



# Patient Care & Treatment Protocols

*Prepared For*

# The Williamson County EMS System

Version 2026.1

Effective Date: 01/01/2026

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**Agency Medical Director:**

Dr. Taylor Ratcliff, MD, FACEP, FAEMS  
The Williamson County EMS System  
Williamson County EMS  
3189 SE Inner Loop  
Georgetown, TX 78627  
(512) 943-1264  
Taylor.Ratcliff@wilco.org



# Approved Provider Participation and Coverage

Only Texas State certified or licensed EMS personnel who are employees or approved members of participating agencies may utilize these protocols. Each participating member must be appropriately credentialed prior to functioning under these protocols. See section **“Provider Credentialing”**.

These protocols will be followed while the provider is in their area of jurisdiction. When a provider credentialed under these protocols happens upon an emergency outside of their defined jurisdictional area, they may stop and provide necessary care, within the State of Texas, as outlined in these protocols, to address immediate emergency patient care needs. The provider is to transfer care to the appropriate authority having jurisdiction as soon as reasonably possible. This may include a transfer to a lower level of care as the provider in this situation has no duty to respond but due regard should be practiced. These protocols will be upheld in the event of mutual aid or disaster response without Medical Director oversight. Additionally, providers will follow these protocols while performing any inter-facility transport within the State of Texas.

These protocols may be extended to approved EMS students who are on an active/official clinical rotation and who are functioning under the direct supervision of the agency’s preceptor. The authorized EMS provider is responsible for any actions and skills performed by the EMS student. EMS students will perform skills and assessments only to their level of current certification or training and/or competency. The EMS Medical Director shall be a signor in all agreements with any school’s EMS student training agreement.

## Approved Provider List

<b>Texas DSHS Service Name</b>	<b>Approved Provider Level</b>
Williamson County Emergency Medical Services #246013	MICU Licensed EMS Provider



Taylor Ratcliff, MD, FACEP, FAEMS, FF/EMT-LP

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## Office of the Medical Director Contact Information

Providers credentialed to use these protocols shall recognize and be in communication with the Office of the EMS Medical Director (OMD), herein referred to as the Division of Pre-Hospital Medicine (DPHM). All communications and reporting to the DPHM shall be through the following routes listed below. Complaints or concerns, provider and/or provision of care issues may be similarly communicated. The DPHM includes all MDs overseeing prehospital emergency care at the Baylor Scott & White Central Texas Division of Prehospital Medicine, they are listed below.

### **Taylor Ratcliff, MD, FACEP, FF/EMT-LP, EMS Medical Director**

Division of Prehospital Medicine

Department of Emergency Medicine

Scott & White Medical Center, Temple

2401 S. 31st Street

Temple, Texas 76508

Office Phone: 254-724-1068

Cell Phone: 806-777-2539 (please use only for urgent issues or medical control needs)

E-mail: [taylor.ratcliff@bswhealth.org](mailto:taylor.ratcliff@bswhealth.org)

While providing EMS care in the Central Texas area, providers may encounter the following EMS physicians. Their presence on scene should be equated to my presence and the following physicians may provide direct on-scene supervision and medical control direction in my absence:

**Dr. Louis Fornage, Associate Medical Director**

**Dr. Margaret Strecker-McGraw**

**Dr. Zachary Brady**

# Acknowledgements, Disclaimer and Copyright

These protocols are adapted from and influenced by pre-hospital treatment protocols from many leading EMS agencies across the United States. Many thanks to our Nation's collaborative medical directors who have made public and shared information used in the production of this document. These protocols are intended to reflect what is considered the standard of pre-hospital care in the State of Texas and are intended to take into account current national guidelines and be evidence informed where possible. They are not intended to substitute, override or take the place of professional and sound medical judgment on the part of online medical control Physician.

## **Copyright**

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## **The Intent of Patient Care Protocols**

These protocols are written to direct and assist the EMS provider in providing the highest standard of pre-hospital emergency medical care. Standing orders (herein referred to as **protocols**) are meant to direct patient care prior to reporting and consulting with an on-line Medical Control (OLMC) physician. Patient care shall be carried out within respective protocols unless a contraindication to the listed action(s) exists. Providers may consult with an OLMC physician at any time for treatment guidance or alternate orders when doing so would benefit the patient. Providers **MUST** consult with an OLMC physician where indicated in the protocols before certain medications and/or interventions may be administered.

As with any protocol or guideline, not all conditions or situations are anticipated or addressed. Remember that each patient care protocol is a guideline representing a best practice. Accordingly, this document may contain typographical errors or mistakes. Providers should use good judgment in evaluating these protocols and consult OLMC if they find a therapy that seems incorrect.

To the best of our knowledge, drug dosages and indications are consistent with national emergency healthcare standards and/or have been peer reviewed and deemed safe. The Division of Pre-Hospital Medicine is not responsible for deviations or misinterpretations of these protocols.

Please use these protocols to care for our patients in a manner that we would want care for ourselves and our families and loved ones. Put the patient first!

For correspondence:

Baylor Scott & White CTX Division of Pre-Hospital Medicine  
Department of Emergency Medicine  
Scott & White Memorial Hospital  
2401 S. 31<sup>st</sup> Street, Suite AG 62  
Temple, Texas 76508

## Medical Director's Preamble

*“EMS does not save lives. God does. It's our job to entertain our patients until He makes up His mind.” - Dr. Red Duke*

### **Welcome to OUR Team**

If you are reading this, there is a good chance that you are credentialed or credentialing under these protocols and that we are going to work together! Welcome to the team! I have tried to come up with analogies about EMS and EMS medical direction in Texas and football seems to be the best that I can come up with. You are part of the team, you may be a wide receiver, a full back or our point kicker. The 'point' being, you have specific talents that you bring to OUR team and I am happy to have you. Our team has an owner (probably the entity that pays you), a head coach (usually the director or chief) and along with other people (like your clinical manager, etc.) I make up part of the line coaches. Seeing as how we are trying to keep people alive; I consider it offense, but that can be debated! Either way, we share a common goal, playing football – well providing Emergency Medical Services really. You are a valuable player, maybe even the MVP at times. As such, one of my goals is to make sure you know the plays and that you have the 'coaching' and training to be able to run them. My job along with your clinical team is to try and give you this knowledge and training and on game day be with you to help you call plays and win the game. The playbook proverbially is this set of protocols and being with you on game day (on a call) is our presence as online medical control. Our one common goal is to win the game, better known as doing our best and the right thing for the patient and their families.

### **Delegated Medical Practice in Texas and OUR Relationship**

It is important for EMS providers to understand how our 'coaching' relationship works in Texas. Texas' EMS system is based on what is called a "delegated practice" statute. That means unlike other states where there is an overarching State EMS medical director, restrictive regional protocols and a 'mother may I' approach, each individual EMS physician determines what the EMS provider may do. There is good and bad associated with this. As our current State EMS director says, the bad part is there really is no 'floor' but the great part is there really is no 'ceiling' as to what we can do! This latitude makes me think of the saying either from Voltaire or Spiderman's Uncle Ben..." with great power comes great responsibility". While legally the EMS medical director can authorize a heart cath in the field, the reality is that we are limited by what we can safely do with the tools and resources on hand. As such it is important that pre-hospital care is cutting edge, but not so sharp that the knife cuts us. Delegated practice is a major factor that influences and defines my professional relationship with you. Read on!

Here is another way to think of this. When you respond to a call for help and care for a patient; when you speak to them, touch them, heal them, I am (in essence) there with you. Yes, I understand that I may physically be warm and cozy in my bed while you are out running calls at 3 AM, but the point is you are providing care on behalf of you and me both. Envision it this way. Let's say we are climbing Mt. Everest and we have gotten to a dangerous ridge on an icy pass. To help stay safe, we have all tied a

rope to each other, that way if one of us slips and falls, the others will have a chance to catch them. If we aren't paying attention and protecting the team, then we all just get pulled down the mountain together to our death. One of us has to react and take our ice axe and jam it into the frozen ice, stopping us all from falling. The example means we are all in this together and we have to take care of each other. What does that mean? Well, that means that you look out for me and I will look out for you. I promise to try and give you the right training, playbook and game time support to provide high quality care for our patients. In turn, I need you to train and be strong (be a prepared and competent provider).

### **Our Mission is Singular**

Win the game of course! What does winning look like for our team? We win when we provide the best, most accurate, most compassionate and most appropriate care for our patient. We hope their outcome will be good, but as Dr. Red Duke said, much of that is out of our hands. Just do the best you can! If you take care of people like every patient is your mom, dad, sibling or favorite grandparent, you will win. If you put the patient first and let that direct your actions, you will win.

Thank you for what you do. Your work is hard, at times thankless, and certainly doesn't get you fame or fortune. Remember you do this because you care for OUR patients.

See you out there,

*Ratcliff*

On-Line Medical Control Physician (OLMC)  
**Use Pulsara For All Consults Unless Not Able:**  
**(254) 724-7555 (TEMPLE ADULT ER)**  
**(254) 935-4642 (TEMPLE CHILDRENS ER)**  
**(806) 777-2539 (RATCLIFF DIRECT) \***

**\*Providers should use the agency's approved communication system first before resorting to direct telephone call (Pulsara, comm center, etc.)**

At all times, providers covered under these protocols have an online Medical Control Physician (**OLMC**) available. The physicians who answer the phone are Emergency Medicine senior level residents directly accompanied by an attending staff physician that is on duty in the Baylor Scott & White Emergency Department in Temple. **The provider may call the medical director when the care situation requires the expertise of an EMS medical director.** This may include certain terminations, entrapped patients or other odd scenarios that other physicians may not understand.

**OLMC should be contacted at any time the EMS provider needs consultation or where indicated in the protocols.** The OLMC physician is an advocate for the EMS provider and should be happy to help with any care issues ranging from consent, refusal, unusual circumstances, or abnormal patient presentations. They will also be able to assist you with medication information and other treatment guideline interpretation.

When you contact OLMC, please identify the following:

- Your EMS agency, unit and name
- Your certification level and unit capability "This is EMT Johnson on a BLS unit."
- Your transport destination, status, and ETA
- A brief description of your situation and your ongoing treatments
- Clearly state your need or question if you have one or identify this as a required contact call

OLMC **SHALL** be contacted for any of the following reasons:

- Termination of resuscitation (agency MD first, ED if no response)
- Questionable death in field consultation
- Administration of any medication or performance of any procedure that these protocols require the provider to contact OLMC
- Patient refusals in which there is any doubt as to the patient's competency to refuse treatment/transport
- Physician on scene who desires to assume care of the patient and directs actions outside normal patient care protocols, or where there is any question about care

When transporting certain conditions that are time sensitive or will need the immediate presence of critical care on ED arrival, consider speaking with a physician at the receiving hospital. This document does not supersede or negate the need to contact the receiving facility for a medical report. Unless an unusual situation occurs, providers should give a report to all facilities prior to delivering a patient to that location.

# Patient “Type” Definitions

Providers may have questions and agency discussions about what constitutes a patient, a refusal, a false call or what is termed “not a patient”. The definitions will be used and provider policies will be designed around these definitions. Providers and FROs are at liberty to institute agency specific procedures, but the following will be adhered to:

**Who is a “Patient”** – A “patient” is any person identified by EMS that has a stated or visible complaint, a mechanism of injury leading a reasonable person to conclude they likely have injuries, or a person who is not of mental capacity to identify that they have a medical need. This includes persons for which a third party summoned EMS. The required documentation is a patient care narrative (ePCR) and/or refusal form if not transported.

- For example, “You respond to a motor vehicle collision called in by a passing motorist. You arrive and the driver of a single car has struck a tree. They are fully alert and have normal mental capacity. They deny injury and deny a need for EMS. You notice bruising along the face and a laceration to the patient’s arm.” This is a “patient”. Despite the claim of not having injuries, you note a visible problem or injury. This patient should be encouraged to allow transport to the hospital and if not, a refusal must be obtained in accordance with refusal, treat/release guidelines.
- Another example, “You are attending to an adult male whose wife called EMS because he passed out. He is clearly very intoxicated, not alert to place, time or situation. He denies any complaints but you note he is hypoxic and tachycardic.” Even in the absence of a visible and stated complaint, he is still a patient.

**Patient Refusal** – A patient refusal is any “patient” defined as above who refuses to go to the hospital against the medical advice of the EMS provider. Patient refusal cases are very high liability and should be documented extremely well. Please see the separate policy on the patient refusal process.

**False Calls** – Especially in the era of cell phones and with the simplicity of calling 911, many bystanders and passing citizens will summon EMS for non-emergency issues. If the person for whom EMS was requested has normal mental capacity and has no visible, stated or expected medical or trauma related problem, they are “not a patient”. Some record must be recorded for these calls indicating the situation and reason for call. If possible, the person’s name and an additional identifier should be recorded and the person signing indicating they have no medical need if possible.

**No Injury Calls** – In some cases EMS will be summoned to situations where an accident or situation has happened and there are persons on scene with no injuries. The EMS provider should be very careful to anticipate and consider hidden or delayed injuries and advise patients appropriately. For example, if a patient is ejected through the windshield of a motor vehicle, they likely will have some type of injury and thus they will be a ‘patient’. A more detailed exam and refusal form is more appropriate.

If the individual continues to decline injury and has no stated, visible or anticipated complaint, they may be listed as “not a patient”. The required documentation is a PCR detailing information related to the incident and persons involved. Each agency should develop a policy detailing when individual “not a patient” ePCRs should be done and in which cases a “multiple not a patient” form may be used. The “multiple not a patient” form must document each individual’s name involved in the incident along with another identifier and a method of contact as well as the individual’s signature confirming they have no medical need for EMS and are declining evaluation and treatment.

# Patient Consent and Treatment

**Consent for treatment and determination of capacity to make an informed consent decision are amongst the most difficult of daily decisions for EMS providers. Healthcare laws and definitions differ in Texas between the prehospital setting and the emergency inpatient healthcare setting. These definitions can help the EMS provider determine the ability to provide care for patients both with and without capacity to make a decision and in the setting of seeking care and refusing care.**

If a patient (or legal decision maker for the patient) requests evaluation and treatment from EMS, they will also be actively encouraged to seek evaluation by a physician. If the requesting party consents, they will be transported to the closest most appropriate acute care facility at the earliest possible opportunity.

**Under no circumstances, will EMS refuse or deny treatment to any patient who requests medical assistance, unless:**

- There is an order given directly by the EMS medical director not to transport.
- There is a pre-arranged, patient specific agreement by order of the medical director.
- Doing so would pose an immediate risk to the safety, life and or health of care providers.
- During a time of mass disaster MCI operations or during a local or greater declared disaster.

## **Determination of Capacity**

Determination of capacity can be one of the most challenging aspects to patient care. Notice the term is capacity not competency. Competency is a legal term and must be deemed by a judge or other magistrate. Our determination is capacity and unfortunately this term's definition differs between the prehospital environment and the hospital setting when Texas laws are examined. For the purposes of these clinical guidelines the following must be normal in order for the patient to have capacity to make a decision:

- They must be able to effectively communicate. This means they must be able to convey their wishes, positive or negative and there must be a way for the EMS team to know they are 'receiving the message'. This includes all forms of communication, patients may speak, write or sign to communicate.
- They should generally know the basic orientation questions of person, place, time and event. Remember this is general and should be adapted to the individual. For example, an elderly retired patient living in assisted living may not know the day of the week or the date. For them that information has likely become irrelevant. Ask more appropriate questions such as the 'season', 'upcoming holidays', etc. People who do not know who they are and generally 'where' they are seldom have capacity.
- They should be able to summarize in layperson terms what illness, injury or problem the EMS team is concerned about and in addition generally repeat the potential consequence of not seeking care for that problem (i.e., death from a 'heart attack').
- They should be able to give a coherent rationale for their decision and should be able to demonstrate understanding of other options (i.e., being able to call EMS back, seeking care POV, with a personal physician, etc.).

## **Issues Surrounding Consent**

**Informed Consent** – Most patients consent to EMS treatment and or transport on the basis of informed consent. By nature, they are alert and are able to understand the benefits and risks of any treatment provided by EMS including the potential consequences of refusing certain aspects of treatment or transport to the hospital. These patients should also understand alternatives should they not accept EMS

treatment or transport and those associated risks and benefits. By definition, these patients or legal guardians must have **capacity** to make a decision.

**Implied Consent** – For a patient **without decision making capacity**, the EMS provider must make the default assumption that the patient would want reasonable care if they were to be in a normal state of mind with adequate capacity. EMS providers who encounter a patient who is refusing care, who lacks capacity to give or refuse consent should try multiple ways of obtaining consent to transport. In the end, the EMS provider should safely transport the patient to the closest most appropriate medical center with or without this patient's assent. Restraint and chemical relaxation may be used when necessary but to the most minimal extent possible, with the patient's safety and comfort at front of mind. All of this information must be documented in the ePCR.

**Intoxicated Patients** – EMS encounters numerous patients who are under the influence of drugs and or alcohol. The presence of drugs and or alcohol does not automatically mean that the patient is unable to give consent. For them to make an informed consent decision, as above, they must have decision making capacity. If they are able to fulfill the above requirements, they likely have capacity to make a care decision. If the EMS provider feels they are too impaired to make an informed consent decision, the patient may not refuse. Involve law enforcement as needed for assistance with a safe patient disposition.

**Law Enforcement and Medical Decision Making** – In Texas, only law enforcement officers and judges have the legal authority to medically detain patients and authorize transport to the hospital against a patient's will. Law enforcement officers may enact a notification of emergency detention (NED), also called an order of emergency detention or protection (OED, OPC) or fulfill an order from a magistrate or judge. When in custody of a peace officer, the officer may make transport destination decisions on the patient's behalf. It is very important for the EMS provider to advocate for the patient and help the officer make a good medical decision regarding transport. The law enforcement officer has the ultimate authority to refuse transport for a patient in custody or demand the patient be transported.

In cases where the officer will not allow transport, document very thoroughly the identity of the officer and have the officer sign an informed consent refusal form. Note, if the officer mandates transport, this does not mean the patient has to consent to physical treatment. Physical treatment apart from transport must be with the consent of the patient so long as they have capacity. Providers should consider having the officer sign the consent for transport portion of your ePCR and accordingly have the patient sign the refusal of treatment section in this particular circumstance.

## **Emergency Treatment of Minor Patients**

**Minor patient** – A patient less than 18 years old who is not otherwise emancipated as defined below.

**Transport of Minor Patients** – Regardless of age, any minor patient experiencing a medical emergency should be cared for immediately. Upon evaluation by the EMS provider, if they feel that a minor patient has a medical condition that does, or could pose an immediate threat to that patient's life or health, treatment and transport should commence immediately. An appropriate guardian should be contacted at the earliest possible time. If the minor patient does not have any apparent life-threatening condition, transport may be deferred until contact with a parent or legal guardian can be accomplished. Contact OLMC for issues where legal guardians cannot be reached.

**Consent Related to Minor Patients (Patients < Age 18)** – Per the State of Texas, minors are not legally able to make informed consent decisions about treatment or transport decisions. Similarly, they shall not be permitted to decline or refuse medical care or EMS transport without obtaining an informed refusal from the parent or legal guardian. If the guardian wishes to refuse for the minor, it is preferable for the guardian to come to the scene and sign in person. If this is physically impossible or would impose undue hardship (i.e., guardian providing care for another, in hospital, etc.), the guardian may give EMS refusal consent verbally. This must be witnessed by another member on scene (preferably law enforcement if

present) and both the name and number of the guardian, as well as the witness to the refusal documented in an appropriate location.

The following individuals may consent to healthcare treatment of a minor (other than immunizations) when the parent or the conservator is unable to be reached, unless they have given written notice against:

- Grandparent
- Adult brother or sister
- Adult aunt or uncle of the minor
- The educational institution (school) in which the child is enrolled, and where the parent has given written authorization for the school to give consent to treat.
- An adult who has care, control and possession of the minor with written authorization to consent from the parent.

If parent or legal guardian refuses critical or needed medical care for their child, contact law enforcement and the on-duty supervisor. Have them respond to the scene and explain the medical need and risks to law enforcement. Proceed with care if law enforcement gives consent and takes custody of the minor.

Remember that minors have the right to give consent in Texas for certain complaints. These include complaints related to pregnancy and sexually transmitted disease and are listed below. Keep informed about changing Texas laws related to consenting age and patients who are “emancipated”.

**Emancipated Minor** – An emancipated minor in Texas is anyone claiming such who is:

- Legally emancipated by a judge or court.
- On active duty with armed services.
- 16 years old or older and residing apart from parents, managing conservator or guardian and managing his or her own financial affairs.
- Unmarried and pregnant and consenting to treatment related to pregnancy other than abortion.
- Unmarried and the parent of a child and has actual custody of that child and consents for treatment of the child.
- Consenting to diagnosis or treatment of an infectious, contagious, or communicable disease that is reportable to the Texas Department of State Health Services.
- Consenting to examination or treatment for chemical addiction, dependency, or any other condition directly related to chemical use.
- Consenting for counseling for suicide prevention, chemical addiction or dependency, or for sexual, physical, or emotional abuse.
- Serving a term of confinement in a facility operated by or under contract by the Texas Department of Criminal Justice.

## Refusal of Treatment or Transportation

Patients who are of legal status to consent and of appropriate mental capacity may refuse EMS treatment and or transportation. The reasons that patients refuse medical treatment are complex ranging from concerns about cost of EMS transportation, to concerns about previous negative medical encounters, etc. In almost all cases, the default position of the EMS provider should be that the patient “needs” to go to the hospital and you “want” to take them! When the patient refuses treatment it is important to try and understand the reasons why, and attempt to make accommodations to encourage the patient. Frequently our patients are worried about pets, bills or other things that can be discussed and addressed.

Other times the patient fails to understand the gravity of the medical situation. Consultation with OLMC to let them speak with a physician sometimes reinforces this. Similarly, if the patient’s primary care physician can be reached, this may help. When all else fails, and if great harm is expected if the patient does not receive care, consider involving law enforcement to see if they will provide an order of emergency detention. Document these cases very carefully and involve family and supervisors when appropriate. Remember to always specifically say that the patients “needs” to go to the hospital and you “want” to take them!

All patient refusals should be carefully documented with a full ePCR and narrative. It should include medical information, exam and vital sign information if the patient allows. If not allowed, this too should be documented. In all cases the EMS provider MUST explain the risks and benefits of transport and refusal. In addition, they should always emphasize that the patient “needs” to be transported and we “want” to take them. They should also emphasize the risk of both death and permanent disability. A proper refusal form should be used and filled out, signed by the patient, the treating EMS provider and a witness. Witness selection is important. This should be someone who has a bonafide interest in the patient’s wellbeing such as a family member, spouse, or other interested party whenever possible. In some litigation cases, people may think that EMS providers and even law enforcement officers ‘cover for each other’ and likely may have ‘faked’ an informed refusal. This is much less likely when witnessed by a family member or friend who otherwise should care about the patient.

Sample EMS refusal verbiage is supplied below that may be used in conjunction with pertinent medical information about the EMS call. All refusal verbiage should be approved by the legal team of the authority having jurisdiction as well as the medical director, and should honor the intent of what is listed below:

*“At this time the patient has normal decision-making capacity. The patient is alert, aware of their person, place and the appropriate time. The patient is able to repeat in layperson terms why EMS was called and the risks and benefits of transport and refusal of transport to the hospital. They understand the benefits are higher level of care and medical evaluation by a physician in a licensed medical facility. The patient understands failure to identify and treat their current problem may result in injury, permanent disability or death from the suspected problem [INSERT FIELD DIAGNOSIS HERE]. We have explained to the patient that they need to go to the hospital now, today with EMS and that we want to take them to the hospital. We have informed the patient and offered transport multiple times. In addition, we have involved [IF APPLICABLE IDENTIFY PERSON HERE – E.G. FAMILY MEMBER, MEDICAL CONTROL MD, ETC] to encourage the patient to allow treatment and transport. These attempts are witnessed by [WITNESS NAME/CREDENTIAL]. We have fully informed the patient that they may change their mind at any time and call 911 to re-summon EMS for reevaluation or if they decide to be transported to the hospital at any time and are*

*encouraged to do so. We have also advised the patient of important signs and symptoms to watch for including [WARNINGS AS APPROPRIATE].”*

In the event that a patient refuses because the EMS provider does not, by policy, transport to a patient requested destination, the EMS provider should make reasonable efforts to assist the patient with an alternate means of transportation. In order of preference this may include:

- Other 911 EMS agency that will respond to the scene and transport to requested hospital or facility.
- Non-emergency EMS agency that will respond to the scene and transport to requested hospital or facility.
- Wheelchair van or other patient transport vehicle.
- Family transport.
- Public transportation, taxi, UBER, etc.

The EMS provider will still obtain a signed, informed consent refusal informing the patient of the risks of delay in care due to the notification and response of the alternate agency. If there is any potential for a life-threatening illness to be present, the primary EMS responder will remain on scene with the patient until alternate transportation arrives. Should the patient lose decision making capacity (become unconscious, etc.) the EMS provider will take them to the nearest most appropriate facility.

## Treat and Release Guidelines

It is understood that in some circumstances, EMS providers may be called upon to treat patients that do not require or desire transportation to an emergency department or other medical facility. This should certainly be the exception, not the rule. In general, any patient who receives invasive medical treatment (medications, IV fluids, oxygen, etc.) should be transported to an appropriate medical facility. There may be some extenuating circumstances where the EMS provider is requested to treat and release the patient. **Any patient not meeting the definitions and requirements for decision making capacity above should be transported to the hospital.**

In the event that a patient refuses further treatment and transport after either has been initiated (either on-scene or enroute), the EMS provider should ensure the following:

- As stated above, the patient has adequate decision-making capacity
- The EMS crew should make attempts to provide or consider safe and appropriate modifications to current treatment or transport
- OLMC should be contacted when the provider deems it might be beneficial, and the OLMC physician given an opportunity to advocate for continued transport and ED treatment
- The patient should sign the EMS agency’s refusal form after risks of refusal are clearly explained per the refusal guidelines above
- The EMS crew should ensure safe disposition to a responsible party and close follow-up with a suitable healthcare professional encouraged

If a patient refuses transport once enroute to the hospital, this complicates the normal refusal process. First and foremost, the patient must have adequate capacity and the above measures undertaken. Discussion and compromise should be the rule and even if all medical care has to cease. The patient should be asked to allow completion of transport. For patients that demand immediate cessation of transport, “stop the ambulance, I’m getting out”, the priority is a safe disposition.

- Do not stop the EMS vehicle in any location that would pose a life safety risk to the patient or crew. For example, do not stop on busy streets, highways, etc.
- Move as soon as possible to a safe parking area, preferably an area with access to resources such as gas station, grocery store, etc.
- Offer to call someone to pick up the patient and/or make other transport arrangements.

- Promptly contact law enforcement if the patient poses an immediate risk to themselves or others for advice and consultation
- Document, document, document!!

## Refusal to Sign or Participate In Refusal

In some cases, patients will refuse to engage in the refusal process. They may refuse evaluation such as vital signs or EKGs or they may only refuse to sign the refusal form itself. Patients who have capacity may choose not to participate in the refusal process but they must at least demonstrate capacity to make an informed decision. Providers should:

- Address any concerns about the refusal process with the patient.
- Engage the patient in parts of the process that they will participate in.
- Involve Online Medical Control when there is question about whether the patient is demonstrating capacity or not.
- Document what you can ascertain from the situation. For example, even without a patient allowing a hands-on exam, you can document alertness, pupils, skin findings, respiratory status, etc. Document what you can.
- Have the most credible person on scene sign as a witness indicating the patient was refusing to sign and or participate in the refusal process. See section above regarding who makes the best person to witness the refusal process.

# Provider Credentialing and Authorization

Within these EMS protocols, providers are credentialed (allowed to practice) not based on their Texas DSHS level of certification or National Registry, but of that authorized through the Medical Director. For example, an EMT certified at the Texas EMT-Paramedic level may only be authorized to practice within these protocols at the EMT-Basic level.

All system responders, when on requests for service, shall display department ID indicating their legal name, agency/service affiliation and **CREDENTIALLED** certification level to help avoid confusion during patient care and in accordance with Texas DSHS requirements.

There shall never be delegations made to a responder that would require them to act outside of their authorization to practice set forth by the Division of Pre-Hospital Medicine (DPHM). In addition, providers do not have the authority to “delegate practice” to other EMS providers.

## **Agency credentialing will be in accordance with one of the following designations:**

- **BLS First Responder** – An organization licensed by the Texas Department of State Health Services as a first responder organization with a BLS modifier. The BLS first responder must maintain the BLS FRO minimum equipment list and personnel may be authorized at the Texas ECA/EMT scope of practice within these treatment protocols. If providing 911 services the first responder organization must have adequate numbers of certified personnel to meet the requirements specified within the provider first responder agreement.
- **ALS First Responder** – An organization licensed by the Texas Department of State Health Services as a first responder organization with an ALS modifier. The ALS first responder must maintain the ALS FRO minimum equipment list and personnel may be authorized at the Texas ECA/EMT or AEMT scope of practice within these treatment protocols. If providing 911 services the first responder organization must have adequate numbers of certified personnel to meet the requirements specified within the provider first responder agreement.
- **MICU First Responder (Local Modification, not-DSHS)** – An organization licensed by the Texas Department of State Health Services as a first responder organization with an ALS modifier. The MICU first responder must maintain the MICU FRO minimum equipment list and personnel may be authorized at the Texas ECA/EMT or AEMT or Paramedic scope of practice within these treatment protocols. If providing 911 services the first responder organization must have adequate numbers of certified personnel to meet the requirements specified within the provider first responder agreement.
- **BLS Transport Provider** – An organization licensed by the Texas Department of State Health Services as a BLS Provider. The BLS transport provider must maintain the BLS transport unit minimum equipment list and personnel may be authorized at the Texas ECA/EMT scope of practice within these protocols as designated by the Medical Director.
- **MICU Transport Provider** – An organization licensed by the Texas Department of State Health Services as a MICU Provider. The MICU transport provider must maintain the MICU minimum equipment list and personnel may be authorized at the Texas ECA/EMT or AEMT or Paramedic scope of practice within these protocols as designated by the Medical Director.

## Agency Provider Credentialing ALL Levels

- All agencies must have a detailed credentialing plan for BLS and ALS levels that has input from and is approved by the medical director.
- At minimum this plan must include:
  - A program verifying the individual's certifications and educational history.
  - A methodology to perform a background check for any significant criminal offenses that would pose a potential threat to patient safety. This should be in accordance with the provider's policy on background checks and pre-employment verification.
  - Proof of vaccination in accordance with guidelines established by the CDC for healthcare workers including proof of immunity from the Hepatitis B Virus vaccination.
    - Those guidelines can be found at <https://www.cdc.gov/vaccines/adults/rec-vac/hcw.html>.
    - The individual provider should provide a doctors note or other agency approved methodology for objection should this not be in place.
  - A systematic program orienting the employee to the provision of medical care that includes an:
    - Administrative orientation period that should include:
      - System operations and communications
      - Orientation to documentation and the EHR
      - Orientation to the protocol including issuance of protocols and periodic assessment of understanding
      - Protocol testing on behalf of the office of the medical director
      - Verification and documentation of BLS and ALS skills proficiency
    - A medical probationary period where the employee:
      - Rides along on the ambulance or first response vehicle as an 'extra', usually called 'third-out' crew member. The intent is for the probationary employee not to be a 'required' medical crew member and staff accordingly
      - Is given progressive responsibility and evaluation for provision of medical care
      - Is evaluated using appropriate written detail to record patient care types encountered and performance feedback from preceptors
      - Demonstrates entry level proficiency to progress to a secondary evaluation period where they will function more independently
      - Meets briefly with the medical director and FTO team to evaluate any barriers to progression
    - A secondary evaluation period where the employee:
      - Continues to ride with an FTO of equal or higher certification
      - Is expected to begin functioning as an independent crew member under the supervision of the FTO
      - Continues to be evaluated with appropriate written detail as above.
      - Has a final meeting with the medical director and FTO & leadership team for final determination of clearance to independent unrestricted duty

## First Responder Credentialing BLS Level

- **To practice within these protocols, the EMS provider (meaning individual) MUST:**
- Have current certification, in good standing with the Texas Department of State Health Services as either ECA, EMT, EMT-Intermediate (AEMT) or EMT-Paramedic/Licensed Paramedic.
- Maintain required continuing education, training and recertification procedures mandated by the State, DSHS and/or the medical director.
- Maintain an American Heart Association CPR certification (or medical director approved equivalent). Other courses such as ACLS, PALS, NRP, ATLS, etc., are strongly encouraged. At the Medical Director's discretion, said agency/practitioner may be required to obtain and keep current such courses.
- The provider must be listed as an active member on the FRO agency roster with Texas DSHS. Texas DSHS provider rosters should be updated monthly and any changes to credentialed roster should be communicated to the medical director.
- The provider must be in possession of and provided a current copy of the EMS treatment protocols either in written or electronic format.
- The provider must take and pass the current DPHM credentialing exam and periodic protocol update exams. The result of this test should be forwarded to the Medical Director and the original kept on file at the provider's agency.
- The provider should have documented completion of the agency's onboarding process as above.
- At the conclusion of these steps, the FRO must notify the Medical Director of the new member and have written verification (by E-mail) that the member may start practicing. DSHS currently requires the medical director to sign an authorization to practice for all credentialed members.
- At the discretion of the Medical Director, prior to authorization, the new system responder may be required to:
  - Meet with the Medical Director and undergo an additional examination process
  - Spend clinical time (in or out of hospital) with the Medical Director or their designee
  - Complete additional training, testing or educational rotations

## First Responder Credentialing ALS Level

- **To practice within these protocols, the EMS provider MUST:**
- Adhere to the section on FRO BLS credentialing above, AND
- First responders who are also ALS credentialed members of one of the MICU transport providers covered by the DPHM are automatically credentialed as ALS first responders. However, they may not carry equipment above and beyond the licensed FRO level.
  - For example, a paramedic volunteer at a BLS first responder organization may not carry additional drugs, medications or devices.
  - They may however assist with ALS procedures at the discretion of the lead Paramedic upon arrival of the MICU unit.
- First responders who are NOT members of one of these agencies must undergo a specified ALS practice pathway to obtain ALS credentials. The member and agency officer may contact the medical director to request an additional credentialing packet for this process. This includes but is not limited to:
  - Advanced skills testing and verification
  - Simulated patient encounter testing with the medical director
  - Clinical ride time with an affiliate EMS preceptor

# Individual Provider Changes to Level of Practice and Decredentialing

At the Medical Director's discretion, the approved level of practice of the EMS provider may be altered as needed to ensure the safety and appropriateness of patient care. When a change in credentialing or level of practice is necessary the following process will be adhered to (but shall not supersede civil service process where different).

- The transport agency or FRO will be informed immediately. The agency chief or appropriate administrative leader will be notified both verbally by phone as well as by E-mail with verification of receipt requested that a change in level of practice is required. This will include:
  - Information regarding the issue or issues prompting the required change.
  - Any information related to due process that has already occurred.
  - The medical director's request as to the time necessary for the change. The change may be requested immediately (in cases of a danger to the general public or a remarkably egregious action) or for future shifts.
  - The medical director's request for removal from duty versus job modification.
  - It will be the responsibility of the agency administrator to determine the actual work performance required following this discussion (i.e. alternate duty vs. suspension, etc.)
- The individual provider will be notified in accordance with the agency's policy whether by E-mail, phone, in person, etc.
- The provider will be given due process including the opportunity for further investigation and evaluation.
- Upon final conclusion of the investigation period, the Medical Director will provide the individual provider with written (electronic or if not possible by mail) notification of:
  - Intended action (in accordance with categories below)
  - The effective date and duration of action
  - The reason or due process cause for said action
- If de-credentialed, the provider will not be able to utilize these protocols or provide emergency services in said capacity unless reinstated by written authorization of the DPHM. Violations of this decredentialing order will be reported to the appropriate State and National agencies, up to and including law enforcement as necessary.
- The provider may appeal the de-credentialing or credentialing change. Appeals to said action must be in writing through the sponsoring agency and sent to the contact e-mail address for the Medical Director or via certified mail to the DPHM.
- Types of action
  - Modification of credentialing level
    - The Medical Director may increase or decrease the individual provider level of practice.
    - This will be not based on the State or National Registry level of certification but in accordance with the practice levels set forth in the treatment protocols.
    - Modifications to credentialing level may be permanent or temporary.
      - If temporary, the necessary steps and process to regain previous credentialing level will be outlined in a performance plan.
  - De-credentialing
    - De-credentialing will be removal of the individual provider's ability to practice under these treatment protocols.
    - The DPHM understands that provider de-credentialing is a serious process that in general removes the ability for the employee to remain employed. This will be undertaken with great care and focus on patient-centered care.
      - All individuals will be given due process and the ability to appeal.
      - This process shall be in accordance with the agency's disciplinary processes and or civil service process if such an entity.
      - The Medical Director will have no say so in the absolute hiring or firing of an employee.

- This will generally be a permanent process without modification but some extreme circumstances may exist where there will be a process to regain credentials.
- Reasons for de-credentialing may include but are not limited to:
  - Failure to maintain State certification requirements or revocation of certification by the issuing board.
  - Violations of professional conduct and behavior expected of a public servant, including moral turpitude, on-duty drug or alcohol use, etc.
  - Other criminal action that prohibits further EMS practice or endangers patient care.
  - Clinical practice errors or violations that are refractory to counsel and education or that pose a threat to the public health.
- Decredentialing from one agency within the Baylor Scott & White Central Texas Division of Prehospital Medicine shall prohibit credentialing with any other BSW CTX DPHM agency for a minimum of one year.

# General Scope of Practice

## **Non-Medical First Responder:**

A non-medical person is any department sponsored / authorized responder without certification by the Texas Department of State Health Services (DSHS). Non-medical first responders do not have a scope of practice, and their practice is not defined by medical direction or protocol. The DPHM is not responsible for any care or actions provided by a non-medical first responder. It is suggested that if non-medical first responders are answering medical calls for help, they should at minimum be able to:

- Operate an approved emergency vehicles in response modes
- Communicate via radio with dispatch, other EMS units, and assisting agencies
- Perform CPR and AED functions with a current BLS CPR/AED certification
- Provide first aid in accordance with national standard first aid classes such as that offered by the American Red Cross or the National Safety Council.
- Assist with traffic control and scene safety management
- Assist with lifting and moving of a patient under the direction of the EMS provider in charge

The authority having jurisdiction assumes all liability of non-medical first responders attending scenes and providing any care.

## **Certified or Licensed Providers:**

Providers may practice at the certification level and scope of care set forth by the EMS Agency Medical Director's authorized level of practice. These are listed below, subject to change, and the scope specified is based upon the Medical Directors authorization to practice. This applies only to the level of care that the Medical Director authorizes the provider to practice at. This applies to all entities utilizing these protocols.

## **Emergency Care Attendant (EMR) and EMT-Basic (EMT-B) providers can perform the following skills as outlined in the treatment protocols:**

All the skills listed above for non-medical first responders

Scene survey, requesting additional resources, triage

Basic patient assessment

Administration of oxygen

Basic airway management including suctioning, OPA/NPA placement, BVM assisted breathing

Supraglottic airway insertion

Assess vital signs

Basic intervention in bleeding control/burn management

Splinting/Spinal motion restriction

Documentation of patient care

Verbal patient care reports to receiving provider

Oral glucose for hypoglycemia

Epinephrine administration for anaphylaxis

Administration of other medications as indicated in the patient care protocols

Clinical c-spine clearance

CPAP application

Assisting the ALS provider with medication administration and other equipment set-up and application

## **EMT-Intermediate (AEMT) providers can perform the following skills as outlined in the treatment protocols:**

Perform all the functions listed above in addition to:

Intravenous/ IO cannulation and fluid administration

Chest decompression with needle thoracostomy or finger thoracostomy if trained

Administration of IV dextrose for hypoglycemia

Administration of other medications as indicated in the patient care protocols  
Endotracheal intubation where allowed in the system or protocols  
Assisting the ALS provider with medication administration and other equipment set-up and application

**EMT-Paramedic (EMT-P) providers can perform the following skills as outlined in the treatment protocols:**

Perform all the assessments and skills listed above, in addition to:  
Apply and interpret electrocardiographic assessment (including 12-lead)  
Administer appropriate pharmacologic therapy for multiple medical conditions  
Pain management  
Perform drug assisted intubation  
Surgical cricothyrotomy  
Perform conscious sedation/chemical restraint as indicated  
Field termination of resuscitation  
Administer IV medication drips through portable IV pumps

**Care provided by non-EMS medical professionals:**

Other (licensed/certified) non-EMS providers such as the Neonatal Intensive Care Team and other advanced transport teams may provide patient care as authorized by that person/team's medical director, while being transported on system provider ambulances. They may request care from the EMS provider, and this should be provided to the extent authorized in the provider's scope of practice. If a physician, licensed in the State of Texas, wishes to provide patient care the crew will refer to the Physician on Scene protocol.

## Scope of Practice Pertaining to Equipment Availability and System Protocols

These protocols are intended to be system protocols and will be used by transport providers, first responders and other system credentialed personnel. This office of the medical director feels it important for the first responder to be able to see the entire series of protocols to be able to anticipate and assist with treatment given by the transporting EMS provider.

As such, first responders and other non-MICU transport agencies will not be carrying each medical item and medication listed in the treatment protocols. As an example, first responders will not be allowed to perform drug facilitated intubation and as such will not be allowed to carry those associated medications.

While the level of practice will be delineated in the first responder agreement, as a further measure, the agency specific minimum equipment list will be engineered and designed to restrict or allow interventions listed in the protocols based on the medical director's discretion. As such the FRO or non-MICU provider MEL will not contain everything necessary to fulfill the full intent of each patient treatment protocol, this is by design. Again, for example, if a first responder agency is not allowed to have fentanyl on their minimum equipment list, it is by intent and design of the medical director for them not to perform that therapy prior to arrival of the MICU ambulance.

This policy does NOT prohibit the ability of the credentialed first responder to be able to assist the MICU ambulance crew with any and all treatments they are credentialed to do, on arrival of the ambulance.

# Destination, Bypass and Diversion

## **Decision Making and Patient Preference**

The medical and/or surgical needs of the critically ill or injured patient are always the **primary** consideration in determining transport destination. However, for the alert patient with medical decision-making capacity, the patient may determine the final destination. If a patient requests a destination that is not medically appropriate, the EMS provider should make every effort to inform, educate and recommend to the patient the most appropriate destination. This process should mirror a patient refusal process (it is inherently a refusal to accept EMS' recommendation) and explain that the patient may suffer death, permanent disability or a poor outcome as a result. However, the patient always has the right to make an informed consent decision, good or bad. This should be clearly documented in the ePCR.

In general, critically ill medical patients should be transported to the closest appropriate facility that can stabilize their immediate medical needs. The exception to this rule can be made if it is felt that it is in the patient's best interest to be transported to a specialty care hospital, rather than the closest facility. This may apply in trauma, STEMI and stroke, pediatric, neonatal or high-risk OB care, amongst other conditions.

Critically injured patients require rapid transport to the closest hospital capable of handling trauma patients. Determination of appropriate transport destination should be based upon the patient's immediate condition, location of the call, possible traffic delays, and the needs of the patient in the critical first hour of trauma. When in doubt, refer to regional TSA and/or RAC guidelines.

Otherwise, transport of most patients shall be to the hospital of the patient's choice with regards to current system status, unless specified by legal order. EMS providers may indicate a maximum transport boundary approved by policy and inter-local agreement. Patients requesting transport to facilities outside the transport boundary should be informed of the policy and offered transport to any other acceptable facility inside the boundary. If the patient refuses and needs medical care, the EMS provider should make reasonable attempts to summon other providers that can transport to the desired destination. Providers should remain on scene and provide care until arrival of that provider unless released by Medical Control order.

First responder organizations will only transport patients in non-ambulance vehicles when allowed in accordance with Texas House Bill 624. First responder organizations will follow locally established guidelines set forth by the local EMS provider, the respective medical directors and the Regional Advisory Council in that area when applicable.

## **Transfer Patient Destination**

For patients being legally transferred from one licensed hospital to another, the sending physician will have selected the receiving facility. The sending physician is responsible for the patient until they arrive at the receiving facility and as such this destination should be honored. It is always a good idea to make sure the patient also knows what hospital you are transferring them to as sometimes this isn't discussed and might cause a disagreement. Confirm this before departure and for any disagreements have the patient and sending physician find a resolution. If the sending physician and patient cannot reach agreement, contact the on-duty supervisor or the EMS medical director. Should the patient change their mind enroute to the receiving facility, contact the sending physician or if unable contact OLMC.

## **Trauma Service Area Guidelines**

It is recognized that the RAC regions and TSAs have set guidelines for all members within their coverage area. Providers covered under these protocols must be members of the RAC/TSA organization and will adhere to those best practices set forth by the RAC/TSA unless another policy, procedure or protocol supersedes that practice. It is required that EMS agencies remain up to date and advise personnel on

current best practices contained within their guidelines. These websites and up to date information can be found online.

Best practice guidelines references include but are not limited to:

- Regional Medical Control and Oversight
- Pre-Hospital triage Criteria
- Pre-Hospital Patient Care Guidelines
- Traumatic Brain Injury Guidelines
- Air Medical Transport Guidelines
- Facility Diversion Criteria
- Facility Bypass Criteria
- Inter-facility Transfers

## **Diversion**

TSA facilities, both designated and undesignated, should request diversion activation only when the resources or capabilities of that facility have been exhausted to the point that further EMS traffic would jeopardize the care and treatment of patients at that facility as well as any subsequent patient transported to that facility by EMS. It is recognized in advance that no diversion strategy can guarantee total compliance with these guidelines and it is likely that EMS will deliver patients to hospitals that have requested diversion activation. It is further understood that a request for diversion activation is honored as a courtesy by EMS. Patient's informed wishes will be honored. Each facility is responsible for defining facility-specific policies and procedures for implementation of these guidelines.

**Communication of diversion status** – A hospital shall communicate “facility diversion” status promptly and clearly to regional EMS and trauma facilities through the appropriate regional communications center and EM Resource if using.

**Time period for diversion status** – Diversion status will be in allotments of up to four (4) hours. A hospital may deactivate a diversion status at any time. Failure of a hospital to update EM resource at the end of the requested four (4) hour allotment will result in automatic deactivation of that hospital's diversion status.

**Authorization to over-ride diversion status** – Diversion is considered a “request”. EMS may over-ride a diversion status after consideration of the following:

- The patient's clinical presentation
- Distance and estimated time to an alternate appropriate facility
- Inclement weather conditions
- Resource availability and capability of the transporting pre-hospital provider
- An informed patient preference request

## **Facility Bypass**

**Trauma Goal** – Patients who have been assessed and determined to be medically unstable or at high risk of multiple and/or severe injuries will be safely and rapidly transported to the nearest designated Level I or II Trauma Center. All other trauma patients will be safely and rapidly transported to the nearest appropriate trauma facility or nearest appropriate acute care facility within that TSA.

**Trauma Decision Criteria** – Regional transport protocols ensure that patients who meet the triage criteria for activation of the TSAs Regional Emergency Healthcare System Plan will be transported directly to the nearest appropriate trauma facility rather than to the nearest hospital except under the following circumstances:

- If unable to establish and/or maintain an adequate airway
- In cases of traumatic cardiac arrest where the provider feels a level III or IV trauma facility may be able to provide blood or another key lifesaving intervention

- A Level III or Level IV trauma facility may be appropriate if the expected scene to level I trauma center transport time is excessive (> 30 minutes) and there is a qualified physician available at the facility's emergency department capable of delivering stabilizing care.
- OLMC may wish to order bypass in any of the above situations as appropriate, such as when a facility is unable to meet hospital resource criteria or when there are patients in need of specialty care (burns, etc.).
- If expected ground transport time to the nearest appropriate trauma center is excessive or if a lengthy extrication or rescue time delay is expected, medical control or the EMS crew on scene should consider activating air transportation resources.

Note: Should there be any question regarding whether or not to bypass a facility, on-line medical control should be consulted for the final decision from the receiving facility.

**STEMI and Stroke Criteria** – EMS member agencies covered under these protocols have the authority to construct local STEMI and stroke transport matrices with the input of the medical director. Providers will use locally obtained data and statistics when considering rankings for local / regional facility transport criteria. For a facility to be considered as a potential transport destination center, they must have the following capabilities:

- **STEMI**
  - 24-hour primary PCI capability with an activation process that meets or exceeds time intervals necessary to accomplish appropriate door-to-balloon time intervals
  - Either in-house CV surgical capability or an agreement for auto-acceptance of patients needing emergency CV surgery related to the PCI process
  - A PI process providing feedback to the EMS agency in accordance with current AHA or American Chest Pain Society guidelines
- **Stroke**
  - Primary (level III) stroke centers should be designated by the State of Texas or Joint Commission, have 24-hour access to providers trained in emergency stroke assessment (Emergency Medicine Physician, Neurologist, and Telemedicine Neurologist), stat CT availability and thrombolytic administration capability.
  - Advanced (level II) stroke centers should meet the requirements of a level III center and be 'thrombectomy capable'. The local EMS jurisdiction needs to clearly be aware when those services are provided if they are not available 24 hours per day. When 'available' the level II center should be able to provide appropriate LVO evaluation and care in time frames deemed reasonable by a recognized body such as Get with the Guidelines.
  - Providers should consider transport to a comprehensive center (level I) over other levels when transport to the comprehensive center adds no more than 20-30 minutes to the transport time. This is especially important in patients with a positive VAN score.
  - Consider immediate diversion to local tPA capable center if patients are very close to the end of the "treatment window". Consult OLMC for guidance.

**ROSC and Post-Resuscitation** – Based on current research and literature, neurologically intact survival at discharge depends heavily on excellent post-cardiac arrest care. Careful management of hemodynamics, temperature management, access to interventional cardiac care and other services are vitally important for CPC level 1 and 2 survivals to discharge. Accordingly, when possible, these patients should be taken to centers capable of the full spectrum of post-cardiac arrest care.

**ESRD Patients** – In accordance with Texas Senate Bill 1876, in a declared state or national disaster related emergency, EMS crews may take dialysis patients directly to dialysis clinics. EMS providers will follow regional advisory council (RAC) plans to do so or will coordinate directly with an EMS physician or online medical control to determine when this is appropriate and necessary. Transport may occur in ambulances or may be in alternate vehicles including EMTF resources such as AMBUS vehicles or even civilian vehicles when necessary.

# Medical/Legal Considerations

## **Duty to Act**

Credentialed EMS providers who are on duty and under the employ of a recognized transport provider or first responder organization have a duty to respond to all calls for emergency aid within the geographical boundaries of their defined service area, and when reasonable resources are available, to provide mutual-aid to agreed upon agencies. Volunteers have a duty to act once they indicate to the governing authority (communication center, etc.) that they are actively responding to a request for emergency aid. Credentialed providers have the duty to render treatment that meets or exceeds the professional standard of care established within the treatment protocols. Once treatment is rendered, providers have a duty to care for that patient until there is a transfer of care to someone of appropriate medical training according to patient condition and in accordance with the treatment protocols, unless otherwise instructed by online medical control.

## **Documentation**

In all cases where an emergency request for service is made, whether patient contact is established or not, a report will be completed detailing the response to incident, patient contact, assessment, treatment, response to therapy, and any events at the receiving facility.

Records will at minimum include:

- Chief complaint, description of the situation and reason EMS called.
- An appropriate SAMPLE style medical history.
- Complete set of vital signs – on arrival and discharge; and when appropriate during transport.
- Physical exam findings including level of consciousness and GCS.
- Any diagnostic findings (EKG, glucose, SpO2).
- Any treatment performed, including attempts, success and response to treatment.
- Condition of patient at presentation and discharge.
- Medical Control call details.
- Appropriate demographic information (name, DOB, other identifier, address, etc.)
- Patient refusals have additional required documentation.

A patient care record will be initiated for all requests for service that involve patient contact.

## **Physician on Scene**

Occasionally a physician (other than the medical director or associate medical directors listed above) will attempt to provide assistance at a pre-hospital scene. When this occurs, the first action is to confirm that the individual is an actively licensed Texas Physician. The physician should at minimum provide a wallet card from the State Medical Board identifying them as a physician with an in-date expiration. For additional information, see the Texas Medical Board website. The following provides guidelines for a physician at the prehospital emergency scene:

**The Good Samaritan Physician:** This physician has no previous connection or relationship with the patient. The doctor should be courteously informed that you are functioning under the delegated practice of a licensed physician medical director. If you need the doctor's assistance or they insist on assisting with patient care, the physician must:

- Submit verification of physician status by providing proof of medical licensure or verifiable personal identification by personnel on scene. If this status cannot be verified, assistance should be **courteously** declined.

- The doctor must be willing to assume responsibility for the patient at the scene and be willing to accompany the crew and patient to the hospital if so requested. This physician must also be willing to sign on the medical record and provide a supplement report as to any care performed.
- EMS personnel will not perform any treatments or procedures that are not within their scope of practice and shall contact medical control with any questions or concerns.
- If the Good Samaritan physician's order seem inappropriate or in direct contrast with those within these standing orders, the EMS provider shall contact medical control and have the Good Samaritan physician speak with OLMC.

**A Physician and Patient in the Provider's Office or Other Medical Facility:** Here the physician has a relationship with the patient and is already providing care. The EMS responder should respectfully listen to all information from the healthcare team and integrate into the care situation.

- The physician should be allowed to assist and participate in the patient's care while in the medical facility and may make recommendations to the EMS crew for care during transport, so long as that care is within the scope of practice for that provider.
- Otherwise, once the transport phase is initiated, the physician must be willing to comply with Good Samaritan physician rules as above and accompany the patient to the hospital.

### **Confidentiality and HIPAA**

All information obtained during an emergency response as it relates to patient care is protected under the health information portability and accountability act of 1996 (HIPAA). These laws prohibit the EMS provider from sharing or disclosing any protected health information to anyone without a medical need to know. Providers may share information with crew members, nurses, physicians and other healthcare personnel as minimally needed to provide patient care. Protected health information (PHI) must be protected from accidental discovery or exposure and may not be shared with anyone outside the need to know umbrella. This includes administrators, media, law enforcement, etc. The exception to this is in the event that a criminal act has been committed, or is confessed to the crew. In this case, law enforcement officials will be notified. PHI may be shared on a need to know basis within the organization for the purposes of billing and quality assurance / improvement processes such as run review, etc. All agencies will provide HIPAA training to responders on an annual basis to ensure understanding of the current rules and information and maintain such records.

### **Release of Patient Information and Documentation**

DO NOT release a patient report to ANYONE (including law enforcement) without making proper requests for information. Each EMS provider or FRO should have an agency policy in place on how to request copies of records. To be admissible in court, law enforcement should request needed information through appropriate subpoena or other legal process to ensure legal access to the information. Patient information may not be shared without an appropriate order or release of information (ROI) signed by the patient or legal representative. Each agency should have a policy on release of information to news media. This is governed by strict rules on what information may be disclosed. Each agency is strongly encouraged to have a trained PIO or relationship with one to provide media information.

# Patient Care Reporting & Maintenance of Reports

Any EMS provider or First Responder Agency covered under these protocols shall adhere to State, National and CMS defined statutes for record storage and maintenance and have a department policy for such. At minimum this shall address:

- Some type of record must be created for all calls. For calls not requiring an electronic patient care record (ePCR) as defined below, a record must be created in the agency's NFIRS database if using.
- An ePCR shall be initiated and maintained for every request for service OTHER than a false call or unfounded call.
  - Examples of false calls are people sleeping in public, a good intent call for a man-down discovered to be someone working on a car, sprinkler, etc.
  - If the individual summons or calls EMS for themselves, this is NEVER a false call.
- Call types requiring documentation:
  - Treatment and transport
  - Treatment and refusal
  - Refusal of care
  - "Not a patient" calls (requires 2 victim identifiers and description of incident)
- In general records shall be completed no more than 24 hours following the incident
- Any locked record that requires changes or additions should be done in the form of an addendum, do not alter the original record
- Providers shall leave at minimum a "short report form" when delivering any prehospital patient to a facility (typically ED, L&D, etc.) that at minimum contains:
  - Basic call type and information (patient hx, meds, allergies)
  - Initial V/S, ending V/S
  - Pertinent exam findings and data (EKG interpretation, BGL, etc.)
  - Treatment
  - Response to treatment
- Providers shall complete all patient care records using a commercially approved ePCR approved by the EMS medical director.
- First responder organizations should use a fire RMS or ePCR selected with input from the medical director to help ensure the program will meet DSHS and other reporting requirements. In some cases where the FRO cannot obtain or afford such a program, these special circumstances may be discussed on a case-by-case basis.
  - First responder organizations must separate protected health information (PHI) from incident NFIRS information
  - If using a NFIRS reporting system it shall have an integrated medical module that will prevent disclosure of HIPAA protected information should that NFIRS record be requested for non-medical use (insurance companies, open records requests, etc.)
- All patient care records, especially those on paper (if agreed upon) shall be properly stored and secured in accordance with proper HIPAA procedures. This includes:
  - A secure location to deposit reports following completion.
  - The ability to shred/destroy PHI containing documents.
  - A secure storage location, inaccessible to the general public, for medical records.
  - A written policy or process to ensure that other responders/employees do not access PHI records for patients they did not provide care for (excluding billing, QA/QI process).

- All medical records shall be kept for a minimum of 7 years, or until the patients 21<sup>st</sup> birthday, whichever is longer, or in accordance with appropriate federal, state or CMS based rules.
- All providers with an ePCR should have a formalized process on how the ePCR company will:
  - Provide records on request
  - Destroy records
  - Provide records to the provider/FRO upon termination of the ePCR contract or upon cessation of business
  - Report any breaches in PHI security

# Required Reporting to Medical Director

Texas Medical Board, Rule 197 requires Texas EMS medical directors to supervise and accept responsibility for numerous aspects of pre-hospital medicine operations. While the medical director is not immediately responsible for EMS operations, some operational features do fall within the purview of the medical director. Accordingly, EMS transport agencies and first responders covered under these protocols will agree to comply with the reporting guidelines indicated below. Failure to comply will result in three levels of warning; verbal, written correction, and a final, after which the medical direction agreement may be terminated or level of practice restrictions placed on the agency.

**Items Requiring Immediate Reporting:** (must be reported within 24 hours)

- Medical errors, medical equipment failures, injuries or unexpected adverse patient outcomes resulting in patient harm
- Medical complaints from patients, payors, medical facilities or State of Texas
- Threats of legal action, lawsuits, subpoenas, etc. resulting from medical care actions
- Narcotic related issues, loss, accidental destruction, DPS/DEA action
- Disciplinary action against agency or providers from Texas DSHS
- Significant employee injury or exposure, while providing medical care

**Items Requiring Monthly Reporting:** (must be reported by 5<sup>th</sup> of the month for prior calendar month)

- Cardiac arrests including Utstein data
- Drug facilitated intubations including performance data
- STEMI, stroke and trauma activations
- Termination of resuscitation in the field
- Procedural sedation and chemical restraint
- Changes to department members under medical direction
- Any case where providers have a question about appropriate care or would like patient follow-up.

**Items Requiring Annual Reporting:** (must be submitted for the current year, due Jan 5<sup>th</sup> for New Year)

- Current membership roster for all Texas DSHS certified personnel, including expiration
- CE summary for each provider or verification the team member is in good standing with the agency medical director approved CE program
- When requested, documentation of current AHA CPR and for paramedics ACLS certification or training documentation demonstrating participation in approved alternate programs

Agencies that electronically maintain patient care (ePCR) and training records do not need to manually submit monthly and annual reports as long as access to those systems is provided to the medical director. For those using paper charting, a copy of the run sheet should be submitted. Documents should be submitted and handled in accordance with HIPPA compliant procedures. They may be scanned and sent electronically or hand delivered to: (DO NOT MAIL PCR's!)

Division of Prehospital Medicine  
Department of Emergency Medicine  
Scott and White Memorial Hospital, Suite AG 62  
2401 S 31st Street  
Temple, Texas 76508  
Taylor.Ratcliff@BSWHealth.org

## Scene Management Hierarchy

Clinical decision making on scene should generally be a 'team sport' but in some cases care authority must be established. Generally speaking, the following should be considered the hierarchy of care authority on scene unless altered by the EMS medical director.

1. Agency EMS Medical Director (on scene or online)
2. Another OMD EMS Medical Director (OMD partner, associate, etc.)
3. Patient's personal treating physician, willing to assume responsibility
4. General physician on scene, properly identified and willing to assume responsibility
5. OMD advanced practice provider (PA, NP)
6. Primary EMS unit lead paramedic
7. EMS agency medical officer on scene
8. Highest credentialed system FRO
9. FRO senior officer

## Asking for Clarity and Clinical Pauses

Each agency should have a process in place that EMS team members are trained on that will generate a 'clinical pause' when a situation or an action is potentially going to cause harm, or when an EMS team member is uncomfortable or unclear on the direction of care. Usually the terminology will 'escalate' when a situation progresses from minor to more severe. At the end of the escalation however, there should be a terminal word or phrase that immediately stops all action until the team can clarify what is happening and why and proceed. Hospitals use terms like 'hold the line', 'stop the line' or 'I need clarity'. Agencies should craft a process that works for their operation. An example might include:

- "I'm feeling a little uncomfortable with this. Can you explain more about what we are doing?"
- "I have concerns about what we are doing. Can we talk about this?"
- "Please STOP what you are doing. I need a clinical pause and clarity."

## Cancellation of Units

With input and approval of the medical director, each agency may establish their operational policy on cancellation of units. Agencies should generally abide by the following guidelines:

- The dispatching 911 PSAP may cancel units if and when it becomes evident there is a false call, the call is deemed unfounded with no victim or caller found, or if the primary patient refuses EMS and states they are either leaving the scene or will not come to the door, etc. EMS should not cancel on the basis of 3<sup>rd</sup> party requests to cancel.
- Law enforcement may cancel units on obvious deaths, scenes where no patient is found or the call is unfounded, and in cases where no one is claiming any injury, illness or pain. LE agencies should use caution in the execution of this process and request EMS whenever the on-scene officer is unsure about any of the above.
- Credentialed on scene system providers may cancel the responding EMS unit if they find there are no patients identified on the scene, or in communication with the responding EMS unit, they mutually determine no further assistance is required.
- Air resources once launched will only be canceled by the primary paramedic on the responding transport unit. This is unless the call is deemed unfounded or after discussion between on scene resources and the responding paramedic, that air resources are no longer needed.

Self-cancellation and cancellation of first responder units will be based on agency established operational policy, with the approval of the EMS medical director and the transport agency having jurisdiction.

- EMS may offer cancellation of first responders for low priority medical calls once on scene or upon determination they are not needed. The first responder having jurisdictional authority may elect to continue to respond, but should reduce to a no lights or siren response.
- EMS units should be very judicious with this practice and make reasonable efforts to ensure that those first responder resources will not be needed, or need to be recalled, which is still permissible.

## Transfer of Patient Care & Conflict Resolution

EMS providers may encounter cases where patient care needs to be transferred to another ambulance, team or a higher level of care that is not the receiving hospital. The most common example would be transfer of care to an aeromedical provider. Sometimes this transition is simple and clear, but sometimes the 'when and where' this happens can be confusing. To help with delineation of responsibility, care coordination and medico legal concern, this transfer needs to be clearly delineated whenever possible.

- Patient care will continue to be the responsibility of the primary EMS personnel, despite the arrival of helicopter EMS or other responding teams.
- The team should work together to fix any immediate threats to the life of the patient.
- When the primary EMS team is ready, they should state that they would like to give the secondary team report and should include:
  - Known patient demographics (age, gender, etc.).
  - Pertinent subjective information (history of illness and injury, patient history, etc.).
  - Pertinent objective information (V/S, assessment findings, etc.).
  - Treatment provided and suspected field impression.
- After report the primary EMS team should verbalize that they are wishing to transfer care to the receiving team.
- The receiving team should verbally agree and state that they now have patient care responsibility.

Note that until the patient departs the scene, both parties should work together to provide high quality coordinated care to the patient. Effort should be made to document in the PCR, the time care was transferred and to whom.

## Clinical Disagreement Resolution During Transfer

If the primary and secondary EMS team have disagreement about who is currently the 'primary caregiver' for the patient, or regarding ongoing treatment, the group should have polite and professional conversation using the above guidance as a template to try and resolve the discrepancy. Should this not be possible, both agencies online medical directors (the medical director or their on-call designee) should be consulted and allowed to speak to one another to resolve the issue for the EMS crews.

# **GENERAL CARE** **SECTION**

# GENERAL PATIENT CARE

<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Location</li> <li>• Onset and Precipitating events</li> <li>• Quality</li> <li>• Radiation</li> <li>• Severity</li> <li>• Modifying factors</li> <li>• Associated symptoms</li> <li>• Prior hx of same/similar</li> <li>• S-A-M-P-P-L-E</li> </ul>	<p><b>Exam:</b></p> <ul style="list-style-type: none"> <li>• Primary Assessment</li> <li>• ABCDE's</li> <li>• Secondary Assessment             <ul style="list-style-type: none"> <li>• HEENT</li> <li>• Respiratory</li> <li>• Cardiovascular</li> <li>• Abdomen</li> <li>• Extremities</li> <li>• Neuro</li> </ul> </li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Vascular</li> <li>• Infectious/Inflammatory</li> <li>• Trauma/Toxins</li> <li>• Autoimmune</li> <li>• Metabolic</li> <li>• Idiopathic</li> <li>• Neoplastic</li> <li>• Congenital</li> </ul>
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Remember that online medical control is **available** at all times to EMS providers through Scott & White Temple ERs.

**PULSARA**  
**Adult (254) 724-7555**  
**Pedi (254) 935-4642**


Contact the EMS physicians or medical control for any questions or if you feel the patient would benefit from intervention not outlined in these treatment protocols.

Unless there are extenuating circumstances, the **receiving** facility should be contacted while enroute to advise of your arrival and for additional patient orders.

<b>E</b>	Scene/Crew Safety/PPE Appropriate Equipment to Patient Bedside	<b>E</b>
	Initial Primary Assessment/Physical Exam <b>Assessment Procedure</b>	
	Obtain Appropriate Vital Signs: HR, BP, RR, SaO2, AVPU, GCS Temperature, BGL and ETCO2 when appropriate	
	<u>Oxygen therapy as needed:</u> Device and flow as needed, keep SaO2 94%	

 <p style="text-align: center;"><u>Consider as appropriate:</u>  <b>Airway Management</b> protocol  <b>Spinal Motion Restriction</b> protocol  <b>Vascular Access</b> protocol  <b>Nausea &amp; Vomiting</b> protocol  <b>Glucose Determination Procedure</b></p>
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<b>P</b>	Continuous EKG monitoring for all patients requiring paramedic interventions	<b>P</b>
	Obtain <b>12-Lead EKG</b> for all patients with suspected ACS or complaints that could be related to ACS regardless of age.	

 <p style="text-align: center;"><b>Go to most appropriate treatment protocol.</b></p>
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Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

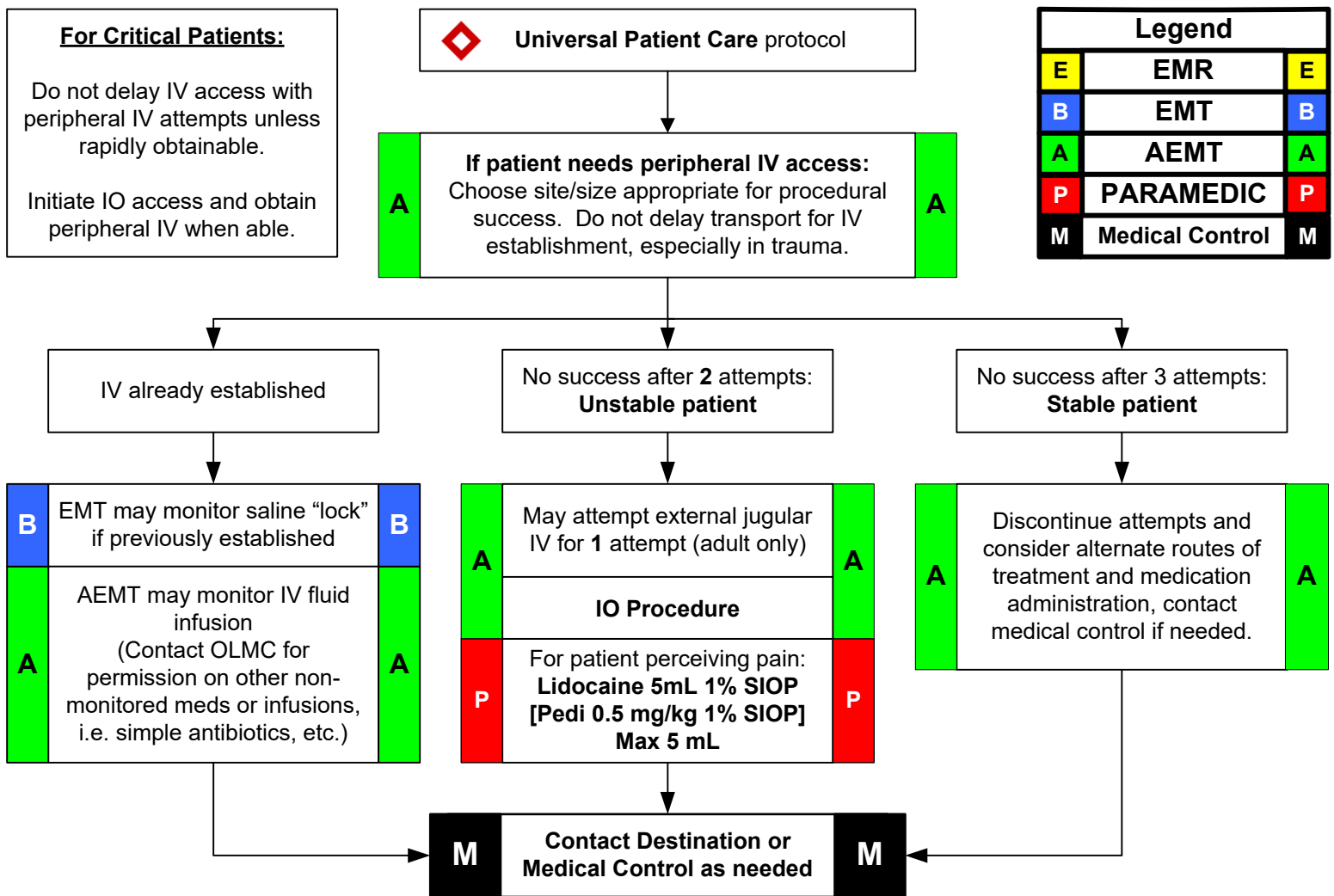
**Clinical Age Definitions:**

Neonate – birth to 1 month  
 Infant – 1 to 12 months  
 Child – 1 to 12 years  
 Adult – 12 years and older  
 Elderly – 70 years and older

Not to be used for medicolegal decision making.

- Pearls:**
- See assessment procedures for minimum exam for every patient encounter. Patient reassessment should happen as treatments and therapies are given or as the patient's clinical condition changes or is expected to change.
  - Vital signs should be taken every 5 minutes for critical patients and every 15 minutes for routine patients. All transported patients should have a minimum of 2 sets of vital signs documented. Arriving ED V/S may be used.
  - In general, adult protocols are intended for patients > 12 years old as most have "adult physiology" and weights at this point, recall that dosing of medication is always weight based up to a "maximum", usually the standard "adult" dose.
  - For the dosing of medications or electrical therapy a pediatric patient is typically less than < 36 kg (80 pounds), doses provided by the Broselow Tape, Pedi STAT or Handtevy system or similar accepted pediatric estimator are typically accurate and acceptable in the critical patient. When in doubt, calculate the dose in ideal body weight and do not exceed age appropriate or weight based maximums.
  - A patient care report (PCR) will be documented for every EMS encounter with a person meeting the definition of a patient. Any reason for not performing a full exam should be documented in the patient care record.

# VASCULAR ACCESS



## Guide to IV Fluid Selection

- Lactated Ringers (LR) is acceptable for most all patients. Exceptions for using NS are below.
- Normal saline (NS) should be used in cases where:
  - Blood is being used: Blood is only compatible with normal saline, other IV locations can be LR or meds, etc.
  - Isolated traumatic brain injury: Higher serum sodium is better (if multi-system go back to LR or BLOOD!)
  - Hyperkalemia: LIKELY A MYTH! Data shows LR and its potassium are of minimal impact but may still be of concern by nephrology staff. Hospitals may give pushback. LR or NS may be used in these cases.

### Pearls:

- In the peri-arrest or cardiac arrest patient, IO access may be the fastest obtainable access. Do not delay care attempting peripheral IV in the critical peri-arrest or cardiac arrest patient unless it is readily obtainable.
- In the cardiac arrest patient, any preexisting external venous catheter may be used if trained. Providers must have documented training of education/competency. Dialysis fistulas/shunts may not be accessed by the provider but may be used if access is already in place in cases of emergency.
- Any prehospital fluids or medications approved for IV use, may be given through an IO. Due to viscosity, if giving, dilute D50W by half prior to infusion. Vasopressors may be infused through the IO in critical patients.
- All IV rates should be TKO (to keep open) unless administering fluid bolus. Saline lock is acceptable if not infusing IV fluids.
- Lower extremity IV sites are last resort in patients with vascular disease or diabetes unless critical need or arrest.
- Avoid IV, blood draw, injection, or blood pressure in arm on affected side of patients with dialysis fistulas or post-mastectomy. Attempt to avoid IV access in R arm on STEMI patients as R radial cath site is commonly used now.
- Monitor all IV infusions carefully for signs of infiltration, pain, swelling, numbness, etc.
- Remember to plan IV attempts for success. Example, for drugs like vasopressors (dopamine, norepinephrine) or adenosine, larger bore, proximal IVs will function better. CT contrast scan can only be done through 20ga or larger peripheral IV.

# SPINAL MOTION RESTRICTION

This SMR protocol de-emphasizes the use of long-spine boards, not necessarily c-collars. Patients now need to “rule in” for the use of LSB and should be applied when indicated below. C-collars should be used anytime the MOI or clinical exam suggests a C-spine injury. If the provider **STRONGLY** feels SMR is appropriate outside this protocol it may be applied but this use should be reviewed by the service provider.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

Does patient meet any of the following criteria?

- 1) Patient < 5yo or > 65yo with high risk or significant mechanism of injury?
- 2) Dangerous or significant mechanism of injury for confused, disoriented or intoxicated patient?
- 3) New neurologic abnormality on exam following accident or injury (weakness, numbness, etc.)?
- 4) Significant pain or abnormality noted on direct palpation of any portion of the spine, including crepitus, step off, deformity, etc.
- 5) Alteration in mental status? (Drugs, alcohol, dementia, low GCS, etc.)
- 6) Distracting injury or pain where patient’s attention is diverted from possible spinal pain or injury?

Yes

No

Spinal motion restriction **REQUIRED**.  
**Spinal Motion Restriction Procedure**

EMS provider must apply C-collar and provide for inline spinal motion restriction while moving patient to ambulance cot. Once on cot, use logroll technique to remove LSB and secure patient with straps, head blocks and/or towel rolls.

If patient is ambulatory and standing, do not perform LSB standing take down.

Spinal motion restriction **NOT** required.

EMS provider **MAY** apply C-collar if they feel clinical concern is warranted and **MAY** use LSB for patient movement as needed such as CPR, etc. but should be removed before transport (except CPR).


