all possible medical/trauma causes for the patient's behavior and address these contributors where possible (hypoglycemia, overdose, substance abuse, hypoxia, head injury, severe pain, etc.).
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If a patient suspected of agitated delirium suffers a cardiac arrest, consider a fluid bolus and sodium bicarbonate early.
- Do not position or transport any restrained patient is such a way that could impact the patient's respiratory or circulatory status. The patient may never be transported in the prone position.
- The patient may have transient non-purposeful movements associated with ketamine. Such movements may include short term muscle rigidity and/or nystagmus, which will resolve on its own.
- Midazolam (Versed) has a much shorter onset of action via the IM route compared to lorazepam (Ativan), but lorazepam offers a longer duration of action on the CNS. The most appropriate medication choice should be based on the current situation and patient needs.
- Monitor your patient for drug interactions, particularly in those patients treated with a benzodiazepine for signs/ symptoms associated with their recreational drug use.

Excited Delirium Syndrome:

Excited delirium is medical emergency that has a high risk for increased mortality (death) due to the causes of it or from the injuries/medical emergencies that may develop secondary to it. Excited delirium needs to be addressed in the prehospital setting, and may involve a combination of psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia, and increased strength.

The use of physical restraints and/or tasers may increase the severity of the potentially life-threatening condition. In the prehospital setting, excited delirium is most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly with stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines, or similar agents. Alcohol withdrawal, severe CNS illness, or head trauma may also contribute to the condition.

Pain Management

History
- Age
- Location, duration
- Severity (1 through 10 scale)
- If non-verbal, use the Wong-Baker FACES or FLACC pain scale
- Past medical history
- Pregnancy status
- Drug allergies and medications

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / respiratory
- Neurogenic
- Renal (colic)

Pain severity?
Use a combination of pain scale, circumstances, MOI, injury, or illness severity.

Mild Pain (scale 0 through 6)

B
Ibuprofen 10 mg/kg PO
(400 to 800 mg typical adult)
Or
Acetaminophen 15 mg/kg PO
(500 to 1000 mg typical adult)
Do not administer if patient will exceed 4000 mg in a 24 hour period with dose.

A Consider IV / IO Procedure

B Observe/monitor patient and reassess

P
Ketorolac 30 mg IV/IO or 60 mg IM for pain of 4 or greater on scale

Fentanyl 50-100 mcg IV/IO/IM/IN per dose
May repeat dose every 10 minutes (*as needed*) until improvement.
Maximum total dose of 300 mcg

Improvement in pain?

Yes → Notify Destination or Contact Medical Control

No → Move to the Moderate to Severe Pain arm of this protocol

Moderate to Severe Pain (Scale > 6) with increased vital signs

A IV / IO Procedure, if indicated

B
Assess and monitor respiratory status. Apply oxygen via appropriate device (minimum of nasal cannula).
Cardiac monitor

P
Fentanyl 50-100 mcg IV/IO/IM/IN per dose
May repeat dose every 10 minutes (*as needed*) until improvement.
Maximum total dose of 300 mcg

Or

For uncontrolled pain – Severe trauma
Ketamine 0.3 mg/kg IV/IO
Maximum of 50 mg Repeat once in 15 minutes if needed
NOT TO EXCEED MAX DOSAGE

P Monitor and reassess the patient every 5 minutes following medication administration. Patient requires paramedic-level care and monitoring.

Notify Destination or Contact Medical Control

See the Pearls to determine the most appropriate medication for the patient.

The Pearls will list indications and contraindications for each type of analgesic used in these protocols.

Pain Management

Appropriate Analgesia Selection – Quick Reference				
Patient Type:	**Acetaminophen**	**Ibuprofen**	**Ketorolac**	**Fentanyl**
Actively bleeding (Includes GI bleed or suspected intracranial bleed)	No	No	No	Yes
Acute burn patients	No	No	No	Yes
Liver disease or **liver transplant**	No	Yes	Yes	Yes
Pregnant or **breastfeeding**	Yes	No	No	Yes
Renal patients	Yes	No	No	Yes
Surgical candidates (Includes open fractures and fracture deformities. Surgical candidates may include abdominal pain or headaches possibly related to an intracranial bleed)	No	No	No	Yes

Pearls:

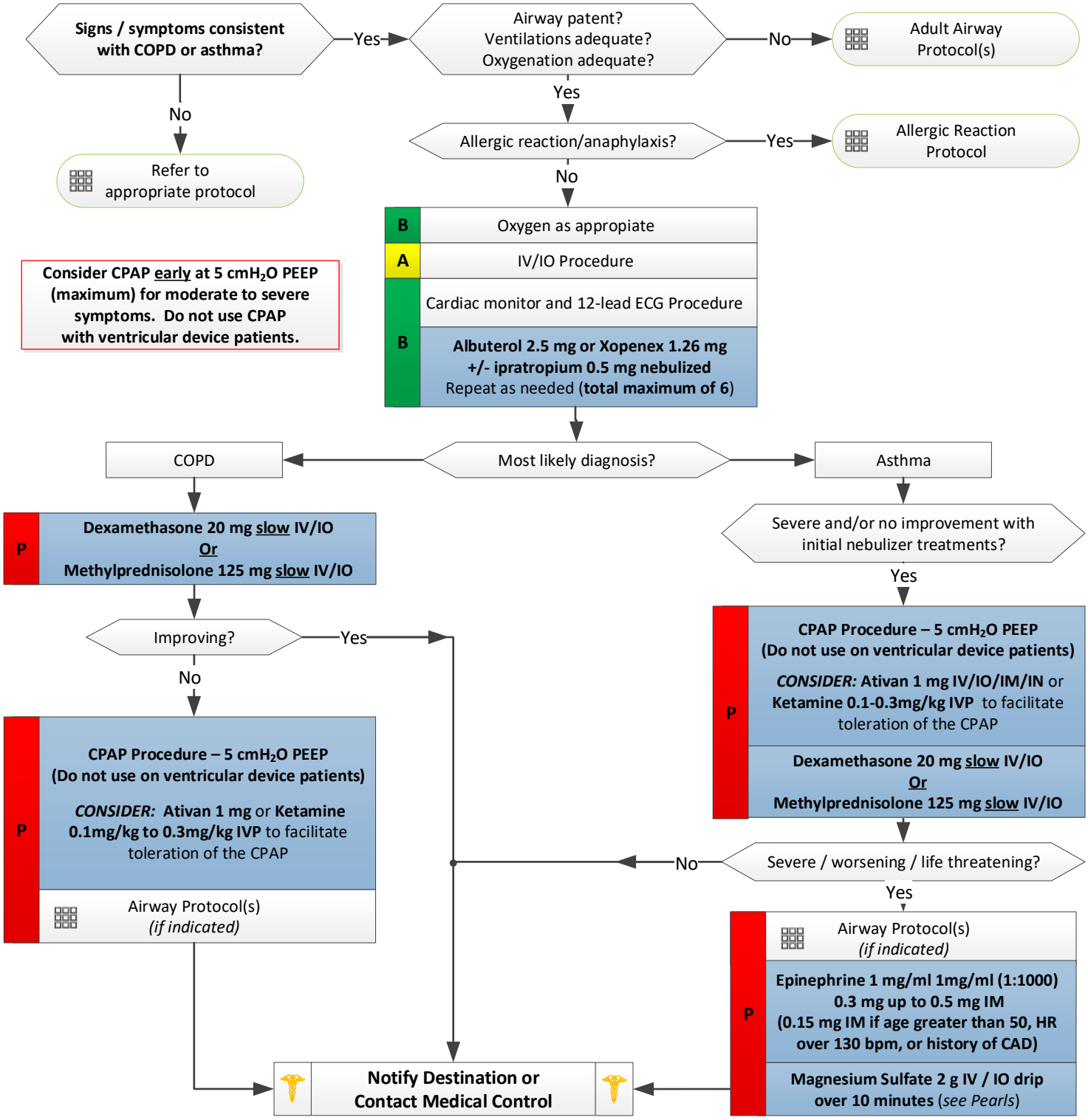
- **Recommended Exam: Respiratory status, mental status, area of pain, neurological.**
- **DO NOT administer ketorolac or ibuprofen to patients who are pregnant.**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO, IM or IN medication delivery and at patient hand off. Monitor BP and respirations closely as sedative and pain control agents may cause hypotension and/or respiratory depression. Monitor and document vital signs before medicating, 10 minutes after medication, and before patient transfer.**
- Patients may display a wide variation of response to opioid pain medication (morphine and fentanyl, aka "narcotics"). Consider the patient's age, weight, clinical condition, other recent drugs or alcohol, and prior exposure to opiates when determining initial opioid dosing. Weight-based dosing may provide a standard means for dose calculation, but does NOT predict patient response. For example, minimal doses of opioids may cause respiratory depression in the elderly, opiate naïve, and possibly intoxicated patients.
- Both arms of the treatment may be used in concert. As an example: For patients in moderate pain, you may use the combination of an oral medication, IM, IN, and/or IV/IO if no contraindications are present and patient remains stable.
- All patients who receive IM or IV medications must be observed 15 minutes for a drug reaction in the event no transport occurs.
- Do not administer any PO medications for patients who may need surgical intervention, such as open fractures or fracture deformities, headaches, or concerning abdominal pain.
- Ketorolac (Toradol) and ibuprofen should not be given to patients with known renal transplant/renal failure, in patients who have known drug allergies to NSAIDs (non-steroidal anti-inflammatory medications), with active bleeding, when intracranial bleeding is suspected, when GI bleeding is suspected, or for patients who may need acute surgical interventions.
- Do not administer **acetaminophen** to patients with a history of liver disease or liver transplant. Maximum: 4000 mg per 24 hrs.
- Burn patients may require higher than usual opioid doses to effect adequate pain control. IF AN ADULT PATIENT HAS SUFFERED BURNS THAT REQUIRE TRANSPORT TO THE BURN CENTER, **THE MAXIMUM TOTAL DOSE OF MORPHINE IS 50 mg**. Do not hesitate to contact medical control regarding the pain management strategy for patients in severe pain despite medications or with significant burns.

Asthma / COPD

History
- Asthma, COPD, chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, and/or "dry" cough
- Use of accessory muscles
- Fever
- Tachycardia

Differential
- Asthma / anaphylaxis
- COPD (emphysema, bronchitis)
- Pleural effusion
- Pneumonia / aspiration
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Inhaled toxin (carbon monoxide, etc.)



Adult Respiratory Section Protocols

Asthma / COPD

Pearls:

- Distinguishing between asthma and COPD can be difficult. These patients will usually know their diagnosis already. Asthmatics tend to be younger (less than 40 years old) and COPD patients tend to be older adults.
- CPAP may ONLY be placed on someone with NORMAL MENTATION. If there is altered mental status, CPAP SHOULD NOT BE USED.

  Other contraindications for CPAP use:

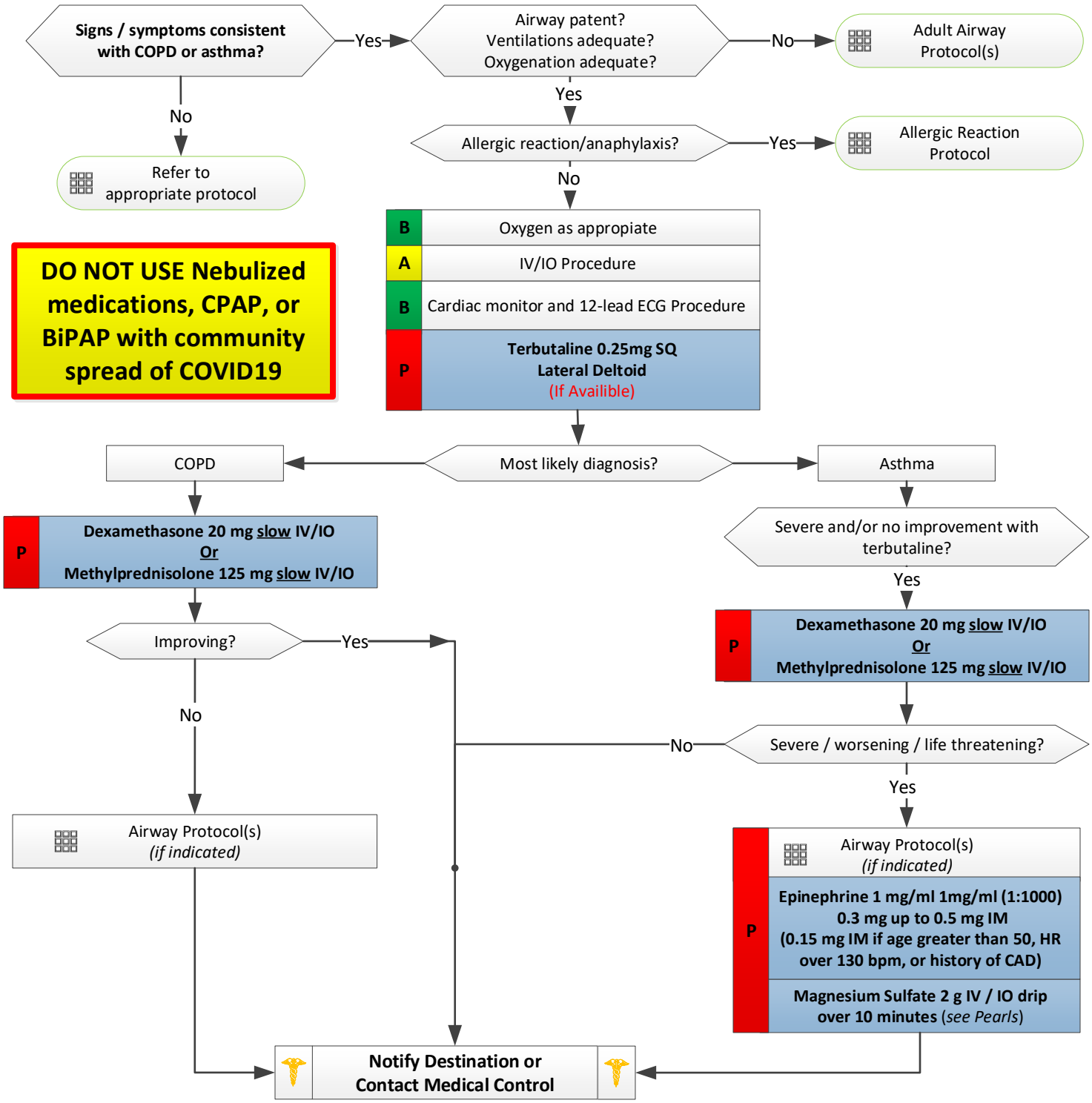
  - Language barrier or unable to follow commands.
  - Facial features or deformities that would prevent an adequate mask seal.
  - Excessive respiratory secretions and emesis that could lead to aspiration.
  - Patients under 12 years old.
  - Unstable patients (systolic BP below 90 mmHg), chest trauma, or suspected pneumothorax.
- CPAP: Do not exceed 5 cmH_2O of PEEP in asthmatic or COPD patients.
- Allow the patient to maintain their position of comfort to maximize their breathing effort.
- Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, beginning to show signs of altered mental status, or who have recent history of alcohol or drug ingestion. All efforts at verbal coaching should be used prior to giving benzodiazepines for patients in respiratory distress.
- Epinephrine may precipitate cardiac ischemia in patients who are older than 50 years, who have a history of cardiac disease, or who have a heart rate greater than 130 bpm. A half dose 0.15 mg should be given to these patients and a 12 lead ECG should be obtained after the medication has been administered.
- The Epi-Pen autoinjector should be used in severe cases where there may be a delay in using the ampule.
- Pulse oximetry and end-tidal waveform capnography should be monitored continuously and documented in the patient care report.
- Corticosteroids (dexamethasone or methylprednisolone) need to be administered slowly to prevent severe patient discomfort. Both of these IV medications should be administered over at least two minutes.
- Signs of hypermagnesemia: Depressed respiratory rate/depth, depressed reflexes, hypotension, dysrhythmias that can lead to bradycardia, atrioventricular heart blocks, and eventually progressing to asystole. If present, contact Medical Control for orders and advise that calcium chloride is available on the unit for treatment considerations.
- Magnesium drip preparation: Add 2 grams of magnesium sulfate to a 100 mL bag of normal saline. Attach a 10 gtts set and infuse at 3 drops every 2 seconds (1.6 drops per second or 600 mL per hour).

Asthma / COPD (During COVID-19 Pandemic)

History
- Asthma, COPD, chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi, and/or "dry" cough
- Use of accessory muscles
- Fever
- Tachycardia

Differential
- Asthma / anaphylaxis
- COPD (emphysema, bronchitis)
- Pleural effusion
- Pneumonia / aspiration
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Inhaled toxin (carbon monoxide, etc.)



Adult Respiratory Section Protocols

Congestive Heart Failure/ Pulmonary Edema

History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix/ furosemide, Viagra/sildenafil, Levitra/vardenafil, Cialis/tadalafil)
- Cardiac history --past myocardial infarction, HTN, A-fib

Signs and Symptoms
- Prior history, hypertension
- Respiratory distress +/- rales (crackles)
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential
- Myocardial infarction
- Asthma / COPD
- Anaphylaxis
- Pleural effusion / pneumothorax
- Pneumonia / aspiration / fever
- Pulmonary embolus
- Pericardial tamponade
- Toxic exposure

Signs / symptoms consistent with CHF / pulmonary edema?

- Yes → Airway patent? Ventilations adequate? Oxygenation adequate?
  - No → Appropriate airway protocol(s)
  - YES ↓
- No → Refer to appropriate protocol

Consider CPAP early starting at 5 cmH_2O PEEP for moderate to severe symptoms. Do not use CPAP with ventricular device patients.

B
- Oxygen as appropriate
- **IF WHEEZING IS PRESENT, administer one (1) Albuterol or Xopenex +/- ipratropium**
- Cardiac monitor
- 12-lead ECG Procedure
- **A** IV/IO Procedure

↔ Follow the Cardiac: Chest Pain and STEMI protocol if acute ischemic changes are suggested with ST segment elevation.

Severity of symptoms?

MILD
Normal heart rate.
Elevated or normal BP

- **B** **Nitroglycerin 0.4 to 0.8 mg SL**
- **P** Paramedic must monitor patient

Improving?
- No → **B** **CPAP starting at 5 cmH_2O PEEP. May titrate up to 10 cmH_2O (maximum) if needed.**
- Yes ↓

MODERATE / SEVERE
Elevated heart rate.
Elevated BP

- **B** **Nitroglycerin 0.4 to 1.2 mg SL**

B **CPAP starting at 5 cmH_2O PEEP. May titrate up to 10 cmH_2O (maximum) if needed.**

P
- **Enalaprilat 1.25 mg slow IV/IO ONLY if systolic BP > 140 mmHg and patient is not pregnant.**
- ***Consider:*** **Ativan 1 mg IV/IO facilitate toleration of CPAP if systolic BP > 90 mmHg.**

CARDIOGENIC SHOCK
Tachycardia followed by bradycardia.
Hypertension followed by hypotension

P
- *Consider*: Removing CPAP if systolic BP < 90 mmHg
- **Levophed 8 to 12 mcg/kg IV/IO** Titrate to a systolic BP ≥ 90 mmHg

Airway protocol, *if indicated*

Notify Destination or Contact Medical Control

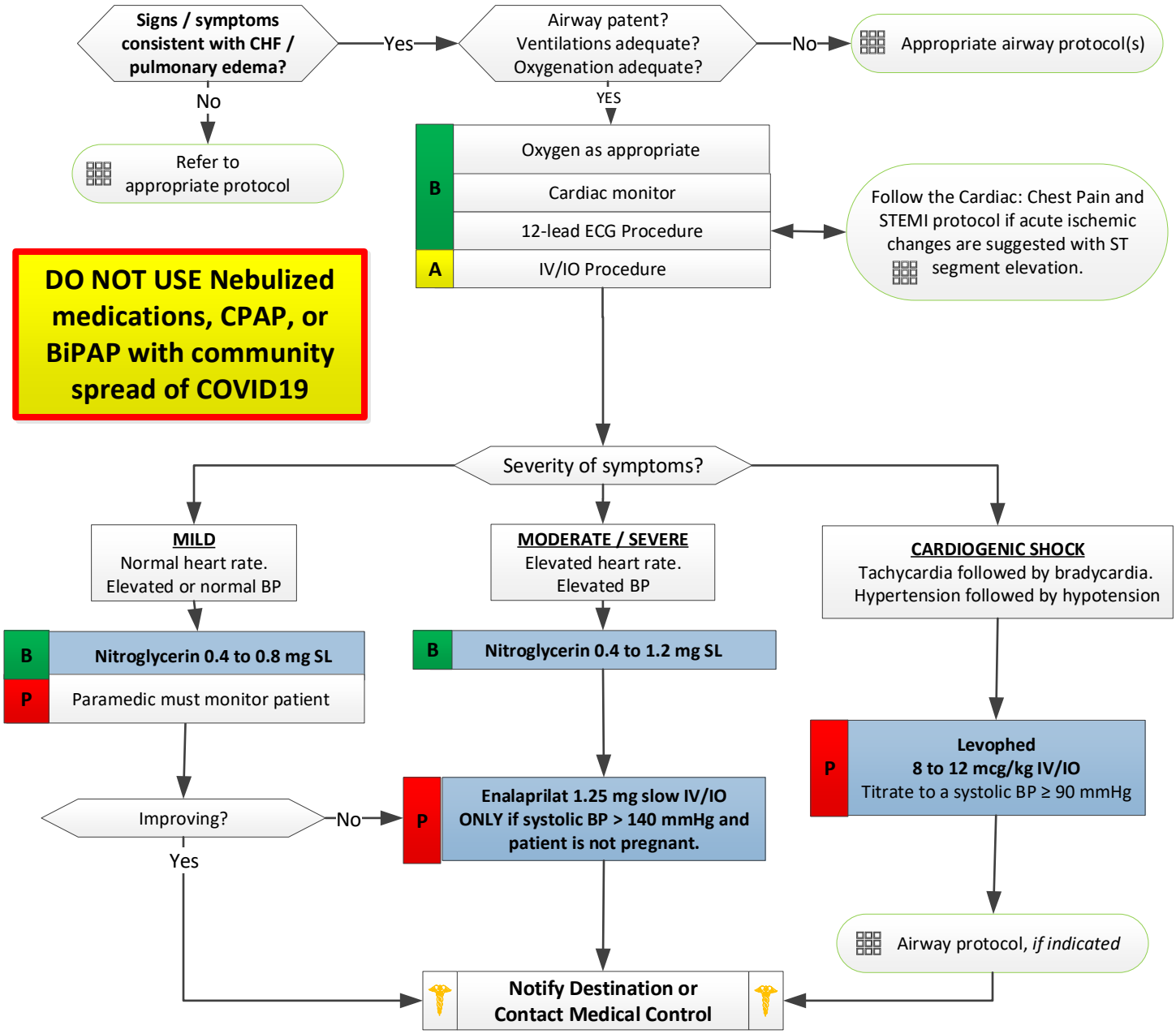
Adult Respiratory Section Protocols

CHF / Pulmonary Edema (During COVID-19 Pandemic)

History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix/ furosemide, Viagra/sildenafil, Levitra/vardenafil, Cialis/tadalafil)
- Cardiac history --past myocardial infarction, HTN, A-fib

Signs and Symptoms
- Prior history, hypertension
- Respiratory distress +/- rales (crackles)
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential
- Myocardial infarction
- Asthma / COPD
- Anaphylaxis
- Pleural effusion / pneumothorax
- Pneumonia / aspiration / fever
- Pulmonary embolus
- Pericardial tamponade
- Toxic exposure



Congestive Heart Failure/ Pulmonary Edema

Pearls:

- CPAP may ONLY be placed on someone with NORMAL MENTATION. If there is altered mental status, CPAP SHOULD NOT BE USED due to increased risk of aspiration.

  Other contraindications for CPAP use:

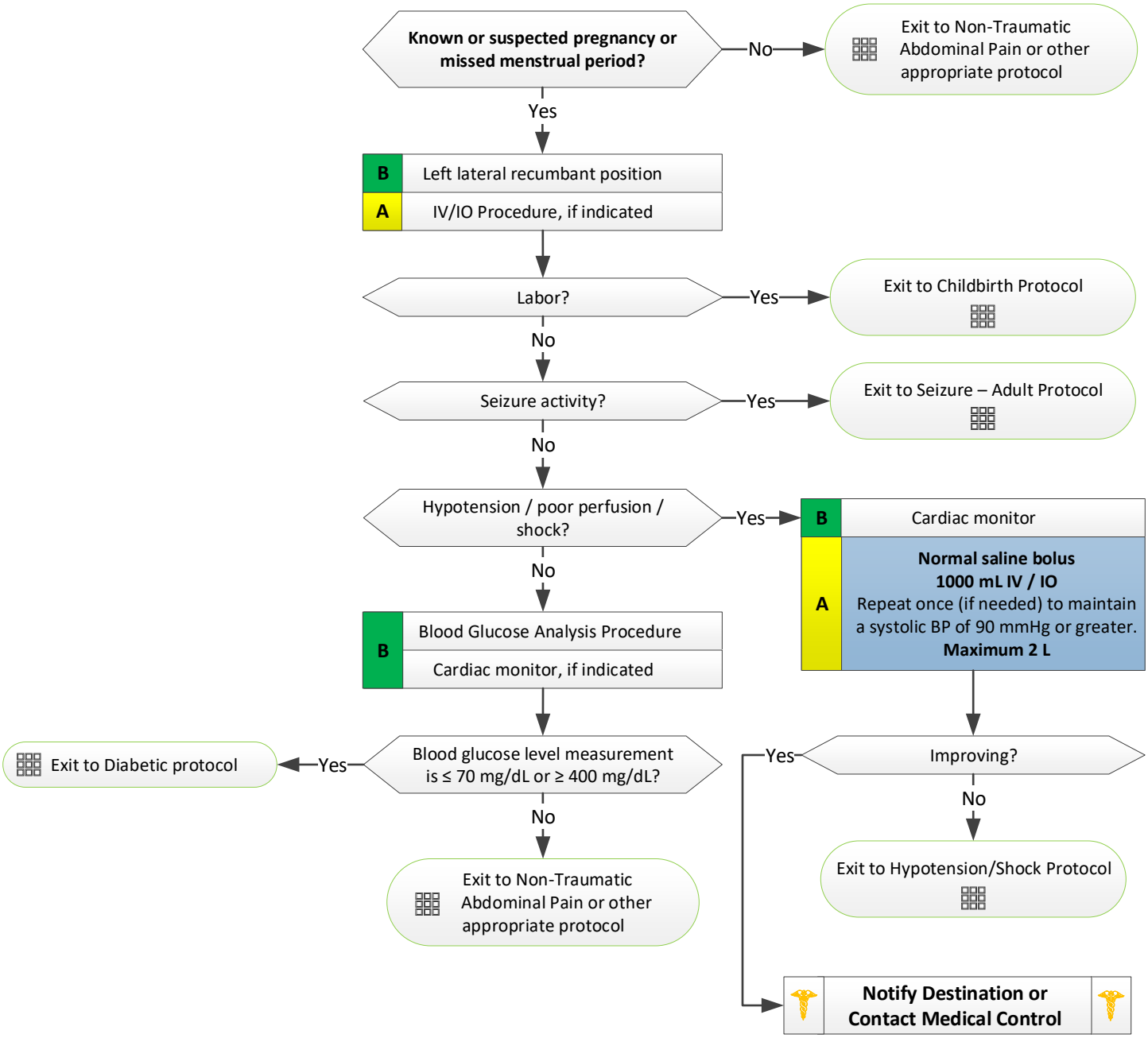
  - Language barrier or unable to follow commands.
  - Facial features or deformities that would prevent an adequate mask seal.
  - Excessive respiratory secretions and emesis that could lead to aspiration.
  - Patients under 12 years old.
  - Unstable patients (systolic BP below 90 mmHg), chest trauma, or suspected pneumothorax.
- Do not exceed 10 cmH_2O of PEEP. Initial settings should begin at 5 cmH_2O and titrate up to 10 cmH_2O if patient response dictates a need for increased PEEP. Use the minimum amount of PEEP needed for effect; more PEEP than necessary may cause barotrauma and/or a pneumothorax.
- Accurate identification of CHF or acute pulmonary edema is made using the medical history, risk factors, medications, and physical exam.
- Strongly consider CHF or acute pulmonary edema in patients presenting with respiratory distress with marked hypertension.
- Consider MI in all of these patients. Diabetics, geriatric, and female patients often have atypical pain or only generalized complaints.
- Avoid nitroglycerin for patients who have used Viagra, Levitra, or Cialis within the past 24 hours.
- DO NOT give enalaprilat to women who are pregnant or may be pregnant due to risk of fetal harm.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, beginning to develop altered mental status, or who have a recent history of alcohol or drug ingestion. All efforts at verbal coaching should be used prior to giving benzodiazepines for patients in respiratory distress

Obstetrical Emergency

History
- Past medical history
- Hypertension medications
- Prenatal care
- Prior pregnancies / births / complications
- Gravida / Para
- Pre-eclampsia/eclampsia history

Signs and Symptoms
- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

Differential
- Pre-eclampsia / eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion
- Ectopic pregnancy



Obstetrical Emergency

Pearls:

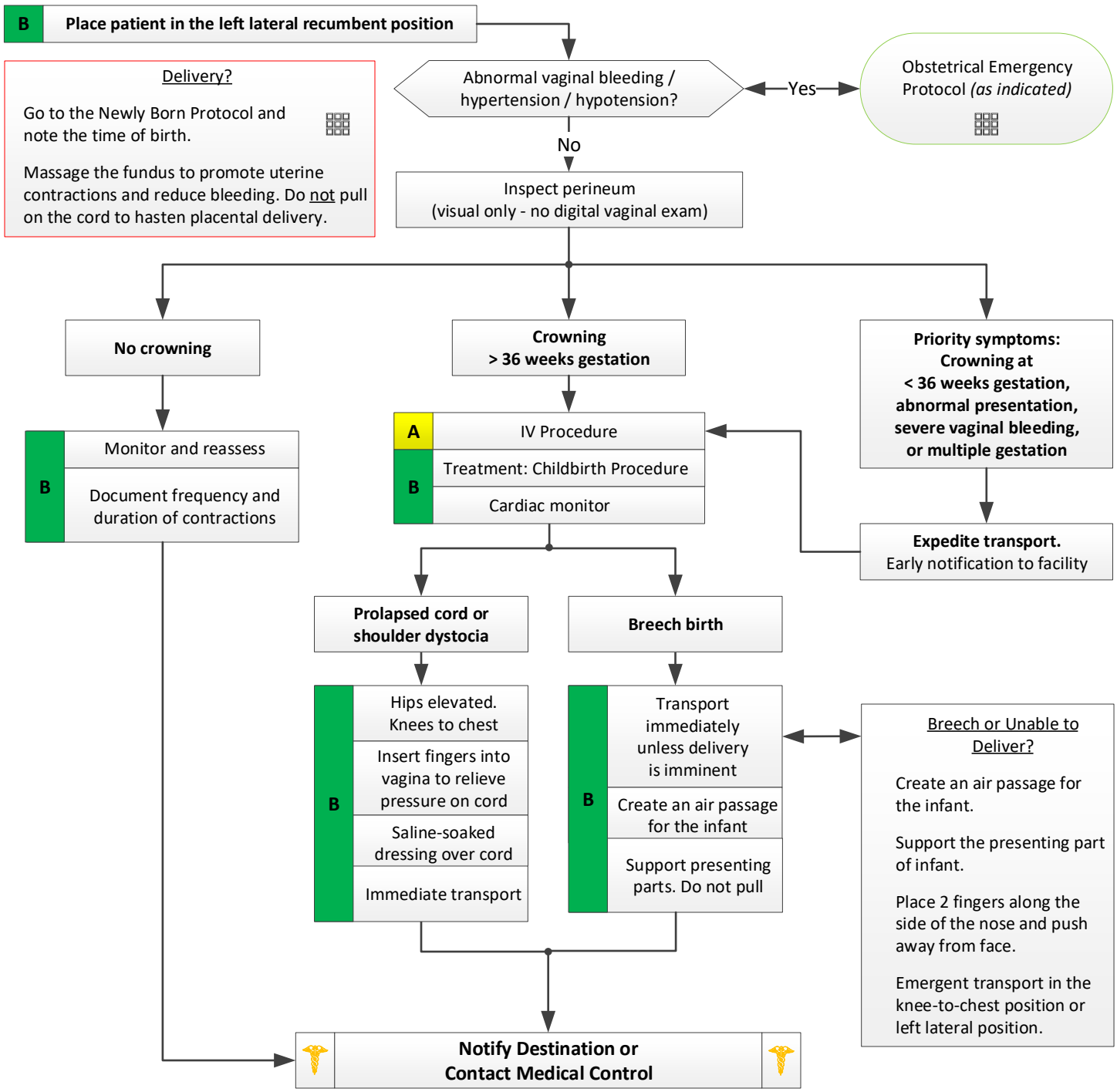
- **Recommended Exam: Mental status, abdomen, heart, lungs, neurologic.**
- Pre-eclampsia: Typically occurs after 20 weeks gestation with hypertension as the most common sign found during pre-hospital evaluation. Other typical signs/symptoms usually include increased protein release in urine during pregnancy (proteinuria), increased edema, and suggestions of liver and/or renal dysfunction.
- Eclampsia: Pre-eclampsia with seizure activity. This is a true medical emergency as the fetus is at risk. Pre-hospital management includes prompt seizure control, supportive therapy, and emergent transport to the hospital. Magnesium sulfate infusion is a priority, but midazolam IM should be used if the patient is found seizing upon EMS arrival.
- Be aware of symptoms not directly involving the pelvic area/lower abdomen. Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- Hypertension during pregnancy: Defined as a blood pressure greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome, which may occur as the fetus grows large enough to compress the vena cava. The right lateral position may also be used if needed.
- Ask patient to quantify bleeding - number of pads soaked per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks gestation generally require several hours of fetal monitoring. DO NOT suggest that the patient needs an ultrasound.
- Magnesium may cause hypotension and decreased respiratory drive. Contact medical control for orders if present.
- A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency. Magnesium administration should be a priority in these patients. However, IM benzodiazepines may be given first due to rapidity of IM administration. For crews with two ALS providers, one provider should administer IM benzodiazepine while the other provider establishes IV access for Magnesium.
- **Do not delay IM administration of midazolam because of difficult IV or IO access in actively-seizing pregnant patients.**

Childbirth / Labor

History
- Due date / prenatal care
- Time contractions started / how often?
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para status
- High risk pregnancy?

Signs and Symptoms
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

Differential
- Abnormal presentation of:
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta

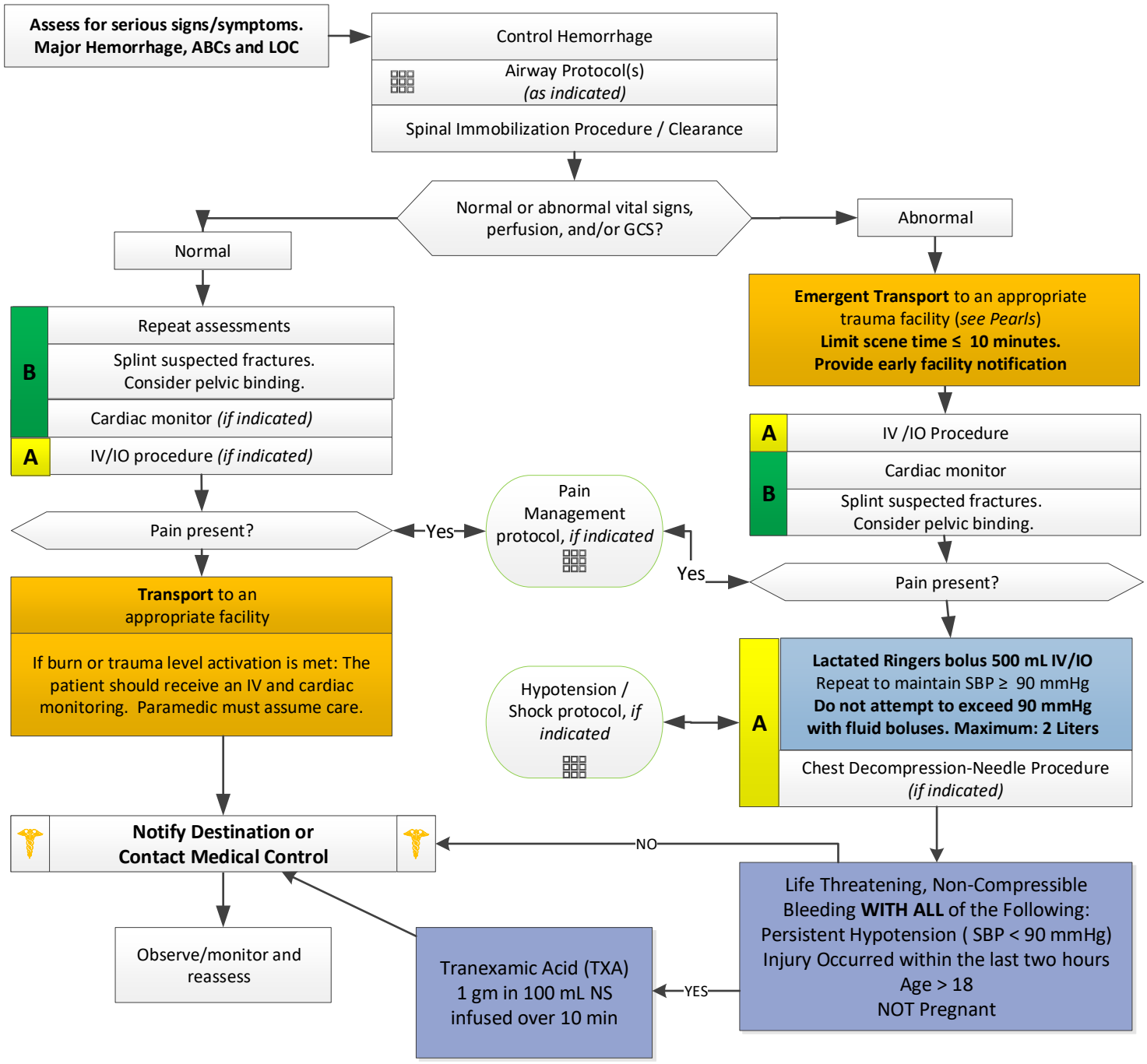


Adult General Trauma

History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)
- Chest:
  - Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis / femur fracture
- Spine fracture / cord injury
- Head injury
- Extremity fracture / dislocation
- HEENT (airway obstruction)
- Hypothermia



Adult Trauma Section Protocols

Adult General Trauma

Trauma Activation Level I Criteria

Adult Patients with:

_____Pulse 130 or greater

_____BP less than 90 systolic

_____RR less than 10 or greater than 29

_____ Intubated patient

_____ Evidence of airway compromise or unsecured airway

_____ GCS less than 9 with mechanism consistent with multiple system injury

_____ Penetrating injury to head, neck, chest or abdomen (i.e., Stabbing, GSW, Impalement)

Trauma Activation Level II criteria

_____ Ejection from vehicle (partial or complete)
_____ Pulsless extremity, crushed,degloved, mangled extremity not including digits
_____ Burns meeting ABA criteria for transfer to a burn unit
_____ Rollover, unrestrained

_____ Auto vs pedestrian/bicyclist greater than 20 mph

_____ Motorcycle crash greater than 20 mph; motorcycle crash with no helmet

_____ Sustained GCS of 14 or less following traumatic event

_____ Falls greater than 10 ft or greater than 2 times patient's height
_____ Flail chest

_____ Two or more long bone fractures
_____ Suspected pelvic fracture
_____Paralysis
_____ Open or depressed skull fracture
_____ Amputation proximal to wrist/ankle

Guidelines for Trauma Activation

- Vital sign abnormalities: i.e. confirmed systolic BP less than 90 or HR greater than 130 documented at any point prior to arrival.
- Transfers out should occur within 2 hours of arrival.

American Burn Association Criteria for Transfer to a Burn Unit

- Partial thickness burns greater than 10% TBSA.
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
- Third-degree burns in any age group.
- Electrical burns (including lightning injury), chemical burns or inhalation injury.
- Burn injury in patient with preexisting medical disorders that could complicate management

Pearls:

Recommended Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neurological.

- **Transport destination is chosen based on the trauma level criteria with EMS pre-arrival notification to the facility.**
- **Scene times should not be delayed for procedures. Procedures should be performed enroute whenever possible. Emergent transport of the unstable trauma patient to the appropriate facility IS the goal.**
- **A bag-valve-mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90% and there is no foreseeable risk of aspiration.**
- Geriatric patients should be evaluated with a high index of suspicion. Often occult injuries are more difficult to recognize and these patients can decompensate unexpectedly with little warning.
- Mechanism can be the most reliable indicator of serious injury. Do not overlook the possibility of associated domestic violence or abuse.
- In prolonged extrications, consider air transportation for transport time and the ability to transfuse blood.
- TXA Drip 1 gram in 100cc NS – infuse over 8 hours.

Traumatic Event with Entrapment

History
- Age
- Location/duration
- Pain severity (1 to 10)
- Type of event involved
- Part of body affected
- Past medical history
- Pregnancy status
- Drug allergies and medications

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area
- Entrapped and unable to assess body

Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / respiratory
- Neurogenic
- Renal (colic)

<u>Ketamine</u>

The patient may have transient non-purposeful movements associated with ketamine. Such movements may include short term muscle rigidity and/or nystagmus, which will resolve on its own.

Watch for any signs of severe nausea, vomiting, or excessive oral secretions, which are uncommon but may compromise the airway. Have portable suction readily available.

Pain with a portion of the body entrapped with a high suspicion of severe bone injury?

No → Adult General Trauma protocol *and* Pain Management protocol

Yes ↓

Severe pain (scale > 8) with abnormal vital signs and GCS ≥ 8?

No → Altered Mental Status protocol, *if indicated*. Adult Airway protocol, *if indicated* → Adult General Trauma protocol

Yes ↓

A	IV /IO Procedure (consider fluid bolus, *if needed*)
B	Cardiac monitor (required when safe to do)

P	Assess and monitor respiratory status. Provide oxygen via appropriate device by ALS provider.
	Ketamine 0.3 mg/ kg SIVP (IV/IO only) Maximum of 50 mg Repeat once in 15 minutes if needed NOT TO EXCEED MAX DOSAGE

↓

Monitor and reassess the patient every 5 minutes following a medication dose by the ALS provider. Follow the Adult General Trauma protocol.

↓

Any decrease in level of consciousness or respiratory status?

Yes → Airway protocol, *if indicated*

No ↓

Notify destination or contact Medical Control. Continue with rescue and appropriate protocol(s). Consult with Medical Control if additional pain management is needed.

Traumatic Arrest

History

- Patient who has suffered a traumatic injury and is now pulseless.

Signs and Symptoms

- Evidence of penetrating trauma
- Evidence of blunt trauma

Differential

- Medical condition preceding traumatic event as cause of arrest.
- Tension pneumothorax
- Hypovolemic shock:
  - External hemorrhage
  - Unstable pelvic fracture
  - Displaced long bone fracture(s)
  - Hemothorax
  - Intra-abdominal hemorrhage
  - Retroperitoneal hemorrhage

Do not attempt resuscitation.

Contact law enforcement as appropriate.

Refer to the Deceased Body Procedure.

Yes ← **Patient with an injury obviously incompatible with life or Traumatic arrest in asystole?**

No ↓

Keep scene time to ≤ 10 minutes.

Emergent transport to the ED for definitive care is the priority in the traumatic arrest patient.

B

Spinal Immobilization / Spinal Clearance Protocol

Begin continuous CPR compressions using ResQPUMP at 80 BPM
If ResQPUMP unavailible –
Push hard (2-2.5 inches) and push fast (110 per min)

Change compressors every 2 minutes
(*Limit changes / pulse checks ≤ 5 seconds*)

Passive oxygenation to start: Nasopharyngeal / oropharyngeal airway inserted with NC @ 15L/min

A

Early placement of an advanced airway is indicated. Do not interrupt compressions or other priorities with intubation attempts. Consider BIAD.

Known or suspected chest injury? → Yes → **A** Chest Decompression Needle Procedure *(if indicated)*

B Control external hemorrhage

A IV/IO Procedure

Normal Saline bolus 500 mL IV/IO
Maximum: 2 Liters

B Cardiac monitor (*if not already done*) ↔ Appropriate cardiac protocol (PEA/Asystole or Pulseless V-Fib/V-Tach)

Return of pulse? → Yes → Exit to Post-Arrest Resuscitation protocol

No ↓

Notify Destination or Contact Medical Control

Traumatic Arrest

Pearls:

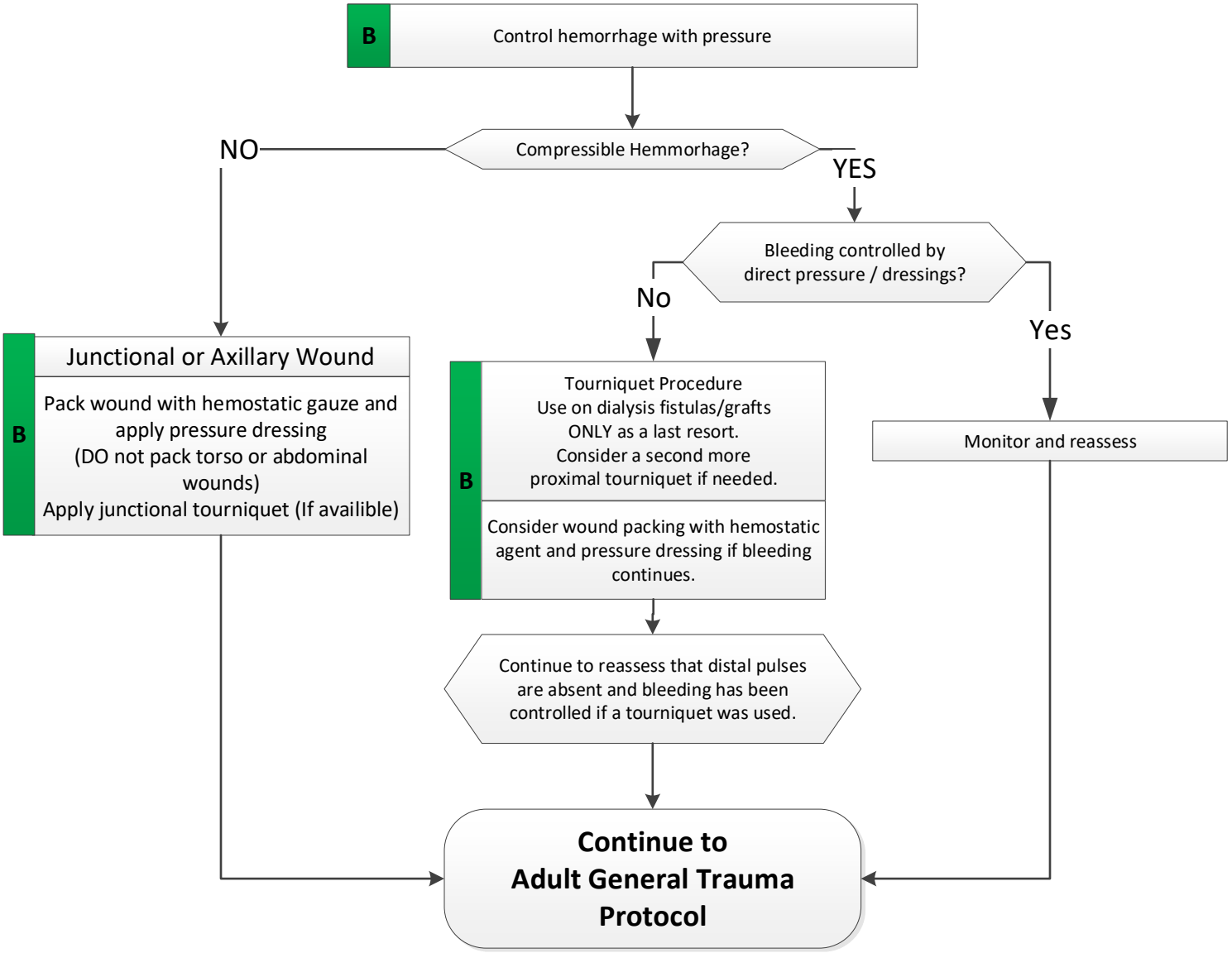
- Injuries obviously incompatible with life include decapitation, massively deformed head or chest injuries, or other features of a particular patient encounter that would make resuscitation futile.
- Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest.
- As with all major trauma patients, transport should generally not be delayed for these patients.
- Where the use of spinal immobilization interferes with performance of quality CPR, make reasonable efforts to manually limit patient movement.
- Patient may be a candidate for Life Gift Donation.