## Pearls:

- Significant mechanism of injury (MOI) remains “controversial”. If high speeds or forces were required to sustain injuries or cause damage, the MOI is significant. When in doubt, err on the side of caution/patient care or contact medical control.
- Patients at the extremes of age typically have problems sensing pain and detecting injury. In very old and very young patients, a normal exam may not be sufficient to rule out spinal injury.
- Patients with medical hx of bone disease, advanced arthritis or history of spine problems including malformation, cancer, etc. should typically be immobilized as they are more likely to sustain injuries.
- If the Provider or First Responder has a concern for spinal cord injury not addressed by these criteria; patients may be immobilized at the Provider’s/Responder’s discretion. If a patient has been immobilized with a C-collar, it should not be removed in the pre-hospital setting. It is acceptable to carefully log-roll a patient from the LSB onto the EMS stretcher preserving spinal alignment to minimize time on the LSB.
- In patients with advanced age, spinal malformations or other unique circumstances, alternate immobilization methods may be needed. C-collar placement does not always require long-spine board placement. For these patients C-collar and very careful, spine-neutral movements may be preferred.
- It is well documented that rigid spine boards cause pressure ulcers and possible necrosis/injury. Attempt to minimize the time on rigid spine board when possible. Use adequate personnel to maintain spinal alignment and prevent twisting/bending.
- Exceptions to LSB use include CPR, traction splint support and poly-trauma with multiple long bone fractures where the LSB is used to contain severely injured fractures, etc.

# ADULT PAIN MANAGEMENT

During pain management, providers must continually monitor LOC, quality of breathing BP, HR, RR, SaO2 and real time EKG.

*Remember pain is subjective and we should treat based on the patient's report of pain. For patients with symptoms vastly out of proportion with complaint, those with well established drug seeking behavior, contact medical control for advice.*


Obtain pain scale to help quantify pain. See **GC.06**  
**Appropriate Analgesia Quick Reference.** 

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M


**TREAT PAIN AS A PROGRESSION WITH MULTI-MODAL THERAPY WHEN APPROPRIATE** 

MILD PAIN (Pain scale 1-3)		
E	Maximize comfort measures such as immobilization, elevation, ice, etc.	E
	<b>Acetaminophen 500–1000mg PO once</b>	
P	<b>Acetaminophen 500-1000mg IV once</b>	P
See <b>Pearls</b> below for total daily acetaminophen and dosing max.		

MODERATE PAIN (Pain scale 4-6)		
A	<b>Ketorolac 15mg IV/IO OR 30mg IM once</b> (**see BLS Pearl below) <b>Contraindications to ketorolac:</b> - Known or suspected pregnancy - High probability going to OR - Known kidney disease - Bleeding disorder (brain, etc.) - Known active GI bleeding - Age > 70	A

SEVERE PAIN (Pain scale 7-10)		
P	<b>Fentanyl 25-100mcg IV/IO/IN/IM</b> (max 100mcg/dose)  <b>May repeat above dose q.10 min</b> (max cumulative dose 300mcg)  Consider <b>N&amp;V protocol GC.09</b> as needed 	P

P	If the patient's pain condition is <b>"catastrophic"</b> (i.e. burns, amputations, etc.) provider may jump directly to ketamine as per dosing below. Or, if the pain has not responded to at least <b>2 doses of Fentanyl AND</b> is <b>acute</b> pain still rated as <b>"severe"</b> (see Pearls), consider:  <b>Ketamine 50mg IM (may repeat once in 10 minutes if pain still severe)</b> OR <b>Ketamine 0.5mg/kg placed in 100mL NS IV/IO infused over 10 minutes</b>	P
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 **Back to most appropriate protocol**

- Pearls:**
- Pain severity (0-10) is a vital sign to be recorded pre and post medication delivery and at disposition. Vital signs should be recorded every 5 minutes in patient receiving pain medication. Monitor patient closely for over sedation - refer to overdose protocol if needed.
  - Contact medical control before administering pain medication to patients with SBP < 90mmHg or MAP < 65mmHg.
  - In patients > 70yo or with liver disease, consider reducing Fentanyl and Ketamine dosing by 50%.
  - ETCO2 should be monitored in all patients receiving ketamine and in any patient with concern for CNS or respiratory depression.
  - Patients with low GCS due to medical or trauma causes typically should not be given sedating pain medications, call med control.
  - Pain reduction goal of "0" is often not reasonable. Pain scores of 2-4 or marked reduction reflects appropriate treatment.
  - Reduce noxious stimuli for patients in addition to medication (i.e. splint fractures for comfort, dim lights for migraine, etc.)
  - Acetaminophen should not exceed per 24 hours, 4 grams for adults or 75 mg/kg for children from all sources. Do not administer acetaminophen if patients have received any type in the past 4 hours.
  - Patients receiving ketorolac for isolated pain not requiring ALS monitoring for any other reason may be attended by BLS provider.
  - Ketamine should be reserved for acute pain, do not treat chronic pain with ketamine.
  - Burn patients likely will need more pain medication and/or ketamine, contact med control early and see burn protocol.

# PEDIATRIC PAIN MANAGEMENT

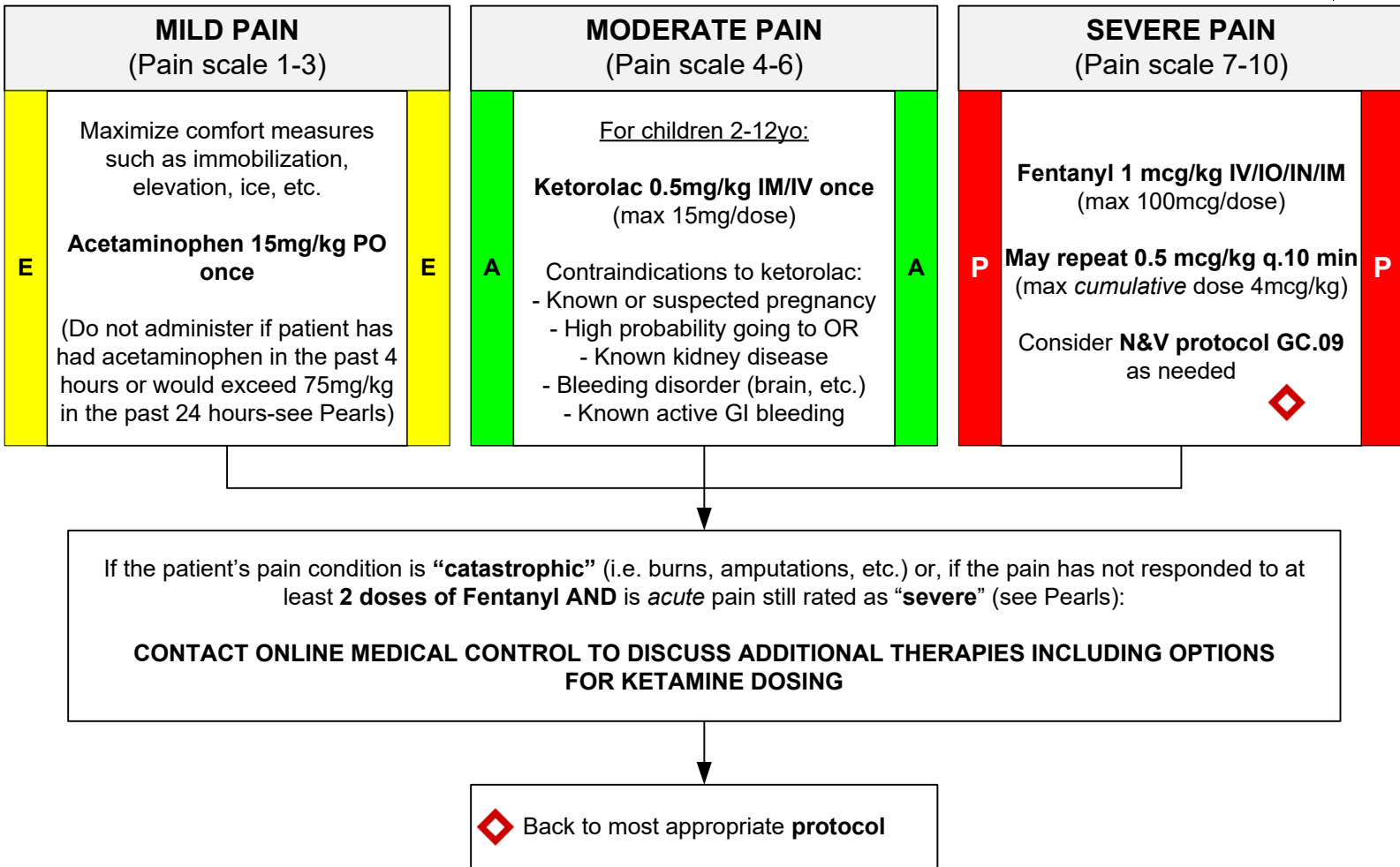
During pain management, providers must continually monitor LOC, quality of breathing BP, HR, RR, SaO2 and real time EKG.

*Remember pain is subjective and we should treat based on the patient's report of pain. For patients with symptoms vastly out of proportion with complaint, those with well established drug seeking behavior, contact medical control for advice.*

Obtain pain scale to help quantify pain. See **GC.06**  
**Appropriate Analgesia Quick Reference.** 

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**TREAT PAIN AS A PROGRESSION WITH MULTI-MODAL THERAPY WHEN APPROPRIATE** 



**Pearls:**

- Pain severity (0-10) is a vital sign to be recorded pre and post medication delivery and at disposition. Vital signs should be recorded every 5 minutes in patient receiving pain medication. Monitor patient closely for over sedation - refer to overdose protocol if needed.
- Contact medical control before administering pain medication to hypotensive patients (SBP < 70+age\*2).
- ETCO2 should be monitored in all patients receiving ketamine and in any patient with concern for CNS or respiratory depression.
- Patients with low GCS due to medical or trauma causes typically should not be given sedating pain medications, call med control.
- Pain reduction goal of "0" is often not reasonable. Pain scores of 2-4 or marked reduction reflects appropriate treatment.
- Reduce noxious stimuli for patients in addition to medication (i.e. splint fractures for comfort, dim lights for migraine, etc.)
- Acetaminophen should not exceed 75 mg/kg or 4 grams (whichever is less) from all sources in a 24 hour period. Do not administer acetaminophen if patients have received any type of acetaminophen in the past 4 hours.
- Ketamine should be reserved for acute pain, do not treat chronic pain with ketamine.
- Burn patients likely will need more pain medication and/or ketamine, contact med control early and see burn protocol.

# APPROPRIATE ANALGESIA REFERENCE

## Appropriate Analgesia Selection – Quick Reference Section

Patient Category:	Acetaminophen	Toradol	Fentanyl	Ketamine
Suspected Surgical Candidates (OR bound trauma, neurosurgical patients, etc.)	No PO medications.	NO	✓	✓
Acute Burn Patients	No PO medications.	NO	✓	✓
Pregnant or Breastfeeding	✓	NO	✓	✓
Renal ESRD Patients	✓	NO	Consider half-dose.	✓
Liver Disease or Transplant	No, liver toxic.	NO	Consider half-dose.	Consider half-dose.



**0**

**No Hurt**



**2**

**Hurts Little Bit**



**4**

**Hurts Little More**



**6**

**Hurts Even More**



**8**

**Hurts Whole Lot**



**10**

**Hurts Worst**

- Monitor BP and respirations closely as sedative and pain control agents may cause hypotension and/or respiratory depression.
- Monitor and document vital signs at least every 5 minutes when giving pain medications. Pain scores should be documented with these vital signs.
- Patients may display wide variation in response to opioid pain medications and other sedating drugs.
  - 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 intoxicated patients. Use the Broselow-Luten Pediatric Tape for weight estimates in children.
  - This effect may be observed with all sedating medications including midazolam and ketamine, use caution.
- 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 PO, IM, IN, and/or IV/IO medication if no contraindications are present and the patient remains stable.
- Do not administer any PO medications for patients who may need surgical intervention.
- Do not administer acetaminophen to patients with a history of liver disease or liver transplant.
- Burn patients may require higher than usual opioid doses for adequate pain control.
  - Do not hesitate to contact medical control regarding the pain management strategy for patients in severe pain related to burn injury.

# ADULT PROCEDURAL SEDATION

Providers must continually reassess pain, LOC, breathing and monitor BP, HR, RR, ETCO2 and SaO2.

This protocol is to be used for painful procedural sedation for adults. This is NOT to be used for routine pain control, post intubation sedation OR control of violent or agitated patients.

Please consult the **Sedation Procedure** and ensure that all equipment, procedures and processes are prepared prior to administering any medication. Always ask yourself if sedation is required for the situation as it is not always without risk.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**M** Contact medical control **FIRST** for *elective* procedural sedation such as dislocation reduction, lifting/moving related sedation, etc., unless an immediately life threatening condition exists. **M**

No SBP > 100mmHg and/or MAP > 70mmHg? Yes

**P** Ensure no contraindication, then:  
**Ketamine 0.5 mg/kg IV/IO/IM (max 100mg/dose)**  
**P**

Remember ketamine will increase HR and BP. Do not give if suspected increased intraocular pressure.

**P** For rapidly resolving painful procedures, i.e. cardioversion:  
**Midazolam 2.5 mg IV/IO**  
**P**

For extended painful procedures, especially related to trauma, extrication, entrapment, etc., consider:  
**Ketamine 0.5mg/kg IV/IO (max 100mg/dose)**

Continue to closely monitor respiratory status, SaO2, ETCO2 and BP/HR until patient fully awake and protecting airway. Once fully awake, consider **Pain Management** protocol **GC.04 & 05** if residual pain. Return to most appropriate **protocol**.

## Pearls:

- **DO NOT GIVE KETAMINE** to patients with suspected increased intra-ocular pressure or known allergy/hypersensitivity.
- Ketamine typically increases HR and BP, sometimes markedly making it a good choice in hypotensive patients but a poor choice for cardioversion of tachyarrhythmia due to catecholamine release, however it may be considered.
- In patients >65 yrs. or with liver disease, consider reducing sedation dosing by 50%. Use caution with Ketamine in this age group.
- Patients receiving sedation must have all V/S as well as SaO2 and ETCO2 continuously monitored.
- Reduce noxious stimuli for patients in addition to medication (i.e. splint fractures for comfort, dim lights for migraine, etc.)
- When doing procedural sedation, set up equipment for intubation and have it ready should complications arise. "Plan for the worst, hope for the best."
- Consider whether procedural sedation should be done in the patient's current location. For example if sedation is done for an entrapped patient in a vehicle – who then has respiratory failure and needs intubation, can that be done in their current position or situation?

# PEDI PROCEDURAL SEDATION

Providers must continually reassess pain, LOC, breathing and monitor BP, HR, RR, ETCO2 and SaO2.

This protocol is to be used for painful procedural sedation for children. This is NOT to be used for routine pain control, post intubation sedation OR control of violent or agitated patients.


Please consult the **Sedation Procedure** and ensure that all equipment, procedures and processes are prepared prior to administering any medication. Always ask yourself if sedation is required for the situation as it is not always without risk.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PAREMEDIC	P
M	Medical Control	M

**M** Contact medical control **FIRST** for elective procedural sedation such as vehicle extrication, lifting/moving related sedation, etc, unless immediately life threatening. **M**

**P** Ensure no contraindication, then:  
**Ketamine 0.5 mg/kg IV/IO/IM (max 100mg/dose)**  
**P**  
Remember ketamine will increase HR and BP. Do not give if suspected increased intraocular pressure.

Continue to closely monitor respiratory status, SaO2, ETCO2 and BP/HR until patient fully awake and protecting airway. Once fully awake, consider **Pain Management** protocol **GC.04 & 05** if residual pain. Return to most appropriate **protocol**.

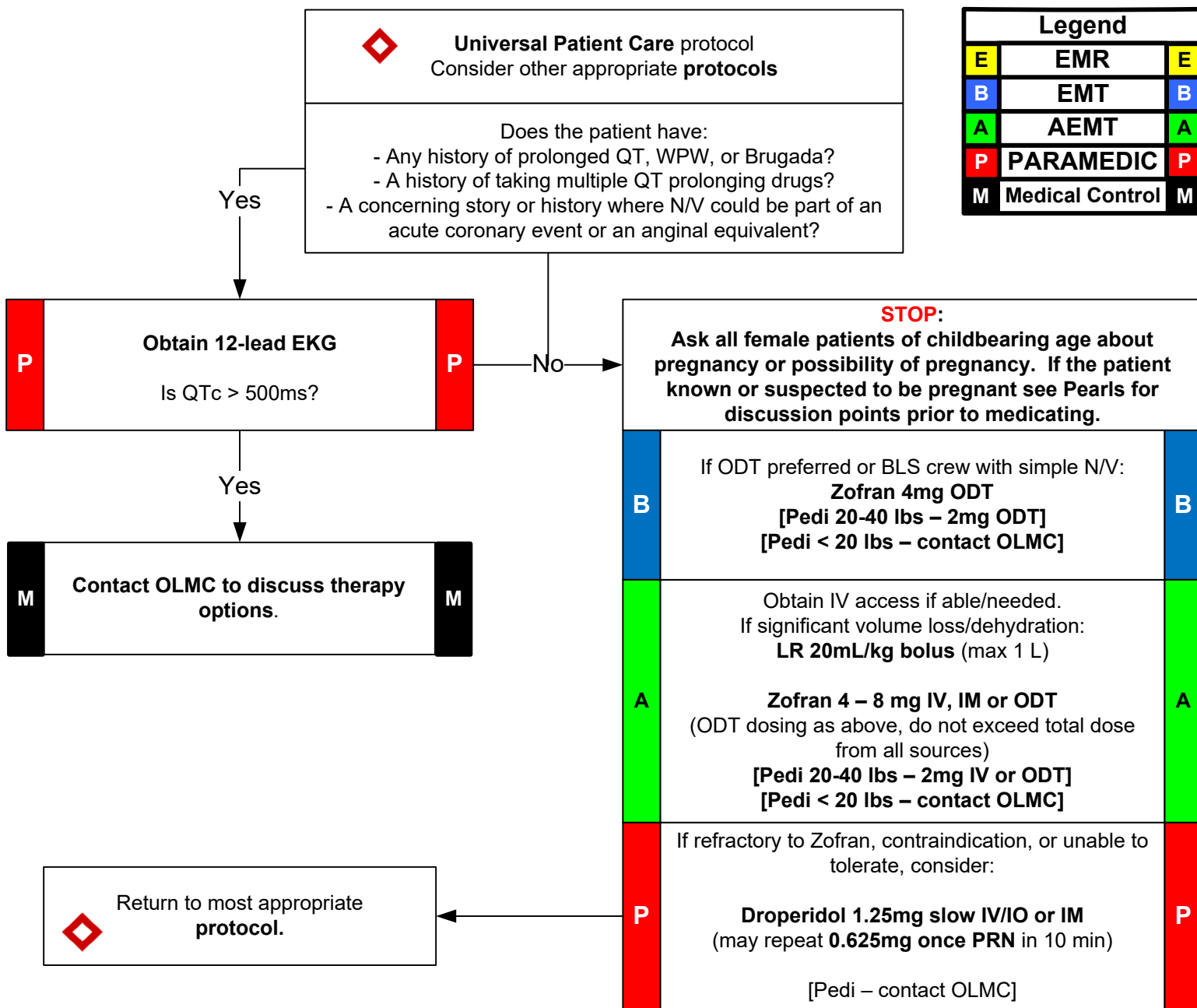


## Pearls:

- **DO NOT GIVE KETAMINE** to patients with suspected increased intra-ocular pressure or known allergy/hypersensitivity.
- Ketamine typically increases HR and BP, sometimes markedly making it a good choice in hypotensive patients but a poor choice for cardioversion of tachyarrhythmia due to catecholamine release, however it may be considered.
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- When doing procedural sedation, set up equipment for intubation and have it ready should complications arise. "Plan for the worst, hope for the best."
- Consider whether procedural sedation should be done in the patient's current location. For example if sedation is done for an entrapped patient in a vehicle – who then has respiratory failure and needs intubation, can that be done in their current position or situation?

# NAUSEA AND VOMITING

This protocol is for nausea and vomiting of multiple causes. Patients may have isolated N/V as a chief complaint or as part of an associated complaint such as motion sickness, chest pain, etc. This may be used in conjunction with other protocols or as a stand along protocol where simple nausea and vomiting is the only complaint. See caveats below.



# PUSH-DOSE EPINEPHRINE

## To Make 'Push-Dose Epi':

Dilute 1mL Epinephrine  
1:10,000 in 9mL NS

Concentration 10mcg/mL



Universal Patient Care protocol

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

Bolus epinephrine administration, better known as 'push dose epi' is a quick and simple alternative to IV infusions in the critically ill patient. Paramedic providers may utilize this in lieu of an infusion or until prepared as outlined below.

## Example Indications

- **Near Arrest:** Either decompensating or after resuscitation. Hallmarks are falling HR and BP. Look to fix underlying problem but augment circulation with epinephrine.
- **Pre Intubation:** Patients with poor hemodynamics or high risk for collapse before intubation. Examples are high shock index (see pearls) or abnormal compensation.
- **Anaphylaxis:** After failure of 2 doses of IM epinephrine with continued hemodynamic instability.
- **Respiratory Failure:** Last resort measure for bronchodilation before respiratory failure and need for intubation.
- **Pediatric Bradycardia:** Symptomatic or peri-arrest.

Dosage range is based on acuity. Use lower dose range for milder indication and higher range for more rapid and powerful effect.

P

**Epinephrine 1:100,000 – 0.5 – 2mL IVP (5-20mcg)**  
May repeat q. 5 min PRN, no maximum

P

[Pedi 0.5 – 1 mcg/kg per dose] (max 20mcg per dose)

M

Contact Destination or  
Medical Control as needed

M

## Pearls:

- In the peri-arrest or cardiac arrest patient, IO access may be the fastest obtainable access. Do not delay care attempting peripheral IV in the critical peri-arrest patient.
- IO access in adults may be in preferred order, humerus head, distal femur, proximal tibia. Pediatric IO should be at the distal femur or anterior tibial site, or contact medical control for other options if needed.
- Push dose-vasopressor may be given carefully through a peripheral IV, watch for local infiltration, ensure patency.
- In the cardiac arrest patient, any preexisting external venous catheter may be used if trained. Providers must have documented training of education/competency. Generally, dialysis fistulas/shunts should not be accessed.
- Remember to plan IV attempts for success. Example, for drugs like vasopressors (dopamine, norepinephrine) or adenosine, larger bore, proximal IVs will function better. CT contrast scan can only be done through 20ga or larger peripheral IV.

# BEHAVIORAL AND AGITATED PATIENTS

<p><b>History</b></p> <ul style="list-style-type: none"> <li>Situational crisis</li> <li>Psychiatric illness/medications</li> <li>Injury to self or threats to others</li> <li>Medic alert tag</li> <li>Substance abuse / overdose</li> <li>Diabetes</li> <li>Other medical disorder</li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>Anxiety, agitation, confusion</li> <li>Delusional thoughts, bizarre behavior, hallucinations</li> <li>Combative violent</li> <li>Expression of suicidal/homicidal thoughts</li> <li>Very "hot" to touch</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>AMS, Hypoxia</li> <li>Alcohol Intoxication</li> <li>Toxin / Substance abuse</li> <li>Medication effect / overdose</li> <li>Withdrawal syndromes</li> <li>Bipolar (manic-depressive)</li> <li>Schizophrenia, anxiety, etc.</li> </ul>
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**Hyperactive Delirium Factors**

- Agitated, drugs or psych.
- Struggle with police.
- Stimulant drugs (cocaine, meth, etc.)
- Hyperthermia

Ensure crew & scene safety, involve LE PRN

**Universal Patient Care protocol**

Consider as needed:  
**AMS, Trauma, Medical or OD protocols**

**Legend**

E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

<b>E</b>	<ul style="list-style-type: none"> <li>- Remove patient from stressful environment. This includes limiting number of responders in room interviewing patient, radio noise and other agitating stimuli.</li> <li>- Utilize verbal techniques of calming and reassurance. Explain what is happening.</li> <li>- Determine patients mental status (i.e. GCS, oriented to what, able to understand situation and circumstances) and if they have normal mental <b>capacity</b> or not.</li> <li>- Determine need to involve law enforcement presence if not already to facilitate mental health detention. If voluntary stable psychiatric issue, place patient in safe location and transport.</li> <li>- Always consider <b>hyperactive delirium</b>. If concerned, evaluate temperature if able, initiate cooling measures (ice, etc.) for temperature above 101°F, <b>Hyperthermia</b> protocol PRN.</li> </ul>	<b>E</b>
<b>A</b>	If hyperthermia or clinical signs of volume depletion <b>LR 1000 mL bolus [Pedi 10mL/kg] (max 1L)</b>	<b>A</b>

**Restraint procedure PRN**  
**Drug Facilitated Relaxation protocol GC.12 PRN**

**Contact Destination or OLMC**

- Pearls:**
- **Consider your safety first. Physical restraint should be performed/assisted by Law Enforcement whenever possible.**
  - **All patients who receive restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival if action was required before arrival.** Restraints must not compromise airway, breathing or chest excursion, use caution over joint or sensitive body areas. Evaluate restrained extremities for PMS every 5-10 minutes as clinical condition allows.
  - Any transported patient who is handcuffed or restrained by Law Enforcement should be accompanied by an officer whenever possible. If not possible the EMS provider must have a way to remove the LE restraints and preferably law enforcement must be immediately available (i.e. following EMS) for a way to remove law enforcement restraints.
  - Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.) and respond appropriately. Intoxication/psychosis should be diagnosis of last consideration.
  - If patient is suspected of hyperactive delirium suffers cardiac arrest, consider aggressive cooling, fluid resuscitation and judicious use of sodium bicarbonate early.

# BEHAVIORAL HEALTH NAVIGATION

**Universal Patient Care** protocol, consult GC.11 & GC.12 for overall mental health patient care.



Consider as needed:  
**AMS, Trauma, Medical or OD** protocols

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

- This guideline is to assist EMS and law enforcement officers (LEO) with decision making about taking mental health patients directly to mental health treatment facilities.
- Remember that most mental health facilities can offer only limited healthcare treatment especially anything related to emergency care and treatment.
- Careful selection can expedite access to proper mental healthcare, reduce inappropriate admissions to the emergency department and reduce ED wall times and congestion.
- If any doubt exists regarding the correct disposition, contact online medical control (OLMC) or an EMS physician directly for consultation.

## Does the patient have any of the following:

- NEW onset of psychosis, delirium or hyperactive delirium (especially age > 65)?
- Combative requiring physical or chemical relaxation?
- Exacerbation of a chronic medical condition requiring stabilization (i.e. CP, SOB, etc.)?
- Acute trauma, head injury or lacerations requiring repair (see pearls)?
- Alcohol or substance intoxication preventing them from safely walking, following simple commands and/or participating in a medical screening discussion?
- Recent overdose or strong clinical suspicion of overdose (see pearls)?
- Abnormal vital signs for age? SBP < 90 or > 200, HR < 40 or > 120, RR > 22, SaO2 < 92%, BGL < 60 or > 400.

**Yes**

**No**

Transport to closest most appropriate emergency department for medical evaluation and treatment.

Contact regional mental health treatment facility to verify acceptance.

LEO or EMS transport to facility is indicated.

### Pearls:

- **Consider your safety first. Physical restraint should be performed/assisted by Law Enforcement whenever possible.**
- **All patients who receive restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival if action was required before arrival.**
- Remember patients essentially need to be medically clinically stable and generally cooperative (i.e. not overtly violent) to do direct navigation to the psychiatric facility.
- For patients needing detoxification from alcohol or dangerous drugs, the hospital is usually the most appropriate first location.
- For patients with minor trauma, judgment calls on the need for wound closure or discussion regarding the severity of an ingestion or overdose, contact OLMC or the EMS physician (i.e. the patient 'overdosed' on two ibuprofen).

# DRUG FACILITATED RELAXATION



## Universal Patient Care protocol Behavioral & Agitated Patient protocol

The use of this protocol is intended to protect patients, and by doing so, all first responders. It is **ONLY** to be used when other restraint methods (verbal, physical) have failed **OR** there is **risk** of substantial harm to the patient, responders or others if the patient's actions continue.

To Continue This Protocol Providers **MUST**:

- Personally evaluate the patient and determine this is the appropriate **CLINICAL** intervention.
- Have all monitoring and lifesaving equipment immediately available.
- Formulate a monitoring plan once the patient is given sedating medication.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

### RASS +1

Anxious, hyperactive, non-combative, to facilitate treatment.

### RASS +2 or 3

Agitated, aggressive, removes equipment, non-violent.

### RASS +4

Combative, violent, immediate danger to self or care team.

**DO NOT USE IN PATIENTS < 12 OR > 70 YEARS OLD WITHOUT OLMC CONSULT PRIOR:**

If IV established or safe to establish:  
**Midazolam 2.5mg IV/IO**

If no IV or unsafe to do so:  
**Midazolam 5mg IM**

**Droperidol 5-10mg IM/IV/IO**  
May give additional **2.5-5mg**  
**after 10 minutes** if RASS 0 – 1  
has not been reached.

**OR**

**Geodon 10 – 20mg IM once**

If IV established or safe to establish:  
**Ketamine 0.5 mg/kg IV/IO**

If no IV or unsafe to do so:  
**Ketamine 250mg IM**

May **repeat once** if RASS 0 – 1 not reached after **2 min using IV/IO route** or **5 min using IM route**.

As soon as safely able, the responder should immediately apply all monitoring equipment including BP, HR, EKG, SaO2 and ETCO2. BGL should be immediately assessed. If < 60 mg/dL go to **Altered Mental Status** protocol.

Evaluate for adequate airway and breathing, if not adequate move forward with airway management and ensure appropriate oxygenation and ventilation.

**Sedation procedure (not protocol)** should be consulted for guidance PRN.

Continue to closely monitor, return to most appropriate **protocol**.

#### Pearls:

- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.) and seek them out aggressively.
- If patient is suspected of hyperactive delirium and suffers cardiac arrest, consider fluid bolus and sodium bicarbonate early.
- Any patient who has been chemically relaxed will be accompanied by MICU level provider to receiving facility.
- Restrained patients should never be maintained or transported in a prone or "suplex" position.
- For initial IM medication restraint, the presence of peripheral pulses shall be adequate to approximate acceptable systolic BP. Accurate V/S should be obtained as immediately as possible.
- Remember contraindications to ketamine include increased intraocular pressure. Ketamine may cause undesirable increases in HR and BP in older patients, consider contacting medical control for advice if unsure. Case reports show ketamine to be safe in patients experiencing agitation and hyperactive delirium but remember these patients remain critically ill even following chemical relaxation. Remember procedures in case of laryngospasm – see RSI protocol.

# HEAT RELATED EMERGENCIES

◆ Universal Patient Care protocol

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

- Remember mimics for heat illness that can still be hot!
- Sepsis
  - Drugs (sympathomimetics like meth, cocaine)
  - Neuroleptic malignant syndrome; Serotonin syndrome
  - Usually only environmental heat illness is > 105F

**IF SICK, OBTAIN CORE TEMPERATURE!**  
What type of heat illness?

## Heat Stroke

- Abnormal** neurologic status.
- AMS, seizure, coma, combative.
- Core temperature > 105 F**

### CRITICAL EMERGENCY!

- Rapidly cooling the patient is critical.
- Cool before transport if possible!
- In order of preference:
  - **Full body ice-water immersion.**
  - Partial body ice-water immersion.
  - Ice sheets/packs to entire body plus passive environmental cooling.

**Rapid Cooling Procedure** ◆

## Heat Exhaustion/Cramps

- Normal** neurologic status.
- Fatigue, malaise, headache, nausea.
- Muscle cramping possible.
- Core temperature < 105 F**

- Remove from heat source to cool area.
- Expose patient and increase airflow
- Apply room temperature water over patient and increase air flow, consider ice packs over neck, groin, axilla, etc.
- If patient awake, no nausea/vomiting give cool oral fluids (isotonic electrolyte such as pedialyte, gatorade, etc.)

If SBP < 90 or MAP < 65:  
**LR 1000 mL IV bolus**

[Pedi: SBP < 70 + (age in years x 2) mmHg]  
**[Pedi: 20mL/kg IV bolus]**

May repeat x 1 if needed, chilled IV fluid is not necessary.

Continue to cool patient and reassess/monitor frequently. Avoid causing shivering.  
Consider **Altered Mental Status** protocol if not already addressed. ◆

**Go to Most Appropriate Protocol** ◆

### Pearls:

- Extremes of age are more prone to heat emergencies (i.e. young and old). Babies and the elderly have no ability to regulate heat.
- Drugs may contribute to hyperthermia: tricyclic antidepressants, phenothiazines (Phenergan, etc.), anticholinergic medications, and alcohol. Cocaine, Amphetamines, and Salicylates may also elevate body temperatures.
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature. **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, mild to moderate hypotension, and an elevated temperature. **Heat Stroke** hyperthermia and an altered mental status or seizure with rectal temp > 105F.

# COLD RELATED EMERGENCIES

 **Universal Patient Care** protocol

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

- Remember mimics for cold illness!
- Prolonged cardiac arrest.
  - Profound hypothyroidism (myxedema coma).
  - Adrenal insufficiency
  - Sepsis

What type of cold illness?  
**IF ANY INSTABILITY OR NEURO SYMPTOMS OBTAIN CORE TEMP!**

**Severe to No Vital Signs**  
**Core Temp < 82 F**

- Profoundly altered, hypotensive, bradycardia.
- Unresponsive or no detectable vital signs.

- Begin CPR and standard resuscitation if V/S cannot be detected.
- Contact OLMC early for resuscitation guidance.
- If patient is spontaneously ventilating be alert for pulmonary edema.

**Mild 90-95 F**  
**Moderate 82-90 F**

- Normal** neurologic status.
- Shivering, tachycardia, tachypnea.
- Nausea, clumsiness.

- Begin passive rewarming techniques:
- Move to warm environment
- Remove wet clothing
- Wrap in warm blankets, include head
- Give warmed oxygen if available
- If no AMS, N/V may sip on warm liquids.

<b>A</b>	<p>If SBP &lt; 90 or MAP &lt; 65:                  [Pedi: SBP &lt; 70 + (age in years x 2) mmHg]  <b>LR 1000 mL IV bolus</b>  <b>[Pedi: 20mL/kg IV bolus]</b>                  May repeat x 1 if needed                  Room temperature IV fluid may worsen hypothermia. Warm when possible.</p>	<b>A</b>
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Go to most appropriate **protocol**. Consider going to **Altered Mental Status** protocol if indicated. 

**M** **Contact Destination or OLMC** **M**

**Pearls:**

- Remember no one is dead unless they are warm and dead (> 32 C / 90 F). Transport immediately for re-warming and treatment.
- If cardiac arrest, see appropriate algorithm. Repeated defibrillation and ACLS medication administration will have limited efficacy until warm. Consult with OLMC for modifications to ACLS algorithms, medication reductions may be indicated.
- Hypothermia may produce profound bradycardia unresponsive to most treatment.
- At temperatures below 30 C (88F) jostling patients may precipitate ventricular fibrillation. Provide necessary care but handle gently.
- Consider transport to an ECMO capable center as ECMO is superior for patient warming and hemodynamic support.

# LIFT ASSIST CHECKLIST

**E**

This checklist is intended to help the responder ensure that patients who are requesting a typically thought benign 'lift assist', get appropriate evaluation and advice on management and seeking care. First responders finding abnormal items below should strongly consider having an ambulance dispatched to assist or contact OLMC for advice.

**E**

## **STEP ONE – Physical Exam**

- On arrival do what you can to help the patient be comfortable in the position found, i.e. pad head, move limbs, etc.
- Perform a good physical exam focusing on head, spine, pelvis, hips and extremities. Look for pain or deformity.
- If obvious injury found, stop and strongly encourage patient to be treated via normal protocol not lift assist.
- If no obvious injury, use an appropriate team lifting technique and get the patient up off of the ground to a chair or bed, etc.

## **STEP TWO – Medical History**

- Get a good story about the fall, was this a slip and trip or did the patient have syncope and lose consciousness. Key clues for syncope include the patient not knowing what happened, not remembering hitting the ground or not being sure how long they have been on the floor. Any suspected syncope patient should be encouraged to be evaluated at the hospital.
- Get a good medical history, any concerning medical problems such as severe osteoporosis, recent surgery or other factors that would make a fall injury worse? Any recent illness that might cause falls such as not eating, diarrhea, etc.?
- Get a good medication history. Especially ask about blood thinning medications like Coumadin, Xarelto, Eliquis, etc. Any patient with a fall and a sudden stop or direct head trauma should be encouraged to be seen immediately in the ER. Ask about any 'new' medications or dosing changes, especially to BP, diabetes and sedating or pain medications.

## **STEP THREE – Vital Signs**

- Obtain a full set of vital signs including BP, HR, RR and SaO2. If any concern about fever or infection, obtain a temperature as well.
- Blood sugar should be evaluated in patients with diabetes or patients with some component of altered mental status.
- End tidal CO2 should be checked in patients with any respiratory complaints or history of high CO2.
- 12-lead EKG should be obtained in any patient with chest pain or anginal equivalents or those with a 'story' sounding more like syncope.
- Orthostatic vital signs should be obtained in any patient with postural dizziness or history of volume losses or new medications that might affect blood pressure.
- Patients with abnormal vital signs for age should be strongly encouraged to allow transport and evaluation in the ER.

## **STEP FOUR – Capacity & Activities of Daily Living (ADLs)**

- Make sure they have capacity to make a decision. Verify they are alert and oriented and ask some additional questions such as; 'How many quarters are in a dollar?', 'Can you count forward from zero by sevens?', 'Can you tell me the days of the week backwards starting with Sunday?' These questions help evaluate cognitive ability as well.
- If no injury has been detected and the patient normally can ambulate, ask them to walk a few steps with their normal assistive devices (cane, walker, etc.). Look for new or abnormal gait problems, unsteadiness, weakness. Any new deficits may be a sign of a stroke or other neurologic problem, they should be evaluated in the ER.
- Can the patient do their own ADLs and manage their own care at their normal baseline?

## **STEP FIVE – Evaluate Home Care Resources**

- If there are family members or other caretakers present, involve them in the discussion and make sure everyone feels comfortable with the patient remaining at home.
- If no one else is present, verify that someone will be or can come to help the patient soon if they need assistance and someone to check on them.
- Ensure the patient has access to their phone (charged) or any medical alert devices they normally use.
- Perform a quick immediate home safety inspection looking for any slip, trip or lighting issues that can be rapidly remedied. Give the patient a pair of no slip socks if indicated.
- Offer transport one additional time and if declined obtain patient care refusal documentation.

# AIRWAY SECTION

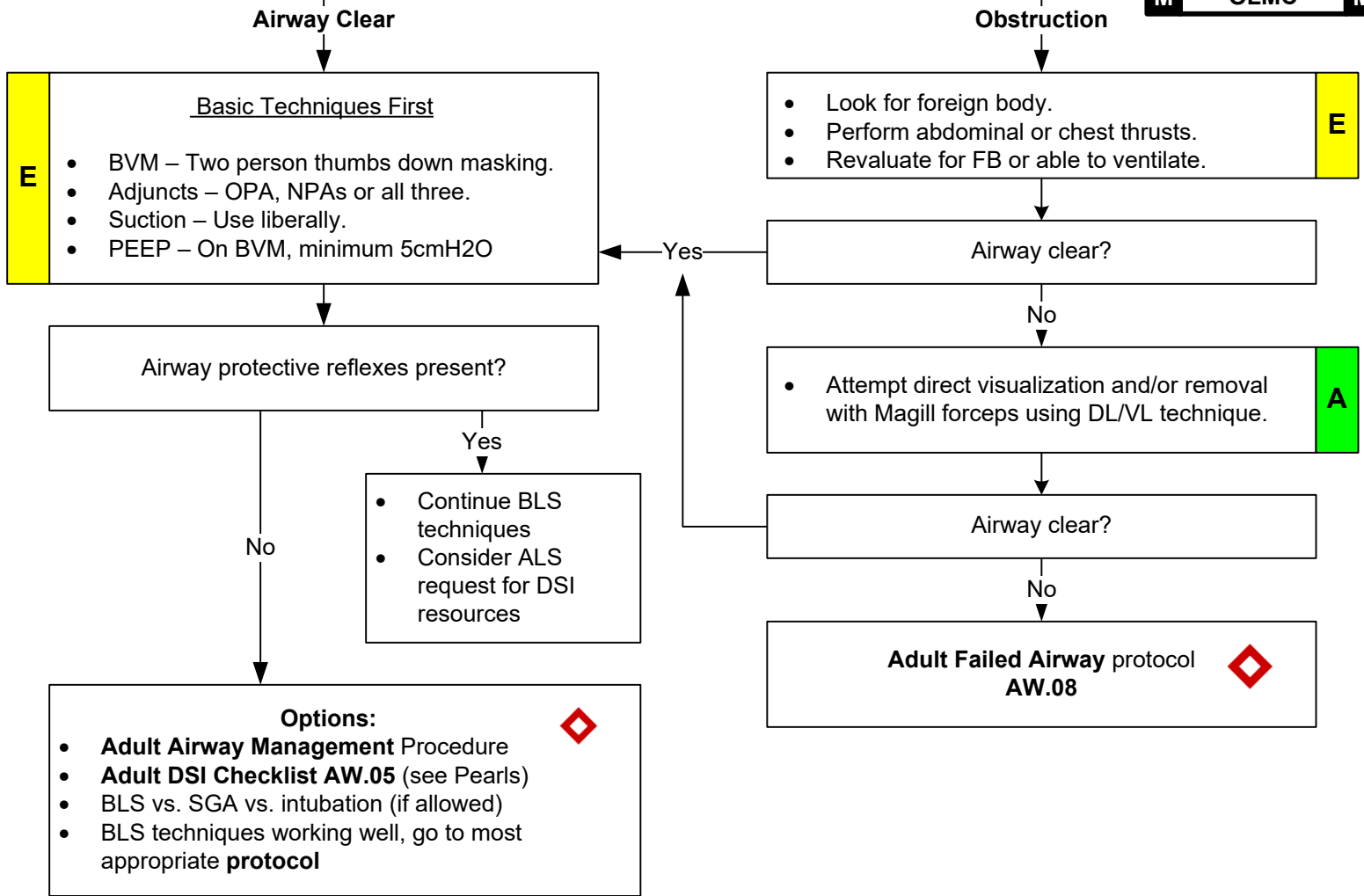
# ADULT BASIC AIRWAY MANAGEMENT

## KEY CONCEPTS:

- This is a conceptual algorithm to use for non-pharmacologically assisted airway management.
- Good, foundational BLS techniques save the day – BVM skill and adjuncts solve most problems.
- Along with this protocol, use differential diagnosis to guide fixing things (i.e. Narcan, glucose, etc.)
- Whenever available, oxygen saturation and end-tidal CO2 measurement should guide your airway management.

**Evaluate Your Airway First:**  
 - Make sure it is open and patent. - Evaluate rate, depth and effort adequate?  
 - Guidance from ETCO2 and SaO2 if available? - Quickly listen to the lungs.  
 Is your airway clear? Remember your suction!

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	MEDIC	P
M	OLMC	M



## Pearls:

- Waveform capnography (ETCO2) and pulse oximetry use is **mandatory** to use when available during airway management.
- If an airway is being maintained by BVM with Pulse Oximetry ≥90% advanced airway is not always required. This can be especially true for children where BVM or supraglottic airways are usually very effective.
- Ventilatory rates should be age appropriate per minute OR to maintain ETCO2 or 35-45 (when appropriate).
- Maintain SMR in those patients with suspected spinal injury. C-collars may help maintain physical security of advanced airways.
- When enough personnel are available, two person masking techniques should be used as they are superior to the one handed E-C technique.
- If providers are trained and allowed to intubate, the 'spirit' of the DSI process must be followed with appropriate preparation, preoxygenation and safeguards, even if no DSI drugs are given. Use AW.05 for process even if no DSI drugs.

# PEDIATRIC BASIC AIRWAY MANAGEMENT

## KEY CONCEPTS:

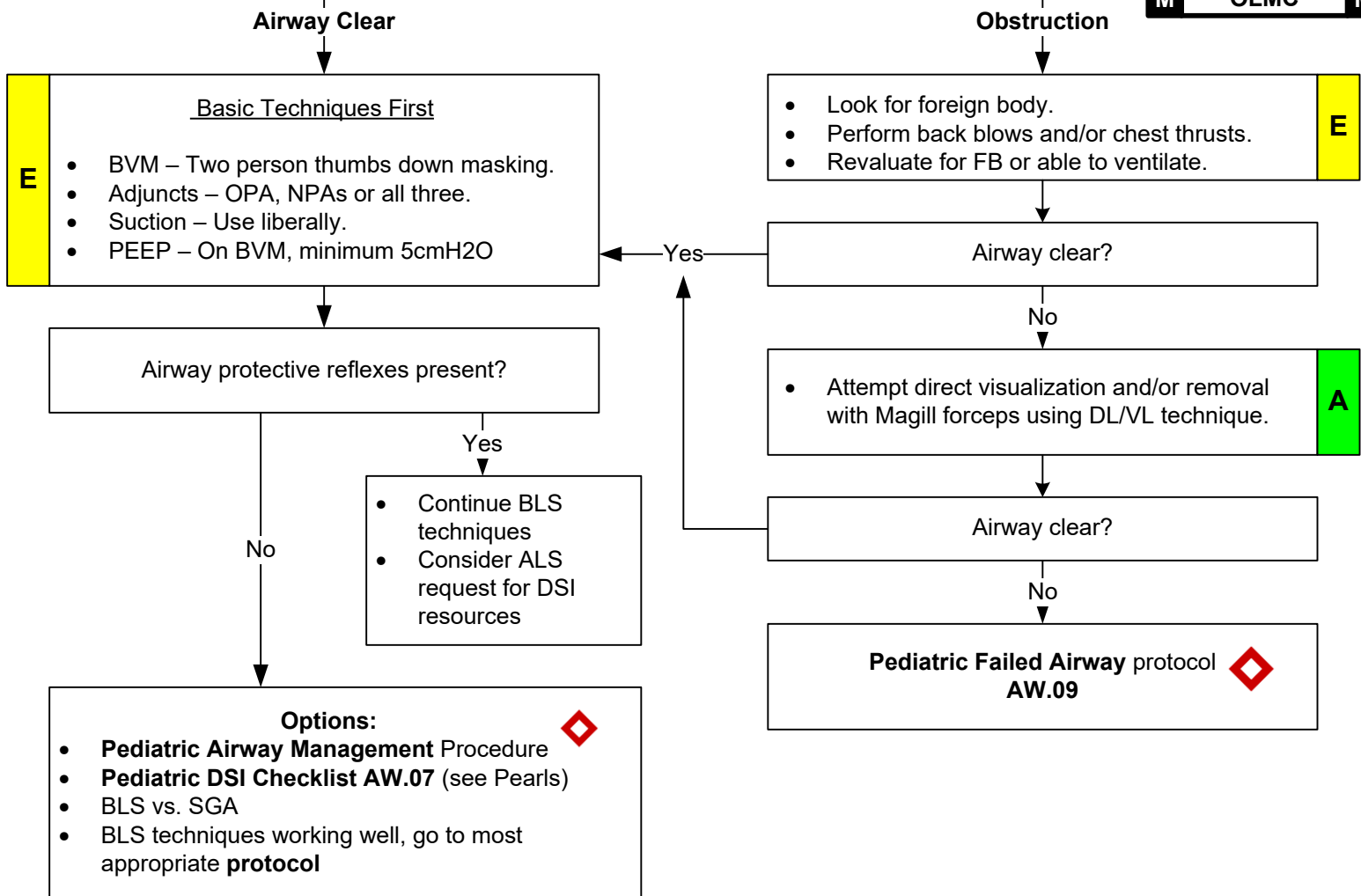
- This is a conceptual algorithm to use for non-pharmacologically assisted airway management.
  - Pediatric age is less than 12 years of age and/or less than 36kg.
- Good, foundational BLS techniques save the day – BVM skill and adjuncts solve most problems.
- Along with this protocol, use differential diagnosis to guide fixing things (i.e. Narcan, glucose, etc.)
- Whenever available, oxygen saturation and end-tidal CO2 measurement should guide your airway management.

**Evaluate Your Airway First:**

- Make sure it is open and patent.
- Evaluate rate, depth and effort adequate?
- Guidance from ET<sub>CO</sub>2 and SaO<sub>2</sub> if available?
- Quickly listen to the lungs.

Is your airway clear? Remember your suction!

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	MEDIC	P
M	OLMC	M



## Pearls:

- Waveform capnography (ET<sub>CO</sub>2) and pulse oximetry use is **mandatory** to use when available during airway management.
- If an airway is being maintained by BVM with Pulse Oximetry ≥90% advanced airway is not always required. This can be especially true for children where BVM or supraglottic airways are usually very effective.
- Ventilatory rates should be age appropriate per minute OR to maintain ET<sub>CO</sub>2 or 35-45 (when appropriate).
- Maintain SMR in those patients with suspected spinal injury. C-collars may help maintain physical security of advanced airways.
- When enough personnel are available, two person masking techniques should be used as they are superior to the one handed E-C technique.
- If providers are trained and allowed to intubate, the 'spirit' of the DSI process must be followed with appropriate preparation, preoxygenation and safeguards, even if no DSI drugs are given. Use AW.07 for process even if no DSI drugs.

# AIRWAY MANAGEMENT PEARLS

## Difficult Airway Assessment

### MOANS

(Predicts difficult BVM ventilation)

- Mask seal difficult due to facial hair, blood, fluid, trauma or anatomy.
- Obese or late pregnancy, big belly!
- Age, advanced age > 55.
- No teeth, hard to make seal, consider leaving dentures until intubation.
- Stiff lungs, COPD, asthma, big belly. Hard to ventilate, increased pressures.

### LEMON

(Predicts difficult laryngoscopy.)

- Look for external problems, small mandible, short neck, large tongue.
- Evaluate 3-3-2 rule. 3 fingers fit in open mouth, mandible to trapezius at least three fingers tall, chin to adam's apple at least 2 fingers.
- Mallampati view (if able)
- Obstruction or obese.
- Neck mobility restriction (old, trauma, surgery)

### RODS

(Predicts difficult supraglottic airway.)

- Restricted mouth opening.
- Obstructed or obese.
- Distorted or disrupted airway (trauma).
- Stiff or increased airway pressures (asthma, COPD, big belly).

## Trauma Airway Pearls

- Expect difficulty with BVM mask ventilation due to C-collar and neutral airway position.
- Intubation will be artificially "anterior" due to head in neutral airway position. Use video laryngoscopy and anticipate need for adjunct such as bougie.
- C-collar front may be opened for intubation AS LONG AS second provider is maintaining manual C-spine stabilization. This makes moving the jaw forward easier.

## Surgical Airway Pearls

### SHORT

(Predicts difficult surgical airway.)

- Surgery (previous) or distortion of the airway.
- Hematoma or trauma to the neck.
- Obese or big belly, pregnant.
- Radiation to the neck (causes skin and tissue scarring)
- Tumors overlying the neck.

Remember helper, light, suction, stabilization are all critical to success.

## Ventilation Pearls

### RATE

- Normal adult ventilatory rates are usually 12-16 breaths per minute.
- For pediatric age appropriate rates see the pediatric intubation procedure.
- Patients with obstructive lung disease need slower rates and more exhalation time (COPD, asthma, etc.)
- Patients with known metabolic acidosis (DKA, severe sepsis or trauma) may need higher rates to "blow off acid" (CO<sub>2</sub>). Consider matching pre-intubation rates if feasible.

### ETCO<sub>2</sub>

- Increasing minute ventilation (tidal volume X ventilation rate) lowers ETCO<sub>2</sub>.
- Decreasing minute ventilation increases ETCO<sub>2</sub>.
- Generally ventilation should target ETCO<sub>2</sub> levels of 35-45 mmHg.
- This may not be feasible in patients with obstructive lung disease who cannot be ventilated too fast, they may range much higher.

### PEEP

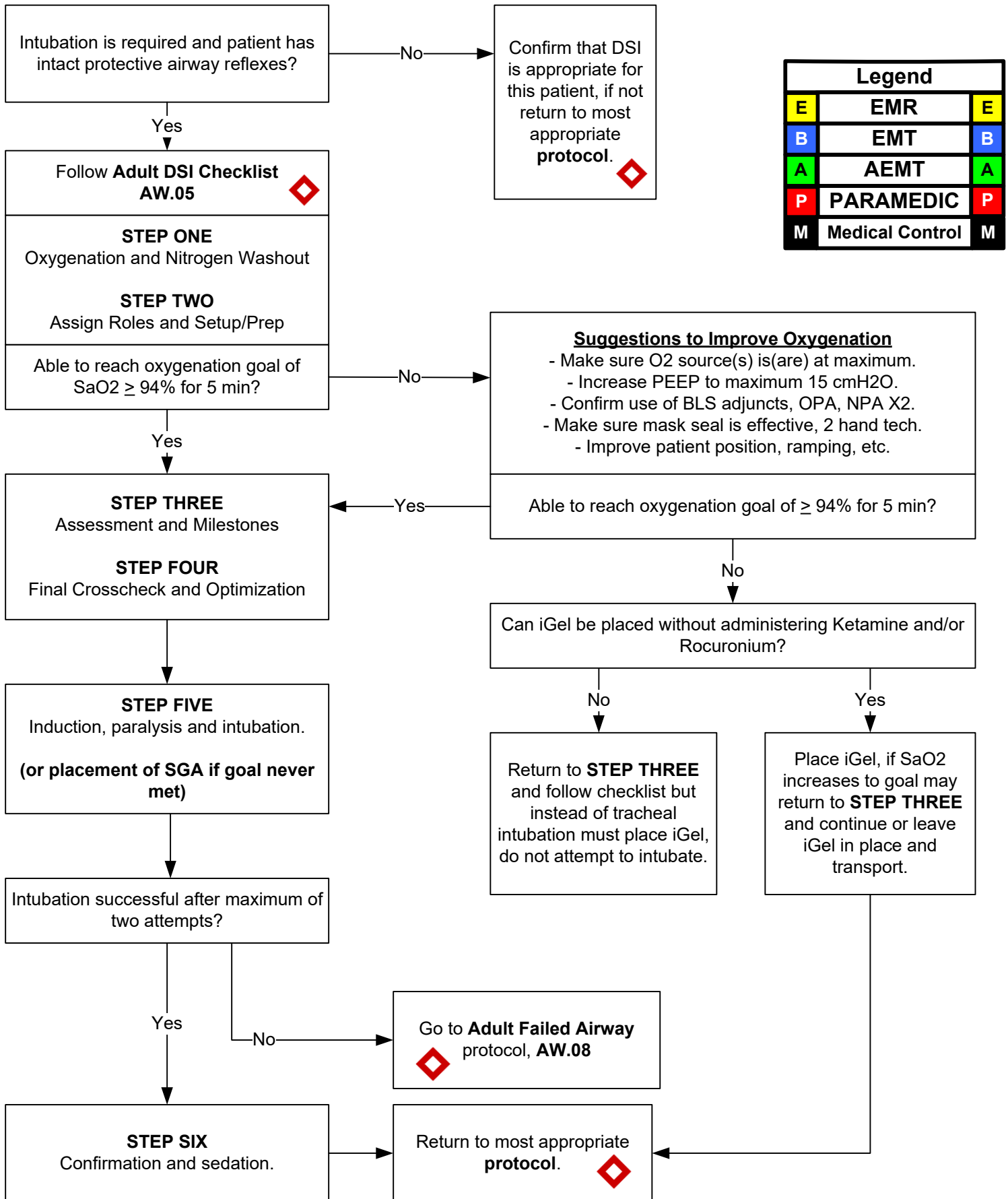
- Remember PEEP and increasing FiO<sub>2</sub> helps to increase oxygen saturations.
- For intubated patients a PEEP of 5 is physiologic and overcomes the resistance of the ETT and tubing.
- Use caution with PEEP in hypotensive patients.
- Obstructive lung disease patients (COPD, asthma) generally create their own auto-PEEP and don't need more.

## Failed Airway Pearls

- **Change equipment** - Laryngoscope blade, try channeled versus non-channeled, acute angle, etc. Remember with video laryngoscopy if you are having trouble advancing the tube...you are almost always TOO DEEP! Back up! Consider bougie, smaller ET tube size. Use your most experienced operator at this point.
- **Change positioning** - Make sure head is in sniffing or ear to sternal notch position (unless c-spine trauma), consider padding under shoulders and slight head up position.
- **Consider BURP maneuver** - Back, up, right, pressure all with the cricoid cartilage. Sometimes helpful, sometimes makes view worse.
- **Suction, suction, suction...**

# ADULT DSI ROADMAP

## PARAMEDIC



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

# ADULT DSI CHECKLIST (PAGE 1)

This is **BOTH** a protocol and a procedure checklist, complete this form during procedure and submit with report. Use during DSI process is mandatory, submit a clinical STOP sign for any incomplete DSI, bail out or missed intubation.

## (1) STEP ONE – CHOOSE STRATEGY BASED ON PATIENT PRESENTATION

<b>E</b>	<b>Awake Patient – Compliant</b> <b>BEST</b> <b>C/BiPAP 100% FiO<sub>2</sub> + PEEP 5-10</b> <b>OR IF NO NIPPV</b> <b>Non-Rebreather Mask @ 15-25 lpm</b> <b>PLUS</b> <b>Regular Nasal Cannula @ 5-10 lpm</b>	<b>Awake Patient – Non Compliant</b> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="background-color: red; color: white; padding: 2px 5px; font-weight: bold;">P</div> <div style="text-align: center;"> <b>Ketamine 250mg IM or</b>  <b>1 mg/kg SLOW IV/IO</b>  <b>THEN</b> </div> <div style="background-color: red; color: white; padding: 2px 5px; font-weight: bold;">P</div> </div> <b>C/BiPAP 100% FiO<sub>2</sub> + PEEP 5-10</b> <b>OR BVM PRN</b>	<b>Unconscious – Poor Ventilation</b> <b>Regular Nasal Cannula @ 15 lpm</b> <b>PLUS</b> <b>BVM @ 15-25 lpm</b> <b>AND</b> <b>OPA and/or NPA</b>	<b>E</b>
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## (2) STEP TWO – ASSIGN ROLES & START SETUP/PREPARATION

Roles may vary depending on numbers of personnel. Usually 4 is minimum, 5 is ideal. Call for help early.

### START PRE-OXYGENATION / DE-NITROGENATION BLS AIRWAY MANAGEMENT (EMR)

- Attach all V/S monitoring equipment: EKG, NIBP, SaO<sub>2</sub> and end tidal capnography
- Apply 100% FiO<sub>2</sub> using your chosen method from above. If a BVM, use the thumbs down two person mask technique
- Verify PEEP set to at least 5-10 cm H<sub>2</sub>O. Attach the end-tidal CO<sub>2</sub>, make sure there is a waveform with each breath
- Insert NPAs and/or OPA as the patient will tolerate, you may insert all three if desired
- Watch the oxygen saturations (SaO<sub>2</sub>) and alert the team when the SaO<sub>2</sub> ≥ 94% (Record that time in the box below.)

Time SaO<sub>2</sub> ≥ 94% Reached: \_\_\_\_\_:\_\_\_\_\_

Time SaO<sub>2</sub> ≥ 94% + 5 Minutes: \_\_\_\_\_:\_\_\_\_\_

### PREPARE INTUBATION EQUIPMENT AND CROSSCHECK (EMT)

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> Video laryngoscope, on and tested</li> <li><input type="checkbox"/> ET tube, desired size, cuff checked and lubed</li> <li><input type="checkbox"/> ET tube, next available size smaller (out, visible)</li> <li><input type="checkbox"/> Bougie</li> <li><input type="checkbox"/> Syringe for cuff inflation</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Suction, on, working w/large bore (DuCanto) catheter</li> <li><input type="checkbox"/> Rescue airway, appropriate size iGel (out, visible)</li> <li><input type="checkbox"/> Surgical airway kit (out, visible)</li> <li><input type="checkbox"/> End tidal for ET tube (if not already attached)</li> <li><input type="checkbox"/> ET tube holder</li> </ul> |
|--|---|

### VASCULAR ACCESS (AEMT)

- Obtain an IV or IO (if not already done)
- Normal Saline (NS)** or **Lactated Ringers (LR)** TKO/KVO
- If patient BP < 110 systolic, begin a **rapid bolus up to 1L**
- Make sure BP cuff and pulse ox aren't on IV arm to interfere with medication administration and SaO<sub>2</sub>

Patient estimated weight in kilograms: \_\_\_\_\_

### PREPARE DRUGS (PARAMEDIC)

- Ketamine 2mg/kg** (prep 1mg/kg for age > 70, OR hemodynamic shock state) Also, reduce dose based on any ketamine given in step 1 unless worn off.
- Rocuronium 1mg/kg** (prep 1.5mg/kg for hemodynamic shock state)
- Make **push dose epinephrine** by adding 1mL epi 1:10,000 to 9 mL saline flush = 10 mcg/mL 1:100,000

WILCO EMS run number: \_\_\_\_\_

## (3) STEP THREE – VERIFY OXYGENATION GOAL

- Verify that SaO<sub>2</sub> has been ≥ 94% for 5 minutes, see second time box above.
- Remember increasing O<sub>2</sub> flow, adding more peep, sitting patient up and bronchodilation may all be ways to help increase SaO<sub>2</sub> along with good mask seal, 2 person technique.
- If the oxygen goal cannot be reached, the paramedic may choose to continue with induction and paralysis if needed but only iGel may be used (rapid supraglottic intubation). See AW.04 Adult DSI Plan

# ADULT DSI CHECKLIST (PAGE 2)

## (4) STEP FOUR – FINAL CROSSCHECK & OPTIMIZATION

### PRE-INTUBATION CHECKS AND HOUSEKEEPING (TEAM)

- Verify good BLS ventilation, remind team to watch SaO<sub>2</sub>, obtain accurate set of pre-intubation vital signs and record below
- Double check that IV and pulse ox are not on same limb as the blood pressure cuff
- Intubating provider needs to position patient for success (ramp patient as needed, etc.) and make sure airway is assessed for difficulty (LEMON, etc.) Recall AW.03 is available for reference

**Pre-Intubation V/S** Time : \_\_\_\_\_ BP: \_\_\_\_\_ / \_\_\_\_\_ HR: \_\_\_\_\_ RR: \_\_\_\_\_ SaO<sub>2</sub>: \_\_\_\_\_ ETCO<sub>2</sub>: \_\_\_\_\_

### OPTIMIZE VITAL SIGNS BEFORE INTUBATION (PARAMEDIC)

- If systolic BP < 110 mmHg or heart rate inappropriately less than 60bpm give **Push Dose Epinephrine 1-2mL (10-20mcg) 1:100,000 q. 5 min PRN** to correct the abnormality.
- Monitor throughout the rest of the process, dose may be repeated q. 5 min as needed.

## (5) STEP FIVE - HARD STOP – PROCEDURE TIME OUT!

- Final visual check of all equipment.
- Team leader verifies everyone knows roles during the intubation process (dedicated 'SaO<sub>2</sub>' monitor).
- Review bail out criteria: SaO<sub>2</sub> < 92%, significant drop in HR, evidence of peri-arrest, intubating provider calls for a 'bail out'.

## (6) STEP SIX – INDUCTION, PARALYSIS & INTUBATION

### ADMINISTER MEDICATIONS AND INTUBATE (PARAMEDIC)

- Perform final drug cross check with team, ensure regular NC is in place and set to 15-25 lpm flow
- Administer **Ketamine** for induction (unless already done) - start 60 – 90 second countdown
- Verify adequate sedation, then **Rocuronium** for paralysis - start 60 – 90 second countdown
- Verify adequate paralysis and proceed with intubation using SALAD technique (or SGA if doing rapid method)
- May re-dose sedation and paralytic medications at a half-dose once if inadequate sedation or paralysis for intubation.

**Ketamine Dose & Time:** \_\_\_\_\_ mg @ \_\_\_\_\_ :

**Rocuronium Dose & Time:** \_\_\_\_\_ mg @ \_\_\_\_\_ :

**Intubation Attempt #1 Time** \_\_\_\_\_ :

**Intubation Attempt #2 Time** \_\_\_\_\_ : (or mark N/A)

## (7) STEP SEVEN – CONFIRMATION & SEDATION

### VERIFY INTUBATION SUCCESS (TEAM)

- Verify correct tube placement by evaluating that the capnography waveform is present, ETCO<sub>2</sub> number is consistent, that there are breath sounds bilaterally, good chest rise and a stable or improving oxygen saturation
- Secure ET tube, apply a c-collar to help avoid tube dislodgement, obtain post-intubation vital signs

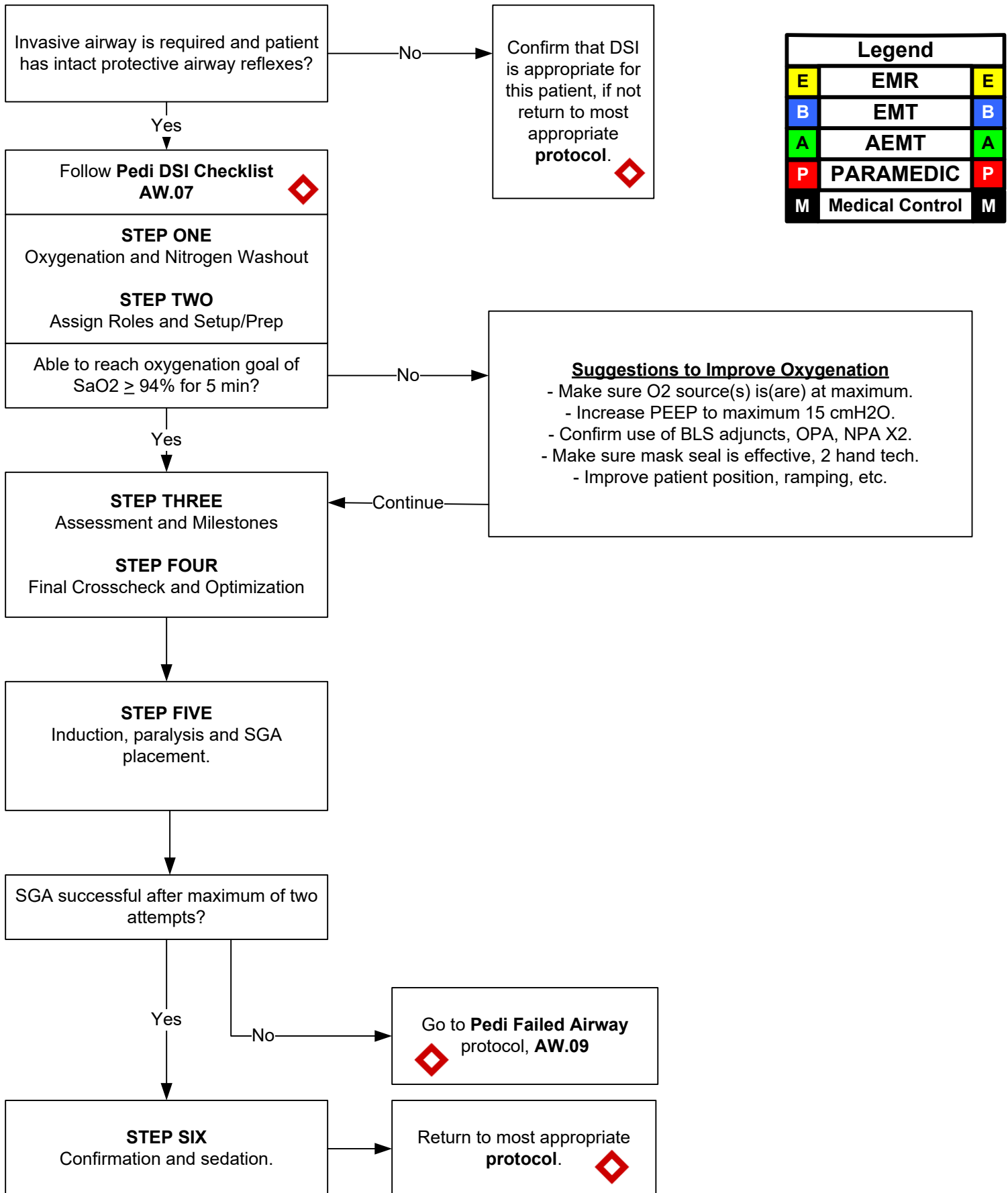
### INITIATE POST-INTUBATION SEDATION AND ANALGESIA (PARAMEDIC)

- Provide post intubation sedation and analgesia on all patients right away. Goal RASS is -3 to -5:
  - **Ketamine 0.5-2 mg/kg IV/IO push q.15 minutes** (use ketamine only if hemodynamically unstable) **OR**
  - **Fentanyl 100 – 150 mcg slow IV/IO push q.15-30 min AND Midazolam 2.5 – 5mg slow IV/IO q. 30 min**
- Refer to **AW.10** for full information and guidance on post-intubation sedation, pump infusion dosing, etc.



# PEDIATRIC DSI ROADMAP

## PARAMEDIC



# PEDIATRIC DSI CHECKLIST (PAGE 1)

This is **BOTH** a protocol and a procedure checklist, complete this form during procedure and submit with report. Use during DSI process is mandatory, submit a clinical STOP sign for any incomplete DSI, bail out or missed intubation.

## (1) STEP ONE – CHOOSE STRATEGY BASED ON PATIENT PRESENTATION

<b>E</b>	<p><b>Awake Patient – Compliant</b> BEST C/BiPAP 100% FiO<sub>2</sub> + PEEP 5-10 OR IF NO NIPPV Non-Rebreather Mask @ 15-25 lpm PLUS Regular Nasal Cannula @ 5-10 lpm</p>	<p><b>Awake Patient – Non Compliant</b> <b>P</b> Ketamine 2mg/kg IM or 1 mg/kg SLOW IV/IO <b>P</b> THEN C/BiPAP 100% FiO<sub>2</sub> + PEEP 5-10 OR BVM PRN</p>	<p><b>Unconscious – Poor Ventilation</b> Regular Nasal Cannula @ 15 lpm PLUS BVM @ 15-25 lpm AND OPA and/or NPA</p>	<b>E</b>
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## (2) STEP TWO – ASSIGN ROLES & START SETUP/PREPARATION

Roles may vary depending on numbers of personnel. Usually 4 is minimum, 5 is ideal. Call for help early.

### START PRE-OXYGENATION / DE-NITROGENATION BLS AIRWAY MANAGEMENT (EMR)

- Attach all V/S monitoring equipment: EKG, NIBP, SaO<sub>2</sub> and end tidal capnography
- Apply 100% FiO<sub>2</sub> using your chosen method from above. If a BVM, use the thumbs down two person mask technique
- Verify PEEP set to at least 5-10 cm H<sub>2</sub>O. Attach the end-tidal CO<sub>2</sub>, make sure there is a waveform with each breath
- Insert NPAs and/or OPA as the patient will tolerate, you may insert all three if desired
- Watch the oxygen saturations (SaO<sub>2</sub>) and alert the team when the SaO<sub>2</sub> ≥ 94% (Record that time in the box below.)

Time SaO<sub>2</sub> ≥ 94% Reached: \_\_\_\_\_:\_\_\_\_\_

Time SaO<sub>2</sub> ≥ 94% + 5 Minutes: \_\_\_\_\_:\_\_\_\_\_

### PREPARE INTUBATION EQUIPMENT AND CROSSCHECK (EMT)

- Supraglottic airway (iGel), proper size selected, out and lubricated
- Suction, on, working w/large bore (DuCanto) catheter
- Needle cricothyrotomy rescue equipment (out, visible)
- Holder for supraglottic airway
- End tidal (if not already attached)

### VASCULAR ACCESS (AEMT)

- Obtain an IV or IO (if not already done)
- Normal Saline (NS) or Lactated Ringers (LR) TKO/KVO
- If patient BP < 70 + (age x2) systolic, begin a **rapid bolus up to 20mL/kg**
- Make sure BP cuff and pulse ox aren't on IV arm to interfere with medication administration and SaO<sub>2</sub>


Patient estimated weight in kilograms: \_\_\_\_\_

### PREPARE DRUGS (PARAMEDIC)

- Ketamine 2mg/kg** (prep 1mg/kg if hemodynamic shock state) Also, reduce dose based on any ketamine given in step 1 unless worn off.
- Rocuronium 1mg/kg** (prep 1.5mg/kg for hemodynamic shock state)
- Make **push dose epinephrine** by adding 1mL epi 1:10,000 to 9 mL saline flush = 10 mcg/mL 1:100,000

WILCO EMS run number: \_\_\_\_\_

## (3) STEP THREE – VERIFY OXYGENATION GOAL

- Verify that SaO<sub>2</sub> has been ≥ 94% for 5 minutes, see second time box above.
- Remember increasing O<sub>2</sub> flow, adding more peep, sitting patient up and bronchodilation may all be ways to help increase SaO<sub>2</sub> along with good mask seal, 2 person technique.
- If the oxygen goal cannot be reached, the paramedic may choose to continue with induction and paralysis if needed but only iGel may be used (rapid supraglottic intubation). See AW.06 Pediatric DSI Plan 

# PEDIATRIC DSI CHECKLIST (PAGE 2)

## (4) STEP FOUR – FINAL CROSSCHECK & OPTIMIZATION

### PRE-INTUBATION CHECKS AND HOUSEKEEPING (TEAM)

- Verify good BLS ventilation, remind team to watch SaO<sub>2</sub>, obtain accurate set of pre-intubation vital signs and record below
- Double check that IV and pulse ox are not on same limb as the blood pressure cuff
- Intubating provider needs to position patient for success (ramp patient as needed, etc.) and make sure airway is assessed for difficulty (LEMON, etc.) Recall AW.03 is available for reference

**Pre-Intubation V/S** Time : \_\_\_\_\_ BP: \_\_\_\_\_ / \_\_\_\_\_ HR: \_\_\_\_\_ RR: \_\_\_\_\_ SaO<sub>2</sub>: \_\_\_\_\_ ETCO<sub>2</sub>: \_\_\_\_\_

### OPTIMIZE VITAL SIGNS BEFORE INTUBATION (PARAMEDIC)

- If systolic BP < 70 + (age x2) mmHg or heart rate inappropriately low for age:
- Give **Push Dose Epinephrine 1-2mL (10-20mcg) 1:100,000 q. 5 min PRN** to correct SBP or concerning bradycardia. Monitor throughout the rest of the process.

## (5) STEP FIVE - HARD STOP – PROCEDURE TIME OUT!

- Final visual check of all equipment.
- Team leader verifies everyone knows roles during the intubation process (dedicated 'SaO<sub>2</sub>' monitor).
- Review bail out criteria: SaO<sub>2</sub> < 92%, significant drop in HR, evidence of peri-arrest, intubating provider calls for a 'bail out'.

## (6) STEP SIX – INDUCTION, PARALYSIS & INTUBATION

### ADMINISTER MEDICATIONS (PARAMEDIC)

### PLACE SUPRAGLOTTIC AIRWAY (TEAM)

- Perform final drug cross check with team, ensure regular NC is in place and set to 15-25 lpm flow
- Administer **Ketamine** for induction (unless already done) - start 60 – 90 second countdown
- Verify adequate sedation, then **Rocuronium** for paralysis - start 60 – 90 second countdown
- Verify adequate paralysis and proceed with supraglottic airway (iGel) using SALAD technique
- May re-dose sedation and paralytic medications at a half-dose once if inadequate sedation or paralysis for intubation.