Extremity Trauma

History
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open versus closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation



Amputation

Rinse the amputated part with normal saline, and then completely wrap the part in a sterile trauma dressing soaked with normal saline. Place the wrapped part in a leak proof plastic bag and then place the bag in an ice water bath or cold saline, if available. Do not place the part directly on ice.

Do not delay transport to search for an amputated part; delegate this task to other responders.

Extremity Trauma

Pearls:

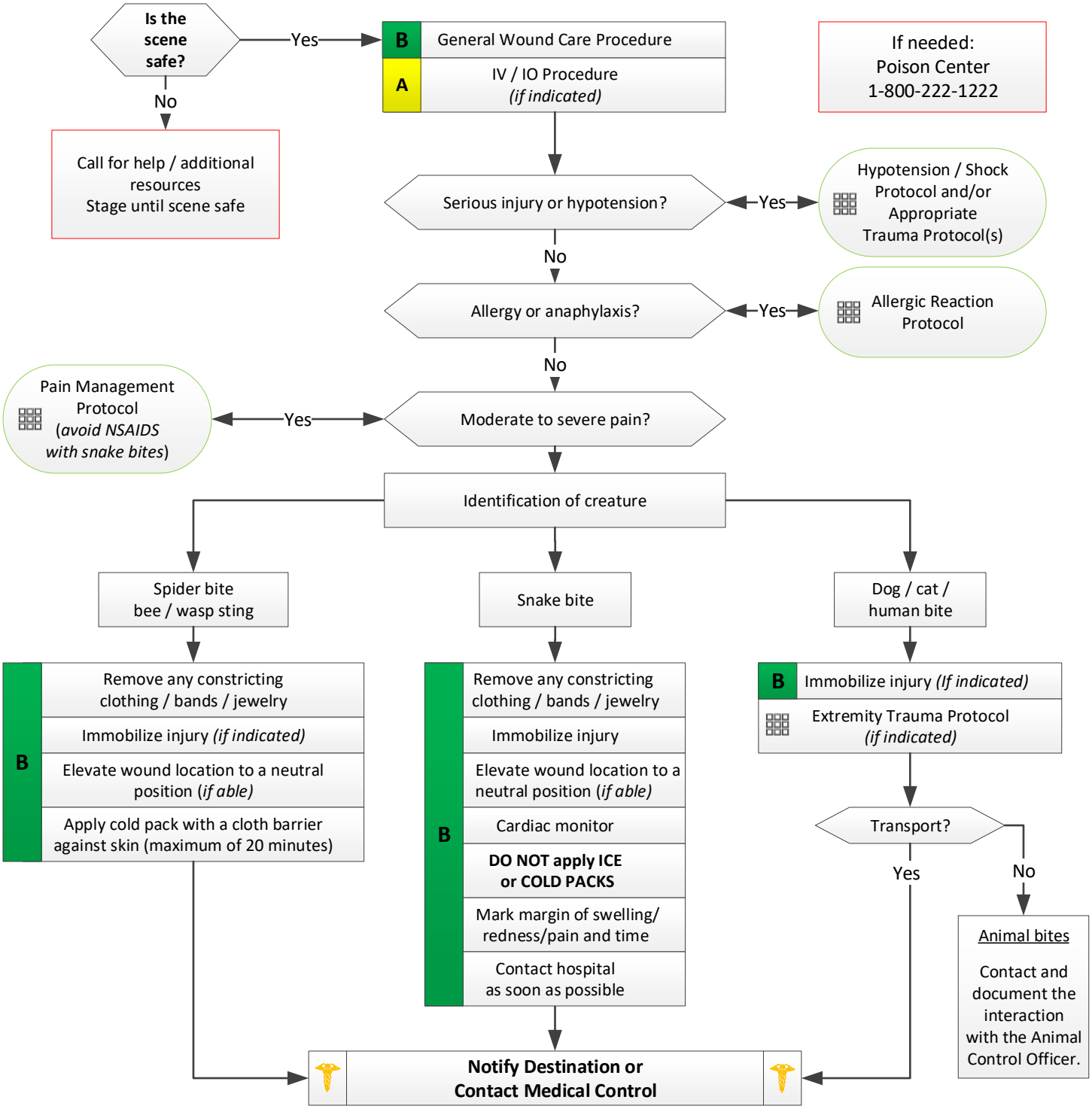
- **Recommended Exam: Mental status, extremity, neurological.**
- **Mass casualty incident or obvious life-threatening hemorrhage: Consider Tourniquet Procedure FIRST.**
- Peripheral neurovascular status is important. This information should relayed to the receiving facility and documented in the patient care report.
- Hip, knee, and elbow fractures/dislocations have a high incidence of vascular compromise.
- Emergent transport is indicated for any injury with vascular compromise and any amputation; time is particularly critical in these cases.
- Blood loss may be concealed or not apparent with extremity injuries. Monitor patient response, pain, and vital signs frequently.
- Lacerations should be evaluated for repair within 6 hours from the time of injury.
- Law enforcement and/or fire responders may have a tourniquet in place upon your arrival.
- Tourniquets are extremely painful. Address the patient's pain management needs as soon as safely feasible. Consider intranasal fentanyl if IV access is difficult or delayed.
- Tourniquets should not be loosened unless indicated by Medical Control.
- **It is vital to have the time of amputation and time the tourniquet was tightened relayed to the receiving hospital and documented in the PCR. If possible, document the time of tourniquet application on the tourniquet itself.**

Bites and Envenomations

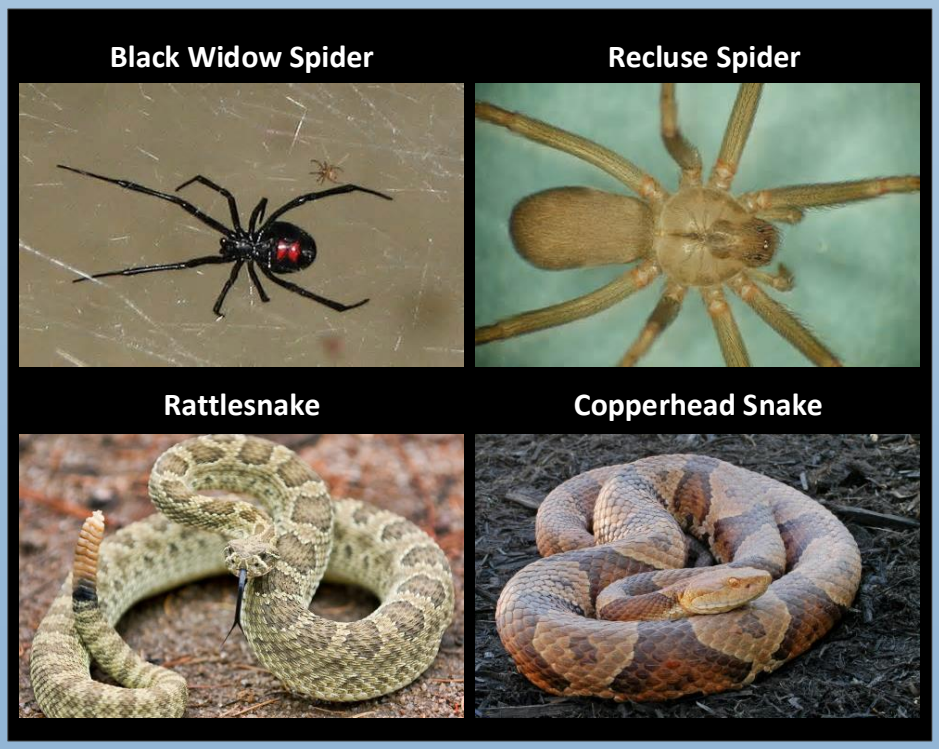
History
- Type of bite / sting
- Description or bring dead creature / photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic versus wild
- Tetanus and rabies risk
- Immunocompromised patient

Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk



Bites and Envenomations



Pearls:

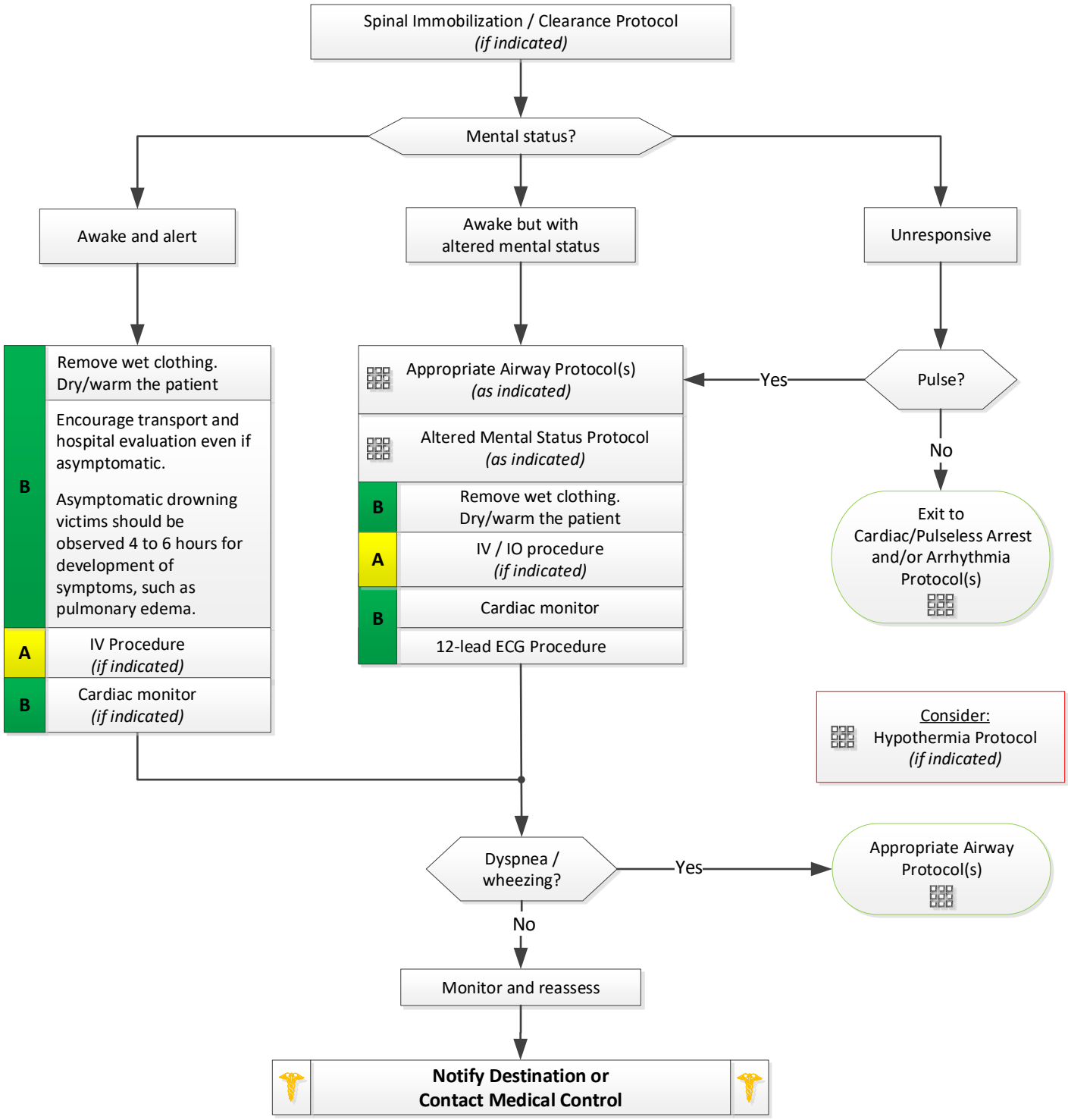
- **Recommended Exam: Mental status, skin, extremities (location of injury), and a complete neck, lung, heart, abdomen, back, and neurologic exam if systemic effects are noted.**
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria *(Pasteurella multicoda*).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead. Notify the emergency department early for anti-venom preparation.
- Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- If no pain or swelling is present, envenomation is unlikely. Up to 25% of snake bites are “dry” bites.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop. The spider is usually black with a red or orange hourglass on belly.
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days. It is a brown spider with fiddle shape on its back.
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Do not give NSAIDs for snake bites due to effect on platelet aggregation. Opiate medications are preferred.
- Immunocompromised patients are at an increased risk for infection: diabetics, chemotherapy patients, and transplant patients.
- Elevating wound to a neutral position: A neutral position is where the site of injury is level to the heart.

Drowning / Submersion Injury

History
- Submersion in water regardless of depth
- Possible history of trauma (example: diving board injury)
- Duration of immersion
- Temperature of water or possibility of hypothermia
- Degree of water contamination

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing, wheezing, rales, rhonchi, stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
  - Barotrauma
  - Decompression sickness
- Post-immersion syndrome



Drowning / Submersion Injury

Pearls:

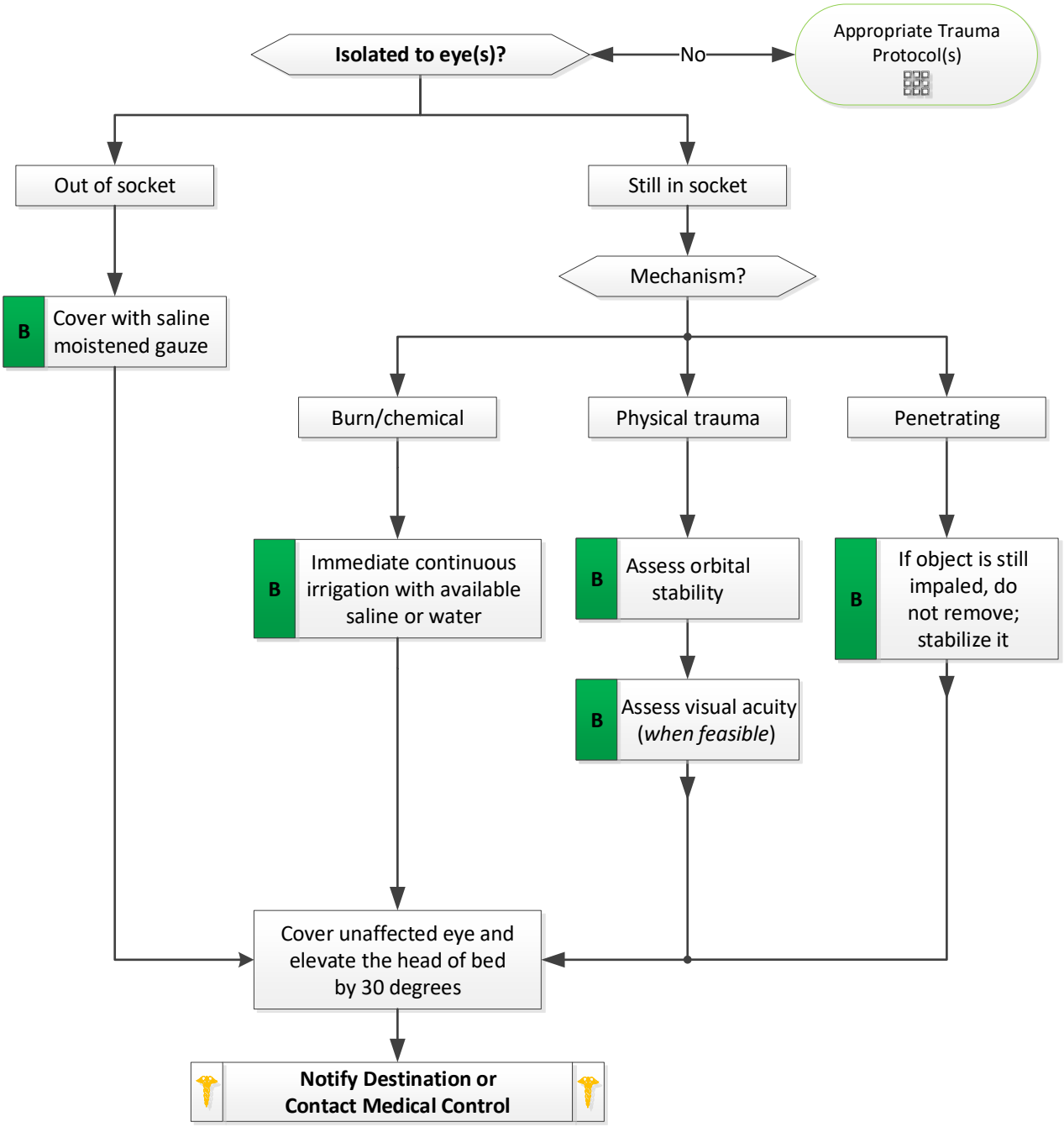
- **Recommended Exam: Trauma survey, head, neck, chest, abdomen, pelvis, back, extremities, skin, neurologic.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **Allow appropriately-trained and certified rescuers to remove victims from areas of danger whenever possible.**
- **Resuscitate all patients who have been submerged in cold water unless there are signs clearly incompatible with life.**
- Have a high index of suspicion for possible spinal injuries.
- Hypothermia is often associated with drowning and submersion injuries.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Post-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP.
- Pulmonary edema may develop minutes to hours from the submersion fluid's inflammation/irritation of the respiratory tract. Monitor the patient for signs/symptoms related to this condition. If transport is refused even after explanation of the risks, advise the patient of the symptoms that may develop and the need to call EMS immediately.

Eye Injury / Complaint

History:
- Time of injury/onset
- Blunt/penetrating/chemical
- Open versus closed injury
- Involved chemicals/MSDS
- Wound contamination
- Medical history
- Tetanus status
- Normal visual acuity
- Medications

Signs and Symptoms:
- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- "Shooting" or "streaking" light
- Visible contaminants
- Rust ring
- Lacrimation

Differential:
- Abrasion/laceration
- Globe rupture
- Retinal nerve damage/detachment
- Chemical/thermal burn/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion



Eye Injury / Complaint

Pearls:

- Normal visual acuity can be present even with severe eye injury.
- Remove contact lenses whenever possible.
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult.
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status.
- Always cover both eyes to prevent further injury and eye movement.
- Do not remove impaled objects.
- Suspected globe rupture or compartment syndrome requires emergent intervention.
- Only opiate-based analgesics should be used for pain management. Avoid the use of ketorolac or other NSAIDs due to their platelet-inhibiting properties.
- Do not allow the patient to vomit due to the increase in intraocular pressure. Consider ondansetron for nausea.

Adult Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and medications
- Other trauma
- Loss of consciousness
- Tetanus / Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

Differential
- Superficial (1st degree): Red - painful (don't include in TBSA)
- Partial thickness (2nd degree): Blistering
- Full thickness (3rd degree): Painless/charred or leathery skin
- Thermal injury
- Chemical – electrical injury
- Radiation injury
- Blast injury

Burn / concomitant injury severity?

Minor burn

< 5% TBSA of 2nd/3rd degree burn
No inhalation injury, not intubated, and is normotensive.
GCS of 14 or greater

B
- Remove rings, bracelets, and other constricting Items
- Dry clean sheet or dressings over burn

- Adult Airway Protocol(s) *(as indicated)*

A
- IV Procedure *(if indicated)*
- **Normal Saline**
  2 mL/kg (x % TBSA) by IV/IO
  Half over first 8 hours.
  (if indicated)

- Adult Pain Management Protocol *(if indicated)*

Transport to burn center

Severe burn

5 to 15% TBSA of 2nd/3rd degree burn
Suspected inhalation injury or requiring intubation for airway stabilization.
Hypotension or GCS of 13 or less

Critical burn

>15% TBSA of 2nd/3rd degree burn
Burns with multiple trauma.
Burns with definitive airway compromise

B
- Remove rings, bracelets, and other constricting items
- Dry clean sheet or dressings over burn

- Adult Airway Protocol(s) *(as indicated)*

A
- IV Procedure
  Consider 2 IV sites if greater than 15 % TBSA or if IV is unobtainable, one IO site *(if indicated)*
- **Normal Saline**
  2 mL/kg (x % TBSA) by IV/IO
  Half over first 8 hours.

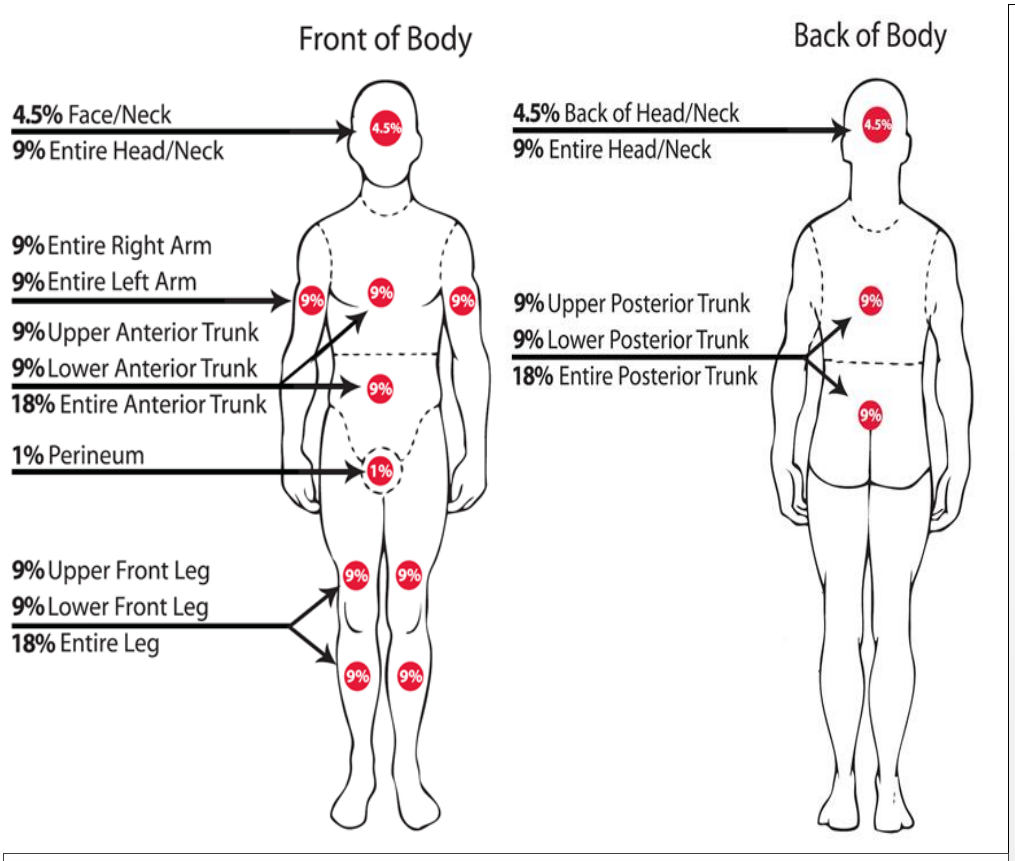
B
- Cardiac monitor

- Adult Pain Management Protocol

Emergent Transport to trauma center

Notify Destination or Contact Medical Control

Adult Burn



Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Rule of Nines:

- Seldom do you find a completely isolated body part injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burns from those of partial (2nd) or full (3rd) degree thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of a burn, include only partial and full thickness burns. Report the observation of other superficial (1st degree) burns, but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th, 5th, and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial, and full thickness burn at least at the level of emergent and primary care. For our work, all are included in full thickness burns.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Pearls:

- **Recommended Exam: Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, and neurologic.**
- **Critical or Serious Burns:**
  - **> 5 to 15% total body surface area (TBSA) of 2nd or 3rd degree burns, or**
  - **3rd degree burns > 5% TBSA for any age group, or**
  - **Circumferential burns of extremities, or**
  - **Electrical or lightning injuries, or**
  - **Suspicion of abuse or neglect, or**
  - **Inhalation injury, or**
  - **Chemical burns, or**
  - **Burns of face, hands, perineum, or feet**
- Serious and critical burns require direct transport to a burn center, which is University Medical Center for our service area.
- Burn patients are often trauma patients; evaluate for multisystem trauma.
- Assure that whatever has caused the burn is no longer contacting the injury. Stop the burning process!
- Early intubation is required when the patient experiences significant inhalation injuries; laryngoedema is likely to develop.
- Circumferential burns to the extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn; Must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- **Never administer IM injections to a burn patient.** Consider intranasal fentanyl for pain if IV access cannot be obtained.

Chemical Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history /medications
- Other trauma
- Loss of consciousness
- Tetanus / immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing / hypotension

Differential
- Superficial (1st degree): Red – painful. Don't include in TBSA.
- Partial thickness (2nd degree): Blistering.
- Full thickness (3rd degree): Painless/charred or leathery skin.
- Thermal injury
- Chemical or electrical injury
- Radiation injury
- Blast injury

Assure that the chemical source is NOT a hazard to responders. Will the chemical "gas off" from the patient's skin or breath?

Remove clothing. Burn/concomitant injury severity?

Minor burn

< 5% TBSA of 2nd/3rd degree burn
No inhalation injury, not intubated, and is normotensive.
GCS of 14 or greater

Severe burn

5 to 15% TBSA of 2nd/3rd degree burn
Suspected inhalation injury or requiring intubation for airway stabilization.
Hypotension or GCS of 13 or less.
Transport to a burn center.

Critical burn

>15% TBSA of 2nd/3rd degree burn
Burns with multiple trauma.
Burns with definitive airway compromise.
Transport to a burn center.

B Cardiac monitor

A IV/IO Procedure, *if indicated*

Normal Saline *(if indicated)*
2 mL/kg (x % TBSA) by IV/IO
Half over first 8 hours

Hydrofluoric Acid

Dry brush off powder then flush with water for 15 minutes.

Eye involvement? — Yes → **B** Irrigate involved eye(s) with normal saline for 15 minutes. May repeat as needed

B Identify contact points and flush area with sterile saline for 15 minutes

Cardiac dysrhythmias? — Yes → Appropriate cardiac protocol

Pain? — Yes → Pain Management protocol

Notify Destination or Contact Medical Control

Pearls:

- **Recommended Exam: Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, and neurologic.**
- **Chemical Burns:** Normal saline or sterile water is preferred. However, if sterile fluids are not available, do not delay irrigation with concerns about using tap water. Other water sources may also be used based on availability. Flush the area as soon as possible with the cleanest readily-available water or saline solution using copious amounts of fluids.

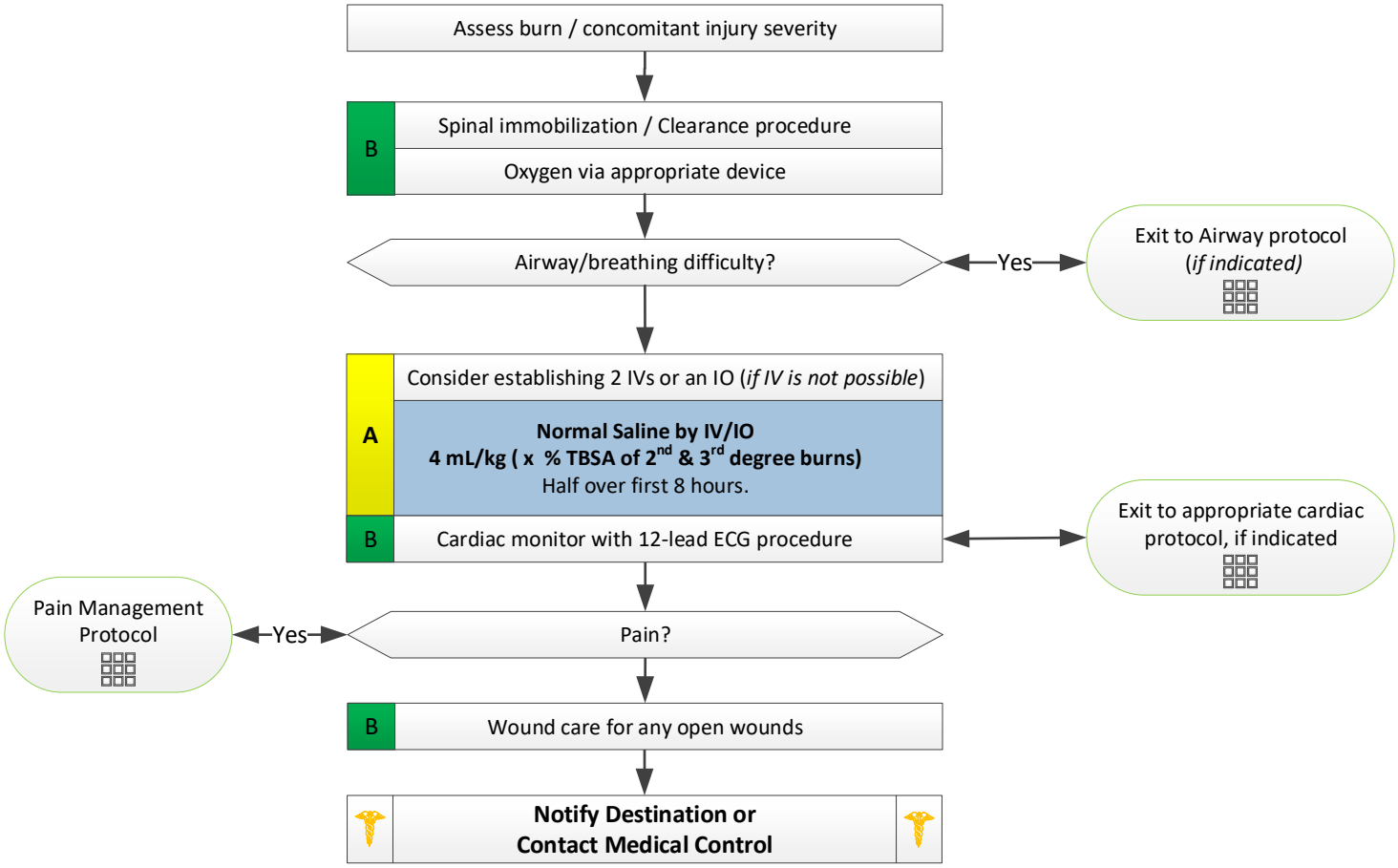
Electrical Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history /medications
- Other trauma
- Loss of consciousness
- Tetanus / Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing / Hypotension

Differential
- Superficial (1st degree): Red - painful (don't include in TBSA)
- Partial thickness (2nd degree): blistering
- Full thickness (3rd degree): painless/charred or leathery skin
- Thermal injury
- Chemical – electrical injury
- Radiation injury
- Blast injury

Assure that the electrical source is NO longer in contact with patient before touching patient.



Pearls:

- **Recommended Exam: Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, and neurologic.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source does not always reflect the more extensive and unseen internal damage.**
- **Electrical Burns:**

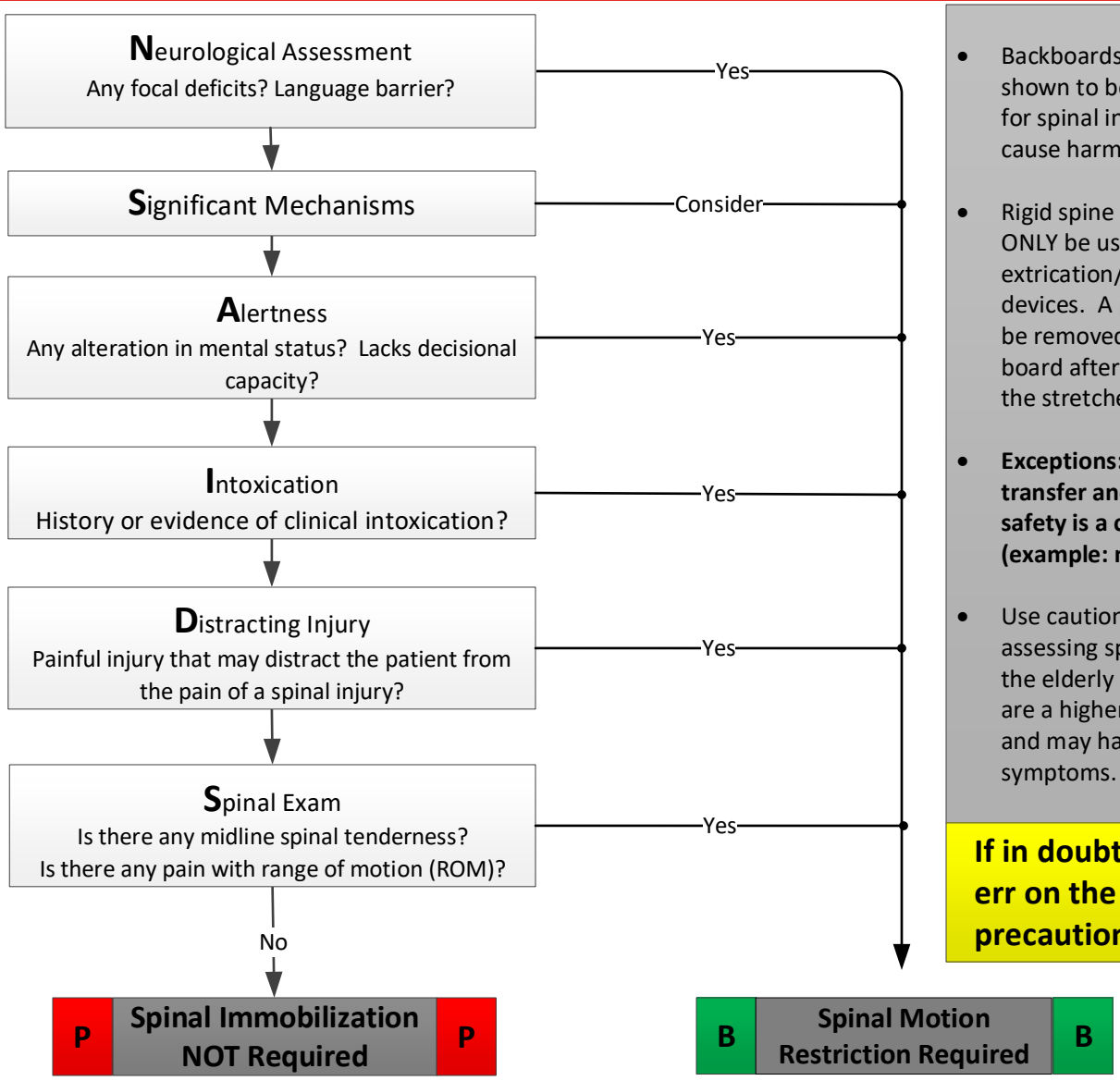
  DO NOT contact the patient until you are certain the source of the electrical shock has been disconnected.

  Attempt to locate contact points (generally there will be two or more), which includes the point where the patient contacted the source and a point(s) where the patient was grounded. Sites will generally be full thickness burns. **Do not refer to any burn as an entry / exit site.**

  Cardiac monitor is required: Anticipate ventricular or atrial irregularity including ventricular tachycardia, ventricular fibrillation, atrial fibrillation and/or heart blocks. Follow the appropriate protocol with emphasis on early defibrillation, where indicated.

  Attempt to identify the nature of the electrical source (AC / DC,) the voltage, and the amount of current (amperage) the patient may have been exposed to during the electrical shock.

Spinal Immobilization Clearance



- Backboards have not been shown to be any benefit for spinal injuries, but may cause harm.
- Rigid spine boards should ONLY be used as extrication/ transfer devices. A patient should be removed from the board after transition to the stretcher.
- **Exceptions: When ease of transfer and/or patient safety is a concern (example: morbid obesity)**
- Use caution when assessing spinal injuries in the elderly patient. They are a higher risk patient and may have only minimal symptoms.

If in doubt, ALWAYS err on the side of precautions.

Pearls:

- The acronym "**NSAIDS**" should be used to remember the steps in this protocol:

  "**N**" - Neuro Exam: Look for focal deficits such as tingling, reduced strength, or numbness. Verify you and the patient speak the same language.

  "**S**" - Significant Mechanisms: Use your judgment; Studies have shown that mechanism alone should NOT dictate the need for immobilization.

  "**A**" - Alertness: Is the patient oriented to person, place, time, and situation? Do they meet the age criteria?

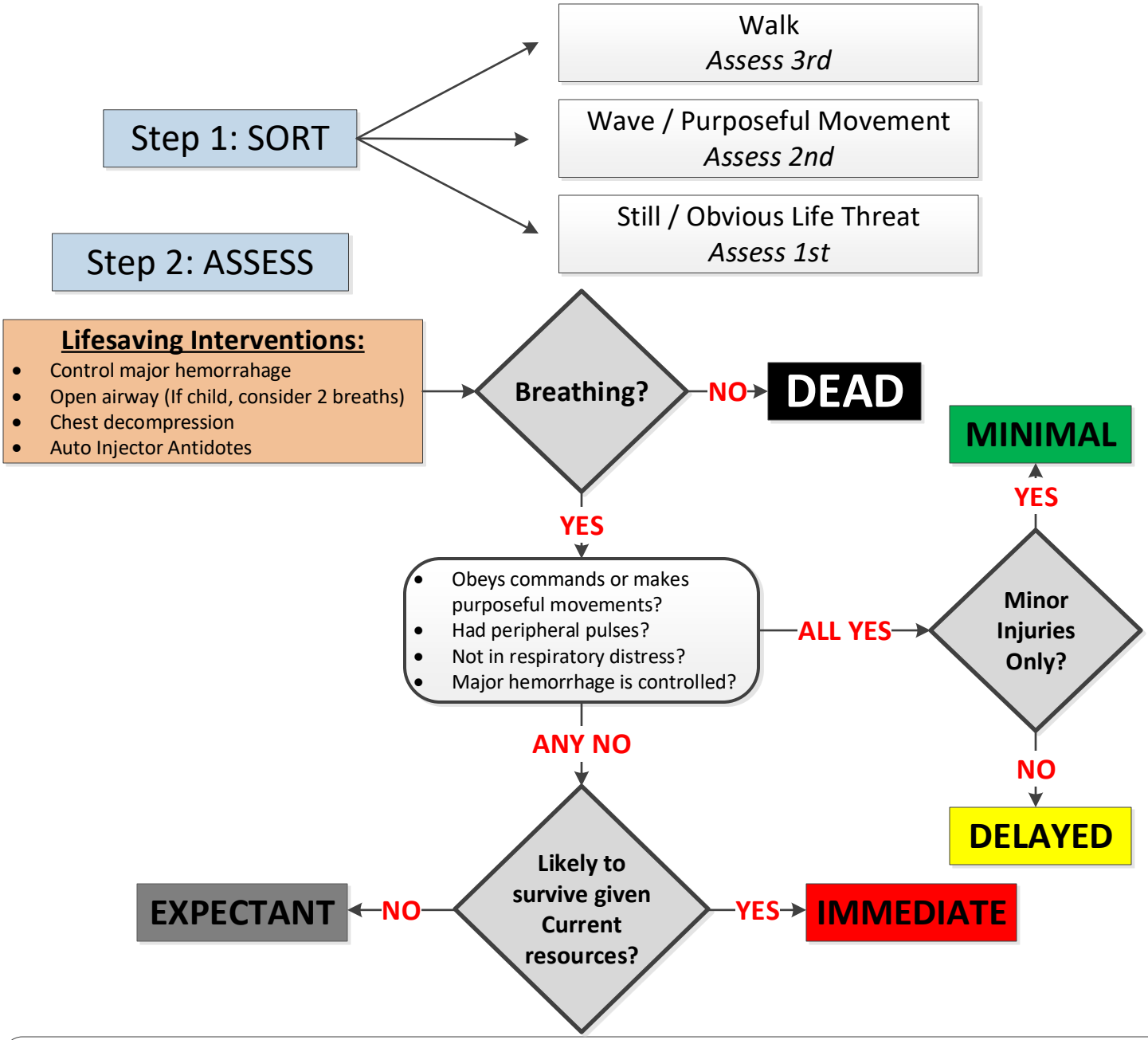
  "**I**" - Intoxication: Are there any indications the person is intoxicated or under the influence (illicit or legal drugs, alcohol, etc.)?

  "**D**" - Distracting Injury: Is there any other part of the body causing enough pain to where the patient may not realize his or her spine is hurting?

  "**S**" - Spinal Exam: Check for point tenderness along the spinous process of the entire spine; also check for painful range of motion. Log rolling the patient to assess is appropriate with someone maintaining manual C-spine stabilization until cleared.

- **Range of motion should NOT be assessed if the patient has pain or tenderness to ANY area of the spine.**
- Range of motion: Patient should **slowly** touch his or her chin to the chest, extend the neck (look up), and turn the head from side to side without midline spinal pain. Immediately stop the range of motion assessment and provide cervical stabilization/immobilization if any pain is reported.
- Once a cervical collar has been placed, it MUST ONLY BE REMOVED by a physician. However, a paramedic may choose to remove the backboard from the patient with spinal precautions taken (logroll or lift on sheet with multiple responders).
- An EMT-B or AEMT may use precautions based on this protocol, however, if they feel that spinal immobilization is NOT required, they **must maintain manual stabilization until an EMT-P has arrived**. ONLY an EMT-P may make the decision to not use spinal precautions.
- Always inform the patient with spinal motion restrictions to remain still on the cot.

SALT Triage



Pearls

When approaching a multiple casualty incident where resources are limited:

Triage decisions must be made rapidly with less time to gather information

Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.

Scene Size Up:

1. Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMD or CO poisoning.

2. Utilize Triage system if available

3. Determine number of patients. Communicate the number of patients and nature of the incident, establish unified command and establish a medical officer, triage officer, and transport officer if personnel are available to perform these functions

Triage is a continual process and should recur in each section as resources allow

Pediatric Pulseless Arrest

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of congenital heart defect
- Possibility of foreign body
- Hypothermia

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Respiratory failure: Foreign body, secretions, infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (glucose, potassium)
- Acidosis

Criteria for Death / No Resuscitation? DNR available and signed?

Yes →
- **Decomposition**
- **Rigor mortis**
- **Dependent lividity**
- **Injury incompatible with life**

Do not begin resuscitation if any one of these criteria have been met. If CPR has already begun, you may terminate CPR efforts.

Follow the Criteria for Death/ Withholding Resuscitation policy

No ↓

Cold exposure patients

See Pearls for medication and defibrillation guidelines

Patient has reached puberty?

Yes → Exit to Adult Cardiac Arrest protocol

No ↓

B — **Begin continuous CPR compressions using ResQPUMP at 80 BPM**
If ResQPUMP unavailible –
Push hard (1.5 inches in infants or 2 inches in children)
and push fast (110 per min)
Change compressors every 2 minutes
(*Limit changes / pulse checks ≤ 5 seconds*)

AED Procedure, if available

→ **Early airway intervention. Refer to the Pediatric Airway protocol**

ALS available?

No →

B Call for ALS

Place AED. Shockable rhythm?

No →

B Continue CPR for 2 minutes. AED analysis. Repeat and reassess

Yes →

B **Clear patient and deliver shock**
Continue CPR for 2 minutes. AED analysis. Repeat and reassess

Yes →

B Cardiac monitor

Shockable rhythm?

No → Follow Pediatric Asystole / PEA protocol and Pediatric Airway Protocol

Yes → Follow Pediatric VF / VT protocol and Pediatric Airway Protocol

Notify Destination or Contact Medical Control

AT ANY TIME

Return of spontaneous circulation (ROSC)

Go to the Pediatric Post Resuscitation protocol

Pediatric Pulseless Arrest

Pearls:

- **Recommended Exam: Mental Status, heart, skin, respiratory, neurologic.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early airway management and defibrillation (when indicated). Consider early IO placement if available and / or difficult IV access is anticipated.**
- **DO NOT HYPERVENTILATE. If an advanced airway is in place, ventilate at a rate of 8 to 10 breaths per minute with continuous, uninterrupted compressions.**
- **Puberty: Defined by the American Heart Association as presence of underarm hair (males) or breast development (females) for resuscitation purposes.**
- **Do not interrupt compressions to place an endotracheal tube.**
- **Airway is a priority intervention in pediatric arrests. Consider using BIAD on all arrest intubations to limit interruptions in compressions and increase patient survival with proper oxygenation and ventilation.**
- **In order to be successful in pediatric arrests, a cause must be identified and corrected whenever possible.**
- **Defibrillation: Chest compressions must be continued while the monitor is charging, stopping just before delivery of the shock. Resume chest compressions immediately after defibrillation.**
- **Cold exposure/systemic hypothermia patients:**

  Severe hypothermia: If core temperature is less than 86°F, only one defibrillation attempt may be made and the only medication that may be administered is 1 mg of epinephrine 0.1mg/ml (1:10,000) IVP/IO. No repeat doses.

  Moderately hypothermic: If the core temperature is between 86 to 93.2°F, the protocol may be followed as indicated, but there should be longer intervals between repeated doses of medications.

  Refer to the Hypothermia/Frostbite protocol concurrently with other appropriate cardiac protocols. Remember that hypothermia may also occur during the hottest months of the year (for example, a near-drowning in a swimming pool).

- Resuscitation is based on proper planning and organized execution. Procedures require space and patient access; make room to work. Use the Team Focused Approach by assigning responders to predetermined tasks.
- Reassess, document endotracheal tube placement, and monitor $EtCO_2$ frequently. This also needs to be done after every patient move and upon transfer of care.

Pediatric Asystole / PEA

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse; shaken baby syndrome, pattern of injuries
- SIDS

Signs and Symptoms
- Unresponsive
- Cardiac arrest
- Signs of lividity or rigor

Differential
- Respiratory failure
- Foreign body
- Hyperkalemia
- Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Pediatric Pulseless Arrest Protocol
(Review criteria for death/no resuscitation/review DNR, if present)
Maintain continuous chest compressions.

Shockable Rhythm?
- Yes → Follow Rhythm Appropriate Protocol
- No ↓

B	Search for potential causes →
A	IV/IO Procedure
P	**Epinephrine 0.1mg/ml (1:10,000) 0.01 mg/kg to a maximum of 1 mg IV / IO per dose.** Repeat every 5 minutes

B	**Continuous CPR compressions** Push hard (1.5 inches for infants or 2 inches for children) and push fast (110 per minute). Change compressors every 2 minutes (*Limit changes / pulse checks ≤ 5 seconds*)

B	Blood Glucose Analysis Procedure
P	**Consider: Dopamine 2 to 20 mcg/kg/min by IV/IO**
	Consider: Chest Decompression – Needle Procedure

↔ Pediatric Diabetic Protocol if BGL ≤ 70 mg/dL

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Consider Early for Suspected:

- **Hypovolemia**: Repeated normal saline boluses at 20 mL/kg to a maximum of 60 mL/kg.
- **Hypoglycemia**: Obtain BGL. Dextrose IV/IO (diabetic protocol).
- **Opiate overdose**: Naloxone IV/IO/ IN at 0.1 mg/kg to a maximum of 2 mg.
- **Hyperkalemia, TCA, or sodium channel blocker overdose**: Sodium bicarbonate 1 mEq/kg to a maximum of 50 mEq IV/IO. Do not administer in same IV line with dopamine.
- **Distributive shock**: Dopamine 2 to 20 mcg/kg/min.
- **Hyperkalemia or calcium channel blocker overdose**: Calcium chloride 20 mg/kg to a maximum of 1 gram.
- **Chest trauma or suspected pneumothorax**: Chest decompression
- **Organized PEA with rate < 60 bpm**: Atropine 0.02 mg/kg. Minimum of 0.1 mg and maximum of 0.5 mg per dose.

Potential Causes:

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / **H**yperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Pediatric Asystole / PEA

Pearls:

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, which in infants is usually 1.5 inches and in children 2 inches. Consider early IO placement if difficult IV access is anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 to 10 breaths per minute with continuous, uninterrupted compressions when an advanced airway is in place.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- If no IV / IO access: May use **epinephrine 1mg/ml (1:1000) at 0.1 mg/kg (0.1 mL/kg)** via endotracheal tube. **Maximum: 10 mg.**
- Airway is a more important intervention in pediatric arrests. Patient survival is often dependent on proper ventilation and oxygenation.
- In order to be successful in pediatric arrests, a cause needs to be identified and corrected, if possible.
- Respiratory arrest is a common cause of cardiac arrest in pediatrics. Unlike adults, early ventilation intervention is critical.
- In most cases, pediatric airways can be managed by basic interventions and/or a BVM.
- Reassess and document endotracheal tube placement and $EtCO_2$ frequently, after every move, and at transfer of care.