**Ketamine Dose & Time:** \_\_\_\_\_ mg @ \_\_\_\_\_ : \_\_\_\_\_

**Rocuronium Dose & Time:** \_\_\_\_\_ mg @ \_\_\_\_\_ : \_\_\_\_\_

**SGA Attempt #1 Time** \_\_\_\_\_ : \_\_\_\_\_


**SGA Attempt #2 Time** \_\_\_\_\_ : \_\_\_\_\_ (or mark N/A)

## (7) STEP SEVEN – CONFIRMATION & SEDATION

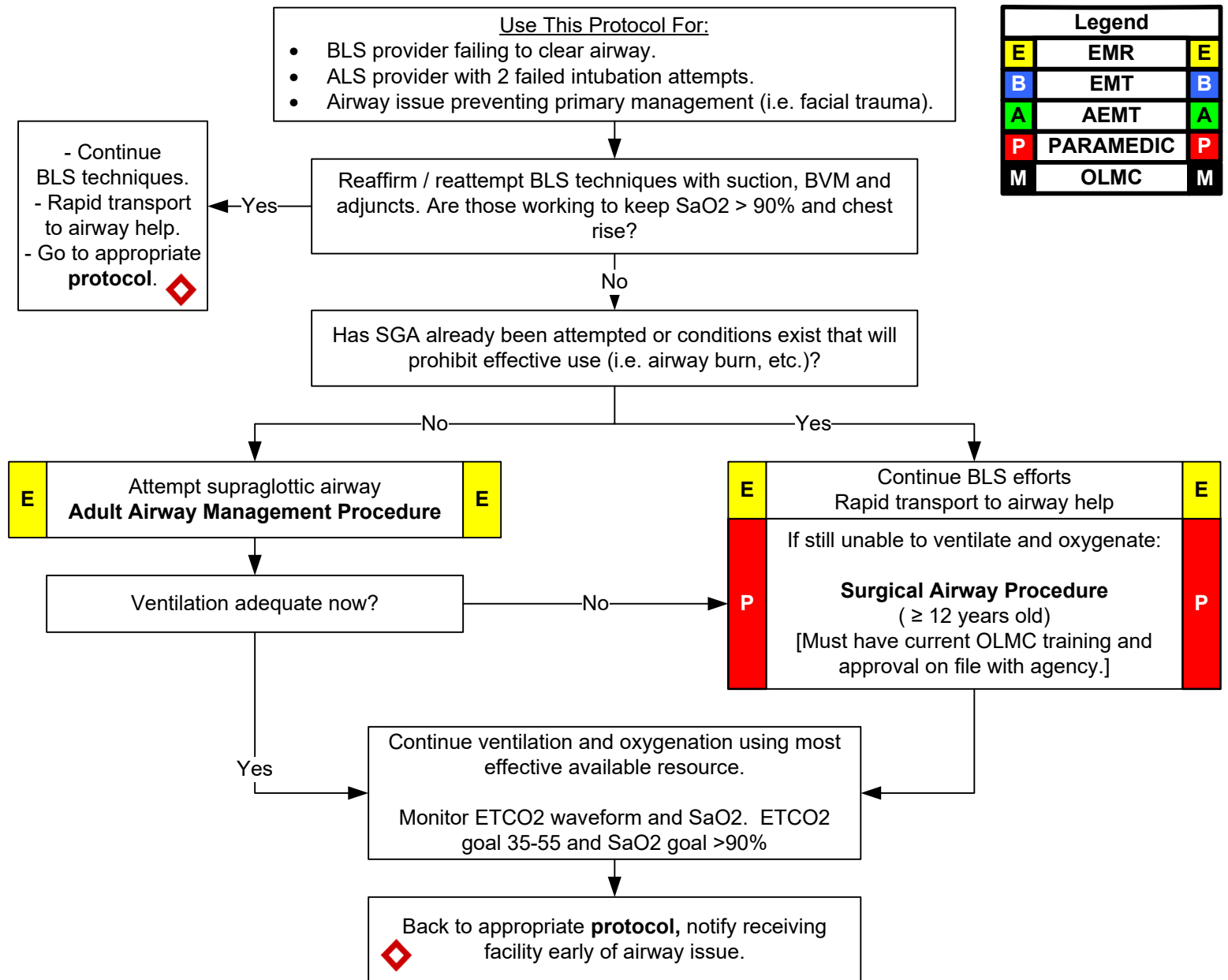
### VERIFY INTUBATION SUCCESS (TEAM)

- Verify correct SGA placement by evaluating that the capnography waveform is present, ETCO<sub>2</sub> number is consistent, that there are breath sounds bilaterally, good chest rise and a stable or improving oxygen saturation
- Secure airway, apply a c-collar to help avoid tube dislodgement, obtain post-intubation vital signs

### INITIATE POST-INTUBATION SEDATION AND ANALGESIA (PARAMEDIC)

- Provide post intubation sedation and analgesia on all patients right away. Goal RASS is -3 to -5:
  - **Ketamine 0.5-1 mg/kg IV/IO push q.15 minutes** (use ketamine only if hemodynamically unstable) **OR**
  - **Fentanyl 1 mcg/kg slow IV/IO push q.15-30 min AND Midazolam 0.05-0.1 mg/kg slow IV/IO q. 30 min**
- Refer to **AW.11** for detailed information and guidance on post-intubation sedation, pump infusion dosing, etc. 

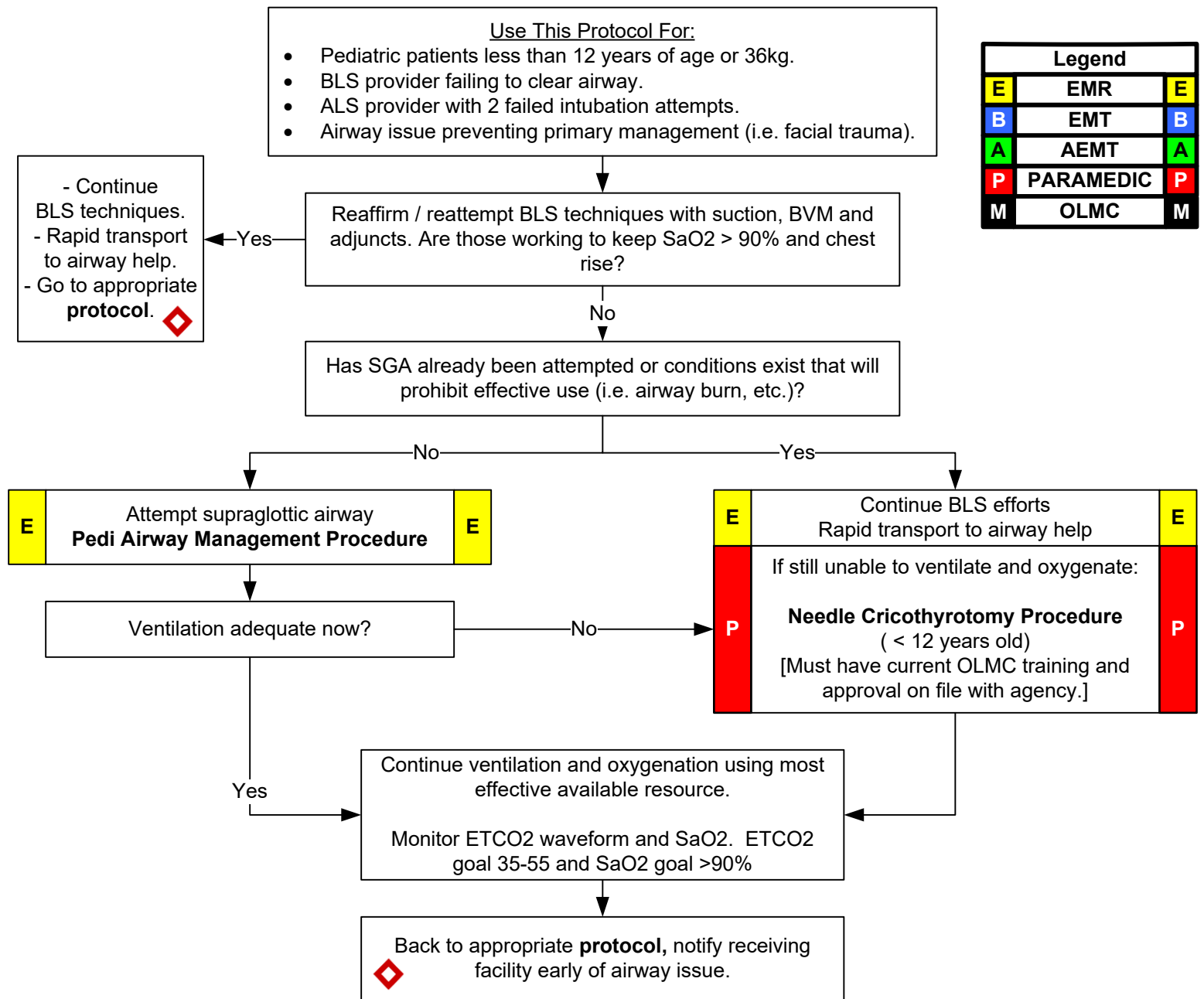
# ADULT FAILED AIRWAY



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	OLMC	M

- Pearls:**
- If an airway is being maintained by BVM with Pulse Oximetry >90%, it is acceptable to maintain basic airway measures instead of using a supraglottic airway device (SGA) or ETT, especially in the setting of short transport or perceived difficult airway.
  - An adequate airway is when the patient is now appropriately oxygenated and ventilated. If SGA is providing good ventilatory exchange and is functioning appropriately DO NOT REMOVE or EXCHANGE unless important reason exists.
  - To be allowed to do a surgical airway, providers must have been trained within an approved interval and have documented training and skill approval by the office of the medical director. Methods will vary by agency for records maintenance.
  - Surgical airway technique and equipment is outlined in the surgical airway procedure. Request help early.
  - Notify the agency medical director promptly regarding any failed airway (see required reporting to the medical director).
  - Patients with failed airways should be transported to the closest facility that can provide a secure airway.

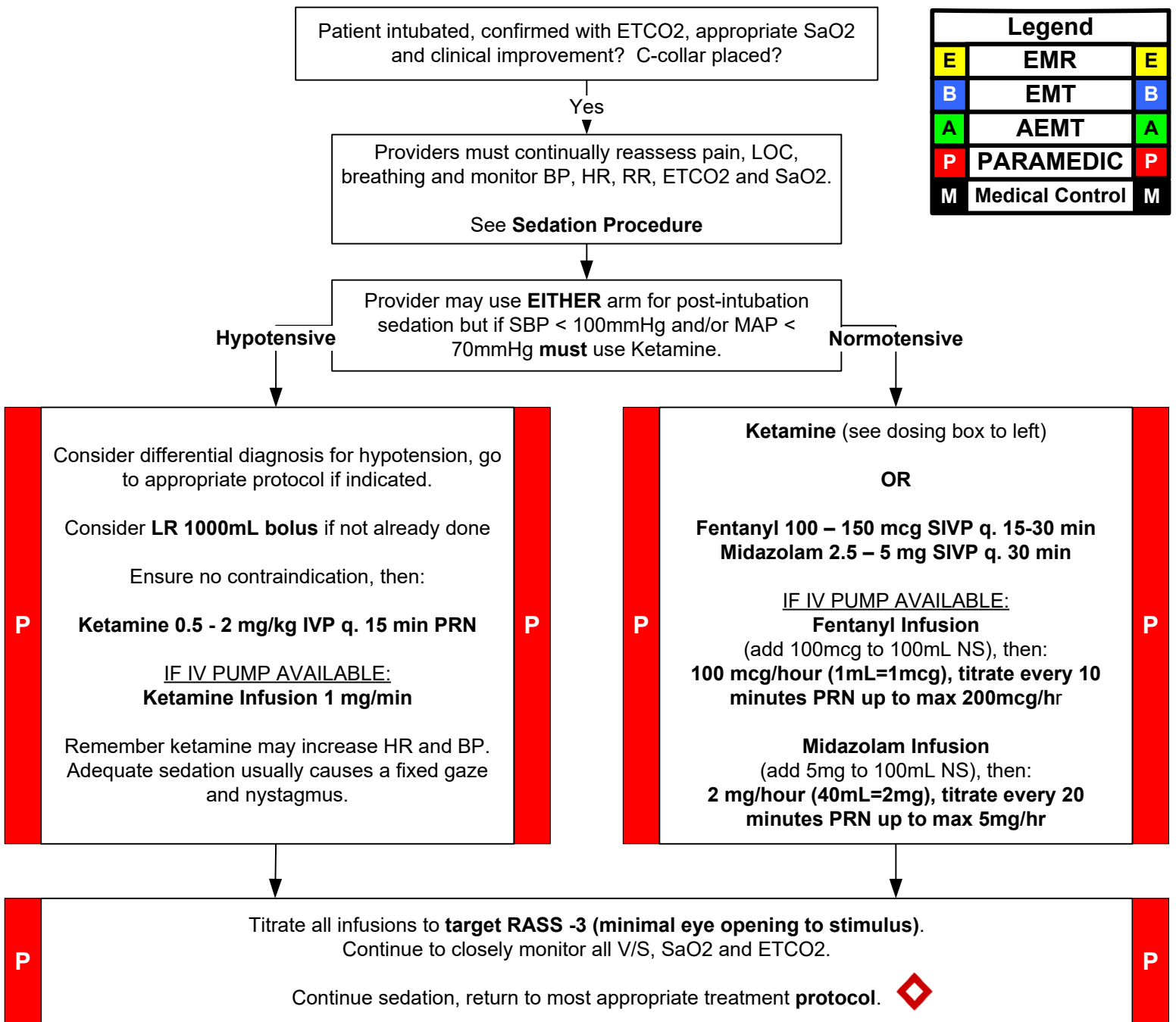
# PEDIATRIC FAILED AIRWAY



## Pearls:

- If an airway is being maintained by BVM with Pulse Oximetry >90%, it is acceptable to maintain basic airway measures instead of using a supraglottic airway device (SGA) or ETT, especially in the setting of short transport or perceived difficult airway.
- An adequate airway is when the patient is now appropriately oxygenated and ventilated. If SGA is providing good ventilatory exchange and is functioning appropriately DO NOT REMOVE or EXCHANGE unless important reason exists.
- To be allowed to do a needle cricothyrotomy, providers must have been trained within an approved interval and have documented training and skill approval by the office of the medical director. Methods will vary by agency for records maintenance.
- Needle airway technique and equipment is outlined in the needle thoracostomy airway procedure. Request help early.
- Needle thoracostomy is a very temporary intervention and is not true ventilation. It mainly only provides limited oxygenation. CO2 will begin to rapidly rise and pH will fall. Transport immediately and emergently to a center that can assist with pediatric airway rescue. This may be a pediatric or adult hospital in some cases.
- Notify the agency medical director promptly regarding any failed airway (see required reporting to the medical director).
- Patients with failed airways should be transported to the closest facility that can provide a secure airway.

# ADULT POST INTUBATION SEDATION

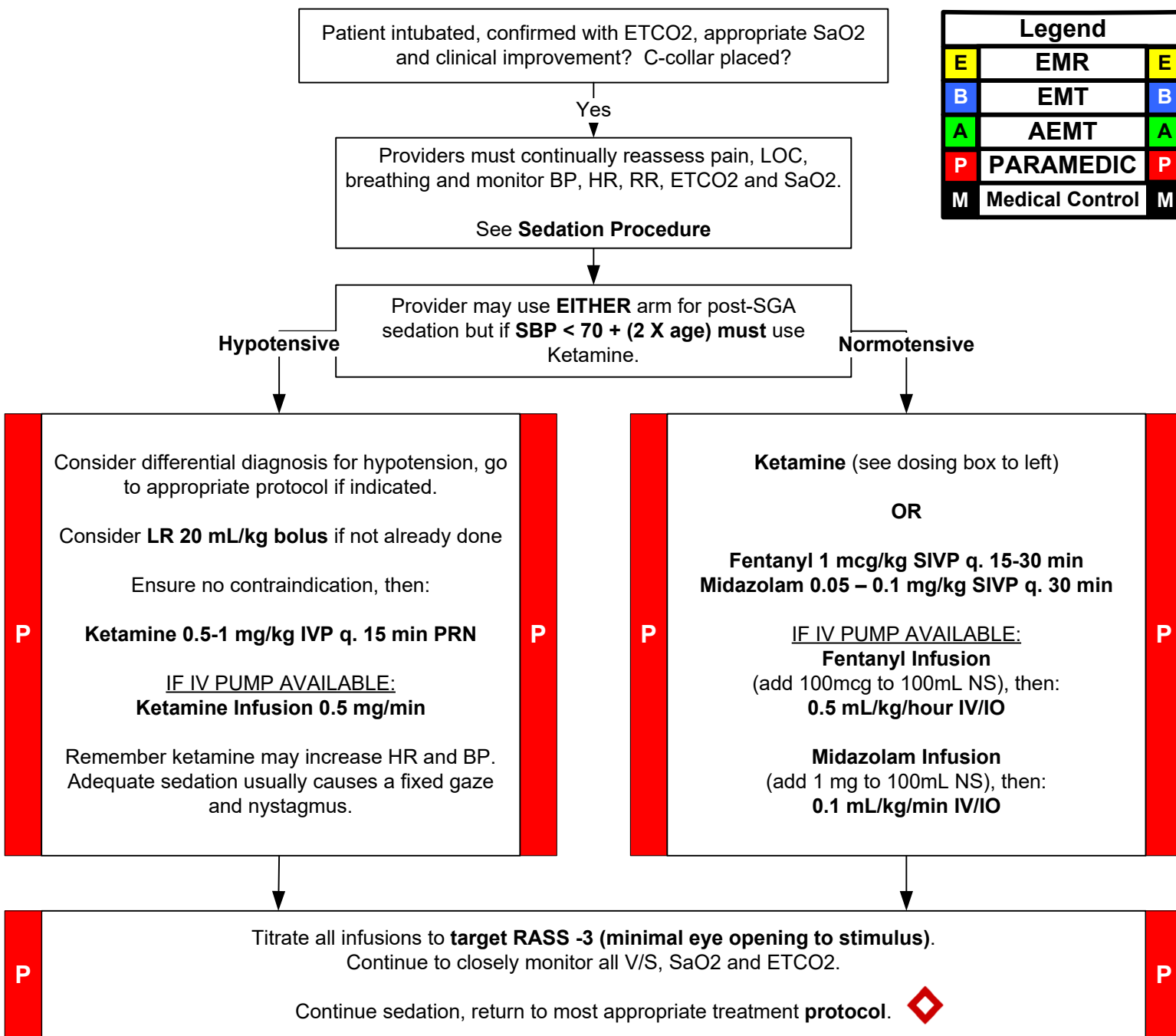


Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## Pearls:

- Remember that the effect of opiates (fentanyl) and benzodiazepines (midazolam) are additive. They are given together to work better than either alone. Ranges are given and the provider should use the lowest effective dose.
- If only one pump available and using fentanyl and midazolam, place fentanyl on infusion with pump and push dose midazolam.
- Do not give ketamine to patients with suspected increased intra-ocular pressure or known allergy/hypersensitivity.
- Especially for patient who are chemically paralyzed and intubated, patients with inadequate post intubation sedation will likely display increased HR and BP, especially if not present prior to intubation. Patients "over-breathing" the vent or BVM likely need more sedation. Do not re-dose paralytics without OLMC order.
- Ketamine typically increases HR and BP, sometimes markedly, making it a good choice in hypotensive patients. Ketamine should be given cautiously to older patients with existing HTN or CAD or existing tachycardia. Consider medical control consultation.
- In patients > 70 yrs. or with liver disease, consider reducing sedation dosing by 50%.
- Reduce noxious stimuli for patients in addition to sedation medication, i.e. dim lights, minimize movement, painful procedures, etc.

# PEDI POST INTUBATION SEDATION



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## Pearls:

- Remember that the effect of opiates (fentanyl) and benzodiazepines (midazolam) are additive. They are given together to work better than either alone. Ranges are given and the paramedic should use the lowest effective dose.
- Do not give ketamine to patients with suspected increased intra-ocular pressure or known allergy/hypersensitivity.
- Especially for patient who are chemically paralyzed and intubated, HR, BP and RR are the main ways to determine sedation. Patients with inadequate post intubation sedation will likely display increased HR and BP, especially if not present prior to intubation. Patients "over-breathing" the vent or BVM should be appropriately sedated. Do not re-dose paralytics without OLMC order. Intubation in this case referring to supraglottic intubation (SGA).
- Reduce noxious stimuli for patients in addition to sedation medication, i.e. dim lights, minimize movement, painful procedures, etc.

# **ADULT CARDIAC** **ARREST SECTION**

# ADULT MEDICAL CARDIAC ARREST

## History:

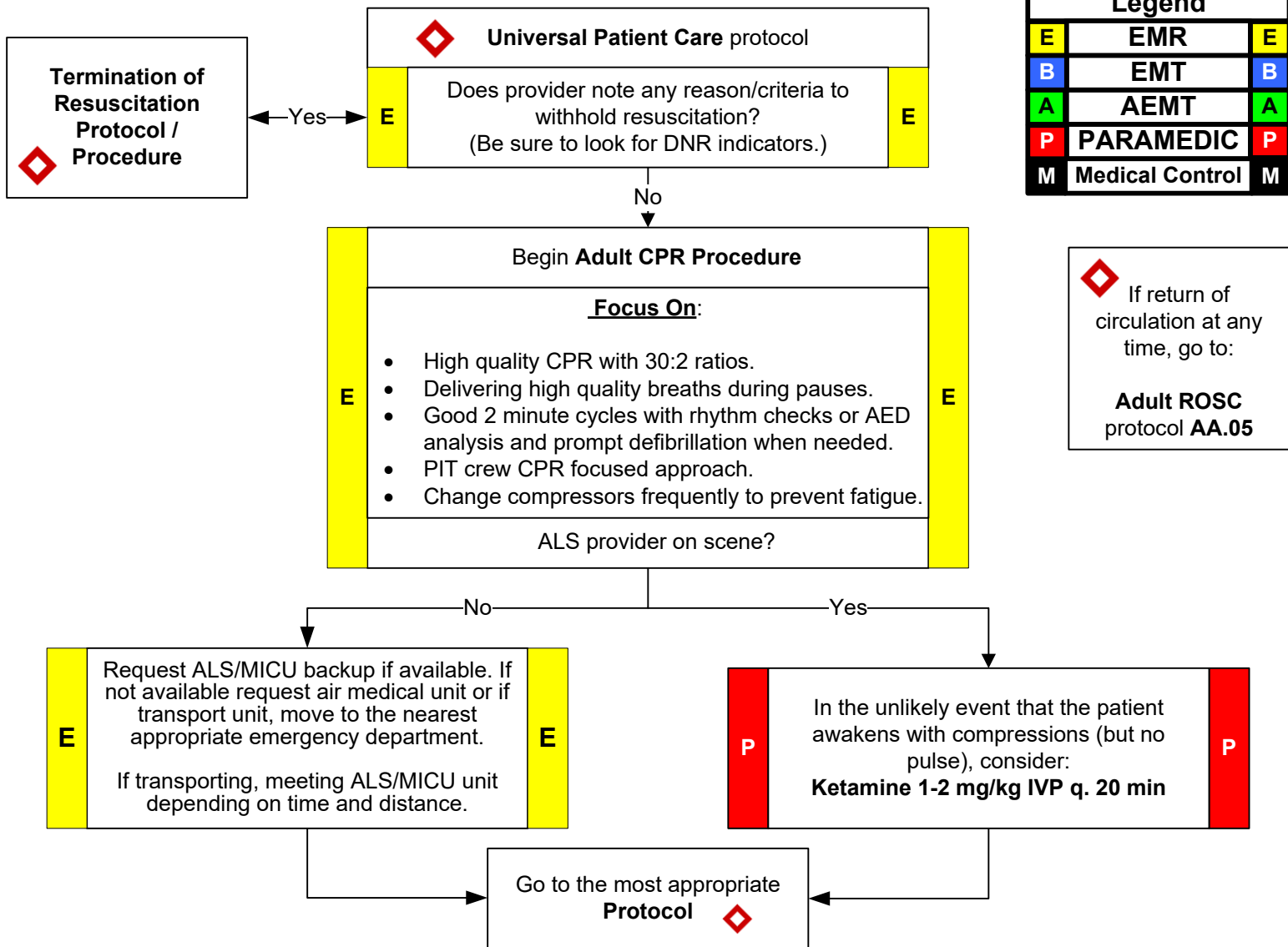
- Events leading to arrest
- Estimated downtime
- PMHx, Meds
- Signs of lividity or rigor
- DNR, terminal illness?

## Signs and Symptoms:

- Unresponsive
- Absent signs of circulation, movement, skin color, etc.
- Abnormal breathing (gasps)
- Pulseless

## Differential:

- Medical vs. Trauma
- VF vs Pulseless VT
- Asystole
- PEA
- LVAD



## Pearls:

- If three or more responders are present, use the "pit crew" CPR procedure. Strongly consider initial A/P placement of defibrillation pads when logistically possible (better electrical current to LV and easier for future dual sequential pad placement).
- BLS providers are only allowed to use AED modes for defibrillation. Minimize interruptions to compressions except for ventilation and rhythm checks. Plan interventions around planned pauses (i.e. mCPR). Approved mechanical CPR devices may be used whenever CPR is indicated and logistically helpful.
- Success is based on proper planning and execution. Procedures require space and patient access so make room to work. Immediate and adequate compressions with timely defibrillation are the keys to survival.
- Reassess airway frequently and after every patient move, especially if advanced airway in place. If equipped, monitor end tidal CO2 and also use "CPR feedback device" to record and help set CPR rate/depth.
- BLS providers should always request ALS/MICU backup for cardiac arrest if they are available in the system. If transport provider, BLS crews should transport patient toward ALS care to minimize time to ALS intercept.
- Withholding resuscitation or termination of resuscitation should ideally be done by the ALS provider. CPR should not be started in cases of obvious death. Reference the resuscitation termination procedure for decision making tools and information on when to contact medical control. When in doubt, start BLS CPR and contact medical control.

# ADULT V-FIB AND PULSELESS V-TACH

## History:

- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- DNR

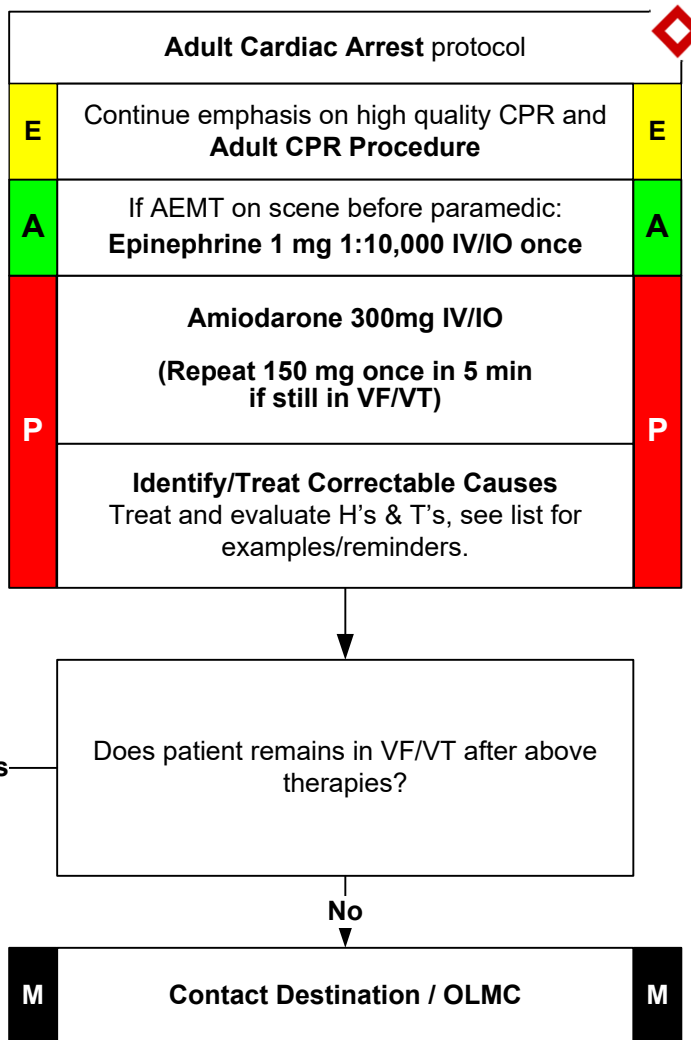
## Signs and Symptoms:

- Pulseless
- Abnormal Breathing (gasps)
- No electrical activity on ECG
- No auscultated heart tones

## Differential:

- Medical or Trauma
- Hypoxia
- Potassium (hyper/hypo)
- Drug overdose
- Acidosis
- Hypothermia
- Device (machine error)
- Obvious Death

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



## Treat potential causes (H&T's):

- Hypoxia**  
(ensure adequate oxygenation)
- Hypothermia**  
(passive rewarming)
- Hypovolemia**  
(LR 1L bolus IV/IO)
- Hypoglycemia**  
(D10 or D50 25g IV/IO)
- Acidosis**  
(ensure effective ventilation)  
(Sodium Bicarb 1meq/kg IV/IO)
- Hyperkalemia**  
(Calcium gluconate 2g IV/IO)  
(Sodium Bicarb 1meq/kg IV/IO)
- OD Ca Channel Blocker**  
(Calcium Gluconate 2g IV/IO)
- OD Beta Blocker**  
(Glucagon if available 2mg IV/IO)
- OD Narcotics/Heroin**  
(Naloxone 2mg IV/IO)
- Tension Pneumothorax**  
(Chest Decompression)
- Torsades de Pointes**  
(Magnesium sulfate 2g slow IV/IO)

If return of circulation at any time, go to:

**Adult ROSC protocol AA.05**


Go to **Refractory VF/VT protocol, AA.03**

Does patient remains in VF/VT after above therapies?

## Pearls:

- Treatment priorities: **high quality 30:2 CPR**, prompt defibrillation, then IV/IO, medications, then consider advanced airway control. This portion of the CPR algorithm should take approximately 10 minutes before moving to AA.03 PRN.
- Advanced EMTs with proper training may administer cardiac arrest epinephrine first dose per this protocol.
- Correctable causes of arrest must be addressed, do not call for discontinuation/termination order without treating appropriate H's & T's as able. Remember torsades de pointes as a variation of VT and it responding well to magnesium sulfate.
- Remember to focus on high-quality effective CPR at all times. Change compressors often and ensure good ventilations during 30:2 pauses. Use the "pit crew" method whenever responder numbers permit.
- ECAs, EMT-Basics and EMT-Intermediates may only use automated defibrillation (AED) modes for defibrillation.
- Whenever available, continuous ETCO2 should be used to confirm placement of all airways placed during CPR and monitor CPR progress as well as CPR feedback devices when equipped.
- If question of low amplitude V-fib, increase gain on the monitor and if question, defibrillate PRN.

# ADULT REFRACTORY V-FIB AND V-TACH

Ensure all previous care has been completed from the regular **VF/VT protocol AA.02**. 

<b>E</b>	Continue to focus on high quality pit crew CPR.	<b>E</b>
<b>P</b>	If two cardiac monitors or monitor and AED are available, change shocks to <b>Dual Sequential Defibrillation (DSD) procedure</b> .  If only one defib device available, change location of pads to alter the shock vector.	<b>P</b>
	<b>NO MORE EPINEPHRINE</b>  <b>Lidocaine 1.5 mg/kg IV/IO</b>  Repeat X 1 in 2 cycles if still shockable rhythm. (max total dose 3mg/kg)	
	<b>Continue to Treat Correctable Causes</b> Treat and evaluate H's & T's, see list for examples/reminders.	

<b>M</b>	If patient remains in VF/VT <b>contact OLMC</b> . If advised to transport use extreme caution (see Pearls). <b>OLMC</b> may terminate in some cases w/ ongoing VF/VT. In those cases remain with patient until rhythm degrades into asystole.	<b>M</b>
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Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

## Treat potential causes (H&T's):

- Hypoxia**  
(ensure adequate oxygenation)
- Hypothermia**  
(passive rewarming)
- Hypovolemia**  
(LR 1L bolus IV/IO)
- Hypoglycemia**  
(D10 or D50 25g IV/IO)
- Acidosis**  
(ensure effective ventilation)  
(Sodium Bicarb 1meq/kg IV/IO)
- Hyperkalemia**  
(Calcium gluconate 2g IV/IO)  
(Sodium Bicarb 1meq/kg IV/IO)
- OD Ca Channel Blocker**  
(Calcium Gluconate 2g IV/IO)
- OD Narcotics/Heroin**  
(Naloxone 2mg IV/IO)
- Tension Pneumothorax**  
(Chest Decompression)
- Torsades de Pointes**  
(Magnesium sulfate 2g slow IV/IO)

For rhythm changes go to most appropriate protocol.

If return of circulation at any time, go to: **Adult ROSC protocol AA.05**

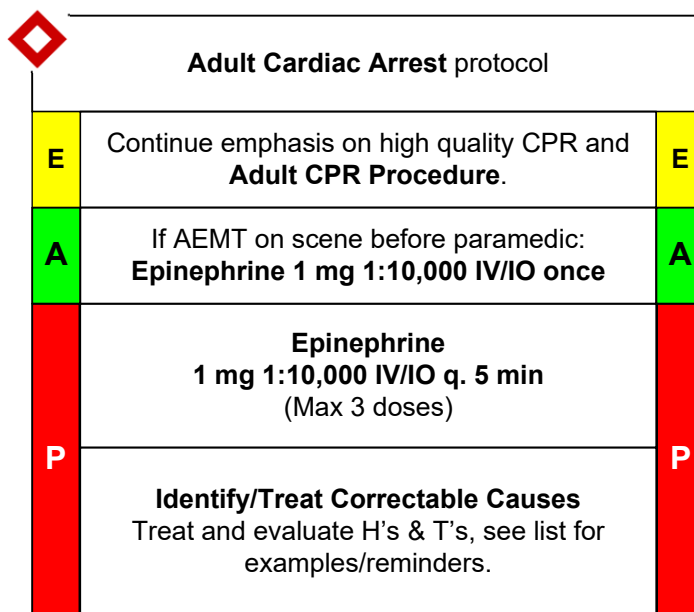
## Pearls:

- Main treatment priority remains high quality CPR and timely defibrillation. Once beginning dual sequential defibrillation (DSD), all future defibrillation should be DSD.
- DSD pearls:
  - Make sure defib pads do not touch.
  - Do not simultaneously discharge both monitors, discharge monitor 1, delay 0.5 second, then discharge monitor 2. This should prevent theoretical damage to either monitor for the electrical discharge.
- Lidocaine is added in this case to block sodium channels and has been shown to be effective in some cases where amiodarone is not. If ROSC is obtained consider contacting OLMC to discuss a lidocaine infusion.
- If OLMC orders termination in place with ongoing VF/VT, please explain the situation to family or bystanders and leave the patient connected to the EKG until asystole is achieved. This will help ensure no spontaneous conversion after EMS leaves.
- If transport is ordered or decided upon, use EXTREME caution.
  - Lights and siren transport is not usually indicated in these cases, outcomes are generally poor.
  - Mechanical compression devices should be used whenever available to allow providers to remain seated and secured during transport.

# ADULT PEA AND ASYSTOLE

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

If return of circulation at any time, go to:  
**Adult ROSC protocol AA.05**



- Treat potential causes (H&T's):**
- Hypoxia**  
(ensure adequate oxygenation)
  - Hypothermia**  
(passive rewarming)
  - Hypovolemia**  
(LR 1L bolus IV/IO)
  - Hypoglycemia**  
(D10 or D50 25g IV/IO)
  - Acidosis**  
(ensure effective ventilation)  
(Sodium Bicarb 1meq/kg IV/IO)
  - Hyperkalemia**  
(Calcium gluconate 2g IV/IO)  
(Sodium Bicarb 1meq/kg IV/IO)
  - OD Ca Channel Blocker**  
(Calcium Gluconate 2g IV/IO)
  - OD Beta Blocker**  
(Glucagon if available 2mg IV/IO)
  - OD Narcotics/Heroin**  
(Naloxone 2mg IV/IO)
  - Tension Pneumothorax**  
(Chest Decompression)

Evaluate the category of the rhythm:

**Narrow/Fast PEA (< 120ms)**  
**Consider Volume / Obstructive:**  
- Hypovolemia, Hemorrhage  
- Pneumothorax, Tamponade  
- PE

**Wide/Slow PEA (> 120ms)**  
**Consider Metabolic / Pump Failure:**  
- Acidosis, Hyperkalemia  
- Toxin, BB, CACB Toxicity  
- Massive MI

**Asystole**  
**Consider H & T Causes:**  
- Hypoglycemia  
- Toxins  
- Narcotic overdose

Use **treatments** in the H&T causes box above to treat **suspected or known** causes as listed.

After 20 minutes of appropriate resuscitation, evaluate total arrest time and ETCO2:

- If **Asystole or Wide/Slow PEA and ETCO2 < 15** - consider calling OLMC for termination orders.
- If **any rhythm and ETCO2 > 15**, resuscitate for additional **20 minutes** address H&T's.
- Consider evaluation for pseudo-PEA using point of care ultrasound if available (see Pearls).

**M** **Contact Destination or OLMC** **M**

- Pearls:**
- Advanced EMTs with proper training may administer cardiac arrest epinephrine first dose per this protocol.
  - Correctable causes of arrest must be addressed, do not call for discontinuation/termination order without treating appropriate H's & T's as able.
  - Remember to focus on high-quality effective CPR at all times. Change compressors often and ensure good ventilations during 30:2 pauses. Use the "pit crew" method whenever responder numbers permit.
  - Pseudo PEA occurs when the heart is actually contracting but not generating a palpable pulse and has a better prognosis. In organized PEA when available, use ultrasound to evaluate for any cardiac movement, contact OLMC for advice if found.


# ADULT RETURN OF CIRCULATION

## Receiving Facility Pearls:

Contact receiving hospital ASAP to advise of ROSC alert.

Patients with presumed cardiac cause of arrest should be transported to centers with emergency STEMI services (24/7 cath lab).

## AIRWAY OPTIMIZATION

E		Obtain secure airway if not already done <b>Airway Management</b> protocol	E
P		Consider endotracheal intubation as needed	P


Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## BREATHING OPTIMIZATION

E	<b>AVOID HYPERVENTILATION</b> - SaO <sub>2</sub> goal is around <b>94%</b> , use O <sub>2</sub> as needed. - Goal ETCO <sub>2</sub> is <b>35-45</b> , adjust ventilation rates carefully as needed.	E
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## OPTIMIZE CIRCULATION (MAP 70-80)

Vasopressor use may be preferred alone if severe volume overload is suspected (rales, edema, etc.)

A	Begin LR <b>1000 – 2000 mL bolus</b> if hypovolemia suspected.	A
P	Use vasopressors PRN to achieve goal MAP. Push dose epinephrine may be used alone or before, or in combination with, epinephrine or norepinephrine infusion. Contact OLMC if you feel the need to use multiple vasopressor infusions (e.g. epi + norepi, etc.).  - Push dose Epi 1-2 mL q. 5 min (10-20 mcg 1:100,000) OR - Norepinephrine 5 – 20 mcg/min IV/IO OR - Epinephrine 5 – 20 mcg/min IV/IO  <b>Amiodarone 150 mg IV infusion over 10 minutes</b> (if not already given) for patient converting from VF/VT arrest (especially if significant ectopy being seen).	P
	Obtain 12 Lead EKG - If STEMI identified use <b>AC.01 Cardiac Chest Pain</b> Go to most appropriate <b>protocol</b> for other problems such as bradycardia, etc.	


M
 Notify Destination or Contact OLMC
 M

## Pearls:

- Norepinephrine, based on data, is the preferred vasopressor for ROSC patients although epinephrine can be used.
- Hyperventilation is a significant cause of hypotension and cardiac arrest in the post resuscitation phase it must be avoided. Oxygen saturations should be kept between 93-95%, avoid hyperoxia as it can cause cell death to CNS and cardiac tissues.
- Monitor ETCO<sub>2</sub> - a rapid rise or fall in ETCO<sub>2</sub> can signal impending re-arrest. Take action to identify the problem quickly.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, they require close monitoring.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Significant ectopy is defined as a dysrhythmia that meets treatment criteria as part of another protocol (i.e. SVT, V-Tach).
- After obtaining ROSC, the provider may wish to remain in place for 5-10 additional minutes to stabilize ABCs. The patient should be medically maximized before moving. Exceptions are time sensitive causes such as STEMI.
- **These patients should only be transported to Resuscitation Centers of Excellence with robust ICUs, targeted temperature management and STEMI care capabilities.**

# ADULT TERMINATION OF RESUS

**\*\*REMEMBER\*\***  
 "You aren't dead until you are warm and dead."  
 Contact medical control for guidance **on all patients less than 90°F.**

Refer to detailed information in the **Termination of Resuscitation procedure.** Remember:  
 - Withholding resuscitation means not starting for a specific reason (DNR, obvious, etc.)  
 - Terminating resuscitation means stopping resuscitation for a specific reason.  
 -When in doubt start BLS CPR and call OLMC.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## WITHHOLDING RESUSCITATION (Reason NOT to start.)

- Reason to withhold or not start CPR:
- **Valid DNR.**
  - **End stage disease process** with family asking EMS not to resuscitate (see below).
  - **Signs of irreversible/obvious death.**
    - Rigor and lividity.
    - Decomposition.
    - Injuries incompatible with life (ex. decapitation, exposed brain, warm water submersion > 20 min, massive trauma, etc.) without vital signs.

## TERMINATING RESUSCITATION (Reason to stop.)

- Before considering termination of resuscitation the patient needs to have received appropriate ACLS care including H&T management (see BLS caveat below)
- Resuscitation times should be **at least 20 minutes** for asystole/agonal PEA with ETCO<sub>2</sub> < 15 or **40 minutes for all other situations.**
- See **Termination of Resuscitation procedure.**

- Provider may **independently** withhold resuscitation for DNR or signs of irreversible/obvious death.
- Provider **must contact OLMC** for physician authorization to withhold resuscitation in cases of advance directive, family request or extenuating circumstances.

- BLS crews may call for orders to terminate resuscitation in rare or extenuating circumstances (e.g. disaster situations where ALS availability cannot be obtained or extremely rural or inaccessible locations where time to ALS arrival is severely long).

- Provider **must contact OLMC** for physician authorization to terminate resuscitation.
- Be prepared to give the following info:
  - Age, events leading up to arrest.
  - Pertinent medical history (ESRD, etc.)
  - Rhythm, interventions, response.
  - Resuscitation time and ETCO<sub>2</sub>
  - Consensus that team is ready to stop


**M** Contact OLMC as indicated. **M**

- Pearls:**
- If doubt exists about resuscitation, EMS providers should start BLS care while determining needed factors such as DNR status, family wishes and pending OLMC contact and orders.
  - Provider may use magnet at direction of OLMC to terminate AICD function in patients with termination of resuscitation.
  - EKG strip should be obtained on ALL deceased patients who do not have decomposition or mortal injuries unless doing so would cause immediate danger to the responder or prohibited by law enforcement such as a crime scene, etc. A copy of EKG strip should be left on scene for use by the Justice of the Peace (JP).
  - Deceased patients should not be left in public or compromising places unless ordered or necessitated by a peace officer or JP as part of a crime scene, etc.
  - Generally, termination should not be done inside the EMS unit as then the patient will need to remain there until the JP has authorized removal, rendering the unit out of service. Patients should not be unloaded from the EMS unit back onto the scene unless ordered by the JP or law enforcement.

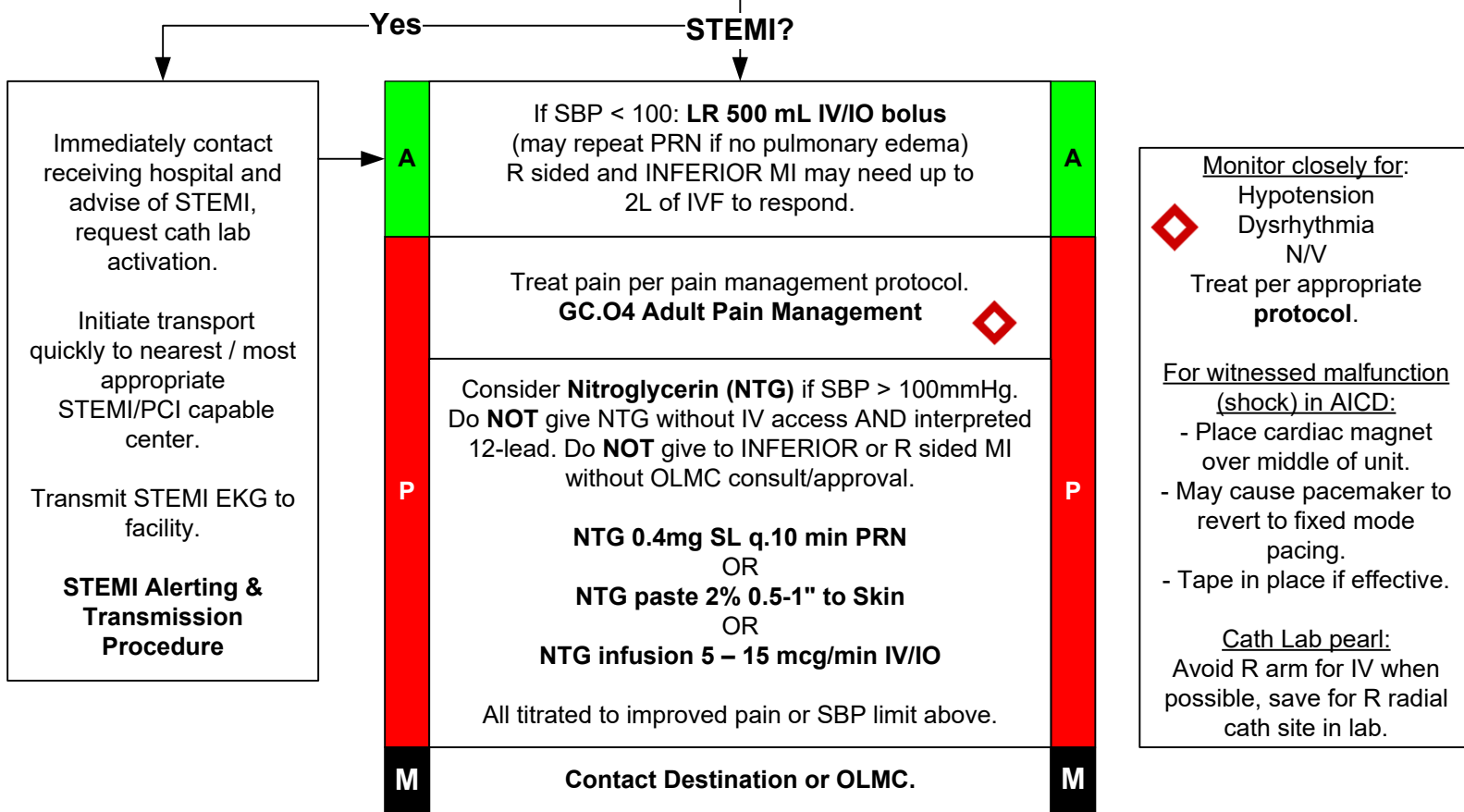
# **ADULT CARDIAC** **SECTION**

# CARDIAC CHEST PAIN

History	Signs & Symptoms	Differential
<ul style="list-style-type: none"> <li>PMHx – HTN, Cholesterol, DM, Prior MI, CABG, CHF</li> <li>Family Hx of cardiac disease in parents, siblings (early age)?</li> <li>Smoker, drugs, ETOH?</li> <li>Diaphoresis, nausea?</li> <li><b>Meds - Viagra, Levitra, Cialis or pulmonary HTN meds?</b></li> </ul>	<ul style="list-style-type: none"> <li>CP (pain, pressure, aching, vice-like tightness)</li> <li>Nausea, vomiting, dizziness</li> <li>Shortness of breath</li> <li>Pale, diaphoresis</li> <li>Location (sub-sternal, epigastric, arm, jaw, neck, shoulder)</li> <li>Syncope with pain onset</li> </ul>	<ul style="list-style-type: none"> <li>MI, angina, equivalent</li> <li>PE, pericardial tamponade, pneumothorax, dissection,</li> <li>ST elevation mimics – LVH, pericarditis, early repolarization, LBBB</li> <li>GI process – hernia, GERD</li> <li>Drugs - Cocaine</li> </ul>

 Universal Patient Care protocol		
E	<b>Aspirin 325 mg PO</b> <b>Aspirin Administration procedure</b>	E
	O2 PRN to keep SaO2 94%	
P	Obtain and interpret 12-lead EKG (goal = within 5 min of patient contact)	P

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



- Pearls:**
- Do not administer nitrates for any patient who has used phosphodiesterase inhibitors such as **Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 48 hours, or who takes these meds for pulmonary hypertension.**
  - Remember that two interventions make the most difference in ACS – aspirin administration and rapid access to PCI center.
  - Declare STEMI alert if symptomatic with ST elevation  $\geq 1$ mm in two contiguous leads and transmit 12 lead EKG if able.
  - Providers may obtain R sided or posterior 12-lead EKG anytime, but should routinely for patients with inferior MI pattern.
  - Contact medical control for asymptomatic patients with EKG meeting STEMI criteria -or- symptomatic patient with new LBBB.
  - If patient has EKG changes, or is going directly to cardiac cath lab, establish a second IV but do NOT delay transport.
  - Diabetics, elderly and female patients often have atypical pain, or vague complaints, have a low threshold for obtaining 12-lead EKG.
  - Effects from stimulant abuse usually present with sustained HR >120 bpm and HTN. If chest pain occurs in setting of stimulants utilize benzodiazepine per **Overdose/Toxic Ingestion** protocol in addition to above. Avoid B-blockers in cocaine intoxication.

# CARDIOGENIC HYPOTENSION

## History:

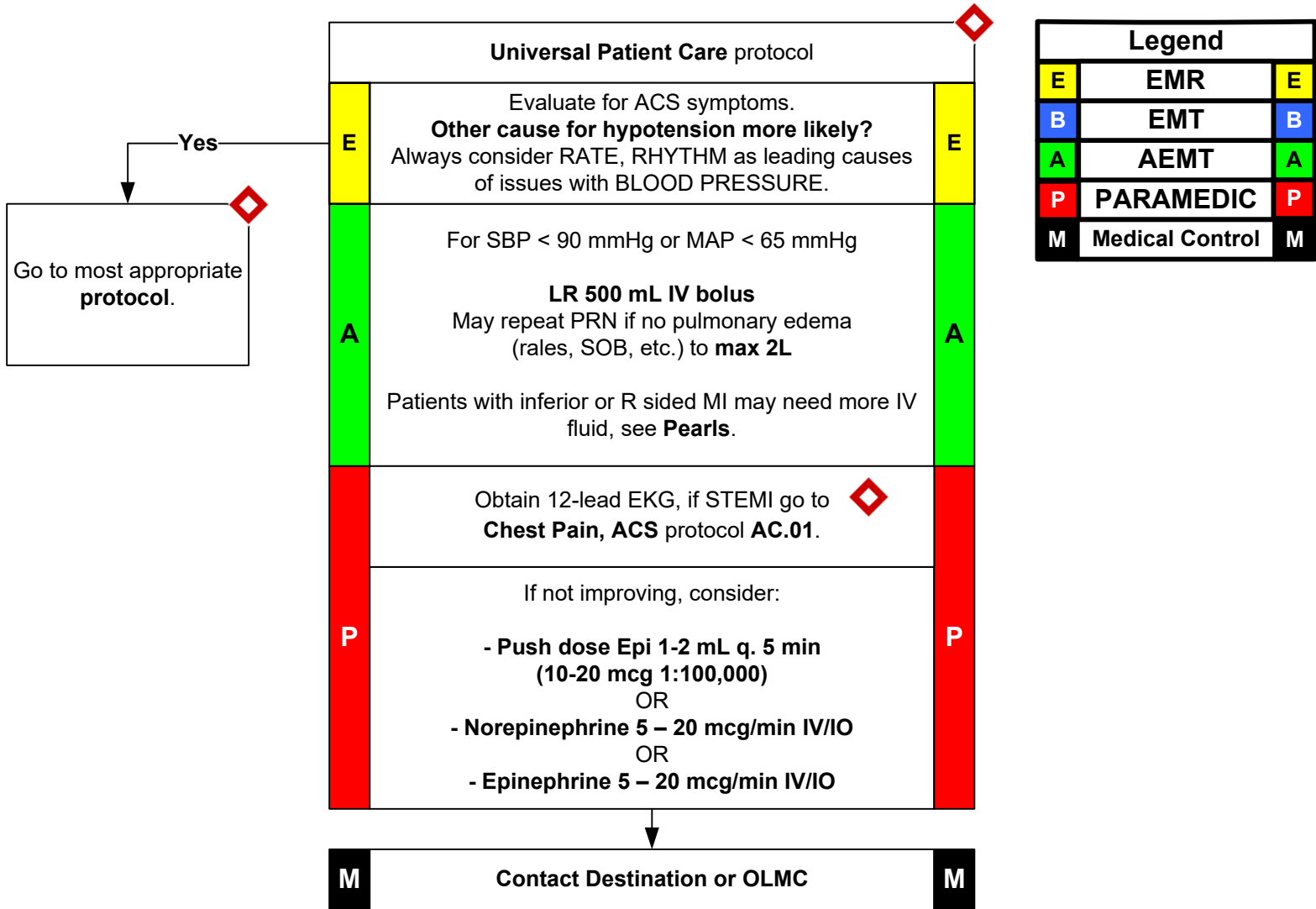
- Cardiac ischemia (MI, CHF)
- CV medications, changes?
- Fluid Loss- vomiting, diarrhea, fever, infection, neuro insult
- Fluid restriction
- LVAD or inotropic infusion?
- Medications
- Allergic Reaction

## Signs and Symptoms:

- Restlessness, confusion
- Weakness, dizziness
- Weak pulse, often inappropriately slow
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension

## Differential:

- Pt having acute MI?
- Other causes shock – sepsis, hypovolemic, neurogenic, anaphylaxis
- Rate or rhythm problem
- Pulmonary embolus
- Tension pneumo / tamponade
- Worsening heart failure

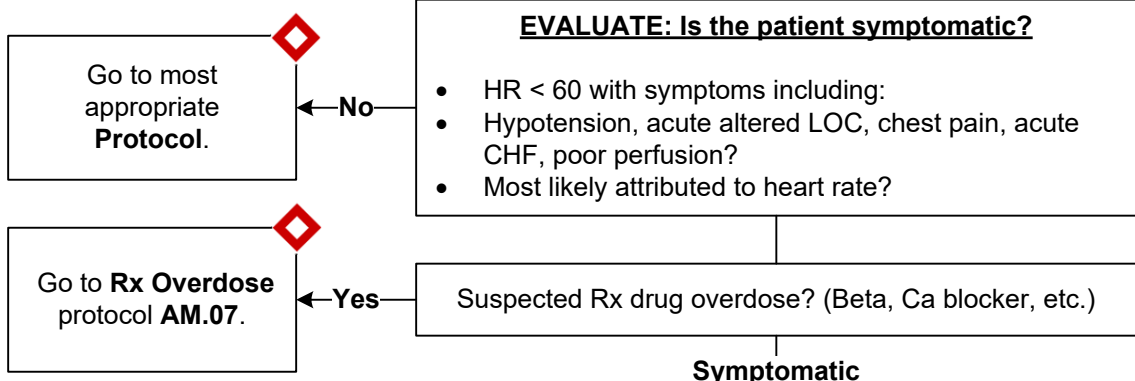


## Pearls:

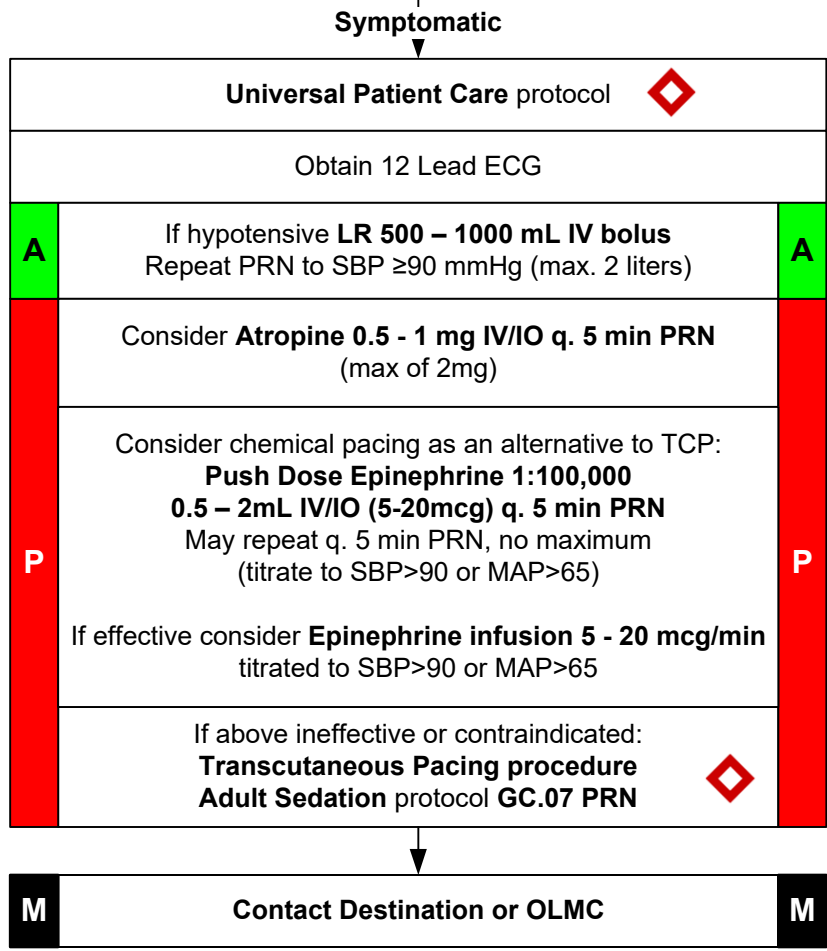
- To maximize cardiac output, always treat RATE, RHYTHM, then blood pressure.
- Heart failure patients are frequently hypotensive on a NORMAL basis, only treat if symptomatic.
- Consider all possible causes of shock and treat per appropriate protocol, if dysrhythmia present, go to correct protocol.
- Patients should always have adequate intravascular fluid volume prior to the use of vasopressors, use caution in patients with a known low ejection fraction (EF), remember normal is 50-65%, critical low near 15-20%.
- Patients with R sided or inferior MI may respond to IV fluids, they may require multiple liters of crystalloid.
- Titrate vasopressors to keep SBP > 90 mmHg or MAP = 65mmHg. Remember they increase myocardial O2 demand. Responders may continue previously established vasopressors initiated by transferring facilities if they are trained on the use of such vasoactive agent.
- Place in position of comfort for breathing and monitor for developing pulmonary edema.

# ADULT BRADYCARDIA

<b>History</b> <ul style="list-style-type: none"> <li>ACS Symptoms?</li> <li>Medications                     <ul style="list-style-type: none"> <li>⇒ Beta &amp; Ca Channel Blockers</li> <li>⇒ Digoxin</li> <li>⇒ Cholinergics &amp; Clonidine</li> </ul> </li> <li>Pacemaker/LVAD?</li> <li>Events Leading to Current Status</li> </ul>	<b>Signs &amp; Symptoms</b> HR <60/min with: <ul style="list-style-type: none"> <li>Hypotension</li> <li>Acute altered LOC</li> <li>Chest pain</li> <li>CHF</li> <li>Syncope or shock</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>Acute MI</li> <li>Hypoxia, hypothermia</li> <li>Hyperkalemia</li> <li>Pacemaker Failure</li> <li>Increased BP or ICP</li> <li>Cardiac electrical blocks</li> <li>Drugs, Rx and street</li> </ul>
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Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



**Pearl – Hyperkalemia**  
 If hyperkalemia known or strongly suspected as cause of refractory bradycardia, see **Hyperkalemia protocol AM.11**

- Pearls:**
- Treatment of bradycardia is based on the presence of symptoms. If asymptomatic, prepare to treat but monitor only.
  - The use of atropine or vasopressors for bradycardia in the presence of an MI may worsen ischemia. Medication should be titrated to SBP > 90 or MAP > 65mmHg or HR > 50. Use an agent such as dopamine for the increased inotropic effects on HR.
  - Consider treatable causes for bradycardia (beta or calcium channel blocker OD, hyperkalemia, etc.). Treat appropriately.
  - Be sure to appropriately oxygenate the patient and support respiratory effort.
  - If wide complex bradycardia consider hyperkalemia, if findings of head injury with HTN and bradycardia consider increased ICP.
  - Remember not to push bicarbonate and calcium in the same IV, if no option, flush well in-between.

# NARROW COMPLEX TACHYCARDIA

## History:

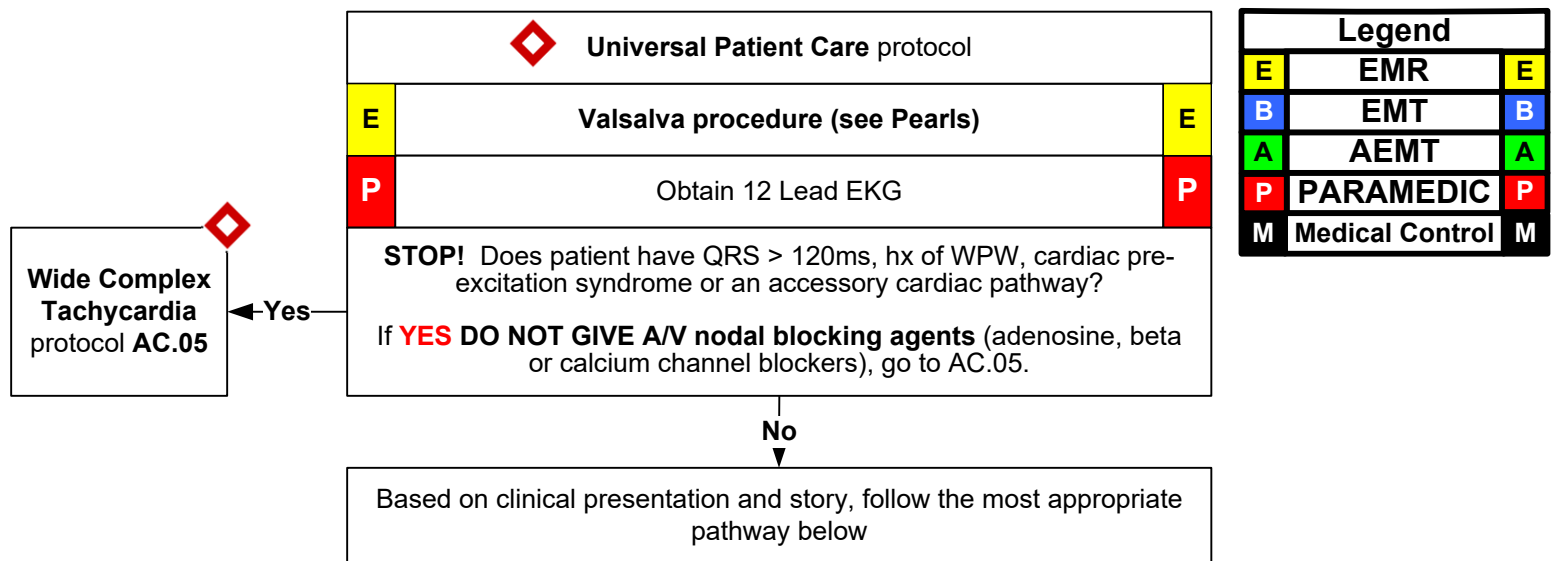
- Medications such as Aminophylline, diet pills, thyroid supplements, decongestants, Digoxin)
- Diet (caffeine) & Drugs (cocaine)
- Hx of cardiac ablation, WPW
- History of palpitations / heart racing
- Syncope / near syncope

## Signs and Symptoms:

- HR > 150 bpm
- Narrow QRS (< 120 msec)
- No history of pre-excitation (i.e. Wolf-Parkinson-White) if yes go to Wide Complex Tach Protocol
- Symptomatic patient

## Differential:

- Heart disease (MI, WPW, Valvular)
- Electrolyte imbalance
- Exertion, Pain, Stress, Fever
- Hypoxia, Hypovolemia or Anemia
- Drug effect / Overdose (see Hx)
- Hyperthyroidism
- PE, Cardiac Tamponade



P		
<b>UNSTABLE</b> (AMS, HoTN, CHF w/SOB)	<b>BORDERLINE</b> (NEW ONSET SVT or BORDERLINE BP)	<b>VERY STABLE</b> (ESTAB. SVT OR ANY FIB/FLUTTER)
If SVT, consider <b>Adenosine 12 mg rapid IV/IO</b> (while preparing for cardioversion)	If SVT is suspected to be the primary rhythm, <b>Adenosine 12 mg rapid IV/IO</b> . May repeat once PRN.	If the patient has any atrial fibrillation or flutter, or a known history of SVT and is very stable (normal BP, no severe CP, CHF, etc.) consider:
<b>Adult Sedation protocol GC.07</b>	<b>LR 500 mL Bolus</b>	<b>Diltiazem 10mg slow IV/IO Give over 5 min</b>
<b>Synchronized Cardioversion Procedure</b> Zoll – Shock 1 @ 100, repeat @ 200J LP – Shock 1 @ 200, repeat @ 360J (max 3 total shocks) If unsuccessful contact <b>OLMC</b> for advice.	If no conversion above OR the primary rhythm is suspected to be A-Fib or Flutter, consider:  <b>Amiodarone 150 mg IV/IO administered over 20 minutes</b> (hold if HR < 140, SBP < 100mmHg)	May <b>repeat once after 15 minutes</b> if adequate rate control not obtained or no conversion from SVT.  (hold if HR < 140, SBP < 100mmHg)

**M Contact Destination or OLMC M**

- Pearls:**
- If patient has hx of Wolfe Parkinson White, other cardiac pre-excitation syndrome, cardiac accessory pathway or 12-lead EKG reveals WPW, **DO NOT** administer adenosine or any AV nodal blocking agents, go to VT with pulse protocol and contact medical control.
  - Rate related symptoms are uncommon with HR < 150 and generally do not require treatment here, although recall older patients and patients with impaired cardiac function may become symptomatic at lower HR. Maximum physiologic HR is 220 bpm-age in years.
  - Diltiazem has demonstrated efficacy not only in rate control but can terminate SVT in some patients. For stable patients with a known history, it may be a more comfortable way to stop SVT as opposed to adenosine and may help with recurrence.
  - For 'borderline' patients not yet fully unstable who are alert, Amiodarone infused at a slower rate may be able to reduce heart rate or convert tachycardias and with a slower rate of infusion may not significantly lower blood pressure, making it ideal for 'borderline patients'.
  - EMR and EMT may perform Valsalva procedure in patients with high heart rate and hx of SVT before 12-lead if not immediately available.

# WIDE COMPLEX TACHYCARDIA

## History:

- Past medical history / medications, diet, drugs
- Syncope / Near syncope
- Palpitations
- Pacemaker
- Allergies: Lidocaine / Novocaine

## Signs and Symptoms:

- QRS width > 120 msec
- Chest Pain, SOB, Dizziness
- Typical rate 150-200 bpm
- Pacemaker?
- Hx of A-Fib with RVR and conduction delay may be mimic

## Differential:

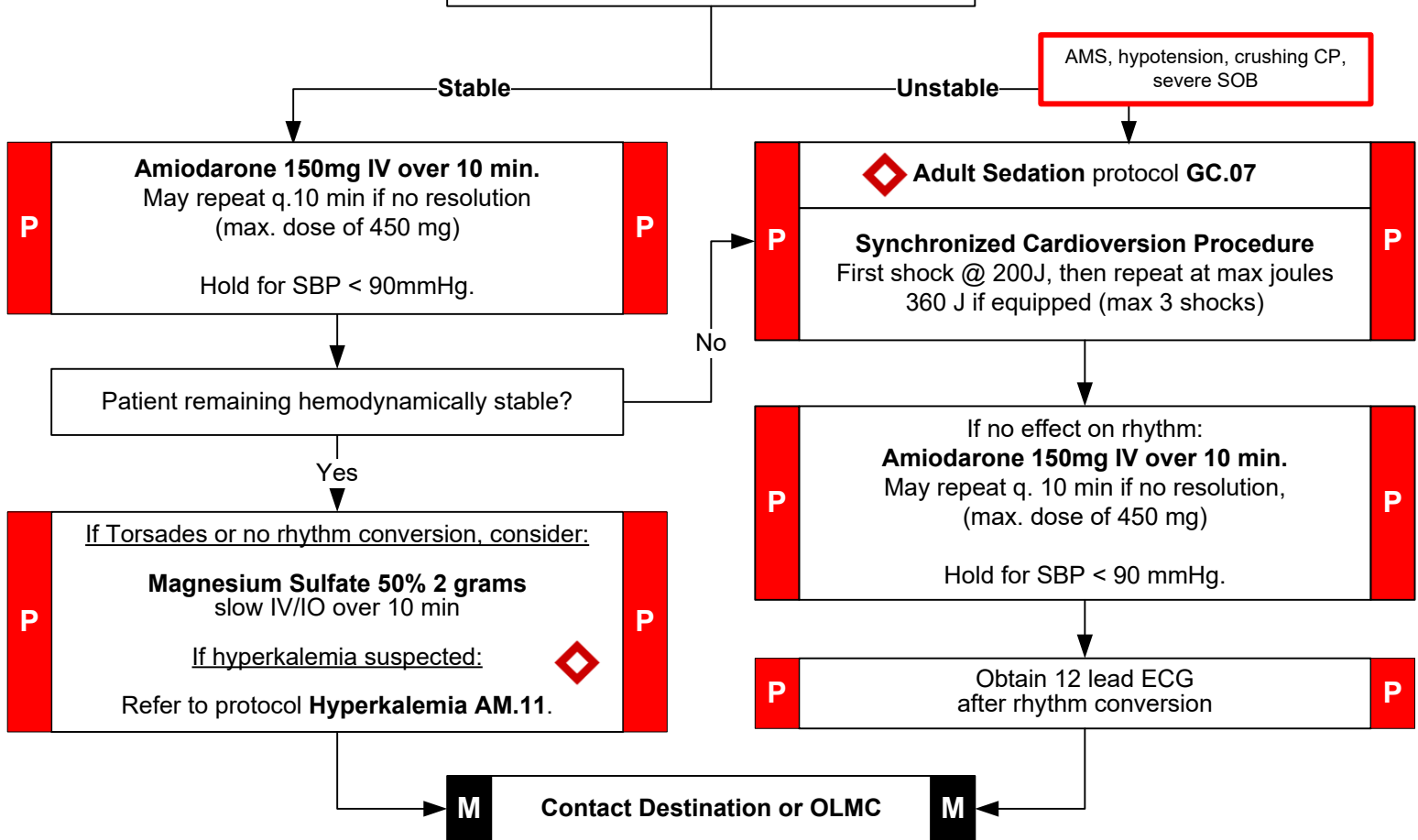
- Artifact / Device Failure
- Cardiac
- Endocrine/Electrolyte
- Drugs/Toxic exposure
- Pulmonary disease
- Torsades de Pointes

**◇ Universal Patient Care protocol**

Obtain 12-lead EKG

**STOP!** If patient has hx of WPW, cardiac pre-excitation syndrome or accessory cardiac pathway, **DO NOT GIVE A/V nodal blocking agents** (amiodarone, adenosine, beta or calcium channel blockers). Call medical control or cardiovert if unstable.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



## Pearls:

- Do not give any AV nodal blocking agents if history or evidence of WPW, cardiac pre-excitation or accessory pathway.
- Lidocaine may be used with medical control order when amiodarone not working or contraindicated. Consultation with medical control may be beneficial early on if initial treatment therapy is not working.
- If tricyclic antidepressant overdose, see **AM.07, Rx Med Overdose**.
- Be aware that most medication interventions for wide complex tachycardia will lower blood pressure. Be prepared to respond to hypotension.
- **Torsades de Pointes:** If seen or QTc > 500ms give magnesium sulfate as above early. Unstable torsades with a pulse may **preferably** be synchronized cardioverted *when and if the cardiac monitor will sync*. If unable to sync, defibrillation using the above joule settings may be utilized. Torsades without a pulse should be treated like VF/VT arrest incorporating magnesium sulfate early as a therapy in addressing the H's and T's.

# CHF & PULMONARY EDEMA

## History:

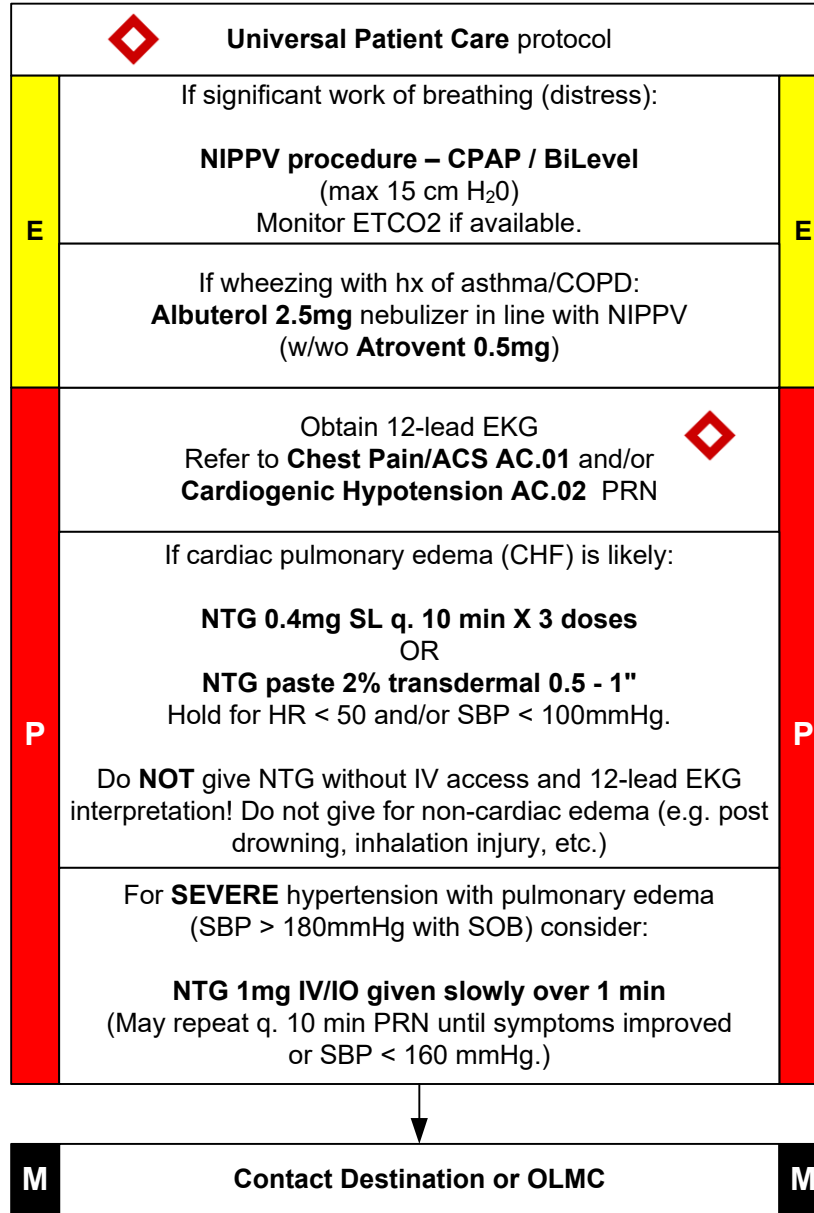
- Congestive heart failure
- Ejection fraction if known
- Past medical history
- Medications (digoxin, Lasix)
- Viagra, Levitra, Cialis
- Cardiac history --past myocardial infarction?

## Signs & Symptoms:

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

## Differential:

- Myocardial infarction
- Congestive heart failure
- Asthma, COPD, pneumonia
- Anaphylaxis
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>EMT- P</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

## Pearls:

- **Avoid Nitroglycerin (NTG) in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 48 hours due to possible severe hypotension. Remember pulmonary hypertension patients may use the same class of medications.**
- Patients with **non-cardiac causes** of pulmonary edema such as inhalation injury, drowning, choking or massive PE do not need nitrates. Use positive pressure ventilation and suction as needed.
- Consider myocardial infarction in all CHF patients. Remember that nitrates can dangerously lower blood pressure in patients with inferior and R sided myocardial infarction. Evaluate 12-lead EKG and contact medical control before administering in those patients.
- Nitrates are an excellent treatment for CHF related pulmonary edema in hypertensive patients.
- Careful monitoring of level of consciousness, BP, and respiratory status with above interventions is essential.
- Allow the patient to obtain a position of comfort to maximize their breathing effort.

# LVAD ASSESSMENT

## History:

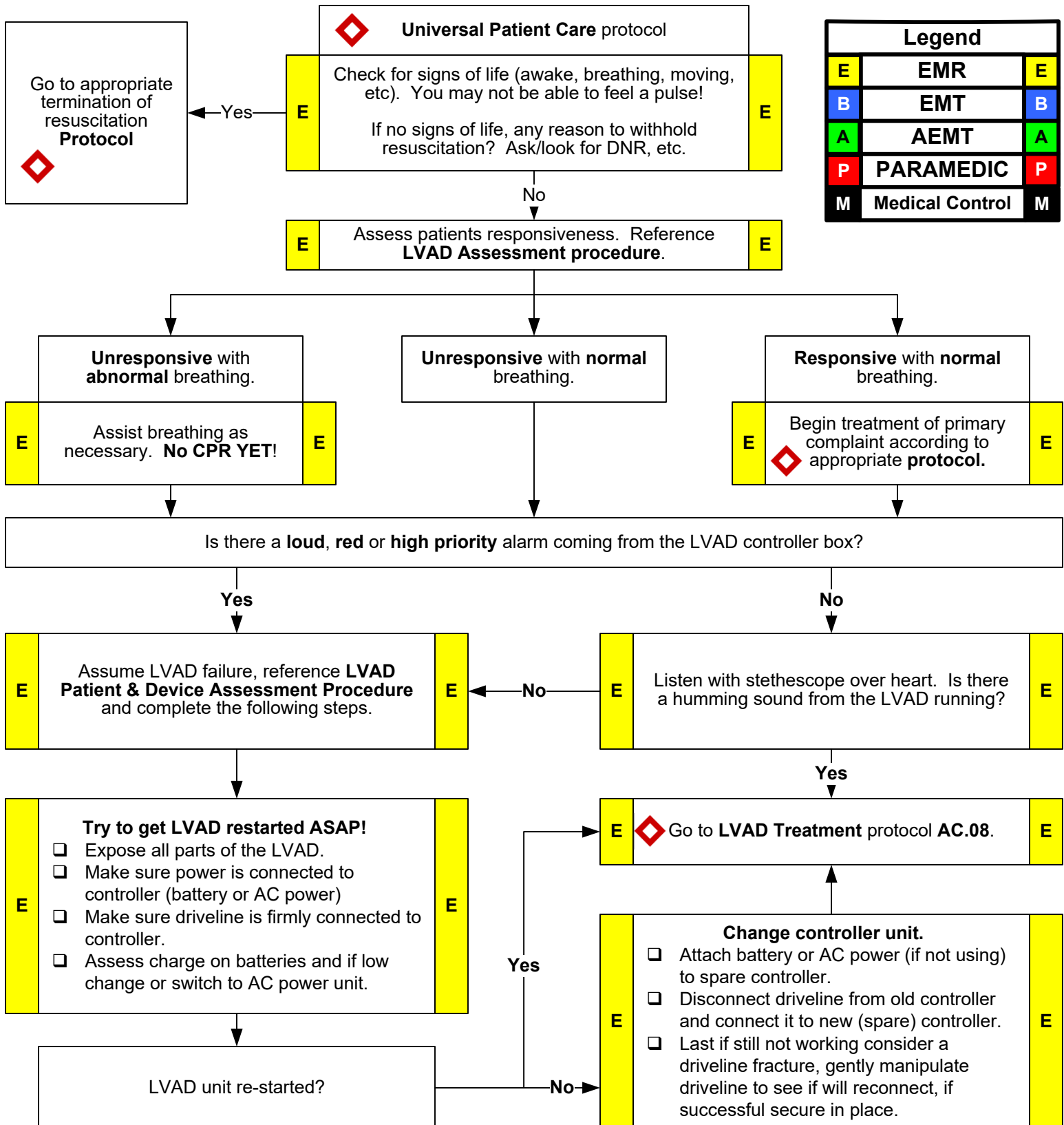
- Events leading up to now?
- Estimated duration of problem?
- PMHx, Medications
- DNR or terminal illness?

## Signs and Symptoms:

- Unresponsive
- Absent detectable circulation
- Agonal (gaspings) breathing
- Lividity, rigor, signs of death?

## Differential:

- Mechanical vs. Medical
- Hypovolemia
- Pump malfunction
- Battery failure



# LVAD RELATED TREATMENT

## History:

- Events leading up to now?
- Estimated duration of problem?
- PMHx, Medications
- DNR or terminal illness?

## Signs and Symptoms:

- Unresponsive
- Absent detectable circulation
- Agonal (gaspings) breathing
- Lividity, rigor, signs of death?

## Differential:

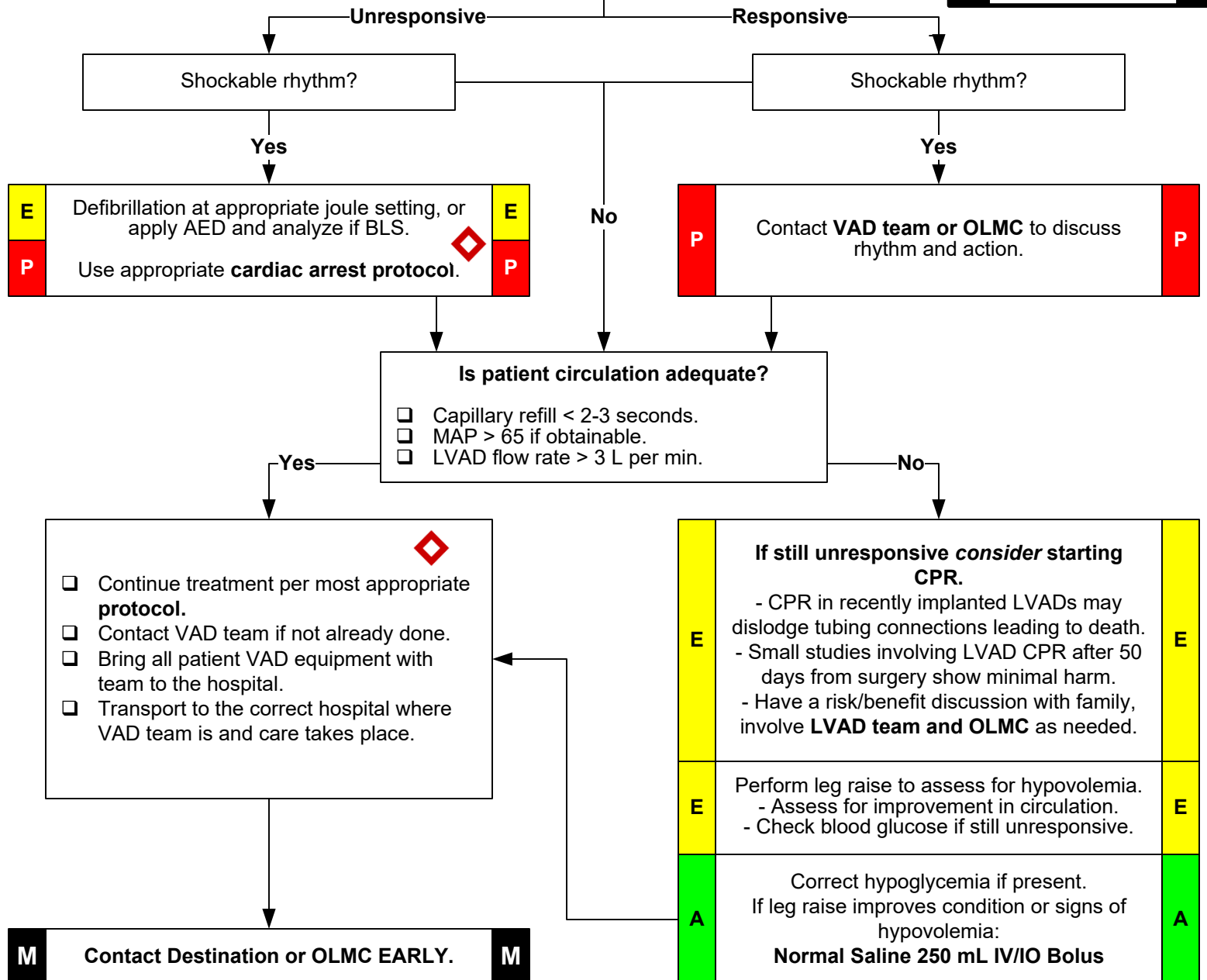
- Mechanical vs. Medical
- Hypovolemia
- Pump malfunction
- Battery failure

**\*\*Pearl:** Remember LVAD patients may not have palpable pulses or BP without using doppler.

**Universal Patient Care protocol**

Assess patients responsiveness. Reference **LVAD Assessment** procedure.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



# LVAD TREATMENT QR CODES

**EMERGENCY  
PROCEDURES  
REFERENCE  
SCAN CODE**



**HEARTMATE II**

**EMERGENCY  
PROCEDURES  
REFERENCE  
SCAN CODE**



**HEARTMATE 3**

**EMERGENCY  
PROCEDURES  
REFERENCE  
SCAN CODE**



**JARVIK 2000**

**EMERGENCY  
PROCEDURES  
REFERENCE  
SCAN CODE**



**HEARTWARE**

**EMERGENCY  
PROCEDURES  
REFERENCE  
SCAN CODE**



**TOTAL ARTIFICIAL HEART**

# **ADULT MEDICAL** **SECTION**

# ADULT ALLERGIC REACTION

<b>History</b> <ul style="list-style-type: none"> <li>Onset and location</li> <li>Past medical history, reactions</li> <li>New environmental exposures</li> <li>New medication exposures</li> <li>New food or dietary exposures</li> <li>Insect sting or bite, occult</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>2 body systems involved?:</li> <li>Skin – hives, redness, itching</li> <li>Pulm – SOB, wheeze, cough</li> <li>ENT – Mouth swelling, throat</li> <li>GI – Vomiting, diarrhea, cramps</li> <li>CV – Hypotension or shock</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>Mild allergy, rash only</li> <li>Anaphylaxis (systemic effect)</li> <li>Anaphylactic shock (w/HotN)</li> <li>Angioedema (drug induced)</li> <li>Aspiration / Airway obstruction</li> <li>Pulmonary event? Asthma?</li> </ul>
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**Universal Patient Care protocol**

**A: Severe Anaphylaxis**

- ≥ 2 body systems
- Involves pulmonary & CV
- Sx include SOB, HoTN, AMS

**Epi Administration Procedure**

May assist patient with use of patient's own prescribed **Epi-Pen** if present.

**Epi 0.5mL 1:1,000 IM**

Or If Not IM Trained **Epi Pen Adult X 1**

**Go to Top of Column B: Moderate Symptoms**

**B: Moderate Symptoms**

- 1-2 body systems
- Mild symptoms, GI, skin, etc.
- No hypotension or significant SOB

<b>E</b>	<b>Albuterol 5 mg Neb</b> May repeat X1 PRN	<b>E</b>
<b>A</b>	<b>LR 1 – 2 L bolus</b> Titrate to SBP > 90, MAP >65	<b>A</b>
<b>P</b>	<b>Diphenhydramine 25-50mg IV</b>	<b>P</b>
<b>P</b>	<b>Dexamethasone 10mg slow IV/IO/PO</b>	<b>P</b>

Reevaluate patient **5 minutes** after epinephrine. Still having significant anaphylaxis?

**C: Mild Symptoms**

- 1 body system
- Usually just itching, hives
- No pulmonary or cardiac effects

<b>B</b>	<b>Diphenhydramine 25mg – 50mg PO</b>	<b>B</b>
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Carefully reassess patient and continue to monitor. If worsened go back to top of protocol.

**Legend**

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

**Yes**

<b>E</b>	<b>Repeat Epinephrine</b> dose from column "A". (May repeat q. 5 – 10 min if anaphylaxis persists)	<b>E</b>
<b>P</b>	Paramedic may continue IM epi or change to: <b>Push Dose Epi GC.10</b> OR <b>Epi Infusion 5–20mcg/min IV/IO</b>	<b>P</b>
<b>M</b>	<b>Contact OLMC</b>	<b>M</b>



- Pearls:**
- Epinephrine is the best treatment for anaphylaxis, it reverses hypotension, airway constriction and helps perfusion. Use caution in patients with strong hx of CAD or elderly. Consult medical control as needed if concern exists.
  - If the patient has airway concerns, consider airway management early on. Do not wait for severe distress/decompensation.
  - Epinephrine 1:1,000 is always given IM and 1:100,000 is always given IV, never mix routes of administration.
  - Patients receiving epinephrine should have a 12-lead EKG after administration.
  - BLS providers should request ALS backup in any patient who has taken or needs epinephrine.
  - Epi Pen dosing may not be enough for LARGER patients, consider contacting medical control for dosing assistance.

# ADULT ALTERED MENTAL STATUS

## History:

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Consider HAZMAT, toxins

## Signs/Symptoms:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resp; signs of dehydration)

## Differential:

- Head trauma
- CNS (stroke, tumor, seizure, infxn.)
- Cardiac (MI, CHF), hypoxia
- Infection, electrolytes
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicologic, environmental

## Universal Patient Care protocol

Consider differential diagnosis and correct if able. If different protocol more appropriately addresses suspected problem, then go to appropriate **protocol**.

## Legend

E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

A — Alcohol ingestion, acidosis, toxic alcohols.  
 E — Endocrine (diabetic, DKA), epilepsy, encephalopathy  
 I — Infection, meningitis, encephalitis, sepsis  
 O — Opiates, other drug overdose  
 U — Uremia (renal failure, no dialysis)

T — Trauma, head injury, blood loss, shock  
 I — Insulin, hypoglycemia, recurring  
 P — Poisoning, psychosis, poly-pharmacy  
 S — Stroke, syncope

## Hypoglycemia (< 70mg/dL)

E	<b>Turn Off Insulin Pump PRN</b>  <b>Oral Glucose 15 grams</b> (if patient can swallow on own) May repeat x1 in 10 minutes	E
A	<b>D10W 250 mL (25g) IV/IO</b> Begin infusion and monitor LOC and BGL. Stop infusion when BGL is WNL or pt alert enough to take PO food.	A

## Suspected Narcotic Intoxication

E	If trained, ECA/EMT may administer naloxone per <b>SO.02</b>	E
A	<b>Naloxone</b> <b>0.5 - 6 mg SLOW IV/IM/IO/IN</b>  Titrate small doses SLOWLY up to 6mg total dose if some response is seen to initial. (See pearls.)	A

## AEIOU TIPS Differential

Most causes will be difficult for EMS provider to address. For conditions causing dehydration or increased blood osmolarity, consider IVF.

A	<b>LR 20 mL/kg IV bolus</b> (Max 2L)	A
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**M** Contact Destination or OLMC **M**

## Pearls:

- Be aware of AMS as a presenting sign of environmental toxin, HAZMAT or other exposure and use appropriate PPE.
- Never assume anyone is ONLY intoxicated. Alcoholics frequently develop hypoglycemia and other complications.
- Hyperglycemia is treated with IV hydration initially as these patients are volume depleted.
- If hypoglycemia is present and the patient has an insulin pump, attempt to pause or turn off the pump. You may seek family assistance.
- D10W is safer and more physiologically pleasant to patients, lower risk of tissue damage with infiltration, should be considered in all but critical, combative or cardiac arrest patients. 250mL of D10W is 25 grams of dextrose, it can be given wide open infusion.
- If giving D50W, give through large IV, watch patency closely for any infiltration and dilute in running IV of NS.
- Patients on oral hypoglycemic agents are at risk for repeat episodes of hypoglycemia, monitor closely and encourage transport. Never leave them home alone or unattended. If hypoglycemic patients have returned to baseline and wish to refuse care, make certain that the patient eats and that there is someone to observe them for repeat hypoglycemic episodes.
- Use naloxone very carefully/slowly in patients on chronic opiates. Titrate small doses to adequate breathing/airway protection. In contrast, patients with large narcotic overdose or extended release preparations may require larger doses of naloxone, sometimes as much as 4-6mg. Newer more potent narcotics such as carfentanil may only respond to high doses of naloxone.

# STROKE AND NEURO IMPAIRMENT

## History:

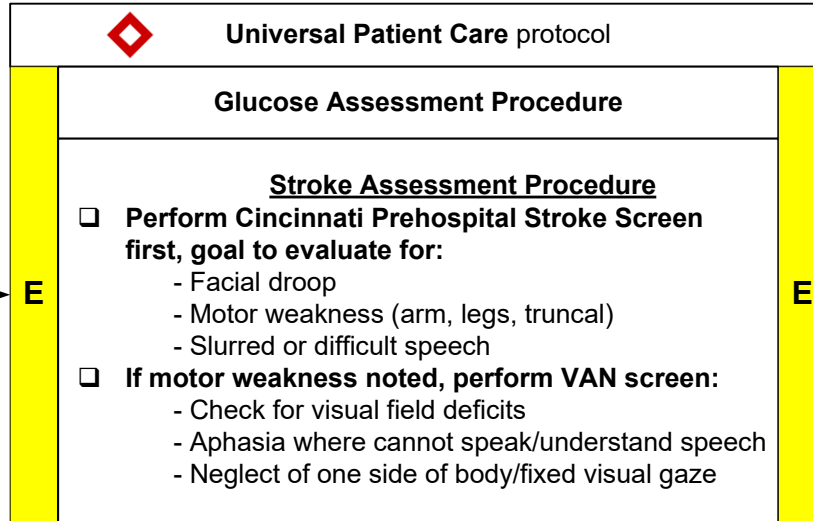
- Previous CVA, TIAs
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- Recent trauma / surgery
- DNR/Code status

## Signs and Symptoms:

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope / Seizures
- Vertigo / Dizziness/Headache
- Vomiting

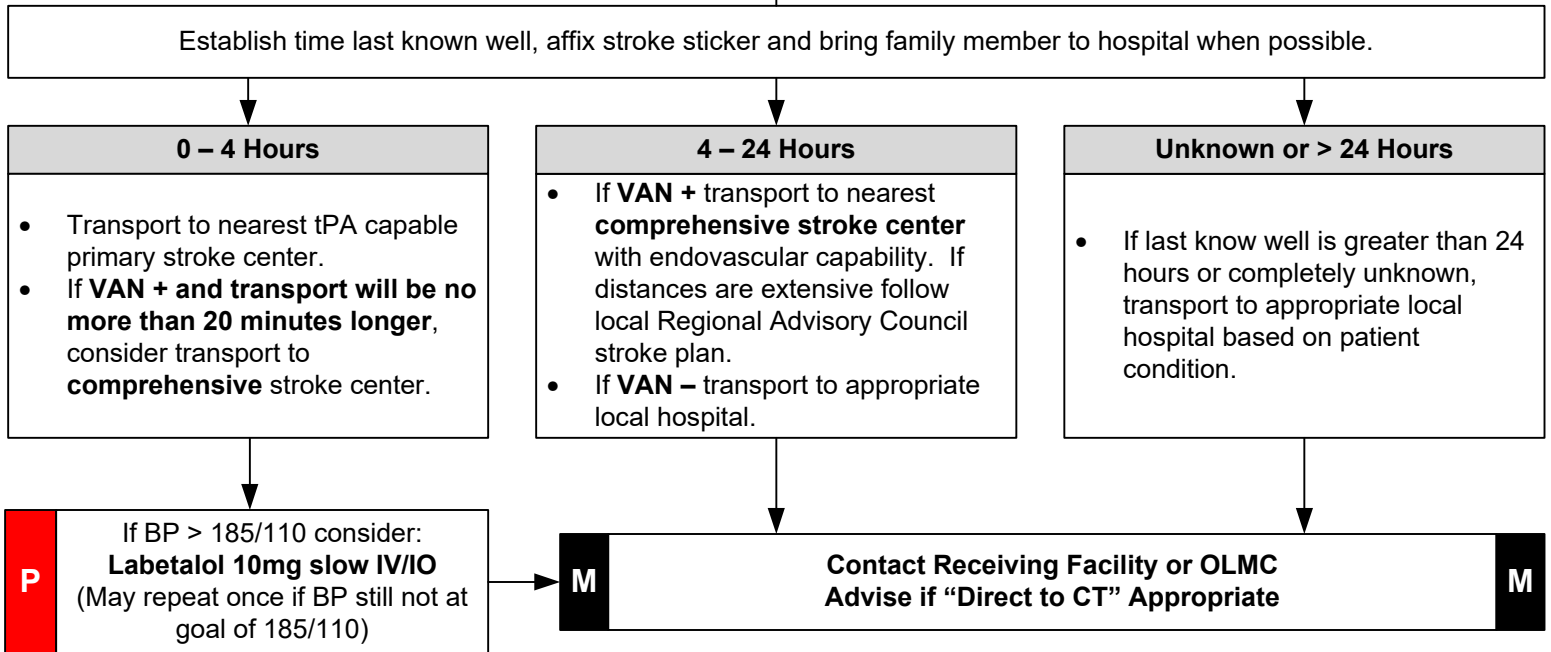
## Differential:

- Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Hypoglycemia
- Hypoxia/Hypercarbia
- Stroke, ICH, Trauma
- Tumor



If hypoglycemia present, go to **AM.02**. If stroke symptoms resolve, or stroke assessments are negative, go to most appropriate **protocol**.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



## Pearls:

- Last known well is defined as the last time the patient was seen at baseline (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was at baseline) It is imperative to know from the family what the “normal” baseline is for the patient, i.e. previous stroke deficits, paralysis, etc.
- Whenever possible, a family member should accompany the patient to the hospital to provide a detailed history.
- Obtain for hospital; family contact info (phone # for decision maker), recent patient interventions or procedures, last known well as above, medications including any antiplatelet or anticoagulant medications, normal functional baseline.
- Be alert for airway problems (swallowing difficulty, vomiting). Do not give anything by mouth until swallow screen done.
- Consider other protocols as indicated: Altered Mental Status, Seizures, Hypothermia.
- VAN is a screening tool for a ‘large vessel occlusion’ that can require clot retrieval. Positive VAN/LVO requires both weakness and a positive VAN score finding. This is explained more in stroke procedures.

# HYPOTENSION NON-TRAUMATIC

## History:

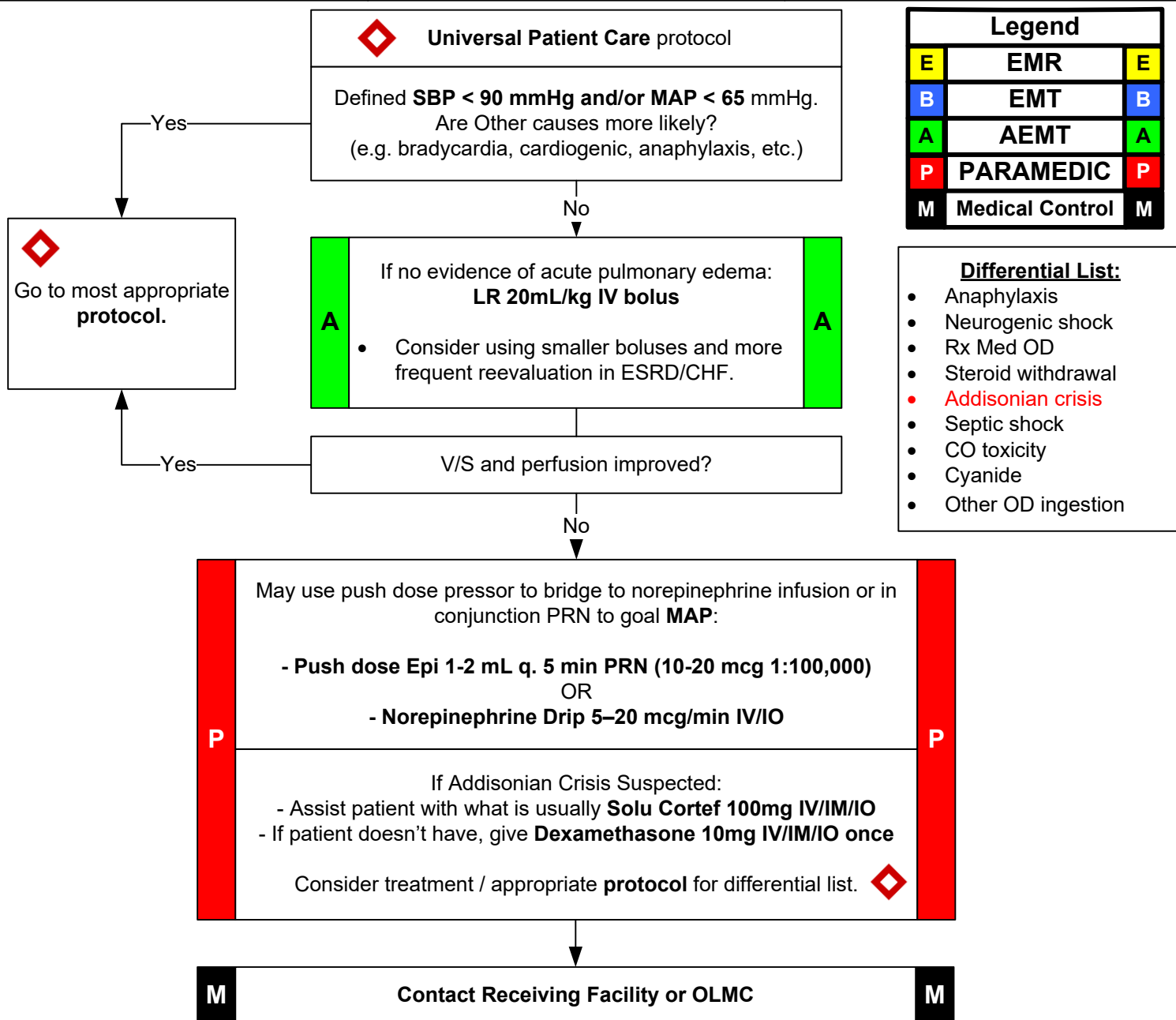
- Vomiting, Diarrhea
- Fever, Infection
- Sick contacts
- PO intake
- Urination

## Signs and Symptoms:

- Restlessness, confusion, weakness
- Syncope
- Tachycardia
- Diaphoresis
- Delayed capillary refill

## Differential:

- Infection/Sepsis
- Vomiting / Diarrhea / Dehydration
- Congenital heart disease
- Medication or Toxin
- Anaphylaxis



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**Differential List:**

- Anaphylaxis
- Neurogenic shock
- Rx Med OD
- Steroid withdrawal
- Addisonian crisis
- Septic shock
- CO toxicity
- Cyanide
- Other OD ingestion

## Pearls:

- There are multiple causes for hypotension, the goal is to make a field diagnosis and treat the cause. Patients with hypovolemia need volume, trauma patients need blood products, septic, anaphylaxis and neurogenic shock patients need adequate volume and then vasopressors (use lowest effective dose given through patent, proximal IV or IO, check often for evidence of extravasation and stop immediately if noted).
- Be sure to ask patients about medications or ingestions that can cause hypotension. Ask about recent discontinuation or reduction of chronic steroid dose. Patients with Addison's disease and crisis may have profound hypotension with minimal physiologic stress, e.g. infection, trauma, stress. It is ok to assist the patient with taking prescribed stress steroids.
- Consider OLMC consultation for refractory shock. Patients may benefit from guided treatment of extreme pH, low calcium, high potassium or need more cardiac support. This should be done in consultation with the physician.

# ADULT SEPSIS

## History:

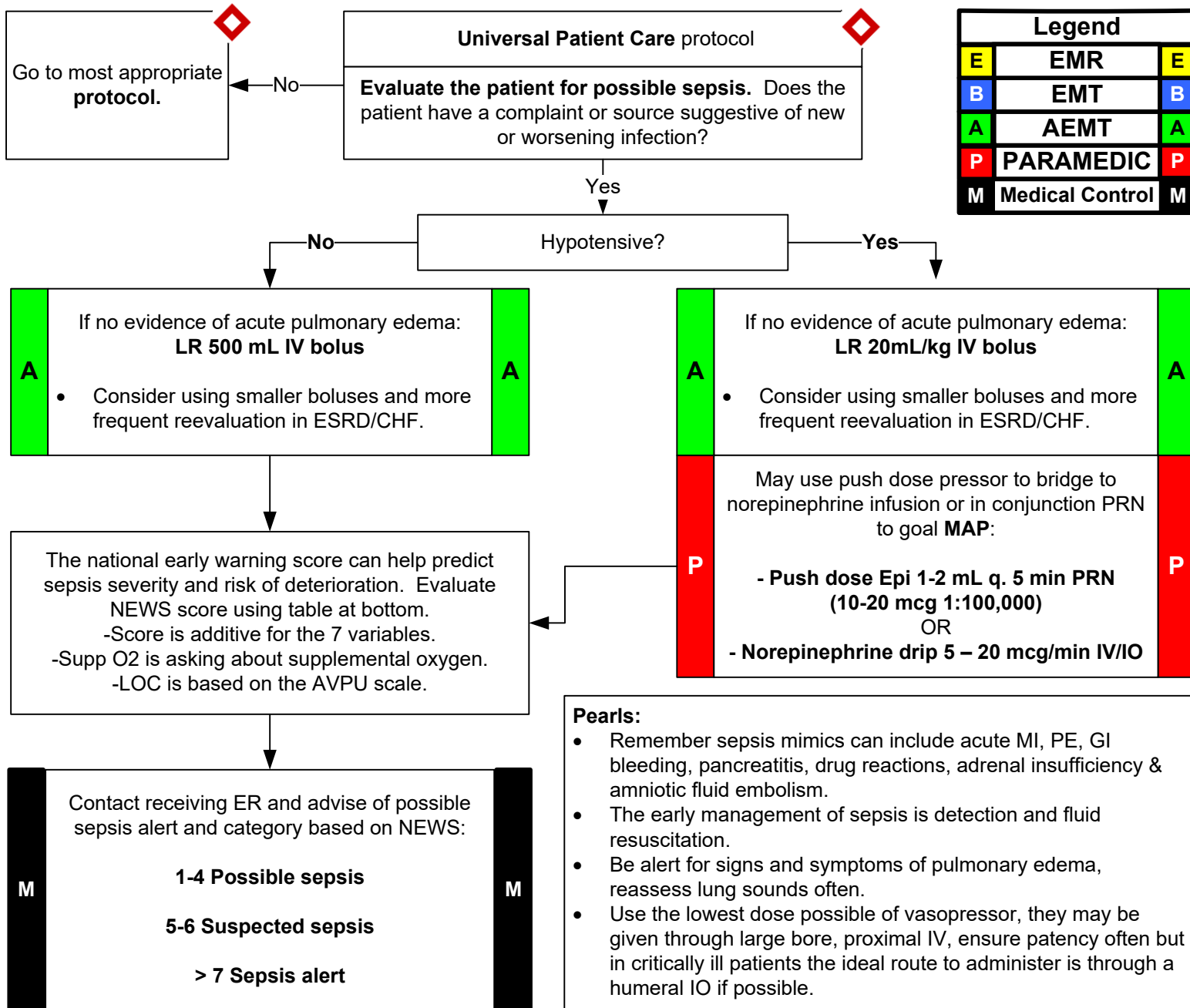
- Infection source (cough, catheters, lines, wounds).
- Recently prescribed antibiotics.
- Fever, subjective vs. actual.
- Chief complaint symptoms.

## Signs and Symptoms:

- Temperature < 96.8 F, > 100.4 F
- Heart rate > 90 bpm
- Respirations > 20 bpm
- White blood cell count > 12,000
- Hypoxia, new O2 requirement

## Differential:

- Infection (pneumonia, urinary, wound/cellulitis, diverticulitis, appendicitis, meningitis)
- Mild/severe sepsis
- Septic shock



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

	+3	+2	+1	0	+1	+2	+3
<b>RR</b>	< 8		9-11	12-20		21-24	>25
<b>SaO2</b>	< 91	92-93	94-95	96-100			
<b>Supp O2</b>		Yes		No			
<b>Temp</b>	< 95		95.1-96.8	96.9-100.4	100.5-102.2	> 102.3	
<b>SBP</b>	< 90	91-100	101-110	111-219			>220
<b>HR</b>	< 40		41-50	51-90	91-110	111-130	> 130
<b>LOC</b>				Alert			V,P,U

# POISONING AND TOXIC INGESTION

<b>History:</b> <ul style="list-style-type: none"> <li>Ingestion or suspected ingestion of a possibly toxic substance</li> <li>Substance ingested, route, quantity</li> <li>Time of ingestion</li> <li>Reason</li> <li>Bring medication to ED</li> <li>Past medical history, medications</li> <li>Vomited after ingestion?</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>Mental status changes</li> <li>Hypotension/ hypertension</li> <li>Decreased respiratory rate</li> <li>EKG QRS changes</li> <li>Tachycardia, dysrhythmias</li> <li>Seizures</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Tricyclic antidepressants</li> <li>Acetaminophen</li> <li>Salicylates</li> <li>Depressants/stimulants</li> <li>Anticholinergic</li> <li>Organophosphates</li> <li>Cardiac medications</li> <li>Solvents, alcohols, cleaners</li> </ul>
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**Universal Patient Care** protocol  
Call poison control center as needed.

Consider other **protocol** as needed:  
**Behavioral GC.11 and GC.12 protocol**  
**Rx Overdose AM.07 protocol**

**Poison control center:**  
1-800-222-1222

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**E**

- Obtain professional information, container and MSDS sheets
- Use information to guide first aid and decontamination
- Remove/isolate decon from toxin
- Begin supportive care

**E**

**E**

If trained, ECA/EMT may administer naloxone per **SO.02**

**E**

CNS depressant overdose  
Heroin, prescription drugs, patches

**A**

**Naloxone 0.5 – 6mg Slow IV/IO/IM/IN**  
Titrate to adequate respiratory effort only.

**A**

Suspected stimulant overdose  
Cocaine, crack, meth, PCP, synthetics.

**P**

**Midazolam 2.5 – 5mg Slow IV/IO/IM**  
For related agitation, tachycardia and HTN.

**P**

Organophosphate exposure  
Nerve agents, pesticides

**P**

**Atropine 3mg IV/IO, double each dose q. 5 min**  
OR  
**MARK 1 kit q. 5 min up to 3 kits**  
Until symptoms adequately resolved.

**P**

**M**

**Contact Receiving Facility or OLMC**

**M**

See **CBRNE related protocols** under **Special Operations** section for more information on certain agents such as cyanide and nerve agent.

- Pearls:**
- DECON of HAZMAT patients should be performed by trained personnel prior to EMS contact or transport.
  - DO NOT TRANSPORT OR BRING CONTAMINATED PATIENTS INTO THE ER!!**
  - Depressants typically cause decreased HR, BP, RR, may have non-specific pupils, not always constricted with chronic narcotic or other depressant use.
  - Stimulants typically cause increased HR, BP, temp, dilated pupils and seizures.
  - Anticholinergic medications cause increased HR, temperature, dilated pupils and mental status changes, worse in elderly.
  - Organophosphates, such as insecticides often cause DUMBELS – defecation, urination, meiosis, bronchorrhea, ectopy, lacrimation and seizures.
  - Synthetics such as spice, K2 and others usually alternate hyper-excitation with CNS depression, be ready for both.
  - Contact the US/Texas Poison Control Center for guidance. 1-800-222-1222. Do not rely on patient history of ingestion especially in suicidal patients.

# PRESCRIPTION MEDICATION OVERDOSE

<b>History:</b> <ul style="list-style-type: none"> <li>• Substance route, quantity</li> <li>• Time of ingestion</li> <li>• Bring medication to ED</li> <li>• Past medical history, medications</li> <li>• Vomited after ingestion?</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Mental status changes, seizures</li> <li>• Hypotension/ hypertension</li> <li>• Decreased respiratory rate</li> <li>• EKG QRS changes</li> <li>• Tachycardia, dysrhythmias</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Tricyclic antidepressants</li> <li>• Acetaminophen</li> <li>• Salicylates</li> <li>• Beta blockers</li> <li>• Calcium channel blockers</li> </ul>
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**Universal Patient Care** protocol  
Contact poison control

**Poison center:**  
1-800-222-1222

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

Refer to most appropriate base **protocol** first.  
If highly suspicious for one of the drugs below:

Beta Blocker Toxicity  
Low HR and BP, AMS, low BGL

**P** **Go To Hypotension Protocol AM.04** **P**  
Vasopressors are likely to be helpful.

Calcium Channel Blocker Toxicity  
Low HR and BP, normal mental, normal BGL

**P** **Calcium Gluconate 2 gram IV/IO over 10 min.** **P**

Tricyclic Antidepressant (TCA) Toxicity  
Rapid AMS, tachy, low BP, seizures

**P** **If QRS > 120 msec Sodium bicarbonate 1mEq/kg Slow IV/IO** **P**

Aspirin and Salicylate Toxicity  
Ringing ears, hyperventilation

**P** **Volume resuscitation, LR 1000 mL bolus Sodium bicarbonate 1mEq/kg Slow IV/IO** **P**

Dystonic Reaction  
Culprit med hx, involuntary muscle spasm

**P** **Diphenhydramine 25mg IV/IO** **P**

**M** **Contact Receiving Facility or OLMC early for advice on any medication overdose and for other drugs not specified here.** **M**

- Pearls:**
- As with any medical illness, take immediate steps to manage ABCs and BP or HR issues. Then begin to address medication specific concerns.
  - Tricyclic antidepressants cause 4 major areas of toxicity. Seizures, dysrhythmias, hypotension, AMS or coma. Patients may exhibit rapid progression from alert mental status to death (manage airway early). Avoid charcoal.
  - Dystonic reactions are common with medications like older antidepressant and antiemetic medications (i.e. Reglan, etc.)
  - Contacting the US/Texas Poison Control Center for guidance. 1-800-222-1222.
  - DECON of HAZMAT patients should be performed by trained personnel prior to initial patient contact or transport. Do not bring contaminated patients into the ER.

# ADULT RESPIRATORY DISTRESS

## History:

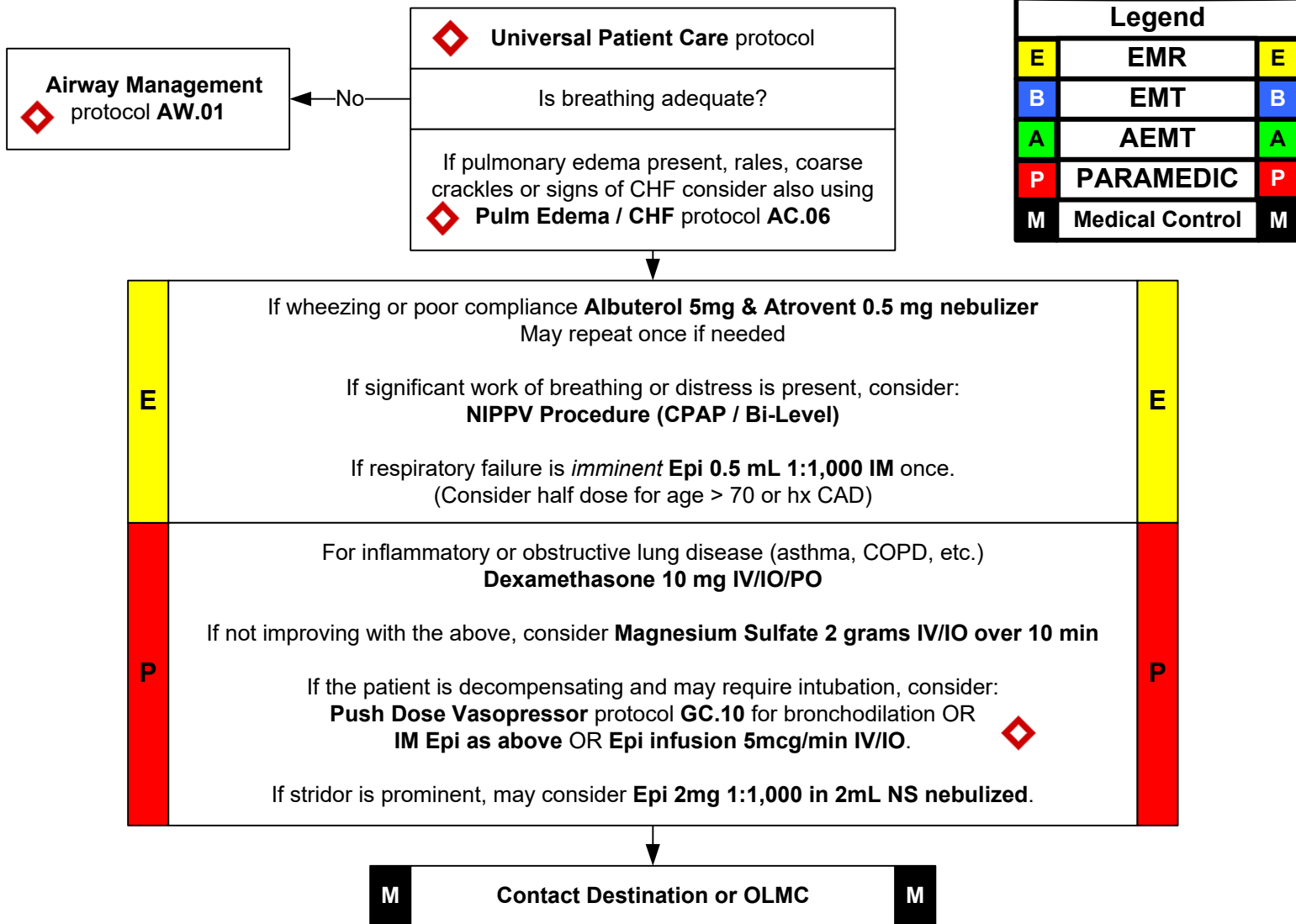
- Asthma, COPD, CHF
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation.

## Signs & Symptoms:

- Increased respiratory rate and effort, accessory muscles
- Pursed lip breathing, tired
- Decreased ability to speak
- Wheezing, rhonchi, rales, stridor
- Tachycardia and coughing

## Differential:

- Asthma, COPD, CHF
- Anaphylaxis
- Aspiration, Pneumonia
- PE, Pneumothorax
- Pericardial tamponade
- Inhaled toxin (CO, CO<sub>2</sub>, H<sub>2</sub>S)



## Pearls:

- Pulse oximetry and ETCO<sub>2</sub> must be monitored continuously in patients with severe respiratory distress. All patients at risk for associated cardiac issues should have a 12-lead EKG performed, especially if treating with epinephrine.
- A silent or “quiet” chest in respiratory distress is a pre-respiratory arrest sign, treat aggressively with the use of beta-agonists and early use of CPAP. As a general rule, if the patient’s breathing is “making you tired watching”, they need NIPPV.
- If anxiety management for NIPPV cooperation, or intubation is required, ketamine should generally be used as the induction agent as it also acts as a bronchodilator.
- The provider should ensure that they know how to connect an in-line nebulizer treatment to work with their CPAP system.
- For help in triaging asthma / COPD patients consider the following criteria:

	EtCO <sub>2</sub>	SpO <sub>2</sub>	Tidal Volume	Lung Sounds
<b>Mild</b>	< 35 mmHg	> 96%	Adequate	Wheezing
<b>Moderate</b>	35 - 45 mmHg	90 - 96%	Diminished	Wheezing
<b>Severe</b>	> 45 mmHg	< 90%	Diminished	Wheezing or Diminished

# ADULT SEIZURE

## History:

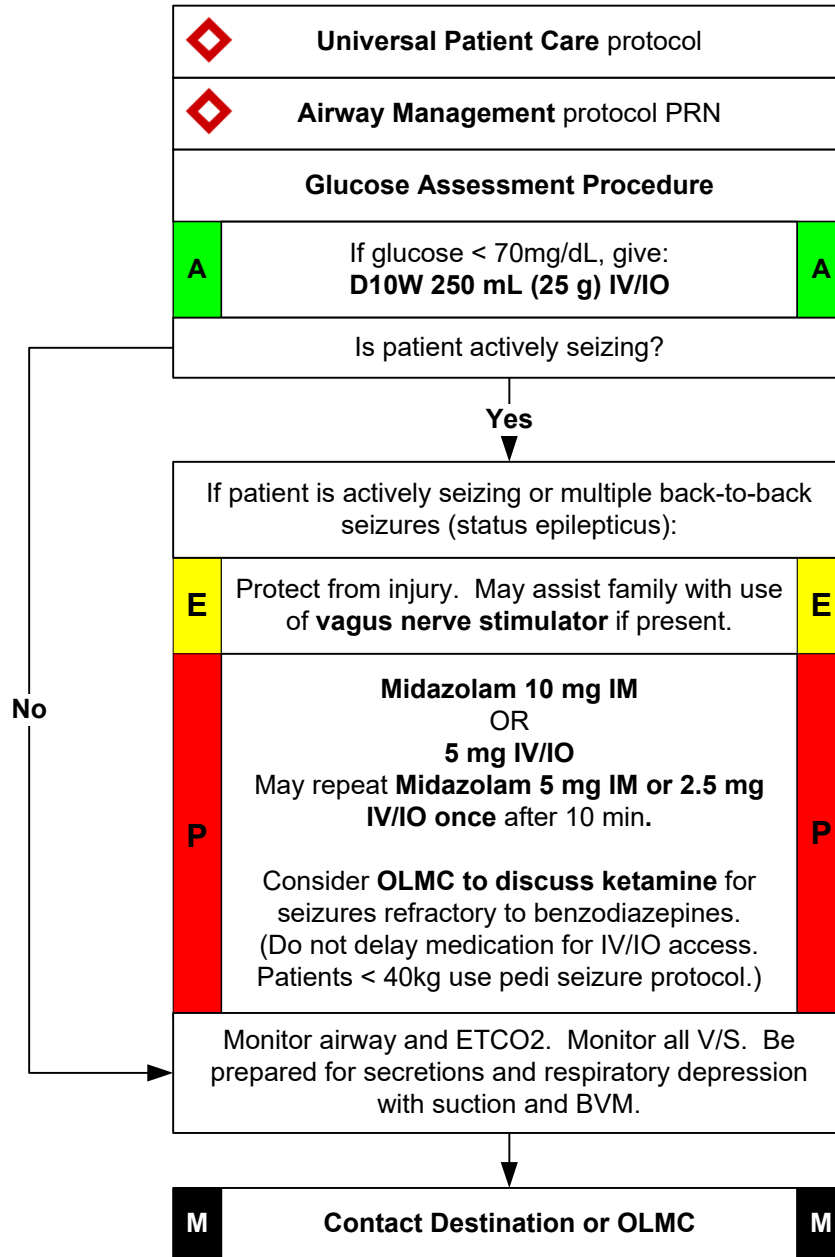
- Reported seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications, compliance
- History of trauma
- History of diabetes
- History of pregnancy

## Signs and Symptoms:

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

## Differential:

- Hypoglycemia, hypoxia
- CNS trauma, tumor, stroke
- Metabolic, hepatic, or renal
- Drugs, med non-compliance
- Infection, fever, hyperthermia
- Alcohol withdrawal
- Eclampsia



Legend		
E	<b>EMR</b>	E
B	<b>EMT</b>	B
A	<b>AEMT</b>	A
P	<b>PARAMEDIC</b>	P
M	<b>Medical Control</b>	M

At any time, if patient known to be or suspected > 20 weeks pregnant, or recently pregnant (6 weeks):



Go to **OB Emergencies** protocol **OB.03**

Definition: **Vagus nerve stimulator (VNS)**  
 Electrical stimulator implanted in the brain and when "activated" with a magnet over the chest, thought to help terminate seizures.

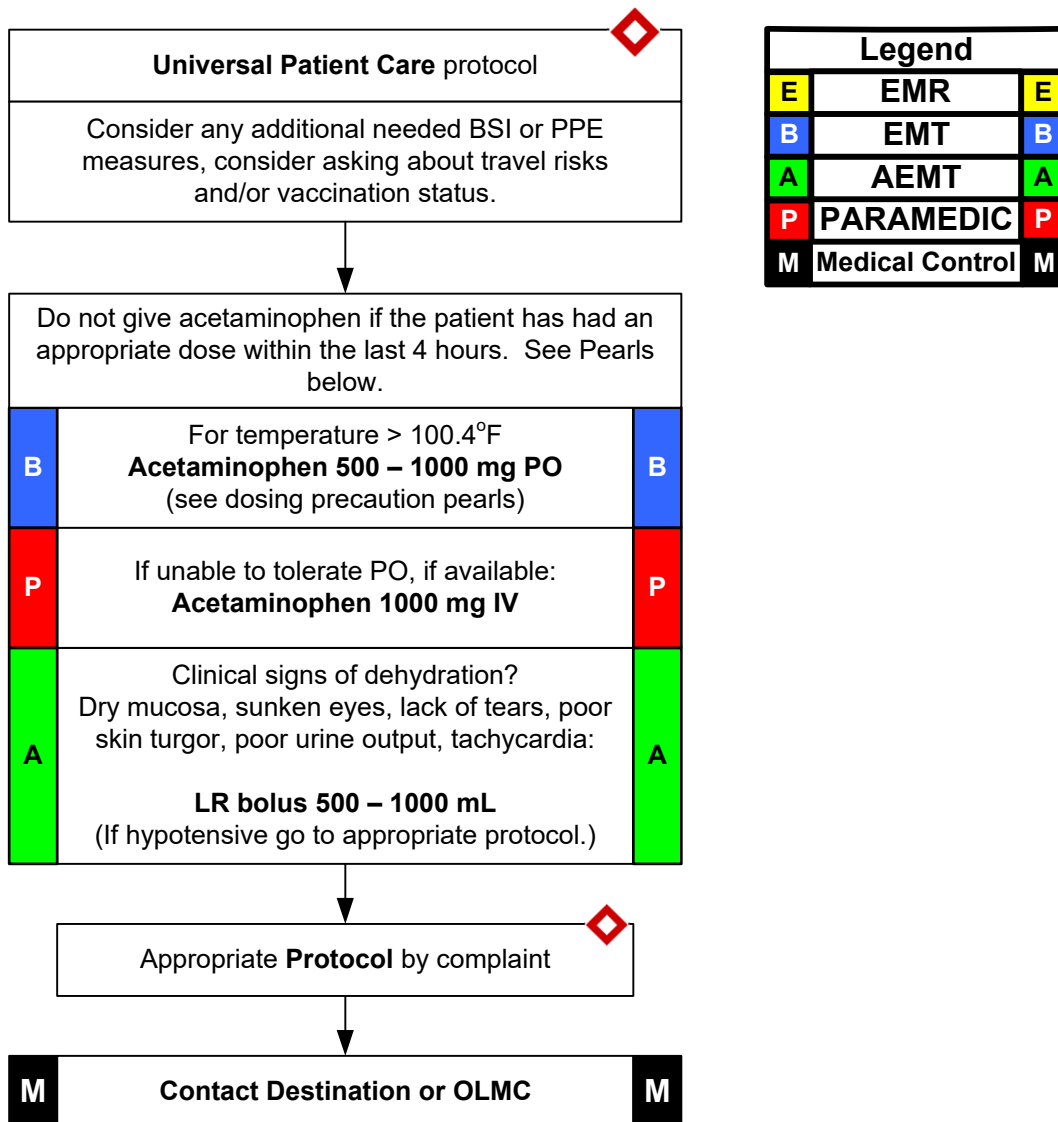
For post-ictal patients who are combative consider midazolam in lieu of ketamine. Use ½ seizure dose.

## Pearls:

- Do not delay administration of midazolam while waiting on IV access. May be given slowly IV or IO if no delay to administration.
- 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.
- **Generalized seizures** are associated with loss of consciousness, incontinence, and tongue trauma. **Partial seizures** (simple) affect only a part of the body and are not usually associated with a loss of consciousness, those with LOC are (complex). **Jacksonian seizures** are seizures which start as a focal seizure and become generalized. In general do not treat psychogenic seizures (non-epileptiform) with anti-convulsant drugs.
- Assess for possibility of trauma and/or substance abuse. Ask about recent tuberculosis treatment medications for refractory seizure.
- Be prepared to assist ventilations or intubate with repeat doses of benzodiazepines. Monitor oxygenation and ventilation carefully.

# ADULT FEVER & GENERAL ILLNESS

History	Signs & Symptoms	Differential:
<ul style="list-style-type: none"> <li>• Age</li> <li>• Duration of fever, severity</li> <li>• Past medical history</li> <li>• Medications</li> <li>• Immunocompromised?</li> <li>• Environmental exposure</li> <li>• Last acetaminophen or ibuprofen</li> </ul>	<ul style="list-style-type: none"> <li>• Warm, flushed, diaphoretic</li> <li>• Chills/Rigors</li> <li>• Tachycardia</li> <li>• Cough</li> <li>• Headache, mental status changes</li> <li>• Dysuria</li> <li>• Abdominal pain</li> </ul>	<ul style="list-style-type: none"> <li>• Infections / Sepsis</li> <li>• Cancer / Tumors</li> <li>• Medication or drug reaction</li> <li>• Connective tissue disease</li> <li>• Kawasaki Disease</li> <li>• Environmental exposure</li> <li>• Meningitis</li> </ul>



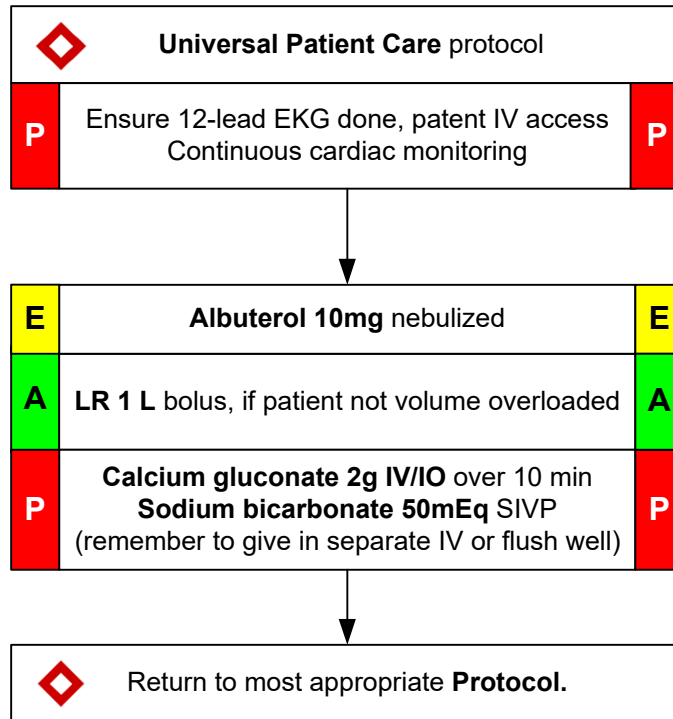
Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## Pearls:

- Patients with a history of liver failure should not receive acetaminophen. Do not give if less than 4 hours since last dose. Do not exceed 4 grams per day from all sources.
- Always attempt oral rehydration and fluid challenge before IV means when possible. Consider use of Zofran if vomiting.
- **Droplet precautions** include standard contact PPE plus a surgical mask for providers who accompany patients in the back of the ambulance. This level of precaution should be utilized with influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
- **Contact precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA, scabies, or zoster (shingles)), or with other illnesses spread by contact are suspected.
- **Airborne precautions** include standard PPE, contact precautions plus N-95 mask for providers. This level of precautions is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS, TB).
- Rehydration with fluids increased the patient's ability to sweat and improves heat loss.

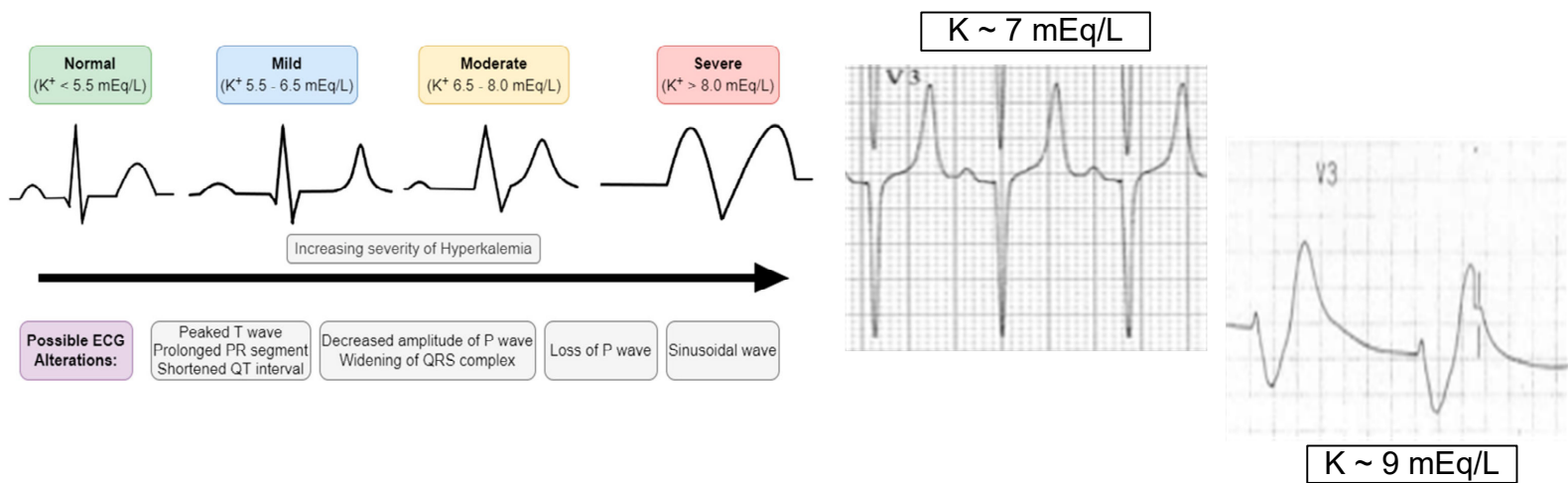
# ADULT HYPERKALEMIA

<p><b>History:</b></p> <ul style="list-style-type: none"> <li>ESRD/dialysis</li> <li>Dehydration, kidney injury</li> <li>ACE/ARB overdose</li> <li>Recent chemotherapy for cancer (lymphoma/leukemia)</li> <li>Concern for crush syndrome</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>Fatigue / Weakness/Malaise</li> <li>Nausea / vomiting</li> <li>Volume overload</li> <li>EKG changes – Peaked t-waves or widening QRS, bradycardia</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>New cardiac conduction block (LBBB, etc.)</li> <li>Early Acute MI</li> </ul>
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Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

- Pearls:**
- This is a frequently asymptomatic condition, with the only objective findings being EKG abnormalities. See figures below. Treat aggressively if suspected to prevent deterioration.
  - Potassium concentrations are likely more significantly elevated in new onset blocks with atypical QRS morphology (not LBBB/RBBB; appears like a paced rhythm without pacer spikes). This will usually be associated with bradycardia.
  - Drugs associated w/ hyperkalemia (not necessarily in overdose quantities): ACE/ARB/spironolactone/bactrim/tacrolimus/cyclosporin.
  - Lactated Ringer's is safe and superior to 0.9% Saline in hyperkalemia.



# **TRAUMA CARE** **SECTION**

# ADULT GENERAL TRAUMA

<b>History:</b> <ul style="list-style-type: none"> <li>• Details of injury, MOI, speed</li> <li>• Damage to structure or vehicle</li> <li>• Location in structure or vehicle</li> <li>• Others injured or dead</li> <li>• Restraints / protective equipment</li> <li>• Past medical history</li> <li>• Medications</li> </ul>	<b>Signs &amp; Symptoms:</b> <ul style="list-style-type: none"> <li>• Pain, swelling</li> <li>• Deformity, lesions, bleeding</li> <li>• Altered mental status or unconscious</li> <li>• Hypotension or shock</li> <li>• Cardiac Arrest</li> </ul>	<b>Differential (Life threatening):</b> <ul style="list-style-type: none"> <li>• Any external hemorrhage?</li> <li>• Airway open intact?</li> <li>• Breathing adequate (pneumo?)</li> <li>• Circulation problem (tamponade)</li> <li>• Open chest wounds?</li> <li>• Non-compressible hemorrhage</li> <li>• TBI, spine, pelvis, long bone fx</li> </ul>
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<b>Universal Patient Care protocol</b> <b>Airway protocol PRN</b> <b>Spinal Motion Restriction protocol PRN</b> <b>Other Trauma Protocol (TBI, Burn, etc.) PRN</b>		
At any time if patient arrests <b>Trauma Arrest protocol TR.11</b>		
<b>E</b>	Rapid trauma assessment, V/S, GCS/RTS  <ul style="list-style-type: none"> <li>• Control external hemorrhage <b>FIRST</b></li> <li>• Ensure airway open, O2 to keep SaO2 &gt; 94%</li> <li>• <b>Tourniquet procedure</b>, hemostatic gauze <b>PRN</b></li> <li>• Seal open chest wounds (allow to "burp")</li> <li>• Bind suspected pelvic fractures</li> </ul>	<b>E</b>
<b>A</b>	<ul style="list-style-type: none"> <li>• ALS airway management if required:</li> <li>• Large bore IV access, consider humerus IO if unable</li> <li>• Appropriate IV fluid resuscitation (see right)</li> <li>• If chest trauma see <b>pleural needle decompression</b> or <b>finger thoracostomy procedure PRN</b></li> </ul>	<b>A</b>
<b>P</b>	<b>Blood Product Administration protocol SO.04 PRN</b>  Advanced BP management PRN (see right) <b>Pain Management protocol PRN</b>  <u>If SBP &lt; 90 and HR &gt; 120, OR shock index &gt; 1.0,</u> <u>OR if you are administering blood:</u>  <b>Tranexamic acid (TXA) 2 gram slow IV/IO push</b> (May give TXA preemptively if injury is certain to cause massive hemorrhage, i.e. torso GSW, etc.) **See Pearls for time restriction on TXA (3 hours)	<b>P</b>
<b>M</b>	<b>Contact Destination or OLMC – Advise of Trauma Alert</b>	<b>M</b>

Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

**If Blood Available Give Blood!**  
**Trauma IV Fluid Management**

For compressible hemorrhage or TBI\*:  
**LR or NS 1000 mL Bolus IV/IO**  
 May repeat X1, goal SBP 90 mmHg

For non-compressible hemorrhage:  
**Titrate IV fluids to SBP 70 - 80 mmHg.**

(\*If isolated TBI suspected, NS may be preferred IV fluid)

**Advanced BP Management**

If neuro (spinal) shock or TBI suspected and no BP response to IV fluid, consider:

**Norepinephrine 5-20 mcg/min IV/IO**  
 OR  
**Epinephrine Push Dose Pressor protocol GC.10**

Titrate to maintain a SBP ≥ 90 mmHg or MAP > 70 mmHg.

- Pearls:**
- **Shock Index = Heart Rate ÷ Systolic Blood Pressure (example BP 80/40, HR 160, shock index = 160/80 or 2)**
  - See Regional Trauma Guidelines for criteria on when to declare trauma activation. Record "trauma activation" somewhere in patient care record.
  - **Pregnant trauma patients** who are visibly pregnant to the level of the umbilicus or > 20 weeks gestation should be transported to a trauma center whenever possible – **EVEN FOR MINOR ABDOMINAL TRAUMA**. MVCs, falls and assault area leading cause of trauma death in pregnant women. Remember to displace the uterus or immobilize in a left lateral recumbent position.
  - TXA should only be given within a 3-hour window of the beginning of trauma or hemorrhage.
  - In trauma, interventions should generally be performed enroute. Minimize scene time (desired < 10 min).
  - If a patient is entrapped and perceived scene time will be more than 45-60 minutes, notify communication center, supervisor and Medical Director.

# PEDIATRIC GENERAL TRAUMA

## History:

- Details of injury, MOI, speed
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Restraints / car seat correct?
- Past medical history
- Medications

## Signs & Symptoms:

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Cardiac Arrest

## Differential (Life threatening):

- Any external hemorrhage?
- Airway open intact?
- Breathing adequate (pneumo?)
- Circulation problem (tamponade)
- Open chest wounds?
- Non-compressible hemorrhage
- Pelvis or long bone fracture
- Spine injury or TBI

<b>Universal Patient Care</b> protocol <b>Airway</b> protocol PRN <b>Spinal Motion Restriction</b> protocol PRN Other Trauma Protocol (TBI, Burn, etc.) PRN		
At any time if patient arrests <b>Trauma Arrest</b> protocol TR.11		
<b>E</b>	Rapid trauma assessment, V/S, GCS/RTS <ul style="list-style-type: none"> <li>• Control external hemorrhage FIRST</li> <li>• Ensure airway open, O2 to keep SaO2 &gt; 94%</li> <li>• <b>Tourniquet procedure</b>, hemostatic gauze PRN</li> <li>• Seal sucking chest wounds (allow to “burp”)</li> <li>• Bind suspected pelvic fractures</li> </ul>	<b>E</b>
<b>A</b>	<ul style="list-style-type: none"> <li>• ALS airway management if required:</li> <li>• Large bore IV access, consider IO if unable</li> <li>• Appropriate IV fluid resuscitation (see right)</li> <li>• If chest trauma see <b>pleural needle decompression</b> and <b>finger thoracostomy procedure</b> PRN.</li> </ul>	<b>A</b>
<b>P</b>	<b>Blood Product Administration</b> protocol SO.04 PRN Advanced BP management PRN (see right) <b>Pain Management</b> protocol PRN If SBP < 70 + (age in years X 2) mmHg. OR if you are administering blood: <b>Tranexamic acid (TXA) 15 mg/kg slow IV/IO push</b> Max dose 2 grams (may give TXA preemptively if injury is certain to cause massive hemorrhage, i.e. torso GSW, etc.) **See Pearls for time restriction on TXA (3 hours)	<b>P</b>
<b>M</b>	<b>Contact Destination or OLMC – Advise of Trauma Alert</b>	<b>M</b>

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

### If Blood Available Give Blood! Trauma IV Fluid Management

**NS or LR 20 mL/kg IV bolus**  
May repeat @ 10 mL/kg IV up to X2

For compressible hemorrhage or TBI\*:  
**SBP = 70 + (age in years x 2) mmHg**

For non-compressible hemorrhage:  
**SBP = 60 + (age in years x 2) mmHg**

(\*If isolated TBI suspected, NS may be preferred IV fluid.)

### Advanced BP Management

If neuro (spinal) shock or TBI suspected with no response to IV fluid above, consider:

**Epinephrine 0.1-1 mcg/kg/min IV/IO**  
OR  
**Push Dose Epinephrine GC.10**

Titrate **SBP = 70 + (age in years x 2) mmHg**  
or signs of adequate perfusion, improved mentation, cap refill, etc.

## Pearls:

- See Regional Trauma Guidelines for criteria on when to declare trauma activation. Record “trauma activation” somewhere in patient care record.
- In trauma, interventions should generally be performed enroute. Minimize scene time (desired < 10 min).
- TXA should only be given within a 3-hour window of the beginning of trauma or hemorrhage.
- Permissive hypotension should be used in the absence of neuro injury. If suspected TBI maintain SBP ≥ 90.
- If a patient is entrapped and perceived scene time will be more than 45-60 minutes, notify communication center, supervisor and Medical Director.

# BURN INJURY

## History:

- Type of exposure (heat, gas, chemical)
- Time of injury, other trauma
- Past medical history and meds
- Loss of Consciousness
- Confined in space?

## Signs & Symptoms:

- Burns, pain, swelling
- Dizziness, LOC
- Hypotension/shock
- Airway compromise/distress singed facial or nasal hair, hoarseness / wheezing

## Differential:

- Superficial (1°) red and painful
- Partial thickness (2°) blistering
- Full thickness (3°) painless and charred or leathery skin
- Type – Thermal, chemical, electrical, radiation, energy

**Universal Patient Care** protocol  
**Airway** protocol PRN  
**Spinal motion restriction** protocol PRN

- Ensure scene safety, consider other risks from fire (collapse, CO, cyanide, etc.)
- Remove rings, bracelets and constricting items
- Remove any burning clothing, stop burning process

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

E	<ul style="list-style-type: none"> <li>• If burn &lt; 10% BSA cool down the wound with NS or sterile water or burn gel dressing</li> <li>• Cover &gt; 10 % burn w/ dry sheet or dressings</li> <li>• Prevent hypothermia</li> <li>• If eye involvement, go to <b>Eye Injury/Complaint</b> protocol <b>TR.09</b>.</li> </ul>	E
A	<p><b>LR 2 mL / kg per % total body area burned</b> (only count 2<sup>nd</sup> &amp; 3<sup>rd</sup> degree only in % BSA )</p> <p>Calculate this total, divide the amount by 16 and give the 1/16<sup>th</sup> result as a bolus.  <b>Example:</b> 100kg patient, 50% TBSA burn gets...            2 X 100 X 50 = 10,000mL / 16 = 625mL bolus</p>	A
P	<p><b>Adult Pain Management</b> protocol <b>GC.04</b></p> <p><b>Pediatric Pain Management</b> protocol <b>GC.05</b></p>	P
M	<b>Contact Destination or OLMC</b>	M

## Additional Burn Considerations

### Chemical Burns:

Remember to “de bulk” dry contaminants first before applying water, once water applied flush thoroughly with copious amounts.

### Hydrofluoric Acid Burns:

Mix 1 amp of calcium gluconate or chloride with 5-10mL of WATER based lubricant. Apply to affected skin area (avoid eyes and mucous membranes).

### Electrical Burns:

Monitor EKG for arrhythmia, remember that high voltage burns (>500v) all tissues are affected, all patients need evaluation. Remember to look for entry and exit wounds.

### Confined Space Fire:

Consider early use of hydroxocobalamin (Cyanokit) in any patient who is unstable found down in confined fire area.

See **Cyanide & Inhaled Toxin** protocol **SO.01**.

## Pearls:

- Remember to evaluate involved body surface area. Use rule of nines chart or use one side of patients hand = 1% BSA.
- **Critical Burns Include:**
  - >20% 2° and 3° body surface area (BSA) age > 10 or < 50.
  - 3° burns >5% BSA
  - Electrical burns; respiratory burns or deep chemical burns
  - Burns with associated major traumatic injury
- Minor burns (< 5% BSA 2<sup>nd</sup> and 3<sup>rd</sup>) not complicated by airway compromise or trauma do not require transport to a trauma center.
- Potential CO exposure should be treated with 100% oxygen, obtain carboxy pulse-ox reading if available, have FD obtain CO levels.
- Circumferential burns to extremities are dangerous due to potential vascular compromise 2° to soft tissue swelling.
- Burn patients are prone to hypothermia - Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma or child abuse with burn injuries.
- Remember to evaluate airway in any burn patient, consider intubation early if signs of airway burn – facial burn, facial hair singed, soot around nose, mouth and oral mucosa, red swollen throat, hoarse voice or stridor.
- >10% BSA age < 10 or > 50.
- 2° and 3° burns to face, eyes, hands or feet or genitalia
- Burns with extremes of age or chronic disease

# EXTREMITY TRAUMA AND AMPUTATION

## History:

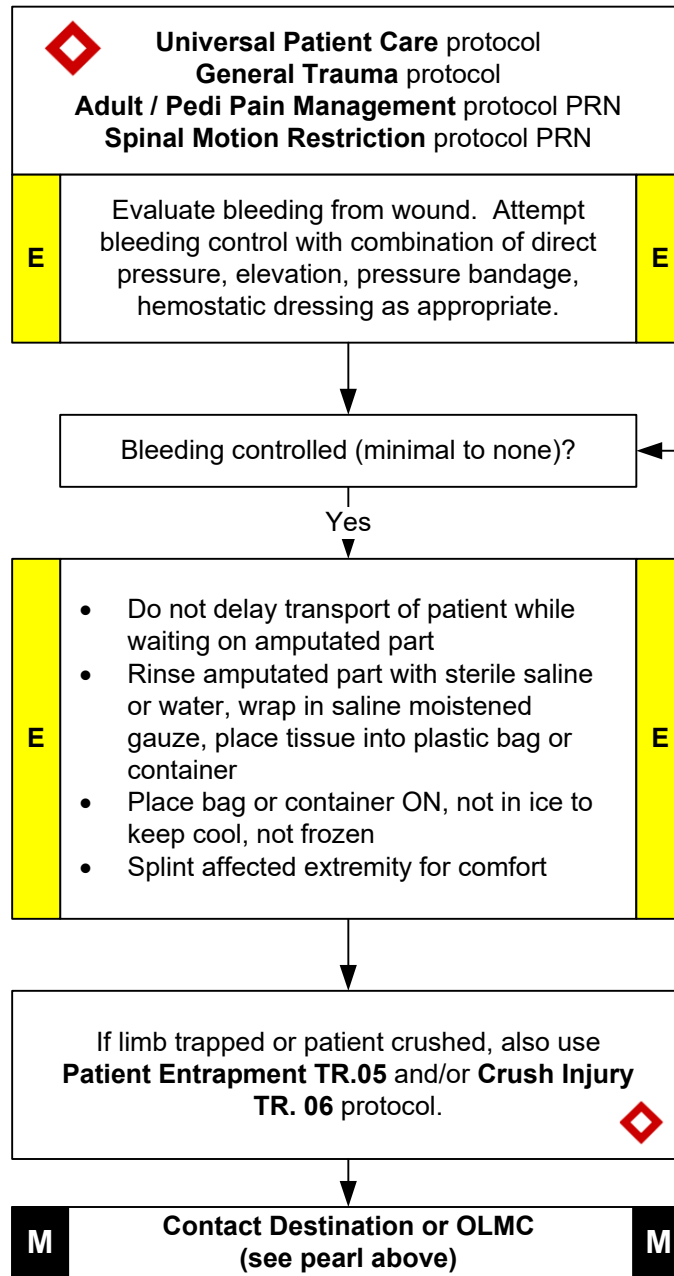
- Mechanism of injury
- Time of injury
- Open vs. closed wound or fx
- Wound contamination
- Medical history
- Dominant limb or hand?

## Signs & Symptoms:

- Pain, swelling, deformity
- Poor sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temp

## Differential:

- Abrasion, laceration
- Contusion, sprain, strain
- Dislocation
- Fracture
- Amputation, partial vs. full



Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

<b>E</b>	<b>Tourniquet procedure</b>	<b>E</b>
<b>P</b>	<b>Consider Tranexamic acid (TXA) 2 grams slow IV/IO</b>	<b>P</b>

**Pearl:**  
 Contact receiving facility early to ensure that facility has medical capability for caring for patient's specific injury. Specialty hand injury, etc. may need to go to different hospital.