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

Signs and Symptoms
- Unresponsive
- Cardiac arrest

Differential
- Respiratory failure / airway obstruction
- Hyper / hypokalemia
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Acidosis
- Tension pneumothorax
- Tamponade
- Toxin or medication
- Thrombosis: Coronary / pulmonary embolism
- Congenital heart disease

Pediatric Pulseless Arrest Protocol

P — **Defibrillation - Manual Procedure at 2 Joules/kg.**

B — **Begin continuous CPR compressions**
Push hard (1.5 inches for infants and 2 inches in children).
Push fast (110 compressions per minute).
Change compressors every 2 minutes
(*Limit changes / pulses checks to ≤ 5 seconds*)

A — IV / IO Procedure

P — **Epinephrine 0.1mg/ml (1:10,000) 0.01 mg/kg by IV / IO**
Maximum of 1 mg each dose. Repeat 5 minutes

Defibrillation - Manual Procedure at 4 Joules/kg

B — **Resume continuous CPR compressions**
Push hard (1.5 inches for infants and 2 inches in children).
Push fast (110 compressions per minute).
Change compressors every 2 minutes
(*Limit changes / pulses checks to ≤ 5 seconds*)

P — **Amiodarone 5 mg/kg IV/IO with a maximum initial dose of 300 mg.**
Repeat at 5 mg/kg to a maximum of 150 mg every 5 minutes.
Maximum total dose is 15 mg/kg or 450 mg (whichever is reached first)

Defibrillation - Manual Procedure at 4 Joules/kg

Continue CPR and administer anti-arrhythmics / epinephrine during compressions.

Continue CPR up to point where you are ready to defibrillate with the device charged.

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

For persistent VF / VT:

Third defibrillation: Increase to 6 Joules/kg.

After the fourth defibrillation, increase energy to a maximum of **10 Joules/kg, not to exceed 360 J.**

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls:

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, which in infants is usually 1.5 inches and in children 2 inches. Consider early IO placement if difficult IV access is anticipated.**
- **DO NOT HYPERVENTILATE: Ventilate 8 to 10 breaths per minute with continuous, uninterrupted compressions when an advanced airway is in place.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- If no IV / IO access: May use **epinephrine 1mg/ml (1:1000) at 0.1 mg/kg (0.1 mL/kg)** via endotracheal tube. **Maximum: 10 mg.**
- Airway is a more important intervention in pediatric arrests. Patient survival is often dependent on proper ventilation and oxygenation.
- In order to be successful in pediatric arrests, a cause needs to be identified and corrected, if possible.
- Respiratory arrest is a common cause of cardiac arrest in pediatrics. Unlike adults, early ventilation intervention is critical.
- In most cases, pediatric airways can be managed by basic interventions and/or a BVM.
- Reassess and document endotracheal tube placement and $EtCO_2$ frequently, after every move, and at transfer of care.

Pediatric Post Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of pulse

Differential
- Continue to address specific differentials associated with the original dysrhythmia

Ensure ITD is removed once ROSC is obtained.

B — **Repeat Primary Assessment**

Optimize ventilation and oxygenation
- Advanced airway, if indicated
- Goal SpO_2: 94% or better with $ETCO_2$ of 35 to 45 mmHg
- Ventilatory rate of 8 to 10 breaths per minute

DO NOT HYPERVENTILATE

Obtain and monitor vital signs / reassess patient

A — IV Procedure *(if not already done)*

B — Cardiac monitor *(if not already done)*

B — 12-lead ECG Procedure

Hypotension: Age-based

0 to 28 days old:
Systolic BP < 60 mmHg

1 month to 1 year old:
Systolic BP < 70 mmHg

1 to 10 years old:
Systolic BP < 70 + (2 x age)

11 years and older:
Systolic BP < 90 mmHg

Hypotension (age-based)? — Yes →

A — **Normal saline bolus 20 mL/kg by IV/IO**
May repeat to a total of **60 mL/kg** if lungs remain clear

P — **Dopamine 2 to 20 mcg/kg/min by IV/IO**
Titrate dopamine to age appropriate blood pressure

No ↓

Blood glucose is ≤ 70 or ≥ 400 mg/dL? — Yes → Pediatric Diabetic Protocol

No ↓

Symptomatic bradycardia? — Yes → Pediatric Bradycardia Protocol

No ↓

Symptomatic tachycardia? — Yes → Pediatric Tachycardia Protocol

Arrhythmias are common and usually self limiting after ROSC.

If arrhythmia persists, follow the rhythm appropriate protocol.

P — Consider sedation with midazolam, but <u>only</u> with a definitive airway in place

Midazolam 0.1 to 0.2 mg/kg by IV/IO/IN (maximum of 5 mg)
Systolic blood pressure must be above age-based hypotension.
May repeat once in 3 to 5 minutes (if needed) and blood pressure remains adequate.

<u>And / Or</u>

Fentanyl 2 mcg/kg IV/IO/IN to maximum of 100 mcg per dose.
No blood pressure requirements.
May repeat dose every 5 minutes as needed to a **maximum total of 6 mcg/kg**

Notify Destination or Contact Medical Control

Pediatric Bradycardia

History
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

Differential
- Respiratory failure:
  - Foreign body
  - Secretions
  - Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Is the bradycardia causing hypotension, altered mental status, poor perfusion, and/or shock?

Yes → Airway patent? Oxygenation / ventilation adequate?

No → Observe/monitor patient. Exit to appropriate protocol

Airway patent? Oxygenation / ventilation adequate?

No → Pediatric Airway Protocol(s)

Yes →

Attempt to identify underlying cause

B	Blood Glucose Analysis Procedure
A	IV / IO procedure
B	Cardiac monitor

Blood Glucose Analysis Procedure ↔ Pediatric Diabetic Protocol if the blood glucose measurement is ≤ 70 mg/dL

Continued poor perfusion/shock despite oxygenation and heart rate remains less than 60 bpm?

Yes → Perform CPR. Exit to Pediatric Pulseless Arrest Protocol

No →

Persistent symptomatic bradycardia?

No → Continue to monitor, oxygenate, and provide supportive therapy

Yes →

A	**Normal Saline Bolus of 20 mL/kg by IV/IO** Repeat as needed up to a total of 60 mL/kg
P	**Epinephrine 0.1mg/ml (1:10,000) 0.01 mg/kg by IV/IO** **Maximum of 1 mg per dose** Repeat every 3 to 5 minutes as needed.
	If suspected increased vagal tone: **Atropine 0.02 mg kg by IV/IO** **Minimum of 0.1 mg and maximum of 1 mg per dose** May repeat once in 5 minutes at same dose.
	Consider Cardiac Pacing Procedure ▫ Neonate to 1 year old: Pace at 100 bpm ▫ 1 year old to 8 years old: Pace at 80 bpm ▫ 8 years old and older: Pace at 60 bpm

Transcutaneous Pacing

Consider sedation with midazolam, but only with a definitive airway in place. Otherwise, use fentanyl.

Midazolam 0.1 to 0.2 mg/kg by IV/IO/IN to a maximum of 5 mg per dose.

Systolic blood pressure must be above age-based hypotension.

If needed, may repeat once in 10 minutes (same dose) if BP remains adequate.

And / Or

Fentanyl 2 mcg/kg by IV/IO/IN to a maximum of 100 mcg per dose.

No blood pressure minimum.

May repeat 2 mcg/kg every 10 minutes as needed to a **maximum total of 6 mcg/kg.**

Suspected beta-blocker, opiate, or calcium channel blocker overdose?

Follow Pediatric Overdose/Toxic Ingestion Protocol

Notify Destination or Contact Medical Control

Pediatric Bradycardia

Pearls:

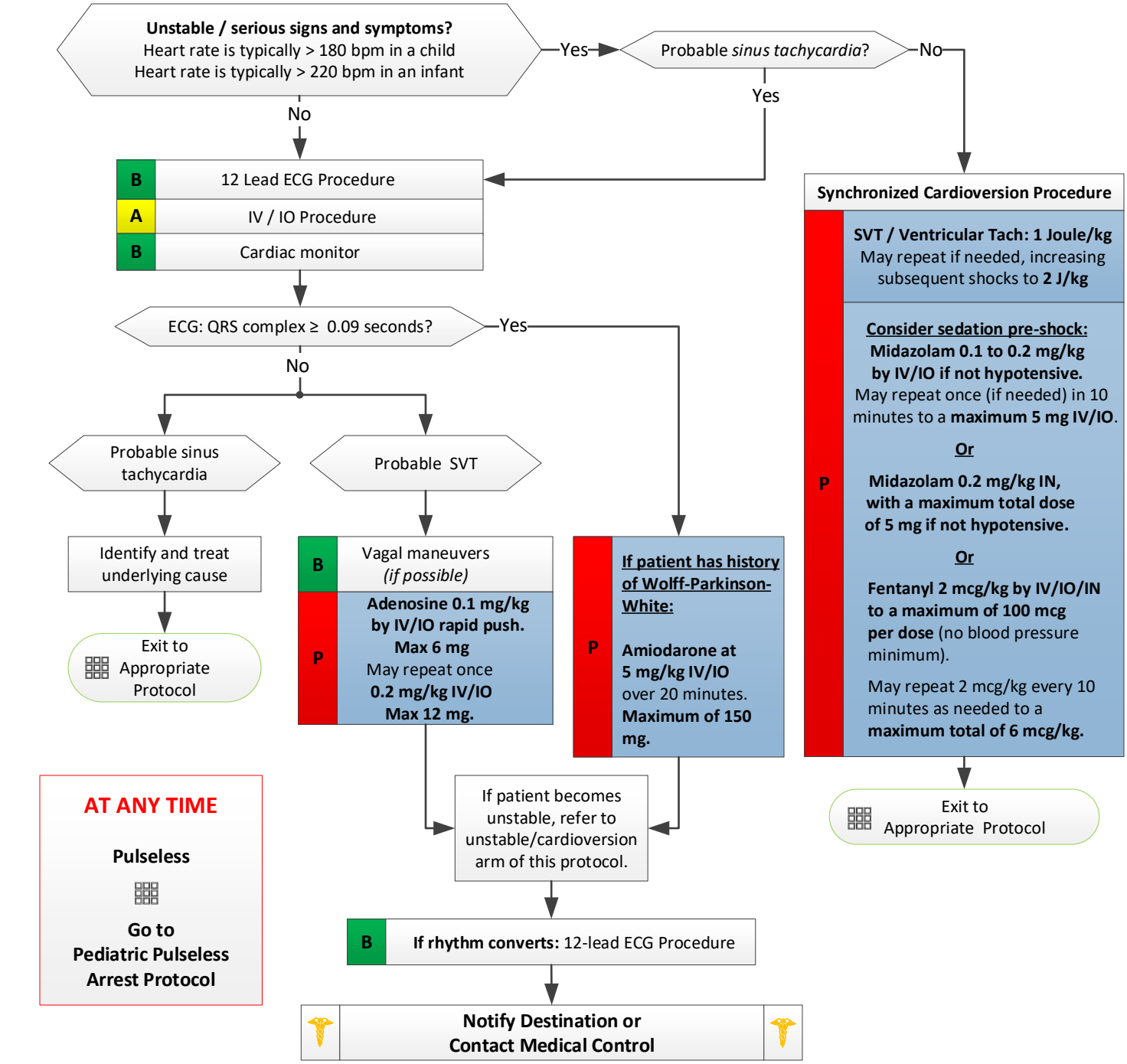
- **Recommended Exam: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neurologic.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **The majority of pediatric arrests and bradycardia are due to airway problems.**
- **Most maternal medications pass through breast milk to the infant.**
- **Hypoglycemia, severe dehydration, and narcotic effects may produce bradycardia.**
- Pediatric patients needing transcutaneous pacing should have pads appropriate for pediatric patients, when available. If unavailable, use adult pacing pads but make sure the edges of the pads do not overlap or contact each other.
- The minimum atropine dose for any patient is 0.1 mg due to paradoxical effects at extremely low doses.
- Transcutaneous pacing should be considered early in bradycardic patients with shock.

Pediatric Tachycardia

History
- Past medical history
- Medications or toxic ingestion: (aminophylline, diet pills, thyroid supplements, decongestants, digoxin)
- Drugs (nicotine, cocaine)
- Congenital heart disease
- Respiratory distress
- Syncope or near-syncope

Signs and Symptoms
- Heart Rate: Child > 180 bpm for SVT; Infant > 220 bpm for SVT
- Pale or cyanosic
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered level of consciousness
- Pulmonary congestion
- Syncope

Differential
- Heart disease (congenital)
- Hypo / hyperthermia
- Hypovolemia or anemia
- Electrolyte imbalance
- Anxiety / pain / emotional stress
- Fever / infection / sepsis
- Hypoxia
- Hypoglycemia
- Medication / toxin / drugs (see history)
- Pulmonary embolus
- Trauma
- Tension pneumothorax



Pediatric Cardiac Section Protocols

Pediatric Tachycardia

Pearls:

- **Recommended Exam: Mental status, skin, neck, lung, heart, abdomen, back, extremities, neurologic.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **Serious signs and symptoms:**
  - **Respiratory distress / failure**
  - **Signs of shock / poor perfusion with or without hypotension**
  - **Altered mental status**
  - **Sudden collapse with rapid, weak pulse**
- **Narrow complex tachycardia (< 0.09 seconds):**
  - **Sinus tachycardia**: P waves present. Infants are usually < 220 beats per minute and children are usually < 180 beats per minute. Fever, pain, agitation, and illness are common causes.
  - **SVT**: Greater than 90% of children with SVT will have a narrow QRS (<0.09 seconds) complex. P waves are absent or abnormal. R-R waves are not variable, and PSVT is usually an abrupt onset. Infants are typically > 220 beats per minute while children are usually > 180 beats per minute.
  - **Atrial flutter / fibrillation**: Irregular R to R variations with atrial fibrillation (irregularly-irregular). Atrial flutter may have "sawtooth-appearing" waves in front of the QRS complex, which may or may not be variable depending on the conduction ratio of flutter waves to QRS complexes (2:1, 3:1, 4:1, etc.).
- **Wide complex tachycardia (≥ 0.09 seconds):**
  - **SVT with aberrancy**. May have a history of Wolff-Parkinson-White syndrome or other abnormal conduction pathway.
  - **Ventricular tachycardia (VT)**: Uncommon in children. Rates may vary from near normal to over 200 beats per minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
- **Torsades de Pointes / polymorphic (multi-shaped) tachycardia:**
  - Rate is typically 150 to 250 beats per minute.
  - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, and many cardiac drugs.
  - May quickly deteriorate to ventricular tachycardia.
- **Vagal Maneuvers:**
  - Breath holding, blowing a glove into a balloon, or having the child blow out "birthday candles" through an obstructed straw.
  - Infants: May put a bag of ice water/cold pack over the upper half of the face while being careful to not occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Monitor for respiratory depression and hypotension if midazolam is used.
- Continuous pulse oximetry is required for all SVT patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum rate for *sinus tachycardia* can be calculated by subtracting the patient's age in years from 220.

Pediatric LVAD

History

- End-stage heart failure
- Patient has a surgically-implanted pump that assists the action of one or both ventricles.
- Patient may or may not be on a list for cardiac transplantation.

Signs and Symptoms

- The flow through many of these devices is not pulsatile, therefore THE PATIENT MAY NOT HAVE A PULSE AT BASELINE. For this reason pulse oximetry readings may also be inaccurate.
- Altered mental status may be the only indicator of a problem.
- Consider both LVAD-related and non-LVAD-related problems.

Differential

- Stroke
- Cardiac arrest
- Dysrhythmia different from patient's baseline
- Infection
- Bleeding (VAD patients are anti-coagulated)
- Dehydration
- Cardiac tamponade
- Device problem such as low battery or disconnected cable

B

Auscultate the left upper abdominal quadrant.
If there is a humming sound, the pump is functioning.

Oxygen via mask and monitor $ETCO_2$ with nasal capnography sensor.

If the LVAD pump is not functioning, refer to the caregiver and operation book.

Notify the LVAD coordinator

Is the patient conscious?

Yes

A IV / IO procedure with 20 mL/kg normal saline bolus *(if indicated)*

B

Supportive care

Cardiac monitor and 12-lead ECG

$ETCO_2$ with nasal waveform capnography sensor

Blood glucose analysis
Treat if BGL ≤ 70 or ≥ 400 mg/dl.
Refer to the Pediatric Diabetic protocol

P

Pain management:
Fentanyl 2 mcg/kg by IV/IO/IM/IN
Maximum of 100 mcg per dose, which may be repeated every 10 minutes to a total maximum of 6 mcg/kg.

Respiratory (if wheezing is present):
DuoNeb HHN. EMT-B may assist.
Maximum of one dose.

Chest pain:
Fluid bolus only.

Nausea:
Ondansetron (Zofran) 0.15 mg/kg to a maximum of 4 mg SIVP/IM in patients older than 3 months.

SVT (heart rate > 220 bpm in infants or > 180 bpm in children):
Adenosine 0.1 mg/kg to a maximum of 12 mg RIVP. May repeat once.
Do not administer amiodarone or diltiazem.

Other chief complaints:
See Pearls. Consult with Medical Control, if needed.

No

A IV / IO procedure with 20 mL/kg normal saline bolus

B

Cardiac monitor and 12-lead ECG

$ETCO_2$ with nasal capnography sensor

Blood Glucose Analysis Procedure
Treat if BGL ≤ 70 or ≥ 400 mg/dl.
Refer to Pediatric Diabetic protocol.

Respirations ≥ 8?

Yes

P

Follow protocols as indicated. **Any medications that reduce cardiac preload, vasoconstrict, vasodilate, or otherwise will cause a drop in systolic blood pressure must be avoided in the non-cardiac arrest patient.** See Pearls and consult with Medical Control, if needed.

Initiate emergent transport with early ED notification.

No

A

Narcan 0.1 mg/kg to maximum of 2 mg IV/IO/IN
Consider 0.2 mg increment doses for chronic pain patients.

P

If no response to Narcan:

Confirm ECG as V-tach, V-fib, or asystole. If one of these rhythms is present, initiate the Pediatric Pulseless Arrest protocol and begin CPR. Limit compression depth to protocol specifications to prevent LVAD dislodgement.

Do **not** initiate CPR for all other cardiac rhythms. Continue ventilations, consider intubation with PAI, and emergent transport with early ED notification.

Notify Destination or Contact Medical Control

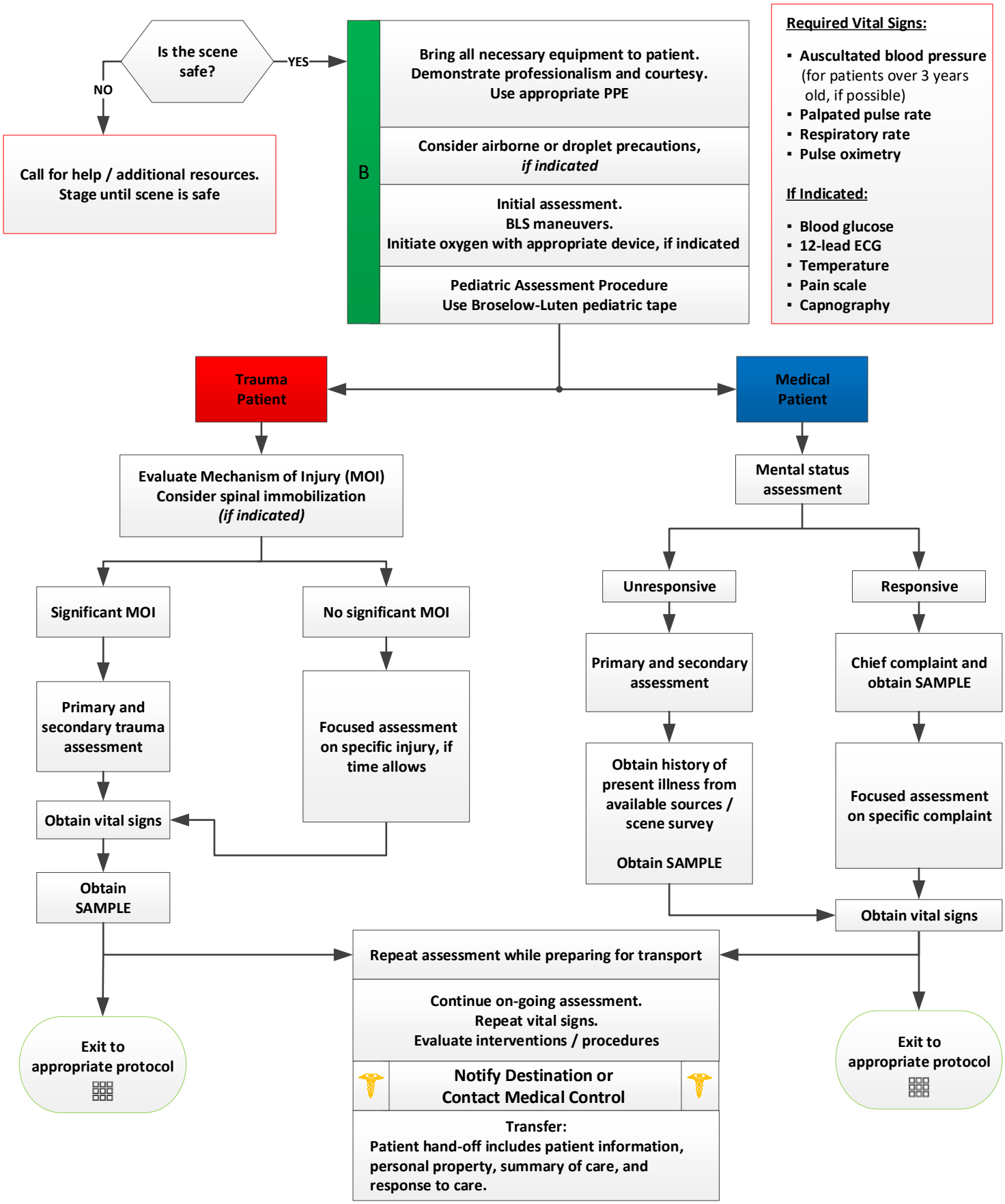
Pediatric LVAD

Prehospital Medications to Avoid with Ventricular Assist Device (VAD) Patients	
Anti-arrhythmics - May be used only if patient is in cardiac arrest	
Amiodarone Diltiazem (Cardizem) and other calcium channel blockers Lidocaine	Amiodarone and lidocaine may be used in cardiac-arrest. Calcium channel blockers should not be administered due to the negative inotropic effect and potential to develop hypotension.
Anti-coagulants / anti-platelet properties	
Aspirin	Patient is already very anti-coagulated, and adding aspirin may increase bleeding risks or delay healing.
Anti-hypertensives	
Enalapril (Vasotec) Labetalol (Normodyne)	Peripheral vasodilation or significant reduction in blood pressure may decrease preload. The VAD patient is dependent on preload for optimal pump function.
Benzodiazepines	
Diazepam (Valium) Lorazepam (Ativan) Midazolam (Versed)	May result in peripheral vasodilation that can reduce preload to the heart. For continuous seizures, the safest drug choice may be lorazepam (Ativan) since it remains primarily in the CNS and is not well-distributed to the periphery compared to other benzodiazepines.
Elementals	
Magnesium sulfate	Risk for developing hypotension and cardiac dysrhythmias.
Sympathomimetic medications - May be used only if patient is in cardiac arrest	
Epinephrine Dopamine Repeated doses of nebulized beta-agonists	Drugs that stimulate the sympathetic response may increase myocardial oxygen demands to the portion of the heart not supported directly by the VAD.
Vasodilatory medications	
Nitroglycerin Morphine	Peripheral vasodilation will decrease preload. The LVAD patient is dependent on preload for optimal pump function.

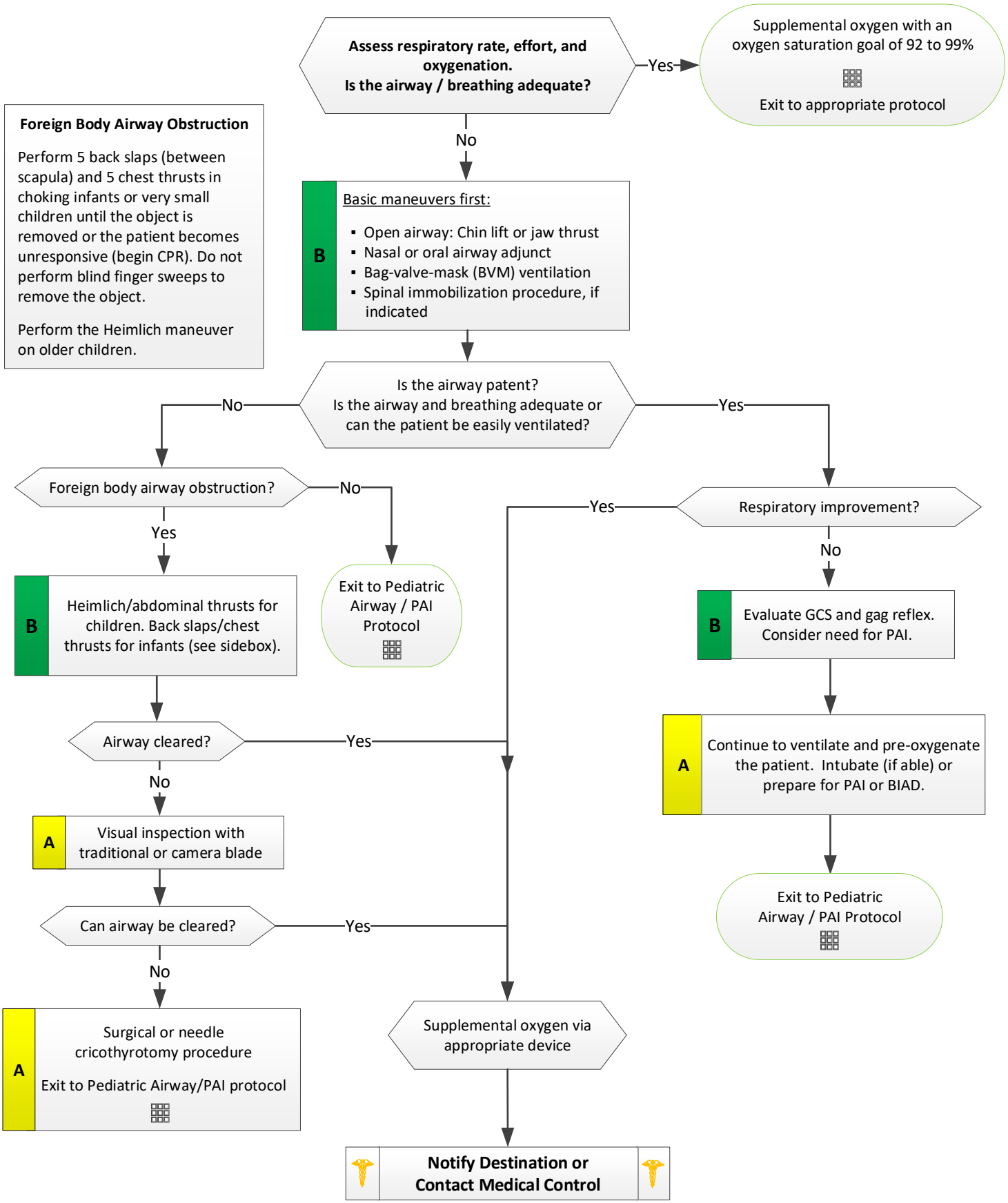
Pearls:

- **ALWAYS talk to family / caregivers since they will have specialized training and knowledge about the device. An appropriate knowledgable/ trained family member should accompany the patient to the hospital. CALL THE VAD COORDINATOR EARLY per patient/family instructions or as listed on the device. The VAD coordinators are available 24/7 and should be an integral part of the treatment plan.**
- **QUESTIONS TO ASK: DOES THE PATIENT HAVE A DNR? Can the patient be cardioverted or defibrillated if needed? Can CHEST COMPRESSIONS be performed in case of pump failure?**
- **Deciding when to initiate chest compressions is very difficult. Consider that chest compressions may cause death by exsanguination if the device becomes dislodged. However, if the pump has stopped, the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and medical control for further guidance.**
- **Follow protocols as indicated. Any medications that reduce cardiac preload, vasoconstrict, vasodilate, or otherwise will cause a drop in systolic blood pressure must be avoided in the non-pulseless arrest patient.**
- Common complications in VAD patients include stroke and TIA (incidence up to 25%), bleeding, dysrhythmias, and infection.
- The cardiac monitor and 12-lead ECG are not affected by the VAD and will provide important information.
- VAD patients are preload dependent. Consider that a FLUID BOLUS can often reverse hypoperfusion.
- Transport patients with ALL device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers. Most patients will have a “go bag” available.
- Remember that it is unlikely an auscultated or palpated blood pressure can be measured. Pulse oximetry may be inaccurate.
- Unconscious with no respiratory effort and ECG shows ventricular fibrillation/ventricular tachycardia: Defibrillation is appropriate.

Pediatric Universal Patient Care



Pediatric Airway



Pediatric Basic Airway

Difficult Airway Assessment

Difficult BVM Ventilation – "MOANS": Difficult **M**ask seal due to facial hair, anatomy, blood, secretions, or trauma. **O**bese or late pregnancy. **A**ge > 55. **N**o teeth (roll gauze and place between gums and cheeks to improve seal). **S**tiff or increased airway pressures (asthma, COPD, obese, pregnant).

Difficult Laryngoscopy – "LEMON": **L**ook externally for anatomical distortions (small mandible, short neck, large tongue). **E**valuate "3-3-2 Rule" (the opened mouth should accommodate 3 patient fingers, mandible to neck junction should accommodate 3 patient fingers, and the chin-neck junction to the thyroid prominence should accommodate 2 patient fingers). **M**allampati (this is difficult to assess in the field). **O**bstruction / **O**bese or late pregnancy. **N**eck mobility.

Difficult BIAD – "RODS": **R**estricted mouth opening. **O**bstruction / **O**bese or late pregnancy. **D**istorted or disrupted airway. **S**tiff or increased airway pressures (asthma, COPD, obese, pregnant).

Difficult Cricothyrotomy / Surgical Airway – "SHORT": **S**urgery or distortion of airway. **H**ematoma overlying the neck. **O**bese or late pregnant. **R**adiation treatment skin changes. **T**umor overlying the neck.

Trauma

Use inline cervical stabilization during intubation, BIAD, or BVM use. To facilitate translation of the mandible/mouth opening during intubation or BIAD, the cervical collar front should be exposed with manual stabilization of the cervical spine.

Pearls:

- **The Pediatric Basic Airway protocol is intended for patients who have not reached puberty and fit the Broselow-Luten Pediatric Tape (under 36 kg in weight).**
- **Continuous waveform capnography is required for all methods of intubation, BIADs, or surgical airways. Document results.**
- **Basic airway maneuvers (including BVM ventilation) may be maintained if continuous pulse oximetry measurements ≥ 92%. A lower pulse oximetry measurement may be acceptable if expected for the patient's pathological condition along with otherwise reassuring or significantly-improving vital signs.**
- **An advanced airway (intubation, BIAD) must be considered if the patient cannot be reasonably expected to protect his or her own airway from aspiration of emesis or secretions due to an acute injury or illness.**
- **For the purposes of this protocol, an adequate airway exists when the patient is appropriately oxygenation, ventilated, and has no foreseeable risk of aspiration.**
- **An intubation attempt is defined as passing the endotracheal tube past the teeth.**
- **An appropriate ventilatory rate is one that maintains the $EtCO_2$ between 35 to 45 mmHg, or at a level appropriate for the patient's condition (example: known congenital heart defect). Avoid hyperventilation, particularly with head trauma patients.**
- All rescuers should use a BIAD if orotracheal intubation is unsuccessful.
- Maintain cervical spine immobilization for patients with suspected spinal injury.
- Cricoid pressure and BURP maneuvers may assist with difficult intubations. They may also worsen the view in some cases.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well and consider padding/CID use to limit head movement during care. The endotracheal tube should have additional manual stabilization during all patient moves and transfer to the hospital bed.
- Succinylcholine should never be used AFTER an advanced airway has been secured. Only a long-acting, non-depolarizing paralytic may be considered if sedation efforts are inadequate.

Delayed Sequence Intubation - Pediatric

E

- Maintain high flow oxygen with a non rebreather mask or nasal cannula (8-10 Lpm)
- Cardiac Monitor
- Apply waveform EtC02
- Ensure BVM has PEEP and EtCO2 attached
- Position patient in ear-to-sternal-notch alignment unless contraindicated due to suspected cervical spine injury. Head of stretcher at 30 degrees

I

IV or IO procedure, if not already done.

P

Address hypotension – Epinephrine 1 mcg/kg (0.1mL/kg) Push Dose
(Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL)

Suspected Head Injury: Lidocaine 1 mg/kg IV/IO to a maximum of 100mg. Do NOT administer if EKG shows a 2nd or 3rd degree heart block or bradycardia.

ALL PATIENTS: Ketamine 2mg/kg SLOW IV/IO to a maximum of 500mg (note time given)

ETT placement note: If unable to obtain $EtCO_2$ readings even after sensor replacement, consider it as a failed airway and remove the endotracheal tube. Consider re-insertion after 3 minutes of oxygenation above 94% SpO_2, maintain BLS airway ventilation, and/or proceed with the Failed Airway protocol.

Suspected airway edema or SEVERE airway compromise from fluid?

No →

E

Insert NPA if no contraindications. Maintain SP02 of 94% or better for 3 minutes before proceeding to the next intervention. See sidebar to right.

Three minutes of preoxygenation has passed at an SP02 of 94% or greater

Apply a nasal cannula at 8-10 LPM if not already done.

P

All pediatric patients: 0.02 mg/kg Atropine IV/IO before laryngoscopy. Minimum of 0.01. Maximum of 1mg

Administer Rocuronium 1 mg/kg by IV/IO

Yes →

If SpO_2 drops below 94% on oxygen:

- Reposition patient
- Readjust seal of BVM
- Confirm PEEP

If SpO_2 cannot be maintained at 94% or better despite interventions, do not intubate. Use a BVM and/or BIAD and transport to the hospital.

Do not intubate unless waveform capnography is immediately available.

If unavailable, use a BIAD or maintain BLS airway management instead.

I

Intubate with video laryngoscopy, or traditional laryngoscopy if video unavailible, and/or Bougie adjunct using the SALAD procedure. Ventilate with a BVM between attempts. Do not reattempt intubation if SP02 drops below 94%; in this case, continue ventilating until SP02 reached 94% or better for 3 minutes. Afterwards allowing a second appropriate responder to attempt intubation once. If still unsuccessful, maintain BLS airway with BVM ventilations and BIAD.

E

- Secure airway and maintain oxygen saturation with goal of 92 to 99% Maintain EtC02 to goal of 35 to 45 mmHg
- Ventilate at 1 breath per 6 seconds or if available and not contraindicated, use a ventilator.
- All intubated patients must have ETC02 monitoring immediately after intubation and continued until transfer of care at ED

P

Sedation/Analgesia. Option 1: Midazolam 0 .1 mg/kg by IV/IO to a maximum of 10mg. Systolic BP must be >90mmHg. Watch for hypotension.
AND/OR
Fentanyl 2 mcg/kg by IV/IO. My repeat every 10 minutes as needed for continued sedation. Maximum of 6 mcg/kg
Or Option 2:
Ketamine 2 mg/kg by IV/IO to a maximum of 500mg.

Always provide sedation and/or pain management, even if the patient is unresponsive. Consider how long your paralytics will last, and never allow your patient to remain chemically paralyzed without pain management and sedation.

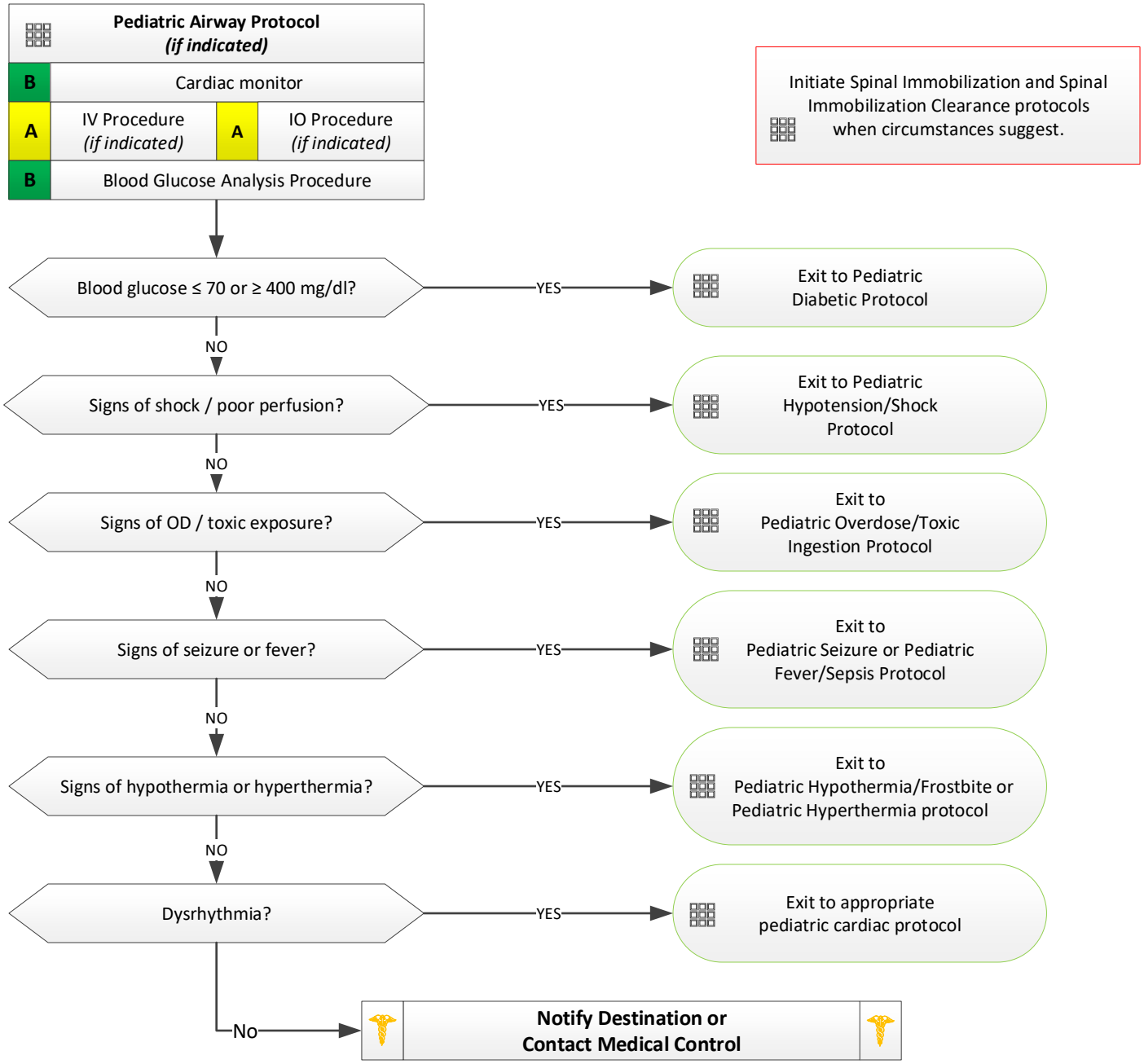
Notify Destination or Contact Medical Control

Pediatric Altered Mental Status

History
- Known diabetic; medical alert tag
- Drugs or drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or ingestion
- Acidosis / alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

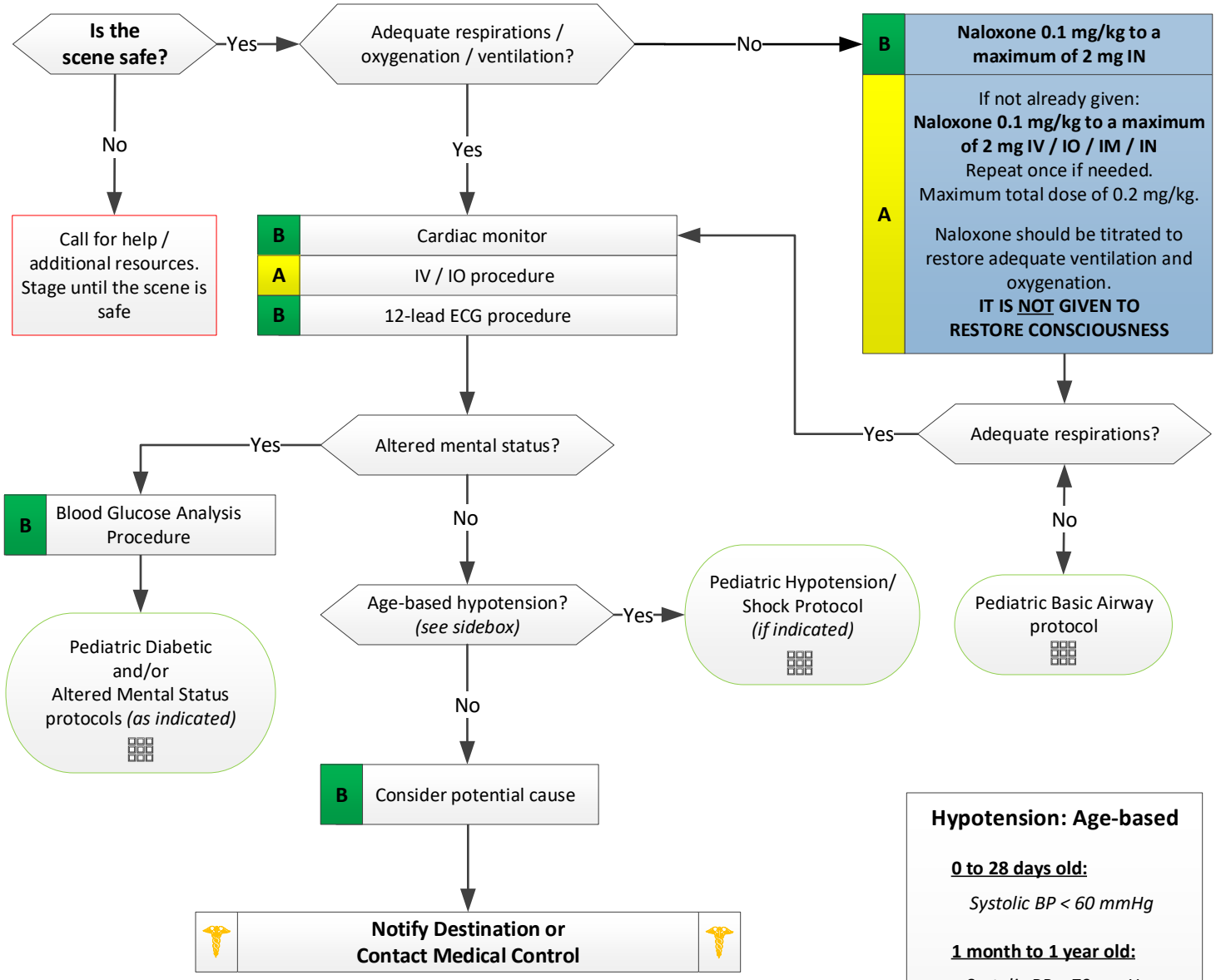


Pediatric Overdose/Toxic Ingestion

History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Abnormal respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)



Hypotension: Age-based

0 to 28 days old:
Systolic BP < 60 mmHg

1 month to 1 year old:
Systolic BP < 70 mmHg

1 to 10 years old:
Systolic BP < 70 + (2 x age)

11 years and older:
Systolic BP < 90 mmHg

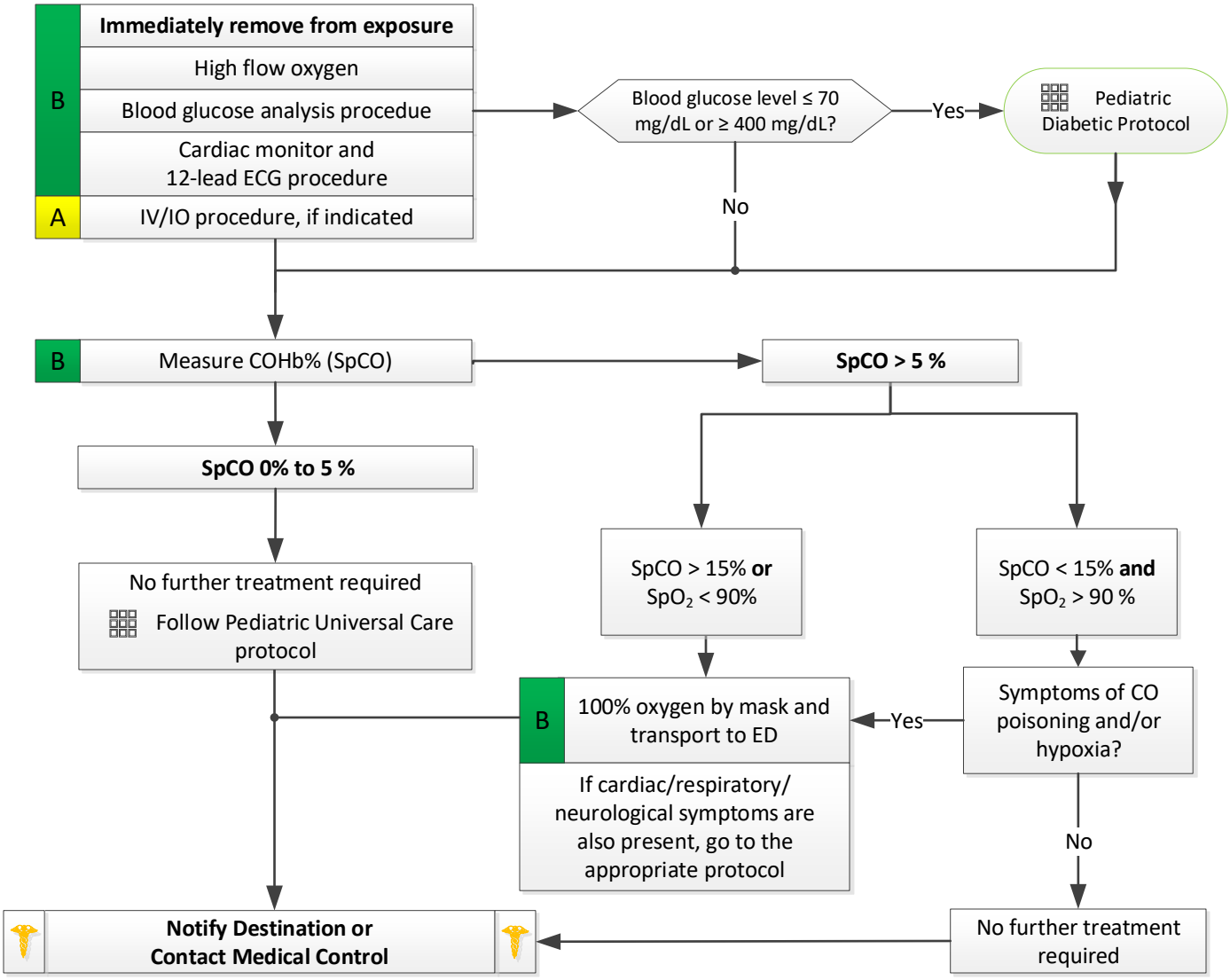
Poison Control Center: 1-800-222-1222

Pediatric Carbon Monoxide Exposure

History
- Fire victim
- Suspected CO exposure
- Suspected source/duration exposure
- Age
- Reason (accidental, suicidal)
- Measured atmospheric levels
- Past medical history

Signs and Symptoms
- Altered mental status/dizziness
- Headache, nausea/vomiting
- Chest pain / respiratory distress
- Neurological impairments
- Vision problems / reddened eyes
- Tachycardia / tachypnea
- Dysrhythmias, seizures, coma

Differential
- Effects of other toxic fire byproducts
- Acute cardiac event
- Acute neurological event
- Flu / gastrointestinal illness
- Acute intoxication
- Diabetic ketoacidosis
- Headache of a non-toxic origin



Pearls:

- **Recommended exam: Neurologic, skin, heart, lungs, abdomen, extremities.**
- **Scene safety is priority.**
- Consider carbon monoxide (CO) with any product of combustion.
- A normal environmental CO level does not exclude CO poisoning. The absence (or low detected levels) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire.
- The differential list for CO toxicity is extensive. Attempt to evaluate other correctable causes when possible.