## Pearls:

- Peripheral neuro and vascular status should be documented on all extremity injuries also before and after procedures.
- If pulseless extremity a single attempt at realignment may be performed while splinting in process, consider giving pain medication first when clinically safe. Knee and elbow dislocations and fractures have a high probability of vascular injury – do not attempt to relocate, splint in place. Urgently transport any injury involving a pulseless extremity.
- If an amputation is incomplete, splint affected digit or limb in physiologic position.
- For amputated parts, time is critical. If uncertain, contact the receiving facility early or consult online medical control for decision support on which facilities can treat amputated parts.
- Blood loss may be concealed or not apparent with extremity injuries, monitor closely for signs of shock.

# PATIENT ENTRAPMENT

## History:

- MOI, limb versus torso
- Time of injury
- Patient still viable?
- Estimated time needs for rescue
- Open wounds / fractures
- Traumatic compression of torso

## Signs & Symptoms:

- Pain, swelling, deformity
- Altered sensation / motor
- Diminished pulse / capillary refill
- Decreased extremity temperature
- Estimated blood losses

## Differential:

- Survivable injury?
- Patient still viable?
- Remove patient with limb
- Need for field amputation
- No way to remove patient
- Advanced resuscitation

### Pearl:

Victims in collapse or crush zone may need eye, hearing and respiratory protection.



**Universal Patient Care** protocol  
**General Trauma** protocol  
**Extremity Trauma & Amputation, Crush** protocol PRN  
**Pain Management** protocol as appropriate

### Legend

E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

<b>E</b>	<ul style="list-style-type: none"> <li>• Access patient as soon as safe for responder, begin any care able</li> <li>• Bleeding control, ABCs, O2, V/S, EKG, ETCO2 monitoring when able</li> <li>• Discuss extrication strategy and length of anticipated extrication with incident command.</li> <li>• Evaluate need to have blood products brought to scene, i.e. from aeromedical provider.</li> <li>• Evaluate level of concern for prolonged extrication (&gt;60 min) and/or possible need for field amputation?</li> </ul>	<b>E</b>
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<b>P</b>	<p><b><u>Prolonged extrication anticipated &gt; 60 min</u></b></p> <ul style="list-style-type: none"> <li>• Call for additional resources (tools, agency, etc.)</li> <li>• Notify dispatcher and agency supervisor</li> <li>• Notify and consult with MD medical director or online medical control</li> <li>• Consider need for treating prolonged bleeding, hypothermia, pain, other medical problems</li> </ul>
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<b>P</b>	<p><b><u>High anticipation for needed field amputation</u></b></p> <ul style="list-style-type: none"> <li>• Call for additional resources (tools, agency, etc.)</li> <li>• Notify dispatcher and agency supervisor</li> <li>• Contact MD medical director and advise <b>field amputation needed</b>. If unavailable, contact online med control</li> <li>• Optimize patient medically, 2<sup>nd</sup> IV access, etc.</li> </ul>
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<b>P</b>	<p>If sedation or intubation will permit disentanglement of the patient, <b>contact OLMC FIRST</b> and consider:  <b>Adult Sedation GC.07 or Pediatric Sedation GC.08</b> protocol  <b>Adult DSI Plan AW.04 or Pediatric DSI Plan AW.06</b> protocol</p>	<b>P</b>
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<b>M</b>	<b>Contact Destination or OLMC</b>	<b>M</b>
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### Pearls:

- Safety of emergency responders is paramount. Do not enter scene without appropriate PPI and training.
- Anticipate that patients will rapidly decompensate following extrication from a crush load or disentanglement.
- If the provider is considering sedation or RSI for patient disentanglement, remember that airway management will likely be more complicated. Coordinate with the treatment team and IC, plan ahead for difficulty in otherwise simple appearing procedures. Do not make the situation worse!
- If it is obvious that removing the patient from entrapment (i.e. 2 train cars) will result in immediate death, consider end of life requests of the patient such as talking on phone with loved ones, receiving last rites, etc. Remember appropriate analgesia. Get extra scene assistance, contact MD medical director or online medical control can assist with comfort care instructions.

# CRUSH INJURY

## History:

- Traumatic compression of torso
- Compression of significant percentage of extremity
- Victim of structural, excavation or agricultural collapse (i.e. grain silo)
- Asphyxia, last seen, viability?

## Signs & Symptoms:

- Noted compression injury
- Pain, pulseless, pale extremities
- Stable versus unstable V/S
- Altered mental status
- Inadequate ventilation

## Differential:

- Single versus multi-system injury
- Time and surface area required
- Viable patient for rescue
- Cause of initial injury? Syncope, fall, MI, etc?
- Associated trauma

### Pearl:

Victims in collapse or crush zone may need eye, hearing and respiratory protection.



**Universal Patient Care** protocol  
**General Trauma** protocol  
**Extremity Trauma & Amputation, Entrapment** protocol  
 PRN  
**Pain Management** protocol as appropriate

## Legend

E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

<b>E</b>	<ul style="list-style-type: none"> <li>• <b>DO NOT ENTER COLLAPSE AREA UNLESS TRAINED AND EQUIPPED, CALL FOR HELP!</b></li> <li>• Access patient as soon as safe for responder, begin any care when able</li> <li>• Bleeding control, ABCs, O2, V/S, EKG, ETCO2 monitoring when able</li> <li>• Discuss extrication strategy and length of anticipated extrication with incident command.</li> <li>• Is there concern for prolonged time under load (&gt;30 min) and/or possible need for field amputation?</li> </ul>	<b>E</b>
	<p style="text-align: center;"><b><u>If prolonged extrication and time under load anticipated &gt;30 min</u></b>                  Call for additional resources (tools, agency, aeromedical, etc.)                  Notify dispatcher and agency supervisor                  Notify and consult with MD medical director or online medical control                  Consider need for treating prolonged bleeding, hypothermia, pain, other medical problems</p>	

<b>P</b>	<p><u>If patient with large surface area trapped &gt; 30 min, extended entrapment &gt;1 hr or clinically suspected crush injury syndrome (preferred to initiate before removal of load – but DO NOT delay rescue):</u></p> <p style="text-align: center;"><b>LR 1 Liter IV/IO bolus [Pedi 20mL/kg]</b>                  If hypotension ensues resuscitate in accordance with trauma protocol <b>TR.01 / TR. 02.</b></p> <p><u>If patient decompensates after removal with hyperkalemia associated symptoms (see Pearls):</u></p> <p style="text-align: center;"><b>Calcium gluconate 2 g IV/IO over 10 min [Pedi 60 mg/kg IV, max 800mg]</b>  <b>Albuterol 10mg neb [Pedi 2.5 mg]</b>  <b>Sodium Bicarbonate 50mEq slow IV/IO [Pedi 1mEq/kg, max 50mEq]</b></p>	<b>P</b>
	<p style="text-align: center;"><b>Contact Destination or Medical Control</b></p>	


## Pearls:

- Safety of emergency responders is paramount. Do not enter scene without appropriate PPE and training.
- Anticipate that patients will rapidly decompensate following extrication from a crush load or disentanglement.
- Recall symptoms of hyperkalemia may be peaked T-waves on EKG, inappropriately bradycardic rate or slow PEA.
- Issues with LR and potassium have largely been debunked. Either NS or LR is appropriate in this case.
- Remember all procedures will be more difficult and take more time, anticipate problems and use resources well.
- If it is obvious that removing the patient from entrapment (i.e. 2 train cars) will result in immediate death, consider end of life requests of the patient such as talking on phone with loved ones, receiving last rites, etc. Remember appropriate analgesia. Get extra scene assistance, contact MD medical director or online medical control can assist with comfort care instructions.

# TRAUMATIC BRAIN INJURY

<b>History:</b> <ul style="list-style-type: none"> <li>• Time of injury</li> <li>• Mechanism: blunt / penetrating</li> <li>• Loss of consciousness</li> <li>• Bleeding, other trauma</li> <li>• Medical hx, meds, allergies</li> <li>• Helmet use and condition</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Pain, swelling, bleeding</li> <li>• Altered mental status</li> <li>• Respiratory distress / failure</li> <li>• Vomiting</li> <li>• Pupillary abnormalities</li> <li>• CSF leak from ears, nose, mouth</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Skull fracture, abuse?</li> <li>• Concussion, contusion</li> <li>• Epidural/subdural hematoma</li> <li>• Subarachnoid, ICH</li> <li>• Spinal injury</li> <li>• Other? (ETOH, low BGL)</li> </ul>
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<b>Herniation Signs:</b> <ul style="list-style-type: none"> <li>• Rapidly falling GCS</li> <li>• Unilateral blown pupil</li> <li>• Posturing</li> <li>• Seizures</li> <li>• Cushing's triad</li> </ul>
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 <b>Universal Patient Care protocol</b> <b>Spinal Motion Restriction protocol PRN</b>
Perform rapid trauma assessment and evaluation of neurologic status. Pt GCS? Neuro deficits?
Aggressively manage all trauma bleeding and airway needs. As soon as possible manage TBI considerations.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

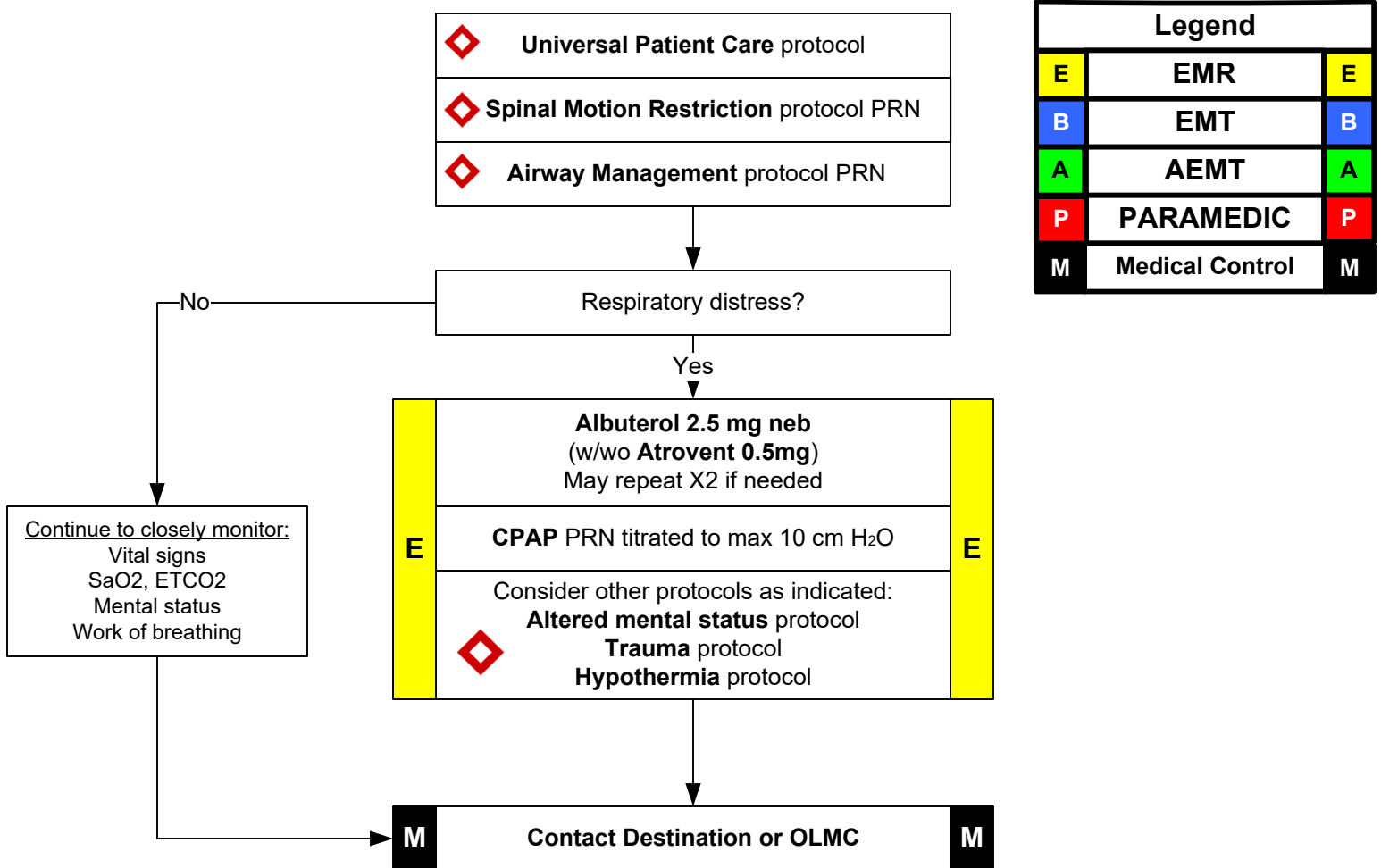
<b>NEVER LET THE H-BOMBS HAPPEN!</b> One episode doubles patient mortality, so NO: - <b>HYPOTENSION</b> - <b>HYPOXIA</b> - <b>HYPER/HYPOCAPNEA</b>		
<b>E</b>	Manage key TBI parameters: <ul style="list-style-type: none"> <li>• O2 PRN, keep SaO2 &gt; 94% using O2 device as needed</li> <li>• Ventilate as needed to keep ET/CO2 35 mm Hg</li> <li>• Avoid HYPER-thermia, passive cooling usually enough</li> <li>• Head of pt up 30 degrees, pad PRN to maintain C-spine protection</li> </ul>	<b>E</b>
<b>A</b>	Avoid hypotension, keep SBP > 90 and MAP > 70: <ul style="list-style-type: none"> <li>• If multisystem trauma suspected give blood to maintain V/S per <b>SO.04</b></li> <li>• <b>Otherwise, NS 20mL/kg bolus IV/IO PRN</b> to maintain goal vitals as above</li> <li>• Glucose assessment procedure, treat if &lt; 60 mg/dL.</li> </ul>	<b>A</b>
<b>P</b>	<ul style="list-style-type: none"> <li>• If BP not responsive to IVF bolus, see "Advanced BP Management" in <b>General Trauma</b> protocols <b>TR.01 / TR.02</b>.</li> <li>• Treat seizures if occurring per <b>Seizure</b> protocol <b>AM.09 / PD.13</b>.</li> <li>• If patient has signs of herniation (see herniation signs box @ top left):                         <ul style="list-style-type: none"> <li>- Adult: <b>Hypertonic saline 3% 250mL bolus IV/IO</b> once</li> <li>- Pedi: <b>Hypertonic saline 3% 3mL/kg bolus IV/IO</b> once (max 250mL)</li> </ul> </li> <li>• Or if hypertonic saline is unavailable:                         <ul style="list-style-type: none"> <li>- Adult: <b>Sodium bicarbonate 8.4% 100mL slow IV/IO</b> once</li> <li>- Pedi: <b>Sodium bicarbonate 1mEq/kg 8.4% slow IV/IO</b> once (max 100mL)</li> </ul> </li> </ul>	<b>P</b>

<b>M</b>	<b>Contact Destination or OLMC</b>	<b>M</b>
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<b>Pearls:</b> <ul style="list-style-type: none"> <li>• Hypotension is devastating to neurologic injury and should be aggressively treated, keep SBP &gt; 90mmHg and MAP &gt; 70mmHg or the age appropriate pediatric equivalent 70 + (age in years X2), oxygen, CO2 and temperature should be kept normal as well. Hypothermia is generally not beneficial for adults in the field but hyperthermia should be avoided.</li> <li>• If DSI for TBI patient is needed, Ketamine is a good choice for induction to help prevent hypotension. Concerns that ketamine raises ICP have been largely disproven from any clinical negative effect.</li> <li>• Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).</li> <li>• If hypotension without clear cause, consider spinal shock or additional occult injury as source.</li> <li>• Consider <b>Altered Mental Status</b> protocol for any trauma patient with altered LOC and minimal trauma.</li> <li>• Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. Any documented loss of consciousness, prolonged confusion or mental status abnormality should be evaluated by a physician ASAP.</li> </ul>
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# SUBMERSION AND DROWNING

<b>History:</b> <ul style="list-style-type: none"> <li>• Submersion in any depth water</li> <li>• Possible history of trauma</li> <li>• Duration of immersion</li> <li>• Temperature of water</li> <li>• Fresh/Salt Water</li> <li>• Age of patient pedi vs. adult</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Unresponsive</li> <li>• Mental status changes</li> <li>• Decreased or absent vital signs</li> <li>• Vomiting</li> <li>• Coughing</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Trauma</li> <li>• Pre-existing medical problem</li> <li>• Pressure injury (diving)                     <ul style="list-style-type: none"> <li>Barotrauma</li> <li>Decompression sickness</li> </ul> </li> </ul>
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**Pearls:**

- Criteria for resuscitation of a submersion victim depends on multiple circumstances. Age of victim, temperature of water, time last seen, time until effective rescue available all come into play. Do not risk emergency crews for a body recovery.
- Consider increasing rescue intervals for cold water (especially pediatric) submersions. In cold water, resuscitations at 40-45 minutes have been documented for children with normal neurologic outcomes.
- Final decision for transition from rescue to recovery mode rests with on-scene command.
- SMR should be used when a suspected or known traumatic mechanism preceded the drowning.
- Drowning is a leading cause of death among would-be rescuers. Allow appropriately trained rescuers to remove victims from areas of danger.
- With diving related injuries (decompression / barotrauma), consider transport to or availability of a hyperbaric chamber. If possible transport dive computer and/or dive logs with patient. Contact receiving facility early.
- Consider CPAP early if respiratory distress for any age if adequate mask seal can be established.
- **ALL VICTIMS OF SUBMERSION SHOULD BE TRANSPORTED PROMPTLY TO THE ED FOR EVALUATION DUE TO RISK OF DELAYED RESPIRATORY DISTRESS AND PULMONARY EDEMA (AKA SECOND DROWNING).**

# EYE/ENT INJURIES & COMPLAINTS

## History:

- Time and injury/onset
- Blunt/penetrating/chemical
- Involved chemicals/MSDS
- Wound Contamination
- Normal visual acuity/correction
- Anticoagulation

## Signs and Symptoms:

- Pain, swelling, blood, deformity
- Visual deficit, abnormal movement
- Leaking aqueous/vitreous humor
- Shooting or streaking light, colors
- Visual contaminants
- Rust ring around cornea

## Differential:

- Globe rupture, penetration
- Laceration, abrasion, ulcer
- Chemical, UV or thermal burn
- Orbital fracture, compt syndrome
- Nasal fracture
- Recent nasal surgery



Universal Care protocol

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## EYE RELATED COMPLAINTS

### Visible Foreign Body (hair, sand, etc.)

May gently irrigate eye with NS to try and wash away - do not rub. Dress both eyes with moist dressing if still symptomatic and go for evaluation.

### Extruded Eye or Open Globe

Gently cover with saline moistened gauze and dress to prevent any pressure on eye.

### Impaled Object (pencil, glass, etc.)

Do not remove, use cup or similar item to dress around the object and stabilize/protect. Cover both eyes and transport.

### UV/Thermal Burn

It may improve symptoms to gently irrigate with NS for 10-15 minutes, do not delay transport and do not place anything directly on the eye. Cover other eye.

### Chemical Burn

If large amount of chemical, irrigate face with copious amounts of water, avoiding runoff into good eye. Then continue irrigation of the eye with NS until at hospital. Be able to identify chemical. Morgan lens may be used if available.

## EPISTAXIS (NOSE BLEED)

- Adequate compression from the bridge to the base of the nose fixes 95% of epistaxis.
- Ensure nasal compression for at least 10 minutes continually.
- Instruct the patient not to blow their nose or snort or sneeze if avoidable.
- Ice pack may be placed over the forehead, nose or upper lip.
- Have the patient tilt their head forward to minimize bleeding down the throat.
- If bleeding is refractory to above then:  
**Oxymetazoline 2 sprays to nostril once** then repeat 10 min pressure.

- If bleeding is refractory to above then:  
**Tranexamic acid 500mg soaked onto gauze placed intranasally once** (pediatric dose 7.5mg/kg)
- Continue pressure.

Avoid vomiting, if nausea: **Nausea & Vomiting GC.09**

**Pain Management protocol GC.04 & GC.05 PRN**

M

Contact Destination or OLMC

M

## Pearls:

- Normal visual acuity can be present even with severe injury. Do not force eye open for evaluation. Cover both eyes to prevent further insult, remember they move together even when closed.
- Remove contact lenses whenever able, but if adherent to globe do not force. Irrigation may assist removal.
- Any chemical or thermal burns to the face/eyes should raise concern for airway injury, always assess the airway.
- Orbital fractures can come from direct trauma, may result in crepitus on the face or motion restriction of the eye.
- Use shield not pads for physical trauma to the eye, goal is to prevent additional pressure on globe. Pads ok for non-trauma eye.
- Nasal packing should be done carefully to ensure gentle pressure but make certain the gauze does not fall / lost into airway.

# BITES & ENVENOMATIONS

## History:

- Is the scene secure?
- Time and injury/onset.
- Where is the animal?
- Vaccination status if known?

## Signs and Symptoms:

- Pain, swelling, blood, deformity
- Symptoms of allergic reaction.
- Hemodynamic instability.

## Differential:

- Human bite
- Mammal bite
- Venomous insect bite
- Venomous animal bite

### \*\*Pearl: Exotic Snakes\*\*

Many people keep exotic snakes (cobras, etc.). For those bites ask owners if they keep a supply of anti-venom, if yes transport the anti-venom to the hospital with the patient.



### Universal Care protocol

Maintain scene safety, identify where the insect or animal is and ensure it is secure.  
Contact poison control when necessary  
**1-800-222-1222.**

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

Type of bite?

Animal

Insects

<b>E</b>	<input type="checkbox"/> General animal bites control bleeding if present, decontaminate with saline irrigation if needed, dress wounds appropriately.	<b>E</b>
	<input type="checkbox"/> For snake bites gently immobilize the extremity (can splint, rest, etc.) and keep slightly above heart level.	
	<input type="checkbox"/> Remove any constricting items such as jewelry, rings, etc.	
	<input type="checkbox"/> Do not apply ice or suction, etc.	

<b>E</b>	<input type="checkbox"/> Remove stinger if present. Scrape do not squeeze, use credit card, etc.	<b>E</b>
	<input type="checkbox"/> Remove any constricting items such as jewelry, rings, etc.	
	<input type="checkbox"/> Apply ice, elevate if swollen.	
	<input type="checkbox"/> If widespread muscle pain and spasm following suspected black widow spider bite contact medical control for possible additional interventions.	

<b>P</b>	 <b>Pain Management protocol</b> <b>GC.04 &amp; GC.05 PRN</b>	<b>P</b>
	Other <b>protocols</b> such as general trauma, allergic reaction, etc. as needed.	

<b>M</b>	<b>Contact Destination or OLMC</b>	<b>M</b>
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## Pearls:

- Always consider scene safety when responding to bite or envenomation calls, use caution and assess for swarming bees, live animals, etc. Request animal control and LE resources early, consider FD response for swarming bees.
- Human and cat bites are at VERY high risk for infection followed by all carnivore bites, recommend all patients come for evaluation and consideration of antibiotics.
- Do not bring any live insects or animals into the ambulance or to the Emergency Department. Pictures on a phone are usually enough to identify the source insect or animal. Remember even dead insects and animals can still sting and/or bite.
- Venomous snakes native to Texas are the crotalids better known as pit vipers (rattlesnake, copperhead and water moccasin) as well as one elapid (the Texas coral snake). Remember coral snake bites are fairly painless but toxic (red touching yellow).
- Snake bite patients should be transported to an emergency department that has antivenom (Crofab or Anavip usually).
- In Texas bats, skunks, foxes and raccoons are the highest risk for rabies. Dog risk is low unless in contact with high risk animals. Ask dog owners for proof of rabies vaccination or consider animal control quarantine for rabies observation.

# TRAUMATIC CARDIAC ARREST

## History:

- Events leading to arrest
- Estimated downtime
- PMHx, Medications
- Injury incompatible with life
- DNR

## Signs and Symptoms:

- Unresponsive
- Absent signs of circulation, movement, skin color, etc.
- Abnormal breathing (gasps)
- Pulseless

## Differential:

- Medical vs. Trauma
- VF vs Pulseless VT
- Asystole
- PEA
- LVAD

**Universal Patient Care protocol GC.01**

Any obvious reason/criteria to withhold resuscitation (i.e. trauma incompatible w/ life)?

No

Asystole or slow, wide PEA with reported loss of vital signs > 10 minutes prior to your evaluation?

No

Continue **high quality CPR** but place **emphasis** on addressing the critical issues below:

### Make Load and Go vs. Stay and Treat Decision

If distance to trauma center < **10 minutes**, initiate **transport immediately** and perform all procedures enroute. **Otherwise** the following should take place **on scene** as **quickly and simultaneously** as possible:

<b>E</b>	<ul style="list-style-type: none"> <li>- Rapidly stop all external hemorrhage with <b>tourniquets</b> and <b>wound packing</b>. Bind the pelvis.</li> <li>- Aggressive BLS airway management, consider inserting iGel as primary airway.</li> </ul>	<b>E</b>
<b>A</b>	<ul style="list-style-type: none"> <li>- If blunt or penetrating thorax or abdominal trauma: <b>Bilateral needle chest decompression OR Bilateral finger thoracostomy (ADULT ONLY &gt; 12yo)</b></li> <li>- Rapidly obtain IV/IO access and give: <b>LR 2L rapid bolus (Pedi 20mL/kg once)</b></li> </ul>	<b>A</b>
<b>P</b>	<p>For penetrating chest trauma "in the box", consider <b>pericardiocentesis</b> procedure (contact OLMC if needed for guidance).</p> <ul style="list-style-type: none"> <li>- If team agrees victim may be viable and if available (see blood Pearl at right): <b>Blood Product Administration SO.04</b></li> </ul>	<b>P</b>

**M** If ROSC on scene, transport immediately to nearest trauma center. If no response to therapy, contact OLMC for termination orders. **M**

Yes

**Termination of Resuscitation**  
Protocol **AA.06** and **PD.17**

Yes

### Legend

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

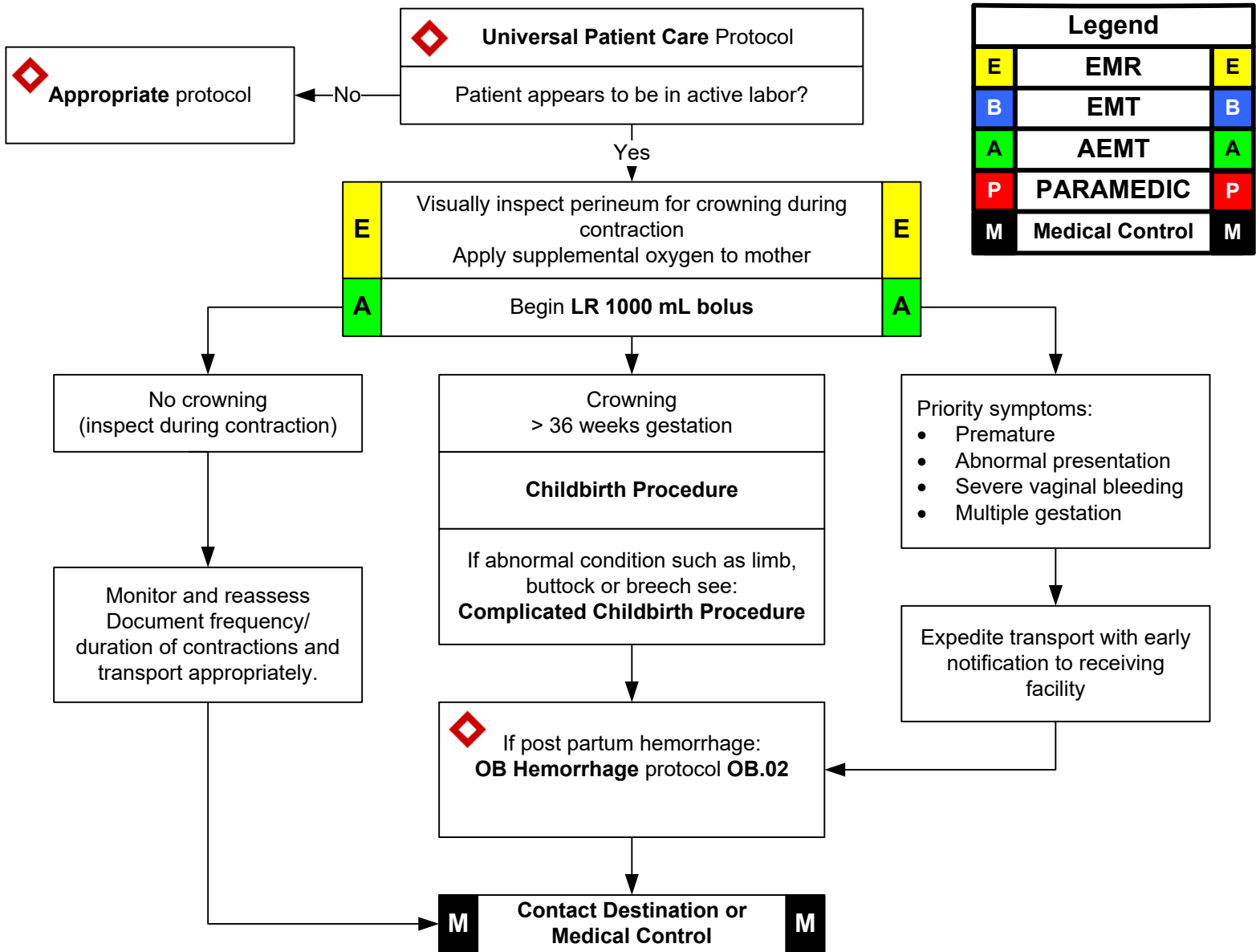
### Pearls:

- Traumatic cardiac arrest is **NOT** medical cardiac arrest and is managed differently. High quality CPR is important but the emphasis needs to be fixing what is making them dead: **exsanguination, obstructive traumatic shock, ventilatory failure**. ACLS medications do not improve outcomes and are not indicated (aka no Epi).
- The presence of a fast, narrow PEA means they are either obstructed (tension or tamponade) or they are massively hypovolemic or both! This is actually a good finding, decompress the chest and fill the tank (preferably with blood if available).
- If blood products are on scene, the provider may discuss attempting a blood product bolus to see if pulses can be recovered. This is at the sole discretion of the provider who has the blood products. Blood should generally be reserved for patients that the 'team' thinks has a reasonable chance of survival. Good indicators are recent arrest, narrow complex PEA, good ETCO2, etc.
- Survival is very poor from traumatic cardiac arrest but small outcomes differences were noted in patients who arrived at the trauma center within 20 minutes of traumatic arrest. The timeline decisions in this protocol are oriented around this, ten and ten. Vital signs within the last ten minutes...ten minutes to the trauma center. Yes and yes to these questions should be a 'load and go' situation! Stop bleeding, start CPR, BLS your airway and do everything else on the way to the trauma center.
- Termination of traumatic arrest is also different, it is based on response to treatment mainly. Providers may call for termination after appropriate management, not a time metric (i.e. 20 or 40 min).
- To perform finger thoracostomy and/or pericardiocentesis, the provider must have current training documentation on file.

# **OB/GYN SECTION**

# ACTIVE LABOR

<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Due date</li> <li>• Time contractions started / how often</li> <li>• Rupture of membranes</li> <li>• Time / amount of any vaginal bleeding</li> <li>• Sensation of fetal activity</li> <li>• Past medical and delivery history</li> <li>• Gravida/Para Status</li> <li>• Medications</li> <li>• High Risk pregnancy (known)</li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>• Episodic pain</li> <li>• Vaginal discharge or bleeding</li> <li>• Crowning or urge to push (defecate)</li> <li>• Meconium</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Abnormal presentation             <ul style="list-style-type: none"> <li>-- Buttock</li> <li>-- Foot</li> <li>-- Hand</li> </ul> </li> <li>• Prolapsed cord</li> <li>• Placenta previa</li> <li>• Abruptio placenta</li> <li>• Premature labor</li> <li>• False labor</li> </ul>
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- Pearls:**
- Document all times (delivery, contraction frequency, and length). Record APGAR at 1 minute and 5 minutes after birth.
  - If maternal seizure, refer to the **Obstetrical Emergencies** protocol. Eclampsia can occur up to 2 months post partum.
  - After delivery, allowing child to nurse and massage the uterus (lower abdomen) will promote uterine contraction and help to control postpartum bleeding.
  - Some post partum hemorrhage is frequently present. Significant (brisk or copious) bleeding should be addressed. Consult the OB Emergencies protocol. The perineum should be checked for bleeding from vaginal tears. Bleeding should be controlled by direct pressure over the laceration. The most common cause of post partum hemorrhage is uterine atony (muscle flaccidity) due to prolonged labor, or multiple gestations.

# OBSTETRICAL HEMORRHAGE

<b>History</b> <ul style="list-style-type: none"> <li>• Previous pregnancy</li> <li>• Previous C-section</li> <li>• Placenta previa diagnosis</li> <li>• Placenta accreta diagnosis</li> <li>• Bleeding disorders</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>• Painful bleeding</li> <li>• Painless bleeding</li> <li>• Bleeding post delivery</li> <li>• Vaginal lacerations</li> <li>• Shock?</li> </ul>	<b>Differential Pre-Delivery:</b> <ul style="list-style-type: none"> <li>• Placenta previa/accreta</li> <li>• Uterine rupture</li> </ul> <b>Differential Post-Delivery:</b> <ul style="list-style-type: none"> <li>• Uterine atony (#1 cause!)</li> <li>• Vaginal/external trauma</li> <li>• Retained placenta</li> </ul>
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Universal Patient Care protocol 

<b>Pregnancy Related Bleeding</b>		
<b>E</b>	<input type="checkbox"/> Place patient on supplemental oxygen (6-12lpm) <input type="checkbox"/> Position L lateral and for shock as needed	<b>E</b>
<b>A</b>	Establish large bore IV <b>LR 1L bolus</b> Titrate SBP > 90, MAP >65	<b>A</b>
<b>P</b>	If SBP < 90 and HR > 100 OR shock index > 1.0: <b>Tranexamic acid (TXA) 2 gram slow IV/IO push</b>	<b>P</b>

<b>Legend</b>		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

<b>Additional Treatment for Bleeding Following Delivery</b>		
<b>E</b>	<input type="checkbox"/> Evaluate the perineum for external lacerations and bleeding controllable with direct pressure <input type="checkbox"/> Firm fundal massage and encourage infant to breast feed	<b>E</b>
<b>P</b>	<b>Oxytocin 20 units</b> added to 1L NS or LR; run wide open until bleeding improved or 20 units given (see Pearls)	<b>P</b>

Bleeding improved and / or patient stable?

 Consider **Blood Product Administration** protocol **SO.04**

**Contact Receiving Facility or OLMC**

**Pearls:**

- Most post-partum patients will have a small amount of bleeding. Hemorrhage is significant when bleeding is brisk or copious. The perineum should be checked for bleeding from superficial vaginal tears, bleeding should be controlled with direct pressure, do not pack the vagina.
- The most common cause of post-partum hemorrhage is uterine atony from prolonged labor or multi-gestations.
- Remember painless bleeding can be placenta previa, whereas painful bleeding can be placental abruption, uterine rupture or remember to think about ectopic pregnancy in early pregnant patients.
- TXA can be administered to pregnant patients with severe bleeding. The risk is thought to be low but remember the treatment approach that mom must be alive for baby to stay alive.
- Oxytocin can be added to already running IV fluids but do not exceed a concentration of 10 units per 250mL of fluid.
- Placenta accreta is a complex problem with a very high risk of life threatening hemorrhage during labor.

# OB PREECLAMPSIA & ECLAMPSIA

## History:

- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

## Signs and Symptoms:

- Vaginal bleeding
- Abdominal pain, RUQ pain
- Seizures
- Hypertension, severe headache
- Visual changes
- Edema of hands and face

## Differential:

- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion



## Universal Patient Care protocol

Is the patient pregnant greater than 20 weeks or less than 6 weeks post-partum?

NO

Go to most appropriate protocol.

YES

Does the patient have **2 or more** of the symptoms noted below:

- Hypertension – BP > 140/90 (either SBP or DBP)
- Headache and vision changes
- Swelling of the hands, feet and or face
- Abdominal pain
- Altered mental status

YES

**E** Apply high flow oxygen.  
Place patient in L lateral recumbent position.

**P** **Magnesium sulfate 4 grams IV/IO infusion**  
administer over 20 minutes  
See Pearls below for administration precautions

Magnesium administration will not terminate active seizures. If the patient is seizing also use the **Seizure protocol AM.09.**



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

Go to **OB Hypertensive Emergency protocol OB.04.**



YES, STILL ELEVATED

After 15 minutes of magnesium sulfate, is BP still > 160 systolic or > 110 diastolic?

NO, IMPROVED

**M**

Contact Destination or OLMC

## Pearls:

- Hypertension in pregnancy, pre-eclampsia and eclampsia can all be part of the same syndrome. Treatment of blood pressure and the eclampsias should be done in tandem. See the OB hypertension protocol for blood pressure management guidelines. BP thresholds for eclampsia treatment and OB hypertensive emergencies are different (OB.04).
- Eclampsia, preeclampsia and seizures may occur from around 20 weeks of gestation up to 6-8 weeks post partum. Always consider this as a differential diagnosis in pregnant / recently pregnant seizure patients.
- Magnesium, especially in high and rapid doses, may cause hypotension, decreased respiratory drive, and altered mental status. Be prepared to deal with these side effects. Calcium can be effective in reversing some of these effects, contact online medical control if needed for instructions. Monitor patients closely for abnormal V/S and/or breathing.
- Check reflexes - Patients with abnormal or loss of deep tendon reflexes (i.e. patellar tendon knee jerk) may be at risk, this is a sign of impending respiratory or cardiac complications. Be prepared to treat hypotension and respiratory failure.

# OB HYPERTENSIVE EMERGENCY

## History:


- Past medical history
- Hypertension history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

## Signs and Symptoms:

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension, severe headache
- Visual changes
- Edema of hands and face

## Differential:

- Pre-eclampsia / Eclampsia
- Essential hypertension
- Gestational hypertension
- Hypertensive emergency

 **Universal Patient Care** protocol


This protocol is to be used for patients suspected of having a hypertensive crisis during pregnancy, **after 20 weeks gestation**. Unlike non-pregnant persons, the following approach is critical to treat even asymptomatic hypertension during pregnancy:

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

<b>E</b>	Apply high flow oxygen. Place patient in L lateral recumbent position if visibly pregnant.	<b>E</b>
<b>E</b>	Measure blood pressure and if $\geq$ than 160/110, wait 15 minutes and re-measure. If SBP or DBP either or both are still $\geq$ 160/110, proceed with BP treatment below.	<b>E</b>

<b>P</b>	<b>Labetalol 20mg IV over 2 min</b>  Reevaluate BP in 10 minutes. If still $\geq$ 160/110: <b>Repeat Labetalol 40mg IV over 2 min</b>  *If BP improved continue to monitor. See <b>Pearls</b> for Labetalol considerations.	<b>P</b>
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<b>M</b>	<b>Contact Destination or OLMC</b>	<b>M</b>
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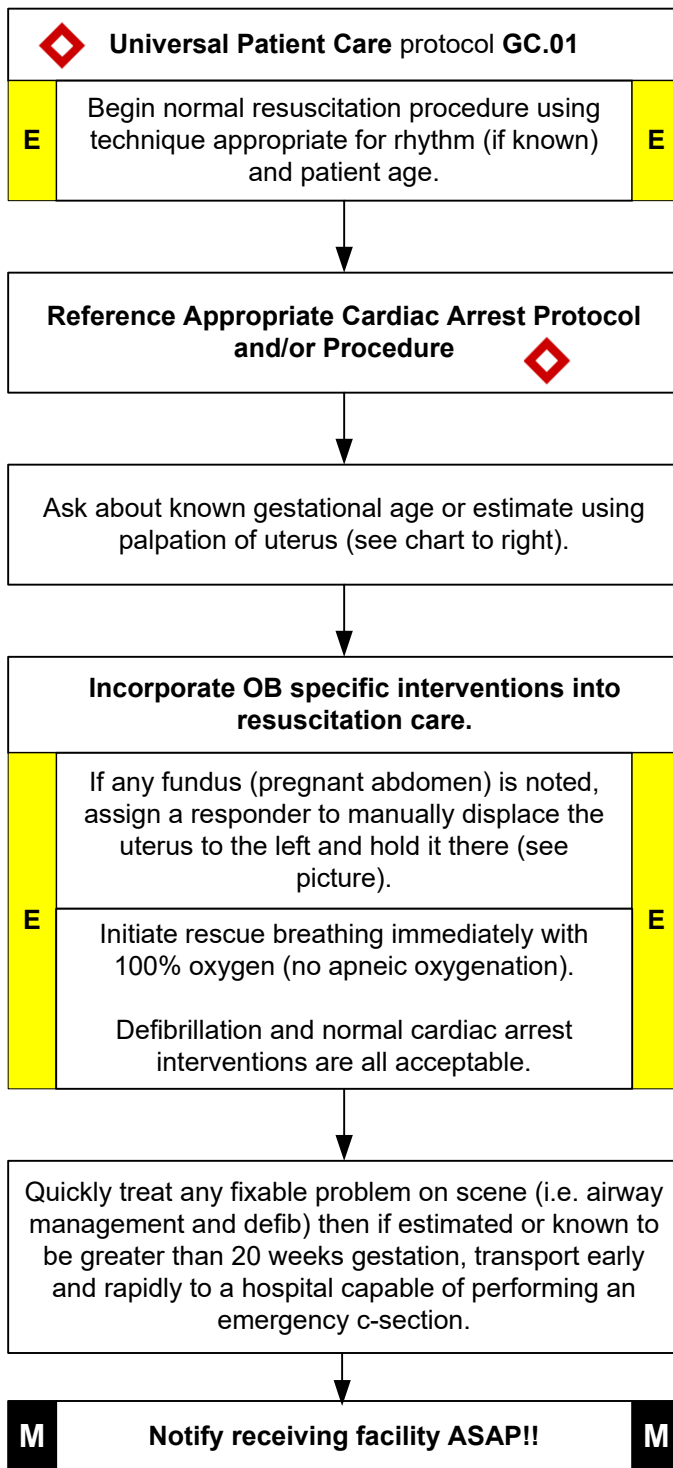
If symptoms of pre-eclampsia or eclampsia consider **OB.03** as well. 

## Pearls:

- Hypertension in pregnancy, pre-eclampsia and eclampsia can all be part of the same syndrome. Treatment of blood pressure and the eclampsias should be done in tandem. See the OB preeclampsia / eclampsia protocol as needed.
- Pregnant women may have chronic hypertension discovered before being 20 weeks gestation. Gestational hypertension is blood pressure greater than 140/90 found on examination after 20 weeks gestation.
- Pre-eclampsia is often accompanied by gestational hypertension and can be a warning sign.
- Severe hypertension is any blood pressure greater than or equal to 160/110 after 20 weeks gestation and should be aggressively treated, especially in the setting of pre-eclampsia symptoms. If pre-eclampsia or eclampsia is suspected as well, also use the OB protocol for those problems. Consultation with medical control may be beneficial.
- Labetalol should be used with caution in patients with active asthma, congestive heart failure or bradycardia. Consult medical control for assistance in decision making in these cases.

# ADULT PREGNANT CARDIAC ARREST

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



This protocol is intended to be used with the appropriate cardiac arrest protocol for the presenting problem or rhythm. The guidance is intended for women known to or suspected to be greater than 20 weeks pregnant.

## Estimation of Fetal Age:

- 12 weeks – Uterus can be palpated above the pubic symphysis.
- 20 weeks – Uterus can be palpated at the umbilicus (belly button).
- 36 weeks – Uterus can be palpated just below the sternum.



### Pearls:

- Pregnancy starts to affect maternal physiology negatively starting as early as 16 weeks. Uterine compression of the inferior vena cava is one of the largest issues impacting venous return to the heart since the uterus gets as much as 10% of the total cardiac output in pregnancy. Displacing the uterus off of the vena cava is imperative to help alleviate this.
- Oxygen consumption in pregnancy is very high. Supplemental oxygen is always indicated and providers should not perform typical 'cardio-cerebral resuscitation' involving apneic oxygenation like might happen in a typical adult arrest. Ventilations should begin with 100% oxygen immediately.
- Emergency c-section may be indicated in cases where the infant is older than 23 weeks gestation. Generally in these cases the provider can feel the uterine fundus at or above the belly button. However, c-section can improve maternal mortality in most cases (although the prognosis is still poor), so for any visibly pregnant patient, urgent transport to a hospital capable of performing an emergency c-section is important. Some ER physicians may be capable of performing this as well, know your local capabilities.

# NEONATAL RESUSCITATION

## History

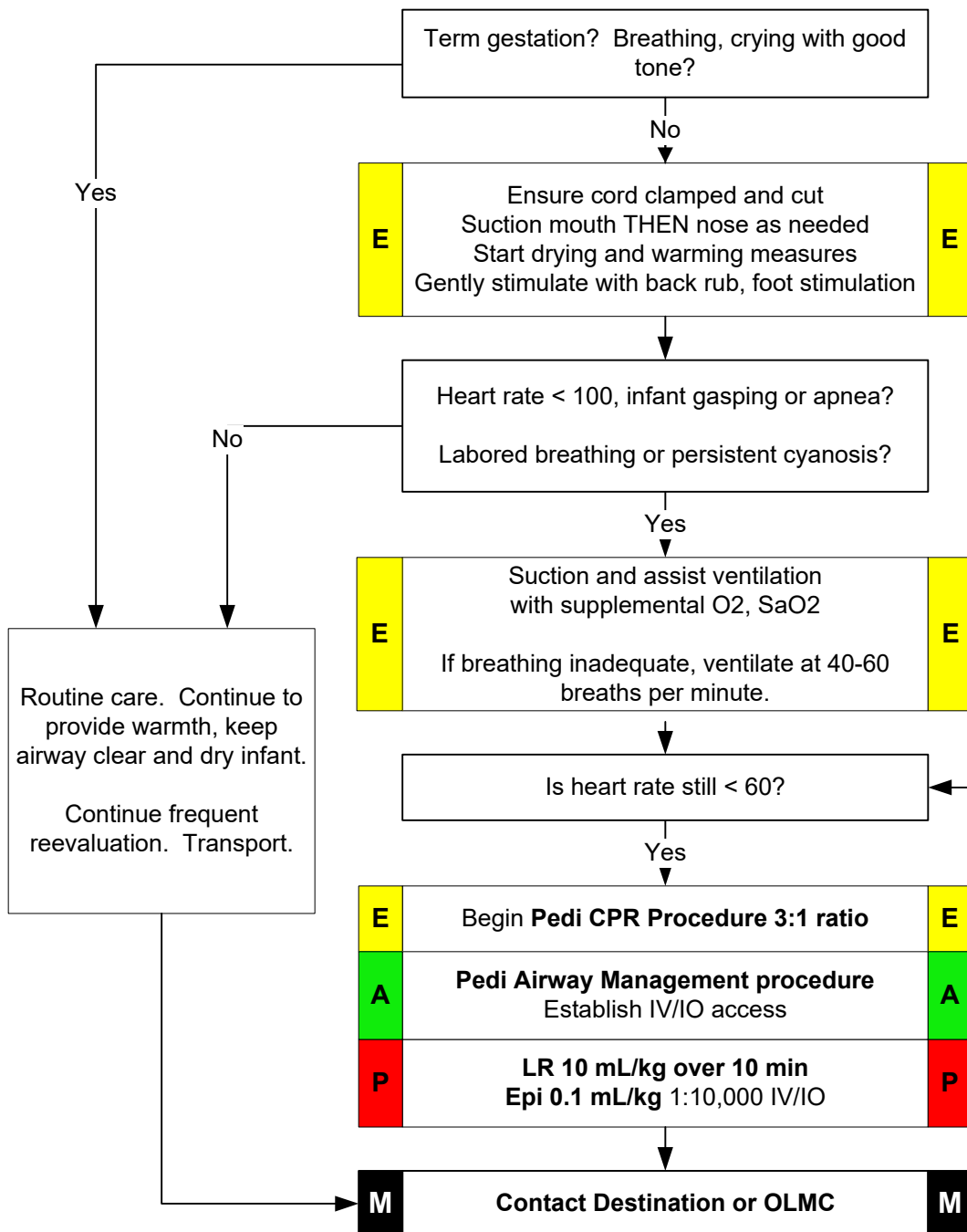
- Gestational age
- Maternal prenatal care history
- Gravida/para mother
- Delivery complications
- Maternal history of drug or alcohol

## Signs & Symptoms

- APGAR Score at 1 and 5 minutes
- Meconium
- Hypothermia, Hypoglycemia
- Cyanosis
- Birth trauma

## Differential:

- Multiple gestation
- Complicated delivery
- Congenital defects
- Hypoxic injury
- Withdrawal syndrome



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

### Remember the Timing!

- 0-30s**  
Warming, drying, stimulation and evaluation of HR
- 30-60s**  
Assisting ventilation and oxygenation if HR < 100
- 60-90s**  
Start CPR if HR < 60
- 90-120s**  
Continue CPR, fluid bolus and epinephrine if HR < 60

## Pearls:

- Active warming required in all environments to prevent hypothermia.
- Have mother nurse baby immediately after warming and suctioning if infant is clinically stable.
- Remember to obtain APGAR scores at 1 and 5 minutes.
- Use the infant's right upper extremity for obtaining oxygen saturation whenever possible (in case of coarctation).
- Pediatric CPAP bag (Mapleson) should be utilized if available for ventilations to help ensure appropriate airway pressures.
- Check blood glucose as soon as able, see pediatric altered mental status for glucose dosing.
- Consider other diagnosis in the neonate not responding to resuscitation, narcotic or substance intoxication, trauma, etc.

# NEONATAL RESUSCITATION - APGAR

<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Gestational age</li> <li>• Maternal prenatal care history</li> <li>• Gravida/para mother</li> <li>• Delivery complications</li> <li>• Maternal history of drug or alcohol</li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>• APGAR Score at 1 and 5 minutes</li> <li>• Meconium</li> <li>• Hypothermia, Hypoglycemia</li> <li>• Cyanosis</li> <li>• Birth trauma</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Multiple gestation</li> <li>• Complicated delivery</li> <li>• Congenital defects</li> <li>• Hypoxic injury</li> <li>• Withdrawal syndrome</li> </ul>
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	<i>Points Value</i>		
	<b>0</b>	<b>1</b>	<b>2</b>
<p><b>APPEARANCE</b> <i>Evaluate skin color.</i></p>	Blue or pale all over	Blue extremities, body is pink	No cyanosis, body and extremities are pink
<p><b>PULSE</b> <i>Evaluate pulse rate.</i></p>	Absent	< 100 beats per minute	> or equal to 100 beats per minute
<p><b>GRIMACE</b> <i>Reflex response to stimulation.</i></p>	No response to stimulation	Grimaces to suction or aggressive stimulation	Cries on stimulation
<p><b>ACTIVITY</b> <i>Muscle tone.</i></p>	None	Some flexion	Flexes arms and legs, resists extension
<p><b>RESPIRATION</b> <i>Respiratory effort.</i></p>	Absent	Weak, irregular or gasping	Strong, robust cry

<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>• Active warming required in all environments to prevent hypothermia.</li> <li>• Have mother nurse baby immediately after warming and suctioning if infant is clinically stable.</li> <li>• Remember to obtain APGAR scores at 1 and 5 minutes.</li> <li>• Use the infant's right upper extremity for obtaining oxygen saturation whenever possible (in case of coarctation).</li> <li>• Pediatric CPAP bag (Mapleson) should be utilized if available for ventilations to help ensure appropriate airway pressures.</li> <li>• Check blood glucose as soon as able, see pediatric altered mental status for glucose dosing.</li> <li>• Consider other diagnosis in the neonate not responding to resuscitation, narcotic or substance intoxication, trauma, etc.</li> </ul>
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# **PEDIATRIC CARE** **SECTION**

# PEDIATRIC CARDIAC ARREST

## History:

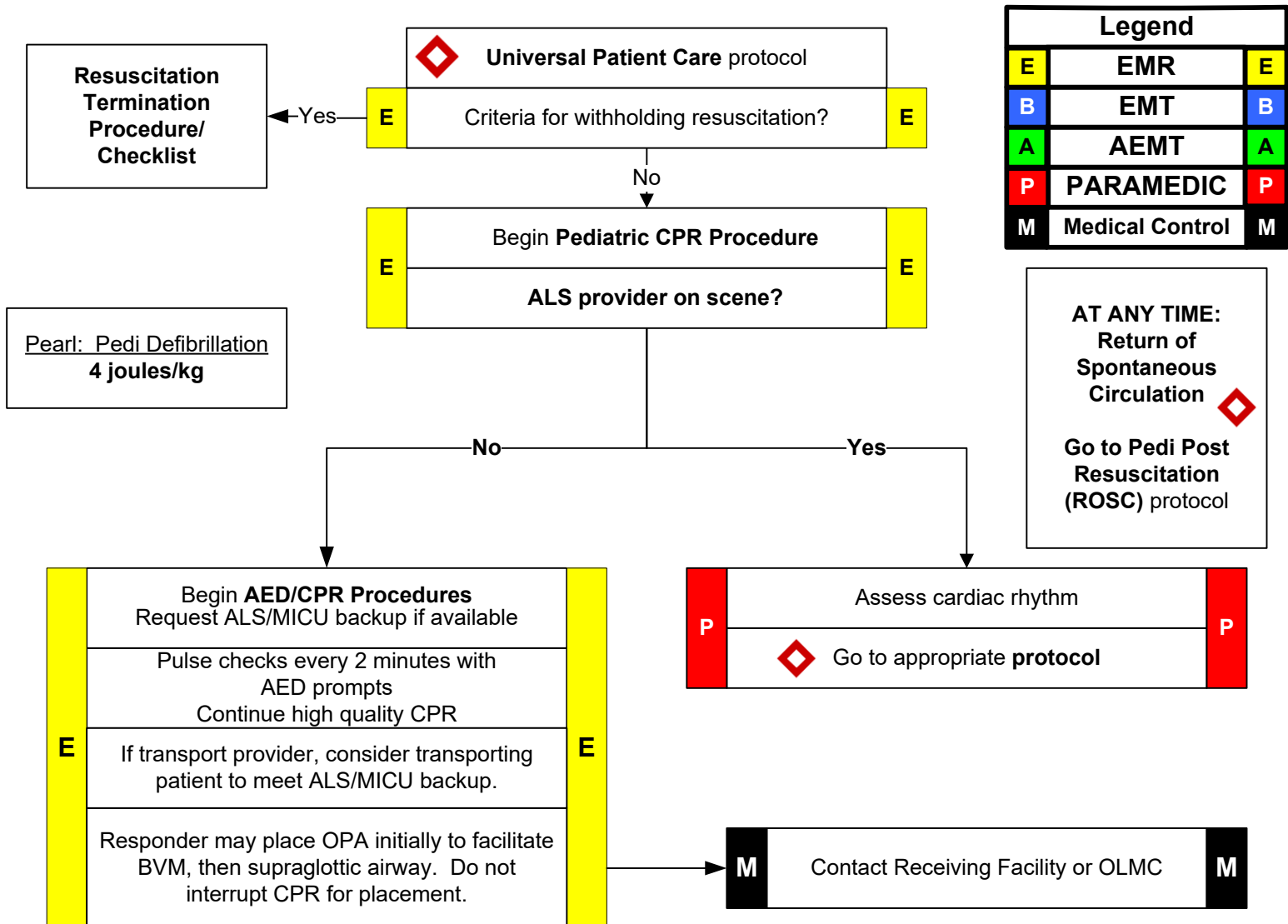
- Events leading to arrest
- Estimated downtime
- Past medical history, birth history
- NICU stay? Monitoring at home
- Medications
- Existence of terminal illness
- Signs of lividity or rigor

## Signs and Symptoms:

- Unresponsive
- Absent signs of circulation, movement, skin color, etc.
- Abnormal breathing (gasps)
- Pulseless

## Differential:

- Respiratory arrest
- Medical vs. Trauma
- VF
- Pulseless VT
- Asystole
- PEA
- Abuse/neglect/poisoning



## Pearls:

- Remember the differences in pediatric resuscitation. Do appropriate compressions and manage the airway early. Most pediatric arrests begin with respiratory compromise.
- If three or more responders are present, use the "pit crew" CPR procedure if the patient is large enough. Sometimes pediatric patients will be too small to make "pit crew" CPR feasible. Use "thumbs encircling" compression technique in neonates/infants.
- BLS providers are only allowed to use AED functions for defibrillation. Do not interrupt compressions for any reason, examples are airway placement, ventilation, medication administration. Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Immediate and adequate compressions with timely defibrillation are the keys to survival.
- Reassess airway frequently and after every patient move, especially if advanced airway in place. If equipped, monitor end tidal CO2 and also use "CPR feedback device" to record and help set CPR rate/depth.
- Remember energy settings: Pediatric defibrillation 4 joules/kg. Use pedi pads or pedi AED whenever possible.

# PEDIATRIC V-FIB AND V-TACH

<b>History:</b> <ul style="list-style-type: none"> <li>Past medical history/meds</li> <li>Events leading to arrest</li> <li>Estimated downtime</li> <li>Suspected hypothermia</li> <li>Suspected overdose</li> <li>Congenital defects</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>Pulseless</li> <li>Abnormal Breathing (gasps)</li> <li>No electrical activity on ECG</li> <li>No auscultated heart tones</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Medical or Trauma</li> <li>Hypoxia</li> <li>Electrolytes (potassium, etc)</li> <li>Drug overdose</li> <li>Acidosis, hypothermia</li> <li>Obvious Death</li> </ul>
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## Look for and treat H & T's:

Hypoxia

Tension Pneumothorax

Hypothermia

Hypovolemia

LR 20 mL/kg IV/IO bolus

Hypoglycemia

D10W 5mL/kg IV/IO  
(Max 250mL)

Acidosis

Ensure adequate ventilation

Hyperkalemia / TCA OD

Calcium gluconate 60 mg/kg IV/IO  
(max 800 mg/dose)

Age 2 or older:

Sodium bicarb 8.4% 1 mEq/kg IV/IO

Age less than 2yo:

Sodium bicarb 4.2% 2mEq/kg IV/IO

OD Calcium channel/Beta blocker

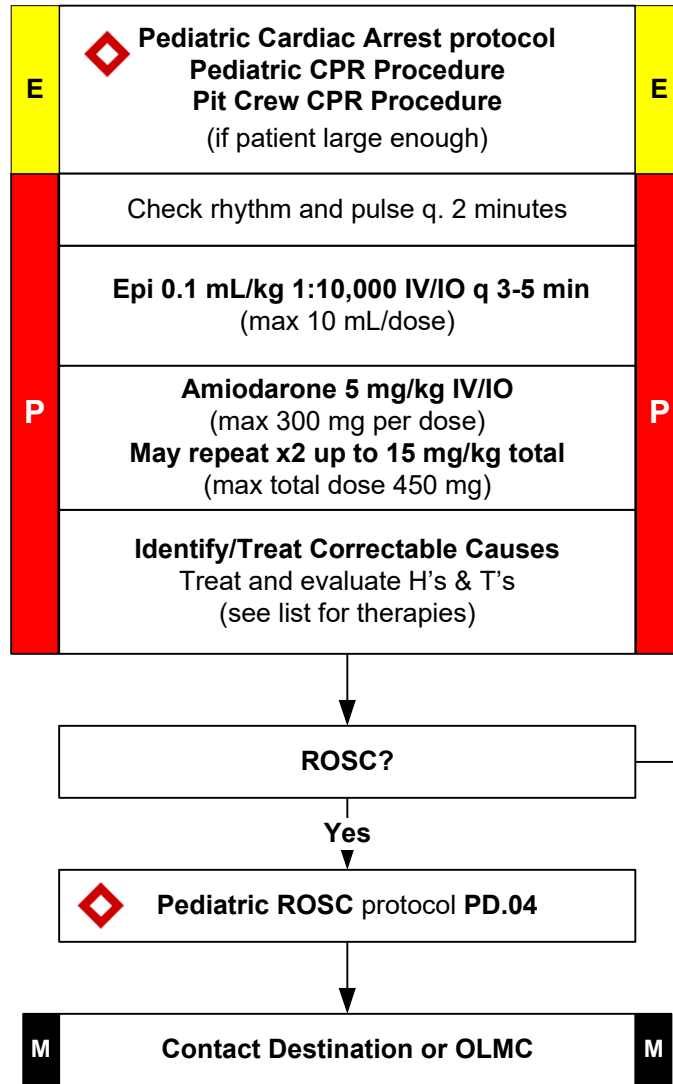
Calcium Gluconate 60mg/kg IV/IO  
(max 800mg/dose)

OD Narcotics/Heroin


Naloxone 0.1mg/kg IV/IO  
(max 2mg)

Torsades de Pointes

Magnesium sulfate 50mg/kg IV/IO




Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M


**AT ANY TIME**

Change in rhythm, go to appropriate **protocol**.

For return of spontaneous circulation go to **Pediatric ROSC protocol PD.04**.



 After 20 min. or > 4 rounds CPR and treating H & T's, contact online medical control for guidance.

## Pearls:

- Treatment priorities are different for children: **begin ventilation, then** high quality, uninterrupted compressions and defibrillation, then IV/IO, drugs.
- Correctable causes of arrest must be addressed, do not call for discontinuation/termination order without treating appropriate H's & T's.
- Remember to focus on high-quality effective CPR at all times, push hard, fast at greater than 100 beats per minute, change compressors often! Use the "pit crew" method whenever responder numbers and patient size permits. Use thumb-encircling technique for neonates/infants. Use CPR feedback/performance device if equipped when patient size permits.
- EMRs, EMTs and AEMTs may only use automated defibrillation (AED), prefer pediatric AED pads.
- Most pediatric patients can be ventilated adequately with BVM and mask. Remember to document airway placement after every move and at transfer of patient care. Continuous ET/CO2 waveform capnography should be used if equipped.
- If question of low amplitude V-fib, increase gain on the monitor and if question exists, defibrillate PRN.

# PEDIATRIC PEA AND ASYSTOLE

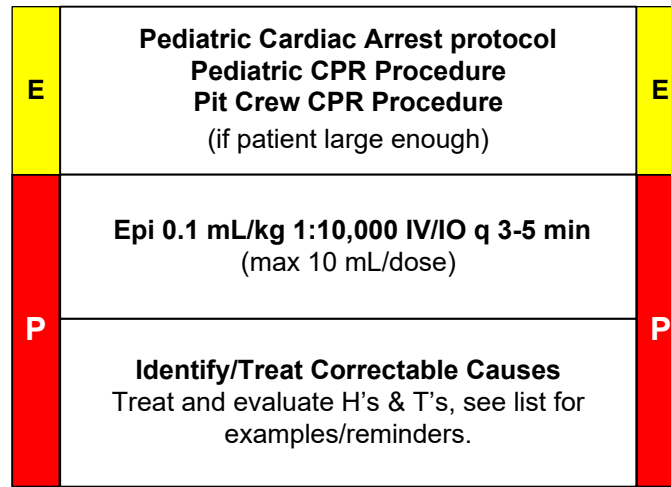
Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

 **AT ANY TIME**

Change in rhythm, go to appropriate **protocol**.

For return of spontaneous circulation go to **Pediatric ROSC** protocol

 **Pedi Cardiac Arrest protocol**



- Look for and treat H & T's:**
- Hypoxia
  - Tension Pneumothorax
  - Hypothermia
  - Hypovolemia
  - LR 20 mL/kg IV/IO bolus**
  - Hypoglycemia
  - D10W 5mL/kg IV/IO**  
(Max 250mL)
  - Acidosis
  - Ensure adequate ventilation**
  - Hyperkalemia / TCA OD
  - Calcium gluconate 60 mg/kg IV/IO**  
(max 800 mg/dose)
  - Age 2 or older:  
**Sodium bicarb 8.4% 1 mEq/kg IV/IO**
  - Age less than 2yo:  
**Sodium bicarb 4.2% 2mEq/kg IV/IO**
  - OD Calcium channel/Beta blocker
  - Calcium Gluconate 60mg/kg IV/IO**  
(max 800mg/dose)
  - OD Narcotics/Heroin
  - Naloxone 0.1mg/kg IV/IO**  
(max 2mg)
  - Torsades de Pointes
  - Magnesium sulfate 50mg/kg IV/IO**

Evaluate the category of the rhythm:

Narrow/Fast PEA (< 120ms)

**Consider Volume / Obstructive:**

- Hypovolemia, Hemorrhage
- Pneumothorax, Tamponade
- PE

Wide/Slow PEA (> 120ms)

**Consider Metabolic / Pump Failure:**

- Acidosis, Hyperkalemia
- Toxin, BB, CACB Toxicity
- Massive MI

Asystole

**Consider H & T Causes:**

- Hypoglycemia
- Toxins
- Narcotic overdose

Use **treatments** in the H&T causes box above to treat **suspected or known** causes as listed.

After 20 minutes of appropriate resuscitation, evaluate total arrest time and ETCO<sub>2</sub>:

- If **Asystole or Wide/Slow PEA and ETCO<sub>2</sub> < 15** - consider calling OLMC for termination orders.
- If **any rhythm and ETCO<sub>2</sub> > 15**, resuscitate for additional **20 minutes** address H&T's.
- Consider evaluation for pseudo-PEA using point of care ultrasound if available (see Pearls).

**M**      **Contact Destination or OLMC**      **M**

- Pearls:**
- Treatment priorities are different for children: **begin ventilation, then** high quality, uninterrupted compressions, defibrillation, then IV/IO, drugs.
  - Correctable causes of arrest must be addressed, do not call for discontinuation/termination order without treating appropriate H's & T's as able. Remember to focus on high-quality effective CPR at all times, push hard, fast at greater than 100 beats per minute, change compressors often! Use the "pit crew" method whenever responder numbers and patient size permits. Use end-tidal CO<sub>2</sub> monitoring and CPR feedback/performance device when equipped.
  - Pseudo PEA occurs when the heart is actually contracting but not generating a palpable pulse and has a better prognosis. In organized PEA when available, use ultrasound to evaluate for any cardiac movement, contact OLMC for advice if found.

# PEDIATRIC RETURN OF CIRCULATION


## Receiving Facility Pearls:

Contact receiving hospital ASAP to advise of ROSC alert.

Transport pediatric ROSC patients to facilities with pediatric ICU capability.

If STEMI noted, contact OLMC early for destination discussion.

## Manage Airway


**E**  Obtain airway if not already done  
**Airway Management** protocol **E**

## Optimize Breathing

**E** **AVOID HYPERVENTILATION**  
- SaO<sub>2</sub> goal is around 94%, use O<sub>2</sub> as needed.  
- Goal ETCO<sub>2</sub> is 35-45, adjust ventilation rates carefully as needed. **E**

## Achieve Systolic BP Goal (70+[age x 2])

Use IV fluids and vasopressors simultaneously as needed. Watch HR for bradycardia.

<b>A</b>	<p>Begin <b>LR 20 mL/kg IV/IO bolus</b> (may repeat 10mL/kg boluses PRN to support BP to max of 40mL/kg total)</p>	<b>A</b>
<b>P</b>	<p>Begin to “fill tank” with crystalloid then use vasopressors PRN to goal MAP. Push dose epinephrine may be used alone, before, or in combination with, epinephrine infusion. Contact OLMC if you feel the need to use multiple vasopressor infusions.</p> <p>- Push dose Epi 0.5-2 mL q. 5 min (5-20 mcg 1:100,000) OR - Epinephrine 0.1 – 1 mcg/kg/min IV/IO</p> <p>Contact OLMC to discuss <b>Amiodarone</b> if significant ongoing ventricular ectopy is being seen.</p>	<b>P</b>
<b>P</b>	<p> Obtain 12 Lead EKG to evaluate for STEMI even in pediatric patients! If STEMI noted, see receiving facility pearls above. Avoid active rewarming in pediatric ROSC (don't cool, don't warm). Go to most appropriate <b>protocol</b> for other problems such as bradycardia, etc.</p>	<b>P</b>

**M** **Notify Destination or Contact OLMC** **M**

## Legend

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

## Pearls:

- Epinephrine, based on data, is the preferred vasopressor for ROSC in pediatric patients.
- Hyperventilation is a significant cause of hypotension and cardiac arrest in the post resuscitation phase it must be avoided. Oxygen saturations should be kept between 93-95%, avoid hyperoxia as it can cause cell death to CNS and cardiac tissues.
- Monitor ETCO<sub>2</sub> - a rapid rise or fall in ETCO<sub>2</sub> can signal impending re-arrest. Take action to identify the problem quickly.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, they require close monitoring.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Significant ectopy is defined as a dysrhythmia that meets treatment criteria as part of another protocol (i.e. SVT, V-Tach).
- After obtaining ROSC, the provider may wish to remain in place for 5-10 additional minutes to stabilize ABCs. The patient should be medically maximized before moving. Exceptions are time sensitive causes such as STEMI.
- **These patients should only be transported to Resuscitation Centers of Excellence with robust pediatric ICUs.**

# PEDIATRIC BRADYCARDIA

## History:

- Past Medical History
- Congenital heart issues
- Medications
- Access to adult medications
- Events leading up to now

## Signs & Symptoms:

- Age based low HR w/ symptoms
- SOB, pulmonary edema
- Shock or hypotension
- Signs of poor perfusion
- Hypothermia

## Differential:

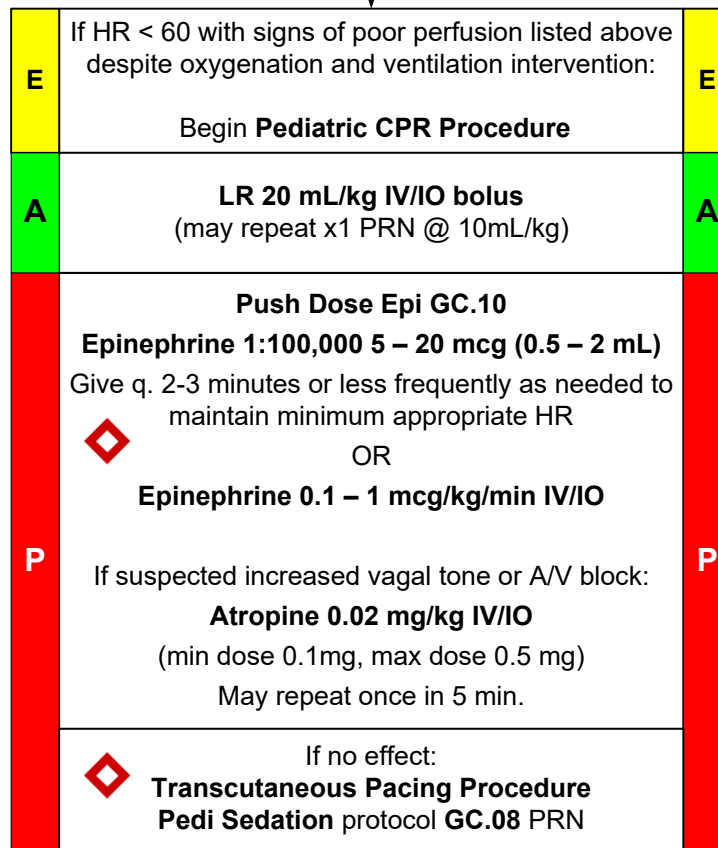
- Profound hypoxia
- Infection or sepsis
- Medication or toxin
- Hypoglycemia
- Trauma or head trauma
- Congenital heart / metabolic prob.



**Universal Patient Care protocol  
Pediatric Airway protocol PRN**



Only use this protocol for symptomatic bradycardia!  
(AMS, cyanosis, SOB, hypotension, shock)



**M**      **Contact Destination or OLMC**      **M**

## Legend

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

## Age based heart rates:

Neonate	120-180
First year	100-180
Toddler	80-150
5 to 10	80-130
> 10yo	60-120

Consider treatable or reversible causes for bradycardia:

Hypoxia  
Hypovolemia  
Hypoglycemia  
Hypothermia  
Hyperkalemia  
Toxins  
Trauma

See H & T treatments in **cardiac arrest protocols** for specific therapies.

Refer to **PD.14** or **PD.15** for poisoning, overdose.

## Pearls:

- Treatment of pediatric bradycardia is based upon the presence or absence of symptoms, see normal rates above.
- If symptomatic, treat. If asymptomatic, monitor closely for any deterioration and use most appropriate **protocol**.
- If a patient has AMS with normal blood pressure and normal peripheral perfusion (i.e. good capillary refill, palpable heart rate and pulses, obtainable SaO<sub>2</sub>, etc.), bradycardia is not likely the cause, look for other causes.
- Consider treatable causes for bradycardia listed above similar to H's and T's and treat appropriately.
- Be sure to aggressively oxygenate to SaO<sub>2</sub> of at least 94% and support respiratory effort.
- Refer to **Pediatric Sedation** protocol if using transcutaneous pacing if patient awake and responding.
- Remember pediatric ingestion of adult medication (B and Ca-channel blockers, clonidine) is a common cause.

# PEDI NARROW COMP. TACHYCARDIA

## History:

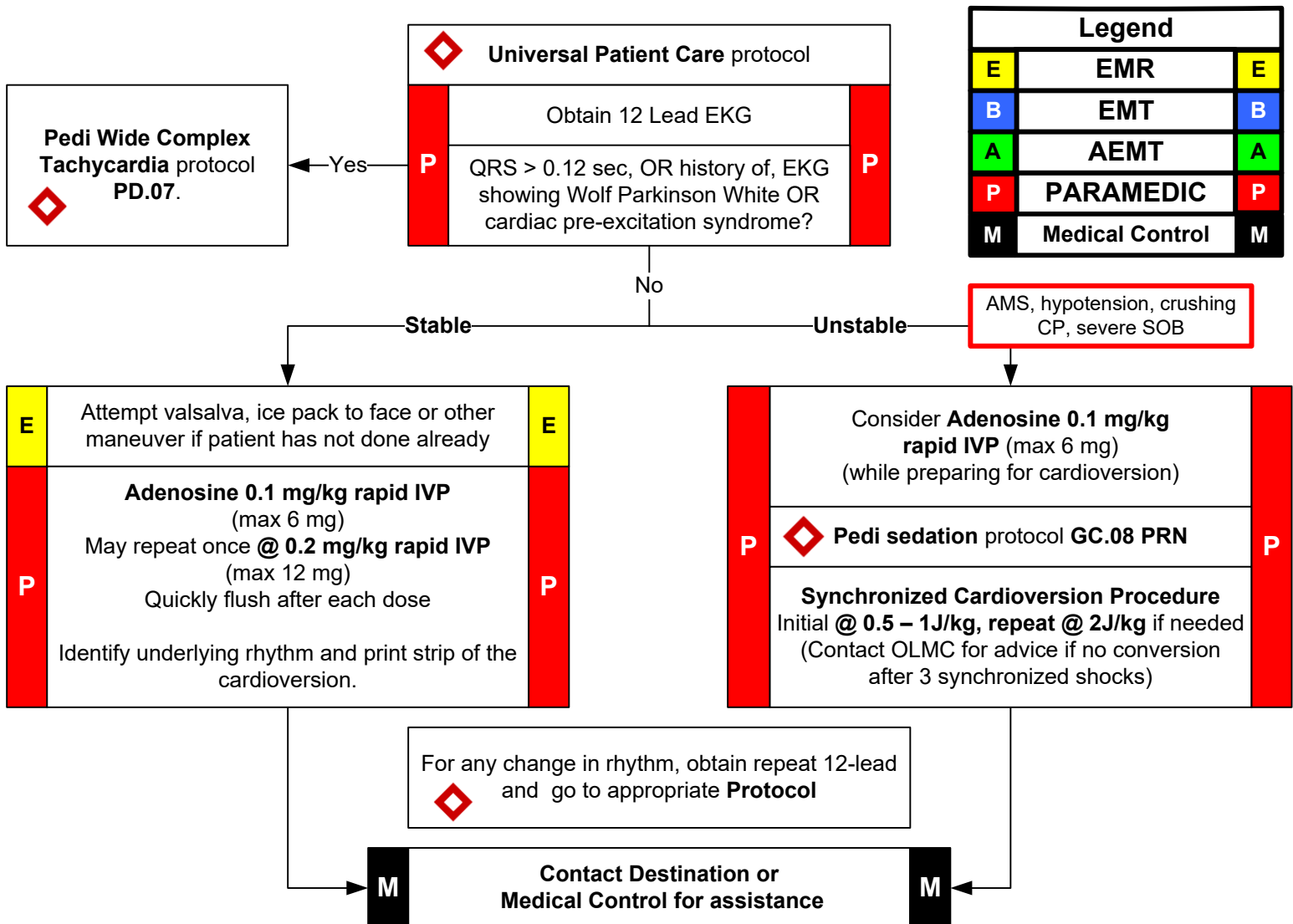
- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- Hx of nodal ablation
- History of palpitations / heart racing
- Syncope / near syncope

## Signs and Symptoms:

- HR typically greater than 180 bpm for children and 220 bpm for infants
- QRS less than 0.12 Sec (QRS greater than 0.12 sec go to V-Tach Protocol)
- If history of WPW, go to V-Tach Protocol
- Symptomatic patients typically have – Dizzy, SOB, CP, syncope, AMS.

## 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 Hx)
- Hyperthyroidism
- Pulmonary embolus



- Carefully evaluate the rhythm to distinguish sinus tachycardia, supraventricular tachycardia and ventricular tachycardia. Recall that sinus tachycardia is usually less than 180 bpm in children and 220 bpm in neonates with regular P-waves. SVT is usually faster than those thresholds with a QRS duration less than 100 ms.
- Contact Medical Control before giving medication if child has known Wolf-Parkinson-White or EKG evidence of WPW or cardiac pre-excitation pathway (accessory pathway with hx of rapid rate), do NOT give AV nodal blocking agents!
- Use pediatric defibrillator settings and pads for children. Document all rhythm changes and therapeutic interventions.
- Estimation of the usual maximum sinus tachycardia rate = 220 bpm - patients age in years.
- Do not treat asymptomatic patients with no evidence of physical or circulatory distress. Contact medical control.
- Children with a history of congenital heart defects, cardiac surgery or implanted devices are complex. Consider contacting medical control prior to intervention in patients with known heart problems or defects.

# PEDI WIDE COMPLEX TACHYCARDIA

## History:

- Medications or toxic ingestion, consider aminophylline, ephedrine, diet pills, thyroid
- History of palpitations or congenital heart problems
- Recent syncope / near syncope

## Signs and Symptoms:

- Heart rate in pathologic range for age. Child > 180/bpm, infant > 220
- Pale, cyanotic or diaphoretic
- Tachypnea, CHF or SOB
- Syncope or hypotension
- AMS
- QRS width more than 100 ms

## Differential:

- Cardiac abnormality, electrical or structural (WPW, tetralogy)
- Electrolyte imbalance
- Exertion, pain, stress, trauma
- Fever, infection, sepsis
- Hypoxia, hypovolemia
- Drug effect, toxin, ingestion

Example delta wave in WPW seen in V4.

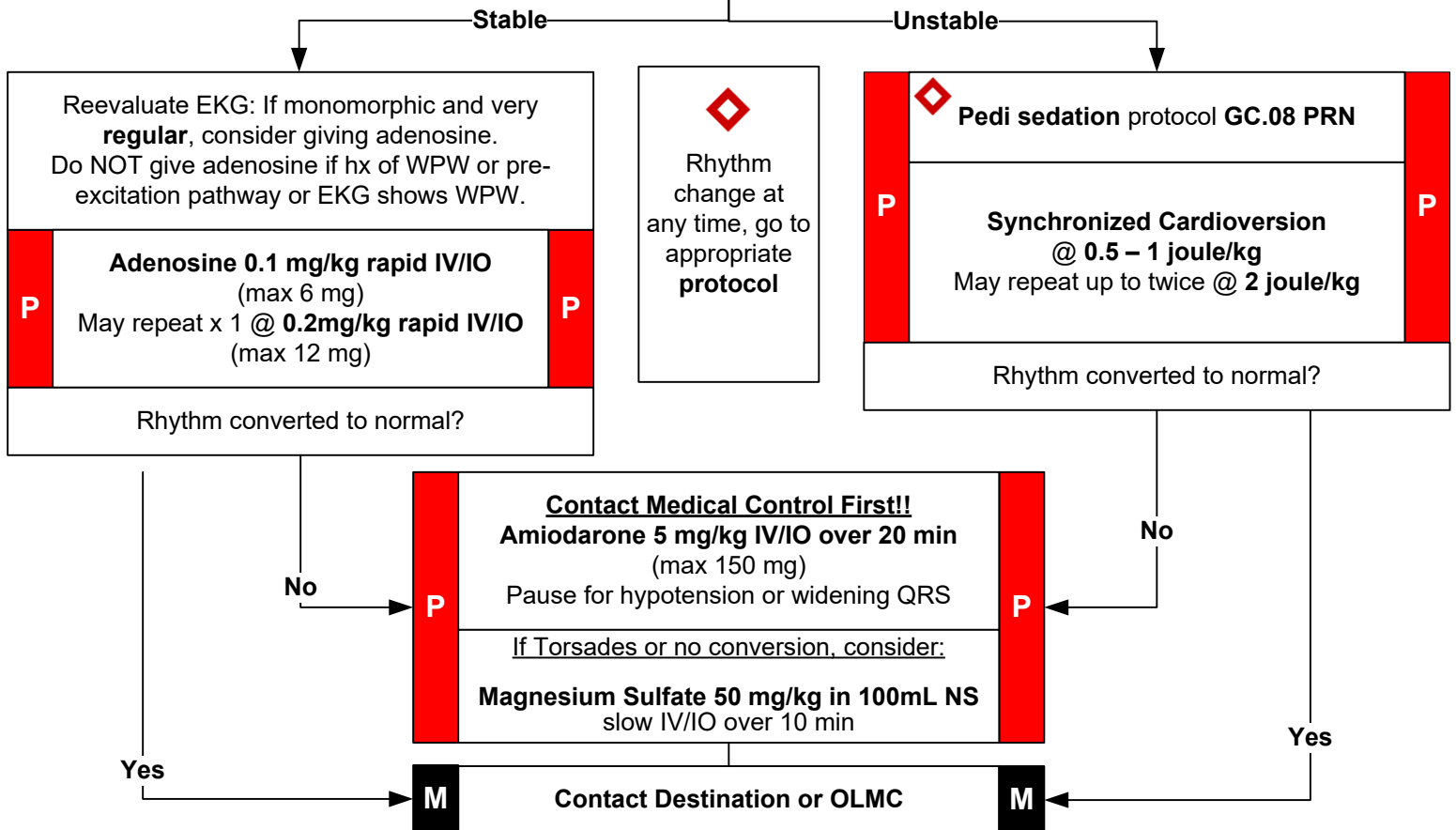


**Universal Patient Care** protocol

Ensure 12-lead EKG done, patent IV access

Patient stable or unstable?  
Unstable features are severe chest pain, severe respiratory distress, altered mental status, cyanosis.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



## Pearls:

- Carefully evaluate the rhythm to distinguish sinus tachycardia, supraventricular tachycardia and ventricular tachycardia. Recall that sinus tachycardia is usually less than 180 bpm in children and 220 bpm in neonates with regular P-waves. Ventricular tachycardia can be slower or faster than those thresholds with a QRS duration more than 100 ms.
- Contact Medical Control before giving medication if child has known Wolf-Parkinson-White or EKG evidence of WPW. Do not give AV nodal blocking agents to any child with WPW or pre-excitation syndromes or conduction pathway.
- Use pediatric defibrillator settings and pads for children. Document all rhythm and interventions with monitor strips.
- Do not treat asymptomatic patients with no evidence of physical or circulatory distress. Contact medical control.
- Children with a history of congenital heart defects, cardiac surgery or implanted devices are complex. Consider contacting medical control prior to intervention. Contact medical control for professional consultation prior to giving amiodarone, infusion can be complicated and cause significant side effects.

# PEDIATRIC ALLERGIC REACTION

<b>History</b> <ul style="list-style-type: none"> <li>Onset and location</li> <li>Past medical history, reactions</li> <li>New environmental exposures</li> <li>New medication exposures</li> <li>New food or dietary exposures</li> <li>Insect sting or bite, occult</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>2 body systems involved?:</li> <li>Skin – hives, redness, itching</li> <li>Pulm – SOB, wheeze, cough</li> <li>ENT – Mouth swelling, throat</li> <li>GI – Vomiting, diarrhea, cramps</li> <li>CV – Hypotension or shock</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>Mild allergy, rash only</li> <li>Anaphylaxis (systemic effect)</li> <li>Anaphylactic shock (w/HoTN)</li> <li>Angioedema (drug induced)</li> <li>Aspiration / Airway obstruction</li> <li>Pulmonary event? Asthma?</li> </ul>
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**Universal Patient Care protocol**

**A: Anaphylaxis**

- ≥ 2 body systems
- Involves pulmonary & CV
- Sx include SOB, HoTN, AMS

**Epi Administration Procedure**

May assist patient with use of the patient's own prescribed Epi-Pen if present.

**[Patient 10-30 kg]**  
Epi 0.15mL 1:1,000 IM  
Or Epi Pen Junior

**[Patient > 30 kg]**  
Epi 0.5mL 1:1,000 IM  
Or Epi Pen Adult

Pt < 10 kg call OLMC.

**Go To Top of Column B: Moderate Symptoms**

**B: Moderate Symptoms**

- 1-2 body systems
- Mild symptoms, GI, skin, etc.
- No hypotension or significant SOB

<b>E</b>	<b>Albuterol 2.5 mg Neb</b> May repeat X1 PRN	<b>E</b>
<b>A</b>	<b>LR 20mL/kg bolus</b> Titrate to SBP > 70 + (age x2)	<b>A</b>
<b>P</b>	<b>Diphenhydramine 1mg/kg IV</b> (Max dose 25 mg)	<b>P</b>
<b>P</b>	<b>Dexamethasone 0.6mg/kg IV/IO/IM/PO</b> (max 10mg, give slow)	<b>P</b>

Reevaluate patient **5 minutes** after epinephrine.  
Still having significant anaphylaxis?

**C: Mild Symptoms**

- 1 body system
- Usually just itching, hives
- No pulmonary or cardiac effects

<b>B</b>	<b>Diphenhydramine 1mg/kg PO</b> (If available, max 25 mg)	<b>B</b>
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Carefully reassess patient and continue to monitor. If worsened go back to top of protocol.

Yes

<b>E</b>	<b>Repeat IM Epinephrine</b> dose from column "A". (May repeat q. 5 min PRN if anaphylaxis still persists)	<b>E</b>
<b>P</b>	Paramedic may continue IM epi or change to: <b>Push Dose Epi GC.10 PRN</b> OR <b>Epi Infusion 0.1-1 mcg/kg/min IV/IO</b>	<b>P</b>
<b>M</b>	<b>Contact OLMC</b>	<b>M</b>

No

Continued Improvement

**Legend**

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

- Pearls:**
- Epinephrine is the best treatment for anaphylaxis, it reverses hypotension, airway constriction and helps perfusion. It should be given as early as possible when indicated. Most patients tolerate epinephrine well but caution must be used. Get medical control consultation if concern exists, especially in the elderly or those with strong hx of CAD.
  - Push dose vasopressor may be used for refractory hypotension or difficulty breathing. See associated protocol and proced.
  - If the patient has airway concerns, consider airway management early on. Do not wait for severe distress/decompensation.
  - Epinephrine 1:1000 is always given IM and 1:100,000 is always given IV, never mix routes of administration.
  - Patients receiving epinephrine should have a 12-lead EKG if possible prior to administration of Epi but always afterwards..
  - BLS providers should request ALS backup in any patient who has taken or needs epinephrine.

# PEDIATRIC ALTERED MENTAL STATUS

## History:

- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drugs or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Consider HAZMAT, toxins

## Signs/Symptoms:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resp; signs of dehydration)

## Differential:

- Head trauma, tox, environmental.
- CNS (stroke, tumor, seizure, infxn.)
- Cardiac (MI, CHF), hypoxia
- Infection, electrolytes
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)

**Universal Patient Care protocol**

Consider differential diagnosis and correct if able. If different protocol more appropriately addresses suspected problem, then go to appropriate **protocol**.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

A — Alcohol ingestion, acidosis, toxic alcohols.      T — Trauma, head injury, blood loss, shock  
 E — Endocrine (diabetic, DKA), epilepsy, encephalopathy      I — Insulin, hypoglycemia, recurring  
 I — Infection, meningitis, encephalitis, sepsis      P — Poisoning, psychosis, poly-pharmacy  
 O — Opiates, other drug overdose      S — Stroke, syncope  
 U — Uremia (renal failure, no dialysis)

**Hypoglycemia (< 70mg/dL)**  
 \*Newborn normal blood glucose can be as low as 40mg/dL. It should normalize within 2-3 days.

E	<b>Turn Off Insulin Pump PRN</b>	E
E	<b>Oral Glucose 7.5 grams</b> (if patient can swallow on own) May repeat x1 in 10 minutes	E
A	<b>D10W Infusion 5mL/kg</b> (Max 250mL) Titrate to BGL > 70 and awake.	A

**Suspected Narcotic Intoxication**

E	If trained, ECA/EMT may administer naloxone per <b>SO.02</b>	E
A	<b>Naloxone 0.1mg/kg SLOW IV/IM/IO/IN</b>  May repeat 2mg doses up to 6mg total dose if initial dosing is partially effective. (See PEARLS)	A

**AEIOU TIPS Differential**

Most causes will be difficult for EMS provider to address. For conditions causing dehydration or increased blood osmolarity, consider IVF.

A	<b>LR 20 mL/kg IV</b> (Max 1L)	A
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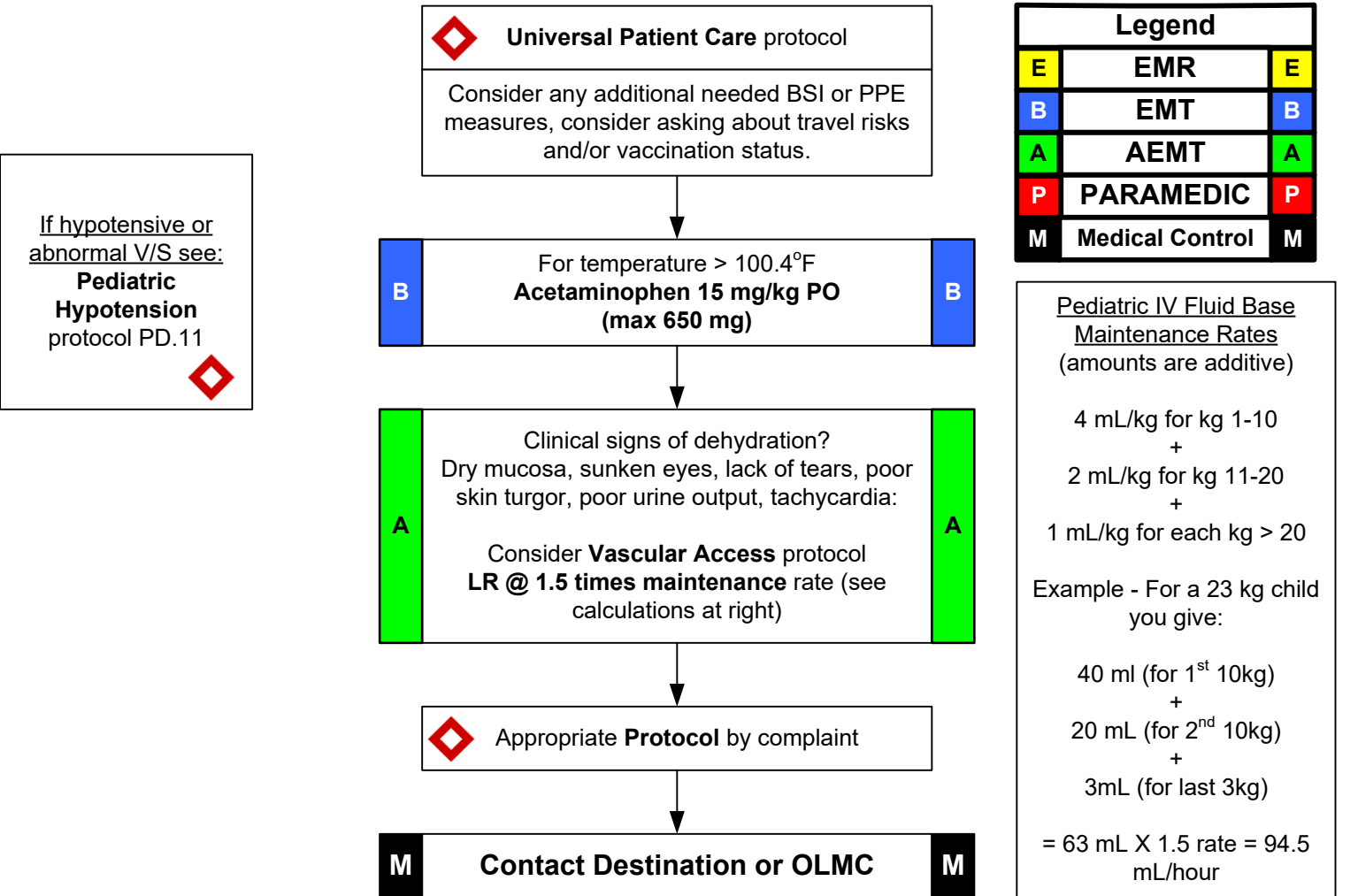
**M** Contact Destination or OLMC **M**

## Pearls:

- Remember to consider abuse and neglect in any child with altered mental status (head injury, nutritional neglect, etc.).
- Be aware of AMS as a presenting sign of environmental toxin, HAZMAT or other exposure and use appropriate PPE.
- Never assume anyone is ONLY intoxicated. Alcoholics frequently develop hypoglycemia and other complications.
- Hyperglycemia is treated with IV hydration. These patients are volume depleted, glucose will begin to clear with adequate hydration.
- If the patient is hypoglycemic and insulin pump is present, pause or turn off. You may want to seek family assistance with operation.
- D10W is safer and more physiologically pleasant to patients, lower risk of tissue damage with infiltration, should be considered in all but critical, combative or cardiac arrest patients. 250mL is 25 grams, it can be given wide open infusion.
- Patients on oral hypoglycemic agents are at risk for repeat episodes of hypoglycemia, monitor closely and encourage transport. Never leave them home alone or unattended. If hypoglycemic patients have returned to baseline and wish to refuse care, make certain that the patient eats and that there is someone to observe them for repeat hypoglycemic episodes.
- Use naloxone very carefully/slowly in patients on chronic opiates. Titrate small doses to adequate breathing/airway protection. In contrast, patients with large narcotic overdose or extended release preparations may require larger doses of naloxone, sometimes as much as 4-6mg. Newer more potent narcotics such as carfentanil may only respond to high doses of naloxone.
- Consider use of IO access in patients with failed IV attempts and failed glucagon or oral glucose therapy.

# PEDIATRIC FEVER & GENERAL ILLNESS

<b>History</b> <ul style="list-style-type: none"> <li>• Age</li> <li>• Duration of fever, severity</li> <li>• Past medical history</li> <li>• Medications</li> <li>• Immunocompromised?</li> <li>• Environmental exposure</li> <li>• Last acetaminophen or ibuprofen</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>• Warm, flushed, diaphoretic</li> <li>• Chills/Rigors</li> <li>• Tachycardia</li> <li>• Cough</li> <li>• Headache, mental status changes</li> <li>• Dysuria</li> <li>• Abdominal pain</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Infections / Sepsis</li> <li>• Cancer / Tumors</li> <li>• Medication or drug reaction</li> <li>• Connective tissue disease</li> <li>• Kawasaki Disease</li> <li>• Environmental exposure</li> <li>• Meningitis</li> </ul>
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- Pearls:**
- Patients with a history of liver failure should not receive acetaminophen. Do not give if less than 4 hours since last dose. Do not exceed 75 mg/kg or 4 grams per day (whichever is less) from all sources.
  - Always attempt oral rehydration and fluid challenge before IV means when possible. Consider use of Zofran if vomiting. Do not perform IV therapy on small children unless there is a clear clinical benefit or other medical need. Stable children with mild dehydration can be treated in most cases with oral rehydration therapy.
  - **Droplet precautions** include standard contact PPE plus a surgical mask for providers who accompany patients in the back of the ambulance. This level of precaution should be utilized with influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
  - **Contact precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA, scabies, or zoster (shingles)), or with other illnesses spread by contact are suspected.
  - **Airborne precautions** include standard PPE, contact precautions plus N-95 mask for providers. This level of precautions is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS, TB).
  - Rehydration with fluids increased the patient's ability to sweat and improves heat loss.

# PEDIATRIC HYPOTENSION NON-TRAUMA

## History:

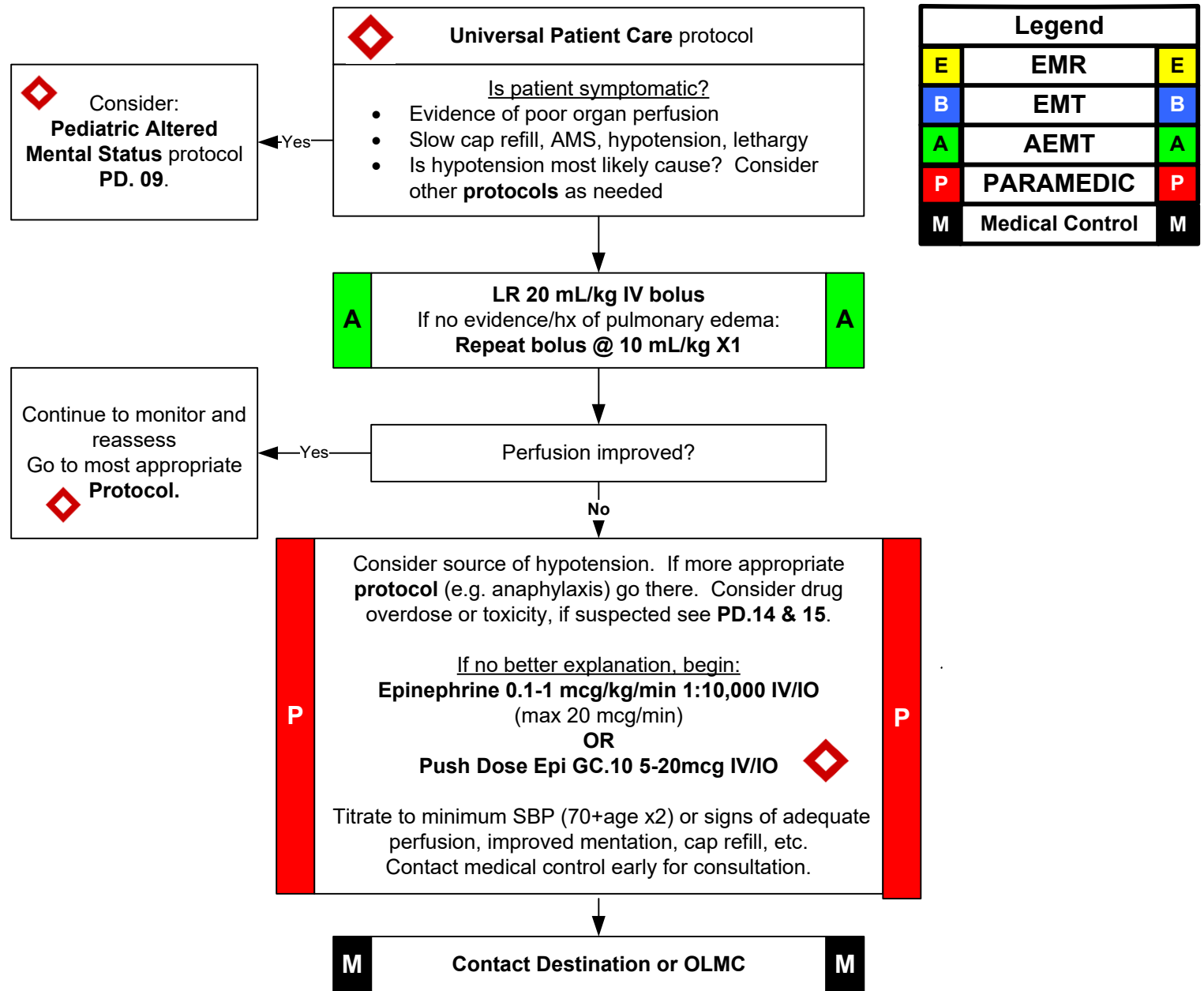
- Vomiting, Diarrhea
- Fever
- Infection
- Sick contacts
- PO intake
- Last wet diaper/urine

## Signs and Symptoms:

- Restlessness, confusion, weakness
- Syncope
- Tachycardia
- Diaphoresis
- Pale, cool, clammy skin
- Delayed capillary refill

## Differential:

- Infection/Sepsis
- Dehydration
- Vomiting, Diarrhea
- Congenital heart disease
- Medication or Toxin
- Anaphylaxis



## Pearls:

- **Pediatric hypotension is defined as a SBP <70 + (age in years x 2) mmHg, DO NOT TREAT ASYMPTOMATIC PT'S!**
- Consider causes of pediatric hypotension and address per appropriate protocol.
- Contact medical control early for expert consultation. Multiple issues can cause hypotension in children including sepsis, trauma, volume depletion, neurologic injury, anaphylaxis, medication ingestion such as beta or calcium channel blocker overdose. Remember to ask about congenital defects of the heart or endocrine system and the use of any or recent discontinuation of any steroids.
- Ensure the patient has adequate intravascular volume before starting vasopressors.

# PEDIATRIC RESPIRATORY DISTRESS

## History:

- Asthma, lung disease
- Congenital heart disease
- New allergens, pets, etc.
- Medications, out of any?
- Toxic exposure, smoke, etc.

## Signs & Symptoms:

- Decreased ability to speak, cry
- Increased resp rate and effort, retractions, nasal flaring, tired
- Wheezing, rhonchi, rales, stridor
- Fever, cough

## Differential:

- Foreign body, choking
- Asthma, aspiration, pneumonia
- Anaphylaxis
- PE, pneumothorax, cardiac
- Inhaled toxin (CO, CO<sub>2</sub>, H<sub>2</sub>S)

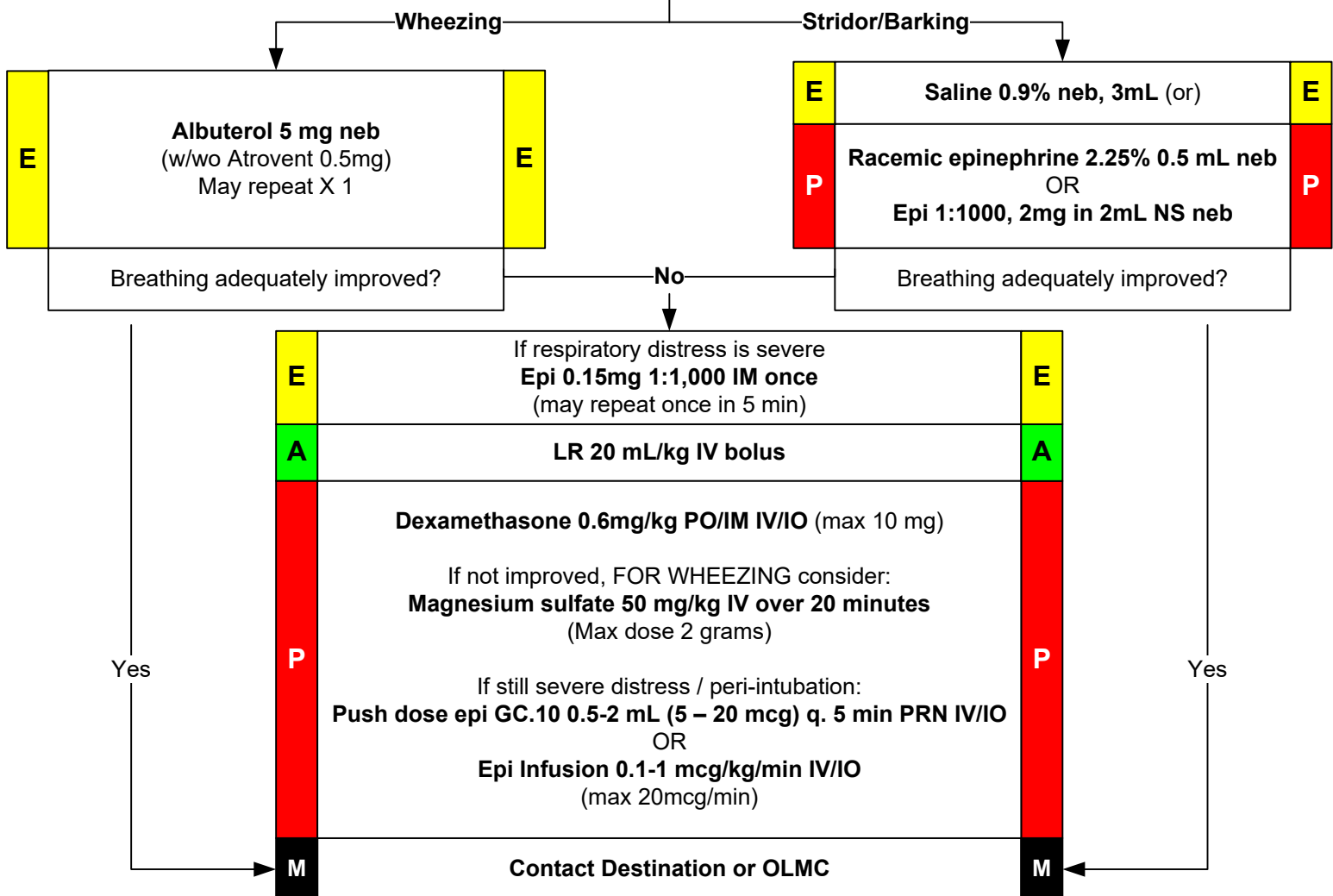
**Universal Patient Care protocol**

Evaluate breathing, work of breathing (use ETCO<sub>2</sub> and pulse oximetry if available)  
Inadequate breathing, imminent failure?  
History of choking or foreign body obstruction?

Place patient in position of comfort, supplemental O<sub>2</sub> to keep SaO<sub>2</sub> 94%.

**Pedi Airway Management protocol AW.02**

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M



## Pearls:

- Pulse oximetry must be monitored continuously. The provider should consider monitoring waveform ETCO<sub>2</sub> if available.
- A silent chest in respiratory distress is a pre-respiratory arrest sign, treat aggressively.
- Most children tolerate epinephrine well but consider decreasing or holding the dose for heart rate in age based SVT range.
- If SGA placement is required, use ketamine as induction agent for induction, it also acts as a bronchodilator.
- Remember that magnesium sulfate may cause hypotension, monitor V/S closely.
- Recall that younger children with stridor and shortness of breath, fever, a history of sore throat and drooling is concerning for epiglottitis. Avoid stressing or disturbing the child, keep with parent, do minimal intervention, transport urgently.

# PEDIATRIC SEIZURE

## History:

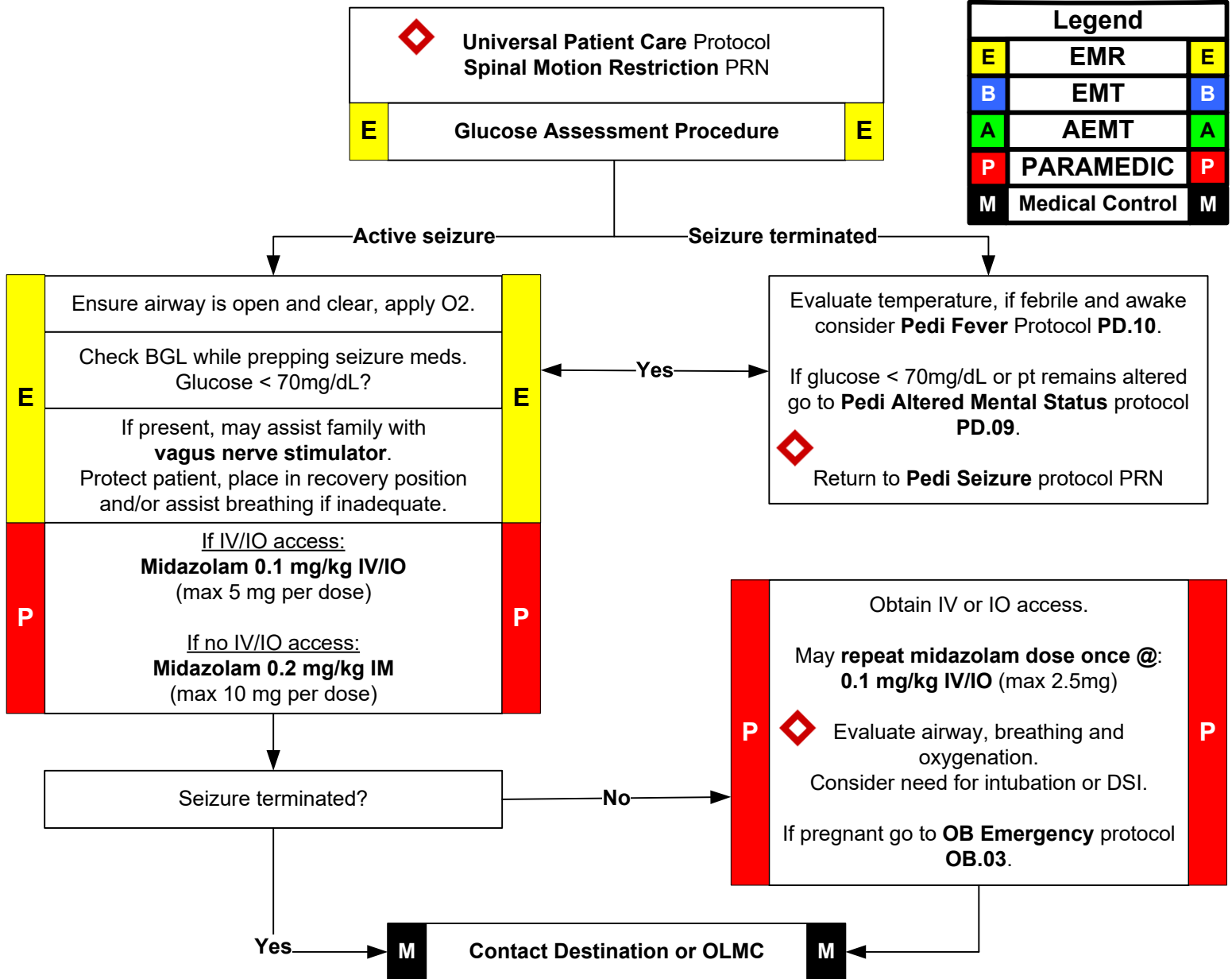
- Reported / witnessed seizure
- Previous seizure history
- Medical alert tag information
- Seizure medications
- Medication compliance
- History of trauma, DM, pregnant

## Signs and Symptoms:

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

## Differential:

- Hypoglycemia, hypoxia
- CNS trauma, tumor, stroke
- Metabolic, Hepatic, or Renal
- Electrolyte abnormality
- Non-compliance, drug, ETOH
- Infection, fever, hyperthermia
- Eclampsia



## Pearls:

- 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.
- **Generalized seizures** are associated with loss of consciousness, incontinence, and tongue trauma. **Partial seizures** (simple) affect only a part of the body and are not usually associated with a loss of consciousness, those with LOC are (complex). **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- Assess possibility of occult trauma and/or substance abuse. Ask about recent tuberculosis treatment for refractory seizure patients.
- Be prepared to assist ventilations or place supraglottic airway with repeat doses of benzodiazepines, especially if midazolam is used.
- For any seizure in a pregnant or recently post partum patient, follow the **OB Emergencies Protocol**.
- All anticonvulsants are to be titrated to effect and given with adequate BP (SBP >70 + age X2) to avoid hypotension, monitor ETCO<sub>2</sub> and breathing adequacy closely in all seizure patients, especially those receiving benzodiazepines.

# PEDIATRIC OVERDOSE & POISONING

## History:

- Ingestion or suspected ingestion of a possibly toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason
- Bring medication to ED
- Past medical history, medications
- Vomited after ingestion?

## Signs and Symptoms:

- Mental status changes
- Hypotension/ hypertension
- Decreased respiratory rate
- EKG QRS changes
- Tachycardia, dysrhythmias
- Seizures

## Differential:

- Tricyclic antidepressants
- Acetaminophen
- Salicylates
- Depressants/stimulants
- Anticholinergic
- Organophosphates
- Cardiac medications
- Solvents, alcohols, cleaners

**◇ Universal Patient Care protocol**  
Consider other **protocols** as needed, eg:  
**Rx Overdose protocol PD. 15**

**Poison control center:**  
1-800-222-1222

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**E** **E**

- Remove/isolate from toxin
- Begin supportive care, decon PRN
- Obtain container, MSDS sheets perform indicated first aid

**E** **E**

If trained, ECA/EMT may administer naloxone per **SO.02**

Suspected narcotic overdose  
Heroin, prescription drugs, patches

**A** **A**

**Naloxone 0.1 mg/kg mg IV/IM q. 2 min PRN**  
(6mg max total dose, 2mg per dose)

Suspected stimulant overdose  
Cocaine, crack, meth, inhalants.

**P** **P**

**Midazolam 0.1 mg/kg IV/IO**  
(2.5mg max)  
For agitation, tachycardia and hypertension.

Organophosphate exposure  
Nerve agents, pesticides

**P** **P**

If symptomatic (see pearls below)  
**Atropine 0.1 mg/kg IV/IO, double dose q. 5 min**  
until symptoms begin to resolve

**M** **M**

**Contact Destination or OLMC**

**See CBRNE related protocols under Special Operations**  
section for more information on certain agents such as cyanide and nerve agent.

## Pearls:

- Do not rely on patient history of ingestion especially in suicidal patients.
- Depressants typically cause decreased HR, BP, RR, may have non-specific pupils, not always constricted with chronic narcotic or other depressant use.
- Stimulants typically cause increased HR, BP, temp, dilated pupils and seizures.
- Anticholinergic medications cause increased HR, temperature, dilated pupils and mental status changes, worse in elderly.
- Organophosphates, such as insecticides often cause DUMBELS – defecation, urination, miosis, bronchorrhea, ectopy, lacrimation and seizures. Call medical control for pralidoxime dosing if available.
- Contact the US/Texas Poison Control Center for guidance. 1-800-222-1222.
- DECON of HAZMAT patients should be performed by trained personnel prior to initial patient contact or transport. Do not bring contaminated patients into the ER.

# PEDIATRIC PRESCRIPTION OVERDOSE

## History:

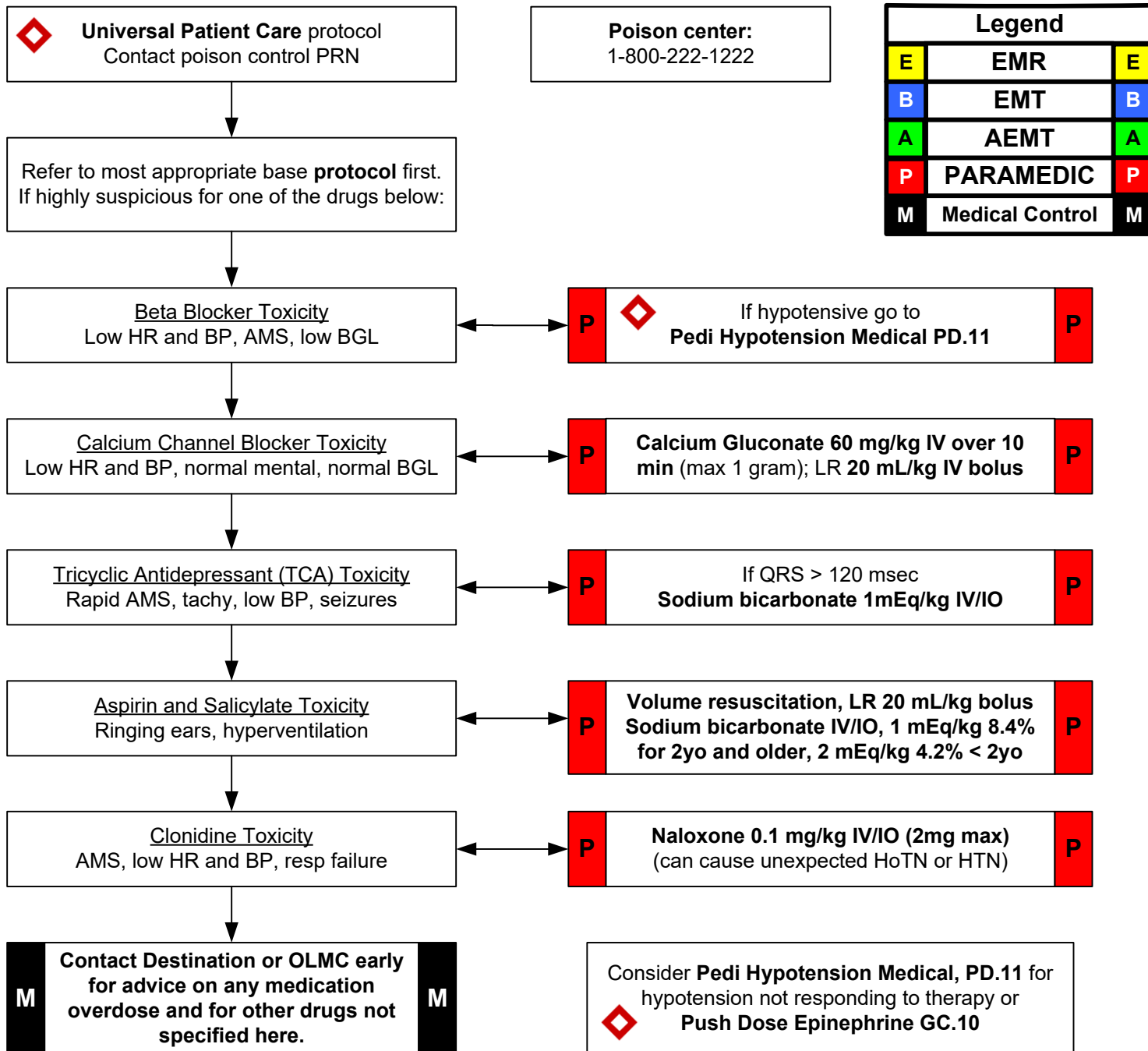
- Substance route, quantity
- Time of ingestion
- Bring medication to ED
- Past medical history, medications
- Vomited after ingestion?

## Signs and Symptoms:

- Mental status changes, seizure
- Hypotension/ hypertension
- Decreased respiratory rate
- EKG QRS changes
- Tachycardia, dysrhythmias

## Differential:

- Tricyclic antidepressants
- Acetaminophen
- Salicylates
- Beta blockers
- Calcium channel blockers



## Pearls:

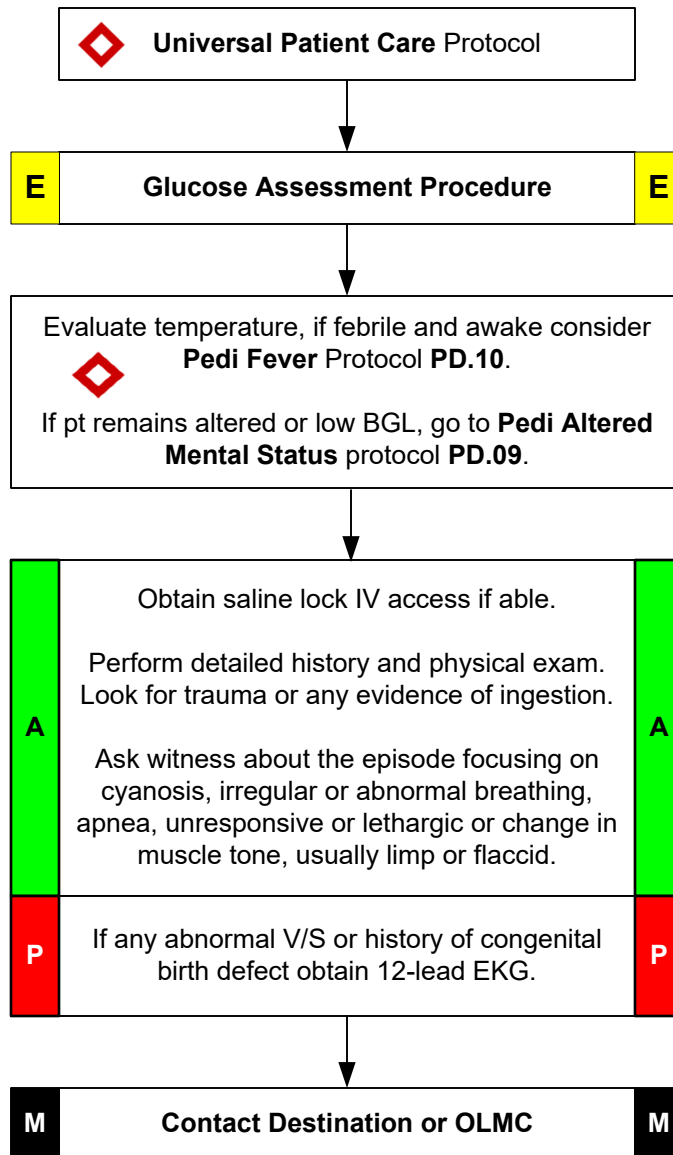
- As with any medical illness, take immediate steps to manage ABCs and BP or HR issues. Then begin to address medication specific concerns.
- Tricyclic antidepressants cause 4 major areas of toxicity. Seizures, dysrhythmias, hypotension, AMS or coma. Patients may exhibit rapid progression from alert mental status to death (manage airway early). Avoid charcoal.
- Contacting the US/Texas Poison Control Center for guidance. 1-800-222-1222.
- DECON of HAZMAT patients should be performed by trained personnel prior to initial patient contact or transport. Do not bring contaminated patients into the ER.

# NEONATAL & INFANT B.R.U.E.

- History:**
- Report of activity by witness
  - Age of infant
  - Focus on history of:
    - Cyanosis
    - Absent, irregular breathing
    - Change in tone
    - Altered mental status
  - Any inciting event or illness?

- Signs and Symptoms:**
- Sleepiness, lethargy
  - Poor tone, flaccid, hyperreflexive
  - Cyanotic or labored breathing
  - Poor feeding
  - Fever, abnormal V/S
  - Trauma, ingestion
  - Hypoglycemia

- Differential:**
- Hypoglycemia, hypoxia
  - Sepsis
  - Trauma
  - Hypoglycemia
  - Errors of metabolism



Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

**Helpful Hint:**  
For newborns and babies younger than one year old, use the right upper extremity for pulse ox measurement due to the possibility of coarctation of the aorta.

- Pearls:**
- Formerly called an ALTE (acute life threatening event), now called BRUE (brief resolved unexplained event), this is a problem in a child less than one year old that involves one of four problems. These include loss of responsiveness or unconsciousness, cyanosis, abnormal or irregular breathing or poor tone, usually flaccid.
  - Parents may also report a long stretch of inconsolability or poor feeding, although not defined, these are concerning as well.
  - An ALTE or BRUE has a strong association with a potentially life threatening illness or injury, this commonly includes sepsis, trauma, an inborn error in metabolism or surgical emergency.
  - **All patients with a reported BRUE or ALTE should be transported to the hospital for thorough evaluation even if the event has resolved. Do not suggest or obtain refusal unless parent is refusing transport by making an informed consent refusal and medical control has been contacted. Make every attempt to transport.**

# PEDI TERMINATION OF RESUS

**\*\*REMEMBER\*\***  
 "You aren't dead until you are warm and dead."  
 Contact medical control for guidance **on all patients less than 90°F.**

Refer to detailed information in the **Termination of Resuscitation procedure.** Remember:  
 - Withholding resuscitation means not starting for a specific reason (DNR, obvious, etc.)  
 - Terminating resuscitation means stopping resuscitation for a specific reason.  
 ♦ -When in doubt start BLS CPR and call OLMC.

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

## WITHHOLDING RESUSCITATION (Reason NOT to start.)

- Reason to withhold or not start CPR:
- **Valid DNR.**
  - **Congenital/terminal disease process** with family asking EMS not to resuscitate.
  - **Signs of irreversible/obvious death.**
    - Rigor and lividity.
    - Decomposition.
    - Injuries incompatible with life such as decapitation, exposed brain, etc.

## TERMINATING RESUSCITATION (Reason to stop.)

- Before considering termination of resuscitation the patient needs to have received appropriate ACLS care including H&T management (see BLS caveat below)
- Resuscitation times should be **at least 20 minutes** for asystole/agonal PEA with ETCO<sub>2</sub> < 15 or **40 minutes for all other situations.**
- See **Termination of Resuscitation** procedure.

<b>E</b>	<ul style="list-style-type: none"> <li>• Provider may <b>independently</b> withhold resuscitation for DNR or signs of irreversible/obvious death.</li> <li>• Provider <b>must contact OLMC</b> for physician authorization to withhold resuscitation in cases of advance directive, family request or extenuating circumstances.</li> </ul>	<b>E</b>
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<b>E</b>	<ul style="list-style-type: none"> <li>• BLS crews may call for orders to terminate resuscitation in rare or extenuating circumstances (e.g. disaster situations where ALS availability cannot be obtained or extremely rural or inaccessible locations where time to ALS arrival is severely long).</li> </ul>	<b>E</b>
<b>P</b>	<ul style="list-style-type: none"> <li>• Provider <b>must contact OLMC</b> for physician authorization to terminate resuscitation.</li> <li>• Be prepared to give the following info:                             <ul style="list-style-type: none"> <li>- Age, events leading up to arrest.</li> <li>- Pertinent medical history (ESRD, etc.)</li> <li>- Rhythm, interventions, response.</li> <li>- Resuscitation time and ETCO<sub>2</sub></li> <li>- Consensus that team is ready to stop</li> </ul> </li> </ul>	<b>P</b>

**M**
**Contact OLMC as needed.**
**M**

- Pearls:**
- See procedure section for discussion on considerations unique to pediatric termination of resuscitation.
  - If doubt exists about resuscitation, EMS providers should start BLS care while determining needed factors such as DNR status, family wishes and OLMC contact.
  - EKG strip should be obtained on ALL deceased patients unless visibly decomposing, doing so would cause immediate danger to the responder, or prohibited by law enforcement such as a crime scene, etc. A copy of EKG strip should be left on scene for use by the Justice of the Peace (JP).
  - Deceased patients should not be left in public or compromising places unless ordered or necessitated by a peace officer or JP as part of a crime scene, etc.
  - Generally, termination should not be done inside the EMS unit as then the patient will need to remain there until the JP has authorized removal, rendering the unit out of service. Patients should not be unloaded from the EMS unit back onto the scene unless ordered by the JP or law enforcement.

# **SPECIAL OPERATIONS** **SECTION**

# CYANIDE, CO & INHALED TOXINS

<b>History</b> <ul style="list-style-type: none"> <li>Known cyanide exposure</li> <li>Occupational risk</li> <li>Exposure to fire in enclosed area</li> <li>Down firefighter/victim</li> <li>Soot present around nose/mouth</li> <li>Altered mental status</li> </ul>	<b>Exam:</b> <ul style="list-style-type: none"> <li>Evaluate ABC's</li> <li>Look for abnormal V/S, AMS</li> <li>Mydriasis</li> <li>Slow breathing/apnea/wheezing</li> <li>Hyper/hypotension</li> <li>Vomiting</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Cyanide poisoning</li> <li>Carbon monoxide poisoning</li> <li>Trauma/Head injury</li> <li>Seizure</li> <li>Sepsis</li> <li>Drugs/ETOH</li> </ul>
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Focus on crew safety. Remember some toxic gases can 'off-gas' from the patient, use appropriate decon and PPE!



<b>E</b>		<b>Universal Patient Care protocol</b> <b>Respiratory distress protocol PRN</b> <b>Airway management protocol PRN</b>	<b>E</b>
	Evaluate Nature of Exposure: For CO concerns, FD air monitoring and use of CO-oximeter if available at scene can be helpful. <b>High flow oxygen</b> and <b>ventilatory support</b> including use of <b>PEEP</b> is recommended for all of these exposures.		

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

<b>Cyanide &amp; Hydrogen Sulfide (H2S)</b> CN is usually from inhaled smoke from structure fires or occupational exposure. H2S has a rotten egg smell and is from drilling and oil well sites.	
<b>P</b>	<b>P</b>
If patient is in cardiac arrest or unresponsive/peri-arrest: Administer <b>Cyanokit</b> if available - <b>Fill 1 vial (5g) Cyanokit with 200 mL NS</b> (not included) to fill line. Swirl for 30 seconds (do not shake). <b>Adults: Infuse 200 mL over 15 minutes</b> <b>Pedi: OLMC</b> (not compatible w/ other meds)	

<b>CO or Asphyxiant Gases (CO2, etc.)</b> Carbon monoxide is released from combustion of any hydrocarbon. Fires and improper venting are top sources. Asphyxiant gases are generally non-toxic but displace oxygen.
Safely remove the victim from the environment. - Provide 100% oxygen using appropriate delivery device or BVM. - If able to measure, carboxyhemoglobin (COHb): - COHb > 10mmHg in non-smoker is abnormal. - COHb > 15mmHg in smoker is abnormal. - Ensure transport for these patients. Contact <b>OLMC</b> for advice on hyperbaric considerations for CO exposure if severely symptomatic or pregnant.

<b>Irritant Gases (Cl, NO2, NH3)</b> Irritant gases when inhaled convert generally to a toxic acid or base and cause pulmonary injury resulting in pulmonary edema. Ammonia, chlorine, silo gas and phosgene are examples.
Safely remove the victim from the environment and ensure appropriate decon has taken place. - Provide 100% oxygen using appropriate delivery device or BVM. - Depending on the chemical, pulmonary injury may be immediate (chlorine, ammonia) or delayed (nitrogen dioxide – silo gas). - Intubation may be preferred as pulmonary edema will be an issue and PEEP manipulation is helpful.

**M** Contact OLMC or poison control 1-800-222-1222 for advice. Go to most appropriate protocol. **M**

- Pearls:**
- All patients with suspected inhalation injury must be transported for observation, even if asymptomatic. Non-cardiac pulmonary edema may be delayed 6-12 hours in many cases.
  - Cyanide poisoning may not be clearly evident, the provider must have a high clinical index of suspicion.
  - Firefighters/responders may have decompensation after the fact, consider administration in delayed presentation of altered mental status, unexplained cardiovascular decompensation or cardiac arrest, even 6-12 hours following structure fire response.
  - Cyanokit may cause red skin & alters some lab values, take package insert to treating Physician in receiving ER. Cyanokit may also have some effectiveness in hydrogen sulfide exposure, call poison control for assistance 1-800-222-1222.

# FIRST RESPONDER OPIATE REVERSAL

## History

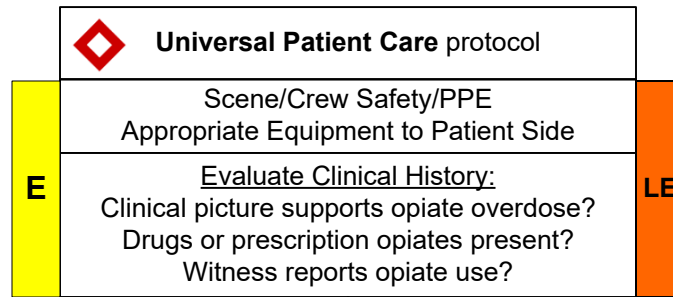
- Known or high probability of acute opiate ingestion or injection
- Occupational exposure to opiate (e.g. law enforcement exposure to evidence, etc.)
- Circumstances and surroundings suggest illicit drug use

## Exam:

- Evaluate ABC's
- Signs of opiate overdose:
- AMS, unresponsive
- Pinpoint pupils
- Slow breathing/apnea
- Tachycardia/bradycardia
- Track marks

## Differential:

- **Opiate overdose**
- Other drug ingestion/poisoning
- Trauma, Head injury
- Seizure
- Low blood sugar
- Other medical problem
- Drugs/ETOH



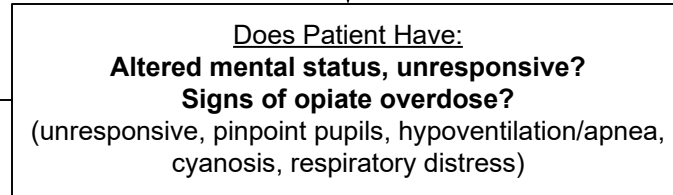
Legend		
<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>
<b>LE</b>	<b>LAW</b>	<b>LE</b>

Consider other diagnosis.  
Support ABCs.

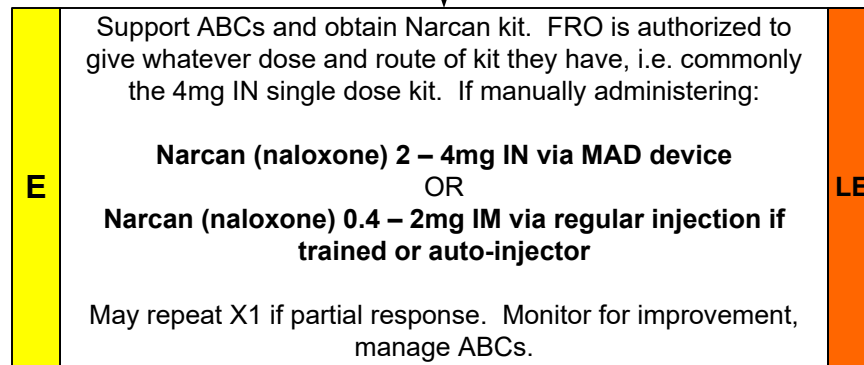


Go to  
**Altered Mental Status**  
OR  
Appropriate **Protocol**

←No



Yes



Go to most appropriate **Protocol**

## Pearls:

- Breathing should always take priority for unresponsive apneic patients. Do not delay ventilation unless not equipped or tactical situation does not permit.
- Overdose or poisoning may not be clearly evident, the provider must have a high clinical index of suspicion.
- Patients on high potency opiates may require multiple doses of naloxone.
- Patients may become combative after reversal of narcotics, be alert and ready.
- Opiate reversal with Narcan (naloxone) is temporary. Patient should be transported via EMS to a medical facility for evaluation after administration of Narcan.
- The provider can call poison control for assistance 1-800-222-1222.
- Remember when using nasal route, apply MAD (mucosal atomizer device) to the syringe and inject no more than 1mL with medium pressure into each nostril. IM route may be better if nostrils are occluded (blood, etc.)

# MASS CASUALTY RESPONSE

## History

- Issues with location previously?
- Witness accounts, smell, clouds, explosion?
- High risk day for terror? (i.e. Jul 4)
- Occupancy of event, structure
- Response plan in place?

## Exam:

- Look for key consistent symptoms
- Pulmonary (coughing, choking)
- Skin (blistering, rash, color)
- Neuro (seizures, AMS)
- None but incapacitated

## Differential:

- Normal civil event (plane, bus crash, gas explosion).
- Nerve agent exposure
- Gas inhalation (ammonia, chlorine, phosgene, CN)
- Blister agent (mustard, etc.)

Legend		
E	EMR	E
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P
M	Medical Control	M

E	<p>First priority crew safety and scene size-up.</p> <p>Remain far enough away from scene to evaluate for responder dangers, see exam and differential above.</p> <p><b>When in doubt do not enter area.</b></p>	E
	<p><u>Evaluate Clinical Aspects:</u></p> <p>Are victims exhibiting key symptoms? Are they appropriate, i.e. some walking wounded some more severe, some fine? What are people reporting?</p>	
	<p><u>Give General Size-Up:</u></p> <p>Approximate number of patients 10 or 100? Rough description of scene. Initial request for units and staging location. Advise coms to make MCI notifications.</p>	
	<p>After scene is safe prioritize ICS and MCI positions based on resource availability.</p> <p>Usually initially needed is:</p> <ul style="list-style-type: none"> <li>- Incident command</li> <li>- Triage</li> <li>- Staging</li> <li>- Transport</li> </ul>	
	<p>Triage teams should use START triage if resource limited or SALT triage if resources are available. See <b>MCI procedure</b>.</p> <p><b>Use approved County/RAC triage tags.</b></p>	

## Remember CBRNE:

- Chemical: Any chemical that harms life or environment.  
Nerve agents, organophosphates, irritants.  
Liquid, powder or gas.  
Inhaled, absorbed, ingested.
- Biologic: A living organism or pathogen that infects or injures the host. Usually not immediate symptoms on exposure. Usually must be ingested or inhaled.  
Smallpox, anthrax, tularemia.  
Toxins like ricin.
- Radiologic: A device or method to spread radiation.  
Contaminated water, dirty bomb. Usually low grade radioactive substance, cesium, etc.
- Nuclear: Physical energy damage from detonation and radioactive contamination from a nuclear device.
- Explosive: Any device causing conventional explosives. May have additional components such as shrapnel to increase damage.

↓

<b>M</b>	<b>Refer to Local MCI Response Plan</b>	<b>M</b>
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## Pearls:

- Remember not to enter the scene until you are sure it is safe. Dead responders only add to the burden on the system.
- Be aware of secondary devices intended to kill or maim first responders. Criminals may watch normal emergency provider response patterns and put secondary explosive devices in staging areas. Consider using creative or unexpected locations.
- Ask for resources early on, especially specialty resources such as HAZMAT or radiologic detection teams.
- Notifications are critical, make sure emergency management and hospitals are notified along with response teams.
- Remember to consider mass decontamination plans if needed.
- Request resources early to keep walking wounded patients corralled and cared for but moved away from the immediate scene.
- Just in time training for fringe participants (civic groups, Red Cross, CERT) is appropriate to assist with triage and ancillary tasks.

# BLOOD PRODUCT ADMINISTRATION

- History**
- History of injury or illness with acute blood loss.
  - Trauma related.
  - Massive GI bleeding.
  - Obstetrical bleeding.

- Exam:**
- Stop any external hemorrhage!
  - Evaluate ABC's
  - Obtain accurate vital signs.
  - Evaluate overall perfusion.

- Differential:**
- Trauma with internal or external hemorrhage (? Spinal shock)
  - Upper GI bleeding, lower GI bleeding.
  - Post-partum, massive GYN hemorrhage.

## Does the Patient Meet Criteria for Blood Administration?

The provider suspects shock or poor perfusion is due to acute blood loss **AND**:


### ADULT

- Any one of the following:
- Shock index of 1.0 or greater. (SI = HR / SBP)
  - An ABC score of 2 or greater (each below is 1 point):
    - \*Penetrating trauma
    - \*SBP < 90
    - \*HR > 120
    - \*Positive FAST exam
  - A pulse pressure < 40 mmHg (SBP – DBP)
  - Cardiac arrest secondary to blood loss (see Pearl TR.11)
  - Provider judgment with OLMC approval.

### PEDIATRIC (3 - < 12 yo)

- STOP** and contact OLMC if the patient is < 3 years old.
- Any one of the following:
- SBP < 70 + (2 x age in years) or < 90 if greater.
  - Blood loss criteria. Increased HR above age normal and poor pulse strength along with:
    - \*Anxious, irritable and confused (OR)
    - \*Lethargic, less response to pain, comatose (OR)
    - \*Pale, mottled, cyanotic or prolonged cap refill
  - Cardiac arrest secondary to blood loss (see Pearl TR.11)
  - Provider judgment with OLMC approval.

No

If **NO**, go to most appropriate **Patient Care** protocol 

No

Yes

**P**

Before administration, if the patient is awake and has capacity, confirm they have no religious or objection to receiving blood.

Prepare 1 blood unit in accordance with **Blood Administration Procedure**. Do **NOT** remove the blood unit from the cooler until you are immediately ready to transfuse!

**Adults: 1 unit warmed LTOWB IV/IO bolus**  
**Pedi: 10 mL/kg warmed LTOWB IV/IO bolus**

**If LTOWB not available give:**  
**Adults: 1 unit warmed Type A+ liquid plasma**  
**Pedi: 20mL/kg warmed Type A+ liquid plasma**

### !! ONLY NS GOES WITH BLOOD PRODUCT!!

Contact OLMC if additional blood administration is needed (still meets administration criteria above).

Simultaneously in *separate* IV (or after blood) give:  
**Calcium gluconate 2 gram (Pedi 60 mg/kg) slow IV/IO**  
**Tranexamic acid (TXA) 2 gram (Pedi 15 mg/kg) slow IV/IO**



Go back to most appropriate **Protocol**

Yes

**P**

### Remember:

Leave copies of blood forms and blood bag with RN in charge of patient care.

### Legend

<b>E</b>	<b>EMR</b>	<b>E</b>
<b>B</b>	<b>EMT</b>	<b>B</b>
<b>A</b>	<b>AEMT</b>	<b>A</b>
<b>P</b>	<b>PARAMEDIC</b>	<b>P</b>
<b>M</b>	<b>Medical Control</b>	<b>M</b>

### Pearls:

- LTOWB = Low titer O whole blood. Low titer refers to major blood antibodies, not Rh type.
- Children under the age of 3 may have complications from blood administration, contact OLMC for advice on transfusion.
- **Blood products must always be administered through a filtered Y-set designed for blood, blood is only compatible with Normal Saline, do NOT use LR or other fluids. Never mix any medications or other fluids with blood.**
- Blood product should ideally be warmed to approximately 37 C (95 F) whenever possible using an in-line warmer.
- Be alert for major reactions to blood administration that may look like anaphylaxis, unexplained fever or back/abdomen pain. Treat by stopping the blood product infusion and use anaphylaxis protocol.
- TXA should **ONLY** be given within three hours of the onset of bleeding.

# MECHANICAL VENTILATION – HAMILTON T1 VENTILATOR

**START HERE**

## PREPARE EQUIPMENT:

- Hamilton T1 ventilator
- Ventilator circuit (use pedi tubing for patients < 16kg)
- HME filter
- Test lung (if using/needed)
- BVM, ETCO<sub>2</sub>, O<sub>2</sub> source (w/capacity calculation)

**1**

## PRE-OPERATIONAL CHECKS

Correctly attach the appropriate circuit and verify that the three pre-operational checks have been done and are all 'checked green'. If not, tightness and flow sensor checks may be done at the bedside, O<sub>2</sub> cell calibration is usually done monthly.

**2**

## PATIENT TYPE SETTINGS

Select "Adult/Ped" patient type and then select the appropriate birth gender and input the patient height in centimeters. If this is not known the patient's ideal body weight can be selected by changing the cm up or down until achieved (see IBW calculator).

**3**

## DETERMINE VENTILATION MODE

### NORMAL HEALTHY LUNG

(Standard lung protective approach.  
I.e. non-pulmonary reason for intubation (TBI, OD, etc.)

**(S)CMV+**

**RATIONALE:** Helps with cognitive offloading and sets tidal volume (Vt) and provides consistent minute ventilation (Mve).

### INJURED OR CHALLENGING LUNG

(Diseased or injured lung that will require a 'strategy' to ventilate (COPD, asthma, obese, acidosis, etc.)

**PCV+**

**RATIONALE:** Allows clinician to set a consistent pulmonary inspiratory pressure (PIP) for lung safety. Will usually require a ventilation 'strategy' (see remainder of protocol).

**CROSSWALK:** **(S)CMV+** is very similar to the traditional assist control (AC) volume mode on other ventilators, targets a set tidal volume (Vt) using the lowest pressure possible, AC trigger.

**CROSSWALK:** **PCV+** is very similar to the traditional assist control (AC) pressure mode on other ventilators. Pressure control will determine exhaled tidal volume (Vte), AC trigger.

**4**

**ADJUST  
SETTING**

**PG 2 NORMAL LUNG**

**PG 3 ARDS TYPE LUNG**

**PG 4 OBSTRUCT LUNG**

**PG 5 SEVERE ACIDOSIS**

**PG 6 TRBLESHOOTING**

REMEMBER: The ventilation mode can be selected from the initial screen and then available settings can be adjusted before beginning ventilation or with the test lung attached and ventilating.

(S)CMV+

<b>RESP RATE</b>	START: 12 BPM (RANGE 8 – 25)	Remember patients with special conditions (acidosis, high CO <sub>2</sub> , etc.) may need higher ventilation rates (incr. MV)
<b>VT</b>	START: 6 mL/kg IBW (RANGE 4 – 10)	Goal to keep PIP less than 35 and PLAT less than 30 cmH <sub>2</sub> O. See guidance above about special conditions (incr. MV need)
<b>I : E</b>	START: 1:2 (RANGE 1:8 – 3:1)	1:2 is comfortable ventilation. Use flow waveform to guide changes. Ensure waveform returns to baseline.
<b>PEEP</b>	START: 5 (RANGE 3 - 20)	If no oxygenation issue, remain at 5. For oxygenation issues, follow the PEEP/FiO <sub>2</sub> chart below.
<b>FiO<sub>2</sub></b>	START: 100% (RANGE 21 - 100)	See above for oxygenation issues. Goal SaO <sub>2</sub> is 92 – 96% unless otherwise specified in protocol.

MONITORED PARAMETERS:

<b>PIP (Ppeak)</b>		<b>CAUSES:</b> ARDS/ ↓Cstat, bronchospasm/ ↑Rinsp, dysynchrony, saturated HME, obesity	<b>GUIDANCE:</b> Slow inspiratory time. Eliminate causative factors.
<b>VLeak</b>		<b>CAUSES:</b> uncuffed ETT, cuff leak, mask leak in NIV	<b>GUIDANCE:</b> Intubate with cuffed ETT or inflate ETT cuff to minimize leak, especially if high levels of PEEP are required. May have to inflate cuff > 30 cmH <sub>2</sub> O.
<b>Rinsp (Resistance)</b>		<b>CAUSES:</b> bronchoconstriction, saturated HME, small or kinked ETT, mucus	<b>GUIDANCE:</b> Long inspiratory time. Ensure patient has time to exhale. Consider manual decompression. Eliminate HME. May have to increase PIPs > 30 or 40 to ventilate
<b>Cstat (Compliance)</b>		<b>CAUSES:</b> ARDS, fibrotic lungs, obesity, seatbelts, dysynchrony, saturated HME	<b>GUIDANCE:</b> Sit patients up, address seatbelts/HME/sedation. May decrease Vt to protect lungs. PEEP may ↑Cstat with recruitment, or may ↓Cstat via overdistention

CHALLENGING LOW O<sub>2</sub>/ARDS LUNG

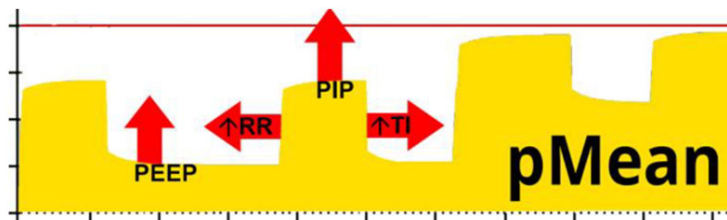
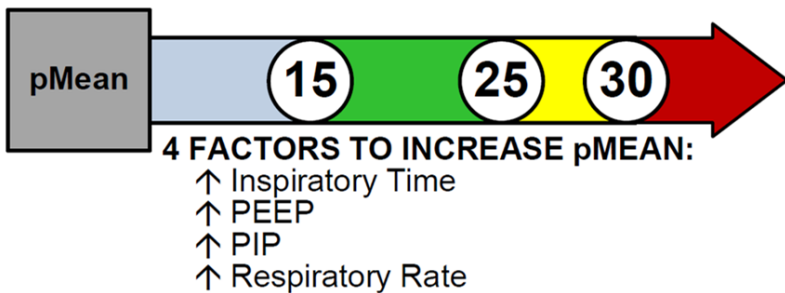
GO TO PAGE 3

CHALLENGING OBSTRUCTIVE LUNG

GO TO PAGE 4

PCV+ - SEVERE HYPOXIA / ARDS LUNG

<b>RESP RATE</b>	<b>24</b> BPM	<b>Rationale:</b> RR increases Pmean, and compensates for tidal volumes < 6 mL/kg (very likely in ARDS).
<b>PCONTROL</b>	<b>15</b> CMH2O	<b>Rationale:</b> 15/10 will set PIP at 25, and Driving Pressure <15: a good starting place for a lung that will require high levels of Pmean and poor compliance. Room to increase Pcontrol or PEEP carefully for a PIP of 30.
<b>I : E</b>	<b>1:1</b>	<b>Rationale:</b> TI will be a huge part of increasing Pmean. Don't be afraid to invert I:E –should not induce hypercapnia if expiratory flow waveform is returning to baseline
<b>PEEP</b>	<b>10</b> CMH2O	<b>Rationale:</b> PEEP is an important part of Pmean, but increasing PEEP may decrease tidal volumes. Increase in 1-2 cmH2O increments to find "Optimal PEEP" (~the highest PEEP with acceptable Vte's)
<b>FiO2</b>	<b>100%</b>	Goal SaO2 in severe lung injury or ARDS may be as low as 88-92%.



<b>PEEP/FiO2 Chart</b>	<b>GUIDANCE:</b> start at 100% + 5 PEEP then get on track with PEEP/FiO2 chart. (Use minimal FiO2 to maintain SpO2 of 92-96%)					
	<b>FiO2:</b>	40	50	60	70	Higher ratios indicate the patient would likely benefit from severe hypoxia strategy.
	<b>PEEP:</b>	5	8	10	12	

**Severe Hypoxia/ARDS Keys:**

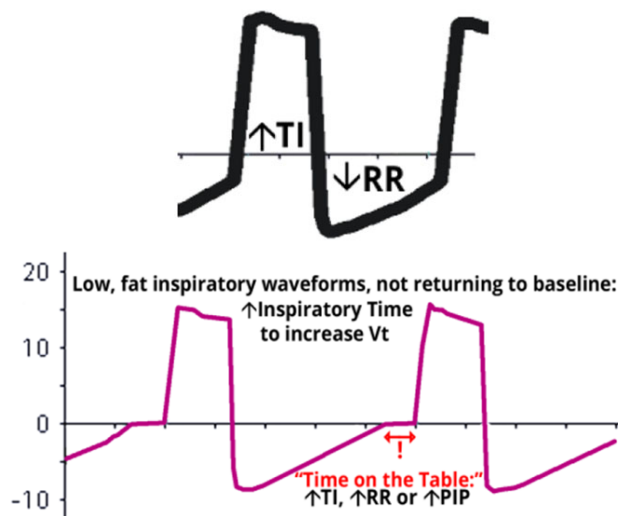
- Use **Pmean** as an indicator of oxygenation, and increase as high as possible in severe hypoxia.
- ARDS will likely decrease **compliance**: try to maintain PIP 30 or less if at all possible, even if Vtes are 4-6 mL/kg.
- **Permissive hypercapnia** is expected, especially if pH is 7.2 or greater.
- Maintaining a **Driving Pressure**(Pressure control setting) <15 is another method of minimizing lung strain.
- Determine **Optimal PEEP**with careful titration: stop increasing the PEEP if Vtes fall to unacceptable levels, Driving Pressure increases >15, or Cstats begin to fall

PCV+ - OBSTRUCTIVE HIGH RESISTANCE LUNG

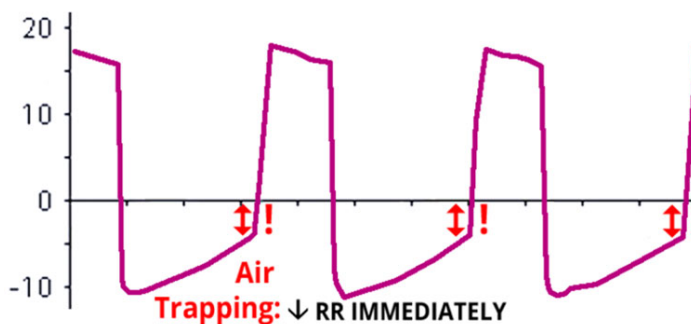
<b>RESP RATE</b>	<b>12</b> BPM	<b>Rationale:</b> A slow RR is required to facilitate the exhalation, and the prolonged TI needed for Vte's
<b>PCONTROL</b>	<b>27</b> CMH2O	<b>Rationale:</b> 27/3 will set PIP at 30, a good starting place for a lung with high Rinsp. Do everything possible to optimize settings with a PIP of 30, but be prepared to increase the PIP to 40 (or higher) if needed.
<b>I : E</b>	<b>1:2</b>	<b>Rationale:</b> Constricted airways will need ↑TI in order to patiently push past the obstruction. <b>Simply, ↑TI will ↑Vte's.</b> This I:E is a starting place: rigorously adjust RR and TI based on the flow waveform to optimize Mve.
<b>PEEP</b>	<b>3</b> CMH2O	<b>Rationale:</b> This pathology has prolonged exhalation, and adding PEEP will slow exhalation. A minimum of 3 of PEEP is maintained to prevent atelectasis/collapse (more prevalent in COPD than asthma). Do not increase to "match auto-PEEP".
<b>FiO2</b>	<b>21-100%</b>	Titrate to appropriate SaO2 for the patient. Remember target goal for chronic COPD patients is usually around 92%. Oxygenation is usually less difficult than ventilation in these patients.