Cyanide Exposure

History
- Suspected source/duration exposure
- Products of Combustion
- M44 Predator Trap
- Chemical Suicides
- Eating large quantity of fruit pits

Signs and Symptoms
- Headache, weakness, vertigo
- Nausea/vomiting
- Tachycardia/tachypnea

Severe
- Cardiac Arrest
- Seizures
- Altered Mental Status/Coma

Differential
- Effects of other toxic fire byproducts
- Acute cardiac event
- Acute neurological event
- Flu / gastrointestinal illness
- Acute intoxication
- Diabetic ketoacidosis
- Headache of a non-toxic origin

Request Hazmat Response as appropriate IF PREOPERLY TRAINED AND EQUIPPED: Remove patient from the source of exporsure.

↓

UNIVERSAL PATIENT CARE GUIDELINE

↓

B Oxygen at 15LPM via NRB

↓

Severe symptoms?

- No → Monitor Only and Follow Universal Care Protocol
- Yes → **P** Hydroxocobalamin
  Pediatric- 100mg/kg IV/IO (Maximum of 5g)
  Infuse over 15 minutes
  (Repeat once in 15 minutes if still severe symptoms)

↓

Alert Receiving Facility:
Hendrick Medical Center-North
HMC-North is the only appropriate receiving facility for cyanide exposure patients.

CYANOKIT QUICK DRIP RATES

0-19 POUNDS	1 DROP EVERY 2 SECONDS
20-39 POUNDS	1 DROP PER SECOND
40-59 POUNDS	2 DROPS PER SECOND
60-89 POUNDS	3 DROPS PER SECOND
90 + POUNDS	4 DROPS PER SECOND
ADULT	4 DROPS PER SECOND

CYANOKIT DOSING TABLE

WEIGHT	DOSE	ML	ML/MIN	DROPS/MIN	DROPS/SECOND
5kg	500mg	20mL	1.3	26	0.4
10kg	1000mg	40mL	2.6	52	0.8
15kg	1500mg	60mL	4	80	1.3
20kg	2000mg	80mL	5.3	106	1.7
25kg	2500mg	100mL	6.6	132	2.2
30kg	3000mg	120mL	8	160	2.6
35kg	3500mg	140mL	9.3	186	3.1
40kg	4000mg	160mL	10.6	212	3.5

Pearls:

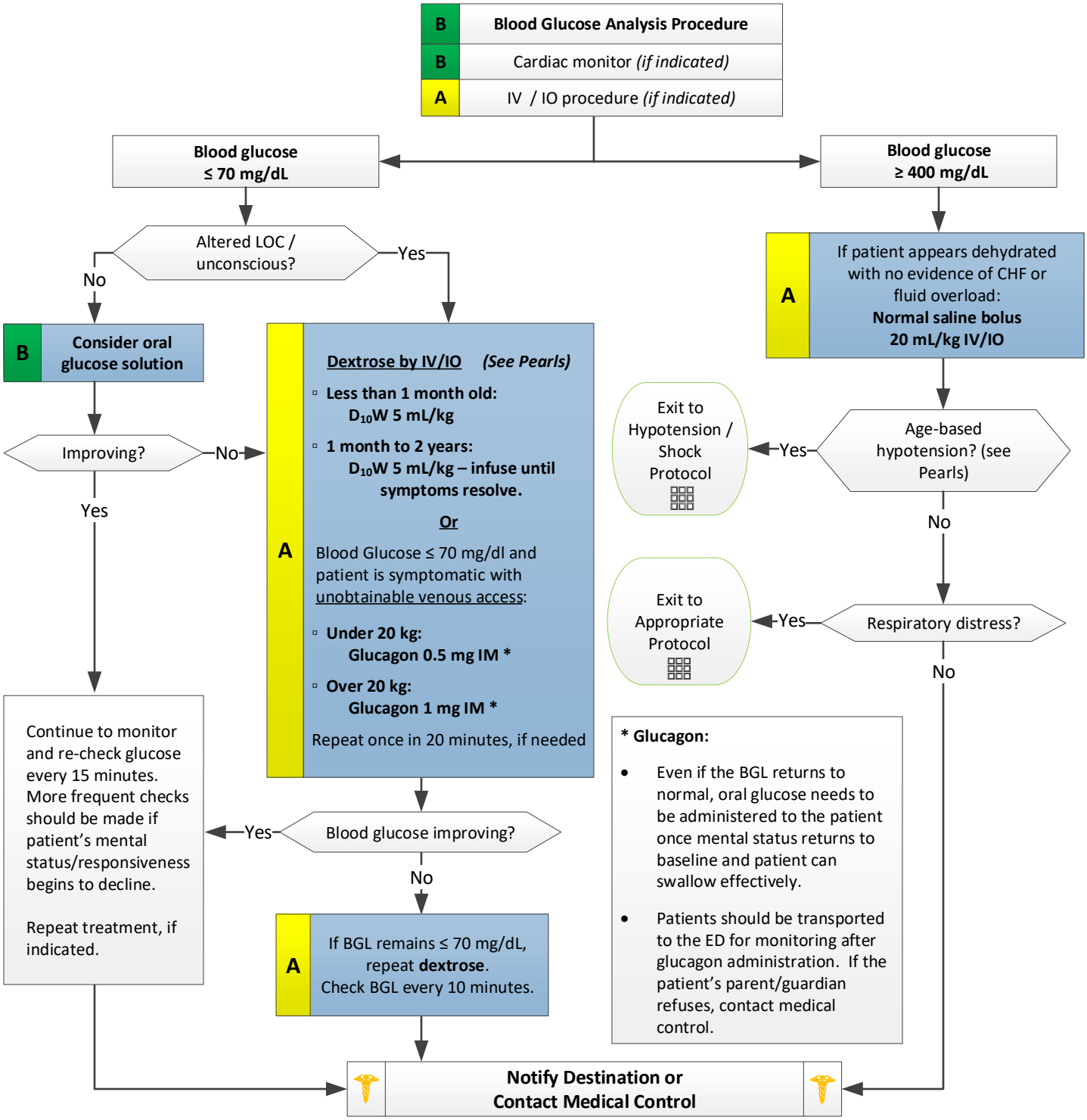
- **Recommended exam: Neurologic, skin, heart, lungs, abdomen, extremities.**
- **Scene safety is priority.**
- Consider carbon monoxide (CO) and Cyanide with any product of combustion
- A normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse oximetry readings.

Pediatric Diabetic

History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.



Pediatric Diabetic

Pearls:

- **Recommended Exam: Mental status, HEENT, skin, heart, lungs, abdomen, back, extremities, neurological.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Do not administer oral glucose to patients who are unable to swallow or protect their airway.
- To create $D_{10}W$ and $D_{25}W$:

  $D_{25}W$: Using aseptic technique, withdraw 50 ml of NS from a 100 ml IV bag, inject 50 ml of D50W into the 100 ml bag . This will give you the correct concentration to withdraw to a syringe to administer. The intent is not administer the D25 as a IV drip unless indicated by medical control

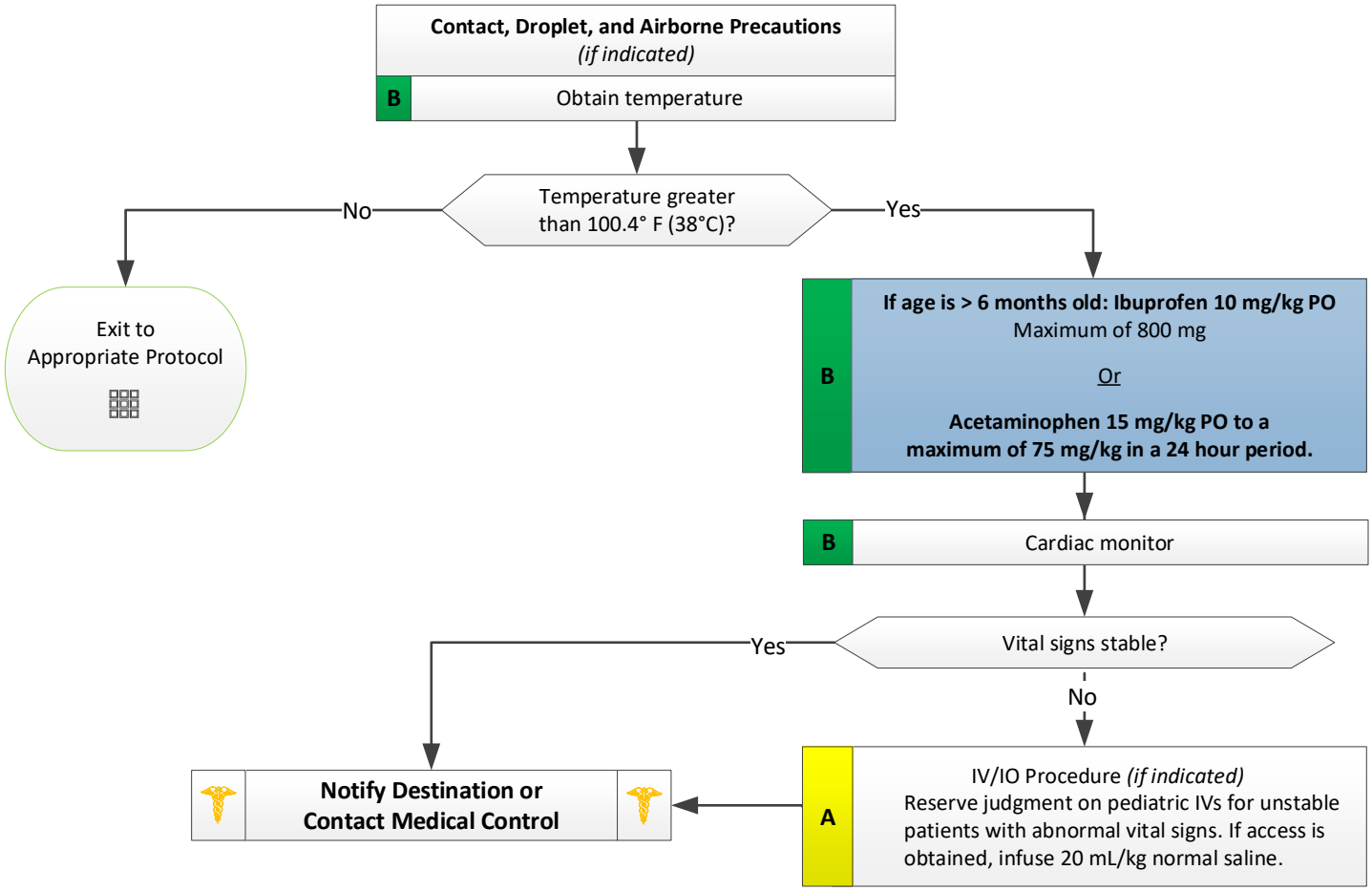
  $D_{10}W$: Using aseptic technique, transfer 10 mL of $D_{50}W$ into a 60 mL syringe. Using the same syringe, draw out 40 mL of normal saline from an IV bag. The syringe will now contain 50 mL of $D_{10}W$, which is enough $D_{10}W$ for a 10 kg or less infant.

Pediatric Fever / Sepsis

History
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills/rigors
- Hypotension
- Tachycardia

Differential
- Infections / sepsis
- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat stroke
- Meningitis



Pearls:

- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neurologic.**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- Rehydration with fluids increases the patient's ability to sweat and improves temperature control.
- An allergy to NSAIDs (non-steroidal anti-inflammatory medications) is a contraindication to ibuprofen.
- Consider whether elevated temperature is due to "fever" (and suspected infection), or a possible environmental heat emergency. NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child.
- Removal of clothes is recommended for rapid cooling measures.
- If the patient has taken one anti-fever medication, another type may be administered if 2 hours have passed.

Pediatric Emerging Infectious Disease (suspected)

History
- Flu-like illness
- Recent overseas travel within 21 days.

Signs and Symptoms
- Fever greater than 101.5°F
- Severe headache
- Diaphoretic
- Chills
- Weakness and/or flu-like symptoms
- Muscle pain
- Diarrhea
- Abdominal pain
- Unexplained bleeding

Differential
- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat-related emergency
- Meningitis
- Food poisoning

If Ebola is suspected, minimize the number of providers who directly contact the patient.

Contact, droplet, and/or airborne precautions

B — Obtain temperature and thorough travel and contact history

Positive contact or travel history?

No → Exit to appropriate protocol

Yes →

Universal precautions with proper PPE required.
No exposed skin.
N95 mask, impermeable gown, double glove, full-face shield.
Patient should wear an N95 mask.

B — Vital signs and cardiac monitor

A — IV / IO Procedure, *if indicated*

A — **Fluid bolus of 20 mL/kg up to 60 mL/kg** (*if indicated*). May repeat once.

Age-based hypotension?

No → See Destination Guidelines

Yes →

P — If no improvement in hypotension from fluid: **Consider dopamine at 2 to 20 mcg/kg/min**

See Destination Guidelines

Hypotension: Age-based

0 to 28 days old:
Systolic BP < 60 mmHg

1 month to 1 year old:
Systolic BP < 70 mmHg

1 to 10 years old:
Systolic BP < 70 + (2 x age)

11 years and older:
Systolic BP < 90 mmHg

Destination Guidelines

- Upon arrival to the destination, the driver will make contact with the hospital staff while the patient remains in the unit with attendant.
- Provide a full report to appropriate hospital personnel and wait for further instructions.
- Once patient has been cleared from the ambulance, carefully remove PPE and discard in the red container in the patient's room by the door.
- Re-suit with a new set of PPE and carefully clean/disinfect the ambulance and any surfaces the patient contacted, as instructed.
- Once the ambulance and equipment have been thoroughly cleaned, carefully remove and bag the PPE. Take the bagged contaminated items and dispose in a red container in a soiled utility room or as indicated by the emergency department.

Pearls:
- Most Ebola patients need supportive care only. Do not administer aspirin or NSAIDs; these medications will affect platelet function/ coagulation.
- Aggressive fluid management may be needed due to severe diarrhea and vomiting.
- Proper PPE required to ensure **no** exposed skin, utilizing impermeable gown , boot covers, full face shield, N95 mask, surgical hood, and double glove.
- Ebola is a direct contact disease. Use droplet/splatter precautions. One must have contact with a symptomatic patient's bodily fluids in order to contract Ebola. Ebola has a 21 day incubation period, and patients are not contagious unless symptomatic.
- Deceased Ebola patients are still considered contagious.
- If you come in contact with a suspected Ebola patient's direct body fluid without PPE, wash/flush area and isolate yourself. Contact the shift supervisor for further instruction.

Pediatric Allergic Reaction

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms
- Itching and/or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea/vomiting

Differential
- Rash without hives
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / airway obstruction
- Vasovagal event
- Asthma
- CHF

Assess Symptom Severity

MILD
Flushing, hives, itching, erythema with normal BP and perfusion.

B: Cardiac monitor

A: IV/IO Procedure *(if indicated)*

A: **Diphenhydramine 1 mg/kg to a maximum of 50 mg PO/IV/IM/IO** *(if not already given)*

MODERATE
Mild symptoms with respiratory findings (*wheezing, dyspnea, hypoxia*) or GI symptoms (*nausea, vomiting*). Normal BP.

B: Oxygen as appropiate

B: **Consider Epinephrine 1mg/ml (1:1000) 0.01 mg/kg IM to a maximum of 0.3 mg**

B: **Albuterol 2.5 mg or Xopenex 0.63 mg +/- Ipratropium 0.5 mg nebulized** if respiratory findings are present. Repeat as needed to a maximum of 6 doses.

B: Cardiac monitor

A: IV/IO Procedure

A: **Diphenhydramine 1 mg/kg to a maximum of 50 mg PO/IV/IM/IO** *(if not already given)*

P: **Age is 2 years old or older:**

Dexamethasone 0.6 mg/kg to a maximum of 20 mg slow IV/IO

Or

Prednisolone (Orapred) 2 mg/kg PO. Maximum of 60 mg

SEVERE
Skin symptoms may or may not be present. Decreased perfusion, hypotension, and impending or severe respiratory compromise.

B: **Early: Epinephrine 1mg/ml (1:1000) 0.01 mg/kg IM to a maximum of 0.3 mg**

B: Oxygen as appropiate

B: **Albuterol 2.5 mg or Xopenex 0.63 mg +/- Ipratropium 0.5 mg nebulized** if respiratory findings are present. Repeat as needed to a maximum of 6 doses.

B: Cardiac monitor

A: IV/IO Procedure

A: **Diphenhydramine 1 mg/kg to a maximum of 50 mg IV/IM/IO** *(if not already given)*

A: **Normal saline bolus 20 mL/kg by IV/IO** Repeat as needed to remain above age-based hypotension (see Pearls) to a **maximum of 60 mL/kg**

P: **Age is 2 years old or older:**

Dexamethasone 0.6 mg/kg to a maximum of 20 mg slow IV/IO

Consider an advanced airway if there is no improvement

Continuous waveform capnography is required for any level of severity with a respiratory sign or symptom.

Monitor and reassess.
Observe for worsening signs and symptoms.

Notify Destination or Contact Medical Control

Pediatric Medical Section Protocols

Pediatric Allergic Reaction

Pearls:

- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Mild Symptoms: Flushing, hives, itching, and/or erythema with normal BP and perfusion.
- Moderate Symptoms: Mild symptoms plus respiratory findings (wheezing, dyspnea, hypoxia) or GI Symptoms (nausea, vomiting) and normal BP.
- Severe Symptoms: Skin symptoms may/may not be present. Likely to present with decreased perfusion/hypotension and impending/severe respiratory failure.
- Albuterol or Xopenex (with or without ipratropium) may be used if there is any wheezing or difficulty breathing present.
- The most important medication for a patient having a severe allergic reaction is epinephrine! It should be given in the THIGH.

Pediatric Allergic Reaction (During COVID-19 Pandemic)

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms
- Itching and/or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea/vomiting

Differential
- Rash without hives
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / airway obstruction
- Vasovagal event
- Asthma
- CHF

Assess Symptom Severity

MILD
Flushing, hives, itching, erythema with normal BP and perfusion.

- **B** Cardiac monitor
- **A** IV/IO Procedure *(if indicated)*
- **A** **Diphenhydramine 1 mg/kg to a maximum of 50 mg PO/IV/IM/IO** *(if not already given)*

MODERATE
Mild symptoms with respiratory findings (*wheezing, dyspnea, hypoxia*) or GI symptoms (*nausea, vomiting*). Normal BP.

- **B** Oxygen as appropiate
- **B** **Consider Epinephrine 1mg/ml (1:1000) 0.01 mg/kg IM to a maximum of 0.3 mg**
- **B** Cardiac monitor
- **A** IV/IO Procedure
- **A** **Diphenhydramine 1 mg/kg to a maximum of 50 mg PO/IV/IM/IO** *(if not already given)*
- **P** **Age is 2 years old or older:**
  Dexamethasone 0.6 mg/kg to a maximum of 20 mg slow IV/IO
  Or
  Prednisolone (Orapred) 2 mg/kg PO. Maximum of 60 mg

SEVERE
Skin symptoms may or may not be present. Decreased perfusion, hypotension, and impending or severe respiratory compromise.

- **B** **Early: Epinephrine 1mg/ml (1:1000) 0.01 mg/kg IM to a maximum of 0.3 mg**
- **B** Oxygen as appropiate
- **B** Cardiac monitor
- **A** IV/IO Procedure
- **A** **Diphenhydramine 1 mg/kg to a maximum of 50 mg IV/IM/IO** *(if not already given)*
- **A** **Normal saline bolus 20 mL/kg by IV/IO** Repeat as needed to remain above age-based hypotension (see Pearls) to a **maximum of 60 mL/kg**
- **P** **Age is 2 years old or older:**
  Dexamethasone 0.6 mg/kg to a maximum of 20 mg slow IV/IO

Continuous waveform capnography is required for any level of severity with a respiratory sign or symptom.

Monitor and reassess.
Observe for worsening signs and symptoms.

Consider an advanced airway if there is no improvement

Notify Destination or Contact Medical Control

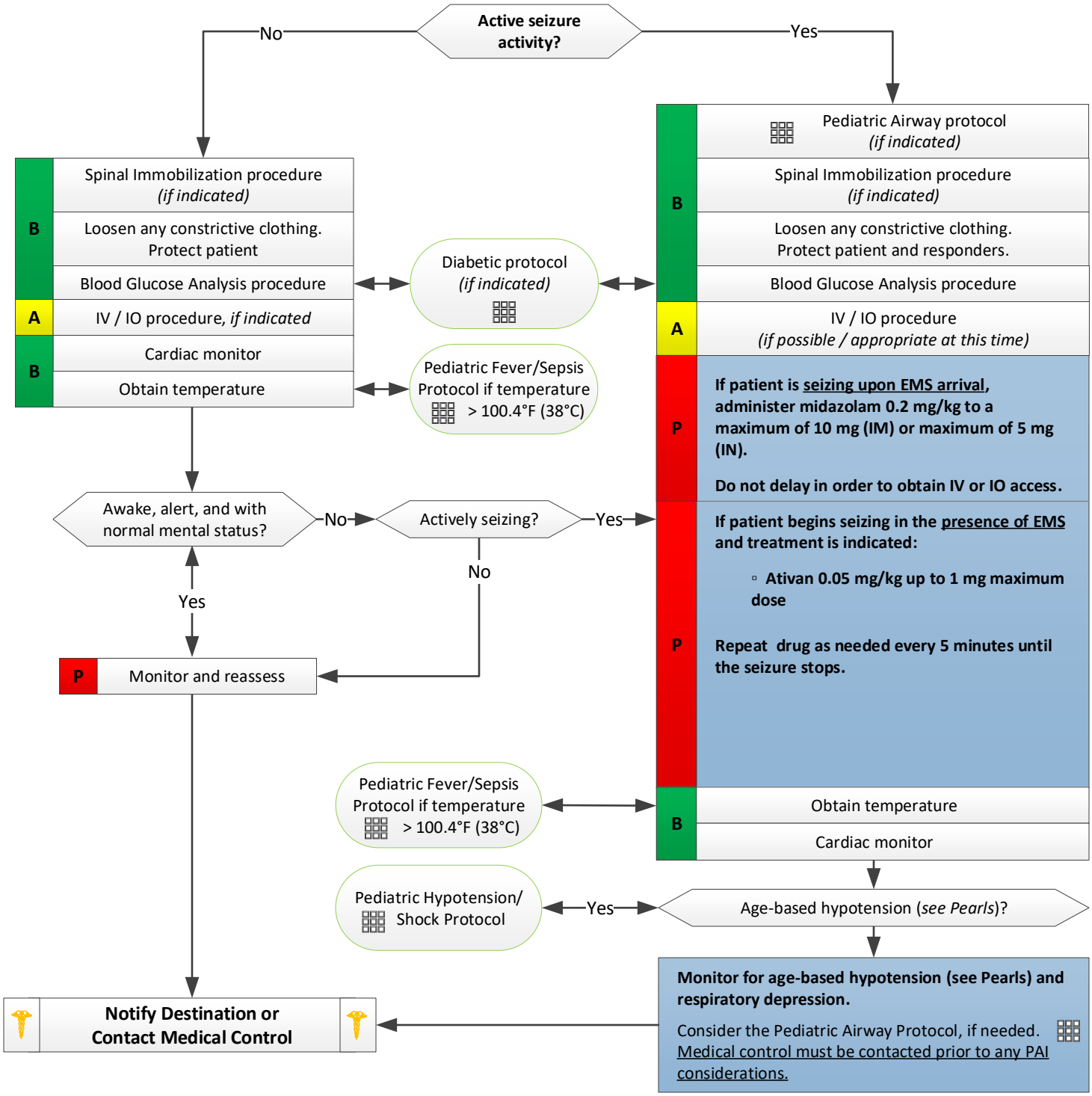
Pediatric Medical Section Protocols

Pediatric Seizure

History
- Fever, sick contacts
- Prior history of seizures
- Medication compliance
- Recent head trauma
- Whole body versus unilateral seizure activity
- Duration, single/multiple
- Congenital abnormality

Signs and Symptoms
- Fever; hot, dry skin
- Seizure activity
- Incontinence
- Tongue trauma
- Rash
- Nuchal rigidity
- Altered mental status

Differential
- Simple febrile seizure
- Infection
- Head trauma, medication, or toxin
- Hypoxia or respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor



Pediatric Seizure

Pearls:

- **Recommended Exam: Mental status, HEENT, heart, lungs, extremities, neurological**
- Simple febrile seizures: Are most common in ages 6 months to 5 years old. By definition, they are generalized seizures with no seizure history in the setting of any grade of fever and with an otherwise normal neurologic and physical exam and recent history. It may be reasonable to simply provide supportive care and observe these seizures while treating fever with acetaminophen or ibuprofen and passive cooling measures (i.e. undressing) for up to five minutes. Any seizure confirmed to last for more than five minutes should be treated with medication.
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **Midazolam 0.2 mg/kg (maximum 10 mg) by the intramuscular (IM) route is effective in the rapid termination of seizures. Do not delay IM administration with a difficult IV or IO access. IM is preferred over IO.**
- Addressing the ABCs, verifying blood glucose, and obtaining a temperature is as important as stopping the seizure itself.
- Be prepared to assist ventilations, especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed-head injury. Looks for any signs of potential trauma.
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Assess for possibility of occult trauma and substance abuse, overdose, or exposure to toxins.
- Ativan (Lorezepam): Raises seizure threshold at the neuro-muscular junction, and limits propagation of seizure in brain, while diminishing overall CNS functions.
- Midazolam (Versed): Enters the brain tissue rapidly and exerts a powerful, short-duration action. Midazolam is highly lipophillic. When given intramuscularly, midazolam reaches 80% of peak levels within five minutes of administration by the intramuscular route, and is the preferred choice for IM administration.
- Prolonged seizure activity: It is important to treat prolonged or recurrent seizure activity not only because of the risks for aspiration, brain injury, traumatic injury, and hypoxia, but to also prevent benzodiazepine resistance that may develop due to $GABA_A$ receptor trafficking (down-regulation).
- Consider potential causes of the seizure: Medication/toxin overdose or exposure, alcohol or drug withdrawal, brain injury, hypoxia, diabetic emergencies, fever, hyperthermia, sepsis, “water intoxication”, etc.

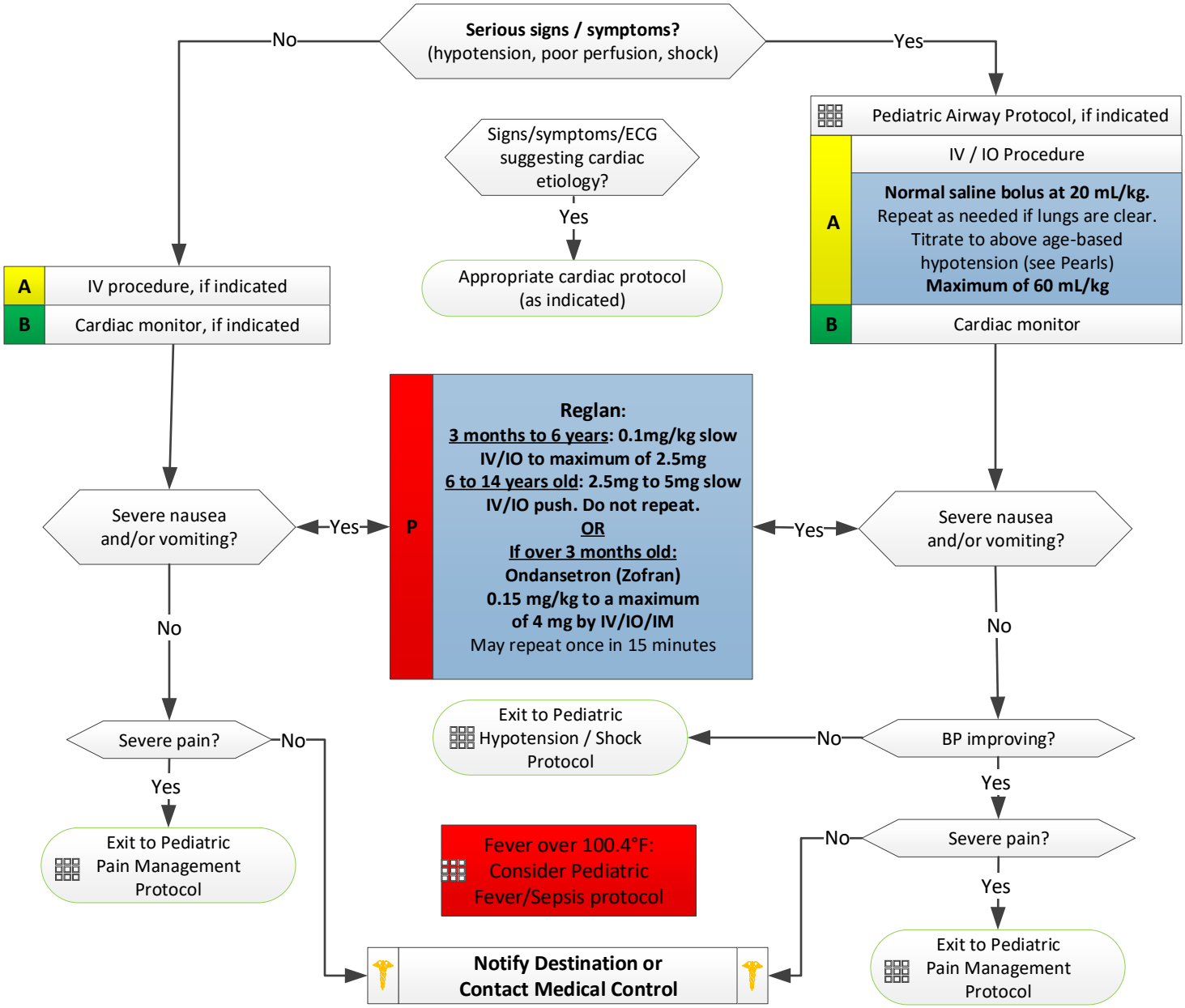
Pediatric Non-Traumatic Abdominal Pain

History
- Age
- Past medical / surgical history
- Medications
- Onset
- Palliation / provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / radiation / referred
- Pain severity (1 through 10, FACES, FLACC)
- Time (duration / repetition)
- Fever
- Last meal eaten
- Last bowel movement / emesis

Signs and Symptoms
- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation

Associated symptoms (helpful to localize source):
Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash

Differential
- Pneumonia or pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic ulcer disease / gastritis
- Gallbladder
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder / prostate disorder
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian and testicular torsion
- Intusseption of intestinal tract



Pediatric Non-Traumatic Abdominal Pain

Pearls:

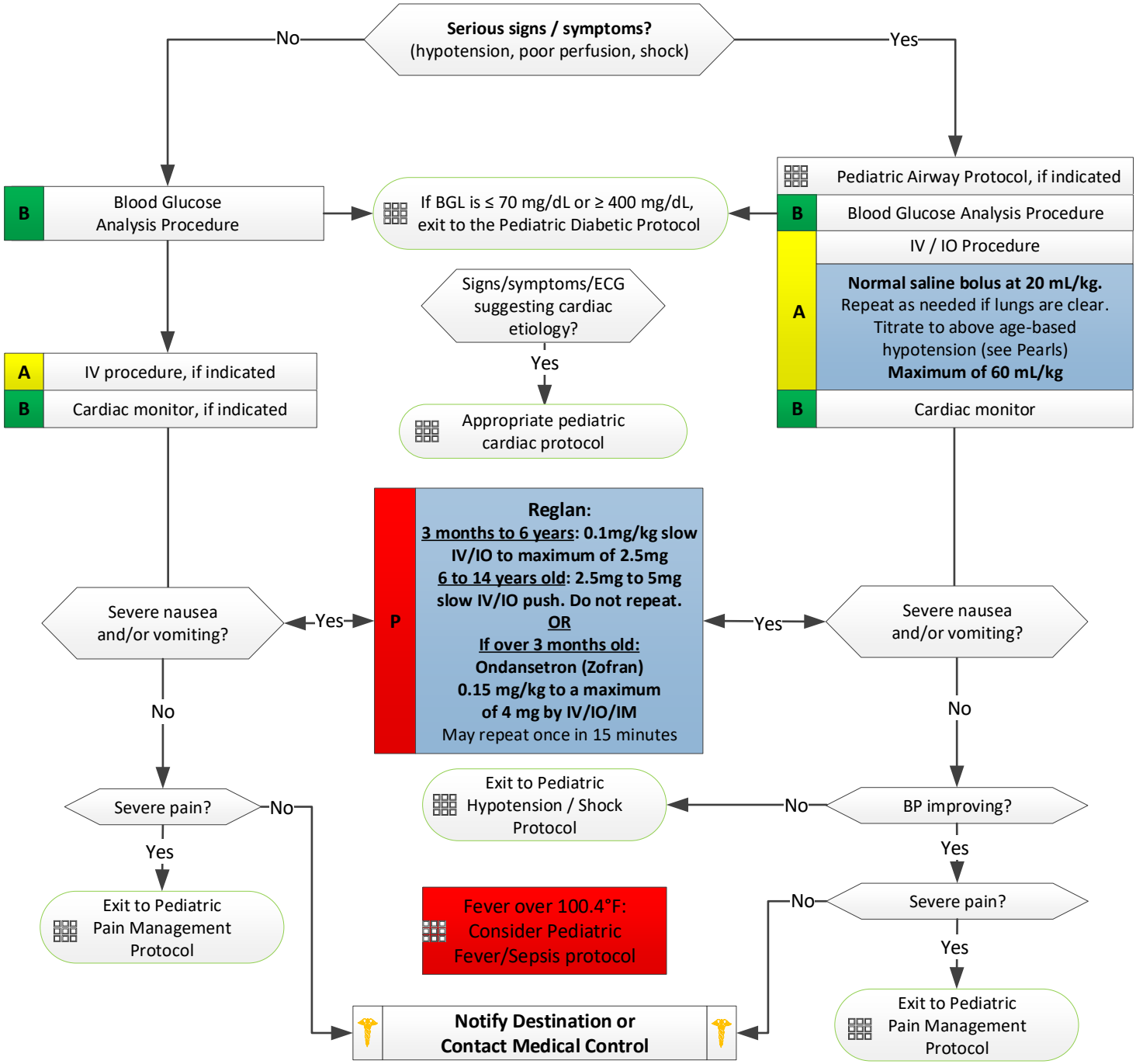
- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lung, abdomen, back, extremities, neurologic.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Document the mental status and vital signs prior to administration of anti-emetics and/or analgesics.
- Oral antacids should be avoided in patients with renal disease.
- Repeat vital signs after each 20 mL/kg fluid bolus.
- IV administration of ondansetron has a rare association with causing a prolonged QT interval on the ECG.

Pediatric Vomiting / Diarrhea

History
- Age
- Time of last meal
- Last bowel movement / emesis
- Improvement or worsening with food or activity
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Travel history
- Bloody emesis or diarrhea

Signs and Symptoms
- Pain
- Distension
- Constipation
- Diarrhea
- Anorexia
- Fever
- Cough
- Dysuria

Differential
- CNS (increased pressure, headache, tumor, trauma or hemorrhage)
- Drugs
- Appendicitis
- Gastroenteritis
- GI or renal disorders
- Diabetic ketoacidosis
- Infections (pneumonia, influenza)
- Electrolyte abnormalities



Pediatric Vomiting / Diarrhea

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lung, abdomen, back, extremities, neurologic.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Heart rate: One of the most common initial clinical signs of dehydration is increased heart rate. Tachycardia increases as dehydration becomes more severe. If the heart rate is close to normal, dehydration is either unlikely or the patient is in very severe shock.**
- **Pediatric patients will compensate better than adults, but their decline into shock is usually with very little warning. A history of the event is vital. Urine output (number of wet diapers), fluid intake, mental status changes, and number of times the patient vomited within an appropriate time period will help better determine the severity of the patient's condition.**
- **Beware of only vomiting (i.e. no diarrhea) in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with isolated vomiting.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Document the mental status and vital signs prior to administration of anti-emetics and/or analgesics.
- Repeat vital signs after each 20 mL/kg fluid bolus has been infused.
- IV administration of ondansetron has a rare association with causing prolongation of the QT interval on the ECG.

Pediatric Hypotension / Shock

History
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Congenital heart conditions/CHF
- Medications
- Allergic reaction
- History of poor oral intake

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal

Pediatric Diabetic Protocol *(if indicated)*

B
- **Blood glucose analysis procedure**
- Cardiac monitor
- IV / IO procedure
- Pediatric Airway Protocol *(if indicated)*

Appropriate pediatric cardiac protocol *(if indicated)*

The history, exam, and circumstances often suggest the **Type of Shock:**
Was trauma involved?

Yes

Consider hypovolemic (bleeding), neurogenic (spinal injury), or obstructive (pneumothorax)

B
- Spinal Immobilization Procedure *(if indicated)*
- Wound care, CONTROL HEMORRHAGE *(if indicated)*

A
- **Normal Saline solution or Lactated Ringers (only if trauma related):**
  Bolus of 20 mL/kg by IV/IO
  Maintain above age-base hypotension (see Pearls)
  Maximum of 60 mL/kg

P
- Chest Decompression Procedure *(if indicated)*
- **Consider vasopressors ONLY after a 60 mL/kg fluid bolus with declining response.**
  Dopamine 2 to 20 mcg/kg/min IV / IO
  to maintain blood pressure above age-based hypotension (see Pearls)

No

Consider hypovolemic (dehydration, GI bleed), cardiogenic (CHF), distributive (sepsis, anaphylaxis), or obstructive (PE, tamponade)

A
- **Normal saline solution**
  Bolus of 20 mL/kg by IV / IO
  Repeat as needed to remain above age-based hypotension (see Pearls)
  Maximum of 60 mL/kg

P
- **Cardiogenic shock: Be cautious of excess fluid administration. Consider the presence of pulmonary edema and use dopamine early.**
  Dopamine 2 to 20 mcg/kg/min IV / IO
  to remain above age-based hypotension
- **For non-cardiogenic shock, consider pressors after a 60 mL/kg fluid bolus:**
  Dopamine 2 to 20 mcg/kg/min IV / IO
  to remain above age-based hypotension

Notify Destination or Contact Medical Control

Pediatric Hypotension / Shock

Pearls:

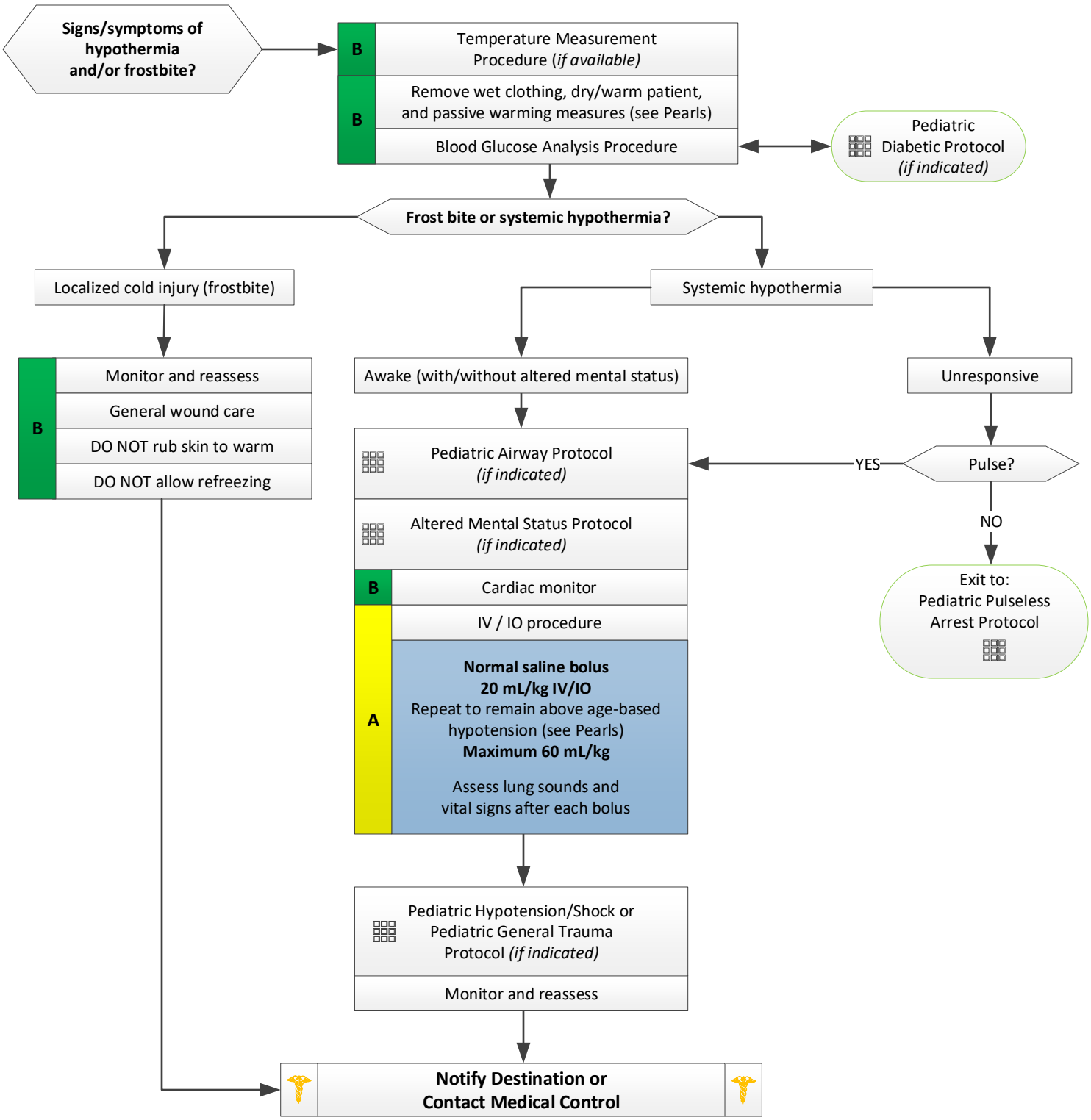
- **Recommended Exam: Mental status, skin, HEENT, neck, heart, lung, abdomen, back, extremities, neurologic.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Heart rate: One of the most common initial clinical signs of dehydration is increased heart rate. Tachycardia increases as dehydration becomes more severe. If the heart rate is close to normal, dehydration is either unlikely or the patient is in very severe shock that will most-likely lead to cardiac arrest.**
- **Pediatric patients will compensate better than adults, but their decline into shock is usually with very little warning. A history of the event is vital. Urine output (number of wet diapers), fluid intake, mental status changes, and number of times the patient vomited within an appropriate time period will help better determine the severity of the patient's condition.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Repeat vital signs after each 20 mL/kg fluid bolus has been infused.
- Consider all possible causes of shock and treat as appropriate. Majority of decompensation in pediatrics is airway-related.
- Shock may present with a normal blood pressure initially.

Pediatric Hypothermia / Frostbite

History
- Age: very young and old
- Exposure to decreased temperatures, but may also occur in normal temperatures.
- Past medical history / medications
- Drug use: Alcohol, barbituates
- Infections / sepsis
- Length of exposure / wetness / wind chill

Signs and Symptoms
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury



Pediatric Hypothermia / Frostbite

Pearls:

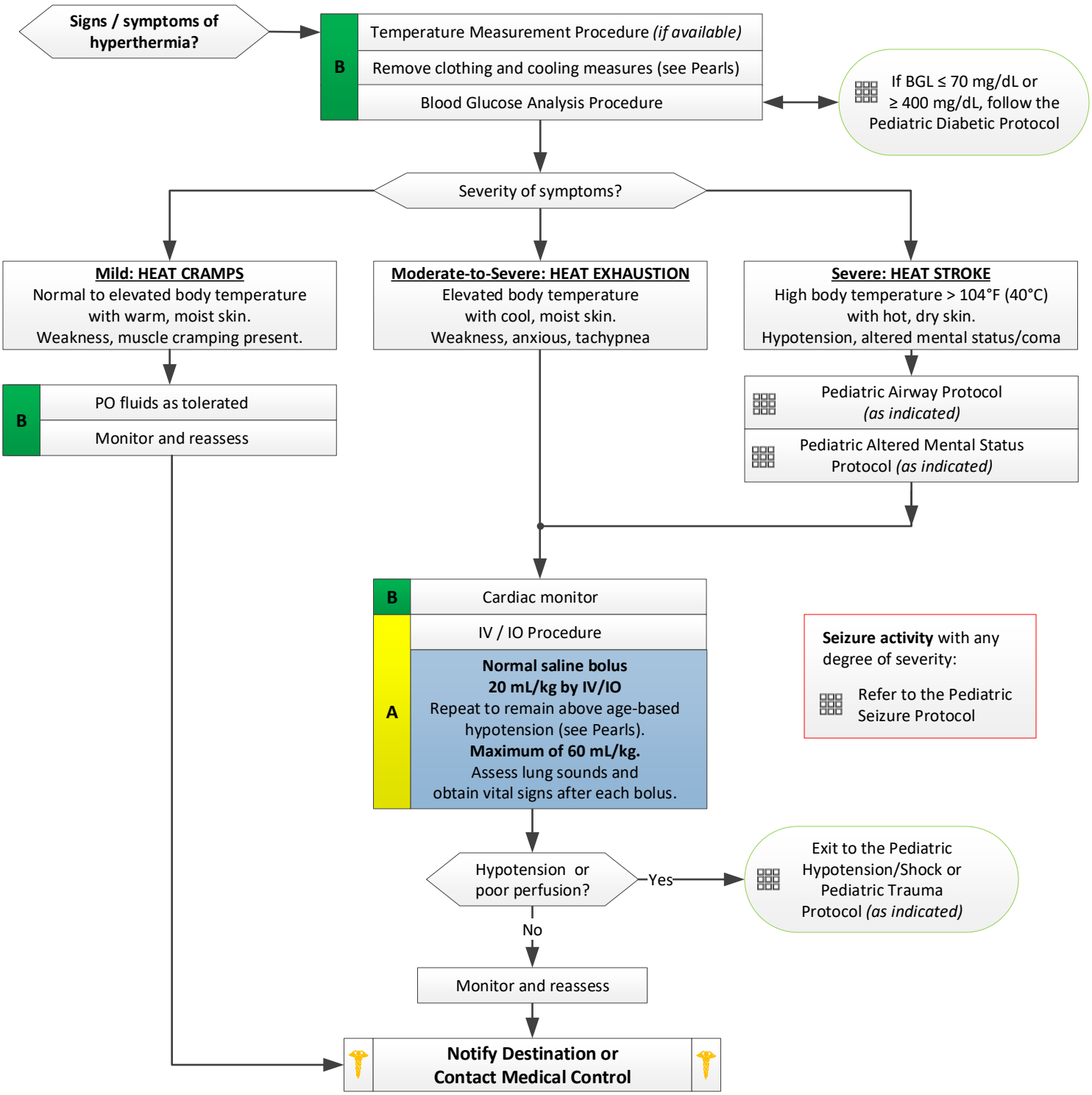
- Recommended Exam: Mental status, heart, lungs, abdomen, extremities, and neurological.
- **Use the Broselow-Luten pediatric tape for weight estimates.**
  - **Age-based hypotension:**
    - **Newborn to 28 days old: Systolic BP < 60 mmHg**
    - **1 month to 1 year old: Systolic BP < 70 mmHg**
    - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
    - **11 years and older: Systolic BP < 90 mmHg**
- Contributing factors to hypothermia: Alcohol consumption, age extremes, malnutrition, drug use, water immersion.
- **Only passive warming should be done in the prehospital setting**, which includes:
  - Remove patient's clothing
  - Warm the ambulance
  - Warm, dry blankets
  - Do NOT use hot packs, friction from rubbing, or hot water on skin. Active warming should only be done in the hospital setting.
- **Handle the patient gently** to prevent further injury to freezing/frozen areas and possibly increasing the risk for cardiac dysrhythmias.
- Pulseless arrest: Perform CPR and follow protocols as indicated. Refer to the specific protocol's guidelines for hypothermic patients. Transport to the hospital should begin early (even if CPR must be continued during travel) as the patient will most likely benefit from hospital-based warming procedures.
- Severe hypothermia (below 86° F [30°C]) is more susceptible to cardiac instability. Rough handling of the patient can theoretically cause ventricular fibrillation, but there is not enough evidence to definitely support or refute this concern. Intubation and CPR should be performed (if indicated by protocol) despite this concern.
- Be aware that dopamine and other sympathomimetic drugs may increase the risk for dysrhythmias in hypothermic patients.
- Antiarrhythmics and pacing may not work in patients with a core temperature below 86°F (30°C). AHA recommends that antiarrhythmics be withheld at this temperature.
- Hypothermia may produce severe bradycardia; the duration of pulse checks may need to be extended.