**Obstructive / High Rinsp Keys:**

- This strategy is ideal for asthma, tracheal stenosis, etc; a more routine strategy will probably work for most COPD patients.
- Address hypercapnia by **increasing Vte's before RR** to minimize the impact of deadspace ventilation.
- Be ready for PIPs to be above 30, or even above 40.
- **Permissive hypercapnia** is expected, especially if pH is 7.2 or greater
- The **flow waveform** will dictate your settings (see below). Don't be surprised at a TI of 2".



- Detect air trapping (AutoPEEP) when the expiratory flow doesn't return to baseline  
**↓RR first** and then **↓TI** if required
- If inspiratory section is wide, your first move to **increase Vt** should be to **↑TI**
- Leave no "time on the table" - if the patient is hypercapnic, **↑RR, ↑TI and/or ↑PIP** until all the baseline is used up.



## PCV+ - HIGH MINUTE VOLUME STRATEGY (CAN ALSO USE (S)CMV+ AS WELL)

### RESP RATE

**30** BPM

**Rationale:** Adjust rate based on waveform to ensure no breath stacking but otherwise maximize rate to maximize Mve

### PCONTROL

**25** CMH<sub>2</sub>O

**Rationale:** 25/5 will set PIP at 30, a good starting place for an otherwise healthy lung. Do everything possible to optimize settings within a PIP of 30.

### I:E

**1:1**

**Rationale:** Adjust RR and TI based on the flow waveform to optimize Mve.

### PEEP

**5** CMH<sub>2</sub>O

**Rationale:** Minimize exhalation time. Can decrease to a minimum of 3 of PEEP (don't go below 3 to prevent atelectasis/collapse).

### FiO<sub>2</sub>

**21-100%**

Titrate to appropriate SaO<sub>2</sub> for the patient. Oxygenation is usually relatively normal in these patients.

### Extreme Metabolic Acidosis Keys:

- 1) May need massive minute ventilation to achieve goals. Keep PIP <30 to protect the lungs. Increase Vt/kg as high as PIP allows and is required to meet ventilatory needs. PCV+ is the ideal mode to accomplish these goals, or ASV with 200-300 %MinVol.
- 2) The goal is to get off this strategy and back to a routine strategy as soon as the extreme acidosis is correcting.
- 3) More routine examples of metabolic acidosis should have a strategy somewhere between this (extreme) and a routine lung protective approach (page 1 defaults).

**TROUBLESHOOTING / ALARMS:**

**Low Oxygen**

- This is different than the "Oxygen Supply Failed" alarm. This indicates the delivered FiO2 is >5% less than your set FiO2.
- STEP 1: press the "Monitoring" tab and observe the delivered FiO2. Compare to the patient status to determine priority.
- RESOLUTION: if you have massive minute volumes or a large leak, this may occur because the plumbing is not sufficient to deliver enough O2. Ensure D-tank is all the way open. This alarm may also simply indicate an Oxygen Calibration is necessary.

**IRV (inverse ratio ventilation)**

- Just a heads-up that you set an inverse I:E ratio.

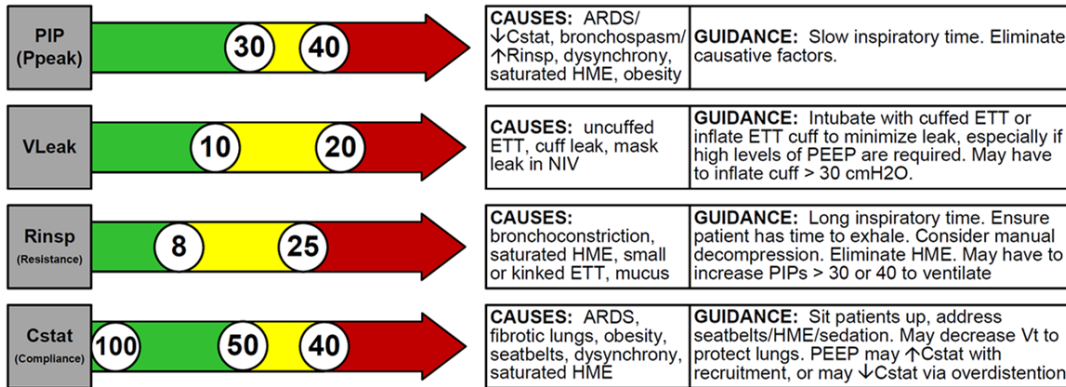
**Wrong Expiratory Valve**

- This is not the clearest, but you are trying to use the neonatal mode with an adult circuit, or vice versa.
- Either change the circuit, or your preset/mode.

**Pressure Limitation**

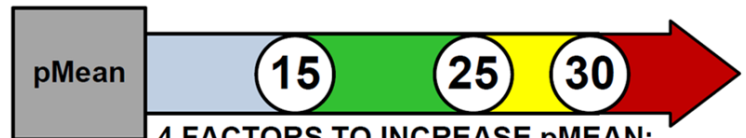
- The pressure limit automatically 10 cmH2O below the High Pressure Alarm (indicated by a blue line on the pressure waveform; red line = high pressure alarm)
- This alarm indicates your settings are trying to exceed the blue line but the vent is not allowing it.
- RESOLUTIONS:
  - 1) **Fix mechanical obstructions:** HOB 45 or more, loosen seatbelts, remove HME, suction ETT, verify no right mainstem.
  - 2) **Ensure adequate analgesia and sedation;** proceed to paralysis if needed
  - 3) **Optimize settings:** increase RR, decrease Vt or lower Pcontrol, increase TI
  - 4) **Increase high pressure alarm:** carefully monitor airway pressures to ensure lung safety.

**MONITORED PARAMETERS:**



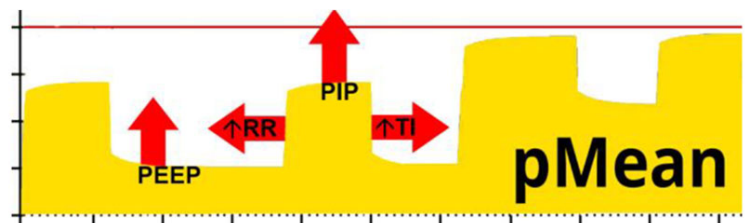
**IDEAL BODY WEIGHT**

FOR MALE			FOR FEMALE		
Height	weight Pounds	Kilos	Height	weight Pounds	Kilos
5' 0"	106	48.1	4' 8"	80	36.3
5' 1"	112	50.8	4' 9"	85	38.5
5' 2"	118	53.5	4' 10"	90	40.8
5' 3"	124	56.2	4' 11"	95	43.1
5' 4"	130	59.0	5' 0"	100	45.3
5' 5"	136	61.7	5' 1"	105	47.6
5' 6"	142	64.4	5' 2"	110	49.9
5' 7"	148	67.1	5' 3"	115	52.2
5' 8"	154	69.8	5' 4"	120	54.4
5' 9"	160	72.6	5' 5"	125	56.7
5' 10"	166	75.2	5' 6"	130	59.0
5' 11"	172	78.0	5' 7"	135	61.2
6' 0"	178	80.7	5' 8"	140	63.5
6' 1"	184	83.5	5' 9"	145	65.8
6' 2"	190	86.2	5' 10"	150	68.0
6' 3"	196	88.9	5' 11"	155	70.3



**4 FACTORS TO INCREASE pMEAN:**

- ↑ Inspiratory Time
- ↑ PEEP
- ↑ PIP
- ↑ Respiratory Rate



**CLINICAL**  
**PROCEDURES**  
**SECTION**

# Automated External Defibrillator (AED) Use

**Approved Practice Level:** FRO, EMR, EMT, AEMT, Paramedic

**Last Review Date:** 1/2022

## **Clinical Indications:**

- For any patient who is unresponsive with no detectable signs of circulation.
- AED pads may be placed on any unstable patient but the AED unit should not be turned on until the patient becomes unresponsive.

## **Contraindications:**

- Paramedic responder on scene with immediately available manual cardiac defibrillator.
- Environmental hazard making defibrillation immediately hazardous (explosion, etc.)
- Severe hypothermia, refractory to initial defibrillation (relative)

## **Clinical Considerations or Precautions:**

- All responders in the system regardless of certification should be trained in the application and use of AED devices.
- This procedure is not specific to any one device and the responder must know and have documented training of their system's AED device.
- It shall be used in conjunction with the CPR procedure and cardiac arrest algorithms where indicated and for BLS responders shall take the place of defibrillation where indicated.

## **Procedure:**

1. Establish that the patient is pulseless with no signs of circulation.
2. Move patient to the floor and expose chest.
3. Single rescuer
  - a. With an AED should verify unresponsiveness and unless a witnessed arrest or bystander CPR in progress, begin 2 minutes of CPR.
  - b. Then the rescuer should turn on the AED and proceed via provided instructions on the device. Generally this will consist of:
    - i. Apply pads.
    - ii. Stop CPR and allow AED to analyze rhythm.
  - c. If shock is advised, CONFIRM that personnel are not touching the patient, advise everyone to be CLEAR of the patient.
    - i. Press the shock button to deliver shock
  - d. Resume immediate CPR
4. AEDs today have variable programs depending on the latest AHA CPR updates. In general the device should allow 2 minutes for uninterrupted CPR before indicating a need for analysis of the patient. If this is so, it should be left on.
  - a. If the device continually tries to analyze the patient, it may be turned off during 2 minute intervals to permit CPR.

5. With the exception of hypothermic patients (see protocol), 2 minute CPR and AED cycles should be continued until:
  - a. Higher level of care arrives and assumes manual rhythm analysis (EMT-P or MD).
  - b. The patient regains signs of spontaneous circulation such as waking, talking, movement or effective breathing.
  - c. The patient reaches the destination and care is transferred.
  - d. Resuscitation becomes futile and Medical Control orders termination of resuscitation.
6. Use on children - the responder must know if their device has pediatric capability.
  - a. In some devices, attachment of pediatric pads enters such a "mode" or the responder must use a "key", etc. Again, the responder must be familiar with the device.
  - b. Use on children, especially in cases of sudden "drop attack" cardiac arrest is strongly encouraged.
  - c. At present, the AHA has approved emergent use of adult AEDs on children in cardiac arrest if no pediatric device is accessible. This however does NOT allow for the sole use of adult AEDs for use by an EMS service. The responder should have AEDs with pediatric capability. If using adult pads in an emergency, make sure the edges do not touch.
7. Special conditions
  - a. If necessary to analyze rhythm during transport, stop unit, and allow AED to analyze rhythm and give shock if necessary. Movement and vibration will interfere with analysis.
  - b. Use the AED with caution while standing in water or in rain. Decontaminate any patient contaminated with flammable liquids before defibrillation.
8. Maintenance
  - a. AED owners must be responsible for monthly evaluation of AED readiness
  - b. Most units have a battery life indicator that is visible through the AED case
    - i. Most AED units are capable of delivering multiple shocks even when a "low battery" indicator becomes lit
    - ii. Do not delay replacement of the battery however
  - c. AED pads do expire, they become brittle and lose moisture, conductivity and adhesive properties. Replace as appropriate.

## End AED Use

# AIRVO 2 HIGH FLOW NASAL CANNULA

Approved Practice Level: **Paramedic**

Last Review Date: 1/2022

## **Clinical Indications:**

- For the treatment of refractory hypoxia and respiratory distress requiring long term non-invasive positive pressure ventilation and oxygenation not amenable to CPAP/BiPAP.
- To facilitate clinical transfer of patients already receiving high flow nasal cannula (HFNC) to other facilities or long-term care facilities.

## **Contraindications:**

- Patients who are experiencing imminent respiratory failure or are not cooperative with HFNC therapy.

## **Clinical Considerations or Precautions:**

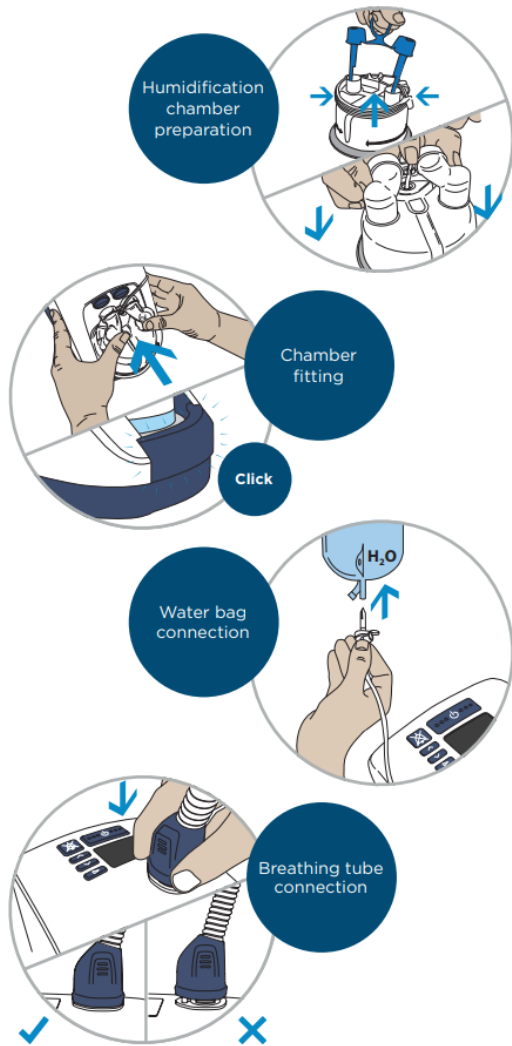
- The provider must be trained and credentialed to use the specific machine prior to use on a patient.
- Providers should consider contacting medical control or seeking further consultation before transferring patients on 'maximal' flow settings.
- Providers must do an oxygen consumption estimation to ensure they have enough oxygen on board to complete the required transport and have an emergency backup plan.

## **Procedure:**

- Before embarking on patient pickup, verify that all parts of the Airvo 2 system are in working order and ready for patient use.
  - Airvo 2 heating and humidification unit.
  - Heating and humidification insert.
  - Blue heated breathing circuit.
  - Assorted sizes of the patient treatment therapy being used (i.e. HFNC, tracheostomy adapter, etc.)
  - Sterile water, 1L IV bag.
  - High flow oxygen manifold and connection tubing.
  - Backup circuits and units.
  - Two full oxygen M cylinders and preferably three full oxygen D cylinders.
  - Verify that the Airvo unit has been disinfected (green light).
- Upon arrival verify the patient's settings on the facility HFNC and verify the Airvo 2 unit is capable of providing those settings.
- Assemble your Airvo 2 circuit.
  - Remove water reservoir and heating tube from packaging.
  - Remove the blue plugs from the top of the water reservoir.
  - Remove the stored IV tubing from packing reel and untangle/extend for connection.

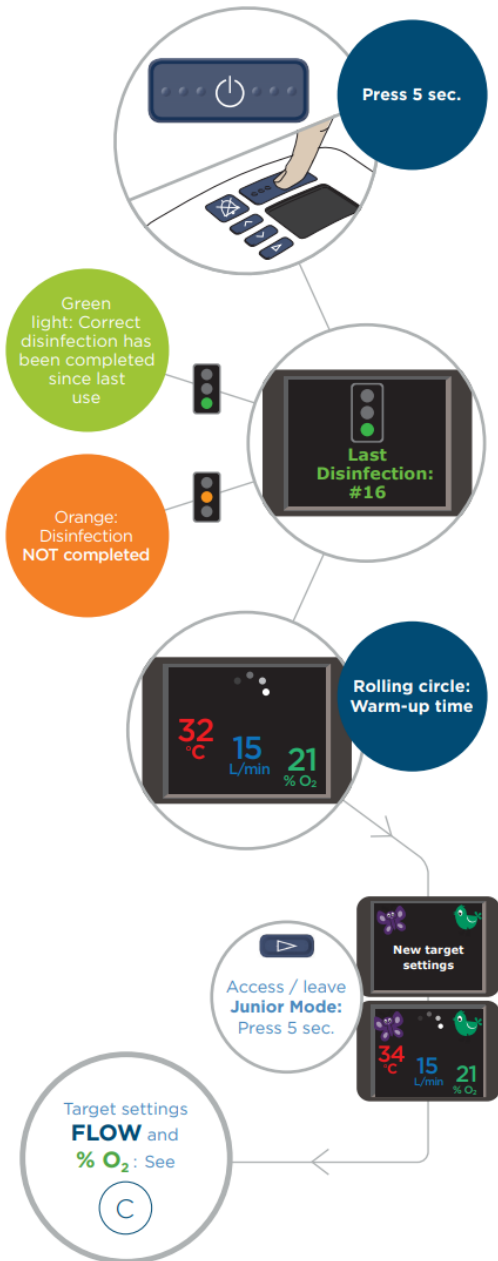
- Attach the flow port adapters to the top of the reservoir and clip IV tubing into the holder in the middle.
- Slide the reservoir into the Airvo 2 unit by depressing the finger guard sliding the unit in to make sure the flow port adapters line up with the flow ports coming out of the machine. Slide firmly into place until the guard clicks back up into position.
- Spike your liter of sterile water with the tubing and open the vent on the tubing set.
- Verify the humidification chamber is filling with water up to but not above the arrow line on the front. If the water level ever rises above these arrows discard and replace the reservoir.
- Clip the blue heated air tubing onto the top of the Airvo machine.
- Power up the Airvo 2 machine and prepare settings.
  - On power up you should see a green 'go' light indicating the machine has been disinfected.
  - If a yellow light is encountered the machine must be disinfected before use.
  - Press the 'play' key to enter settings modes, adjust:
    - Temperature – 37C will be the temperature for most but can be reduced based on clinical situation.
    - Flow – The total air flow in LPM may be adjusted between 2 – 60 liters per minute depending on the device and mode. Generally use the same flow rate as the patient's current therapy.
    - Oxygen % - Remember the machine only senses the percentage of oxygen being administered. Turn the oxygen regulator up or down to increase or decrease this number.
  - The 'play' key skips between these categories and acknowledges a value entered.
  - If a category is 'locked' hold down both up and down arrows for three seconds to unlock.
  - Press the 'play' arrow one last time to exit the menu.
- Allow the unit to continue warm up until a round circle with a check-mark is seen. You may now connect the Airvo 2 to the patient.
  - As with any ventilation product make sure your patient is stable on the new device or settings before moving the patient.
- After use, return the unit to the station or headquarters for disinfection before next use.
  
- The following are helpful links and documents for quick reference with the Airvo 2 machine.
- Helpful Videos About Airvo2 Setup & Use
  - <https://www.fphcare.com/us/hospital/adult-respiratory/optiflow/airvo-2-system/#resources>

**A**  
**Setup**



Scan the relevant QR code above to download the AIRVO 2 simulator app to your smartphone.

**B**  
**Start**



C

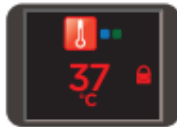
Settings

1 Target Flow Setting

Access the target flow setting.



Move past the temperature setting menu.



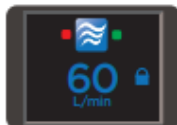
Adjust target flow:



If the setting menu is locked (🔒), unlock by pressing 3 sec: ⏻



Parameter setting adjustment

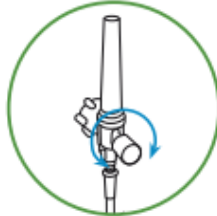


Exit the menu settings.



2 % O<sub>2</sub> Setting

Adjust the O<sub>2</sub> flow meter to change % O<sub>2</sub> value.



Note: This will NOT affect the delivered patient flow.



Read the measured % O<sub>2</sub> value.

3 When the target flow setting is adjusted:

New target flow setting adjustment (item 1) will change the delivered % O<sub>2</sub>. If required, adjust the % O<sub>2</sub> (item 2).

D

Patient interfaces



Nasal

OPT942  
OPT944  
OPT946

Tracheostomy

OJR416  
OJR418

Tracheostomy

OPT970

Available target settings

	Temp °C			Flow L/min						
	31	34	37	2	5	10	15	20	25 - 55	60
OJR416		●		2		20				
OJR418		●		2		25				
OPT942 S	●	●				10		50		
OPT944 M	●	●				10		60		
OPT946 L	●	●				10		60		
OPT970			●			10		60		

Turn Off

Press 5 sec. →



Cleaning and disinfection



**1**  
Select appropriate size. Prongs must not create a seal in the nares. A clear gap must be visible around each prong.

**2**  
For patient comfort keep the cannula headstrap away from the ears

**3**  
Adjust headstrap to fit. Do not over-tighten.

**4**  
Ensure headstrap clip is attached, to prevent cannula from being pulled out of the nares.

**5**  
Cannula can become unattached if not used with the headstrap clip.

**6**  
Attach tubing clip to clothing/bedding to prevent cannula from pulling off face.

**7**  
If using an MR850 Heated Humidifier, attach the tubing clip to the breathing circuit but ensure probe cable is not crushed by tubing clip.

## END AIRVO 2

# Adult Airway Management

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AA04; AA05; AA06

**Clinical Indications:**

- Any adult (12 years old or more) requiring airway management.

**Definitions:**

- Adult – For the purposes of intubation, a patient is an “adult” 12 years or older, and if the video laryngoscope fits within the oropharynx (mouth) comfortably.
- PAI – Pharmaceutically assisted intubation, any patient requiring sedation and paralysis for the purpose of intubation. Also referred to as RSI or DSI.
- RSI – Rapid sequence intubation, classically described as rapid sedation, paralysis and intubation without ventilation in between.
- DSI – Delayed sequence intubation, the process of maximizing ventilation, oxygenation and hemodynamics either before or during the intubation process.
- Induction agent – The medication given to produce relaxation, unconsciousness and amnesia.
- Paralytic agent – Medication given to relax muscles inducing neuro-muscular blockade.
- Crash airway – A clinical situation in which the patient is not able to be ventilated without induction and paralysis. A true second by second airway emergency.
- FiO<sub>2</sub> – Fraction of inspired oxygen, commonly referred to as % O<sub>2</sub> administered.

**Contraindications:**

- Patients with a very high probability of inability to ventilate following DSI (relative, contact medical control).

**Clinical Considerations or Precautions:**

- Foremost, the provider should remember that all patients must be VENTILATED, not intubated. While intubation is preferred, supraglottic airway insertion, BLS ventilation and of last resort, surgical airway are all available to ventilate the patient.
- Pre-planning and careful execution are the keys to excellent airway management. Adequate help should be present for the given procedure and equipment should be prepped and ready prior to its need.
- Do not use this algorithm for children, see Pediatric Airway Management procedure.

**Procedure:**

**1. Planning and determination**

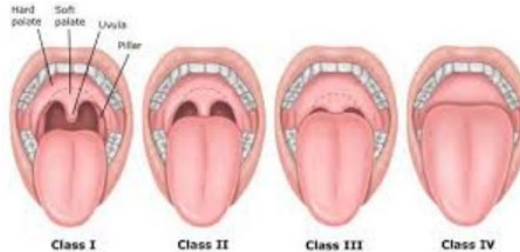
- a. Not all patients require intubation. Remember that CPAP and BVM assistance of breathing is appropriate in many cases.
  - i. Intubation for sole indication of “GCS less than 8” is not always indicated. Contact OLMC for advice on these patients.

- ii. Less than responsive patients may receive CPAP provided that the paramedic consistently monitors the airway and the patient has adequate airway patency and respiratory drive.
- b. What are my resources?
  - i. A minimum of 3 providers (one BLS and either two EMT-P, or one EMT-P and one AEMT) are STRONGLY recommended to proceed with the DSI procedure. Five providers are ideal.
  - ii. What is my relationship to the nearest hospital? Am I able to temporarily manage the airway without DSI until arrival?
- c. Is the patient a good candidate for DSI?
  - i. Patient and airway pre-assessment should always be performed. See section 2 below.
  - ii. Do NOT begin the DSI pathway if the likelihood of successful ventilation is low.

## 2. Airway pre-assessment

- a. In all but the “crash airway”, the patients should be evaluated for difficulty of airway management.
- b. Provider may remember LEMON acronym explained below
  - i. Look
  - ii. Evaluate
  - iii. Malampatti
  - iv. Obstruction
  - v. Neck mobility
- c. History
  - i. If able to talk has the patient ever been intubated? If yes...
    - 1. Any problems with anesthesia drugs?
    - 2. Any problems with airway management?
  - ii. Ever been told of any airway problems or abnormal anatomy?
  - iii. Any surgeries on the upper airway or head/neck cancer?
- d. General body habitus (LOOK)
  - i. What is the patient’s general size and appearance?
  - ii. Consider desired positioning and patient augmentation before medications are given when able
- e. Face and neck (LOOK)
  - i. Any abnormal facial features (cleft palate, retracted chin, etc.)
  - ii. Facial hair or barriers to BVM mask seal
  - iii. Neck length and mobility (EVALUATE) (NECK MOBILITY)
    - 1. Normal is 3-4 fingers tall from top of trapezius to angle of jaw
    - 2. Too short predicts anterior airway and poor neck mobility
    - 3. Too long may predict deep anatomy
    - 4. If no C-spine injury, have patient look up and down, range neck
  - iv. Chin, is it normal or “too far back” (called micrognathia)
    - 1. Micrognathia usually suggests an also small mouth and anterior airway
    - 2. May have other structural abnormalities
  - v. Mouth opening
    - 1. Normally able to insert three fingers

2. Check dentition at same time, any loose teeth, dentures, partials
  - i. Have patient open mouth and stick out tongue
  - ii. Evaluate view – “Mallampati class”
    1. Best view is 1, predicts good space to work in airway and correlates to good view of glottis
    2. Grade 4 suggests very “full” hypopharynx and poor glottis view



### 3. Patient preparation

- a. As soon as the provider realizes intubation may be needed, begin the following
- b. De-nitrogenation and oxygenation
  - i. Goal is to remove dissolved nitrogen from blood plasma and replace with oxygen – goal is to prolong working time before hypoxia.
  - ii. Ensure adequate tidal volume and rate
    1. If patient not breathing adequately, apply either CPAP or assist ventilation with BVM, 2 person thumbs down masking
  - iii. Apply O<sub>2</sub> delivery device to achieve as close to 100% as possible
    1. CPAP or BVM with 100% O<sub>2</sub> at high flow rate
    2. NRB plus Nasal Cannula
      - a. If NRB only, turn regulator as high as possible, ideally 25lpm or to “flush” setting
      - b. Add a nasal cannula set as high as the patient can tolerate
    3. DO NOT REMOVE THE O<sub>2</sub> DEVICE!
      - a. As little as 2-3 breaths of room air diminishes the benefit and reintroduces nitrogen
  - iv. Monitor SaO<sub>2</sub>
    1. Optimal is 100% SaO<sub>2</sub> for 5 minutes
    2. Satisfactory is 95% for 5 minutes
    3. Prepare equipment while waiting
- c. Positioning
  - i. Perhaps most important is that the EMS provider be comfortable during intubation. Providers should know how they “like” to position themselves during intubation and attempt to replicate that each time.
  - ii. Consider the “where” to perform intubation as well. Providers may elect to stay on scene to intubate where they have more room as compared to the back of the EMS unit.
  - iii. Head up positioning
    1. Consider elevating the patient’s upper torso 15-30 degrees for intubation especially for:

2. Large abdomen or “full abdomen” – head up position allows the abdominal contents to move down reducing pressure on the stomach and the lungs
3. This position may improve ventilation and reduce the chance of regurgitation during intubation
- iv. Shoulder padding
  1. Consider placing a roll or padding behind the shoulder blades in very obese or patients with limited neck motion
  2. This naturally facilitates head extension
- d. Optimization
  - i. Evaluate patient hemodynamics including oxygenation, ventilation and circulation
  - ii. Oxygenation
    1. Ensure SaO<sub>2</sub> has reached at least 95% and held for more than five minutes
    2. If not, consider alternate ways to improve oxygenation
      - a. Increase LPM flow
      - b. Add PEEP (BVM or CPAP)
  - iii. Ventilation
    1. Is tidal volume adequate? How is ETCO<sub>2</sub>?
    2. Consider different ventilatory strategy if not effective, 2 person BVM, increased PEEP, etc.
  - iv. Circulation
    1. Expect that cardiac output will decrease by up to 25% after intubation and positive pressure ventilation is started
    2. Shock index remains helpful in identifying patients at risk for hemodynamic deterioration
      - a.  $SI = HR / SBP$
      - b. Normal adult is 0.5-0.7 (imagine 60/120 = 0.5)
      - c.  $SI > 0.8$  and more so  $> 1.0$  predicts post intubation hypotension
    3. If concerns about borderline hypovolemia or hypotension, consider IV fluid bolus 500mL – 1L
    4. Prepare and consider push dose epinephrine

#### 4. Equipment preparation

- a. At minimum the following should be out, assembled, tested and readily available for any intubation attempt
  - i. Video laryngoscope with spare batteries available (open, ready)
  - ii. Appropriate size ET tube, checked and lubed, with or without stylet based on technique (open, ready)
  - iii. ET tube, one size smaller, checked and lubed
  - iv. Bougie
  - v. Large bore suction with tubing and catheter
  - vi. End tidal waveform CO<sub>2</sub> setup and ready to attach
  - vii. BVM
  - viii. Intubation medications
- b. Immediately accessible, in view may remain in package

- i. Supraglottic airway (iGel)
- ii. Direct laryngoscopy tools – in case of VL failure
- iii. Surgical airway equipment

#### **5. Induction**

- a. Evaluate patient oxygenation. If SaO<sub>2</sub> is > 95% for more than five minutes, move forward with administration of induction drug
- b. If SaO<sub>2</sub> < 94%, will induction facilitate improvement in SaO<sub>2</sub>?
  - i. If answer is no, consider BLS airway or supraglottic airway (SGA) insertion
  - ii. If answer is yes, proceed with induction using ketamine
    - 1. Examples might include patients with significant anxiety related to respiratory distress not allowing CPAP or BVM
    - 2. After relaxation with induction drug, use CPAP or BVM to ventilate and oxygenate
    - 3. Obtain and hold SaO<sub>2</sub> > 95% for five minutes
- c. If unable to obtain SaO<sub>2</sub> > 95% place supraglottic airway

#### **6. Paralysis**

- a. Only proceed if SaO<sub>2</sub> is > 95% for 5 minutes or use SGA technique
- b. Confirm that all equipment and personnel are ready
- c. Place nasal cannula on patient and flow at maximum setting for the flow meter, at least 15lpm or greater, preferred is 25lpm
- d. Administer rocuronium and start timer, wait 60 seconds
- e. Confirm relaxation of muscles, if not fully relaxed wait additional 15 seconds

#### **7. Complete intubation**

- a. May continue working on obtaining airway as long as SaO<sub>2</sub> remains above 92%
- b. Use good technique
  - i. Identify landmarks as you advance the VL – tongue, uvula, epiglottis, arytenoid cartilage, and glottis – say it out loud as you go!
  - ii. Always use the suction catheter – lead with your suction and keep your VL lens out of the “gunk” (blood, vomit, etc.)
  - iii. Acceptable to gently “park” the suction catheter in the hypopharynx while completing intubation
  - iv. Use tools that you find helpful, bougie, stylet, etc.
- c. If at any time SaO<sub>2</sub> falls below 92%, stop attempt and ventilate until > 95% for 3-5 minutes
- d. Provider may have two attempts if patient remains clinically stable
- e. After two attempts switch to supraglottic airway
- f. If at any time during intubation the patient becomes clinically unstable, abort intubation and place supraglottic airway

#### **8. Difficult intubation or failed airway**

- a. Prepare for the worst, hope for the best
- b. Proper preparation, planning and positioning will help
- c. Identify the problem from the first intubation attempt
  - i. Anterior cords
    - 1. BURP airway
    - 2. Bougie
    - 3. Lift underneath head

- ii. Heavily soiled
      - 1. Use good suction technique
      - 2. Leave suction in place
      - 3. Consider intentionally placing ETT in the esophagus to divert vomit, blood, etc. while completing intubation of trachea
  - d. Always change something on your next attempt
    - i. Blade, position, tube size, adjunct
    - ii. Consider changing operator vs. second attempt
  - e. If unstable or more than 2 attempts, place SGA
  - f. If unable to place SGA attempt BVM mask with oral and nasal airways
  - g. If unable to intubate AND ventilate move forward with surgical airway
- 9. Post Intubation**
  - a. Secure tube
    - i. Use commercial "tube tamer" device
    - ii. Note depth and maintain
      - 1. Most average height adults should have ETT depth of 22-26cm
      - 2. If outside these ranges, consider reevaluating placement
  - b. Ensure ETCO<sub>2</sub> waveform being monitored
    - i. Maintain ETCO<sub>2</sub> monitoring and SaO<sub>2</sub> monitoring at all times
    - ii. Obtain ETCO<sub>2</sub> recording just prior to taking off monitors in ED
  - c. Complete post-intubation sedation
    - i. Remember patient is paralyzed, rocuronium lasts an average of 30-40 min
    - ii. Refer to heart rate and blood pressure to help assess sedation
      - 1. Worsening tachycardia and hypertension herald inadequate sedation
      - 2. If using ketamine, attempt to establish a trend more than absolute numbers
    - iii. All paralyzed patients require sedation!

## End Adult Airway Management

# Pediatric Airway Management

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Last Review:** 1/2022

**Associated Protocols:** AA.02; AA.06; AA.07; AA.09

## **Clinical Indications:**

- Any pediatric patient (less than 12 years old) requiring airway management.

## **Definitions:**

- Pediatric – For the purposes of intubation, a patient is “pediatric” if the video laryngoscope does not fit within the oropharynx comfortably.
- PAI – Pharmaceutically assisted intubation, any patient requiring sedation and paralysis for the purpose of intubation. Also referred to as RSI or DSI.
- RSI – Rapid sequence intubation, classically described as rapid sedation, paralysis and intubation without ventilation in between.
- DSI – Delayed sequence intubation, the process of maximizing ventilation, oxygenation and hemodynamics either before or during the intubation process.
- Induction agent – The medication given to produce relaxation, unconsciousness and amnesia.
- Paralytic agent – Medication given to relax muscles inducing neuro-muscular blockade.
- Crash airway – A clinical situation in which the patient is not able to be ventilated without induction and paralysis. A true airway emergency.
- FiO<sub>2</sub> – Fraction of inspired oxygen, commonly referred to as % O<sub>2</sub> administered.

## **Contraindications:**

- Patients with a very high probability of inability to ventilate following DSI (relative).
- Pediatric patients who are adequately ventilated and oxygenated with BLS measures (relative).

## **Clinical Considerations or Precautions:**

- Foremost, the provider should remember that all patients must be VENTILATED, not intubated. While airway insertion, BLS ventilation and of last resort, needle airway are all available to ventilate the patient.
- Pre-planning and careful execution are the keys to excellent airway management. Adequate help should be present for the given procedure and equipment should be prepped and ready prior to its need.
- Do not use this algorithm for adults, see Adult Airway Management procedure.
- If a supraglottic airway will not fix the problem and endotracheal intubation is required (i.e. airway burns, etc.) contact OLMC for authorization to proceed.

## **Procedure:**

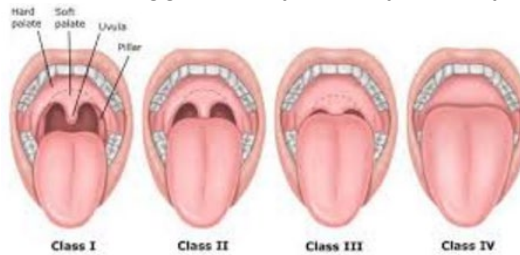
## 1. Planning and determination

- a. Not all patients require intubation. Remember that nasal CPAP and BVM assistance of breathing is appropriate in many cases.
  - i. Intubation for sole indication of “GCS less than 8” is not always indicated. Contact OLMC for advice on these patients.
  - ii. Less than responsive patients may receive CPAP provided that the paramedic consistently monitors the airway and the patient has adequate airway patency and respiratory drive.
- b. What are my resources?
  - i. A minimum of 3 providers (one BLS and either two EMT-P, or one EMT-P and one AEMT) are strongly suggested to proceed with the DSI procedure. Five providers are actually ideal.
  - ii. What is my relationship to the nearest hospital? Am I able to temporarily manage the airway without DSI until arrival?
- c. Is the patient a good candidate for DSI?
  - i. Patient and airway pre-assessment should always be performed. See section 2 below.
  - ii. Do NOT begin the DSI pathway if the likelihood of successful ventilation is low.

## 2. Airway pre-assessment

- a. In all but the “crash airway”, the patients should be evaluated for difficulty of airway management.
- b. History
  - i. If able to talk has the patient ever been intubated? If yes...
    1. Any problems with anesthesia drugs?
    2. Any problems with airway management?
  - ii. Ever been told of any airway problems or abnormal anatomy?
    1. Any evidence of cleft palate?
    2. Any previous noted airway anatomy issues? (Pierre-Robin, etc.)
  - iii. Any surgeries on the upper airway or cancer?
- c. General body habitus
  - i. What is the patient’s general size and appearance?
  - ii. Consider desired positioning and patient augmentation before medications are given when able
- d. Face and neck
  - i. Any abnormal facial features (cleft palate, retracted chin, etc.)
  - ii. Barriers to BVM mask seal
  - iii. Neck length and mobility
    1. Normal is 2-3 fingers tall from top of trapezius to angle of jaw
    2. Too short predicts anterior airway and poor neck mobility
    3. Too long may predict deep anatomy
    4. If no C-spine injury, have patient look up and down, range neck
  - iv. Chin, is it normal or “too far back” (called micrognathia)
    1. Micrognathia usually suggests an also small mouth and anterior airway
    2. May have other structural abnormalities
  - v. Mouth opening

1. Normally able to insert two fingers
  2. Check dentition at same time, any loose teeth
- e. Airway view
- i. Have patient open mouth and stick out tongue if able
    1. Best view is 1, predicts good space to work in airway and correlates to good view of glottis
    2. Grade 4 suggests very “full” hypopharynx and poor glottis view



3. **Patient preparation**

- a. As soon as the provider realizes intubation may be needed, begin the following
- b. De-nitrogenation and oxygenation
  - i. Goal is to remove dissolved nitrogen from blood plasma and replace with oxygen – goal is to prolong working time before hypoxia.
  - ii. Ensure adequate tidal volume and rate
    1. If patient not breathing adequately, apply either nasal CPAP or assist ventilation with BVM
  - iii. Apply O<sub>2</sub> delivery device to achieve as close to 100% as possible
    1. BVM with 100% O<sub>2</sub> at high flow rate
    2. NRB plus Nasal Cannula
      - a. If NRB only, turn regulator as high as possible, ideally 25lpm or to “flush” setting
      - b. NC set as high as the patient can tolerate
    3. DO NOT REMOVE THE O<sub>2</sub> DEVICE!
      - a. As little as 2-3 breaths of room air diminishes the benefit and reintroduces nitrogen
  - iv. Monitor SaO<sub>2</sub>
    1. Optimal is 100% SaO<sub>2</sub> for at least 5 minutes
    2. Satisfactory is SaO<sub>2</sub> 95% for 5 minutes
    3. Prepare equipment while waiting
- c. Positioning
  - i. Perhaps most important is that the EMS provider be comfortable during intubation. Providers should know how they “like” to position themselves during intubation and attempt to replicate that each time.
  - ii. Consider the “where” to perform intubation as well. Providers may elect to stay on scene to intubate where they have more room as compared to the back of the EMS unit.
  - iii. Head sniffing position, may require shoulder padding
    1. Consider placing a roll or padding behind the shoulder blades
    2. This naturally facilitates head extension
- d. Optimization

- i. Evaluate patient hemodynamics including oxygenation, ventilation and circulation
- ii. Oxygenation
  - 1. Ensure SaO<sub>2</sub> has reached at least 95% and held for more than five minutes
  - 2. If not, consider alternate ways to improve oxygenation
    - a. Increase LPM flow
    - b. Add PEEP (BVM)
- iii. Ventilation
  - 1. Is tidal volume adequate? How is ETCO<sub>2</sub>?
  - 2. Consider different ventilatory strategy if not effective, 2 person BVM, increased PEEP, etc.
- iv. Circulation
  - 1. Expect that cardiac output will decrease by up to 25% after intubation and positive pressure ventilation is started
  - 2. Shock index remains helpful in identifying patients at risk for hemodynamic deterioration
    - a.  $SI = \text{Max age normal HR} / \text{Min age normal SBP}$
    - b. Normal is 0.5-0.7
    - c.  $SI > 0.8$  and more so  $> 1.0$  predicts post intubation hypotension
  - 3. If concerns about borderline hypovolemia or hypotension, consider IV fluid bolus 20mL/kg X 1
  - 4. If cardiac output remains an issue or high shock index, consider preparing “push dose epinephrine” and have ready to administer before, during or after intubation.

#### 4. Equipment preparation

- a. At minimum the following should be out, assembled, tested and readily available for any intubation attempt
  - i. Appropriate size supraglottic airway (SGA) checked and lubed
  - ii. Alternate size SGA ready to open if needed
  - iii. Large bore suction with tubing and catheter
  - iv. End tidal waveform CO<sub>2</sub> setup and ready to attach
  - v. Correct size BVM
  - vi. Intubation medications
- b. Immediately accessible, in view but not opened or unpacked
  - i. Direct laryngoscopy tools – in case of SGA failure
  - ii. Needle airway equipment

#### 5. Induction

- a. Evaluate patient oxygenation. If SaO<sub>2</sub> is  $> 95\%$  for more than five minutes, move forward with administration of induction drug
- b. If unable to obtain SaO<sub>2</sub>  $> 95\%$  consider aborting intubation with supraglottic airway and continue BLS technique
  - i. If SGA placement required to prevent further hypoxia, do so quickly and efficiently

#### 6. Paralysis

- a. Only proceed if SaO<sub>2</sub> is  $> 95\%$  for 5 minutes or use SGA technique

- b. Confirm that all equipment and personnel are ready
  - c. Place nasal cannula on patient and flow at maximum setting for the flow meter, at least 15lpm or greater, preferred is 25lpm
  - d. Administer rocuronium and start timer, wait 60 seconds
  - e. After 60 seconds confirm relaxation of muscles, if not fully relaxed wait additional 15 seconds
- 7. Complete SGA intubation**
- a. May continue working on obtaining airway as long as SaO<sub>2</sub> remains above 92%
  - b. Use good technique
    - i. Proper size selection up front is important
    - ii. Remember some SGA devices require “seating” meaning the device may need adjustment following inflation of the balloon cuff
    - iii. Beware iGel and LMA style SGAs may “fold over” on themselves inside the mouth preventing a seal, use good technique to prevent this
  - c. If at any time during intubation the patient becomes clinically unstable, abort intubation and resume BLS techniques
- 8. Difficult intubation or failed airway**
- a. Prepare for the worst, hope for the best
  - b. Proper preparation, planning and positioning will help
  - c. If unable to place SGA attempt BVM mask with oral and nasal airways
  - d. If unable to intubate AND ventilate move forward with needle airway
  - e. If endotracheal intubation is required to correct the problem (i.e. airway burns, etc.) contact OLMC for authorization
- 9. Post Intubation**
- a. Secure tube
    - i. Use commercial “tube tamer” device if large enough or use tape to secure
    - ii. Note depth and maintain
      - 1. If using SGA, appropriate size device should show proper placement markings
      - 2. If outside these ranges, consider reevaluating placement
  - b. Ensure ETCO<sub>2</sub> waveform being monitored
    - i. Maintain ETCO<sub>2</sub> monitoring and SaO<sub>2</sub> monitoring at all times
    - ii. Obtain ETCO<sub>2</sub> recording just prior to taking off monitors in ED
  - c. Complete post-intubation sedation
    - i. Remember patient is paralyzed, rocuronium lasts an average of 30-40 min
    - ii. Refer to heart rate and blood pressure to help assess sedation
      - 1. Worsening tachycardia and hypertension herald inadequate sedation
      - 2. If using ketamine, attempt to establish a trend more than absolute numbers
    - iii. All paralyzed patients require sedation!

## End Pediatric Airway Management

# Alternate Venous Access

**Approved Practice Level:** Paramedic

**Associated Protocols:** GC.02

**Last Review:** 1/2022

**Clinical Indications:**

- Providers may access existing central venous and peripheral venous access catheters in **emergency** situations when normal IV or IO access cannot be appropriately obtained.

**Contraindications:**

- Lack of provider training on specific venous access devices.
- Existing venous access other than those specified.
- AV fistula or AV graft.
- Broken, infected or non-functional access catheter.
- Intended catheter with active infusion of medication such as milrinone or dobutamine. Do not interrupt these infusions.

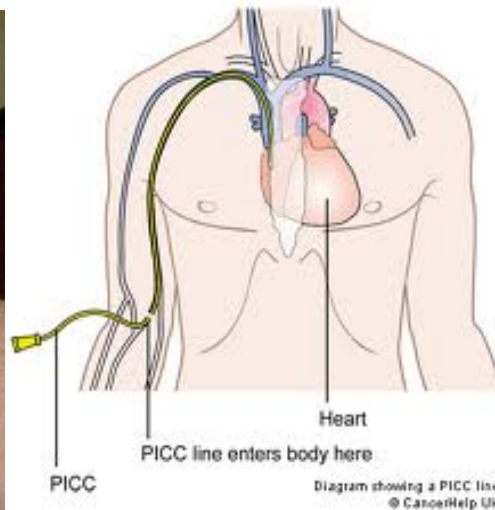
**Clinical Considerations or Precautions:**

- Central line is a term that can refer to multiple different devices and catheters, but is essentially a large bore single or multi-lumen IV catheter that is inserted into a larger peripheral or central vein with the catheter tip located in the “central circulation”.
- Typically catheter tips are inserted and end near the right atrium of the heart in the vena cava.
- A Peripherally Inserted Central Line (PICC) is common in patients going home on long-term medication infusions such as TPN, antibiotics and constant infusion heart medications. It is commonly inserted in the basilic vein in the upper arm.
- Subclavian and internal jugular central lines are typically inserted beneath the clavicle or on the lateral neck and may be “tunneled” under the skin to come out in various locations. A dialysis catheter in the chest is an example of this.
- These lines are typically “packed” or stored with heparin in them to keep them from clotting. It is imperative to withdraw/aspirate 5 – 10 mL of blood removing the heparin from the line prior to use. The heparin is very potent and is not meant to be flushed into circulation. Most of the hubs in these catheter show the mL amount required to flush or to withdraw to clear the line. Double this amount just to be safe.

**Procedure:**

1. Use clean gloves (sterile if possible) and maintain sterility as much as possible. Swab all the ports and visible tubing with an alcohol prep or chlorhexidine if able.
2. Remove any hub covers, attach a 20 mL syringe to the port.
  - a. Unclamp if necessary (needleless port may not have a clamp)

- b. Attempt to aspirate 20 mL of blood. Blood should draw freely. If it does not, remove the syringe and DO NOT use the catheter for access.
  - c. If blood aspirates freely, remove the 20 ml syringe with blood and discard.
3. Attach a 10 mL syringe with NS and gently flush the line. Never use a smaller syringe.
4. If line does not flush, remove the syringe and DO NOT use the catheter for access.
5. If line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of emergency medication.
  - a. Adjust the rate to the needs of the patient within the limits of the catheter.
  - b. Administer medications through IV tubing port if indicated.
6. Notes and Precautions
  - a. Do not administer medications, flush or aspirate with less than a 10 mL syringe. Smaller size syringes generate too much pressure and can damage the catheter.
  - b. Do not attempt to re-inject aspirated blood as it may contain clots.
  - c. The general maximum flow rate for a PICC line is 125mL per hour for less than size 2.0 French, and 250 mL per hour for catheters over 2.0 French. These rates may be listed on the catheter hub.
  - d. Ensure all line connections are secure. Never leave a hub or connection open to air, central lines can “entrain” or draw in air causing air embolism.
  - e. PICC lines access the patient’s central circulation and the risk of infection is high. Avoid contamination to ports and connections while accessing.



## End Alternate Venous Access

# Aspirin Administration

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AC01

**Last Review:** 1/2022

## **Clinical Indications:**

- To be administered to any patient with suspected acute coronary syndrome unless a major contraindication exists.

## **Contraindications:**

- Anaphylaxis to aspirin administration.
- Moderate to severe active GI bleeding.
- History of severe exacerbation of obstructive lung disease with aspirin administration.

## **Clinical Considerations or Precautions:**

- Recall that aspirin is one of only two interventions show to improve all-cause mortality in patients with acute coronary syndrome. The other is PCI.
- Many patients claim to have an aspirin allergy because of GI intolerance, skin rash, co-administration of other anti-coagulants such as Coumadin. These patients still benefit from aspirin therapy.
- Patients also refuse aspirin because of a history of gastric bypass surgery. Advise them to chew the aspirin and that it is generally safe to take a single dose in cases of ACS.

## **Procedure:**

1. All patients should receive 324mg aspirin, chewed and swallowed (typically 4 X 81mg ASA) unless **MAJOR CONTRAINDICATION** listed above.
  - a. This includes patients who are on low-dose or have already taken aspirin.
  - b. Many patients confuse what they are taking for aspirin or the medication may be expired, this has been studied and many patients make this mistake.
  - c. An additional 324 mg is still well within a safe dosing range even if patients have just taken the same.
  - d. Patients with ROSC who cannot take oral medication and demonstrate a STEMI on 12-lead EKG may receive an aspirin suppository, 300 or 600 mg rectally if available (do not use regular aspirin).
2. Do NOT use enteric coated or delayed release aspirin.
3. Consideration will have to be given for patients with existing bleeding disorder such as bleeding aneurysm, hemophilia, etc.
4. If there is also concern for CVA (stroke) or head trauma.
  - a. Patients with symptoms concerning for stroke or a positive pre-hospital stroke screen should not get aspirin unless authorized by medical control or until evaluated with CT in the hospital setting to rule out hemorrhagic stroke.
  - b. STEMI may be the exception, contact medical control.
5. Other Factors

- a. Patients may report being on other blood thinners such as Coumadin, etc. A single dose of aspirin in the setting of possible acute coronary syndrome is typically safe and should be encouraged despite other anticoagulants.

## End Aspirin Administration

# Blood Draw for Law Enforcement

**Approved Practice Level:** AEMT; Paramedic

**Associated Protocols:** None

**Last Review:** 1/2022

**Clinical Indications:**

- At the request of a law enforcement official having jurisdiction, the provider may draw blood from the requested source individual for law enforcement proceedings.

**Contraindications:**

- Do not attempt blood draw on patients that are violent, verbally or physically abusive or who will not fully cooperate with the blood draw procedure.
- Other emergency duties pending. For example if the provider should be doing other emergency duties such as patient transport, scene safety, extrication or if other calls for emergency response are holding, the EMS provider should politely decline.

**Clinical Considerations or Precautions:**

- Current Texas legislation has made it acceptable for law enforcement officers to request EMS assistance obtaining blood samples. This is in addition to previously established persons such as justice of the peace, magistrates, etc. Although legal, this creates possible “unknown” issues and precedents. The EMS provider who draws the blood now becomes part of the chain of custody and may be asked to attend legal proceedings. Patients may also take legal action against the providers for any ensuing problems such as infection, pain, neuralgia, inadvertent arterial puncture, etc.
- Ideally, the EMS provider should encourage the peace officer to obtain the specimen themselves per their agency policy or have a healthcare facility obtain the specimen. However, if the peace officer makes an official demand and instructs the EMS provider to do so, the provider can obtain the blood specimen but should notify their immediate supervisor as well as obtain the peace officer’s name and ID # to document on the patient care narrative. A patient care report must be filled out for any law enforcement blood draw.
- This procedure is considered permissive. Each EMS agency should consult appropriate legal counsel and develop a policy on whether or not they will perform such requests. Ideally the EMS provider should encourage the law officer to have them taken to a local Emergency Department for such. The EMS provider’s City, Municipality or department having jurisdictional authority, must have an approved policy as it pertains to EMS providers performing blood draw for law-enforcement request. This should include when and under what circumstances the provider may assist with this task.

**Procedure:**

1. Determine that the patient is cooperative for blood sampling and ensure that the officer requesting the blood draw has jurisdictional authority.

2. The law enforcement officer must provide the needed materials (blood tubes, etc.) for the blood sampling. Don PPE, gloves and eye protection.
3. Use an appropriate safety-engineered system such as vacutainer or other safety-approved product for the blood draw.
4. Perform blood draw in accordance with law enforcement standards (i.e. using approved antiseptic prep, usually betadine. Note, generally alcohol swabs are avoided in this case).
5. Use standard aseptic technique for the blood draw including placement of venous tourniquet and bandage the wound appropriately following completion.
6. Dispose of all sharps in approved container, wash hands appropriately.
7. A complete patient care report must be completed for all patients that EMS draws blood on.

## End Blood Draw for Law Enforcement

# Burn Estimation, Rule of Nines

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** TR03

**Last Review:** 1/2022

**Clinical Indications:**

- For use in calculating burn severity and surface area.
- Estimation is required for burn treatment calculation.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- Remember that for treatment considerations such as the Parkland Burn formula, only 2<sup>nd</sup> and 3<sup>rd</sup> degree burns are included.
- Patients must be modestly undressed to evaluate all burned areas.

**Procedure:**

1. Burn classification:

**Table 1. Classification of Burn Severity.**

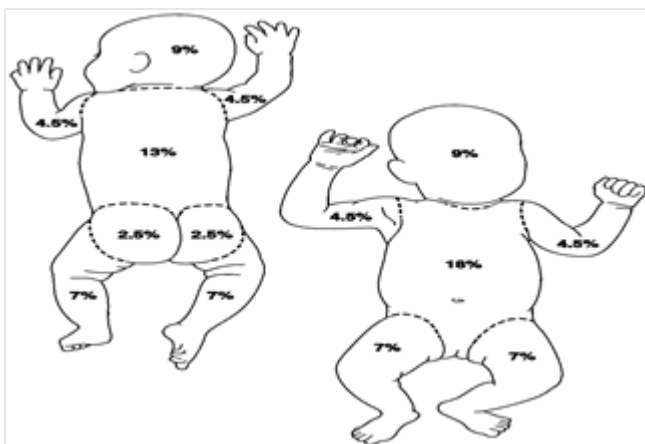
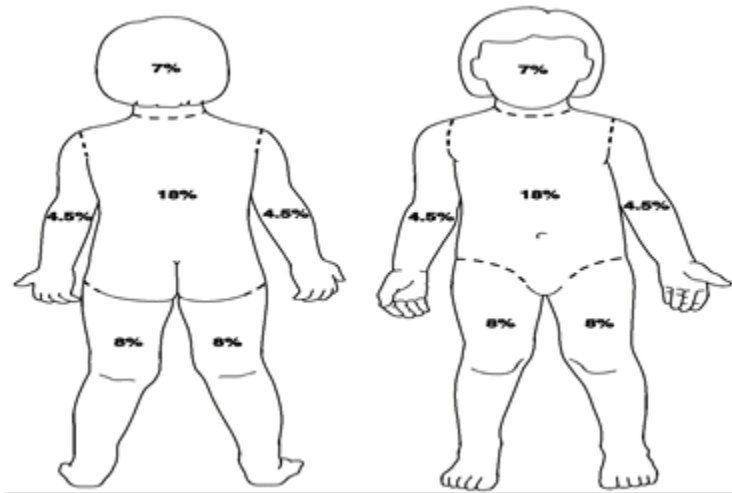
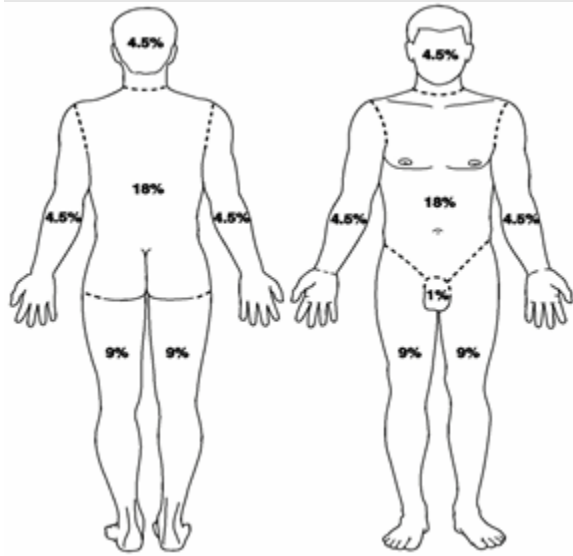
Burn Severity/Age	Children	Adults	Elderly
Minor	<10% TBSA Full-thickness <2% TBSA	<15% TBSA Full-thickness <2% TBSA	<10% TBSA Full-thickness <2% TBSA
Moderate	10-20% TBSA Full-thickness <10% TBSA (non-critical areas)	15-25% TBSA Full-thickness <10% TBSA (non-critical areas)	10-20% TBSA Full-thickness <10% TBSA (non-critical areas)
Severe	>20% TBSA Full-thickness >10% TBSA Burns in critical areas* Complicated burns**	>25% TBSA Full-thickness >10% TBSA Burns in critical areas* Complicated burns**	>20% TBSA Full-thickness >10% TBSA Burns in critical areas* Complicated burns**

\* Critical areas include face, hands, feet, perineum

\*\* Complications include inhalation injury, high-voltage electrical burns, associated major trauma, infants, elderly, and comorbid medical problems (e.g., diabetes mellitus)

2. Burn estimation:

- a. Remember when in doubt, the patient's palm represents about 1% of the total body surface area.
- b. Utilize the "rule of nines" highlighted on the next page to estimate adult, pediatric and neonatal burns.



# Electrical Cardioversion

**Approved Practice Level:** Paramedic

**Associated Protocols:** AC04; AC05; PD06; PD07

**Last Review:** 1/2022

**Clinical Indications:**

- For patients with unstable tachycardia, either not stable enough for medical treatment or refractory to medical treatment.
- Patients must have a mechanical pulse.

**Contraindications:**

- Pulseless
- Clinically stable
- Non-cardiovertable rhythm

**Clinical Considerations or Precautions:**

- Remember that in most cases, a patient not responding to 2-3 cardioversion attempts may have another underlying problem that needs to be addressed. It is generally discouraged to provide more than 2-3 cardioversion attempts if no change is noted. Contact medical control for advice on additional medications or interventions.

**Procedure:**

1. Attach remote pacing patches in anterior-posterior on the front and back of the patient (or antero-lateral if problem with A/P placement). Any sweat or hair should be appropriately removed prior to placement.
2. If awake and condition permits, inform the patient/family of the intended procedure and discuss possible discomfort and complications such as dislodgement of a small blood clot or possible change to worsened rhythm.
3. Initiate sedation or pain management protocols as needed.
4. The responder must know the proper procedure for their specific device and have documented training for cardioversion.
5. In general, to cardiovert:
  - a. The monitor limb leads must be attached and the monitor be on its setting to cardiovert
  - b. When ready the SYNC button should be pressed and “QRS markers” should be noted on the EKG readout, noting the “R” wave on the QRS complex of each beat.
  - c. The joule setting should be selected per the patient care protocols and one final assurance made that the monitor is set to cardiovert and NOT defibrillate.
  - d. Once this is noted, the patient MUST be checked, cleared for other personnel such as with defibrillation.

- e. Once personnel are clear and appropriate medications have taken effect, print a running EKG strip and cardiovert the patient.
6. Remember that the shock button must be held until the energy is delivered and that it may take longer than normal defibrillation modes.
7. Once the energy is delivered, settings should be documented and treatment continued. The patient should be rapidly assessed for rhythm change and adequate ABCs, obtain V/S.
8. V/S should be continued every 2-5 minutes and pulses need to be frequently checked.
9. Continue to provide additional cardioversion as needed/indicated in the patient care protocols.
10. Continue to provide pain management as needed following the procedure as needed.
11. Obtain additional 12-lead EKG following successful cardioversion.

## End Electrical Cardioversion

# Normal Childbirth

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** OB01

**Last Review:** 1/2022

**Clinical Indications:**

- Any pregnant patient who appears to be in active impending labor.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- Remember that normal childbirth has been taking place, un-aided by healthcare providers for a number of years.
- Ideally, if transport to the hospital can be completed prior to delivery this is ideal. However, if delivery is imminent, the responder should pull over and request additional resources and deliver the infant.
- Only if abnormal presentation or complications arise should transport during labor continue.

**Procedure:**

1. Monitor EKG, obtain large bore IV access and begin fluid bolus per protocol
2. If delivery imminent or patient in active labor:
  - a. Have patient remove lower clothing (drape and cover appropriately)
  - b. Obtain prior OB history, especially ask about prior birth complications or high-risk issues with the current pregnancy and any twin or more gestations
  - c. Evaluate the perineum for bulging, crowning, fluid or bleeding, be sure to look during a contraction
  - d. If significant bulging, head crowning or more of the head is present, stop and deliver the infant.
3. Otherwise, begin transport immediately unless delivery is occurring, and contact Med Control.
4. General delivery steps:
  - a. Instruct the mother on how to push “down low like having a bowel movement”, evaluate the perineum and ensure the head is the presenting part. Count with the mother in 10 second cycles with some rest in-between. Have her push with contractions.
  - b. As the head begins to deliver, palpate around the neck and assess for nuchal cord, if present, gently loosen the cord and slip off the neck and head. It is generally not advised to cut and clamp the cord at this point in case delivery halts or is obstructed. If this happens and the cord is cut, oxygen and blood flow are

cut off from the infant. If the cord cannot be reduced and is inhibiting delivery, contact Med Control for permission to clamp and cut.

- c. Provide gentle pressure over the perineum to “guide” gentle (and avoid explosive) delivery of the head.
  - d. Deliver anterior shoulder with gentle downward traction of the head – do not force head down, then deliver posterior shoulder with gentle upward motion. Be READY to catch the child, once the shoulders are clear, delivery can be EXPLOSIVE unless you guide the baby out gently. Take precautions against dropping the child, they are very slippery.
  - e. Keep the child level with mother’s heart and clamp the cord x 2, cut between clamps. Leave at least 3-4 cm of umbilical cord attached to the infant, longer is always better (within reason).
5. Assess and document APGAR 1 and 5 (see below) minutes into the process and begin resuscitative measures for the infant and the mother as needed.
  6. Keep baby warm and dry and monitor mother for delivery of the placenta, transport can take place prior to delivery of placenta, monitor closely for postpartum hemorrhage and any clinical changes.
  7. Assess glucose level and temperature as needed. Remember newborn glucose levels are lower than ‘normal’. Glucose > 40 is normal.
  8. APGAR Score (each row is 0, 1, 2 in that order)

<b>HEART RATE</b>	ABSENT	< 100	> 100
<b>RESPIRATORY EFFORT</b>	ABSENT	WEAK CRY	STRONG CRY
<b>MUSCLE TONE</b>	FLACCID	SOME FLEXION	ACTIVE MOTION
<b>REFLEX IRRITABILITY</b>	NO RESPONSE	SOME MOTION	VIGOROUS CRY
<b>COLOR</b>	BLUE/PALE	BODY: PINK EXT.: BLUE	FULLY PINK

## End Normal Childbirth

# Complicated Childbirth

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** OB01; OB02

**Clinical Indications:**

- For use in pregnant patients with impending delivery and signs of complication.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- On rare occasions, childbirth does not proceed normally, the guidelines below highlight some of the most common complications and basic steps to improve the situation.
- In many of these cases, childbirth cannot proceed without hospital assistance. The mother should be informed of the situation and advised not to push and to breathe through the contractions as much as possible.
- All steps should be taken to maximize maternal circulation and oxygenation including supplemental IV fluids, O2 and positioning to move the uterus off of the inferior vena cava when appropriate.
- Transport all patients with complication to an OB receiving center with NICU capability when able.

**Procedure:**

1. Prolapsed umbilical cord - Delivery cannot proceed as child descent into the canal will “cut off” blood flow through the cord.
  - a. Elevate maternal hips, place in the “far lithotomy” or the knee to chest position.
  - b. Explain what you are doing and insert gloved hand into vagina and gently push back on the fetal presenting part to alleviate pressure from the umbilical cord. Do not remove hand until instructed by receiving physician.
  - c. If successful, the responder should be able to feel pulsations in the umbilical cord.
  - d. If the head is the presenting part, which it will be most often, use caution not to push directly on the fontanelle (soft spot in the skull). Widen fingers and push around this area.
2. Upper limb presentation - In some cases if there is just an arm presentation, the arm can gently be swept back and into position and the head can be delivered. This is generally difficult and should only be performed if appropriately trained.
  - a. Continuation of delivery can injure the upper limb but if delivery cannot be stopped, continue as with normal delivery and deliver that shoulder first being sure to protect the arm as much as possible.
  - b. If the patient can be placed in L lateral position and supplemental O2 applied, delivery should be delayed.

3. Footling presentation - In this case a leg or foot is the presenting part.
  - a. Delivery should not continue, the patient should be placed in the L lateral position and asked not to push. O2 application and rapid transport is crucial.
  - b. If delivery cannot be delayed, refer to breech presentation below.
4. Breech presentation – Presenting part may be both feet or buttocks (frank).
  - a. If the delivery of the body alone occurs and the head remains trapped, support the presenting body and place a gloved hand in the vagina forming a "V" around the mouth and nose to maintain the airway and create a "canal" for breathing.
  - b. Do NOT pull on the body or the head.
  - c. Many breech births progress normally and may eventually deliver. Provide supplemental oxygen in the area of the vaginal canal and preserve warmth in the presenting body.
5. Pre-eclampsia and eclampsia – A syndrome resulting from abnormal placental implantation. This results in hypertension, protein in the urine, kidney issues and sometimes seizures. Patients may report hypertension, swelling, headache and visual disturbance in many cases. This condition can occur for 6 or more weeks following delivery.
  - a. Immediate transport and keep patient calm, monitor vital signs and pulse oximeter
  - b. Go to appropriate protocol.
  - c. Obtain definitive airway for patients with continued seizures or inadequate respirations
  - d. Monitor airway and breathing closely for any patients given benzodiazepines or magnesium sulfate. Be prepared to intubate and support breathing if needed.
6. Placenta previa / Abruptio placenta / Uterine rupture/ Spontaneous miscarriage
  - a. Consider immediate, rapid transport
  - b. Anticipate hypovolemia in all cases, and treat similar to hemorrhagic shock and non-compressible trauma. Remember the treatment is surgical, C-section, etc.
  - c. Remember: Abruptio is painful and previa is painless.
  - d. Suspect uterine rupture when labor was progressing and the mother is suddenly met with severe tearing abdominal pain, massive hypotension and a lack of firm fundus or uterine contractions.

# Adult CPR

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AA01

**Last Review:** 4/2026

**Clinical Indications:**

- Any adult (12 years old and older and > 36kg) in cardiac arrest.

**Contraindications:** None

**Clinical Considerations or Precautions:**

- The Adult CPR procedure should be combined with the “pit crew CPR” method whenever possible. However, sometimes only 2 responders may be present, and the fundamental ‘essence’ of the actions should be performed regardless of provider numbers.
- A cardiac monitor may be used anywhere AED is referenced below either by a paramedic or in AED mode by other certified team members.
- Remember, the major focus is on high quality compressions AND ventilations, with an appropriate depth and rate, all while preventing compressor fatigue.

**Procedure:**

1. Assess responsiveness and signs of spontaneous circulation.
  - a. Remember that some patients, especially those in early ventricular fibrillation, will still have agonal breathing
  - b. Professional rescuers may check a pulse at this point and even if agonal breathing exists, if there is no pulse felt, start CPR
2. Start 30:2 CPR, remembering to push hard and fast allowing full recoil of the chest
  - a. Perform 30 compressions followed by 2 good ventilations, attempt a compression rate to achieve > 100 compressions per minute; adults need greater than 2” of compression depth
  - b. If available, apply and use a CPR feedback device
  - c. Mechanical CPR devices such as the LUCAS or Auto Pulse may be applied when the provider deems it to be advantageous
    - i. Application should follow a phased in approach, be practiced and not delay CPR more than 10 seconds for application
    - ii. Mechanical CPR devices are preferred if the patient needs to be moved or CPR needs to be performed in a moving vehicle
3. Methods for oxygenation and ventilation
  - a. BLS interventions are usually appropriate initially with a focus on opening the airway, using any combination of OPA or NPAs, or using a supraglottic airway such as the iGel
    - i. Begin BVM ventilation using high flow (15-25 lpm) supplemental O2
    - ii. PEEP above 5 cmH20 is generally not used in cardiac arrest unless significant pulmonary edema is encountered (drowning, etc.)

4. Continue high quality, uninterrupted 30:2 ratio CPR, focusing on 2-minute cycles. Plan for success and avoid long pauses by incorporating pre-planned techniques:
  - a. Timed AED placement during pauses or apply 'with' the compressor
  - b. Plan AED analysis around pauses
  - c. Perform CPR while the AED is charging and immediately after defibrillation
  - d. If using a cardiac monitor, the monitor may be 'pre-charged' prior to pulse checks to prevent charging delays
    - i. The responder must know how to 'dump the charge' safely if a shock is not indicated
    - ii. This is not required and results in minimal time savings if attention to CPR detail is followed
5. Change compressors often.
  - a. Compressors should ideally be changed every 1-2 minutes using the "PIT crew" cross-body technique to prevent delays in CPR
  - b. Unless insufficient personnel are present, change compressors at minimum every 2 minutes during pulse checks
6. Advanced interventions.
  - a. Appropriate ACLS and cardiac arrest medication administration should be done during the 2-minute interval of CPR and 'next up' medications prepped and anticipated
  - b. Advanced airway placement may take place when and as needed
    - i. In many cases the supraglottic airway (iGel) may be sufficient
    - ii. If intubation is desired, ensure the intubation procedure does not interfere with ongoing compressions
7. Globally the goal is to maximize compression fraction along with good ventilation – the total CPR time divided by the total code time. Higher compression fraction is associated with better survival.
  - a. Minimize time off the chest, pre-plan interventions around required pauses
  - b. Pauses should be kept to the shortest time possible (<10 seconds)
8. Continue care per the appropriate Cardiac Arrest Protocol.

## End Adult CPR

# Pediatric CPR

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** OB05, OB06, PD01

**Last Review:** 5/2026

**Clinical Indications:**

- Any pediatric patient (<12yo, < 36 kg)
- Neonate - less than one month old; Infant - 1 month to 1 year; Child - 1 year to 12 years.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- The pediatric CPR procedure is different than the adult procedure with emphasis on early airway management and ventilation as most pediatric arrests are respiratory in nature.
- The CPR procedure should be followed in accordance with the “pit crew” method unless the patient is so small that it prohibits physical access of multiple responders. The major focus remains ABC, with ventilation and minimally interrupted compressions, appropriate depth and rate as well as preventing compressor fatigue being paramount.
- NRP (neonatal resuscitation program) resuscitation is globally approved for providers trained to use that curriculum.
- A cardiac monitor/defibrillator may be used anywhere AED is indicated below, either by a paramedic or in AED mode by other providers.

**Procedure:**

1. Assess responsiveness and signs of spontaneous circulation.
  - a. If no signs of breathing or movement, check a pulse
    - i. Use the carotid or brachial pulse in small children
    - ii. Umbilical pulses may be present in some newborns
  - b. Go to appropriate cardiac arrest protocol
2. Immediately begin CPR:
  - a. Open the airway, ensure it is patent and begin ventilation with a BVM
    - i. Use appropriate adjuncts, and supplemental oxygen
    - ii. Remember to provide age-appropriate ventilation, do not hyperventilate
  - b. Remember to push hard and fast allowing full recoil of the chest
    - i. Perform at least 120 compressions per minute
    - ii. Remember to compress approximately 1/3 of the depth of the chest
  - c. Compression ratios by age;
    - i. Newborns and neonates – 3:1 NRP style CPR
      1. Use thumbs encircling technique

2. Breaths are small, just enough for chest rise
    3. Cycles are done quickly, goal > 120 compressions per min
  - ii. Infants and children – 15:2 CPR
    1. Use PIT crew as space allows
    2. One arm vs two arm CPR will vary by age and size
3. Continue high quality, uninterrupted CPR focusing on 2-minute cycles.
  - a. Do not stop CPR unless for ventilation, rhythm analysis and defibrillation
  - b. Focus any needed pauses around the 2-minute pulse checks when possible
4. Place and operate the AED in accordance with the AED procedure, be sure to utilize the pediatric pads or “pediatric key” if so equipped.
  - a. Do not stop CPR to apply the AED, work around the compressor
  - b. At the 2-minute pause, the AED should be allowed to analyze, then follow appropriate steps
  - c. Resume CPR during AED charging, only stopping to get clear to shock
  - d. Change compressors at least every 2 minutes and every 1 minute if rescuers are fatigued
5. As early as feasible and without interrupting CPR, a more secure airway may be obtained:
  - a. Do NOT stop CPR for airway procedures
  - b. The trained responder may ventilate the patient with a BVM and should use BLS adjuncts (OPA/NPA) when possible
  - c. Trained rescuers may also use a supraglottic airway such as an iGel (preferred) when desired in the resuscitation sequence
  - d. Ventilation should not exceed an age-appropriate rate
6. After ABCs, prioritize vascular access and initial epinephrine therapy
  - a. Refer to the appropriate protocol, children have been shown to respond better to epinephrine than adults, especially when given earlier in cardiac arrest
7. Early consultation with Medical Control is strongly encouraged to help guide resuscitation since pediatric resuscitation is a low frequency, high risk event.

## End Pediatric CPR

# Pit Crew CPR

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AA01; PD01

**Last Review:** 1/2022

**Clinical Indications:**

- For any patient in cardiac arrest where patient size and responder numbers are compatible with utilization.