Pediatric Hyperthermia

History
- Age: the very young and the elderly are more susceptible.
- Exposure to increased temperatures and / or humidity.
- Past medical history / medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential
- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism ("thyroid storm")
- Delirium tremens ("DTs")
- Heat cramps, exhaustion, or stroke
- CNS lesions or tumors



Pediatric Hyperthermia

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, heart, lungs, and neurological.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Heart rate: One of the most common initial clinical signs of dehydration is increased heart rate. Tachycardia increases as dehydration becomes more severe. If the heart rate is close to normal, dehydration is either unlikely or the patient is in very severe shock that will most-likely lead to cardiac arrest.**
- **Pediatric patients will compensate better than adults, but their decline into shock is usually with very little warning. A history of the event is vital.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Repeat vital signs after each 20 mL/kg fluid bolus has been infused.
- Extremes of age are more prone to heat emergencies (the very young or elderly).
- Medication and/or drug overdose (tricyclic antidepressants, phenothiazines, anticholinergics, salicylates, amphetamines, cocaine, etc.) and alcohol may contribute directly to hyperthermia or to the patient's prolonged exposure to a hot environment. Children are particularly susceptible to accidental medication ingestion. Consider the Pediatric Overdose/Toxic Ingestion protocol, if indicated.
- Sweating generally disappears as the body temperature rises above 104°F (40°C). Infants are unable to regulate temperature as effectively as adults, and so are at greater risk with any heat and cold exposure.
- Appropriate cooling measures in the pre-hospital setting:
  - Remove patient's clothing (maintain modesty where feasible).
  - Air conditioning to cool ambulance with maximum airflow.
  - Cold packs to axilla (armpits) and groin. Always have a cloth barrier between the cold pack and skin to prevent skin injury. NO cold packs will be applied to the neck.
  - Room temperature (cabinet stock) IV fluids only. Do NOT use chilled fluids in the pre-hospital setting.
- Intense shivering may occur as the older child is cooled. Infants do not have the muscle tissue development needed to shiver, and must rely on non-shivering thermogenesis to maintain body heat.

Pediatric Combative Patient

History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Substance abuse / overdose
- Diabetes
- Consider child or other domestic abuse as a contributor

Signs and Symptoms
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts
- Violent nature

Differential
- Altered mental status differential
- Alcohol intoxication / toxin / substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Always consider abnormal blood glucose levels. Refer to the Pediatric Diabetic Protocol if BGL ≤ 70 mg/dL or ≥ 400 mg/dL

Violent and combative patient?
(Obtain blood glucose measurement, if possible)

No → Exit to appropriate protocol

Yes

Mild

Consider Physical Restraint Procedure and verbal de-escalation techniques

Improvement / patient calming?
- Yes → Notify Destination or Contact Medical Control
- No ↓

B Cardiac monitor and oxygen via appropriate device

A IV / IO Procedure (if possible)

P **Midazolam (Versed) 0.1mg/kg by IV/IO/IN/IM**

Max 5 mg

Improvement / patient calming?
- Yes → Notify Destination or Contact Medical Control
- No ↓

Potential for harm to patient or EMS staff?
- No → Notify Destination or Contact Medical Control
- Yes ↓

P **Repeat the dose of midazolam (Versed)**
Or
Consider contacting Medical Control for ketamine. Monitor for hypotension and respiratory depression. Consider Pediatric Airway Protocol, if needed.

→ Notify Destination or Contact Medical Control

Severe

Excited Delirium Syndrome
Paranoia, disorientation, hyper-aggression, hallucinations, tachycardia, increased strength and / or hyperthermia

Aggressive, violent, or agitated patient is a threat to self or others, possible psychosis?

A IV / IO procedure (if possible)

P **Ketamine 2 mg/kg slow IV/IO**
Or
Ketamine 4 mg/kg IM
to a maximum of 500 mg.
(IM may require multiple injections. Max of 5 mL per injection and can only be administered in the thigh)

B Consider Restraint Procedure

Cardiac monitor

A External cooling measures are needed if temperature ≥ 104.7°F by applying cooling packs to axillary and groin (avoid the neck)

IV fluid bolus of 20 mL/kg of normal saline. Refer to the Pediatric Hypotension/Shock Protocol, if needed.

B
- Monitor ABCs post-sedation
- High flow oxygen: simple mask or NRB
- **Capnography is required**
- *If needed*, provide suction and respiratory support with a BVM

→ Notify Destination or Contact Medical Control

Pediatric Combative Patient

Pearls:

- **Recommended Exam: Mental status, skin, heart, lungs, neurologic.**
- **Crew / responders' safety is the main priority.**
- **Any patient who is handcuffed and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **The necessity for ketamine use must be documented in the patient care report.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Heart rate: One of the most common initial clinical signs of dehydration is increased heart rate. Tachycardia increases as dehydration becomes more severe. If the heart rate is close to normal, dehydration is either unlikely or the patient is in very severe shock that will most-likely lead to cardiac arrest.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **All patients who receive either physical and/or chemical restraint must be continuously observed by ALS personnel.**
- **Due to the rapid onset and prolonged duration of action, ketamine administered by the intramuscular route (IM) may be more suitable for suspected toxin/drug use patients who are an immediate threat to responders and the patient's own safety.**
- Be sure to consider all possible medical/trauma causes for the patient's behavior and address these contributors where possible (hypoglycemia, overdose, substance abuse, hypoxia, head injury, severe pain, interactions learned from observing domestic abuse at home, etc.).
- Repeat vital signs after a 20 mL/kg fluid bolus has been infused.
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If a patient suspected of agitated delirium suffers a cardiac arrest, consider a fluid bolus and orders for sodium bicarbonate early. Early airway interventions are paramount in the pulseless pediatric patient.
- Do not position or transport any restrained patient is such a way that could impact the patient's respiratory or circulatory status. The combative patient may not be transported in the prone position. Pediatric patients are particularly susceptible to deterioration of their condition/pulseless arrest when the airway has been compromised.
- The patient may have transient non-purposeful movements associated with ketamine. Such movements may include short term muscle rigidity and/or nystagmus, which will resolve on its own.
- Ketamine is safe to use with pediatric patients.

Excited Delirium Syndrome:

Excited delirium is medical emergency that has a high risk for increased mortality (death) due to the causes of it or from the injuries/medical emergencies that may develop secondary to it. Excited delirium needs to be addressed in the prehospital setting, and may involve a combination of psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia, and increased strength.

The use of physical restraints and/or tasers may increase the severity of the potentially life-threatening condition. In the prehospital setting, excited delirium is most commonly seen in young male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly with stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines, or similar agents. Alcohol withdrawal, severe CNS illness, or head trauma may also contribute to the condition.

Pediatric Pain Management

History
- Age
- Location, duration
- Severity (1 through 10 scale)
- If child or non-verbal, use the Wong-Baker FACES or FLACC pain scale
- Past medical history
- Pregnancy status
- Drug allergies and medications

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / respiratory
- Neurogenic
- Renal (colic)

Pain severity?
Use a combination of pain scale, circumstances, MOI, injury, or illness severity.

Mild Pain
(scale 0 through 6)

B

If age is greater than 6 months old:

Ibuprofen (Motrin) 10 mg/kg PO to a maximum of 800 mg

Or

For all ages:

Acetaminophen (Tylenol) 15 mg/kg PO to a maximum of 75 mg/kg in a 24 hour period.

A Consider IV / IO Procedure, if indicated

B Observe/monitor patient and reassess

P **Ketorolac 15 mg IV/IO or 30 mg IM for pain of 4 or greater on scale. Must administer IM doses in the thigh for pediatrics. Cardiac monitoring is required.**

Improvement in pain?

- Yes → Notify Destination or Contact Medical Control
- No → Move to the Moderate to Severe Pain arm of this protocol

See the Pearls to determine the most appropriate medication for the patient.

The Pearls will list indications and contraindications for each type of analgesic used in these protocols.

Moderate to Severe Pain
(Scale > 6) with increased vital signs

A IV / IO Procedure, if indicated

B
- Assess and monitor respiratory status. Apply oxygen via appropriate device (minimum of nasal cannula).
- Cardiac monitor

P

Patient is older than 2 years old:

Fentanyl 2 mcg/kg by IV/IO/IM/IN (maximum of 100 mcg per dose)
The dose may be repeated every 10 minutes as needed.
Maximum total of 6 mcg/kg

P Monitor and reassess the patient every 5 minutes following medication administration. Watch for respiratory decline. Patient requires paramedic-level care and monitoring.

Notify Destination or Contact Medical Control

Pediatric Pain Management

Appropriate Analgesia Selection – Quick Reference				
Patient Type:	**Acetaminophen**	**Ibuprofen**	**Ketorolac**	**Fentanyl**
Actively bleeding (Includes GI bleed or suspected intracranial bleed)	No	No	No	Yes
Acute burn patients	No	No	No	Yes
Liver disease or **liver transplant**	No	Yes	Yes	Yes
Pregnant or **breastfeeding**	Yes	No	No	Yes
Renal patients	Yes	No	No	Yes
Surgical candidates (Includes open fractures and fracture deformities. Surgical candidates may include abdominal pain or headaches possibly related to an intracranial bleed)	No	No	No	Yes

Hypotension: Age-based

0 to 28 days old:

Systolic BP < 60 mmHg

1 month to 1 year old:

Systolic BP < 70 mmHg

1 to 10 years old:

Systolic BP < 70 + (2 x age)

11 years and older:

Systolic BP < 90 mmHg

Pearls:

- **Recommended Exam: Respiratory status, mental status, area of pain, neurological.**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO, IM or IN medication delivery and at patient hand off. Monitor BP and respirations closely as sedative and pain control agents may cause hypotension and/or respiratory depression. Monitor and document vital signs before medicating, 10 minutes after medication, and before patient transfer.**
- **Patients may display a wide variation of response to opioid pain medication (morphine and fentanyl, aka "narcotics"). Consider the patient's age, weight, clinical condition, other recent drugs or alcohol, and prior exposure to opiates when determining initial opioid dosing. Weight-based dosing may provide a standard means for dose calculation, but does NOT predict patient response. For example, minimal doses of opioids may cause respiratory depression in the opiate naïve and possibly intoxicated patients. Use the Broselow-Luten Pediatric Tape for weight estimates.**
- **Both arms of the treatment may be used in concert. As an example: For patients in moderate pain, you may use the combination of an oral medication and IV one if no contraindications are present.**
- All patients who receive IM or IV medications must be observed 15 minutes for a drug reaction in the event no transport occurs.
- Do not administer any PO medications for patients who may need surgical intervention, such as open fractures or fracture deformities, headaches, or concerning abdominal pain.
- **Ketorolac (Toradol) and ibuprofen should not be given to patients with known renal transplant/renal failure, in patients who have known drug allergies to NSAIDs (non-steroidal anti-inflammatory medications), with active bleeding, when intracranial bleeding is suspected, when GI bleeding is suspected, or for patients who may need acute surgical interventions.**
- Do not administer **acetaminophen** to patients with a history of liver disease or liver transplant.
- Burn patients may require higher than usual opioid doses to effect adequate pain control. IF A PEDIATRIC PATIENT HAS SUFFERED BURNS THAT REQUIRES TRANSPORT TO THE BURN CENTER, **CONTACT MEDICAL CONTROL FOR THE RECOMMENDED MAXIMUM DOSE OF MORPHINE.** Do not hesitate to contact medical control regarding the pain management strategy for patients in severe pain despite medications.

Pediatric Pulmonary Edema / CHF

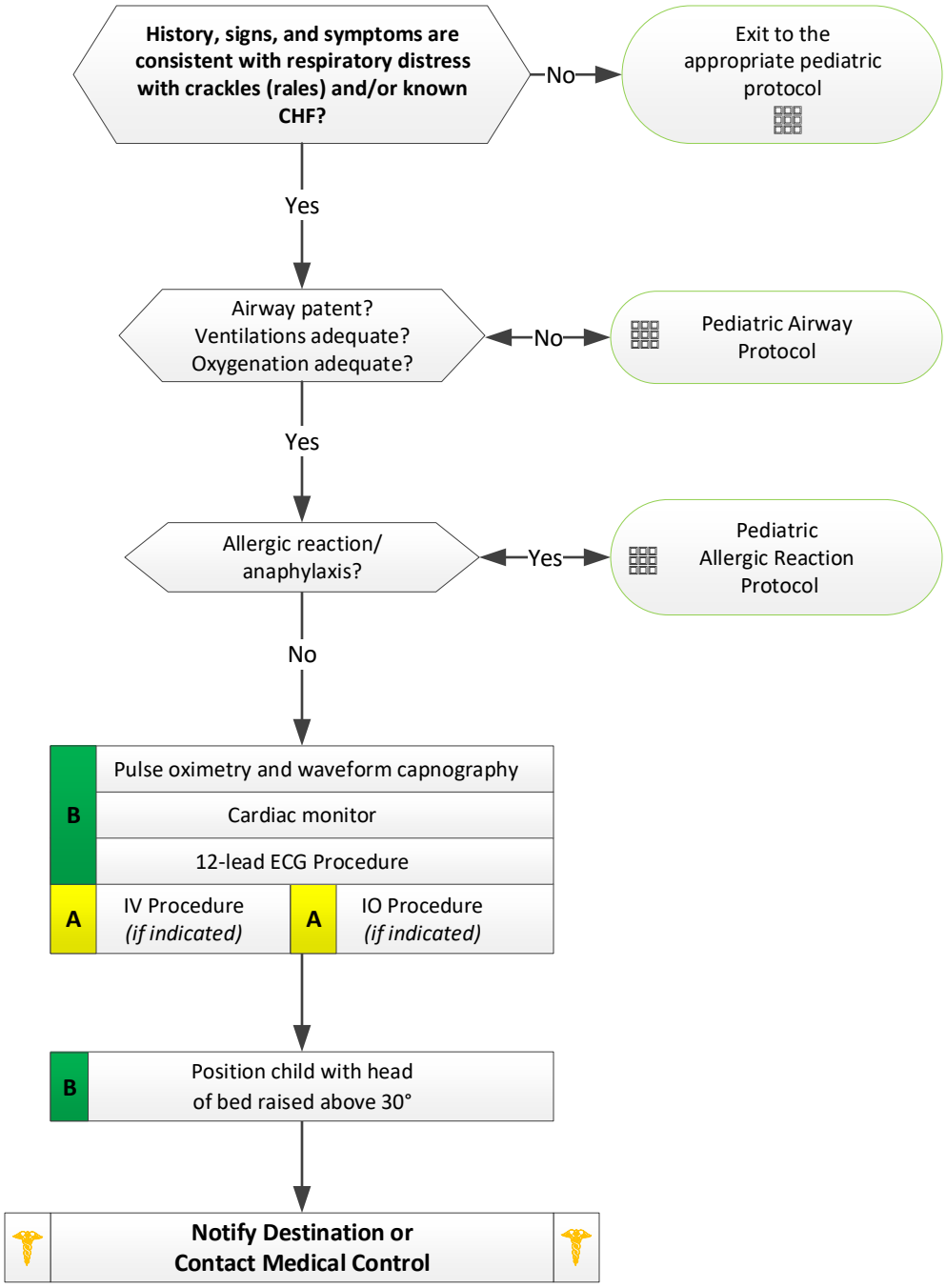
History
- Congenital heart disease
- Chronic lung disease
- Congestive heart failure
- Past medical history
- Parents usually well aware of patients chronic condition as an infant

Signs/Symptoms
- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

Differential
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic exposure

Congenital Heart Defect Patient

Contact Medical Control early for treatment guidance and facility notification, as needed.



Pediatric Pulmonary Edema / CHF

Pearls:

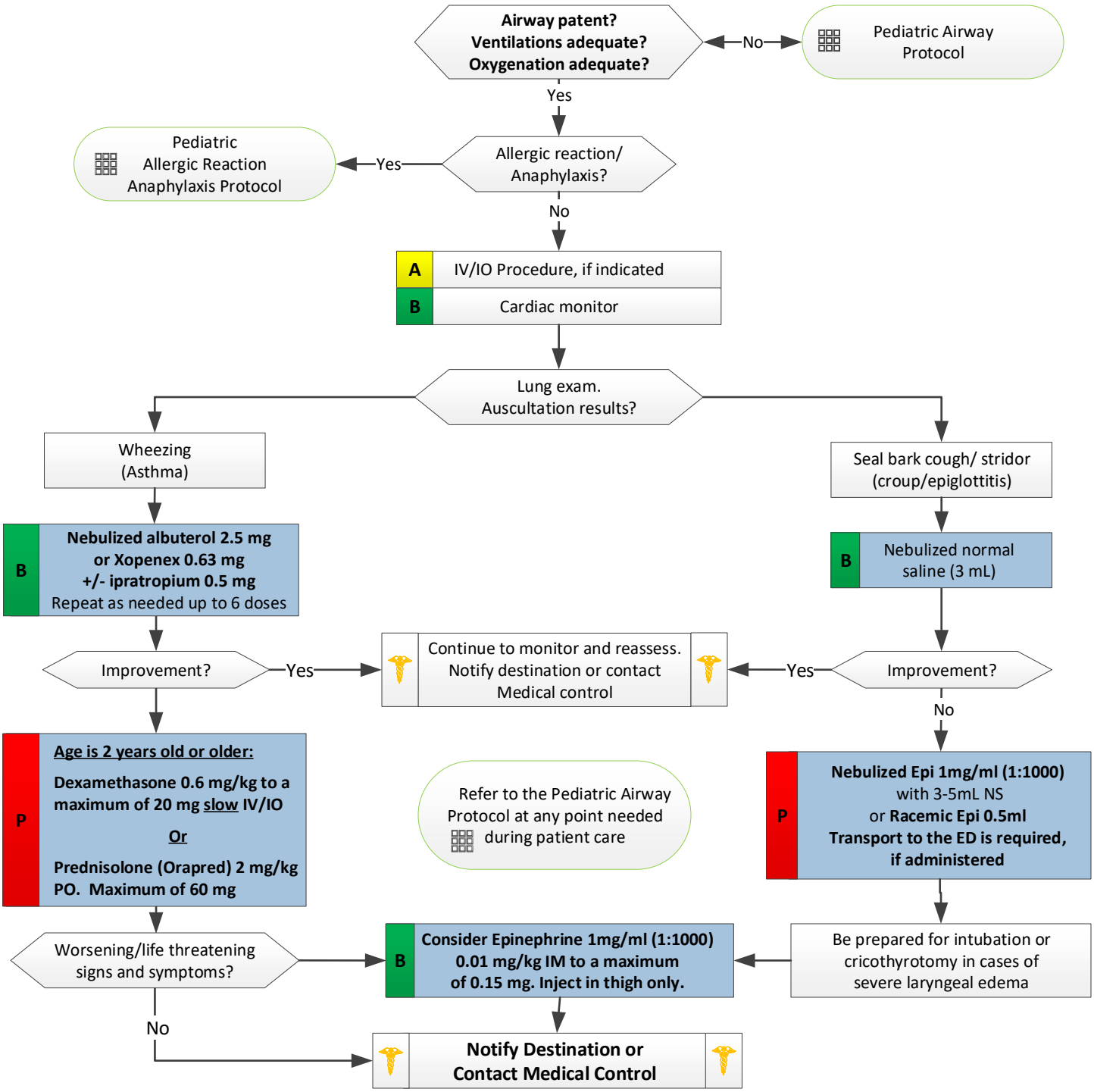
- **Recommended exam: Mental status, respiratory, cardiac, skin, neurological.**
- **Contact Medical Control early (if needed) in the care of the pediatric congenital cardiac patient.**
- **Most children with CHF have a congenital heart defect; obtain a precise past medical history. Family is usually well aware of the condition.**
- **Use the Broselow-Luten Pediatric Tape for weight estimates.**
- **Sometimes doing less is more in these children; Keep them calm and provide quick transport.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 60 mmHg**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **The type of congenital heart condition usually varies by age:**
  - **Less than 1 month old**: Tetralogy of Fallot, transposition of the great arteries, coarctation of the aorta. The infant is usually unable to complete feedings due to lethargy or may become cyanotic during feeding or stress.
  - **2 to 6 months old**: Ventricular septal defects (VSD) and atrioseptal defects (ASD).
  - **Any age**: Myocarditis, pericarditis, SVT, and heart blocks.
- **Treatment of congestive heart failure/pulmonary edema may vary depending on the underlying cause, and may include the following treatments. All interventions listed below REQUIRE Medical Control authorization:**
  - **Fentanyl:** 1 mcg/kg IV/IO for chest discomfort and hypotension associated with the condition. Maximum single dose of 50 mcg.
  - **Dopamine:** 2 to 20 mcg/kg/min by IV/IO. Titrate to remain above age-based hypotension.
- Do not assume all wheezing is pulmonary, especially in a cardiac child.

Pediatric Reactive Airway Disease

History
- Time of onset
- Possibility of foreign body
- Past medical history
- Medications
- Fever / Illness
- Sick contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms
- Wheezing/stridor/crackles (rales)
- Nasal flaring/retractions/grunting
- Increased heart rate
- Altered mental status
- Anxiety
- Attentiveness/distractibility
- Cyanosis
- Poor feeding
- Jugular vein distension/frothy sputum
- Hypotension

Differential
- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma



Pediatric Reactive Airway Disease

Pearls

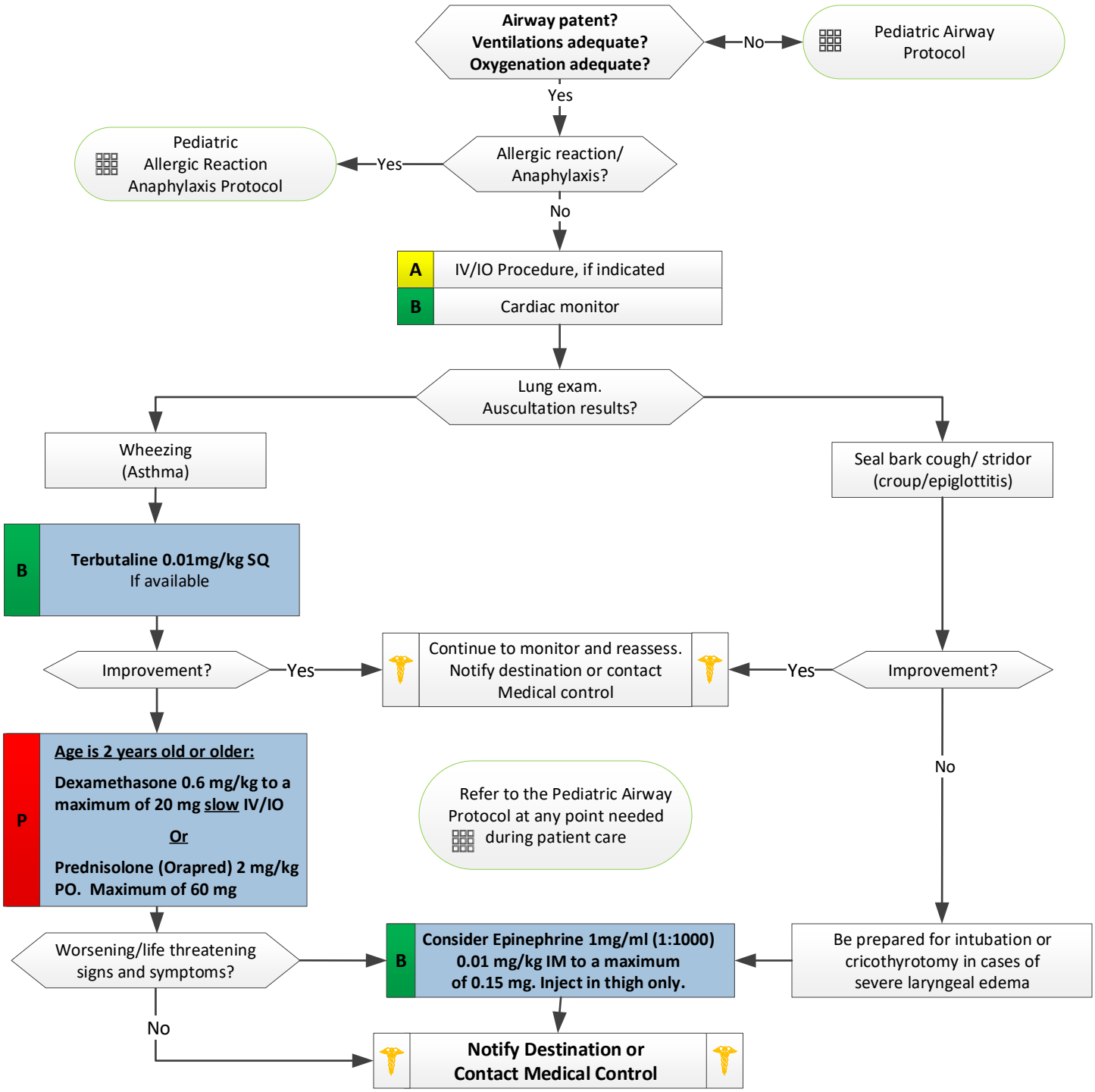
- **Pulse oximetry, capnography, and the ECG should be monitored continuously in the patient with respiratory distress.**
- **Consider IV access when pulse oximetry remains ≤ 92% after beta-agonist treatment. Also consider a normal saline bolus of 20 mL/kg in pediatric patients with respiratory distress; these patients are often dehydrated.**
- Prednisolone (Orapred) has the SAME bioavailability and effect as IV corticosteroids. If able to tolerate oral medications, consider PO prednisolone instead of obtaining IV access in the non-critical patient. The 2 to 8 year old age range can become very fearful with venipuncture attempts; their breathing effort may worsen with the added stress.
- Do not force a child into a particular position. Allow them to assume their position of comfort if safe to do so. They will better protect their own airway through their body positioning.
- The most important component of respiratory distress is airway control.
- Croup typically affects children less than 5 years of age. It is viral with a gradual onset, and may be accompanied by fever. Drooling is uncommon.
- Epiglottitis typically affects children greater than 5 years of age. It is bacterial in origin with a rapid onset. It is usually accompanied by fever, possible stridor, drooling, pain, and the patient wants to sit up to keep his or her airway open. **Airway manipulation and invasive/stressful procedures may worsen the condition**. Even under the best circumstances, the patient may worsen to a point where intubation or cricothyrotomy may be required. Be prepared for emergent transport and request additional resources early.
- If the need arises to intubate an epiglottitis patient, be prepared for needle cricothyrotomy secondary to failed or occluded airway. Significant laryngeal edema and obstruction will be present.

Pediatric Reactive Airway Disease (During COVID-19 Pandemic)

History
- Time of onset
- Possibility of foreign body
- Past medical history
- Medications
- Fever / Illness
- Sick contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms
- Wheezing/stridor/crackles (rales)
- Nasal flaring/retractions/grunting
- Increased heart rate
- Altered mental status
- Anxiety
- Attentiveness/distractibility
- Cyanosis
- Poor feeding
- Jugular vein distension/frothy sputum
- Hypotension

Differential
- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma



Newly Born

History
- Due date and gestational age
- Multiple gestation (twins, etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors:
  - Substance abuse
  - Smoking

Signs and Symptoms
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential
- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

Care of mother and appropriate adult protocol. Request additional assistance as needed

Remember to document the 1 and 5 minute APGAR scores. See the Pearls for a reference chart.

Airway Suctioning

Routine tracheal (deep) suctioning of the newborn is no longer recommended. Use the bulb syringe to remove fluids from the nares and mouth.

Most newborns requiring resuscitation will respond to ventilations by BVM, chest compressions, and/or epinephrine.

If not responding, consider other causes such as hypovolemia, pneumothorax, and/or hypoglycemia (BGL < 40).

Push hard (1.5 inches or ⅓ of the anterior-posterior diameter of chest).

Push fast (110 compressions per minute).

Term gestation? Breathing or crying? Good muscle tone?

Yes → B: Provide warmth/dry infant. Clear oral/nasal passages, if needed. Monitor and reassess. Continue with protocol if patient's condition declines.

No → B: Warm, dry, and stimulate infant. Clear airway, if necessary

Heart rate < 100 bpm? Agonal breathing or apnea?

No → Labored breathing/ persistent central cyanosis?

Yes → B: BVM ventilations; Pulse oximetry and capnography; Cardiac monitor

No → B: Supplemental oxygen. Maintain $SpO_2 \geq$ 94%; Maintain warmth; Monitor and reassess; Notify Destination or Contact Medical Control

Yes → B: BVM ventilations; Pulse oximetry and capnography; Cardiac monitor

Heart rate < 100 bpm?

No → B: Supplemental oxygen. Maintain $SpO_2 \geq$ 94%; Maintain warmth; Monitor and reassess; Notify Destination or Contact Medical Control

Yes → **BVM Ventilations**

If already ventilating with a BVM, take corrective action: Change position or BVM technique. Observe for bilateral chest rise. If no improvement and heart rate is between 60 bpm to 100 bpm, move down the algorithm to intubation in the Pediatric Airway Protocol.

Heart Rate < 60 bpm?

Yes → B: Chest compressions; Pediatric Airway Protocol; A: IV / IO Procedure

Heart rate < 60 bpm?

Yes → P: **Epinephrine 0/1mg/ml (1:10,000) 0.01 mg/kg by IV/IO** Every 3 to 5 minutes as needed; A: **Normal saline bolus 10 mL/kg IV/IO** May repeat once, if needed

No → **Notify Destination or Contact Medical Control**

Pediatric Newborn Section Protocols

Newly Born

APGAR Score

Evaluate at 1 and 5 minutes postpartum

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

Pearls:

- **Recommended Exam: Mental status, heart, lungs, abdomen, extremities, and neurological.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
  - **Age-based hypotension:**
    - **Newborn to 28 days old: Systolic BP < 60 mmHg**
- Transport the mother with the infant when at all possible.
- The most important vital signs in the neonate are respirations, respiratory effort, and heart rate.
- Heart rate is best assessed by listening to heart sounds followed with palpation of the umbilical pulse.
- Pulse oximetry should be applied to the right palm or either foot of the neonate.
- Expected and normal pulse oximetry readings following birth at:

  1 minute: 60 to 65%
  2 minutes: 65 to 70%
  3 minutes: 70 to 75%
  4 minutes: 75 to 80%
  5 minutes: 80 to 85%
  10 minutes and beyond: 85 to 95%

- It is extremely important to keep the newborn warm. Warm the ambulance! If skin-to-skin contact with the mother is not feasible or in the best interest of the newborn over other priorities (resuscitation, etc.), the newborn must be kept warm by other means.
- Maternal sedation or opiate medications will sedate the newborn.
- Newborn airway is typically able to be managed with BLS devices, i.e. BVM, OPA, BIAD. If sedation is needed utilize Ketamine 1-2 mg/kg slow IV/IO, Fentanyl 2 mcg/kg IV/IO Max 50 mcg. **Paralytics are not recommended in the newborn.**
- Always consider the potential for hypoglycemia in the newborn. Use a lancet to the lateral or medial aspect of the heel only. Do not puncture directly over or posterior the heel; damage to the calcaneus may result.
- Always document the 1 and 5 minute APGAR in the PCR.

Pediatric General Trauma

History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential
- Chest: Tension pneumothorax; Flail chest, hemothorax; Pericardial tamponade; Open chest wound
- Intra-abdominal bleeding
- Pelvis/femur/spine fracture/spinal cord injury
- Head injury
- Extremity fracture / dislocation
- HEENT (airway obstruction)
- Hypothermia

Assess for serious signs/symptoms. ABCs and LOC

→ Pediatric Airway Protocol *(if indicated)*

Spinal Immobilization Procedure / Clearance *(immobilization is required if under 10 years old with possible spine injury)*

Pediatric Trauma Activation is based on age, not physiologic development.

For trauma level activation purposes, a pediatric patient includes newborns through 12 years olds.

Normal or abnormal vital signs, perfusion, and/or GCS?

Normal

B
- Repeat assessments frequently
- Splint suspected fractures. Consider pelvic binding. Control external hemorrhage
- Monitor and reassess

A IV/IO procedure *(if indicated)*

B Cardiac monitor *(if indicated. Required if patient meets level activation criteria)*

Pain present? FACES, "1 to 10", or FLACC scale

Yes → Pediatric Pain Management protocol, *if indicated*

No → **Transport** to appropriate trauma facility

If burn criteria activation is met, the patient should receive an IV and cardiac monitoring.

Abnormal

A IV Procedure | **A** IO Procedure

B Cardiac monitor

Emergent transport to an appropriate pediatric-capable trauma facility. **Limit scene time ≤ 10 minutes. Provide early facility notification**

B Splint suspected fractures. Consider pelvic binding. Control external hemorrhage

A **Normal Saline bolus 20 mL/kg IV/IO** Repeat to remain above age-specific hypotension (see Pearls). **Do not attempt to exceed the lower limits of normal blood pressure for the specific age group. Maximum: 60 mL/kg**

Pediatric Hypotension/Shock protocol, *if indicated*

P Chest Decompression-Needle Procedure *(if indicated)*

Pain present? FACES, "1 to 10", or FLACC scale

Yes → Pediatric Pain Management protocol, *if indicated*

Monitor and reassess

Notify Destination or Contact Medical Control

Pediatric Trauma Section Protocols

Pediatric General Trauma

Trauma Activation Level I Criteria

Pediatric Patients with:_____

_____Infant (0-12 months) Pulse greater than 200

_____Infant (0-12 months) RR less than 20

_____Toddlers (1-3) Pulse greater than 160

_____Child (4-12) Pulse greater than 140

_____ Intubated patient
_____ Evidence of airway compromise or unsecured airway
_____ GCS less than 9 with mechanism consistent with multiple system injury
_____ Penetrating injury to head, neck, chest or abdomen (i.e., Stabbing, GSW, Impalement)

Trauma Activation Level II criteria

_____Ejection from vehicle (partial or complete)

_____Rollover, unrestrained

_____ Auto vs pedestrian/bicyclist greater than 20 mph

_____ Motorcycle crash greater than 20 mph; motorcycle crash with no helmet

_____ Sustained GCS of 14 or less following traumatic event

_____ Falls greater than 10 ft or greater than 2 times patient's height

_____ Flail chest

_____ Two or more long bone fractures

_____ Suspected pelvic fracture

_____ Paralysis

_____ Open or depressed skull fracture

_____ Amputation proximal to wrist/ankle

_____Pulseless extremity; crushed, degloved or mangled extremity NOT including digits

_____ Burns meeting ABA criteria for transfer to a burn unit

Guidelines for Trauma Activation

- Vital sign abnormalities: i.e. confirmed systolic BP less than 90 or HR greater than 130 documented at any point prior to arrival.
- Transfers out should occur within 2 hours of arrival.

American Burn Association Criteria for Transfer to a Burn Unit

- Partial thickness burns greater than 10% TBSA.
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
- Third-degree burns in any age group.
- Electrical burns (including lightning injury), chemical burns or inhalation injury.
- Burn injury in patient with preexisting medical disorders that could complicate management.

Pediatric General Trauma

Pearls:

- **Recommended Exam: Mental status, skin, HEENT, heart, lungs, abdomen, extremities, back, neurological.**
- **Transport destination is chosen based on the trauma level criteria with EMS pre-arrival notification to the facility. The specific pediatric criteria (ages 0 to 12 years old) is listed on the right-side column in the chart.**
- **Scene times should not be delayed for procedures. Procedures should be performed enroute whenever possible. Emergent transport of the unstable trauma patient to the appropriate facility IS the goal.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Heart rate: One of the most common initial clinical signs of hemorrhagic shock is increased heart rate. If the heart rate decreases from tachycardia to bradycardia, cardiac arrest may be imminent.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 70 mmHg for UMC's trauma activation criteria.**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- **A bag-valve-mask is an acceptable method of managing the airway if pulse oximetry can be maintained≥ 90% and there is no foreseeable risk for aspiration.**
- Mechanism can be the most reliable indicator of serious injury.
- In prolonged extrications, consider air transportation for transport time and the ability to transfuse blood.
- Do not overlook the possibility of associated domestic violence or abuse.

Pediatric Traumatic Event with Entrapment

History
- Age
- Location/duration
- Pain severity (1 to 10)
- Type of event involved
- Part of body affected
- Past medical history
- Pregnancy status
- Drug allergies and medications

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area
- Entrapped and unable to assess body

Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / respiratory
- Neurogenic
- Renal (colic)

<u>Ketamine</u>

The patient may have transient non-purposeful movements associated with ketamine. Such movements may include short term muscle rigidity and/or nystagmus, which will resolve on its own.

Watch for any signs of severe nausea, vomiting, or excessive oral secretions, which are uncommon but may compromise the airway. Have portable suction readily available.

Pain with a portion of the body entrapped with a high suspicion of severe bone injury?

No → Pediatric General Trauma protocol *and* Pediatric Pain Management protocol

Yes ↓

Severe pain (scale > 8) with abnormal vital signs and GCS ≥ 8?
Use the "1 to 10", FLACC, or FACES scale

No → Altered Mental Status protocol, *if indicated*. Pediatric Airway Protocol, *if indicated* → Pediatric General Trauma protocol *and* Pediatric Pain Management protocol

Yes ↓

A	IV /IO Procedure (consider fluid bolus, *if needed*)
B	Cardiac monitor (required when safe to do)

↓

P	Assess and monitor respiratory status. Provide oxygen via appropriate device by ALS provider.
	Ketamine 0.3 mg/ kg SIVP (IV/IO only)Maximum of 50 mg Repeat once in 15 minutes if needed NOT TO EXCEED MAX DOSAGE

↓

Monitor and reassess the patient every 5 minutes following a medication dose by the ALS provider.
Follow the Pediatric General Trauma protocol.

↓

Any decrease in level of consciousness or respiratory status?

Yes → Airway protocol, *if indicated*

No ↓

Notify destination or contact Medical Control. Continue with rescue and appropriate protocol(s). Consult with Medical Control if additional pain management is needed.

Pediatric Traumatic Arrest

History
- Patient who has suffered a traumatic injury and is now pulseless.

Signs and Symptoms
- Evidence of penetrating trauma
- Evidence of blunt trauma

Differential
- Medical condition preceding traumatic event as cause of arrest.
- Tension pneumothorax
- Hypovolemic shock:
  - External hemorrhage
  - Unstable pelvic fracture
  - Displaced long bone fracture(s)
  - Hemothorax
  - Intra-abdominal hemorrhage
  - Retroperitoneal hemorrhage

Patient with an injury obviously incompatible with life?

Yes →
- **Decomposition**
- **Rigor mortis**
- **Dependent lividity**
- **Injury incompatible with life**

Do not begin resuscitation if any one of these criteria have been met. If CPR has already begun, you may terminate CPR efforts.

Follow the Criteria for Death/ Withholding Resuscitation Policy and Deceased Body Procedure.

No ↓

Keep scene time to ≤ 10 minutes.

Emergent transport to the ED for definitive care is the priority in the traumatic arrest patient.

B

Spinal immobilization/clearance.

Spinal immobilization is required for patients under 10 years old with possible spinal injury.

Begin continuous CPR compressions using ResQPUMP at 80 BPM
If ResQPUMP unavailible –
Push hard (1.5 inches in infants or 2 inches in children) and push fast (110 per min)
Change compressors every 2 minutes
(*Limit changes / pulse checks ≤ 5 seconds*)

↓

Pediatric Airway Protocol. Consider an advanced airway early, including BIAD.

↓

Known or suspected chest injury?

Yes ↔ **P** Chest Decompression Needle Procedure *(if indicated)*

↓

B Control external hemorrhage

A IV/IO Procedure

Normal Saline bolus 20 mL/kg by IV/IO
Maximum of 60 mL/kg

B Cardiac monitor (*if not already done*) ↔ Appropriate pediatric cardiac protocol (PEA/Asystole or Pulseless V-Fib/V-Tach)

↓

Return of pulse?

Yes → Exit to Pediatric Post-Arrest Resuscitation protocol

No ↓

Notify Destination or Contact Medical Control

Pediatric Trauma Section Protocols

Pediatric Traumatic Arrest

Pearls:

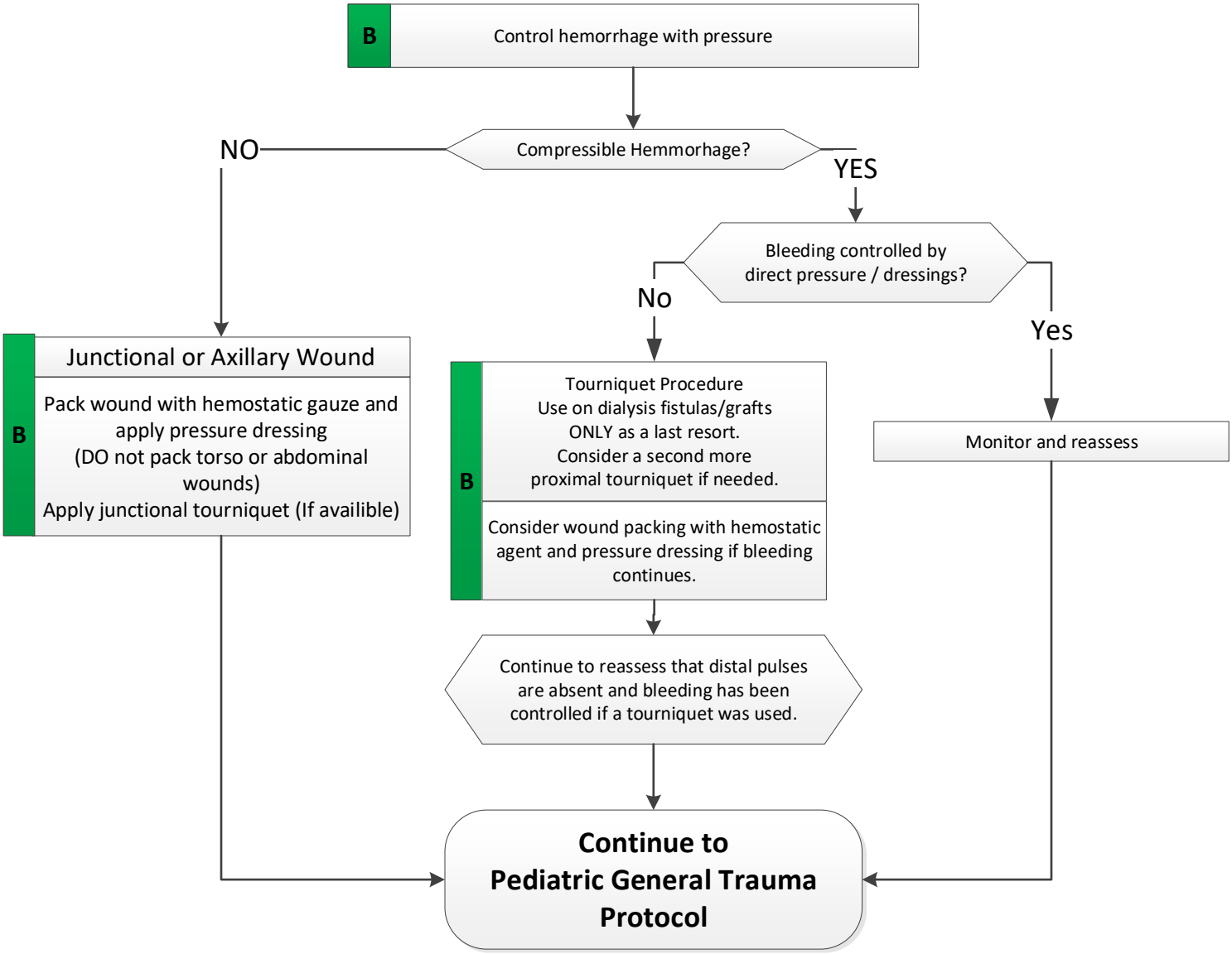
- Injuries obviously incompatible with life include decapitation, massively deformed head or chest injuries, or other features of a particular patient encounter that would make resuscitation futile.
- Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest.
- As with all major trauma patients, transport should generally not be delayed for these patients.
- Where the use of spinal immobilization interferes with performance of quality CPR, make reasonable efforts to manually limit patient movement.
- Patient may be a candidate for Life Gift Donation.

Pediatric Extremity Trauma

History
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open versus closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation



Amputation

Rinse the amputated part with normal saline, and then completely wrap the part in a sterile trauma dressing soaked with normal saline. Place the wrapped part in a leak proof plastic bag and then place the bag in an ice water bath or cold saline, if available. Do not place the part directly on ice.

Do not delay transport to search for an amputated part; delegate this task to other responders.

Pediatric Extremity Trauma

Pearls:

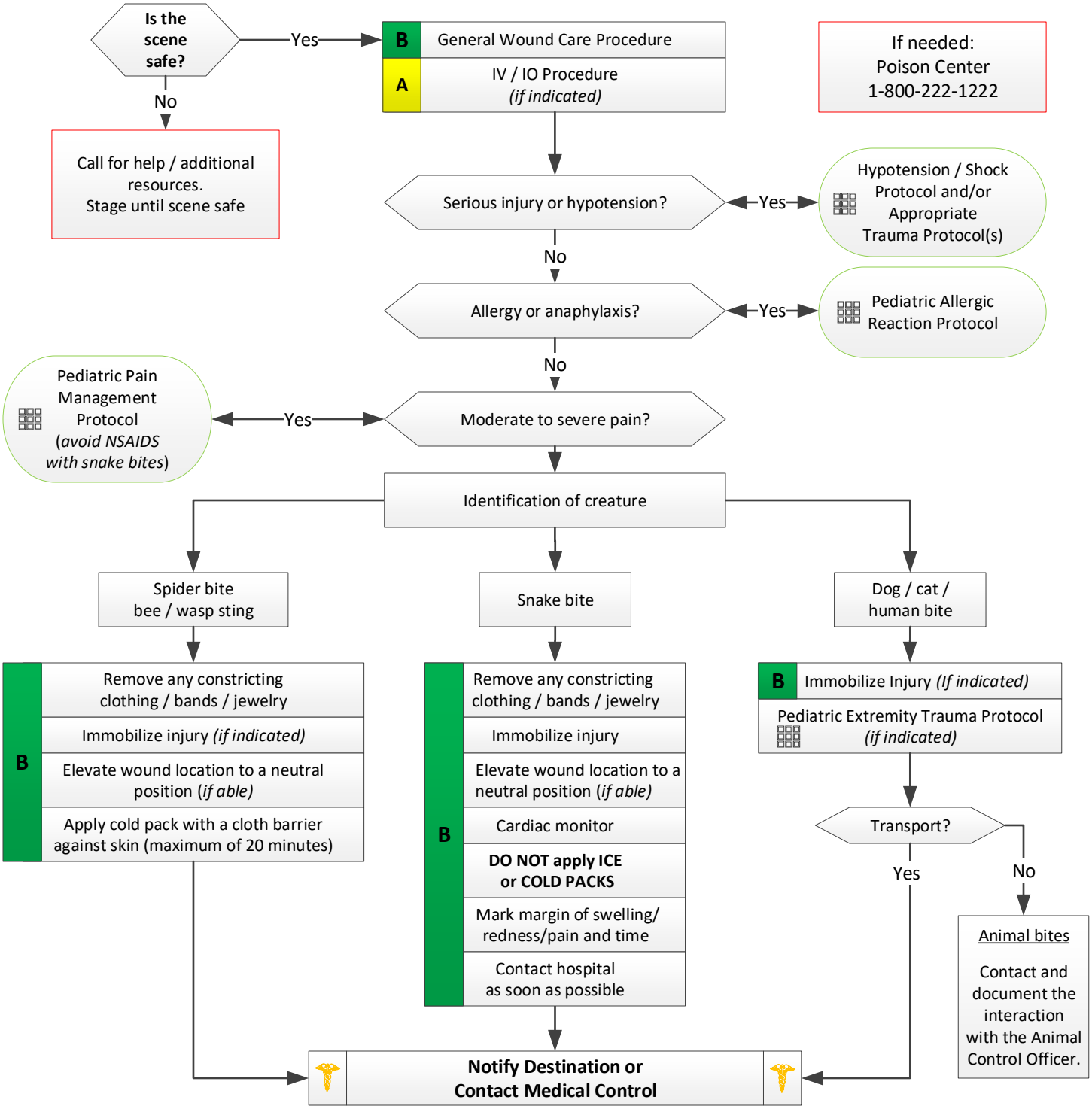
- **Recommended Exam: Mental status, extremity, neurological.**
- **Mass casualty incident or obvious life-threatening hemorrhage: Consider Tourniquet Procedure FIRST.**
- Peripheral neurovascular status is important. This information should relayed to the receiving facility and documented in the patient care report.
- Hip, knee, and elbow fractures/dislocations have a high incidence of vascular compromise.
- Emergent transport is indicated for any injury with vascular compromise and any amputation; time is particularly critical in these cases.
- Blood loss may be concealed or not apparent with extremity injuries. Monitor patient response, pain, and vital signs frequently.
- Lacerations should be evaluated for repair within 6 hours from the time of injury.
- Law enforcement and/or fire responders may have a tourniquet in place upon your arrival.
- Tourniquets are extremely painful. Address the patient's pain management needs as soon as safely feasible. Consider intranasal fentanyl if IV access is difficult or delayed and the patient is older than 2 years old. Morphine can be used for all ages if blood pressure exceeds age-based hypotension values.
- Tourniquets should not be loosened unless indicated by Medical Control.
- **It is vital to have the time of amputation and time the tourniquet was tightened relayed to the receiving hospital and documented in the PCR. If possible, document the time of tourniquet application on the tourniquet itself.**

Pediatric Bites and Envenomations

History
- Type of bite / sting
- Description or bring dead creature / photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic versus wild
- Tetanus and rabies risk
- Immunocompromised patient

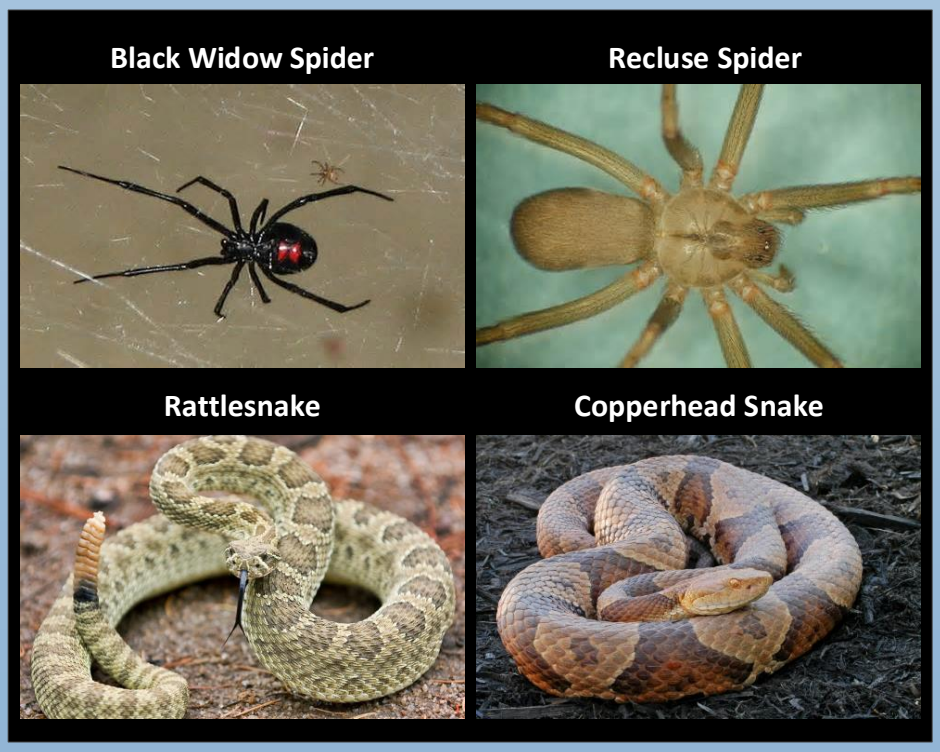
Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk



Pediatric Trauma Section Protocols

Pediatric Bites and Envenomations



Pearls:

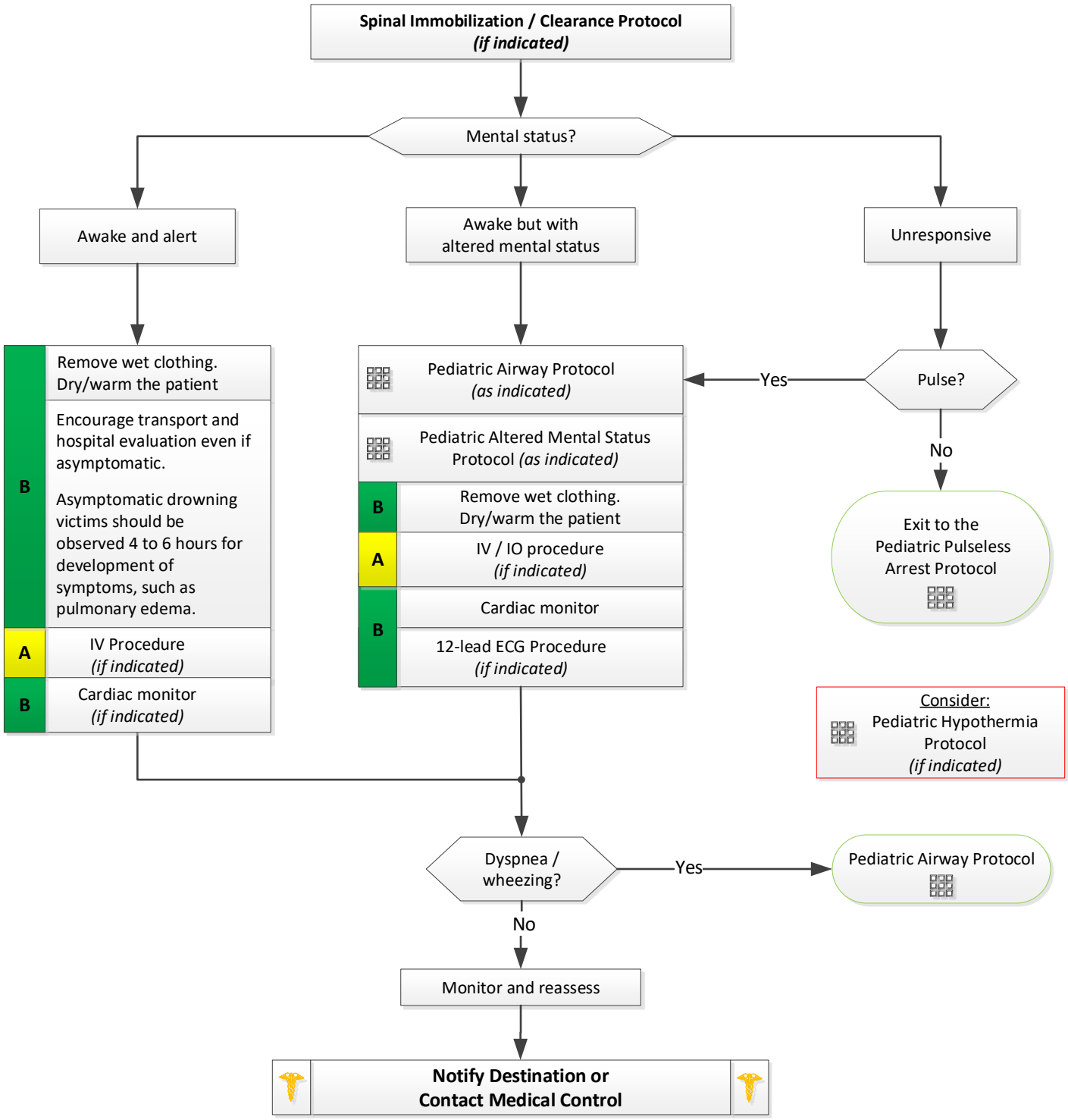
- **Recommended Exam: Mental status, skin, extremities (location of injury), and a complete neck, lung, heart, abdomen, back, and neurologic exam if systemic effects are noted.**
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria *(Pasteurella multicoda*).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead. Notify the emergency department early for anti-venom preparation.
- Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- If no pain or swelling is present, envenomation is unlikely. Up to 25% of snake bites are “dry” bites.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop. The spider is usually black with a red or orange hourglass on belly.
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days. It is a brown spider with fiddle shape on its back.
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Do not give NSAIDs for snake bites due to effect on platelet aggregation. Opiate medications are preferred.
- Immunocompromised patients are at an increased risk for infection: diabetics, chemotherapy patients, and transplant patients.
- Elevating wound to a neutral position: A neutral position is where the site of injury is level to the heart.

Pediatric Drowning / Submersion Injury

History
- Submersion in water regardless of depth
- Possible history of trauma (example: diving board injury)
- Duration of immersion
- Temperature of water or possibility of hypothermia
- Degree of water contamination

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing, wheezing, rales, rhonchi, stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem, such as an undiagnosed congenital heart defect
- Pressure injury (diving)
  - Barotrauma
  - Decompression sickness
- Post-immersion syndrome



Pediatric Drowning / Submersion Injury

Pearls:

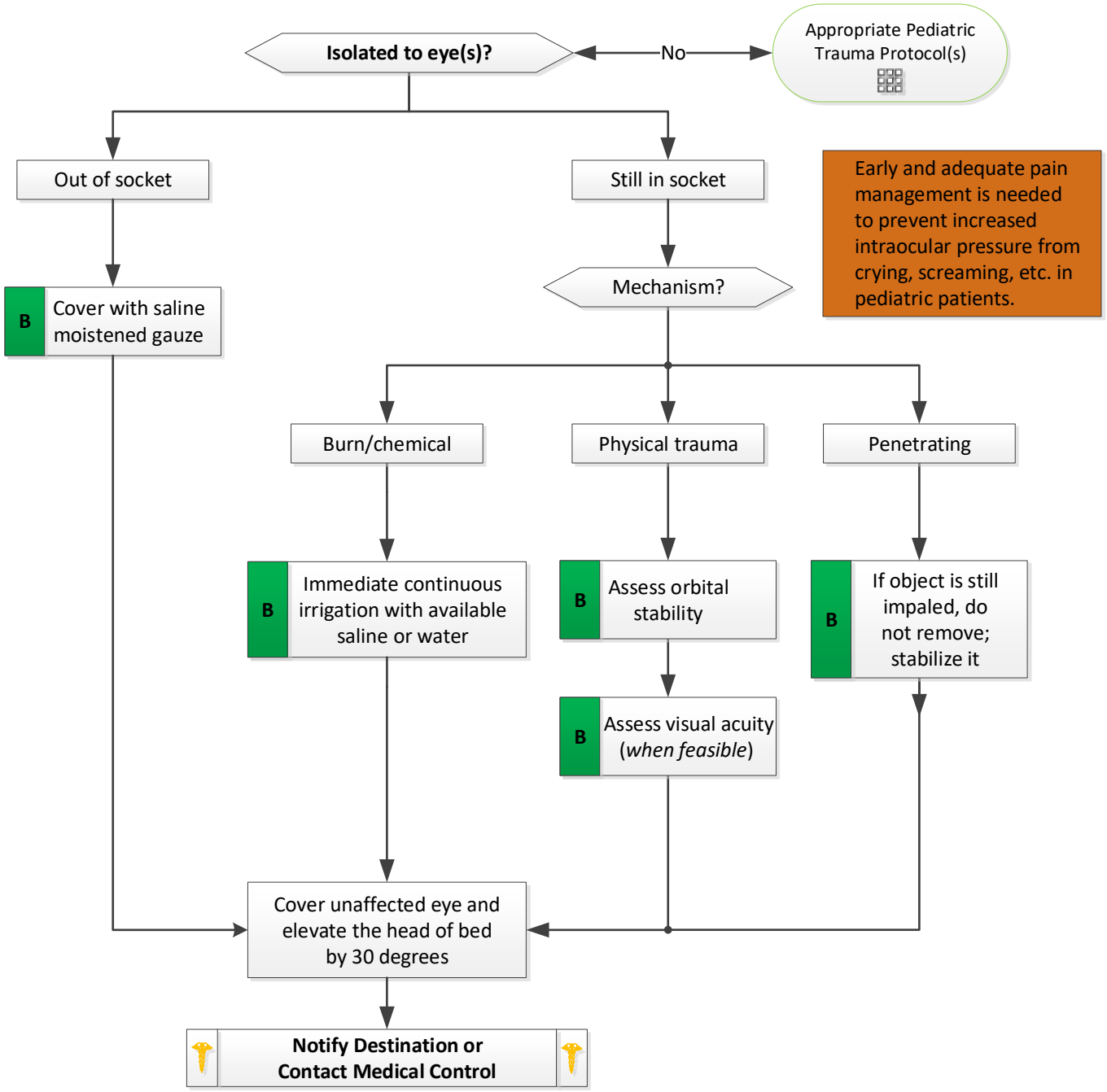
- **Recommended Exam: Trauma survey, head, neck, chest, abdomen, pelvis, back, extremities, skin, neurologic.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **Allow appropriately-trained and certified rescuers to remove victims from areas of danger whenever possible.**
- **Resuscitate all patients who have been submerged in cold water unless there are signs clearly incompatible with life.**
- **Use the Broselow-Luten pediatric tape for weight estimates.**
- **Age-based hypotension:**
  - **Newborn to 28 days old: Systolic BP < 70 mmHg for UMC's trauma activation criteria.**
  - **1 month to 1 year old: Systolic BP < 70 mmHg**
  - **1 year to 10 years old: Systolic BP < 70 + (2 x age) mmHg**
  - **11 years and older: Systolic BP < 90 mmHg**
- Have a high index of suspicion for possible spinal injuries.
- Hypothermia is often associated with drowning and submersion injuries.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Pulmonary edema may develop minutes to hours from the submersion fluid's inflammation/irritation of the respiratory tract. Monitor the patient for signs/symptoms related to this condition. If transport is refused even after explanation of the risks, advise the patient's parent/ guardian of the symptoms that may develop and the need to call EMS immediately.

Pediatric Eye Injury / Complaint

History:
- Time of injury/onset
- Blunt/penetrating/chemical
- Open versus closed injury
- Involved chemicals/MSDS
- Wound contamination
- Medical history
- Tetanus status
- Normal visual acuity
- Medications

Signs and Symptoms:
- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- "Shooting" or "streaking" light
- Visible contaminants
- Rust ring
- Lacrimation

Differential:
- Abrasion/laceration
- Globe rupture
- Retinal nerve damage/detachment
- Chemical/thermal burn/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion



Pediatric Eye Injury / Complaint

Pearls:

- Normal visual acuity can be present even with severe eye injury.
- Remove contact lenses whenever possible.
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult.
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status.
- Always cover both eyes to prevent further injury and eye movement.
- Do not remove impaled objects.
- Suspected globe rupture or compartment syndrome requires emergent intervention.
- Only opiate-based analgesics should be used for pain management. Avoid the use of ketorolac or other NSAIDs due to their platelet-inhibiting properties.
- Do not allow the patient to vomit due to the increase in intraocular pressure. Consider ondansetron for nausea.
- Visual acuity can be difficult to assess in pediatric patients. With children, a visual acuity assessment can include describing the color of a blood tube top, number of fingers, or other simpler means.

Pediatric General Burn (All Types)

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and medications
- Other trauma
- Loss of consciousness
- Tetanus / Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

Differential
- Superficial (1st degree): Red - painful (don't include in TBSA)
- Partial thickness (2nd degree): Blistering
- Full thickness (3rd degree): Painless/charred or leathery skin
- Thermal injury
- Chemical – electrical injury
- Radiation injury
- Blast injury

Burn / concomitant injury severity?

Minor burn

< 5% TBSA of 2nd/3rd degree burn
No inhalation injury, not intubated, and is normotensive.
GCS of 14 or greater

B
- Remove rings, bracelets, and other constricting Items
- Dry clean sheet or dressings over burn

- Pediatric Trauma Protocol *(as indicated)*
- Pediatric Airway Protocol *(as indicated)*

A
- IV Procedure *(if indicated)*
- **Normal Saline 3 mL/kg (x % TBSA) by IV/IO** Half over first 8 hours. *(if indicated)*

- Pediatric Pain Management Protocol *(if indicated)*

Transport to burn center

Severe burn

5 to 15% TBSA of 2nd/3rd degree burn
Suspected inhalation injury or requiring intubation for airway stabilization.
Hypotension or GCS of 13 or less

Critical burn

>15% TBSA of 2nd/3rd degree burn
Burns with multiple trauma.
Burns with definitive airway compromise

B
- Remove rings, bracelets, and other constricting items
- Dry clean sheet or dressings over burn

- Pediatric Trauma Protocol *(as indicated)*
- Pediatric Airway Protocol *(as indicated)*

A
- IV Procedure
  Consider 2 IV sites if greater than 15 % TBSA or if IV is unobtainable, one IO site *(if indicated)*
- **Normal Saline 3 mL/kg (x % TBSA) by IV/IO** Half over first 8 hours.

B
- Cardiac monitor

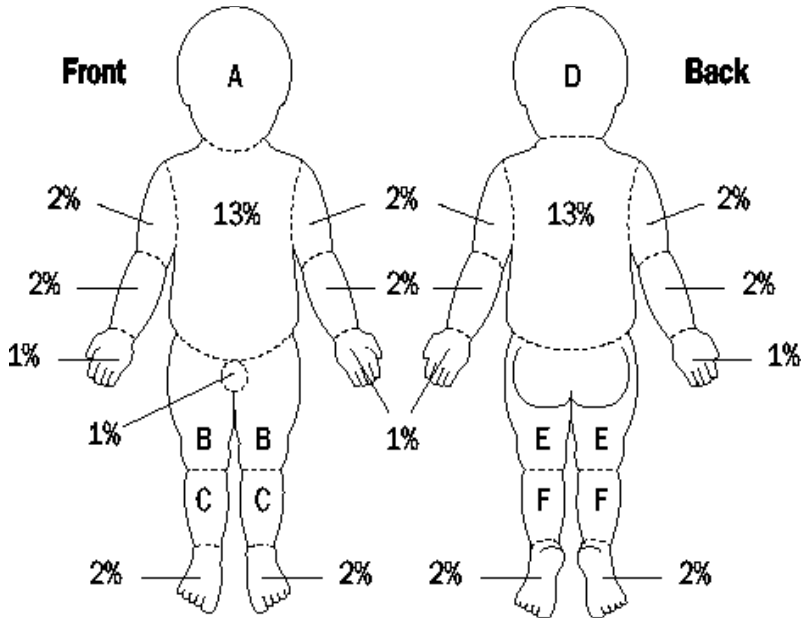
- Pediatric Pain Management Protocol

Emergent transport to trauma center

Notify Destination or Contact Medical Control

Pediatric Trauma Section Protocols

Pediatric General Burn (All Types)



Area	By age in years			
	0 to 1 year	1 to 5	5 to 10	10 and older
Head (A/D)	10%	9%	7%	6%
Thigh (B/E)	3%	3%	4%	5%
Leg (C/F)	2%	3%	3%	3%

Estimate spotty areas of burn by using the size of the patient's palm as 1% TBSA

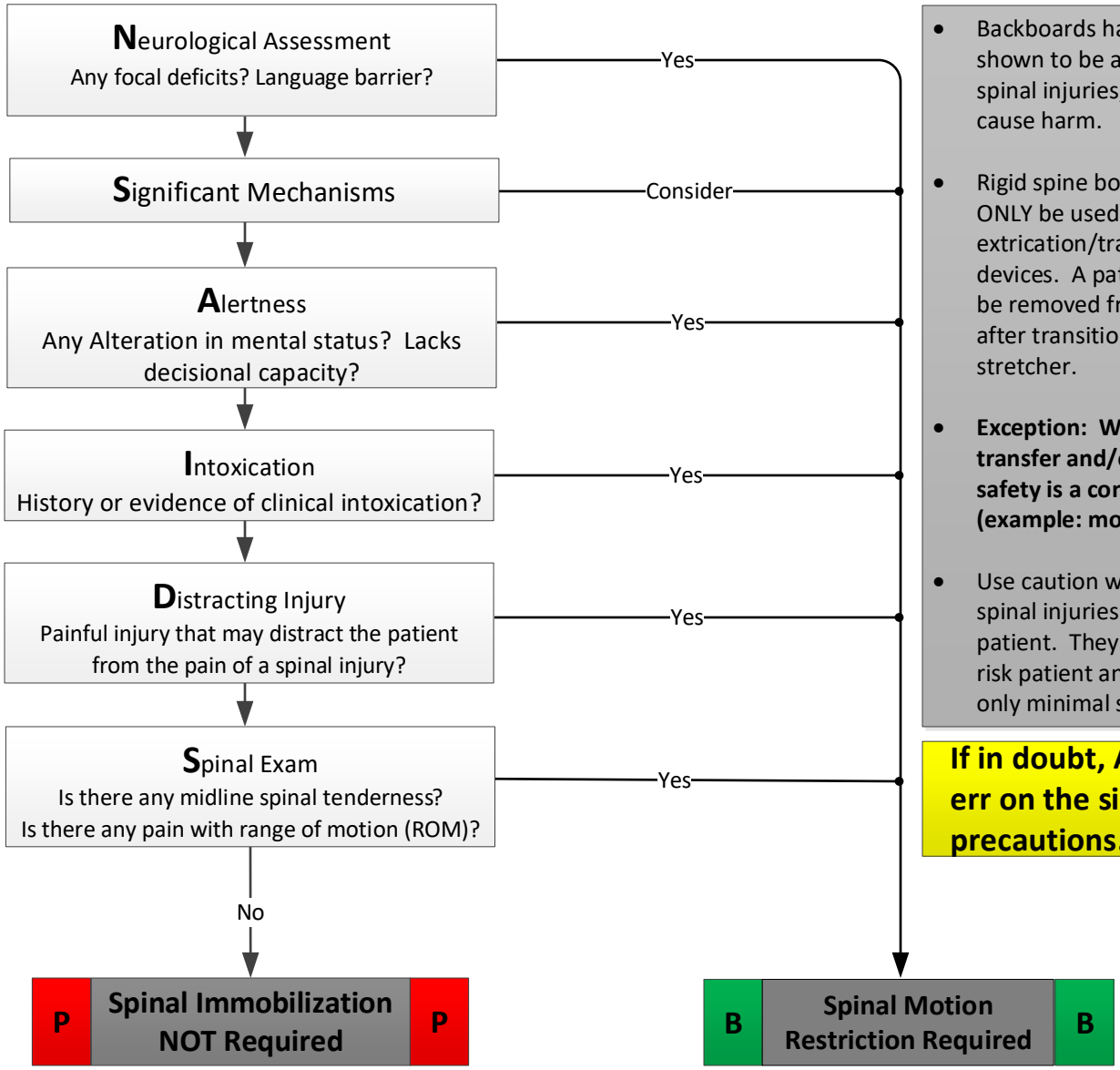
Rule of Nines:

- Seldom do you find a completely isolated body part injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burns from those of partial (2nd) or full (3rd) degree thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of a burn, include only partial and full thickness burns. Report the observation of other superficial (1st degree) burns, but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th, 5th, and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial, and full thickness burn at least at the level of emergent and primary care. For our work, all are included in full thickness burns.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Pearls:

- **Recommended Exam: Mental status, HEENT, neck, heart, lungs, abdomen, extremities, back, and neurologic.**
- **Critical or Serious Burns:**
  - **> 5 to 15% total body surface area (TBSA) of 2nd or 3rd degree burns, or**
  - **3rd degree burns > 5% TBSA for any age group, or**
  - **Circumferential burns of extremities, or**
  - **Electrical or lightning injuries, or**
  - **Suspicion of abuse or neglect, or**
  - **Inhalation injury, or**
  - **Chemical burns, or**
  - **Burns of face, hands, perineum, or feet**
- Serious and critical burns require direct transport to a burn center, which is University Medical Center for our service area.
- Burn patients are often trauma patients; evaluate for multisystem trauma.
- Assure that whatever has caused the burn is no longer contacting the injury. Stop the burning process!
- Early intubation is required when the patient experiences significant inhalation injuries; laryngoedema is likely to develop.
- Circumferential burns to the extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn; Must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- **Never administer IM injections to a burn patient.** Consider intranasal fentanyl for pain if IV access cannot be obtained and patient is greater than 2 years old. Morphine is indicated for all ages as long as above age-based hypotension limits. See Pediatric Pain Management protocol.

Pediatric Spinal Immobilization Clearance



- Backboards have not been shown to be any benefit for spinal injuries, but may cause harm.
- Rigid spine boards should ONLY be used as extrication/transfer devices. A patient should be removed from the board after transition to the stretcher.
- **Exception: When ease of transfer and/or patient safety is a concern (example: morbid obesity).**
- Use caution when assessing spinal injuries in the elderly patient. They are a higher risk patient and may have only minimal symptoms.

If in doubt, ALWAYS err on the side of precautions.

Pearls:

- The acronym "**NSAIDS**" should be used to remember the steps in this protocol:

  "**N**" - Neuro Exam: Look for focal deficits such as tingling, reduced strength, or numbness. Verify you and the patient speak the same language.

  "**S**" - Significant Mechanisms: Use your judgment; Studies have shown that mechanism alone should NOT dictate the need for immobilization.

  "**A**" - Alertness: Is the patient oriented to person, place, time, and situation?

  "**I**" - Intoxication: Are there any indications the person is intoxicated or under the influence (illicit or legal drugs, alcohol, etc.)?

  "**D**" - Distracting Injury: Is there any other part of the body causing enough pain to where the patient may not realize his or her spine is hurting?

  "**S**" - Spinal Exam: Check for point tenderness along the spinous process of the entire spine; also check for painful range of motion. Log rolling the patient to assess is appropriate with someone maintaining manual C-spine stabilization until cleared.

- **Range of motion should NOT be assessed if the patient has pain or tenderness to ANY area of the spine.**
- Range of motion: Patient should slowly touch his or her chin to the chest, extend the neck (look up), and turn the head from side to side without midline spinal pain. Immediately stop the range of motion assessment and provide cervical stabilization/immobilization if any pain is reported.
- Once a cervical collar has been placed, it MUST OBLY BE REMOVED by a physician. However, a paramedic may choose to removed the backboard from the patient with spinal precautions taken (logroll or lift on sheet with multiple responders).
- An EMT-B or AEMT may immobilize based on this protocol, however, if they feel that spinal immobilization is NOT required, they **must maintain manual stabilization until an EMT-P has arrived**. ONLY an EMT-P may make the decision to not use spinal precautions.
- Always inform the patient with spinal motion restrictions to remain still on the cot.

Dopamine Infusion
Based on 400 mg / 250 mL concentration

Patient weight in kg	5 mcg/kg/min (mL / hr)	10 mcg/kg/min (mL / hr)	15 mcg/kg/min (mL / hr)	20 mcg/kg/min (mL / hr)
20	4	8	11	15
30	6	11	17	23
40	8	15	23	30
50	9	19	28	38
60	11	23	34	45
70	13	26	39	53
80	15	30	45	60
90	17	34	51	68
100	19	38	56	75
110	21	41	62	82
120	22	45	68	90
130	24	49	73	98
140	26	52	79	105
150	28	56	84	112

FORMULA: ***If the dose in mcg/kg/min is known*: mL per hour = (mcg x 60 x kg) ÷ concentration**

***If mL per hour is known*: mcg/kg/min = mL per hr ÷ kg ÷ 60 x concentration**

EXAMPLE: **A 50 kg patient needs 5 mcg/kg/min of dopamine. The concentration in the bag is 1600 mcg/mL.**

(5 x 60 x 50) ÷ 1600 mcg/mL = mL/hr

15,000 ÷ 800 = 9.37 mL/hr

Epinephrine / Levophed Infusions

EPINEPHRINE	1mg in 1000mL of NS = 1 mcg/mL	
	Administration Set	
Infusion Rate	10gtt/mL	60 gtt/mL
1 mcg/min	10 drops/min	60 drops/min or 1 drop/sec
2 mcg/min	20 drops/min	120 drops/min or 2 drops/sec
4 mcg/min	40 drops/min	240 drops/min or 4 drops/sec
6 mcg/min	60 drops/min	360 drops/min or 6 drops/sec
8 mcg/min	80 drops/min	480 drops/min or 8 drops/sec
10 mcg/min	100 drops/min	600 drops/min or 10 drops/sec

LEVOPHED	4mg in 1000mL of NS = 4mcg/mL	
	Administration Set	
Infusion Rate	10gtt/mL	60 gtt/mL
2 mcg/min	5 drops/min	30 drops/min or 1 drop/2 sec
4 mcg/min	10 drops/min	60 drops/min or 1 drop/sec
6 mcg/min	15 drops/min	90 drops/min or 1.5 drop/sec
8 mcg/min	20 drops/min	120 drops / min or 2 drops / sec
10 mcg/min	25 drops/min	150 drops/min or 2.5 drops/sec
12 mcg/min	30 drops/min	180 drops/min or 3 drops/sec
14 mcg/min	35 drops/min	210 drops/min or 3.5 drops/sec
16 mcg/min	40 drops/min	240 drops/min or 4 drops/sec
18 mcg/min	45 drops/min	270 drops/min or 4.5 drops/sec
20 mcg/min	50 drops/min	300 drops/min or 5 drops/sec

Approved Medical Abbreviations

The following is a list of approved medical abbreviations for EMS patient care reports and any addendums.

A&O x 3	Alert and oriented to person, place, and time
A&O x 4	Alert and oriented to person, place, time, event
A-FIB	Atrial fibrillation
AAA	Abdominal aortic aneurysm
ABC	Airway, breathing, and circulation
ABD	Abdominal
AC	Antecubital
ACLS	Advanced cardiac life support
AED	Automated external defibrillator
AIDS	Acquired immune deficiency syndrome
AF	Atrial flutter
AKA	Above the knee amputation
ALS	Advanced life support
AMA	Against medical advice
AMI	Acute myocardial infarction
AMS	Altered mental status
AMT	Amount
APAP	Acetaminophen
APGAR	Neonate assessment score
APPROX	Approximately
ASA	Aspirin
ASSOC	Associated
BBB	Bundle branch block
BGL	Blood glucose level
BILAT	Bilateral
BKA	Below the knee amputation
BLS	Basic life support
BM	Bowel movement
BP	Blood pressure
BS	Breath sounds
BVM	Bag-valve-mask
C-SECTION	Caesarean section
C-SPINE	Cervical spine
C/O	Complaint of (complains of)
CA	Cancer
CABG	Coronary artery bypass graft
CAD	Coronary artery disease
CATH	Catheter
CC	Chief complaint
CCU	Coronary care unit
CEPH	Cephalic
CF	Cystic fibrosis
CHF	Congestive heart failure
CMC	Covenant Medical Center
cmH2O	Centimeters of water
CNA	Certified nurse assistant
CNS	Central nervous system
CO	Carbon monoxide
CO2	Carbon dioxide
COPD	Congestive obstructive pulmonary disease
CP	Chest pain
CPR	Cardiopulmonary resuscitation
CSF	Cerebral spinal fluid
CT	Computerized tomography (CT or CAT) scan
CVA	Cerebrovascular accident (stroke)
D10W	10% dextrose in water
D12.5W	12.5% dextrose in water
D5W	5% dextrose in water
D50W	50% dextrose in water
DM	Diabetes mellitus
DKA	Diabetic ketoacidosis
DNR	Do not resuscitate
DOA	Dead on arrival
DSED	Double (or dual) sequential external defibrillation
DT	Delirium tremens
DVT	Deep vein thrombosis
Dx	Diagnosis
ECG	Electrocardiogram
ED	Emergency department
EEG	Electroencephelogram
EJ	External jugular
EMS	Emergency medical services
EMT	Emergency medical technician
EPS	Extrapyramidal symptoms
ESRD	End-stage renal disease
ET	Endotracheal
ETA	Estimated time of arrival
ETCO2	Endotracheal tube carbon dioxide measurement
ETOH	Ethanol (consumable alcohol)
ETT	Endotracheal tube
EXT	External or extension
F	Female
FACES	Wong-Baker FACES pain scale
FB	Foreign body
FBAO	Foreign body airway obstruction
FD	Fire department
FLACC	FLACC pain scale
FLEX	Flexion
Fx	Fracture
g	Gram
G#P#	Gravida-para (insert actual number in place of #)
GCS	Glasgow Coma Score
GERD	Gastroesophageal reflux disease
GI	Gastrointestinal
GSW	Gunshot wound
gtts	Drops
GU	Gastrourinary
GYN	Gynecology (gynecological)

Approved Medical Abbreviations

The following is a list of approved medical abbreviations for EMS patient care reports and any addendums.

H/A	Headache
HEENT	Head, eyes, ears, nose, and throat
H&H	Hemoglobin and hematocrit
HR	Heart rate
HTN	Hypertension
Hx	History
ICD	Implanted cardiac defibrillator
ICP	Intracranial pressure
ICS	Intercostal space
ICU	Intensive care unit
IDDM	Insulin-dependent diabetes mellitus
IM	Intramuscular
IN	Intranasal
IO	Intraosseous
IV	Intravenous
IVP	Intravenous push
IVPB	Intravenous piggyback infusion
J	Joules
JVD	Jugular venous distension
kg	Kilogram
KED	Kendrick extrication device
KVO	Keep vein open
L	Liter(s)
L-SPINE	Lumbar spine
L/S-SPINE	Lumbosacral spine
L&D	Labor and delivery
Lac	Laceration
LAT	Lateral
lb	Pound
LBBB	Left bundle branch block
LLQ	Left lower quadrant
LMP	Last menstrual period
LOC	Level of consciousness or loss of consciousness
LP	Lumbar puncture
Lpm	Liters per minute
LR	Lactated Ringers solution
LSB	Long spine board
LUQ	Left upper quadrant
LVN	Licensed Vocational Nurse
LVAD	Left ventricular assist device
M	Male
MAST	Military anti-shock trousers
mcg	Micrograms
MCI	Mass casualty event
MED	medicine
MDI	Metered-dose inhaler
ME	Medical examiner
mEq	Milliequivalent
mg	Milligram(s)
mg/dL	Milligrams per deciliter
MI	Myocardial infarction
MICU	Medical intensive care unit
min	Minimum or minute
mL	Milliliter
ml	Milliliter
mmHg	Millimeters of mercury
MOI	Mechanism of injury
MRI	Magnetic resonance imaging
MS	Multiple sclerosis
MVC	Motor vehicle crash
N/V	Nausea/vomiting
N/V/D	Nausea/vomiting/diarrhea
NaCl	Sodium chloride
NAD	No apparent distress
NC	Nasal cannula
NEB	Nebulizer or nebulized
NG	Nasogastric
NIBP	Non-invasive blood pressure measurement
NKDA	No known drug allergies
NP	Nurse practitioner
NPA	Nasopharyngeal airway device
NRB	Non-rebreather mask
NS	Normal saline solution
NSAID	Non-steroidal anti-inflammatory drug
NSR	Normal sinus rhythm
NTG	Nitroglycerin
O2	Oxygen
OB	Obstetrics
OB/GYN	Obstetrics/gynecology
OD	Overdose
OPA	Oropharyngeal airway device
OTC	Over-the-counter
oz	Ounce
P	Pulse
PA	Physician Assistant
PAC	Premature atrial contractions
PAI	Pharmaceutically-assisted intubation
PALP	Palpated
PCI	Percutaneous coronary intervention
PCN	Penicillin
PCP	Primary care physician
PCR	Patient care report
PD	Police department
PERRL	Pupils equal, round, and reactive to light
PE	Pulmonary embolism
PEA	Pulseless electrical activity

Approved Medical Abbreviations

The following is a list of approved medical abbreviations for EMS patient care reports and any addendums.

PEARL	Pupils equal and reactive to light
PEEP	Positive end-expiratory pressure
PEG	Percutaneous endoscopic gastrostomy tube
PICC	Peripherally-inserted central catheter
PID	Pelvic inflammatory disease
PJC	Premature junctional contractions
PMHx	Past medical history
PO	Orally
POV	Privately-owned vehicle
PR	Pulse rate
PSVT	Paroxysmal supraventricular tachycardia
PT	Patient
pt	Patient
PTA	Prior to arrival
PVC	Premature ventricular contractions
RBBB	Right bundle branch block
RBC	Red blood cell (count)
RIVP	Rapid intravenous push
RLQ	Right lower quadrant
RN	Registered Nurse
ROM	Range of motion
RR	Respiratory rate
R/t	Related to
RT	Respiratory Therapist
RTS	Revised Trauma Score
RUQ	Right upper quadrant
Rx	Prescription
RXN	Reaction
s/p	Status post
sec	Seconds
SI	Suicidal ideations
SIVP	Slow intravenous push
SL	Sublingual
SOB	Shortness of breath
SNF	Skilled nursing facility
SpO2	Pulse oximetry reading
S/S	Signs and symptoms
SALT	Sort, Assess, Lifesaving interventions, and Treatment/Transport
STD	Sexually-transmitted disease
STEMI	ST segment elevation myocardial infarction
subq	Subcutaneous
SVT	Supraventricular tachycardia
SZ	Seizure
T-SPINE	Thoracic spine
TB	Tuberculosis
TBI	Traumatic brain injury
TCP	Transcutaneous pacing
Temp	Temperature
TENS	Transcutaneous electrical nerve stimulator
TIA	Transient ischemic attack
Tib-Fib	Tibia and fibula
TKO	To keep open
Tx	Treatment
UMC	University Medical Center
Unk	Unknown
UOP	Urinary output
URI	Upper respiratory infection
UTI	Urinary tract infection
UTO	Unable to Obtain
VAD	Ventricular assist device
VF	Ventricular fibrillation
V-fib	Ventricular fibrillation
VO	Verbal order
VS	Vital signs
VT	Ventricular tachycardia
V-tach	Ventricular tachycardia
w/o	Without
WBC	White blood cell (count)
WNL	Within normal limits
WPW	Wolff-Parkinson-White syndrome
YO	Years old
yo	Years old
@	At
=	Equal
>	Greater than
<	Less than
+	Positive
(-)	Negative
L	Left
R	Right

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Acetaminophen (Tylenol) Indications: Indicated for fever and mild pain control as a PO medication. It is not an NSAID. Contraindications: Avoid using in patients with severe liver disease or failure.	General dose: 15 mg/kg PO (500 to 1000 mg tablet for a typical adult) Not to exceed 4000 mg in 24 hours.	General dose: 15 mg/kg PO Not to exceed 75 mg/kg in 24 hours.
Adenosine (Adenocard) Indications: Narrow complex tachycardia / PSVT. Its effect is exerted directly on the AV node to delay conduction of impulses. Half life of adenosine is less than 10 seconds. Contraindications: ▫ Wolff-Parkinson-White syndrome ▫ Known 2nd or 3rd degree AV heart block	12 mg rapid IV push followed by a rapid 20 mL saline flush. May repeat once with a 12 mg dose if no effect.	0.1 mg/kg to a maximum of 6 mg per dose by rapid IV push, followed by a rapid 20 mL saline flush. May repeat once at 0.2 mg/kg to a maximum of 12 mg if no effect.
Amiodarone (Cordarone) Indications: Class III antiarrhythmic agent used for both ventricular and atrial dysrhythmias with multiple effects on sodium, potassium, and calcium channels. Contraindications: Avoid in patients with an AV heart block, bradycardia, and/or hypotension.	**Ventricular tachycardia without pulse or ventricular fibrillation** Dose: 300 mg IV Repeat the dose at 150 mg IV if needed. Total maximum of 450 mg **Ventricular tachycardia with a pulse** 5 mg/kg IV to a maximum of 150 mg over 10 minutes	**Ventricular tachycardia without pulse or ventricular fibrillation** Dose: 5 mg/kg IV to an initial maximum of 300 mg. Repeat the dose up to 150 mg per dose if needed. Total maximum of 15 mg/kg or 450 mg, whichever is reached first **Ventricular tachycardia with a pulse** 5 mg/kg IV to a maximum of 150 mg over 20 minutes
Aspirin Indications: An antiplatelet drug indicated for use with cardiac chest pain and STEMI. Contraindications: Patients with bleeding disorders (bleeding ulcers, hemophilia, hemorrhage) and those with an LVAD. Should be avoided in the 3rd trimester of pregnancy; consult with medical control.	325 mg or four 81 mg chewable tablets	Not for pediatric use

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Ativan (Lorazepam) Indications: Status seizures, Shivering (heat stroke)Tachydysrhythmias secondary to Cocaine, overdose, Raises seizure threshold at neuro-muscular junction Limits propagation of seizure in brain Diminishes CNS functions Contraindications: Myasthenia gravis, acute narrow angle glaucoma, known hypersensitivity to benzodiazepines.	0.05 mg/kg Titrate to effect up to a maximum single dose of 1 mg given by slow IV injection. May repeat every 5 min if symptoms are not resolved for a total max dose not to exceed 4 mg. *Not to exceed maximum total dose of 4mg	0.05 mg/kg of Ativan Titrate to effect up to a maximum single dose of 1 mg given by slow IV injection *Not to exceed maximum total dose of 1mg
Atropine Indications: Anticholinergic drug indicated for use with symptomatic bradycardia. Large doses may be required if used for organophosphate poisoning. If given by endotracheal tube, double the dose. Contraindications: Tachycardia. Note: Pupillary response will be affected and not a unreliable sign after atropine administration.	0.5 mg to 1 mg IVP Maximum of 3 mg total unless used as an organophosphate treatment.	0.02 mg/kg to a maximum of 1 mg IVP Minimum of 0.1 mg per dose Maximum of 3 mg total unless used as an organophosphate treatment.
Calcium chloride Indications: Increases the intracellular and extracellular calcium levels, leading to increased cardiac contractility. Indicated for suspected hyperkalemia during cardiac arrest or hypomagnesemia. Contraindications: Avoid use if patient is taking digoxin. Cannot be administered in a questionable IV access; requires a patent IV preferably in a large vein.	1 gram slow IVP Flush the IV line thoroughly before administering sodium bicarbonate to prevent precipitation.	20 mg/kg to a maximum of 1 gram Flush the IV line thoroughly before administering sodium bicarbonate to prevent precipitation.
Cyanokit (hydroxocobalamin) Indications: Suspected cyanide poisoning and/or Smoke inhalation patients with the following S/S: Altered LOC Seizures Cardiac Arrest Contraindications: None in the emergency setting	5 grams infused over 15 minutes May be repeated once	100 mg/kg infused over 15 minutes May be repeated once

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Dexamethasone (Decadron) Indications: A synthetic glucocorticoid (steroid) drug that has anti-inflammatory and immunosuppressant properties. Relaxes bronchospasms. Indicated for respiratory distress with wheezing. Contraindications: Age less than 2 years old.	20 mg slow IVP over 2 minutes. Completely flush line with normal saline after administration. Dexamethazsone is not compatible with midazolam (Versed) or diphenhydramine (Benadryl) in IV tubing.	Patient must be 2 years old or older 0.6 mg/kg to a maximum of 20 mg slow IVP over 2 minutes. Completely flush line with normal saline after administration. Dexamethazsone is not compatible with midazolam (Versed) or diphenhydramine (Benadryl) in IV tubing.
Dextrose solutions Indications: Indicated for hypoglycemia. A carbohydrate that rapidly reverses the effects of hypoglycemia on the CNS by elevating serum glucose levels. Contraindications: Hyperglycemia.	Varies. See the specific protocol for dosing.	Less than 1 month old: $D_{10}W$ 5 mL/kg 1 month to 2 years: $D_{10}W$ 5 mL/kg – infuse until symptoms resolve.
Diltiazem (Cardizem) Indications: Calcium channel blocker used to treat symptomatic narrow complex tachycardia by affecting the rate of impulse conduction through the AV node. Contraindications: Hypotension, bradycardia, wide-complex tachycardia, known 2nd or 3rd degree AV heart blocks, or known Wolff-Parkinson-White syndrome. Avoid use in myocardial infarction.	20 mg slow IVP if 59 years old or younger. If older, administer 10 mg slow IVP instead. If needed, may repeat once at same dose in 5 minutes if systolic blood pressure remains ≥ 90 mmHg.	Not for pediatric use
Dobutamine Indications: Dobutamine is a direct-acting inotropic agent whose primary activity results from stimulation of the b-receptors of the heart while producing less marked chronotropic, hypertensive, arrhythmogenic or vasodilatory effects. . Contraindications: Patients with idiopathic hypertrophic subaortic stenosis, in patients with pheochromocytoma, and in those patients with hypersensitivity to dobutamine.	Dose dependent response starting at 5 mcg/kg/min and titrating up to 20 mcg/kg/min if needed.	Not for pediatric use

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Diphenhydramine (Benadryl) Indications: Antihistamine used for allergic reactions. Does not decrease histamine release, but blocks those receptors to decrease capillary permeability and vasodilation. Prevents bronchospasm. Contraindications: None for a true allergic reaction.	50 mg PO/IV/IO/IM	1 mg/kg to a maximum of 50 mg by PO/IV/IO/IM
Dopamine Indications: An alpha and beta$_1$ agonist used to increase cardiac output through sympathetic mechanisms with a dose-dependent response. Contraindications: Cardiogenic shock and septic shock with dry lung sounds but not previously addressed with a fluid bolus.	Dose dependent response starting at 5 mcg/kg/min and titrating up to 20 mcg/kg/min if needed.	Dose dependent response starting at 2 mcg/kg/min and titrating up to 20 mcg/kg/min if needed.
DuoNeb – Albuterol 2.5 mg and ipratropium 0.5 mg Indications: Beta agonist and anticholinergic combination indicated for respiratory distress accompanies by wheezing. Contraindications: Allergy to atropine.	Refer to the specific protocol Asthma / COPD Allergic Reaction	Refer to the specific protocol Reactive Airway Disease Allergic Reaction
Enalaprilat (Vasotec) Indications: ACE inhibitor used to reduce afterload in patients with pulmonary edema. Contraindications: ▫ Pregnancy or suspected pregnancy ▫ Hypotension ▫ Bradycardia	1.25 mg slow IVP Administer only if systolic blood pressure > 140 mmHg	Not for pediatric use

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Epinephrine – epinephrine HCl and racemic epinephrine Indications: Alpha and beta-agonist that increases myocardial contractility, automaticity, and irritability. In allergic reactions, it also blocks histamine release. Bronchial smooth muscle relaxation through beta$_2$-agonist effects. Contraindications: None in cardiac arrest.	Dose varies. See specific protocol. Cardiac Arrest Allergic Reaction Asthma/COPD	Dose varies. See specific protocol. Cardiac Arrest Allergic Reaction Reactive Airway Disease
Famotidine (Pepcid) Indications: Prehospitally, used for allergic reactions due to its inhibitory action on histamine at the H_2 receptor sites. Contraindications: Hypersensitivity.	40 mg slow IV/IO push diluted in normal saline. Administer over 2 minutes.	1 mg/kg to a maximum of 40 mg slow IV/IO push diluted in normal saline. Administer over 2 minutes.
Fentanyl citrate Indications: Synthetic opiate analgesic indicated for moderate to severe pain. 100 mcg of fentanyl has the equivalent analgesic activity to 7 to 10 mg of morphine, but without the adverse blood pressure effect. Contraindications: Respiratory depression if airway cannot be managed.	2 mcg/kg by IV/IO/IM/IN to a maximum of 100 mcg per dose. May be repeated as indicated in protocol. Total maximum of 300 mcg	2 mcg/kg by IV/IO/IM/IN to a maximum of 100 mcg per dose. May be repeated as indicated in protocol. Total maximum of 6 mcg/kg
Glucagon Indications: Hormone released by the pancreas that triggers the conversion of glycogen stores in the liver into glucose. Indicated for use with symptomatic hypoglycemia where IV access cannot be obtained. Contraindications: None in emergency settings.	Must reconstitute with sterile or bacteriostatic water only. Do not use saline or Lactated Ringers, as this will cause precipitation of the medication. 1 to 2 mg IM May take between 4 to 8 minutes to reverse hypoglycemia.	Must reconstitute with sterile or bacteriostatic water only. Do not use saline or Lactated Ringers, as this will cause precipitation of the medication. Under 20 kg in weight: 0.5 mg IM Over 20 kg in weight: 1 mg IM May take between 4 to 8 minutes to reverse hypoglycemia.

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Ibuprofen Indications: Antipyretic and analgesic for use with fever, minor pain, and inflammatory conditions. Contraindications: ▫ Do not administer to pregnant patients. ▫ Do not administer to renal disease patients. ▫ Avoid use with suspected surgical candidates due to its antiplatelet properties.	10 mg/kg PO with a typical adult dose of 400 to 800 mg	10 mg/kg PO for pediatrics over 6 months old.
Ketamine hydrochloride Indications: Combative patients and traumatic entrapment. Ketamine is a dissociative anesthesia and analgesic, with dissociation being dose-dependent. Contraindications: None in emergent situations. Pregnancy safety has not been established due to lack of data.	2 mg/kg slow IV/IO or 4 mg/kg IM for dissociation. Maximum dosage 500 mg 0.3 mg/kg slow IV/IO for entrapment situations; remains below the dissociative threshold. **Maximum of 50 mg IV/IO**	2 mg/kg slow IV/IO or 4 mg/kg IM for dissociation. Maximum dosage 500 mg 0.3 mg/kg slow IV/IO for entrapment situations; remains below the dissociative threshold. **Maximum of 50 mg IV/IO**
Ketorolac (Toradol) Indications: A non-selective COX inhibitor that has anti-inflammatory, antipyretic, and analgesic effects. Indicated for mild to moderate pain. Contraindications: ▫ Do not administer to pregnant patients. ▫ Do not administer to renal disease patients. ▫ Avoid use with suspected surgical candidates due to its antiplatelet properties.	30 mg IV or 60 mg IM	15 mg IV or 30 mg IM
Lactated Ringers solution Indications: Intravenous fluid of choice for trauma and burn patients. Contains sodium chloride, potassium chloride, sodium lactate, and calcium chloride. The pH is approximately 6.6, (> than normal saline) Contraindications: Concurrent administration with incompatible medications, which may precipitate in the solution.	Refer to the specific protocol for dose.	Refer to the specific protocol for dose. Do not exceed 60 mL/kg

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Lidocaine Indications: Class I antiarrhythmic that suppresses ventricular automaticity during ventricular dysrhythmias. Also used to reduce pain during intraosseous infusion and to prevent increased ICP during intubation. Contraindications: ▫ Wolff-Parkinson-White syndrome ▫ 2nd or 3rd degree AV blocks ▫ Bradycardia	Cardiac dysrhythmias and PAI: Initial bolus of 1 mg/kg IV/IO to a maximum of 100 mg. Cardiac: Followed by a drip at 2 to 4 mg/min Intraosseous anesthetic: 1 mg/kg to a maximum of 50 mg. Do not flush line for at least 60 seconds to allow the lidocaine to exert its effect.	PAI for head injury: Initial bolus of 1 mg/kg IV/IO to a maximum of 100 mg. Intraosseous anesthetic: 0.5 mg/kg to a maximum of 40 mg. Do not flush line for at least 60 seconds to allow the lidocaine to exert its effect.
Levophed Indications: Alpha-adrenergic agonist For BP control in certain acute hypotensive states eg AMI, Sepsis, cardiac arrest Contraindications: Hypotension from blood volume deficits, except as an emergency measure to maintain coronary and cerebral artery perfusion until blood volume replacement therapy can be completed,	Average Dosage: Initial: 8-12mcg/min (2-3mL) as IV infusion until low normal BP (80-100mmHg systolic) is established and maintained by adjusting rate of flow Maint: 2-4mcg/min (0.5-1mL). Continue infusion until adequate BP and tissue perfusion are maintained w/o therapy Reduce dose gradually, avoiding abrupt withdrawal	Not for pediatric use
Magnesium sulfate Indications: Elemental electrolyte used to treat eclampsia during pregnancy/postpartum and for respiratory distress related to severe asthma. Contraindications: 2nd or 3rd degree AV block	See specific protocol for dosing Seizure – Pregnancy Asthma / COPD	Not indicated for pediatrics
Methylprednisolone (Solu-Medrol) Indications: synthetic glucocorticoid or corticosteroid drug used for its anti-inflammatory effects to treat short-term bronchial inflammation or acute bronchitis due to various respiratory diseases. Administered for severe spinal cord injuries, reducing in swelling. Contraindications: in systemic fungal infections and patients with known hypersensitivity to the product and its constituents. Caution: Perform a glucose check prior to administration	Adult: IV/IM 125 mg Spinal Cord Injuries - 30 mg/kg infused over 30 min	Pediatric: IV/IM 2 mg/kg

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Metoclopromide (Reglan) Indications: A prokinetic that stimulates the muscles of the gastrointestinal tract including stomach. Prevents contents of the stomach from backing up into the esophagus. Contraindications: None in emergent setts.	10mg Slow IV/IO Do not repeat.	3 months to 6 years: 0.1 mg/kg by slow IV/IO push, maximum of 2.5mg. Do not repeat. 6 to 14 years: 2.5mg to 5mg slow IV/IO push. Do not repeat.
Metoprolol (Lopressor) Indications: selective β1 receptor blocker medication used to treat high blood pressure, chest pain due to poor blood flow to the heart, and a number of conditions involving an abnormally fast heart rate. Contraindications: Inferior MI (STEMI). AMI associated with cocaine amphetamine use	5 mg Slow IV/IO	Not indicated for pediatrics
Midazolam (Versed) Indications: Rapid-acting, short duration benzodiazepine indicated for seizure activity, combative patients, and for sedation purposes. May be given by IV, IO, IM, and IN. Contraindications: ▫ Cautious use with neuromuscular disorder history. ▫ Hypotension	See specific protocol for dosing Delayed Sequence Intubation Seizure Combative Patient	See specific protocol for dosing Delayed Sequence Intubation Seizure Combative Patient
Nitroglycerin Indications: Vasodilator used in cardiac chest pain and congestive heart failure/pulmonary edema. Decreases both preload and afterload. Contraindications: ▫ Hypotension ▫ Hypovolemia ▫ Suspected increased intracranial pressure ▫ Use of erectile dysfunction drugs in last 24 hours.	0.4 mg SL every 5 minutes for cardiac chest pain while systolic BP remains above 90 mmHg. See the Congestive Heart Failure/ Pulmonary Edema protocol for dosing of sublingual.	Not for pediatric use unless indicated by medical control

This formulary is provided as a reference only. It does not contain all of the contraindications and potential adverse reactions for each listed drug It is the responsibility of the prehospital provider to have knowledge about the appropriate use of each drug in this formulary. Refer to the specific protocol for actual dose recommendations.

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Naloxone (Narcan) Indications: Opiate antagonist that competes for opiate receptor sites. Indicated ONLY for respiratory depression and will not be used to restore consciousness. Contraindications: Adequate respiratory effort and oxygenation	0.4 to 2 mg IV / IO / IM / IN Repeat once if needed to maximum of 2 mg per dose.	0.1 mg/kg to maximum of 2 mg IV/IO/IN Consider 0.2 mg increment doses for chronic pain patients.
Normal saline solution Indications: Intravenous fluid of choice for non-trauma patients requiring volume. Contraindications: Fluid overloaded patients	See protocol for specific dosing.	See protocol for specific dosing. Not to exceed 60 mL/kg
Ondansetron (Zofran) Indications: A serotonin receptor antagonist used to prevent or treat severe nausea and vomiting. May be used in pediatric patients greater than 3 months old. Contraindications: Long QT syndrome	4 mg IV/IO/IM May repeat once in 15 minutes	For pediatrics over 3 months old: 0.15 mg/kg by IV/IO/IM to a maximum of 4 mg. May repeat once in 15 minutes
Oxygen Indications: Indicated for respiratory distress and other conditions where inadequate oxygenation and/or ventilation is present. Contraindications: Paraquat exposure	See specific protocol for dosing	See specific protocol for dosing
Prednisolone (Orapred) Indications: A synthetic glucocorticoid (steroid) used for respiratory distress in pediatrics to reverse inflammatory and allergic reactions. Contraindications: None in emergent settings.	Not indicated for adult use	2 years old and older only: 2 mg/kg PO to a maximum of 60 mg

Drug Formulary

A brief drug reference for all of the medications listed within these treatment protocols

Medication	Adult	Pediatric
Rocuronium (Zemuron) Indications: Long-acting non-depolarizing paralytic medication for use with pharmaceutically-assisted intubation. Contraindications: None in emergent settings.	1 mg/kg IV/IO	0.6 mg/kg IV/IO
Sodium bicarbonate Indications: Indicated for patients with suspected hyperkalemia, prolonged respiratory distress, and/or prolonged cardiac arrest to address probable acidosis. With medical control authorization, may be considered with TCA or sodium channel blockade overdoses. Contraindications: None in emergent settings.	50 mEq IV/IO Flush IV well with normal saline before and after administration due to drug incompatibilities.	1 mEq per kg IV/IO Maximum of 50 mEq Flush IV well with normal saline before and after administration due to drug incompatibilities.
Succinylcholine (Anectine) Indications: Short-acting depolarizing paralytic medication for use with pharmaceutically-assisted intubation. Contraindications: ▫ Suspected hyperkalemia ▫ End-stage renal disease and/or dialysis patients ▫ Burn patients with burn older than 24 hours ▫ Patients with neuromuscular disease/paralysis ▫ Family history of malignant hyperthermia	2 mg/kg by rapid IV/IO to a maximum of 200 mg Do not repeat	2 mg/kg by rapid IV/IO to a maximum of 200 mg Do not repeat
Tranexamic Acid – TXA Indications: Blunt or penetrating trauma less than 3 hours from onset with hemodynamic compromise, uncontrolled bleeding. Contraindications: Hypersensitivity; MOI > 3 hours, subarachnoid hemorrhage; HX of PE, DVT, or other thromboembolic disorder.	1 gram in 100 ml Infused over 10 minutes.	None
Xopenex (levalbuterol) Indications: Beat agonist indicated for respiratory distress accompanies by wheezing. Contraindications: None in emergent settings.	1.26 mg SVN	0.63 mg SVN

EMS Ambulance Equipment and Medication List

QTY	EQUIPMENT
General Vehicle Equipment	
1	Stretcher with at least 2 Sets of Sheets
1	Stair Chair - optional
1	Cardiac Monitor and Defibrillator
1	Portable Suction Unit
1	Scoop Stretcher
1	Adult Backboard
1	KED
1	Emergency Response Guidebook
1	Set of Emergency Warning Devices
2	Trash Bags for General Waste
1	Flashlight
1	Mounted Fire Extinguisher
1	No-Smoking Signs (cab and patient compartment)
3	Roadside Safety Vests
1	Copy of Current Protocols
Oxygen Supplies	
1	Oxygen Cylinder "D" Portable with Regulator
1	Oxygen Cylinder "M" Mounted with Regulator
1	Oxygen Cylinder Key
1	NPA (each size 20, 22, 24, 26, 28, 30, 32)
1	OPA (each size 40, 60, 70, 80, 90, 100)
1	IGEL (each size 3, 4, 5)
2	ETT (Stylet Optional) (each 2, 3, 4, 5, 6, 7, 7.5, 8)
2	Bougie (Adult and Pediatric (Pedi-Optional))
2	Tube Tamer (each Adult and Pediatric)
1	Laryngoscope Handle
1	Miller Blade (each size 0, 1, 2, 3, 4)
1	Macintosh Blade (each size 3, 4)
1	Magill Forceps (each size large and small)
2	Water Soluble Lubricating Jelly Packets
1	BVM (each Adult and Pediatric, with Infant/ Neonate masks)
1	PEEP Value
4	Nasal Cannula
4	Adult Nonrebreather Mask
2	Hand Held Nebulizer
2	Nebulizer with Mask
2	Pediatric Nonrebreather Mask
1	Infant/Neonate O2 Mask
4	Nasal Cannula CO2
3	In-Line ETT CO2
1	CPAP (each Small and Large)
1	Ventilator (optional)
1	Ventilator Circuit (optional)
1	Video Laryngoscope Kit (Optional)
1	ResQPOD Impedance Threshold Device
Suction Supplies	
1	Mounted 1200cc Suction Canister with Lid
1	Portable 800cc Suction Canister with Lid
1	Suction Tubing
1	Rigid suction tip (Yankauer or equivalent)
1	Each 8Fr, 10Fr, 12Fr, 14Fr, 18Fr Suction Cath

QTY	EQUIPMENT
1	60ml Slip Tip / Luer Lock Syringe
2	Nasogastric Tube 10Fr
2	Nasogastric Tube 18Fr
Personal Protective Equipment	
2	N95 (each size Small, Medium, and Large)
2	Surgical Mask
5	Biohazard Bag
5	Sharp Shuttle
1	Mounted Sharps Container
4	Safety Goggles
4	Disposable Gowns
4	Disposable Foot Protectors (pair)
1	Hand Sanitizer
2	Box of Gloves
1	Germicidal Cleaner
4	Absorbent Underpad (optional)
Obstetrical Supplies	
1	OB Kit
1	Baby Hat
1	Bunting Foil Blanket
1	Meconium Aspirator
1	3 Way Stop Cock
IV Supplies	
6	10gtt IV sets
2	60gtt IV sets
6	0.9% Normal Saline Solution, 1,000ml
2	0.9% Normal Saline Solution, 500ml
2	0.9% Normal Saline Solution, 250ml
2	0.9% Normal Saline Solution, 100ml
1	Dial a Flow
4	Luer Locks
4	0.9% Normal Saline Flushes
6	Tourniquet
2	14g IV Catheter
2	16g IV Catheter
6	18g IV Catheter
6	20g IV Catheter
4	22g IV Catheter
4	24g IV Catheter
2	45mm IO Needle
2	25mm IO Needle
2	15mm IO Needle
1	EZ IO Driver
20	Alcohol Preps
2	Pressure Infuser Bag
1	Blood Draw Kit (optional)
2	Volume control flow set (Buretrol or equivalent)
4	Veniguards / IV dressings

EMS Ambulance Equipment and Medication List

QTY	EQUIPMENT
Needle and Syringes	
4	1cc Syringe with Needle
6	3cc Syringe with Needle
2	5cc Syringe with Needle
2	10cc Syringe with Needle
2	30cc Syringe without Needle
4	Hypodermic Needle (any size)
4	18g Needle
4	Filter Needle
2	MAD
Trauma and Bandaging	
2	14g 2" Needles or equivalent
5	Benzoin Tincture
2	Iodine Swabs
2	Occlusive Dressing
4	Triangle Bandage
4	Kerlix Roll
2	Coban Roll
5	Bandaids
4	4x4 Dressing
5	ABD Dressing
2	Trauma Dressing
2	Sterile Burn Sheet
2	Petroleum Gauze
2	Hemostatic Gauze
2	Sterile Water
2	Sterile Saline
2	Commercial Tourniquet
1	Surgical / Needle Airway Kit
1	Chest decompression needle and/or Kit
2	Trauma Shears
2	Cold Pack
2	Hot Pack
1	½" Tape
1	1" Tape
1	3" Tape
3	Cardboard Splint various sizes
2	Adult Adjustable C-Collar
2	Pediatric C-Collar
2	Infant C-Collar
1	Adult Traction Splint
4	CID
25	Triage Tags with Sharpie
Cardiac Monitor Supplies	
2	Monitor Paper
2	Monitor Batteries
50	Adult Electrodes
2	Adult Defibrillator Pads
2	Pediatric Defibrillator Pads
2	Manual Prep Razors
20	Pediatric Electrodes

QTY	EQUIPMENT
1	Monitor Cable Set (with Precordial Leads)
1	Pulse Ox Cable and Probes
1	BP Cuff (Lg Adult, Adult, Pediatric, Infant)
1	Disposable SpO2 (each Adult, Pediatric, and Infant)
Medications	
2	Acetaminophen Liquid 160/5ml
10	Acetaminophen Tablet 500mg
4	Adenosine 6mg or a total of 24mg
4	Albuterol 2.5mg
3	Amiodarone 150mg
10	Aspirin 81mg
5	Atropine 1mg
2	Calcium Chloride 10% 1gm
1	Cyanokit (Optional)
1	Dexamethasone 20mg
1	Dextrose 10% 25gm and/or Dextrose 50% 25gm
1	Diltiazem 20mg
2	Diphenhydramine 50mg
1	Dopamine Pre-mixed 400mg
2	Enalapril 1.25mg
2	Epinephrine 1 mg/ml (1:1,000) 1mg Ampule
8	Epinephrine 0.1 mg/ml (1:10,000) 1mg Prefilled
2	Famotidine 40mg
4	Fentanyl 100mcg
1	Glucagon 1mg
2	Ibuprofen Liquid 100mg/5ml
4	Ipratropium 0.5mg
2	Ketamine 500mg
2	Lactated Ringers 1L
6	Lidocaine 100mg
1	Lidocaine in D5% 4mg/mL
2	Lopressor 5mg
2	Lorazepam 2mg
2	Magnesium Sulfate 1gm
2	Midazolam 5mg
3	Methylprednisolone 125mg
1	Naloxone 2mg
2	Nasal Spray
2	Nitroglycerin 0.4mg SL Bottles (or equivalent)
1	Norepinephrine 4mg
1	Ondansetron 4mg PO or IV
3	Oral Glucose Tube
1	Prednisolone 15mg/5ml
2	Racemic Epinephrine 2.25% Solution
4	Reglan 10mg
2	Rocuronium 100mg
2	Sodium Bicarb 8.4%
2	Sodium Bicarb 4.2%
2	Toradol 30mg
2	Tranexamic Acid 1000mg
4	Xopenex 0.63mg

EMS Ambulance Equipment and Medication List

QTY	EQUIPMENT
	Miscellaneous Equipment
1	Ring Cutter
1	Glucometer with Test Strips and Test Solution
5	Lancets
2	Drinking Water Bottle
4	Soft Restraints
10	Nail Polish Remover
1	Spare Monitor Battery (optional)
1	Stretcher Battery
1	Thermometer
4	Emesis Bag
1	Urinal
1	Bed Pan
4	Tyvex Suits (2-L, XL)
4	Blanket
1	Stethoscope
1	Each Blood Pressure Cuff (Adult, Large Adult, Thigh, Pedi)
1	Length based tape (Broselow or equivalent)
2	Hydrogen Peroxide

ABILENE FIRE BLS & ALS MEDICAL EQUIPMENT

Item	PAR	Item	PAR
02 Cylinder	1	Defib Load Tester	1
10 cc Luer Lock Syringe	1	Diphenhydramine (50mg)	1
10-gtt	2	Disposable O2 Sensor	1
1cc Luer Lock Syringe	1	Duct Tape (Medical)	1
20cc Luer Lock Syringe	1	ECG Electrodes	10
22g x 1.5 inch needle	1	ECG Printer Paper	1
3.5-8.0 ET Tube	1 EA	Emergency Childbirth Kit	1
3cc Luer Lock Syringe	3	Emesis Bag (White)	1
3-Cuff BP kit	1	EMS Guide Book	1
4 Lead Cable	1	Epi 0.1mg/ml (1/10,000 Lifeshield Syringe)	3
4x4 Non Sterile (200 per bg)	10	Epinephrine- 1mg/ml 1:1000 (1ml Ampule)	1
4x4 Sterile	1	ET Tube Holder	1
5cc Luer Lock Syringe	1	ET Tube Introducer-Bougie	1
60-gtt Set	1	EZ IO Driver	1
Adenosine 12 mg	1	Filter Straw	1
Adult C-Collar	1	FilterLine (Intubated)	1
Adult NRB Mask 84" Tubing	1	Gait Belt	1
AFD EMS Protocol Book	1	Glucometers strips	2
Albuterol (2.5mg 3ml vial)	1	Hand Sanitizer (Alcohol Gel 4 Oz Btl)	1
Alcohol Preps	10	HEPA Masks/N95 (Regular)	2
Amiodarone (150 mg, 3 ml vial)	2	Hot Compresses	1
Aspirin (Children's Chewable)	4	IO Needle (25 mm - Adult)	1
Atropine Sulfate (1 mg 10 ml Syringe)	1	IO Needle (45mm - Large Adult)	1
Backboard	1	Ipratropium Bromide (0.02% 2.5 ml, 30 bx)	1
Backboard Straps	1	Isolation Gowns	2
Band-Aids	2	IV Cath 22-14 ga (ProtectIV Plus)	1 EA
Bio Hazard Bag (Large 30gal)	1	IV Start Kit	2
Length based tape (Broslow or equivalent)	1	K.E.D.	1
Volume control flow set (Buretrol or equv.)	1	iGel Airway Sizes 3,4,5	1 EA
BVM Adult	1	Impedance Threshold Device (ITD)	1
BVM Child	1	Lancets	2
C Battery	2	Laryngoscope Handle	1
CapnoLine (Adult)	1	Lever Lock Cannula	1
CapnoLine (Pediatric)	1	Lidocaine (2% 100 mg 5ml)	1
Cardboard Splint various	3	Lidocaine 2 gm / Dextrose 5%, 500 ml Bag	1
Cavi Wipes	1	LP 15	1
Chest Decompression Needle	1	LP 15 Adult "Quick Combo" Defib Pads	1
Chest lead Cable	1	LP 15 Pedi "Quick Combo" Defib Pads	1
Chest Seal	1	Lubricating Jelly (3-gram)	1
CID (Adult Multi Grip)	1	Mac Blade 1-4	1 EA
Code Strap	1	Magill Forceps (Adult)	1
Cold Compresses	1	Magill Forceps (Pedi)	1
CPAP -Kit Adult M/L masks	1	Mega Mover - Select	1
Cyanokit (Optional)	1	Megamover - Flat	1
D10 Dextrose - 250cc bag	1	Megamover Barrier Sheet 350i	1
Defib Cable	1	Megamover-Chair	1

ABILENE FIRE BLS & ALS MEDICAL EQUIPMENT

Item	PAR
Multi Trauma Dressings (12" by 30")	1
Naloxone (Narcan 2 mg/2 ml)	1
Nasal Cannula	1
Nebulizer	1
Nitrile Gloves	16
Nitroglycerin tabs, spray, or powder	1
NPA 20-36 fr	1 EA
O2 Regulator	1
Ondansetron (4 mg/2 ml)	1
OPA (40-110mm)	1 EA
Oral Glucose (Instant 15 gm)	1
Pedi C-Collar	1
Pedi NRB 84" Tubing	1
PEEP Valve	1
Pen Light	1
Petrolatum Non-Adhering Gauze	1
Povidone Preps	2
Power Suction Unit	1
Pressure Infusing Bag	1
Pulse Oximeter	1
Razor - disposable	1
Rescue Blanket-Hwy Yellow	1
ResQPUMP CPR Device	1
Rigid Suction Tip	1
Ring Cutter	1
Roll Gauze (Sterile 4.5" by 4.1 yds)	1
Safety Glasses	2
Sharps Shuttle	1
NS (0.9%, 10 ml Prefilled Syringe)	1
NS 0.9% Injection 1000ml and/or LR 1L	1
Sodium Chloride 100ml or 250ml bag	1
Commercial Tourniquet	1
Sterile Burn Sheet	1
Sterile Water (500ml)	1
Stethoscope	1
Suction Canister	1
Suction Caths (8-10 Fr)	1 ea
Suction Tubing 6	1
Tape-Transpore 1"	1
Thermometer	1
Traction Splint	1
Trauma Dressing ABD Pads (5X9)	1
Trauma Shears	1
Triage Kit	1
Triangular Bandages	1
Vial Access Cannula	1
Video Laryngoscope Kit (Optional)	1
LUCAS CPR Device (Optional)	1

AFD Field Resource Medic will carry a LUCAS device when it is available.

The listed items are minimum equipment quantities. Additional quantities may be carries according to call volume and patient care needs.

Robert Lawson, MD - Medical Director

Effective Date: July 15th, 2019

Quick Reference: Age-Based Treatment

Criteria for treatment procedures with any age-based limitations. For medication dose, cardioversion, defibrillation, and pacing, follow the specific protocol's guidelines.

General Procedures:	*Criteria:*
General treatment procedures	Unless otherwise indicated on this sheet or in a treatment protocol, an adult is any person who has reached puberty.
Trauma (level activation)	Pediatric trauma level activation: 12 years old or younger.

Specific Treatment Procedures:	*Criteria:*
AED pediatric/infant pads	May be used on patients less than 8 years old. Or per manufacturer guidelines.
Ambulance captain's chair child seat	Between about 1 to 7 years old. Must be able to sit upright on own and weigh less than 50 lbs (23 kg).
Baby Moses law	Applied to infants who are 60 days old or younger.
Blood pressure required	Patients over 3 years old.
Bougie	Pediatric: 4 to 6 mm endotracheal tube. Adult: Greater than 6 mm.
Broselow-Luten Pediatric Tape	About 10 years old or younger. Height limit: 48 inches.
Chest compressions	Infant: 0 to 1 year old. Child: Over 1 year old to puberty.
CPAP	12 years old or older.
Double-sequential external defibrillation (DSED)	Signs of puberty or older.
External jugular venipuncture	8 years older or older.
Intraosseous injection sites	Anteriomedial aspect of distal tibia: Greater than 12 years old. Proximal humerus: Greater than 40 kg in weight.
Needle cricothyrotomy	Younger than 8 years old.
Pacing (transcutaneous external pacing)	100 bpm rate for any patient who has not reached puberty.
Paramedic must attend patient during EMS care	All patients 65 years old or older, regardless of chief complaint.
Surgical cricothyrotomy	8 years older or older.

Always follow the specific protocol's criteria if any conflict exists. If needed, consult with Medical Control.

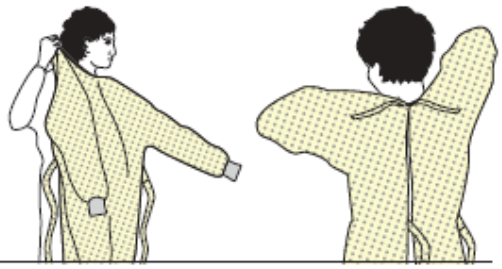
Video

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



2. MASK OR RESPIRATOR

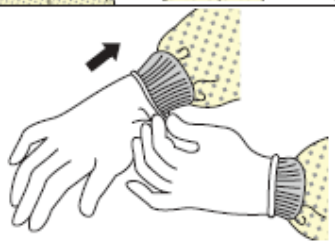
- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator

3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit

4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

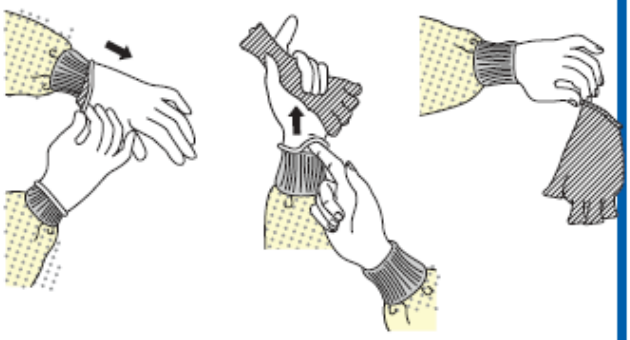
CS250672-A

SEQUENCE FOR REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE)

Except for respirator, remove PPE at doorway or in anteroom. Remove respirator after leaving patient room and closing door.

1. GLOVES

- Outside of gloves is contaminated!
- Grasp outside of glove with opposite gloved hand; peel off
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist
- Peel glove off over first glovet
- Discard gloves in waste container

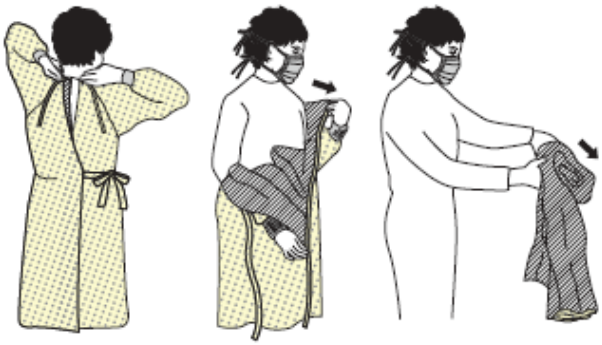


2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield is contaminated!
- To remove, handle by head band or ear pieces
- Place in designated receptacle for reprocessing or in waste container

3. GOWN

- Gown front and sleeves are contaminated!
- Unfasten ties
- Pull away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard



4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- Grasp bottom, then top ties or elastics and remove
- Discard in waste container

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

C8250672-A

Donning PPE with the N95 Respirator Option

Engage A Trained Observer: The donning process is conducted under the guidance and supervision of a trained observer who confirms visually that all PPE is serviceable and has been donned successfully. The trained observer will use a written checklist to confirm each step in donning PPE and can assist with ensuring and verifying the integrity of the ensemble. No exposed skin or hair of the healthcare worker should be visible at the conclusion of the donning process.

1. **Remove personal clothing and items**: Change into surgical scrubs (or disposable garments) and dedicated washable (plastic or rubber) footwear in a suitable, clean area. No personal items (e.g., jewelry, watches, cell phones, pagers, pens) should be brought into the patient's room.

2. **Inspect PPE prior to donning**: Visually inspect the PPE ensemble to be worn to ensure it is in serviceable condition, all required PPE and supplies are available, and that the sizes selected are correct for the healthcare worker. The trained observer reviews the donning sequence with the healthcare worker before the healthcare worker begins and reads it to the healthcare worker in a step-by-step fashion.

3. **Perform hand hygiene**: Perform hand hygiene with an alcohol-based hand rub (ABHR). After using the ABHR, allow hands to dry before moving to the next step.

4. **Put on inner gloves**: Put on the first pair of gloves.

5. **Put on boot *or* shoe covers.**

6. **Put on gown *or* coverall**: Put on a gown *or* coverall. Ensure gown *or* coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of the inner gloves are tucked under the sleeve of the gown *or* coverall.

7. **Put on the N95 respirator**: Put on N95 respirator. Complete a user-seal check.

8. **Put on the surgical hood**: The surgical hood is placed over the N95 respirator. The surgical hood must cover all of the hair and ears, and ensure that it extends past the neck to the shoulders. Be certain that hood completely covers both the ears and neck.

9. **Put on outer apron (if used)**: Put on full-body apron to provide additional protection to the front of the body against exposure to body fluids or excrement from the patient.

10. **Put on outer gloves**: Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown *or* coverall.

11. **Put on face shield**: Put a full face shield on over the N95 respirator and surgical hood to provide additional protection to the front and sides of the face, including the skin and eyes.

12. **Verify**: After completing the donning process, the integrity of the ensemble is verified by the trained observer. The healthcare worker should be comfortable and able to extend the arms, bend at the waist and go through a range of motions to ensure there is sufficient range of movement while all areas of the body remain covered. A mirror in the room can be useful for the healthcare worker while donning PPE.

13. **Disinfect outer gloves**: Disinfect outer-gloved hands with ABHR. Allow to dry prior to patient contact.

Doffing PPE

CDC Guidelines on Doffing PPE

Doffing PPE with the N95 Respirator Option. PPE doffing is performed in the designated PPE removal area. Place all PPE waste in a leak-proof infectious waste container.

Engage A Trained Observer: The doffing process is conducted under the supervision of a trained observer, who reads aloud each step of the procedure and confirms visually that the PPE has been removed properly. Prior to doffing PPE, the trained observer must remind healthcare workers to avoid reflexive actions that may put them at risk, such as touching their face. Post this instruction and repeat it verbally during doffing. Although the trained observer should minimize touching healthcare workers or their PPE during the doffing process, the trained observer may assist with removal of specific components of PPE as outlined below. The trained observer disinfects the outer-gloved hands immediately after handling any healthcare worker PPE.

1. **Inspect**: Inspect the PPE to assess for visible contamination, cuts, or tears before starting to remove. If any PPE is visibly-contaminated, then disinfect using an EPA-registered disinfectant wipe. If the facility conditions permit and appropriate regulations are followed, an EPA-registered disinfectant spray can be used, particularly on contaminated areas.
2. **Disinfect outer gloves**: Disinfect outer-gloved hands with either an EPA-registered disinfectant wipe or alcohol-based hand rub (ABHR).
3. **Remove apron (if used)**: Remove and discard apron, taking care to avoid contaminating gloves by rolling the apron from inside to outside.
4. **Inspect**: Following apron removal, inspect the PPE ensemble to assess for visible contamination or cuts or tears. If visibly contaminated, disinfect affected PPE using an EPA-registered disinfectant wipe.
5. **Disinfect outer gloves**: Disinfect outer-gloved hands with either an EPA-registered disinfectant wipe or ABHR.
6. **Remove boot *or* shoe covers**: While sitting down, remove and discard boot *or* shoe covers.
7. **Disinfect and remove outer gloves**: Disinfect outer-gloved hands with either an EPA-registered disinfectant wipe or ABHR. Remove and discard outer gloves, taking care to not contaminate inner gloves during the removal process.
8. **Inspect and disinfect inner gloves**: Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears. If an inner glove is visibly soiled, cut, or torn, then disinfect the glove with either an EPA-registered disinfectant wipe or ABHR. Then remove the inner gloves, perform hand hygiene with ABHR on bare hands, and don a clean pair of gloves. If no visible contamination, cuts, or tears are identified on the inner gloves, then disinfect the inner-gloved hands with either an EPA-registered disinfectant wipe or ABHR.
9. **Remove face shield**: Remove the full face shield by tilting the head slightly forward, grabbing the rear strap and pulling it over the head, gently allowing the face shield to fall forward and discard. Avoid touching the front surface of the face shield.
10. **Disinfect inner gloves**: Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR.
11. **Remove surgical hood**: Unfasten (if applicable) the surgical hood, gently remove, and discard. The trained observer may assist with unfastening hood.
12. **Disinfect inner gloves**: Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR.
13. **Remove gown *or* coverall**: Remove and discard.

    a. Depending on gown design and location of fasteners, the healthcare worker can either untie fasteners, receive assistance by the trained observer to unfasten the gown, or gently break fasteners. Avoid contact of scrubs or disposable garments with outer surface of gown during removal. Pull gown away from body, rolling inside out and touching only the inside of the gown.

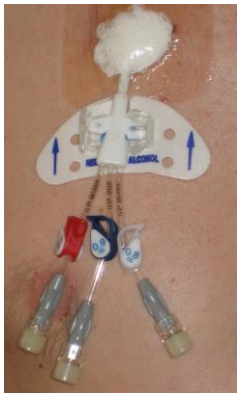
    b. To remove coverall, tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely before rolling down and turning inside out. Avoid contact of scrubs with outer surface of coverall during removal, touching only the inside of the coverall.
14. **Disinfect and change inner gloves**: Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during the removal process. Perform hand hygiene with ABHR. Don a new pair of inner gloves.
15. **Remove N95 respirator**: Remove the N95 respirator by tilting the head slightly forward, grasping first the bottom tie or elastic strap, then the top tie or elastic strap, and remove without touching the front of the N95 respirator. Discard N95 respirator.
16. **Disinfect inner gloves**: Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR.
17. **Disinfect washable shoes**: Sitting on a new clean surface (e.g., second clean chair, clean side of a bench) use an EPA-registered disinfectant wipe to wipe down every external surface of the washable shoes.
18. **Disinfect and remove inner gloves**: Disinfect inner-gloved hands with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves taking care not to contaminate bare hands during removal process.
19. **Perform hand hygiene**: Perform hand hygiene with ABHR.
20. **Inspect**: Perform a final inspection of healthcare worker for any indication of contamination of the surgical scrubs or disposable garments. If contamination is identified, immediately inform the infection preventionist or occupational safety and health coordinator (or their designee) before exiting the PPE removal area.
21. **Scrubs**: Healthcare worker can leave the PPE removal area wearing dedicated washable footwear and surgical scrubs or disposable garments.
22. **Shower**: Showers are recommended at each shift's end for healthcare workers performing high risk patient care (e.g., exposed to large quantities of blood, body fluids, or excreta). Showers are also suggested for healthcare workers spending extended periods of time in the Ebola patient room.
23. **Protocol evaluation/medical assessment**: Either the infection preventionist or occupational health safety and health coordinator (or their designee) on the unit at the time should meet with the healthcare worker to review the patient care activities performed to identify any concerns about care protocols and to record healthcare worker's level of fatigue.

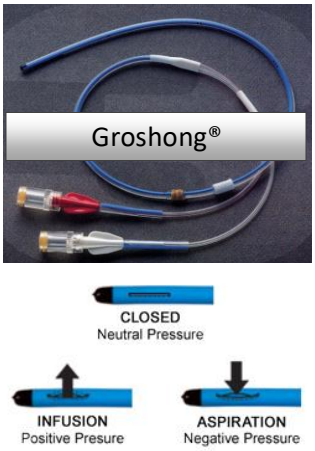
Central Venous Catheters

Central venous catheters are inserted into a large vein to provide long-term intravenous fluid therapy, total parenteral nutrition (TPN), and/or medications. These externally-accessed catheters include "central lines", "PICC lines" (peripherally-inserted central catheters), and dialysis catheters. Both central lines and PICC lines may be accessed whenever any IV medication or fluid must be given to the patient. On the other hand, dialysis catheters can only be accessed during cardiac arrest situations unless prior authorization has been granted by medical control.

There are several types and manufacturers of these catheters. This page provides only a brief description of the more common ones encountered in the pre-hospital setting. Assume all central lines are heparinized, so 10 mL of "waste" will need to be drawn and discarded before using the access.

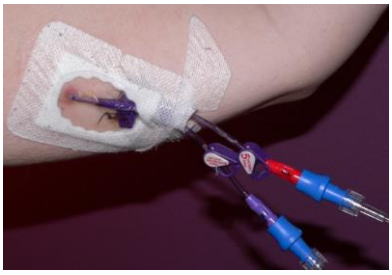
Central lines: These are usually found around the subclavian or lateral area of the chest. They may have one to three lumens accessible for medications or fluids. The catheter itself is usually threaded through the vena cava to near the right atrium of the heart. The more common types include the Groshong® , Hickman®, and Broviac® catheters. The Groshong and Hickman catheters have external clamps that will need to be manually clamped and unclamped for venous access, similar to an INT. The Groshong catheter does not have external clamps; precise splits made in the catheter wall function as a valve instead, as shown to the right. Access is usually made to the distal port.





PICC lines: The only visible difference between a central line and a PICC line is the location of the insertion site, which is usually near the antecubital fossa. PICC lines are usually inserted in the basilic vein, cephalic vein, or brachial vein and are threaded upward through the superior vena cava. They function as a long-term access and like other central and peripheral lines, require aseptic technique.

PICC lines usually have one or two lumens and are typically clamped.



Dialysis catheters: There are several dialysis access catheters, including the Tesio® and other varieties. The external appearance remains similar though. The dialysis catheter is usually inserted into the internal jugular vein and will have only two accessible lumens. One lumen will have a large red clamp, and the other lumen with have a large blue clamp. Another distinguishing difference is that dialysis catheters have larger diameter lumens that are either white or transparent. These catheters may be found in the subclavian area, the neck, or even in the femoral area. If these catheters must be accessed, use the blue-clamped side for pre-hospital treatment.

Protocol Tip Sheet

General patient care reminders for the adult and pediatric protocols

Patient care report (PCR) requirements (Policy 5 and Policy 14)

Vital signs and assessments:

- At least two complete sets of vital signs and two complete assessments are required for transported patients
- A complete set of vital signs are required every 15 minutes for extended transports.
- A set of vital signs must documented within 5 minutes after any medication administration.

Patient care (Policies 5 and 7)

Age ≥ 65 years old. A paramedic must assume and document patient care if the patient is 65 years old or older. The geriatric patient tends to have a more complex medical history. Our medical direction prefers that a paramedic-level practitioner who is educated more extensively in physiology/pathophysiology assume care of the patient in case subtle signs of deterioration develop.

Transfer to lower certification level. The EMS paramedic may transfer patient care to a lower certification level only after he or she has completed a full assessment with appropriate vital signs.

10-79 (dead on scene): A paramedic must assess the patient and document all N8 reports.

ALS Aide treatment: Any patient who refuses transport to the hospital and received any sort of ALS-level treatment (such as $D_{50}W$, etc.) or injectable medication must be cleared by medical control. Document the name of the physician who provided the orders for clearance.

Patients without a protocol (Policy 8)

If your patient does not fit a protocol or is refusing EMS transport, select the Universal Patient Care protocol in your PCR to protect yourself from "practicing medicine" in the legal sense.

Transport of pediatric patients (Policy 11)

Infants under 1 year old: Unless the patient's condition require transport directly on the stretcher, secure these patients in their car seat seatbelted to the stretcher or captain's chair. While allowing a parent ride on the stretcher to hold the infant may seem more comforting, this practice is unsafe if the ambulance has to come to an abrupt stop or is involved in a collision.

Children between 1 year to about 7 years old: If the patient does not require spinal precautions and can sit upright unassisted, he or she should be secured to the captain's child seat. This seat will safely secure children between 20 to 50 lbs (9 to 23 kg).

Parents as rider: A parent may ride in the patient care area with the child if:

- The parent agrees to remain secured with bench or captain's chair seat belts at all times.
- The parent is cooperative and there is no suspicion that crew or patient safety may be jeopardized.
- Patient care will not be adversely affected by the parent's presence.
- Child abuse is not suspected.
- The patient appears to be hemodynamically-stable and there is no indication that the ambulance will need to travel with lights and sirens ("Code 3") at any point of patient care.

Blind Insertion Airway Device (BIAD) (Procedure 1)

Capnography. Remember to attach the end-tidal sampler and monitor the patient's capnography measurements just as you would with an endotracheal tube.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Protocol Tip Sheet

General patient care reminders for the adult and pediatric protocols

Airway: CPAP (Procedure 2)

Congestive heart failure or pulmonary edema patients: Maximum of 10 cmH_2O of PEEP.

Asthma or COPD patients: Maximum of 5 cmH_2O of PEEP.

Double Sequential External Defibrillation (Procedure 24)

Pediatrics. Cannot be used with pediatric patients (below puberty).

Adults. Cannot be used with any VAD (ventricular assist device) patient.

Cardiac: External Pacing (Procedure 26)

Documentation and upload. In the PCR, the Lifepak monitor upload will create a new intervention for every pacing adjustment. Do not delete any of these interventions; they are part of your treatment record.

Rates for age groups. Start at 10 mA. Pacing rate is age-dependent now. Adjust the heart rate to 60 bpm for anyone at puberty or older, 80 bpm for a 1 year old to 8 year old child, and 100 bpm for an infant below 1 year old.

Confirm capture. Confirm mechanical capture by assessing the right radial or right side femoral pulse. Avoid the left radial and left carotid pulse, as muscular contractions from pacing may cause a false sense of mechanical capture.

Pain control. Pacing is painful. Always consider sedation with midazolam (if systolic BP > 90 mmHg) or fentanyl (particularly if BP < 90 mmHg).

Restraints: Physical and Chemical (Procedure 29)

Patient position. Never restrain a patient in the prone position.

Assessment intervals. A patient assessment must be made every 15 minutes on every physically-retrained extremity (handcuffs and/or soft restraints). Document the skin color, temperature, distal pulse quality, and capillary refill (if applicable for patient's age).

Chemical restraints. Generally, chemical restraints should be an early consideration whenever physical restraints are used. Chemical restrains should prevent the patient from harming him/herself against the physical restraints.

Treatment: Chest Decompression (Procedure 30)

Decompression in adults: Large bore angiocatheter.

Decompression in infants: Small bore angiocatheter.

Treatment: CPR Standards (Procedure 32)

Compression rate. Remember that chest compressions are continuous at a rate of 110 bpm with pulse/rhythm checks every 2 minutes. Do not interrupt compressions for airway or IV/IO procedures.

Compression depth:

- Neonate to infant (under one year old): 1.5 inches or 1/3rd the anterior/posterior depth of the chest.
- Child (one year old up to puberty): 2 inches or 1/3rd the anterior/posterior depth of the chest.
- Adult (puberty and older): 2 to 2.5 inches in depth.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Deceased Body Procedure (Procedure 33)

The unit on scene will contact the Medical Examiner's officer for cardiac arrests terminated in the field by EMS and found deceased bodies.

Treatment: Transport of the Decontaminated Patient (Procedure 34)

Do not transport any patient who is still "gassing off" (respiratory or from skin itself) in an enclosed ambulance or air medical transport. Contact a supervisor for assistance with transportation options.

Venous Access: External Jugular Access (Procedure 42)

Age limitations. Can only be attempted on patients who are ≥ 8 years old.

Unilateral attempt only. Only one side of the neck may be attempted due to the risk of airway compromise from infiltration or hematoma formation at a site.

Venous Access: Existing Catheters (Procedure 43)

When to access. Pre-existing central venous catheters ("central lines") may be accessed whenever fluid and/or medications are needed. Peripheral IV attempts do not need to be made beforehand.

Dialysis catheters. Dialysis catheters can be accessed only during cardiac arrest situations unless medical control authorization has been obtained.

Heparin considerations. Using aseptic technique, always draw and discard 10 mL of "waste" from the line before initial flushing with normal saline. For the patient's safety, always assume the catheter contains heparin even though some types may or may not be heparinized.

Venous Access: Intraosseous (Procedure 45)

Humerus: This site may be considered for any patient over 40 kg in weight. Always use the 45 mm IO needle for humoral insertion.

Anesthesia. Lidocaine may be infused for awake patients with the potential for infusion-related pain and with no allergies to lidocaine, bradycardia, or AV heart blocks on the ECG. Allow the medication to dwell for at least 60 seconds for effect.

- Adults: 1 mg/kg of 2% lidocaine (maximum 50 mg).
- Pediatric: Pediatric patients may receive lidocaine at 0.5 mg/kg to a maximum of 40 mg per dose.

Wound Care: Cleaning of General Wounds (Procedure 46)

Hydrogen peroxide must be diluted. Never use hydrogen peroxide directly on the wound bed or burns. Healthy tissue can undergo oxidative damage with high concentrations of hydrogen peroxide; it needs to be diluted by at least half.

Wound Care: Taser Probe Removal (Procedure 47)

ED removal only. Any patient with taser probes embedded in any area above the clavicles, in the female breasts, or either gender's genitalia should be transported to the emergency department for probe removal.

Unable to remove probes with one attempt. If the probes cannot be removed in a single attempt, the patient should be transported to the emergency department.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Wound Care: Tourniquet (Procedure 48)

Indications. A tourniquet may be applied to a partial or complete amputation that may not be hemorrhaging at this time, but expected to once resuscitative efforts restore bleeding.

Hemorrhaging dialysis access. A tourniquet should not be applied to bleeding dialysis grafts or shunts.

Cardiac Arrest (adult) and Pulseless Arrest (pediatric): All rhythms

Passive oxygenation. In general, passive oxygenation should be initiated with an airway adjunct (OPA or NPA) and a Nasal Cannula at 15lpm for at least 6 minutes EXCEPT for:

- Pediatric patients below the age of puberty. Most medical pulseless arrests in this age group are caused by a respiratory compromise. Securing the airway becomes an early priority for pediatric patients.
- Hypoxia/respiratory cause for cardiac arrest in adults. Hypoxia is a potentially-reversible cause of cardiac arrest that should be addressed early with intubation or a BIAD. Chest compressions, securing the airway, and appropriate defibrillation takes priority over IV/IO or medication.
- A "dirty" airway. Any airway with a risk for or signs of aspiration from emesis, blood, or other fluids should be secured early with intubation. Passive oxygenation will not benefit these patients.
- Moderate to severe trauma patients. Trauma patients who are in arrest need early airway securement to prevent aspiration of blood or other fluids.

Blood glucose level. Obtain this measurement early.

Hypothermic patients / cold exposure. Defibrillation and medication administration is limited due to the potential for accumulating medications in peripheral tissues of the severely hypothermic patient. Guidelines:

- Core temperature between 86 to 93.2 °F. Follow protocols as indicated, but increase the interval of time between repeated doses of medication. For example, epinephrine should not be given every 3 minutes, but the repeated doses delayed instead.
- Core temperature under 86 °F. Only one defibrillation attempt may be made if rhythm-appropriate, and the only cardiac arrest medication that may be given is one dose of epinephrine (0.1mg/ml aka 1:10,000).

Compressions. Compressions are continuous at 110 per minute with pauses only for a rhythm/pulse check every 2 minutes or with signs of ROSC via capnography readings or patient response. Continue compressions while the cardiac monitor is charging, and immediately resume compressions after defibrillation. Remember that a shockable rhythm does not require a pulse check after defibrillation.

Hyperkalemia is suspected or renal/dialysis patients (all ages). Consider sodium bicarbonate and calcium chloride for any cardiac arrest rhythm.

Respiratory-caused arrest for adults in asystole/PEA only. Consider sodium bicarbonate after 3rd epinephrine. Patient should have optimal oxygenation for best effect (secured airway preferred).

Double Sequential External Defibrillation. Consider after 3 to 5 defibrillations with persistent pulseless ventricular tachycardia and/or ventricular fibrillation. DSED cannot be used on pediatrics or ventricular assist device patients.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Post-Arrest Resuscitation

Vital signs and 12-lead ECG. Always obtain a full set of vital signs and a 12-lead ECG soon after ROSC.

Adult ventricular fibrillation or ventricular tachycardia. If the patient was in either one of these rhythms and no antiarrhythmic was given, initiate an amiodarone drip of 150 mg over 10 minutes. The patient must have a heart rate above 60 bpm for any antiarrhythmic. An example patient would include an adult who was able to be defibrillated (AED or monitor) and achieved ROSC before amiodarone was given.

Analgesia. Remember that CPR was painful; consider analgesia with fentanyl for responsive patients. Also consider sedation with midazolam only if a definitive airway is in place and blood pressure is above90 mmHg.

Vasopressors. Dopamine starts at 5 mcg/kg/min and may be titrated up to 20 mcg/kg/min if the systolic BP is less than 90 mmHg. Levophed starts at 8 mcg/min titrated up to 12 mcg/min, with a maintenance infusion of 2-4 mcg/min.

Induced Hypothermia

Inclusion criteria. Must be over 18 years of age and heavier than 50 kg (110 lbs). No spontaneous, purposeful movement can be present, and the patient's capnography needs to be greater than 20 mmHg.

Exclusion criteria:

- Patient cannot be pregnant or suspected of being so
- Dialysis/renal patients
- Ventricular-assist device patients
- Arrest caused by hemorrhage
- Traumatic arrests
- Hypoxia (pulse oximetry less than 85%)
- Hypotension with MAP less than 60 mmHg

If ROSC is lost. Continue hypothermia and resuscitate per the rhythm-specific protocol.

Shivering. The muscle movements caused by shivering will generate heat and prevent the goal temperature of 92 °F from being met. Administer ativan (lorazepam) if the blood pressure is above 90 mmHg systolic and/or fentanyl to prevent shivering.

Adult Chest Pain

Analgesia. Chest pain may be treated with fentanyl if the patient's systolic blood pressure is above 90 mmHg.

Oxygen supplementation. Provide supplemental oxygen even though the patient may have acceptable room air pulse oximetry measurements. A nasal cannula may be used. Hypoxia within the myocardial tissue may be contributing to the chest discomfort, and providing a higher concentration of oxygen may help decrease the overall amount of cellular damage.

IV. The IV may be established prior to nitroglycerin administration if there is a suspected potential for hypotension.

Cocaine-induced AMI. Administer aspirin and nitroglycerin as if it was an AMI from an atherosclerotic cause. Ativan can be administered 0.05 mg/kg up to 1 mg repeating every 5 minutes titrated to effect, or maximum dosage of 4 mg to treat tachydysrhythmias.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Bradycardia

Some reversible causes of bradycardia:

- Acute myocardial infarction
- Hypoxia
- Hypovolemia
- Hypoglycemia
- Hyperkalemia
- Beta-blocker overdose
- Calcium channel blocker overdose
- Opiate overdose
- Excessive vagal stimulation

STEMI present on the 12-lead ECG. Consider pacing instead of atropine in order to maintain heart rate control and reduce myocardial oxygen demands.

Levophed, dopamine (pediatric) and epinephrine. If the bradycardia is not responsive to levophed / dopamine, stop the infusion and initiate an epinephrine drip instead. Pediatric patients do not receive dopamine drips for bradycardia.

Analgesia for pacing. Midazolam (Versed) OR Ativan may be used for pacing. Midazolam can only be used if the systolic blood pressure is greater than 90 mmHg.

Tachycardia with Pulses

Stable versus unstable. Unstable patients not only have abnormal vital signs, but also altered mental status suggesting poor perfusion to the brain.

PSVT or tachycardia? Consider if the elevated heart rate is from hyperthermia, fever, stimulant use, pain, trauma, hypovolemia, or difficulty breathing/hypoxia instead, suggesting sinus tachycardia.

Asymptomatic/minor discomfort (such as palpitations). Patient may only require close observation and parenteral fluids (if indicated), particularly if other vital signs (such as blood pressure) remain acceptable.

12 lead ECG. Required before treating stable tachycardia.

Diltiazem. Be aware that there is a smaller dose for patients 60 years or older and diltiazem cannot be given to hypotensive patients of any age. This calcium channel blocker slows conduction through the AV node; watch for hypotension after administration.

Wolff-Parkinson-White syndrome. Do not administer diltiazem or adenosine.

LVAD (Left Ventricular Assist Device)

Fluid. LVAD patients are fluid dependent; hypovolemia is a common concern. Medications that can cause vasodilatation should be avoided.

Chest pain. Do not administer aspirin or nitroglycerin. These patients are already anticoagulated and nitroglycerin will decrease the preload needed for the pump.

Dysrhythmias. Do not administer amiodarone or diltiazem due to the risk of decreased cardiac output.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

LVAD (Left Ventricular Assist Device) *… continued*

Wheezing. Only one DuoNeb may be administered. Do not repeat the dose due to the medication's effect on heart rate and cardiac workload.

CPAP, DSED, and induced hypothermia. Any VAD patient cannot undergo these therapies.

Adult Failed Airway and Airway/PAI protocols (adult and pediatric)

Intubation attempts. If the first person to intubate is unsuccessful after two attempts, a second ALS responder should make one attempt. A blind insertion airway device may be considered early if a difficult airway is anticipated.

Pediatric patients (below puberty). Consider atropine (0.02 mg/kg to a maximum of 1 mg) to prevent bradycardia from the paralytic and a vagal response from laryngoscopy. A minimum of 0.1 mg must be given to prevent reflex bradycardia from smaller doses of atropine.

Succinylcholine (Anectine). Cannot be given to dialysis/renal patients, those patients with burns older than 24 hours, suspected hyperkalemia, muscular disease, or any condition involving any paralysis of the body. Succinylcholine may increase serum potassium by only about 0.55 mEq/L in healthy individuals. However, it may increase significantly more in these contraindicated patients.

Maintaining sedation and reparalyzation. Usually, the combination of midazolam (Versed) and fentanyl is enough to maintain sedation during transport to the emergency department. However, if re-paralyzation is needed, only the non-depolarizing agent Rocuronium (Zemuron) may be used. Do not administer a repeat dose of any depolarizing agent (succinylcholine).

Altered Mental Status

Assessment: Always examine the head for subtle signs of injury and check a blood glucose level, regardless of the patient's age.

Adult patients: A 12-lead ECG is indicated as decreased cardiac output (example: from an AMI) can decrease perfusion to the brain, resulting in confusion or other signs of altered mental status.

Overdose/Toxic Ingestion

Naloxone (Narcan). Given ONLY if ventilation or oxygenation is inadequate. It is no longer used to restore consciousness.

Carbon Monoxide Exposure

Importance of high flow oxygen. High-concentration oxygen will increase the rate of carboxyhemoglobin elimination and is usually continued in the emergency department with symptomatic patients.

Pregnant patients. Encourage the pregnant patient to accept EMS transport to the hospital since fetal hemoglobin has a higher affinity for carbon monoxide than maternal hemoglobin. This binding places the developing fetus at greater risk.

Diabetic

Hypoglycemia / hyperglycemia. Diabetic patients with a blood glucose level of 70 mg/dL or less, or a blood glucose level of 400 mg/dL or greater should be treated in the prehospital setting.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Protocol Tip Sheet

General patient care reminders for the adult and pediatric protocols

Fever/Sepsis

Acetaminophen and ibuprofen. If one antipyretic medication has been given 2 or more hours prior to EMS arrival, a different class of antipyretic may be given by EMS. For example, if a patient (6 months or older) was given oral acetaminophen 2 hours ago and remains febrile (over 100.4 °F), he may be given ibuprofen instead. Review the Pearls for contraindications with both medications.

Suspected sepsis versus "just a cold". Fluid is important in the sepsis patient, even if the blood pressure appears "textbook perfect" --- it may not be normal for the patient. Assess your patient's mental status, respiratory rate, heart rate, and temperature along with a detailed history of the complaint and overall state of perfusion to determine the best treatment needs.

Suspected Ebola Virus

NSAIDs (ibuprofen or ketorolac) cannot be given to suspected Ebola-infected patients for fever or pain due to the medication's detrimental effect on platelets.

Allergic Reaction

Diphenhydramine (Benadryl).AMS/AFD does not carry oral forms of diphenhydramine, but a first responder may administer this medication prior to EMS arrival. In total, the patient should only receive one dose of diphenhydramine. If an oral form was already given, do not administer any additional doses.

DuoNeb. Maximum dose: 6. Indicated for wheezing or signs of difficulty breathing.

Severe symptoms (decreased perfusion and impending/severe respiratory compromise). The most important medication and one that should be given immediately is epinephrine (1mg/ml aka 1:1000) IM in the thigh.

Suspected Stroke

Assessment: Remember to obtain both a blood glucose level, blood draw (if possible), and a 12-lead ECG.

Treatment window for tPA: 3 hours. Determine the exact time of symptom onset when possible. Try not to accept "a few hours ago" or other vague information from the patient, family, or others on scene.

Aspiration risk. Watch for any difficulty in swallowing or other signs that would suggest a high risk for aspiration.

Oxygen supplementation. Provide supplemental oxygen even though the patient may have acceptable room air pulse oximetry measurements. A nasal cannula may be used. Hypoxia within the cerebral tissue may be present and providing a higher concentration of oxygen may help decrease the overall amount of cellular damage.

Seizure

Seizing upon EMS arrival: Immediately administer IM midazolam (Versed); the onset of the medication is rapid and the intramuscular route is not likely to cause significant respiratory decline, even at the higher dose indicated by protocol. On the other hand, intravenous administration of midazolam will have a greater effect on lowering blood pressure and depressing respiratory effort. Stopping the seizure early will prevent physical injury to the patient, improve oxygenation/ventilation, and reduces metabolic demands.

Pregnant patients. Intramuscular midazolam (Versed) is safe for pregnant women, especially when compared to the greater risks of fetal/maternal harm if the seizure is not stopped. Magnesium sulfate is indicated for eclampsia and postpartum seizures if an IV has already been established.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Non-Traumatic Abdominal Pain

IM nausea relief. Ondansetron (Zofran) can now be given intramuscularly at the same dose as IV/IO. It may also be repeated once in 15 minutes, if needed.

12-lead ECG. An optional intervention, but remember the importance of obtaining a 12-lead ECG on patients who are at greater risk for acute coronary syndrome, such as patients over 35 years old, diabetics, renal patients, older females, and obese patients.

Vomiting and Diarrhea

The protocol is similar to the Non-Traumatic Abdominal Pain protocol.

Hypertension

Hypertension in itself is not treated in the prehospital setting but instead the suspected cause is addressed. Is the hypertension related to a stroke, pregnancy, chest pain, pain, or congestive heart failure?

Elevated blood pressure should be determined only after a blood pressure has been obtained several minutes apart

Hypothermia / Frostbite

Passive warming only. Only passive warming should be performed, which includes removing the patient's cold/wet clothing, warming the air in the ambulance, and using blankets as indicated. Do not use hot packs, friction, or warm/hot fluids on skin.

Handle with care. Handle the patient gently to prevent injury to frozen parts and to prevent cardiac dysrhythmias.

Cardiac rhythms. Hypothermia may produce severe bradycardia.

Hyperthermia

IV fluids. Do not use chilled/cold intravenous fluids; only room air fluids should be infused to prevent complications.

Cooling measures. External cooling methods include air conditioning in the ambulance and cold packs to the axilla and groin with a cloth barrier to prevent skin injury.

Combative Patient

Whenever ketamine is given:

- Oxygen must be administered by mask (regardless of the pulse oximetry reading).
- Capnography is required.
- A tympanic temperature needs to be measured with appropriate passive cooling measures started if the temperature is greater than 104.7 °F.
- IV fluids are needed to combat the fluid losses through sweat/respiratory from the patient's prolonged hypermetabolic state.
- Check blood glucose levels.
- If the patient suffers cardiac arrest, consider fluids and sodium bicarbonate early in the treatment.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Protocol Tip Sheet

General patient care reminders for the adult and pediatric protocols

Pain Management

Change in pain. If you are following the mild pain arm of the protocol and the patient's pain worsens, the moderate to severe arm of the protocol may also be used.

Oxygen. Oxygen must be administered with any opiate medication (nasal cannula at a minimum).

Significant burns. These patients may have a total maximum of 50 mg of morphine for adults, or consult with medical control for the maximum total recommendation for pediatric burn patients.

Medication selection. Refer to the Pain Management grid on the second page for a quick reference to the appropriate medication for patients who are surgical candidates, pregnant, actively bleeding, burn patients, or who have renal or liver disease.

Asthma / COPD and Pediatric Reactive Airway Disease

Early interventions: Consider CPAP early at no more than 5 cmH_2O PEEP. Cannot be used with LVAD patients, pediatric patients under 12 years old, unstable vital signs, or altered mental status.

DuoNeb. A maximum of 6 DuoNebs may be given for asthma or COPD.

Croup and epiglottitis. Nebulized saline can be attempted initially. If no improvement, nebulized racemic epinephrine may be administered but the patient must be transported to the hospital.

Congestive Heart Failure / Pulmonary Edema

Adults versus pediatrics. Adults develop congestive heart failure as a progressive response to myocardial damage (AMI, hypertension, etc.) while children develop it usually through a congenital heart defect. Treatment for pediatrics is more supportive with expedient transport to the hospital.

CPAP. For adult patients, CPAP should be initiated early for moderate to severe symptoms (elevated heart rate and elevated BP). Do not exceed 10 cmH_2O of PEEP.

Pregnant patients. enalaprilat may harm the fetus, so cannot be given to pregnant patients.

12 lead ECG. Always obtain a 12-lead ECG to consider an acute myocardial infarction or other contributor for the signs and symptoms.

Obstetrical Emergency

Pre-eclampsia. Pelvic pain may not always be present. Consider pre-eclampsia if the patient reports a severe headache, vision changes, and/or right upper abdominal pain.

Trauma. Any pregnant patient involved in an MVC should be evaluated by a physician.

Newly Born / Neonatal Care

Importance on warming and drying. Clearing secretions from the mouth with a bulb syringe, tactile stimulation, and warming should be a priority with the newborn. Actively drying the neonate and warming may stimulate a lethargic newborn to breathe effectively and increase heart rate on his or her own.

Oxygen. Supplemental oxygen is no longer routinely administered to every newborn, but it should be given if bradycardia and ineffective breathing are present. It may take up to 10 minutes to reach "normal" pulse oximetry readings in a healthy newborn, so this diagnostic tool should not be used as the sole indicator for the newborn's oxygen supplementation needs.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Newly Born … *continued*

CPR. Chest compressions may be needed for pulse rates below 60 bpm despite warming, tactile stimulation, and attempts to oxygenate and ventilate. Check blood glucose levels. Most newborns requiring resuscitation will respond to ventilations by BVM, chest compressions, and/or epinephrine. If not responding, consider other causes such as hypovolemia, pneumothorax, and/or hypoglycemia (BGL < 40 mg/dL).

Adult General Trauma

Level of patient care. Any patient with abnormal vital signs, perfusion concerns, or acute altered mental status should be cared for and monitored by a paramedic. An IV should be established and cardiac monitor applied to the patient.

Level activation. Any trauma or burn patient who meets level 1 or 2 activation should receive intravenous access and cardiac monitoring.

Fluid. Intravenous fluid is infused only to maintain a systolic blood pressure that allows for perfusion (around 90 mmHg). Do not attempt to reach a "normal" blood pressure with fluid when the patient really needs blood.

Pediatric General Trauma

Age. Newborns through 12 year old patients are considered "pediatric" in regards to trauma and level activation. This age range is not dictated by EMS, but instead by hospital level activation criteria.

Level activation. Cardiac monitoring is required for level activation of general trauma. If the patient suffered burns and meets burn activation criteria, both cardiac monitoring and intravenous access is needed. Use your judgment for IV/IO access in pediatric general trauma (not including burn) level activation.

Traumatic Event with Entrapment

Ketamine. For prolonged extrication with severe pain and a GCS of 8 or better, ketamine may be administered to help the patient tolerate the extrication process. In this case, ketamine can only be given by IV or IO. Dose is 0.1 to 0.3 mg/kg for both adults and pediatrics.

Traumatic Arrest

Airway. Early intubation/BIAD is a priority with chest compressions and immediate transport.

Fluids. Lactated Ringers solution is preferred.

Chest decompression. Consider the need for unilateral or bilateral chest decompression in your assessment.

Extremity Trauma

Tourniquets. May be used on partial amputations or when severe bleeding would be expected once resuscitation begins.

Dialysis grafts/fistulas. Tourniquet should not be used over any dialysis access on an extremity. Use direct pressure instead.

Amputated parts. When possible, rinse with normal saline, wrap with saline-soaked gauze, and protect the part in a plastic bag. The bag should be set over cold fluid or an ice-water bath --- never over ice directly. Ice will freeze localized areas of the amputated part quickly since the body is no longer circulating warm blood through it.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

Protocol Tip Sheet

General patient care reminders for the adult and pediatric protocols

Bites and Envenomations

Snake bites. Do not apply cold packs to a snake bite. Use opiate analgesics for pain; do not use NSAIDs due to their effect on platelets.

Drowning/Submersion Injury

Complications with submersion. Pulmonary edema is risk associated with drowning/submersion injuries, which may not develop for minutes or even up to 6 hours after the event. Be sure to advise the patient and his or her family/friends of this risk if the patient refuses transport to the hospital.

Other injuries. Be suspicious of spinal injuries or hypothermia that may accompany the drowning event.

Respiratory distress. If the patient is awake and with normal mental status, he or she may benefit from CPAP if experiencing respiratory distress.

Eye Injury/Complaint

Prevent increased intraocular pressure. If possible, elevate the head of the bed by 30 degrees and consider ondansetron (Zofran) if the patient is nauseated. Provide opiate-based analgesics for pain, avoiding NSAIDs. The goal is to keep the patient normotensive and within normal heart rate ranges to prevent increased systemic pressure, which will in turn increase intraocular pressure.

Burns

Intravenous fluid. The amount of fluid infused may be dependent on the type of burn. Refer to the specific burn protocol for adults.

Multisystem trauma. Burn patients are oftentimes injured by other means. Consider multisystem trauma and spinal precautions.

Injections. Never administer intramuscular injections to a burn patient. Medications should be given by IV or IO.

Spinal Immobilization Clearance

Multiple patients. Remember that if two patients require any sort of spinal precautions (even if only a cervical collar), the patient secured to the bench seat will need to be fully immobilized to a long spineboard or Flexicot to protect his or her spine during transport.

Transport angle no greater than 30 degrees. Patients who require a cervical collar only must still have spinal precautions in place. Sitting the patient upright (over 30 degrees) provides less supportive contact for the back and increases axial loading on the possibly-injured spine. Keep the head of stretcher at 30 degrees or less.

Spinal clearance. Only a paramedic may determine whether the patient's spine may be cleared in the field. However, if any immobilization was done prior to the paramedic's arrival (cervical collar), the device(s) cannot be removed until a physician clears the spine at the hospital.

This Protocol Tip Sheet is provided as a general reminder only. It does not contain all of the protocol treatment guidelines and information needed for optimal patient care. It is the responsibility of the prehospital provider to develop a comprehensive understanding of the individual protocol and to refer to it during treatment.

CCT TRANSPORT

Critical Care Transport Overview

Routine Care

P

Assessment
Primary Assessment

Review History

Monitor and Pulse Ox

EtCO2 if intubated

Secondary Survey
as needed

Vital Signs Q 10 min
(Q 5 min if abnormal)
and after interventions

Transport with appropriate safety measures

Ventilation
Maintain current settings as able

IV Drip Medications
Place medications on pump at current rate

Confirm any additional orders and ensure adequate meds for trip

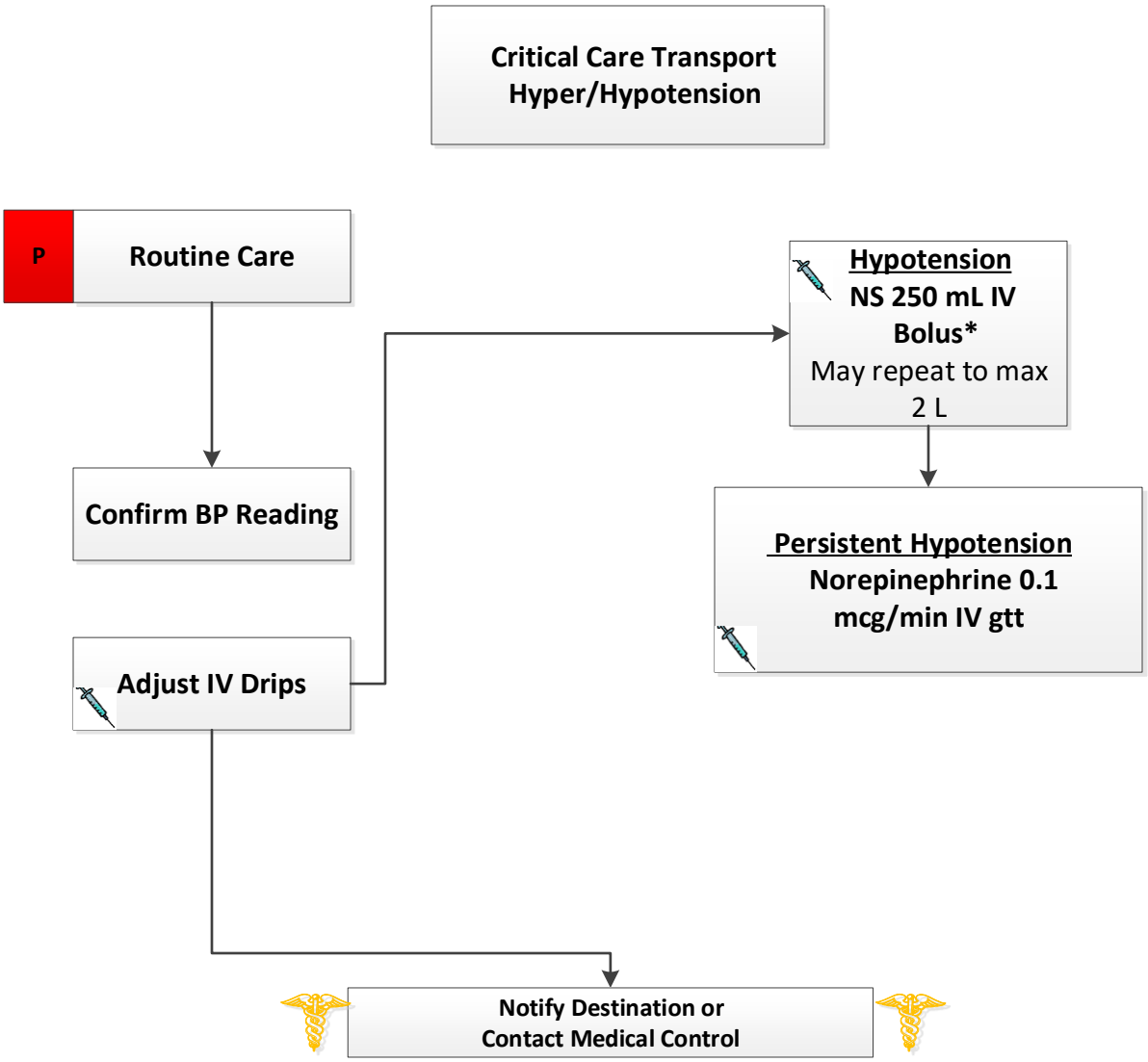
Notify Destination or Contact Medical Control

CCT Transport

Pearls:

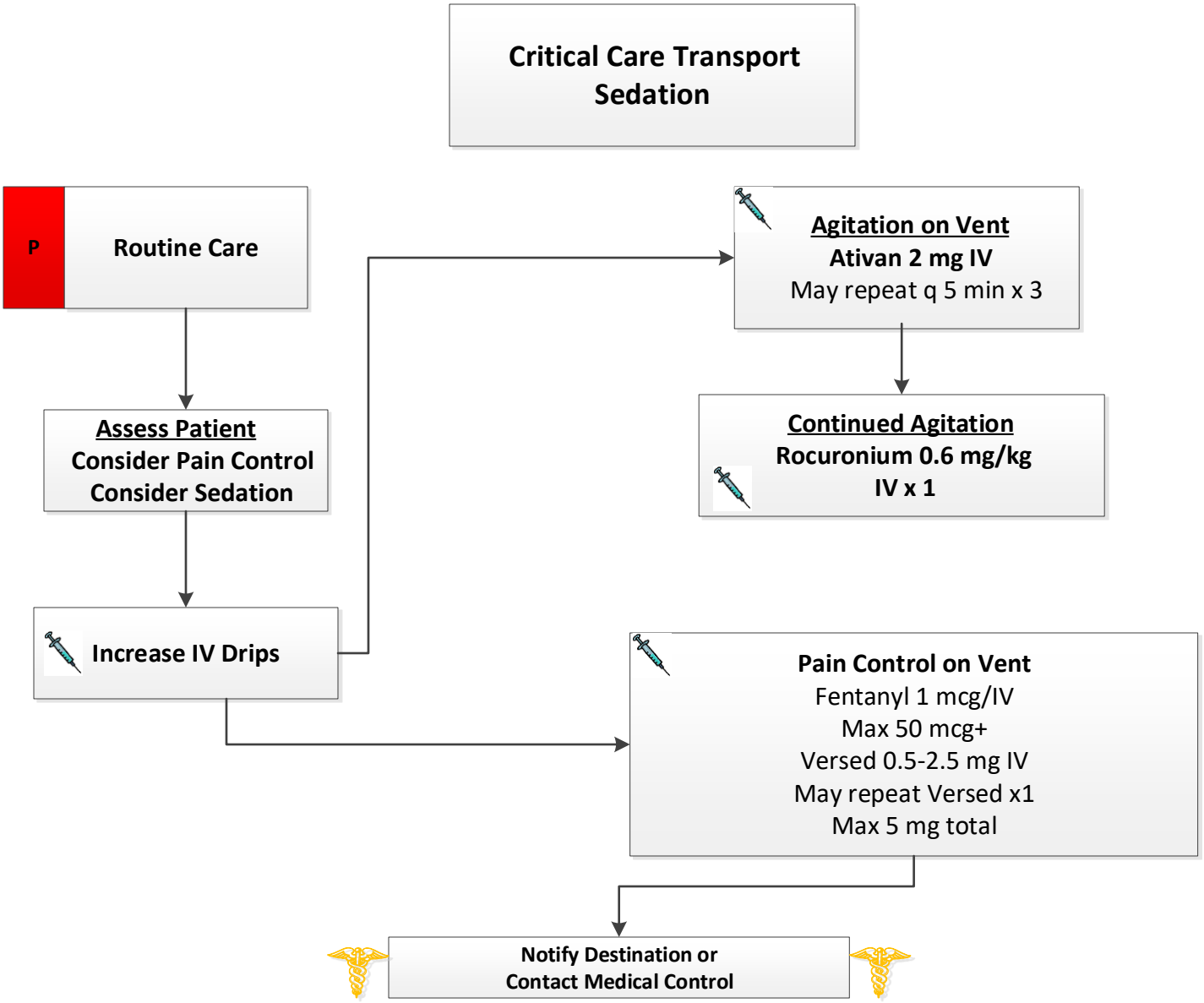
- This protocol only applies during interfacility specialty care or critical care transports for patients requiring ventilatory or hemodynamic support. Otherwise, the standard AMS protocols should be followed.
- Review current SpO2 and EtCO2 or ABG to ensure that ventilator settings are adequately ventilating/oxygenating the patient. Consult transferring hospital or Medical Control for any questions or concerns before making any changes.
- Consider General Trauma Care, Airway Management and other protocols as needed

CCT TRANSPORT



Pearls:

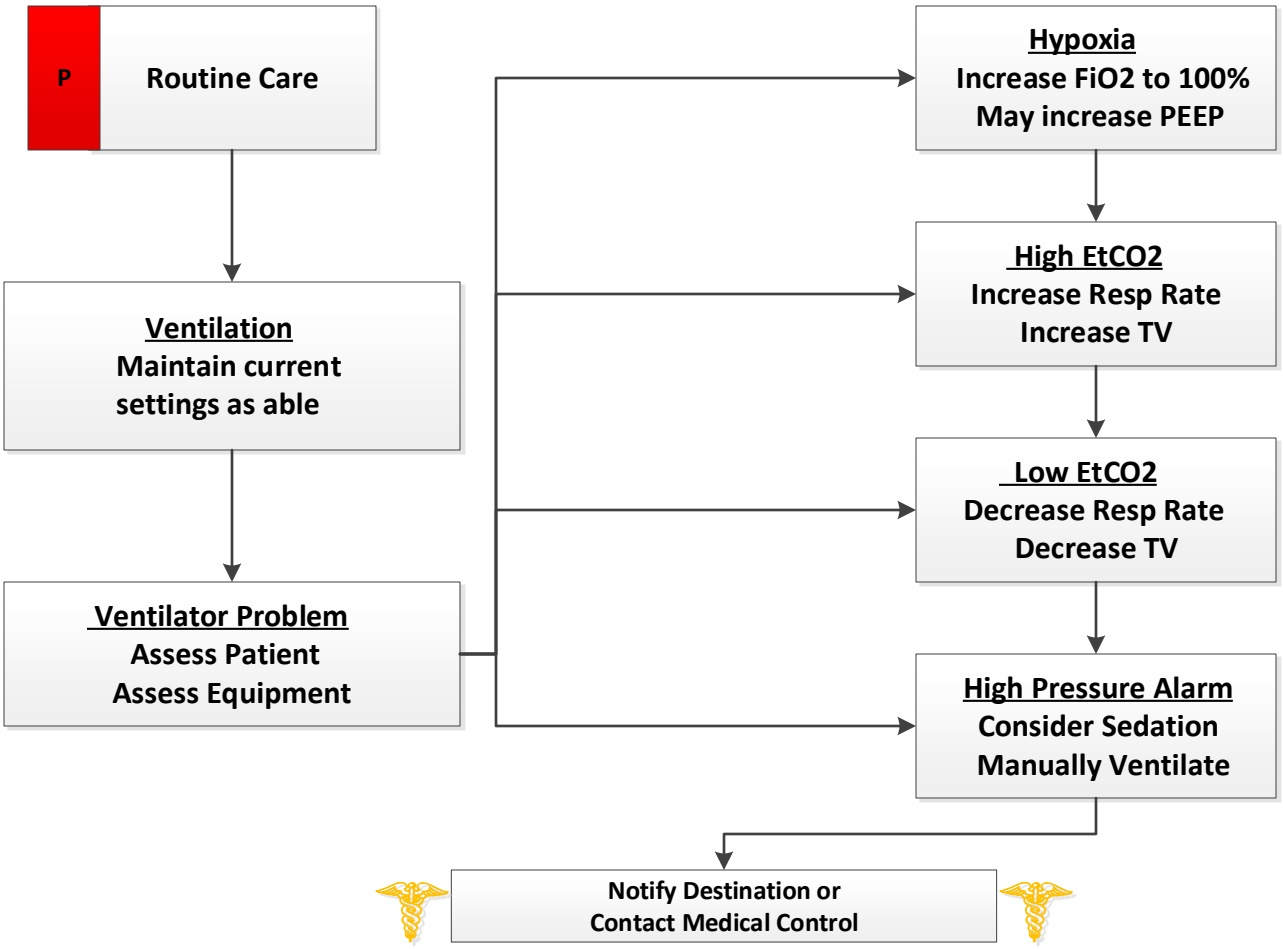
- This protocol only applies during interfacility specialty care or critical care transports for patients requiring ventilatory or hemodynamic support. Otherwise, the standard AMS protocols should be followed.
- If patient is already on drips to correct blood pressure, i.e. pressors for hypotension or medications for hypertension, increase or decrease these medications as appropriate for situation.
- Make gradual changes and closely monitor blood pressure.
- Use caution with IV fluids in patients with known heart failure, ARDS, pulmonary edema, or other ventilatory issues. Give small boluses but repeat if tolerated to max of 2 L.
- Norepinephrine dose may be increased as a gradual titration until SBP is over 90 or to a max dose of 20 mcg/min.
- For aortic dissection, goal is SBP 120 - 140 mmHg. For intracranial hemorrhage, goal is SBP. 140 - 160 mmHg. These goals may be modified by medical control or transferring facility.
- Consider General Trauma Care, Airway Management and other protocols as needed.



Pearls:

- This protocol only applies during interfacility specialty care or critical care transports for patients requiring ventilatory or hemodynamic support. Otherwise, the standard AMS protocols should be followed.
- Evaluate the patient for underlying causes of agitation. Look for abnormal vital signs or ventilator problems. Assess IV patency to ensure IV medications are working.
- Increase pre-established drips for pain and sedation but make small changes and closely monitor vital signs.
- This only applies to patients on a ventilator. For other agitated patients, refer to Acute Mental Health protocol. Check equipment on agitated ventilator patients.
- Consider painful conditions as a reason for tachycardia and agitation during transports but closely monitor vital signs and consider other causes for agitation.
- Consider General Trauma Care, Airway Management and other protocols as needed.

Critical Care Transport Ventilation



Pearls:

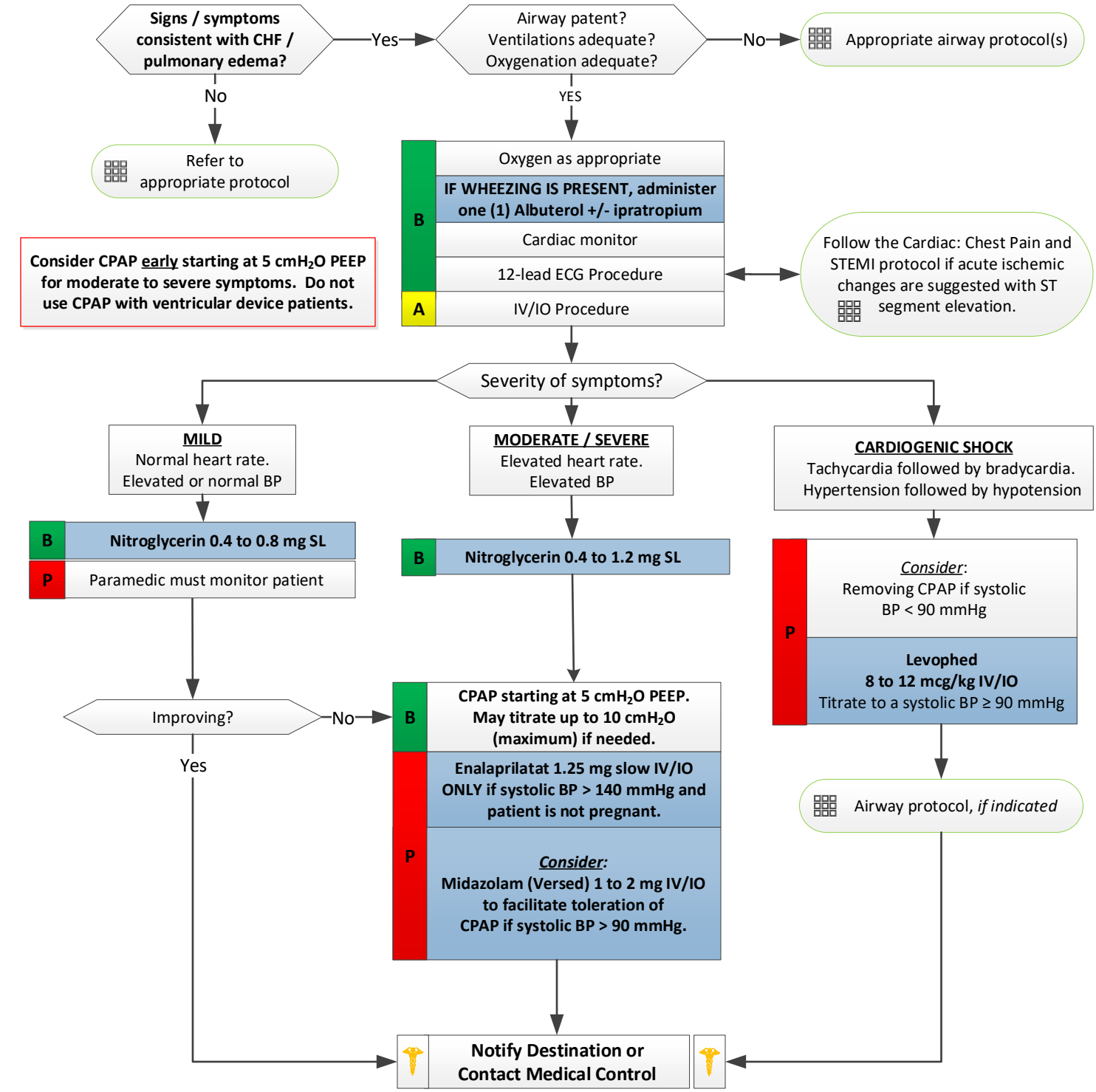
- This protocol only applies during interfacility specialty care or critical care transports for patients requiring ventilatory support. Otherwise, the standard AMS protocols should be followed.
- Review current SpO2 and EtCO2 or ABG to ensure that ventilator settings are adequately ventilating/oxygenating the patient. Consult transferring hospital or Medical Control for any questions. or concerns before making any changes.
- This applies to any ventilator alarms or problems with oxygen saturations or CO2 levels. Goal levels are EtCO2 35 - 45 and SpO2 over 95% (if able).
- Evaluate patient for pneumothorax, bronchospasm, proper ETT placement.
- Check ventilator settings, including tubing and connections.
- Do not increase PEEP above 10 without contacting Medical Control. Consider BVM ventilation and re-intubating with persistent hypoxia.
- For abnormal EtCO2 levels, make small changes to respiratory rate to gradually change readings.TV (Tidal volume) may also be changed to alter EtCO2 - again, make small changes and try not to exceed 7 mL/kg ideal body weight when increasing TV. Avoid changing pressure settings without contacting medical control.
- With high pressure alarms, ensure appropriate patient sedation (no coughing, fighting vent), treat bronchospasm, and consider manual ventilation. Refer to Critical Care Sedation protocol.
- Consider General Trauma Care, Airway Management, Wheezing and other protocols as needed

CCT – CONGESTIVE HEART FAILURE

History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix/ furosemide, Viagra/sildenafil, Levitra/vardenafil, Cialis/tadalafil)
- Cardiac history --past myocardial infarction, HTN, A-fib

Signs and Symptoms
- Prior history, hypertension
- Respiratory distress +/- rales (crackles)
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential
- Myocardial infarction
- Asthma / COPD
- Anaphylaxis
- Pleural effusion / pneumothorax
- Pneumonia / aspiration / fever
- Pulmonary embolus
- Pericardial tamponade
- Toxic exposure



CCT Transport

Abilene Fire Department/MetroCare Services

Treatment Protocols – Temporary Pharmaceuticals Policy

Due to the ongoing pharmaceutical shortages that impact Emergency Medical Services systems nationwide, this policy is being put into place to ensure consistent quality patient care continues with in this system. I am authorizing the Abilene Fire Department and MetroCare Services to substitute approved alternate medications for use with these treatment protocols when the primary medication is temporary unavailable, on an as needed basis.

When the need arises, Abilene Fire Department and MetroCare Services will inform me of the shortage/backorder situation and propose an alternative therapy protocol. Once approved, this temporary protocol will be installed in the appropriate section of the current edition of approved treatment protocols. A temporary inventory list for any items needed to address the shortage/backorder event will also be included in this section. Temporary protocols are authorized to be used until the original medication is available and in stock. Once remedied, the related temporary treatment protocol will no longer be in effect.

Robert Lawson M.D.
Medical Director
Abilene Fire Department/MetroCare Services

12/19/18
Date

Medication Shortage Situations – Additional Supply List

If no Ketamine is availible:

ADD - Etomidate: 3 – 40 mg vials

These medications shall be removed once the original medication becomes availible.

ADULT Delayed Sequence Intubation – Ketamine Shortage

E

- Maintain high flow oxygen with a non rebreather mask or nasal cannula (8-10 Lpm)
- Cardiac Monitor
- Apply waveform EtC02
- Ensure BVM has PEEP and EtCO2 attached
- Position patient in ear-to-sternal-notch alignment unless contraindicated due to suspected cervical spine injury. Head of stretcher at 30 degrees

I

IV or IO procedure, if not already done.

P

Address hypotension – Epinephrine 5-20 mcg Push Dose
(Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL)

Suspected Head Injury: Lidocaine 1 mg/kg IV/IO to a maximum of 100mg. Do NOT administer if EKG shows a 2nd or 3rd degree heart block or bradycardia.

ALL PATIENTS: Etomidate 0.3mg/kg IV (note time given)
If Etomidate unavailable: Midazolam 0.1 mg/kg IV Max 10mg

ETT placement note: If unable to obtain $EtCO_2$ readings even after sensor replacement, consider it as a failed airway and remove the endotracheal tube. Consider re-insertion after 3 minutes of oxygenation above 94% SpO_2, maintain BLS airway ventilation, and/or proceed with the Failed Airway protocol.

Suspected airway edema or SEVERE airway compromise from fluid?

No →

E

Insert NPA if no contraindications. Maintain SP02 of 94% or better for 3 minutes before proceeding to the next intervention. See sidebar to right.

Three minutes of preoxygenation has passed at an SP02 of 94% or greater

Apply a nasal cannula at 8-10 LPM if not already done.

P

Administer Rocuronium 1 mg/kg by IV/IO

Yes →

If SpO_2 drops below 94% on oxygen:

- Reposition patient
- Readjust seal of BVM
- Confirm PEEP

If SpO_2 cannot be maintained at 94% or better despite interventions, do not intubate. Use a BVM and/or BIAD and transport to the hospital.

Do not intubate unless waveform capnography is immediately available.

If unavailable, use a BIAD or maintain BLS airway management instead.

I

Intubate with video laryngoscopy, or traditional laryngoscopy if video unavailible, and/or Bougie adjunct using the SALAD procedure. Ventilate with a BVM between attempts. Do not reattempt intubation if SP02 drops below 94%; in this case, continue ventilating until SP02 reached 94% or better for 3 minutes. Afterwards allowing a second appropriate responder to attempt intubation once. If still unsuccessful, maintain BLS airway with BVM ventilations and BIAD.

E

- Secure airway and maintain oxygen saturation with goal of 92 to 99% Maintain EtC02 to goal of 35 to 45 mmHg
- Ventilate at 1 breath per 6 seconds or if available and not contraindicated, use a ventilator.
- All intubated patients must have ETC02 monitoring immediately after intubation and continued until transfer of care at ED

P

Sedation/Analgesia. Option 1: Midazolam 0 .1 mg/kg by IV/IO to a maximum of 10mg. Systolic BP must be >90mmHg. Watch for hypotension.
AND/OR
Fentanyl 50-100 mcg by IV/IO. My repeat every 10 minutes as needed for continued sedation. Maximum of 300 mcg

Always provide sedation and/or pain management, even if the patient is unresponsive. Consider how long your paralytics will last, and never allow your patient to remain chemically paralyzed without pain management and sedation.

Notify Destination or Contact Medical Control

PEDI Delayed Sequence Intubation – Ketamine Shortage

E

- Maintain high flow oxygen with a non rebreather mask or nasal cannula (8-10 Lpm)
- Cardiac Monitor
- Apply waveform EtC02
- Ensure BVM has PEEP and EtCO2 attached
- Position patient in ear-to-sternal-notch alignment unless contraindicated due to suspected cervical spine injury. Head of stretcher at 30 degrees

I

IV or IO procedure, if not already done.

P

Address hypotension – Epinephrine 1 mcg/kg (0.1mL/kg) Push Dose
(Push Dose Epi: Take 9mL of Normal Saline and add 1mL of Epi 0.1mg/ml. The mixture is now 10mcg/mL)

Suspected Head Injury: Lidocaine 1 mg/kg IV/IO to a maximum of 100mg. Do NOT administer if EKG shows a 2nd or 3rd degree heart block or bradycardia.

ALL PATIENTS: Etomidate 0.3mg/kg IV (note time given)
If Etomidate unavailable: Midazolam 0.1 mg/kg IV Max 10mg

ETT placement note: If unable to obtain $EtCO_2$ readings even after sensor replacement, consider it as a failed airway and remove the endotracheal tube. Consider re-insertion after 3 minutes of oxygenation above 94% SpO_2, maintain BLS airway ventilation, and/or proceed with the Failed Airway protocol.

Suspected airway edema or SEVERE airway compromise from fluid?

No →

E

Insert NPA if no contraindications. Maintain SP02 of 94% or better for 3 minutes before proceeding to the next intervention. See sidebar to right.

Three minutes of preoxygenation has passed at an SP02 of 94% or greater

Apply a nasal cannula at 8-10 LPM if not already done.

P

All pediatric patients: 0.02 mg/kg Atropine IV/IO before laryngoscopy. Minimum of 0.01. Maximum of 1mg

Administer Rocuronium 1 mg/kg by IV/IO

Yes →

If SpO_2 drops below 94% on oxygen:

- Reposition patient
- Readjust seal of BVM
- Confirm PEEP

If SpO_2 cannot be maintained at 94% or better despite interventions, do not intubate. Use a BVM and/or BIAD and transport to the hospital.

Do not intubate unless waveform capnography is immediately available.

If unavailable, use a BIAD or maintain BLS airway management instead.

I

Intubate with video laryngoscopy, or traditional laryngoscopy if video unavailible, and/or Bougie adjunct using the SALAD procedure. Ventilate with a BVM between attempts. Do not reattempt intubation if SP02 drops below 94%; in this case, continue ventilating until SP02 reached 94% or better for 3 minutes. Afterwards allowing a second appropriate responder to attempt intubation once. If still unsuccessful, maintain BLS airway with BVM ventilations and BIAD.

E

- Secure airway and maintain oxygen saturation with goal of 92 to 99% Maintain EtC02 to goal of 35 to 45 mmHg
- Ventilate at 1 breath per 6 seconds or if available and not contraindicated, use a ventilator.
- All intubated patients must have ETC02 monitoring immediately after intubation and continued until transfer of care at ED

P

Sedation/Analgesia. Option 1: Midazolam 0 .1 mg/kg by IV/IO to a maximum of 10mg. Systolic BP must be >90mmHg. Watch for hypotension.
AND/OR
Fentanyl 2 mcg/kg by IV/IO. My repeat every 10 minutes as needed for continued sedation. Maximum of 6 mcg/kg

Always provide sedation and/or pain management, even if the patient is unresponsive. Consider how long your paralytics will last, and never allow your patient to remain chemically paralyzed without pain management and sedation.

Notify Destination or Contact Medical Control