**Contraindications:**

- None

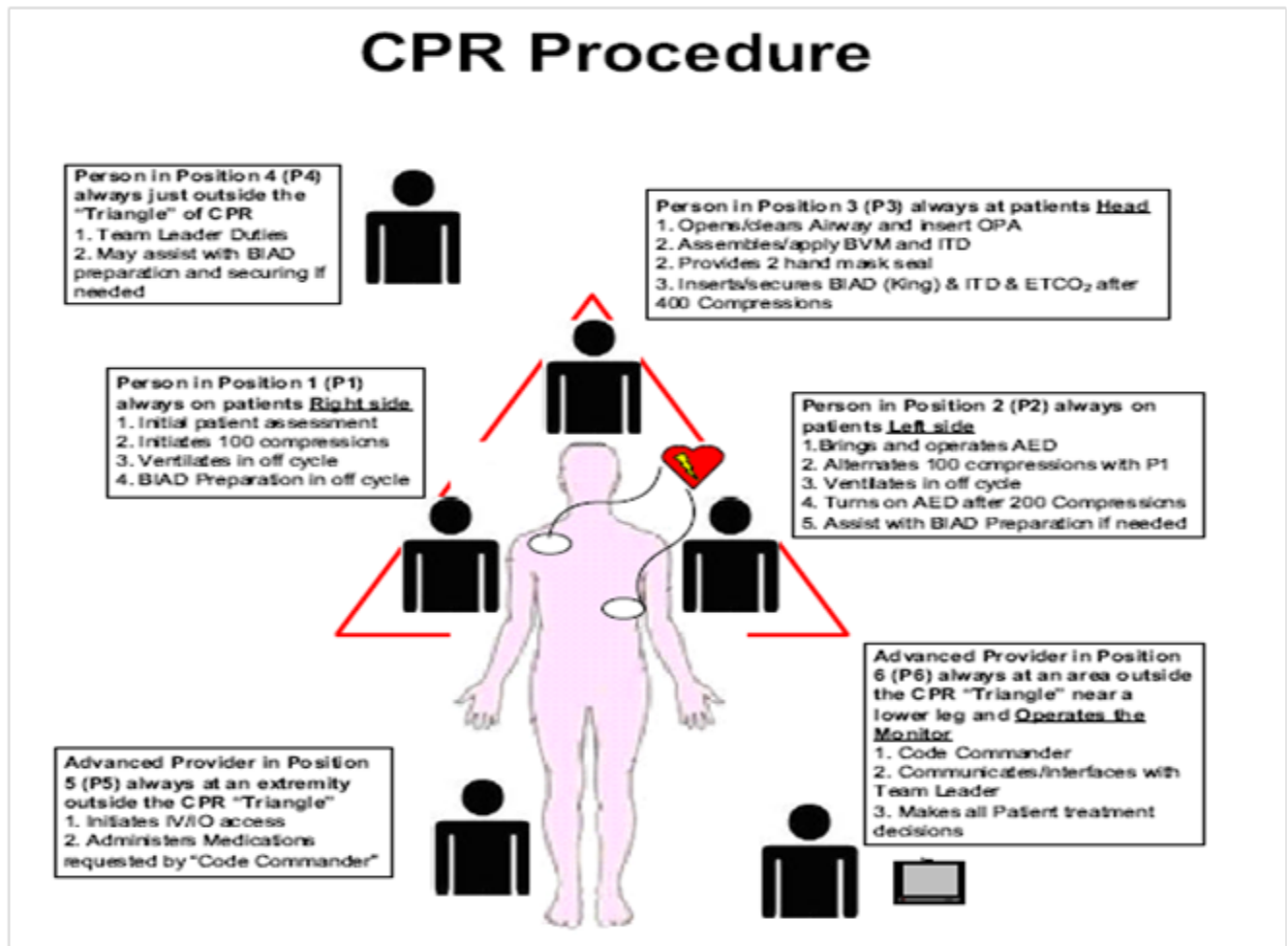
**Clinical Considerations or Precautions:**

- This procedure is designed to standardize the approach to cardiac arrest management. This is to be used on any patient in cardiac arrest except small children where physical size prohibits access of multiple responders.
- Remember that the focus is on provision of coordinated and uninterrupted high quality CPR, changing compressors efficiently and quickly to prevent fatigue.
- If only 2 crewmembers are present, the “pit-crew” method is not possible, move to the regular CPR procedure and alternate roles as needed. This also applies to patients who are in small spaces such as bathrooms, bedrooms, etc. However, patients should be moved rapidly to an acceptable location for CPR as soon as feasible.
- For ALS providers, cardiac monitor defibrillator may be substituted anywhere AED is referred to below.

**Procedure:**

1. First arriving providers should establish a minimum of 3 positions for BLS tasks:
2. **Position 1** (patient R side):
  - a. Initial assessment, responsiveness and pulses
  - b. Immediately starts chest compressions
  - c. Alternates compressions every 2 minutes with Position 2
  - d. When not doing compressions, checks and assembles any advanced airway devices and assists Position 3 with squeezing the BVM when indicated
3. **Position 2** (patient L side):
  - a. Immediately applies the AED or defibrillator pads/EKG
  - b. Operates the AED or cardiac monitor after each 2 minute CPR cycle as needed
  - c. Alternates compressions every 2 minutes with Position 1
  - d. May assist with the airway and squeezes the BVM during breaths
4. **Position 3** (patient head):
  - a. Assembles and applies equipment for airway and ventilation management
  - b. Opens and clears the airway, initially places a NPA/OPA or iGel and non-rebreather mask @ 15lpm

- c. Ensures ventilations are coordinated with compressions
- d. Places the airway device after 5 minutes of CPR, and begins positive pressure ventilation unless otherwise specified in adult and pediatric CPR protocol
- 5. **Position 4** (if available):
  - a. Should float to any needed position. May function as the “team leader”
  - b. BLS should be the focus of efforts for the first 5-6 minutes especially if a limited number of crewmembers are present initially. Once additional providers are present, ALS measures should be initiated:
- 6. **Code Commander** (overall view of scene):
  - a. Is the provider who assumes control of the monitor/AED
  - b. Makes patient treatment decisions and instructs other providers performing CPR
  - c. Should ideally be highest level/most experienced provider
- 7. **Intervention Provider** (patient feet unless doing procedure):
  - a. Obtains vascular access, IO should be front line in cardiac arrest, peripheral IV access can be obtained later as able/indicated
  - b. Prepares and administers medications at the direction of the Code Commander
  - c. Tracks administered medications and anticipates needs during the arrest



# Dual Sequential Defibrillation

**Approved Practice Level:** All Levels

**Associated Protocols:** AA03

**Last Review:** 5/2026

**Clinical Indications:**

- Where indicated in the refractory ventricular fibrillation and tachycardia algorithm.
- For refractory arrhythmia in cardiac arrest not responding to conventional defibrillation and anti-arrhythmic drugs.

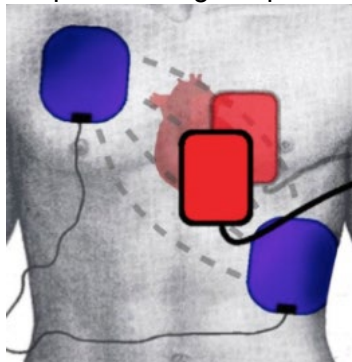
**Contraindications:** None

**Clinical Considerations or Precautions:**

- If initial first or second shocks are not successful, consider asking early for the presence of a second AED or defibrillator (think ahead).
- Do not delay other care waiting on second defibrillator or AED in any patient who is an eCPR (ECMO) candidate.

**Procedure:**

1. Continue high quality CPR and resuscitation, remember CPR and appropriate ventilation are still important too!
2. Pad configuration
  - a. Responders should consider A/P placement of the first set of defibrillation pads on arrival when logistically possible. There may be more available energy to reach the heart in this configuration and applying secondary sets of pads is easier.
  - b. Dual pad configuration (example red = 1<sup>st</sup> set, blue = second set)
    - i. Requires rolling the patient, stay off the spine and just below scapula



- ii.
3. Dual defibrillation steps
    - a. Apply both sets of pads and ensure second unit is powered on
    - b. When ready for next defibrillation charge both monitors to max joule setting based on manufacturer specifications, usually either 200J or 360J
      - i. Note, an AED can be used by letting it analyze and recommend shock and charge

- c. Ideally, position one responder where they can press the button on both devices (easier to time/coordinate)
- d. Visually and verbally 'clear' the patient then:
  - i. Discharge monitor # 1 and then approximately 0.5 seconds later discharge monitor #2
  - ii. This momentary delay addresses a manufacturer theoretical concern that DSED may harm the cardiac monitor.
    - 1. One proposed solution is to offset the shock by a few milliseconds. This is the reason to discharge one unit, then moments later, the second.
    - 2. In theory this allows a protective gating mechanism in most monitor capacitors to close. Contact your cardiac monitor provider for more information on voiding of warranty, damage, etc.
- 4. Continue to use dual sequential defibrillations for all shocks moving forward.
- 5. Consider contacting online medical control early for additional guidance.

## End Dual Sequential Defibrillation

# EKG, 12 Lead

**Approved Practice Level:** Paramedic

**Associated Protocols:** GC01

**Last Review:** 1/2022

**Clinical Indications:**

- Any patient who has a suspected or actual cardiac complaint or any patient with significant clinical illness.

**Contraindications:**

- None

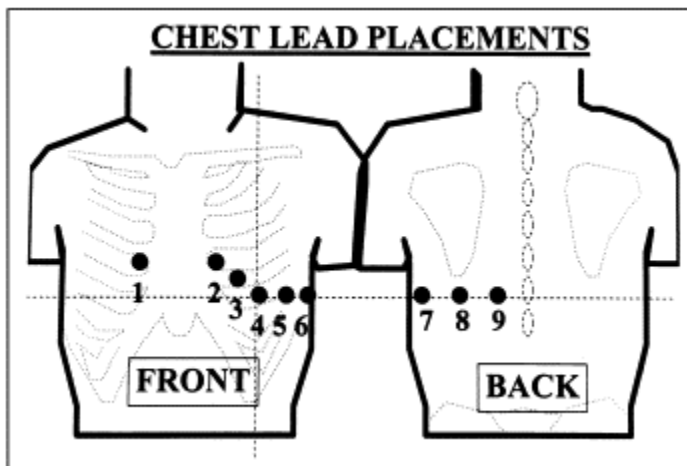
**Clinical Considerations or Precautions:**

- 12-lead EKG should be done on any patient that the EMS provider suspects may have a serious illness or cardiac complaint. Recall that all ages of patients encounter EKG abnormalities, do not exclude because of young age.
- If trained, the BLS provider may assist the Paramedic by applying and obtaining the 12-lead EKG strip. However, they may not make interpretations or treatment decisions, only the Paramedic shall do so.

**Procedure:**

1. Place limb leads in respective sites. Although placing the limb leads on the torso may be acceptable for rhythm strip interpretation, placing the electrode on the inner aspect of the distal extremities yields a more accurate 12-lead ECG. Follow manufacturer recommendations.
  - a. The precordial (chest) leads are placed as follows:
    - i. V<sub>1</sub> - 4<sup>th</sup> intercostal space just to the right of the sternum
    - ii. V<sub>2</sub> - 4<sup>th</sup> intercostal space just to the left of the sternum
    - iii. V<sub>3</sub> - 5<sup>th</sup> intercostal space at the mid-clavicular line
    - iv. V<sub>4</sub> - 5<sup>th</sup> intercostal space midway between V<sub>2</sub> and V<sub>4</sub>
    - v. V<sub>5</sub> - 5<sup>th</sup> intercostal space at the anterior axillary line
    - vi. V<sub>6</sub> - 5<sup>th</sup> intercostal space at the mid-axillary line
2. In the female patient, the precordial leads must be positioned under the breast, against the chest wall. Using the posterior aspect of a gloved hand to displace the breast for electrode placement is the least threatening means for application.
3. Occasionally, skin prep (including shaving chest hair) may be necessary to get a good reading. This is best achieved by using a small quantity of water or alcohol to wipe the electrode site followed by a brisk rub.
4. The best patient position during acquisition is supine although not all patients will tolerate this position for significant periods of time.

5. The EMS provider shall ensure that the 12-lead EKG is included in the patient's ePCR and physically present a copy of any clinically significant 12-lead EKG to the receiving facility.
  - a. Additional 12-lead EKGs should be obtained following patient condition changes or interventions
6. A patient who presents with S-T segment elevation in leads II, III, or aVF or where a right ventricular infarct is suspected, should have a right sided EKG done and labeled accordingly. Patients with significant ST depression in the anterior chest leads V1, 2 and 3 should have a posterior EKG performed as outlined below.
  - a. Right sided
    - i. Take lead V4 and place in opposite position on the right side of the chest, 5<sup>th</sup> intercostal space on the right side
  - b. Posterior
    - i. Take V4, 5, 6 and place just below the L scapula with V8 (aka V5) in the middle as below.
7. Obtain the 12 Lead ECG at the earliest opportunity without interfering with the urgent needs of the patient. Occasionally, situations may arise where a 12 Lead ECG is not possible or practical. Reasonable judgment should guide this decision and thorough documentation to that effect is required.
  - a. The EMS provider should make every attempt to obtain an initial EKG within 5 minutes but no more than 10 minutes after patient contact.
  - b. Any patient with an identified STEMI should have the EKG transmitted whenever possible to the receiving facility at the earliest time possible.



[End EKG, 12 Lead](#)

# Epinephrine Administration

## **Approved Practice Level:**

EMR, EMT, AEMT – Must have documented training & proficiency check off to give manual 'draw & shoot' epinephrine 1:1,000 IM.

Paramedic may give all forms of epinephrine specified in protocol.

**Associated Protocols:** AM01, PC08, others related to hypotension, respiratory distress.

**Last Review:** 1/2024

## **Clinical Indications:**

- For administration of epinephrine as defined in the treatment protocols for the treatment of anaphylaxis and refractory respiratory illness.

## **Contraindications:**

- Known allergy to injectable epinephrine (extremely rare).

## **Clinical Considerations or Precautions:**

- Recall that all forms of epinephrine will increase heart rate, blood pressure and in turn, myocardial oxygen demand. Use with caution or consider reduced dosing or medical direction consultation in patients where abrupt increases in HR or BP would be detrimental.
- Epinephrine is the treatment of choice for anaphylaxis!

## **Procedure:**

1. Auto-Injector for Epinephrine 1:1,000
  - a. Supplied as Epi-Pen (0.3mg) and Epi-Pen Jr. (0.15mg)
  - b. Dosing
    - i. Patients 20-60 pounds should receive Epi-Pen Jr. – 0.15mg IM
    - ii. Patients > 60 pounds should receive Epi-Pen – 0.30mg IM
    - iii. Contact medical control for patients less than 20 pounds.
  - c. For use as defined in the patient treatment protocols
  - d. To use:
    - i. Read directions, confirm medication, expiration date
    - ii. Confirm solution is clear and not cloudy or brown
    - iii. Remove safety device
    - iv. Press firmly into the lateral thigh of the patient, usually a "click" may be heard, pressing down deploys the needle
    - v. Hold in place for 10 seconds then withdraw needle, dispose of the sharps appropriately and dress injection site
  - e. Document administration and monitor the patient for improvement or change
  - f. Redosing as specified in the allergic reaction protocol.

2. Manual injection for Epinephrine 1:1,000
  - a. Provider must have current, annual documented training on manual epinephrine administration
  - b. Supplied as Epinephrine 1:1000 ampoule or vial, 1mg in 1mL
  - c. Dosing
    - i. Patients 20-60 pounds should receive 0.15mg (0.15mL) IM
    - ii. Patients > 60 pounds should receive 0.50mg (0.5mL) IM
    - iii. Contact medical control for patients less than 20 pounds.
  - d. Draw up the medication
    - i. 1mL syringe with IM injection needle (1.5-2", 25-27ga)
    - ii. Confirm medication, Epi 1:1000 in 1mL ampoule
    - iii. If ampoule, twirl ampoule to push medication into bottom of ampoule, break open at scored neck using gauze to protect fingers
    - iv. If vial, remember to inject replacement amount of air into the vial as amount of medication to be removed
    - v. Remove correct amount of medication (with filter needle if available for ampoule),
    - vi. Remove any air from syringe and confirm correct amount of medication
    - vii. Have partner cross-check correct medication, concentration and amount
  - e. Last patient check, right patient, right medication, right site, right dose
  - f. Administer medication
    - i. Clean site on the lateral thigh with alcohol prep
    - ii. Insert needle into muscle at 90-degree angle to skin
    - iii. Aspirate (pull back) on plunger to ensure no flash of blood or inadvertent intravenous placement
    - iv. Depress plunger slowly (2-3 seconds) to administer full dose of medication
  - g. Remove syringe, dispose of sharps appropriately and dress injection site
  - h. Document administration and monitor the patient for improvement or change
  - i. Re-dose the patient as indicated in the allergic reaction protocols
3. Push Dose Vasopressor (Epinephrine 1:100,000)
  - a. Provider trained at the Paramedic level may use "push dose pressor" per the appropriate protocol and procedure, where indicated in the protocols
  - b. Preparation
    - i. Add 1mL Epinephrine 1:10,000 (cardiac epinephrine) to 9 mL normal saline
    - ii. This yields Epinephrine 1:100,000 solution, 10 mcg/mL concentration
  - c. 5-20 mcg slow IVP (0.5 – 2mL), may repeat every 5 minutes PRN to desired effect based on indicated protocol

## End Epinephrine Administration

# Finger Thoracostomy

**Approved Practice Level:** AEMT, Paramedic

**Last Review Date:** 1/2022

## **Clinical Indications:**

- For patients with clinical suspicion of tension pneumothorax or hemothorax who are profoundly hemodynamically unstable or in cardiac arrest (unless otherwise approved by OLMC).
- May be used in medical patients as well where decompression of a medical, iatrogenic or spontaneous pneumothorax is suspected.
- See clinical description below.

## **Contraindications:**

- Age < 12 years old.
- Provider does not have documented clinical training and proficiency verified by medical director.

## **Clinical Considerations or Precautions:**

- Common symptoms include respiratory distress, compatible patient history and any of the following:
- Chest pain, agitation, sense of impending doom.
- Absent or decreased breath sounds, hyper resonance, increased tactile fremitus.
- Tachycardia, hypotension and falling SaO<sub>2</sub>.
- Neck vein distention (JVD), tracheal displacement away from affected side (late signs).

## **Procedure:**

- 1. For patients who are minimally responsive and profoundly hemodynamically unstable OR in cardiac arrest. Provider must be SPECIFICALLY credentialed for this procedure and approved by medical director and the agency.**
2. Prepare equipment
  - a. Sterile drape/towels (if available)
  - b. Sterile gloves (if available)
  - c. Scalpel, #10 blade disposable with safety mechanism
  - d. Curved large hemostat (Kelly)
  - e. Betadine or Chloraprep
  - f. Chest occlusive dressing w/valve (vented)
  - g. Your finger
3. Identify landmarks
  - a. Ensure proper affected side (perform on both sides in undifferentiated major trauma)
  - b. Raise arm up above head
  - c. Locate anterior axillary line at the 4-5<sup>th</sup> intercostal space

- i. This is approximately anatomic ‘nipple line’ in adults (remember, this is the ‘anatomic’ location – think about a mannequin)
    - ii. This position can be estimated with the ‘four fingers armpit estimation’ that was taught with the skill
      - 1. Place your hand into the armpit with fingers extended like you are going to ‘karate chop’ the armpit with pointer finger laying in the armpit
      - 2. Where your pinkie finger sits is approximately the correct space
    - iii. Mark with pen or skin marker if able, indentation can also be made with a ball point pen (tip retracted)
  - d. **Caution:** It is better to be too high than too low!
    - i. Insertion too low can result in inserting the hemostat into abdominal organs.
    - ii. Remember the liver and spleen on each side sit very high up against the diaphragm and up ‘underneath’ the lower ribs – don’t go too low!
- 4. Clean and drape area
  - a. Attempt to use “clean” technique, EMS setting is not “sterile”
  - b. Splash and scrub with betadine or Chloraprep
  - c. Tuck sterile drape under patient and lay one over chest/arm if available
  - d. Apply sterile gloves and don’t contaminate hands when possible
- 5. Make incision
  - a. Find a prominent rib over the area of insertion
  - b. Make a 2-3” incision from front to back (horizontal) over the insertion area
    - i. Make the incision deep enough to expose underlying fat
    - ii. Do not cut down to the rib or penetrate the thorax
  - c. More than one pass may be required with the scalpel
  - d. Tunnel to site
    - i. Using hemostats or finger, tunnel upward in the subcutaneous tissue (toward the head) and just over the top of the rib you can feel
    - ii. Spread hemostats or finger to create a small pocket under the skin
    - iii. Use caution to prevent poking your finger on broken rib ends, will cause needle-stick like injury.
- 6. Penetrate the chest wall
  - a. Using either the finger or hemostats, curve just over the top of the rib into the intercostal muscles
  - b. Push or work through the muscles until a small “pop” is felt, this is the parietal pleura
  - c. **Caution:** Grip farther down on the hemostat where only 4-5 inches protrude beyond your hand. If the hemostat suddenly ‘gives way’ into the chest this will prevent the entire length of the hemostat going into the chest and potentially puncturing lung, the heart or other vascular structures.
- 7. Now using finger, work finger into the hole carefully clearing lung tissue away from the chest wall bluntly if present
  - a. Remove finger and note drainage of air or blood or both
  - b. Apply vented chest seal with valve if the patient is spontaneously ventilating, not necessary with positive pressure ventilation unless desired.
  - c. Secure sharps

8. Videos: <http://www.tamingthesru.com/blog/acmc/finger-thoracostomy>
- i. Key change from video, when inserting the curved hemostats into the chest, grip down on them with your hand where only 4-5” of hemostat is exposed. This way if you suddenly “poke through” you don’t go too far as mentioned above.

## End Finger Thoracostomy

# GCS Determination

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC01

**Last Review:** 1/2022

**Clinical Indications:**

- To be used for determination of responsiveness and degree of impairment in any patient with abnormal neurologic status.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- GCS is intended to provide a common framework for responders and healthcare professionals to communicate level of neurologic responsiveness.
- Recall 15 is normal and 3 is completely unresponsive (minimum score)
- Document intubated and sedated as “3T”

**Procedure:**

1. Evaluate and document the following (pediatric in parentheses):
2. Eye Opening (pedi is the same)
  - a. Spontaneous = 4
  - b. To speech = 3
  - c. To pain = 2
  - d. None = 1
3. Verbal Response
  - a. Oriented = 5 (coos, babbles)
  - b. Confused = 4 (irritable crying)
  - c. Inappropriate = 3 (crying)
  - d. Garbled = 2 (moans)
  - e. None = 1 (none)
4. Motor
  - a. Obeys commands = 6 (spontaneous movement)
  - b. Localizes pain = 5 (withdraws to touch)
  - c. Normal flexion = 4 (withdraws to pain)
  - d. Abnormal decorticate flexion = 3 (flexion to pain)
  - e. Abnormal decerebrate extension = 2 (extension to pain)
  - f. None = 1 (none)

# Glucose Sampling

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC01; GC17, AM02; AM03; AM08; AM10; PD09; PD14

**Clinical Indications:**

- For use where indicated in the protocols to sample and determine blood glucose levels.

**Contraindications:**

- Cardiac arrest (relative) - In cardiac arrest, if clinical concern for hypoglycemia exists, treat empirically (immediately). Blood sampling from the fingers or periphery in cardiac arrest likely does not reflect the blood glucose of the central circulation.

**Clinical Considerations or Precautions:**

- Remember to clean the sampling area and allow alcohol to dry before obtaining a reading.
- Understand that capillary blood from the fingertips in patients with circulatory collapse and poor perfusion is not likely representative of the central circulation. Consider a more proximal blood sample such as from an IV site.

**Procedure:**

1. Ensure that glucometer is calibrated and working properly.
  - a. Providers shall take glucometer through normal controls and preventative maintenance per the manufacturer's guidelines
  - b. Have glucometer strip and machine assembled, ensure strips match machine indicators, lot numbers, etc., where indicated
2. Select appropriate finger and clean with alcohol prep.
  - a. Allow alcohol to dry or wipe once with sterile gauze
  - b. Stick finger using safety engineered lancet device and apply blood to machine.
3. Record result of machine, dress finger and clean machine appropriately.
4. Dispose of sharps appropriately.
5. Peripheral blood from a fresh IV stick may be used.
6. Avoid using blood from:
  - a. Proximal to an IV line with running NS or glucose containing fluids
  - b. Ischemic limbs or those with unclear circulatory status
  - c. Peripheral limbs in cardiac arrest
7. If initial reading does not make clinical sense or is in question, repeat the evaluation or consider using another machine
8. Provider should keep necessary instructions with the glucometer to allow the EMS provider to interpret any error codes or non-plain language messages (i.e., 'Error 05').

# End Glucose Sampling

# Intraosseous Needle Insertion

**Approved Practice Level:** AEMT, Paramedic

**Associated Protocols:** GC02

**Last Review:** 3.2023

**Clinical Indications:**

- For insertion of the IO device as directed in the Patient Care Protocols.
- Provider must have documented training on device.
- All medications that can be given IV may be given through an IO.

**Contraindications:**

- Do not place if less invasive vascular access can be obtained or patient is in stable clinical condition.
- Do not place in artificial, fractured, infected or otherwise compromised extremities.
- Do not place in limbs with recent (1 day) IO placement or existing IO (relative).
- Consider alternate placement to tibial or femoral site if there is significant pelvic trauma (relative).

**Clinical Considerations or Precautions:**

- Patients with total knee replacement generally indicated by a vertical scar over the knee may have hardware over the tibial and femoral location of insertion, choose another site.
- While some pain is reported with IO insertion, patients have noted maximal and sometimes severe pain with fluid infusion under pressure. Pre-treat awake patients with lidocaine accordingly.
- Unless contraindicated by injury or anatomical variation or clear operational need, the humerus is the preferred IO site, especially if large volume resuscitation is needed and peripheral access is not obtainable.

**Procedure:**

1. Prepare all equipment and select an appropriate site:
  - a. Proximal humerus (preferred site) – head of humerus, two fingers below the acromion process in the anterolateral line
    - i. Advantages – better flow rates (nearly double the tibial site) and faster infusion-to-heart times, good for patients with lower extremity issues
    - ii. Disadvantages – technically slightly more difficult, may be easier to dislodge, usually requires 45mm needle (gold) in adults
    - iii. Can be used in older (> 5) children and adolescents as well, size needle appropriately by looking at size of arm
  - b. Proximal tibia - one finger width below the tibial tuberosity, slightly medial to midline

- iv. Advantages – simple to identify and most easy insertion site for novice EZ-IO user. Out of the way during cardiac arrest. Site of choice for young (<5yo) pediatric patients and neonates and works with most needle sizes when inserted to proper depth.
    - v. Disadvantages – longer infusion-to-heart time, slower flow rates.
  - b. Distal femur – two finger widths above the patella inserted in the midline perpendicular to the femur bone.
    - i. Advantages – similar flow rates to the humerus but slightly longer drug-to-heart times. Out of the way during cardiac arrest. Thicker bone cortex may make dislodgement less likely.
    - ii. Disadvantages – relative, drill may take longer to pass through thicker bone cortex, be patient and let the drill work.
- 2. Insert the intraosseous needle according to the manufacturer's instructions. For EZ-IO, the driver should be used unless driver failure or unavailability.
  - a. Clean site with Chloraprep or alcohol.
  - b. Generally, insert the needle through the skin, into the tissue until bone is felt with the needle. Ensure the needle tip feels 'secure' on the bone and then begin drilling.
  - c. Use gentle pressure and do not push, let the drill do the work.
  - d. A sudden decrease in resistance or the needle diving and sucking up to the hub/flange of the IO indicates entry into the marrow cavity – stop drilling at this point!
  - e. IO needles are not 'threaded' meaning they will not get 'tight' in the bone like a screw in wood, etc.
- 3. Aspirate for blood or bone marrow which may or may not be present. Proper position and stability of the needle confirms proper placement.
- 4. Attach stabilizing device/dressing and IV tubing for infusion of fluid.
  - a. Stabilize needle with manufacturer's device or bulk dressing and secure IV tubing to patient's leg, apply IO arm band or mark it clearly on the patient with insertion time clearly printed.
  - b. Fluid may freely flow, but generally IO infusion requires pressure infusion with a syringe or a pressure bag on the IV.
  - c. Carefully monitor the area for signs of infiltration and swelling around the bone.
- 5. If no contraindication and the patient is able to sense pain, a lidocaine bolus should be infused to numb the IO space and periosteum before fluid therapy, 1% (or 2% lidocaine if 1% unavailable) without epinephrine.
  - a. Adults – **50 mg slow infusion, 1% lidocaine** will be 5 mL
  - b. Children - **0.5mg/kg slow infusion, 1% lidocaine** will be a max of 50mg or 5 mL.
  - c. Recall that for 1% lidocaine 1 mL = 10 mg and for 2% 1 mL = 20 mg (always)
  - d. Infuse the appropriate lidocaine dose slowly and allow to sit (dwell) in the IO space for 1-2 minutes before flushing with normal saline if clinical condition allows.
  - e. If still painful, a half dose of the lidocaine bolus above may be repeated with same procedure as above. If pain still significant consider opiate pain medication therapy.
- 6. Training Video

- a. There are many different videos from Teleflex that makes the IO on You Tube
- b. Link to site location for the humeral IO - <https://www.youtube.com/watch?v=-Bcx1roR1DU>
- c. Many others will be associated with this video
- d. Link to YouTube with Dr. Antevy on the distal femur insertion in conjunction with Scotty Bolleter from Bulverde Spring Branch.  
<https://www.youtube.com/watch?v=WaACFmliRuY>

## End Intraosseous Needle Insertion

# LUCAS 3 Procedure

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Last Review Date:** 1/2022

## **Clinical Indications:**

- For adult patients (>12 yo) in cardiopulmonary arrest.

## **Contraindications:**

- Do not use if the device cannot be safely and correctly positioned on the patient (i.e., too small or too large).
- For large patients, if the LUCAS device fits over them and in its retracted position the plunger doesn't touch the chest, it will work.
- For small patients, the LUCAS doesn't have a minimum weight but size. According to information from STRYKER:
  - 6.7 to 11.9 inches / 17.0 to 30.3 cm sternum height (anterior – posterior) • 17.7 inches / 44.9 cm chest width
  - Estimate the 'depth' of the chest, should be at least 7 inches (this is usually about the distance from your wrist to your fingertips). Estimate the 'width' of the chest, should be at least 18 inches (this is usually the distance from your fingertips to your elbow)
  - This isn't necessary unless visually you think the patient might be too big or too small.

## **Clinical Considerations or Precautions:**

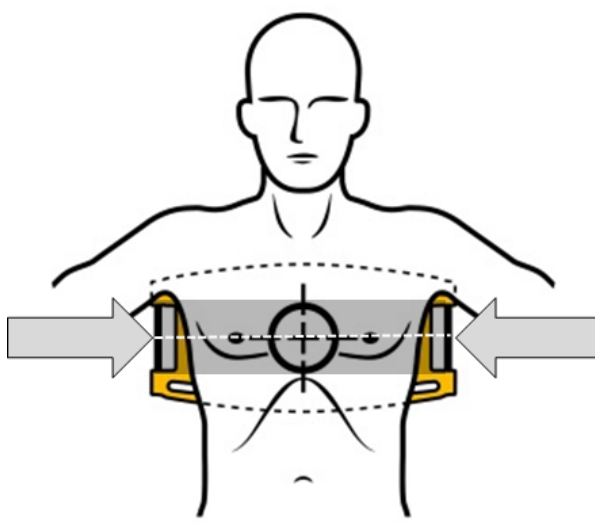
- Do not delay effective CPR waiting on the LUCAS or during placement of the device. Remember the LUCAS has been shown to be EQUALLY effective at CPR, not better than humans performing high quality CPR.
- Like most medical devices the LUCAS is not intrinsically safe and should not be used in explosive environments.
- The LUCAS device position can 'migrate' during CPR. Constantly evaluate for proper position.

## **Procedure:**

- 1) First be sure effective CPR is performed by one of the rescuers or a bystander as the LUCAS is being prepared.
  - a) Unpack the device and turn on the LUCAS by pressing the green button, allowing the unit to power on and self-test. The LUCAS should show a green LED next to the 'adjust' symbol on the controls.
  - b) Prepare the upper portion of the LUCAS by grasping the lock release rings and pull them to make sure the lock claws are open.
- 2) Place the back plate
  - a) This can be done either by logrolling the patient or by quickly sitting the patient up.

- b) The back plate should be centered under the patients' shoulders with the middle of the back plate mid-sternum at the nipple-line or 4<sup>th</sup> intercostal space. Resume manual CPR immediately.
  - c) The back plate ends must be visible on the sides of the patient, this is where the upper portion will lock into.
- 3) Attach the upper LUCAS device
- a) Coordinate placement with the team, ideally being ready to place the LUCAS at the next CPR pause for pulse and rhythm check.
  - b) During CPR, attach one support leg to the back-plate closest to the person placing the LUCAS. At the appropriate interval, stop manual CPR and click the other support leg into position, making sure both locks 'click' onto the back plate.
  - c) Verify the LUCAS is in proper position by looking and also verifying that the outer edge of the suction cup is just above the end of the sternum.
- 4) Position the suction cup
- a) Verify the LUCAS is in the ADJUST mode and use two fingers to bring the suction cup down to where the pressure pad on the suction cup just touches but does not compress the patient's chest.
  - b) The outer bottom edge of the suction cup should be just above the end of the patient's sternum
  - c) Once properly placed push the PAUSE button to lock in the start position.
- 5) Start compressions
- a) When ready to start compressions press either the ACTIVE (continuous) button or the ACTIVE (30:2) button to begin CPR. (Note, continuous should generally be used when a secure airway is in place such as an endotracheal tube or an iGel or other supraglottic airway. 30:2 may be more appropriate when mask BVM ventilation is necessary.)
- 6) Attach the neck stabilization strap and secure the patient's hands/wrists to the sides of the LUCAS device.
- 7) Monitor the patient closely to ensure the device does not change position and appears to be providing satisfactory CPR.
- 8) If the patient needs to be lifted and moved, try to avoid tilting or rocking the patient too much that will result in movement of the LUCAS and improper compressions.
- a) Remember for moving the patient, the back plate has hand holds and is rated for using to help lift the patient.
  - b) If moving down stairs or an angle, feet first is preferred to allow the neck strap to help maintain the position of the LUCAS.
- 9) Monitor battery condition and be aware of the need to either change batteries or plug into AC power while using the LUCAS.
- a) Remember the battery must remain in the machine for it to function.
  - b) If the battery must be removed and replaced, and as long as this is done within 60 seconds, the LUCAS will remember current settings and resume previous CPR settings by pushing ACTIVE.
  - c) If longer than 60 seconds is taken, the whole positioning and start up process will need to be redone.

10) Refer to [https://www.lucas-cpr.com/files/5496926\\_100925-01%20Rev%20E%20LUCAS%203%20IFU%20EN\\_lowres.pdf](https://www.lucas-cpr.com/files/5496926_100925-01%20Rev%20E%20LUCAS%203%20IFU%20EN_lowres.pdf) for more manufacturer information including pictures on how to use the LUCAS device.



## [End LUCAS 3 Procedure](#)

# LVAD Patient & Device Assessment

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AC.07; AC.08; AC.09

**Last Review:** 1/2022

## **Clinical Indications:**

- For troubleshooting and caring for any patient equipped with a Heart Mate II LVAD. General principles may be applied to other devices.

## **Contraindications:**

- None

## **Clinical Considerations or Precautions:**

- **DO NOT perform CPR unless directed by the patient's physician or Medical Control.** CPR can mechanically dislodge the drive-line and motor causing massive internal hemorrhage.
- Care of LVAD patients becomes complicated by the intricate workings of the device and the poor medical status of patients with LVAD implants.
- Family members should always be involved in their care, they are trained on how to work with these devices.
- If an LVAD patient is transported, ALL equipment should accompany the patient to the hospital. Backup batteries, chargers, home base station, etc.
- Always call or notify the patient's LVAD coordinator that you are treating the patient and for advice or destination information.
- The patient can be defibrillated without disconnecting any parts of the device as well as paced. All ACLS medications can be administered. The LVAD does not affect the patient's intrinsic EKG.
- Blood pressure may be difficult to obtain on these patients. Most patients have a mean arterial pressure of 70-90 with a narrow pulse pressure. Palpable pulse may be weak or absent and ultrasound or Doppler may be required to verify flow.
- Common presenting non-pump related complications include bleeding and infection.
- One set of batteries lasts approximately 8-10 hours.
- Any emergency mode of transportation is OK. These patients are permitted to fly.

## **Procedure:**

### **1. LVAD Alarms:**

- a. Yellow or Red Battery Alarm – Need to change batteries
- b. Red Heart Flashing Alarm – This may indicate a LOW FLOW HAZARD. Check patient; the flow may be too low. This alarm will consist of red heart alarm indicator light and steady audio alarm if the flow rate is less than 2.5 liters per minute.

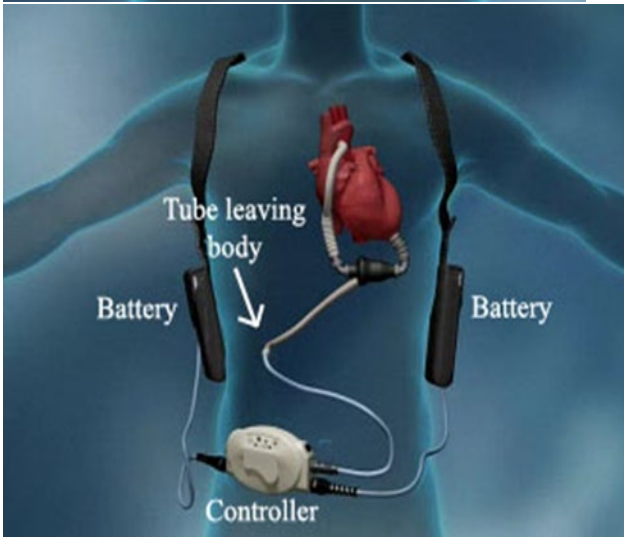
## 2. Troubleshooting the Heart Mate II:

- a. Two potential treatable device complications may present with an LVAD patient:
- b. Battery Failure
- c. Controller Failure
- d. This may present as a catastrophic failure to the pump with the resulting “cardiac arrest in the patient” or a “low flow state”.
- e. Follow the procedures below if the pump has stopped. No visible lights on display and no evidence of perfusion or sound of motor running on chest auscultation.

## 3. Emergency Procedures:

- a. When the pump has stopped:
  - i. Check the connections between the controller and the pump and the power source.
  - ii. Fix any loose connections to restart the pump.
  - iii. If the pump does not restart and the patient is connected to batteries, replace the current batteries with a new fully charged pair of batteries.
  - iv. If the pump does not start, then change the controller.
- b. Changing batteries:
  - i. **WARNING:** At least one power lead must be connected to the power source AT ALL TIMES. DO NOT remove both batteries at the same time or the pump will stop.
  - ii. Obtain 2 charged batteries from the patient’s accessory bag. Charged batteries should be marked with a white fuzzy tab at the end of the battery.
  - iii. Remove only one battery from the clip by pressing the black tab of the battery clip to unlock the battery.
  - iv. Controller will start beeping and flashing green light signals when you remove the battery, this is normal.
  - v. Replace the new battery by lining up arrows on the battery and clip.
  - vi. Slide a new, fully charged battery into the empty battery clip by aligning the black arrows. The battery will click into the clip. Gently tug at battery to assure connection. If battery is properly secured, the beeping and green flashing lights will stop.
  - vii. Repeat the previous steps with the second battery.
- c. Changing controllers
  - i. Place the replacement controller within easy reach, along with the battery and battery clips or PBU/Power Module Cable. The spare controller is usually found in the patient’s travel case.
  - ii. Make sure patient is sitting or lying down since pump will momentarily stop during this procedure.
  - iii. Rotate the PERC lock on the replacement controller in the direction of the “unlocked icon” until the PERC lock clicks into the fully unlocked position.
  - iv. Repeat this step for the original controller until the PERC lock clicks into the unlocked position.
  - v. Attach the power leads on the new, replacement controller to the battery clips or PBU/Power Module Cable.

- vi. If using battery power, place fully charged batteries into the battery clips after attaching the power leads.
- vii. Press the silence alarm button on the new, replacement controller to silence its red heart alarm for 2 minutes.
- viii. Disconnect the PERC Lead/Driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound. The alarm will continue until power is removed from the original controller.  
Getting the new replacement controller connected and the pump restarted is the first priority.
- ix. Connect the new replacement controller. Line up the mark on the PERC lead connector with the mark on the metal tab of the new controller. Fully insert the connector into the socket of the new controller. The pump should restart and alarms should stop. Gently tug on the metal end of the lead to make sure the PERC lead is fully inserted into the socket. DO NOT pull the lead.
- x. If the pump restarts, skip to Step L.
- xi. If the pump does not restart and the RED Heart Alarm continues, firmly press the silence alarm or test select button to restart the pump.
- xii. If the pump speed is set below 8,000 rpm, the pump will not automatically restart when power is restored. Pressing the Silence Alarm or Test Select Button is required to restart the pump if the pump speed is set below 8,000 rpm.
- xiii. Check the power source. Make sure that power is going to the controller.
- xiv. Gently tug on the metal end of the lead to make sure the PERC lead is fully inserted into the socket. DO NOT pull the lead.
- xv. If the pump still does not restart, then try to restart the pump using the system controller backup system. Press and hold both the Test Select and Silence Alarm Buttons at the same time. The RED Heart Alarm will stop and you will hear a repeating cycle of 1 beep per second for 2 seconds, followed by 2 seconds of silence to indicate that the System Controller is operating on the backup system.
- xvi. After the pump restarts, rotate the PERC lock on the new replacement controller in the direction of the “locked” icon until the PERC lock clicks into the fully locked position. If unable to engage PERC lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage PERC lock.
- xvii. Disconnect power from the original controller. The original controller will stop alarming once power is removed.



5.

# Mass Casualty Incident

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** SO.03, other associated protocols for treatment.

**Last Review:** 1/2022

## **Clinical Indications:**

- To be utilized in the care and treatment of patients during a mass casualty incident where the number of patients needing care has dramatically exceeded the capability of the local medical infrastructure.

## **Contraindications:**

- None

## **Clinical Considerations or Precautions:**

- Providers should know and understand how to implement the local, county or regional MCI plan and their role in a MCI.

## **Procedure:**

The first arriving unit must establish effective command and control. Once an MCI has been declared, the Incident Management System (IMS) must be utilized. Appropriate triage, patient management, and patient transport are also vital to a successful outcome.

EMS is responsible for two areas at any incident. The first is the care and transport of any sick or injured victims. Second, the medical care of the on scene responders is important as well. With these responsibilities, EMS should have a presence on scene for the duration of an incident.

Following are ten critical factors of successful MCI operations:

1. In a MCI, patients outnumber EMS providers.
2. The first arriving EMS unit **MUST** establish command and begin triage, not perform treatment.
3. The Incident Management System (IMS) establishes an EMS Branch under Operations; the key EMS areas are Triage, Treatment, and Transport.
4. Treatment is not effective without effective triage.
5. The Treatment Area must coordinate with the Triage and Transport Areas.

6. The Treatment Area is a noisy, busy place and a major resource consumer.
7. On small scale MCI events, EMS Command may be able to coordinate the entire Operation; on large incidents a separate Treatment Area is needed.
8. On large incidents the Treatment Area is divided into Red, Yellow, and Green treatment units.
9. Large-scale incidents or disasters may require separate divisions; each division is a geographic area that is an IMS structure and requires support.
10. In terrorism or hazmat incidents, the scene can be dangerous. Be aware of any dangers and be vigilant about safety.

During the initial response it may or may not be known that a major incident exists. Dispatch should relay any information they might have that is suggestive of a major incident. Regardless of any information received, the initial unit MUST make a size-up of the scene. Evaluate the nature of the incident, possible number of patients, type and severity of injuries, threats and dangers to the responders, and any specialized resources that might be needed.

After the initial size-up, a determination should be made as to whether a major EMS event or MCI exists; or whether there is neither. The communications center should be advised as soon as possible. If a MCI is declared, the following information should be relayed to dispatch:

1. That an MCI has occurred;
2. Type of incident;
3. Who is in command;
4. Approximate number and severity of patients;
5. Location of Incident Command Post;
6. Location of Staging Area;
7. Initial number and types of transport vehicles needed;
8. Special hazards.

### **Establish Command (EMS Command)**

Initially commander may be alone or part of a unified command post (fire, EMS, law, etc.). Eventually EMS command should be established as part of the unified command.

Function: Establish command, and control on-site EMS activities to ensure the best possible care for the greatest number of patients.

Roles and Responsibilities:

- Responsible for all EMS operations on the scene
- Establish Command Post, usually at Incident Command
- Function within the unified command system
- Delegate subordinate positions as needed and as personnel become available
- Coordinate joint operations with all other commands

### **EMS Operations (Per ICS called EMS Branch Director)**

Function: Field supervisor of all on-site EMS activities to ensure the best possible care for the greatest number of patients.

Reports To: EMS Command or Ops Section Chief

Supervises: All field operations of the EMS branch. Triage, treatment, transport, etc.

Roles and Responsibilities:

- Supervise all field operations of EMS Branch
- Represents EMS at any Operations meetings
- Coordinates with EMS Command on resources needed
- Move between EMS functional areas as needed to oversee operations

### **Triage Group Supervisor**

Functions: Assume responsibility for coordination of EMS activities in areas actually impacted by the incident.

Reports To: EMS Operations

Supervises: Triage Strike Team Leaders (or triage personnel if < 5 persons)

Roles and Responsibilities:

- Determine where triage is to be performed
- Coordinate with personnel to ensure that patients are immediately removed from danger areas
- Evaluate resources needed for extrication of trapped patients, initial triage and primary treatment (maintaining airway and bleeding control)
- Ensure personnel have tags and are trained in START triage and correct procedure for applying tags
- Obtain adequate personnel and equipment to move patients to Treatment Area
- Coordinate with fire department on rescue of any trapped patients
- Communicate resource requirements to EMS operations
- Allocate assigned personnel

- Supervise assigned personnel and resources
- Report progress to EMS operations
- Advise EMS operations when all patients have been delivered to Treatment Area

### **Staging Area Manager (EMS Staging)**

Functions: Works alone or in conjunction with other agencies to establish a staging location and coordinates staging of EMS and aeromedical resources.

Reports To: EMS Operations

Supervises: Air operations manager as needed. Others as assigned to staging.

Roles and Responsibilities:

- Coordinate with law enforcement agencies to block streets and secure access as required for staging operations
- Establishes Staging Area for incoming personnel and vehicles
- Enlists a Deputy to assist in tracking incoming personnel
- Ensure all apparatus and vehicles are parked in an appropriate and orderly manner at Staging
- Maintain log of units available and all personnel at Staging Area, and an inventory of all specialized equipment and medical supplies that might be required at the scene
- Review with EMS operations what minimum resources must be maintained in the Staging Area
- Request resources as needed, after coordinating with EMS operations
- Dispatch EMS vehicles and personnel to areas as requested by EMS COMMAND OR EMS operations

### **Treatment Group Supervisor (Treatment)**

Function: Assume responsibility for coordination of patient care in the Treatment Area

Reports To: EMS Operations

Supervises: Treatment Strike Team Leaders

Roles and Responsibilities:

- Establish Treatment Area of appropriate size at a location appropriate for weather conditions and the nature of the incident
- Oversee treatment personnel
- Ensure patients re-triaged as come into Treatment Area
- Divide the Treatment Area by triage category; Red, Yellow, and Green

- Avoid becoming directly involved in patient care unless absolutely necessary
- Request resources as needed
- Coordinate with Transport Group Supervisor to transport patients to proper facilities
- Keep EMS command and EMS operations updated on the status of treatment operations and report when the last patient has been treated and moved to the Transport Area
- Coordinate with other health agencies (i.e. Red Cross, CERT) to establish holding and treatment areas for the Walking Wounded with minor injuries
- Consider need to provide long-term treatment on the scene
- Coordinate with other areas as required
- Coordinate with EMS operations as needed to establish temporary morgue facilities

### **Transport Group Supervisor (EMS Transport)**

Functions: Coordination of patient transportation and maintenance of records relating to patient identification, triage category, mode of transport, and destination

Reports To: EMS Operations

Supervises: Transport personnel as needed.

Roles and Responsibilities:

- Establish a Transport Area near the Treatment Area
- Communicate with local communications center or EOC to obtain medical facility status and treatment capability
- Coordinate with Treatment Group Supervisor on transport of patients
- Re-triage patients, and determine appropriate transport vehicle and destination
- Enlist person to assist in documenting each transport, and to notify receiving facility of incoming patients
- Request vehicles from Staging Area Manager as needed
- Direct transport of patients to hospitals capable of providing appropriate treatment without exceeding hospital capabilities
- **Contact receiving facilities, via radio, and advise them of triage categories for each patient they are receiving and the estimated time of arrival as patients are transported**, and notify EMS operations of the same information
- Maintain record of patient destinations
- Notify EMS command and EMS operations when the last patient has been transported

- Coordinate with EMS OPS/EMS BRANCH DIRECTOR as needed to provide transport for the dead

## End Mass Casualty Incident

# Mucosal Atomization Device (MAD)

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC10; AM02; AM6.1; PD09; SO02

**Last Review:** 1/2022

## **Clinical Indications:**

- Where indicated in protocol for mucosal administration of medications or as otherwise directed by Medical Control.

## **Contraindications:**

- Nasal process that would prevent absorption of the medication such as nasal trauma with bleeding, significant nasal discharge, physical obstruction, etc.
- IV in place already and medication able to be given IV without delay or complication.

## **Clinical Considerations or Precautions:**

- Intranasal administration of medications has benefits and problems. The benefit is the ease and rapid nature of administration. It is also a painless (however annoying) method of administration for children.
- The downside includes the need for a clear nasal passage and adequate surface area for absorption. Absorption can be unpredictable.
- Consider this as a first line treatment for pain in children who otherwise are not at risk for deterioration and otherwise would not require an IV.

## **Procedure:**

1. Wear eye and respiratory protection PRN as this procedure can cause aerosol particles to form and expel from the nose.
2. Determine dose based on Patient Care Protocols and draw up and prepare medication as you normally would.
3. Key considerations:
  - a. Minimize drug volume, maximize concentration
  - b. 0.5 mL per nostril is ideal, 1 mL per nostril is the maximum, use the appropriately concentrated drug and divide the dose when needed
  - c. Maximize total mucosal absorptive surface area by using both nostrils and ensuring they are clear with saline and suction prior to administration
4. Atomize the drug (rather than drip it in) to cover broad surface area, practice with saline first if needed to determine how to “push” the drug
  - a. Aim slightly up and outwards to cover the turbinates and olfactory mucosa
5. Do not give if abnormal mucosal characteristics such as
  - a. Mucous, blood or obstruction
  - b. Abnormal nose anatomy (congenital or trauma related)
  - c. Vasoconstrictors reduce absorption
6. Document patient response and administration in the ePCR as you normally would

# End Mucosal Atomization Device (MAD)

# Needle Cricothyrotomy

**Approved Practice Level:** Paramedic

**Associated Protocols:** AW.06; AW.09

**Last Review:** 1/2024

## **Clinical Indications:**

- Children less than 12 years of age requiring oxygenation and airway management where other airway and ventilation attempts have failed.
- Other patients where surgical airway cannot be attempted for any reason. Note, this will not be highly effective in larger patients and may only temporize oxygenation for a few minutes.

## **Contraindications:**

- Patients who are able to be ventilated and oxygenated via less invasive methods.

## **Clinical Considerations or Precautions:**

- Trans-tracheal ventilation via needle cricothyrotomy does not truly “ventilate” the patient. It is only a brief temporizing measure to introduce oxygen into the airway and lungs. Most patients will not truly “ventilate” resulting in rising CO<sub>2</sub> in the lungs and blood which will become fatal if not treated
- Accordingly, transport should be prioritized to the closest most appropriate facility that the provider feels will be able to provide the patient with a more secure airway
- Other commercial cricothyrotomy devices may be used if approved by the medical director and documented provider training in use. Providers may make “jet ventilators” that attach tubing to oxygen sources with adapters to fit angiocath hubs. Providers should also know how to make “makeshift” ventilators using oxygen tubing and 3mL syringes

## **Procedure:**

1. Locate the appropriate landmarks, the needle should be placed through the cricothyroid membrane just inferior to the thyroid cartilage.
  - a. Another responder should stabilize the cartilage and using a 14ga over-the-needle catheter or other medical director approved cricothyrotomy kit, a needle should be advanced into the trachea at a 90-degree angle while aspirating for air
  - b. Once air is aspirated, the needle should be angled toward the feet and the catheter advanced, taking precautions not to kink the catheter
2. Once in place, ventilation can be performed:
  - a. Remember that needle cricothyrotomy is not actually ventilation. It introduces oxygen, but CO<sub>2</sub> is not removed, allowing it to accumulate
  - b. CO<sub>2</sub> levels will continue to rise with time making this method a short-term measure of last resort. Conversion to another ventilatory method should be sought out rapidly

3. Ventilation may be accomplished via multiple methods:
  - a. Jet vent insufflation – this uses either a specific device or a manufactured valve and tubing system to deliver quick rapid breaths
    - i. Commercial systems are available that adapt to the O<sub>2</sub> source and the angiocath hub
    - ii. The EMS provider can “makeshift” one with a piece of O<sub>2</sub> tubing (connector on both ends) and typically a 3mL syringe
    - iii. Connect one end of the tubing to the O<sub>2</sub> source and flow at maximum setting
    - iv. Remove the plunger from the syringe and carefully screw the 3mL syringe onto the angiocath hub in the neck, hold to ensure it does not dislodge
    - v. To deliver a “breath” press the free end of the O<sub>2</sub> tubing down into the syringe opening creating a seal, watch for any chest rise, remove the O<sub>2</sub> tubing from the syringe to stop the “breath”
  - b. BVM with adapter – the BVM collar from, generally, a 3-4.0 ETT and smaller will fit into the hub of the angiocath. This is not ideal, but can be used to deliver breaths
  - c. There are many videos on YouTube such as this one showing how to put together ventilation “devices”
4. ETCO<sub>2</sub> and SaO<sub>2</sub> should be monitored for evidence of continued deterioration.
  - a. SaO<sub>2</sub> > 85% is adequate with this method, the responder should not expect SaO<sub>2</sub> to reach high 90% ranges
  - b. ETCO<sub>2</sub> if monitored will continue to climb, this may not be avoidable
5. Ensure the needle remains secure and arrange rapid transport to the hospital
  - a. Continue to evaluate for other airway options

## End Needle Cricothyrotomy

# Non-Invasive Positive Pressure Ventilation (NIPPV)

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AM08

**Last Review:** 1/2022

**Clinical Indications:**

- Respiratory distress with spontaneous respirations AND a patent, self-maintained airway.

**Contraindications:**

- No spontaneous breathing.
- Intractable vomiting.
- Known tension pneumothorax or severe facial trauma.
- SBP < 100 mmHg due to risk for hypotension (relative).
- Altered mental status, unable to self-clear airway (relative).

**Clinical Considerations or Precautions:**

- Note the term CPAP is proprietary and refers to constant positive airway pressure. BIPAP is also a form of non-invasive positive pressure ventilation and provides bi-level pressure support with an inhalation pressure (IPAP) and an exhalation pressure (EPAP) that may be individually adjusted. Both are acceptable in this guideline.
- NIPPV will decrease venous return due to increases in intra-thoracic pressure, use in hypotensive patients may worsen blood pressure. Increases in NIPPV pressure will worsen this effect.
- Patients with AMS may qualify for NIPPV use but the EMS provider must be 100% attentive to watch for vomiting and clear the patient's airway immediately if necessary.
- Patients with severe agitation may not tolerate NIPPV, consider chemical relaxation if NIPPV is necessary to avoid intubation.

**Procedure:**

1. Assess patient's vital signs, attach ECG monitor and pulse oximeter. Whenever possible, ventilation should be monitored with ETCO<sub>2</sub> as well
  - a. Consider nasal prongs if mask seal can be obtained
  - b. Some units will obtain readings with in-line ETCO<sub>2</sub> sensor attached between face mask and the NIPPV unit.
  - c. Note at higher flow rates, ETCO<sub>2</sub> values will sometimes be artificially low
2. Connect NIPPV unit to oxygen per manufacturer recommendations.
3. Select appropriate face mask, straps. Mask should form a seal around the bridge of the patient's nose and fully cover both the nose and mouth.

- a. Assemble the mask and straps.
  - b. Attach patient end of NIPPV circuit to the face mask.
4. Select initial NIPPV pressure adjustment to 5 cm H<sub>2</sub>O and ensure air is flowing.
5. Place face mask on patient.
  - a. Explain to the patient what the mask is for and that it will take a few minutes to become accustomed to the feel of the mask and airflow.
  - b. Ensure that the mask fits comfortably. Adjust the head strap as necessary.
  - c. Turn the NIPPV pressure adjustment knob to increase the amount of pressure. Continually monitor the patient for improvement in work of breathing.
6. Titrate pressure to patient comfort between 5 and 15 cmH<sub>2</sub>O as indicated on the NIPPV airway pressure gauge.
  - a. Contact medical control if additional, higher pressure titration is needed.
7. Continually monitor the patient's vital signs throughout transport recording measurements every 5 minutes.
8. If patient's respiratory or hemodynamic condition worsens and/or the patient's mental status deteriorates, consider endotracheal intubation.
9. Other considerations:
  - a. Many patients require close emotional support as they initially adjust to NIPPV.
  - b. Failure of NIPPV is not a direct indication for endotracheal intubation. Reassessment of the patient must be done to determine the need for intubation.
  - c. Avoidance of intubation in COPD and asthmatic patients is strongly desirable and is a difficult assessment best made with the assistance of medical control.
10. Be familiar with the setup for an "in-line" nebulizer treatment to go with the NIPPV when available.
  - a. The combination of NIPPV with in-line bronchodilator nebulization has been shown to be very effective in helping to deliver medication deeper to bronchioles.

## End NIPPV

# Orogastric Tube Insertion

**Approved Practice Level:** AEMT, Paramedic

**Associated Protocols:** GC.04

**Last Review:** 1/2022

## **Clinical Indications:**

- For gastric decompression following endotracheal intubation or as instructed by Medical Control.

## **Contraindications:**

- Caustic ingestion of acid or alkali
- Esophageal trauma from ingestion of objects, direct trauma, etc.
- If NG insertion ordered by Medical Control, mid-face trauma to the mouth, nose, etc. that may damage the cribriform plate

## **Clinical Considerations or Precautions:**

- Insertion via the NG route has very little benefit in the pre-hospital setting. Unless directed by medical control, the only indication and insertion technique will be OG insertion following intubation.

## **Procedure:**

1. Prepare equipment
  - a. Personal protective equipment
  - b. NG/OG tube, slip tip 60ml syringe, water-soluble lubricant, adhesive tape
  - c. Suction device and emesis basin
  - d. Stethoscope
2. Procedure
  - a. Measure tubing from teeth to earlobe, then to the point halfway between the end of the sternum and the navel and mark measured length with a marker or note the distance
  - b. Lubricate 2-4 inches of tube with lubricant (preferably 2% Xylocaine)
  - c. Pass tube via the mouth posteriorly, past the pharynx into the esophagus and then the stomach. If resistance is met, rotate tube slowly with downward advancement toward closest ear. Do not force.
3. Withdraw tube immediately if changes occur in patient's respiratory status, if tube coils in mouth, if the patient begins to cough or vomit.
4. Advance tube until mark is reached and check for proper placement
  - a. Inject 60 mL of air into tube quickly while auscultating over the epigastrium.
  - b. You should hear air bubbling and have gastric content coming from the tube. If you do not hear the air injected into the stomach, remove the tube and replace.
5. Secure tube with tape or commercially prepared tube holder
6. When in position, connect to intermittent low wall suction and document.

# Patient LOC Determination

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC.01

**Last Review:** 1/2022

## **Clinical Indications:**

- Patient with altered mentation must have their true level of consciousness determined. As part of clinical care and GCS calculation, some patients will require painful or noxious stimulus to determine depth of unresponsiveness. Providers should elicit painful stimulus in as minimally invasive or damaging way as possible.

## **Contraindications:**

- Awake patients not requiring determination of responsiveness and or GCS.

## **Clinical Considerations or Precautions:**

- Painful or noxious stimulus may cause physical harm if not properly administered.
- Patients who are not truly unresponsive may become agitated and escalate or try to harm the provider if not properly escalated.

## **Procedure:**

1. Begin with minimum necessary stimulus. Begin with verbal stimulus with escalating volume.
2. Next proceed to physical touch, touching the shoulder or lightly shaking patients having due regard for any unstable injuries to prevent further injury (e.g. c-spine injury).
3. If loud verbal and physical touch do not achieve a response, the provider should escalate proper painful stimulus choosing one of the following:
4. Ammonia cap
  - a. May only use one capsule wafted in front of the nose and mouth at a minimum distance of 2-3"
  - b. Use for no more than 10-15 seconds
5. Eyelash flutter
  - a. May help to predict preservation of airway reflexes. Provider may gently brush the eyelashes looking for fluttering or corneal reflex.
  - b. Do not rub or contact the eye or apply pressure
6. Nailbed pressure
  - a. Mild to moderate increasing pressure may be applied to the cuticle area and nailbed with rounded firm object such as the side of a writing pen
  - b. Stimulus may be firm but should not do more than blanch the nailbed and should not cause physical injury
7. Sternal notch pressure
  - a. Pressure with one finger pulled down gently into the sternal notch may be used
  - b. Pressure should not be exerted down into the underlying trachea

8. Skin should be assessed following use of stimulus and this should only be performed as needed to evaluate mentation and GCS. Any inadvertent injury to the patient should be documented in the ePCR and reported to the receiving ER immediately on arrival.

# Patient Assessment

**Approved Practice Level:** EMT, EMT, AEMT, Paramedic

**Associated Protocols:** GC.01

**Last Review:** 1/2022

## **Clinical Indications:**

- For every patient seen and treated by the EMS provider, an assessment will be performed and documented.

## **Contraindications:**

- Only when doing so will place the EMS responder at risk of harm or injury.
- For example, a full detailed assessment of a psychiatric patient might expose the responder to injury, however any available assessments should be performed.

## **Clinical Considerations or Precautions:**

- Patient assessment can range from very basic to very complex. The patient's clinical condition and complaint drives the detail and degree of assessment.
- In general EMS responders are expected to move through these stages of assessment.
- Assessment of children may proceed in a different fashion compared to adults, age appropriate distraction and exam techniques are appropriate such as toe-to-head assessment, using toys or distraction tools and involving family members are all appropriate.

## **Procedure:**

1. Scene Survey
  - a. The rescuers first priority is the safety and security of themselves and their crew. Do not become a victim yourself. When approaching a scene,
    - i. Assess the scene for hazards
    - ii. Is the ambulance parked in a safe place? Is it parked correctly?
    - iii. Is it safe to approach the patient?
  - b. Is special equipment needed?
  - c. Note the number of patients? Are they all accounted for?
  - d. Does the patient require extrication? Note the mechanism of injury.
  - e. If needed, call for additional resources immediately. Call for additional ambulances or supervisory staff.
  - f. Prioritize (triage) patients if more than one.
  - g. Make a plan for further triage, treatment, and transport.
2. Initial Exam
  - a. A complete initial assessment is performed on every patient.
  - b. Initially, establish the presence or absence of life-sustaining bodily functions. Rapid assessment is performed in the following order:
    - i. (ABCDE) AIRWAY, BREATHING, CIRCULATION, and NEURO DISABILITY, EXPOSE AND EXAMINE.
    - ii. Perform appropriate interventions when abnormalities and/or potential problems are found.
  - c. Airway
    - i. EVALUATION: Open or Obstructed
    - ii. ASSESSMENT: Inspect

- iii. TREATMENT: Suction, Reposition, Remove foreign body
  - d. Breathing
    - i. EVALUATION: Quality, Regularity, Quality
    - ii. ASSESSMENT: Inspection, Auscultation
    - iii. TREATMENT: Oxygen, Airway management
  - e. Circulation
    - i. EVALUATION: Pulse Rate, Regularity & Quality, Hemorrhage
    - ii. ASSESSMENT: Palpation, Auscultation
    - iii. TREATMENT: CPR, Control bleeding, Shock management
  - f. Disability
    - i. EVALUATION: Mental Status, Paresthesia, Paralysis
    - ii. ASSESSMENT: LOC, Glasgow coma scale, Inspection, Palpation
    - iii. TREATMENT: Oxygen, Hyperventilation, Immobilization
  - g. Expose and Examine
    - i. EXAMINE for easily visible injuries.
    - ii. ASSESS by inspecting and palpating.
    - iii. INSPECT and palpate the back, especially when logrolling onto a backboard.
- 3. Focused and Detailed Examinations
  - a. The focused exam is an assessment that is pertinent to the patient's chief complaint. The detailed physical exam is a systematic, whole body and orientation assessment evaluating physical findings, and significant history.
  - b. It is performed after the initial assessment has determined that there is no immediate life threat, or interventions have been made to lessen that threat. The amount of time expended, or even the necessity of these exams is directly dependent on the patient's condition.
  - c. All remarkable findings, and pertinent negatives are to be documented.
- 4. SAMPLE History – This is also the time that an interview is conducted for history. The **SAMPLE** mnemonic is easily remembered as:
  - a. S – Signs/symptoms
  - b. A – Allergies
  - c. M – Medications (prescribed, over the counter, or illicit)
  - d. P – Pertinent past medical history
  - e. L – Last oral intake
  - f. E – Events leading up to the illness
  - g. Note: This information is included in the patient report to the health care provider who receives this patient, as well as in the run record.
- 5. Trauma Survey (when indicated for trauma patients)
  - a. A helpful mnemonic to assess trauma patients comes from the Basic Trauma Life Support class. Head, neck, chest, abdomen and extremities can be systematically checked using DCAP-BTLS, or if you prefer, DCAP-BLSTIC.
  - b. D- Deformity
  - c. C- Contusions
  - d. A- Abrasions
  - e. P- Penetrations or paradoxical movement
  - f. B- Burns
  - g. L- Lacerations
  - h. S- Stability
  - i. T- Tenderness
  - j. I- Instability
  - k. C- Crepitus

6. Physical Assessment General
  - a. For all body areas, the patient should be assessed for:
  - b. Injury
    - i. Deformity, depression, contusion, hematoma, lacerations, abrasions
  - c. Pain
    - i. Careful palpation and examination to find areas of pain
    - ii. When safe, move and range joints through range of motion to assess for pain
    - iii. Move muscles and test strength for pain
  - d. Abnormalities
    - i. Visually inspect for masses, bulges, rashes, abnormal coloration, etc.
7. Assessment of specific body areas
  - a. HEENT – Head, eyes, ears, nose, throat
    - i. Head
      1. Feel for swelling, deformity, crepitus
      2. Sweep through hair to find bleeding, wounds
    - ii. Eyes
      1. Hematomas - Battle's Sign
      2. Extra-ocular motions, pupil reaction, size
      3. Raccoon's eyes
      4. Blink reflex
      5. Contacts or Glasses
      6. Foreign bodies
    - iii. Face
      1. Symmetry
      2. Injuries, all muscles working, moving?
    - iv. Ears, nose
      1. Discharge from either, bloody, clear?
      2. Fractures, lacerations or injury
    - v. Mouth
      1. Mouth Odors
      2. Loose teeth, Dentures
      3. Oral Secretions, vomitus, or bleeding
  - b. Neck
    - i. Point tenderness over spine, alignment of bones
    - ii. Neck veins: Flat or Distended
    - iii. Trachea: Midline or Deviated
    - iv. Any penetrating wounds?
  - c. Chest
    - i. Paradoxical motion
    - ii. Breath/heart sounds
    - iii. Sternal inspection
    - iv. Crepitus
    - v. Retractions with respirations
    - vi. Contusions, Abrasions, Hematomas
    - vii. Sucking or penetrating chest wounds
  - d. Abdomen

- i. Localized tenderness
  - ii. Rebound pain/referred pain
  - iii. Pulsatile mass
  - iv. Distention
  - v. Rigidity
  - vi. Bowel sounds
  - vii. Ecchymosis or scars
- e. Pelvis/Back
  - i. Pain on palpation
  - ii. Contusions, abrasions
  - iii. Hematomas, ecchymosis
  - iv. Genitalia trauma, deformities
- f. Extremities
  - i. Distal circulation
  - ii. Range of motion, motor/sensory response
  - iii. Abnormalities/deformities
  - iv. Contusions, abrasions, hematomas
  - v. Skin turgor, skin color

## End Patient Assessment

# Pediatric CPAP Bag

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AW.02

**Last Review:** 1/2022

**Clinical Indications:**

- If so equipped, for any pediatric patient, especially newborn or neonate needing positive pressure ventilation.

**Contraindications:**

- None

**Clinical Considerations or Precautions:**

- Better known as a “Mapleson” or “anesthesia bag”, the pediatric CPAP bag is essentially a BVM that can be used for multiple applications. It has a soft bag that inflates with O<sub>2</sub> and an attached manometer (pressure gauge). This allows the provider excellent control over airway pressures and the ability to “feel” the resistance of the airway.
- This device helps provide controlled and safe ventilation to small airways and fragile pediatric patients.
- Providers should practice with the Mapleson bag and be knowledgeable in its use, it functions differently than the regular self-inflating EMS BVM.

**Procedure:**

1. Set up the unit for use:
  - a. Attach tubing to supplemental oxygen. Begin O<sub>2</sub> flow at minimum 2 lpm, up to 15 lpm depending on device and need, different amounts will be required to inflate the bag.
  - b. Attach mask to open end opposite the manometer dial.
  - c. Set the “bypass” or CPAP valve to fully open (counterclockwise).
2. Place mask appropriately on pt.’s face with two thumbs masking or E-C clamp with good seal.
  - a. Squeeze the bag to ventilate pt. at the appropriate rate. Note the pressure on the manometer and note what pressure is required to obtain chest rise. In normal “compliant” neonates and infants, this will be minimal (5-10 cmH<sub>2</sub>O).
  - b. Increase oxygen flow and begin to adjust “close” the bypass or CPAP valve to increase PEEP to desired level (use manometer as a guide, 5-10 cmH<sub>2</sub>O recommended).
3. Squeeze bag to ventilate, but ventilate slowly enough for chest rise and until manometer reflects desired peak pressure. Do not routinely exceed 30 cmH<sub>2</sub>O and never 40. Keep the manometer needle in the green or yellow (acceptable) pressure areas.
4. Adjustments may need to be made to blue valve and squeeze pressure to maximize oxygenation while minimizing risk of barotrauma.

5. Ensure that ventilations are producing chest rise.

# Pericardiocentesis

**Approved Practice Level:** Paramedic – OLMC order only outside of trauma arrest.

**Associated Protocols:** TR.11

**Last Review Date:** 1/2024

## **Clinical Indications:**

- Penetrating trauma to the chest in “the box” and cardiac arrest.
- Physiology consistent with pericardial tamponade – hemodynamic instability (hypotension, SOB, etc.), bilateral JVD, electrical alternans on EKG, muffled heart sounds or evidence of large pericardial effusion on ultrasound (if available).

## **Contraindications:**

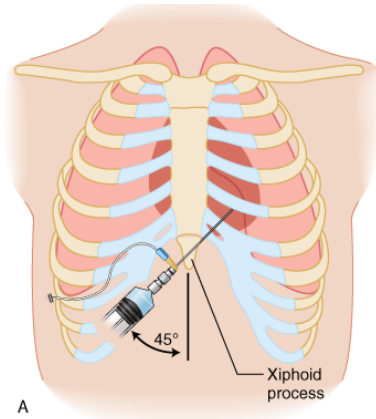
- Blunt trauma or trauma outside the chest.

## **Clinical Considerations or Precautions:**

- Consider confirming presence of pericardial fluid with ultrasound if present.

## **Procedure:**

- 1. For patients in cardiac arrest only, provider must be SPECIFICALLY credentialed for this procedure and approved by medical director and the agency.**
2. Equipment
  - a. 5 - 6” 12-14ga angiocath
  - b. 20mL syringe
  - c. Three-way stopcock
  - d. Betadine or Chloraprep
  - e. Cardiac monitor
3. Preparation
  - a. Patient should be supine on back
  - b. Place syringe on angiocath
  - c. Identify landmarks
4. Clean and drape area
  - a. Attempt to use “clean” technique, EMS setting is not “sterile”
  - b. Splash and scrub with betadine or Chloraprep
  - c. If available, tuck sterile drape under patient and lay one over chest/arm
  - d. If available, apply sterile gloves and don’t contaminate hands
5. Procedure
  - a. Insert needle just to your right of the xiphoid process (patient’s left) aiming at the patient’s left shoulder
    - i. The needle should be inserted at a 30-45-degree angle from the skin
    - ii. Aim toward the patient’s shoulder



- iii. A
- b. Advance the needle while aspirating on the syringe
  - i. The needle should be advanced slowly while aspirating, the goal of course is not to come into contact with the myocardium
  - ii. Typically, between half to two-thirds of the needle length.
  - iii. If no blood is aspirated, the provider may increase the angle slightly and make one additional insertion
- c. If fluid is encountered
  - i. Withdraw as much fluid as possible
  - ii. If the syringe must be removed to empty fluid and aspirate more, be sure to close the stopcock or cover the needle connection to prevent entry of air into the circulatory system
- d. If a pulse is restored
  - i. Carefully thread the angiocath off of the needle taking care not to retract or advance the angiocath more than 1-2mm
  - ii. Quickly occlude the angiocath hub after removing the needle to prevent air entry
  - iii. Place three-way stopcock in closed position back on angiocath hub
  - iv. Secure well consistent with impaled object
  - v. If pulsatile blood is encountered, the needle has inadvertently entered the heart, DO NOT REMOVE IT!
    - 1. Carefully remove the needle as above and secure in place with stopcock closed
    - 2. Inform ED physician immediately upon arrival that the catheter is in the heart
- e. Video - <https://www.youtube.com/watch?v=sy6pKUJzPOk>
  - i. Note that we will not have the luxury of ultrasound however this video discusses the equipment and mechanics of the procedure
  - ii. If the agency has alligator clips available that technique can be used
  - iii. <https://www.youtube.com/watch?v=0AzzKkj2WQo>

## End Pericardiocentesis

# Physical Restraint

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC.11

**Last Revision:** 1/2022

## **Clinical Indications:**

- To prevent patients from harming themselves or others including the public, EMS and other public safety providers including law enforcement.
- Where the patient is interfering with immediately necessary life-saving medical treatment.

## **Contraindications:**

- Do not use in patients where other less restrictive techniques are effective.

## **Clinical Considerations or Precautions:**

- All patients should be carefully, gently and humanely restrained in accordance with best practices regarding restraint.
- All restraints should be used for the minimum amount of time necessary and the least amount of force needed.
- Consideration should be given to chemical relaxation if patients continue to fight aggressively against the restraints. This prolonged struggle can result in clinical deterioration such as in Excited Delirium and patient injury.

## **Procedure:**

1. Attempt all reasonable, less restrictive means and methods of managing the patient.
  - a. Even when it seems the patient doesn't understand or is argumentative, explain what is needed for the patient to avoid restraint.
  - b. Explain once restrained what is expected to be able to have the restraints removed.
2. Request law enforcement assistance early unless purely medical situation.
3. Ensure that there are sufficient personnel available to physically restrain the patient safely.
  - a. Discuss the restraint plan ahead of time and responder roles when able to facilitate successful restraint.
4. Only use accepted restraint methods:
  - a. Restrain the patient ONLY in a lateral or supine position.
  - b. NEVER restrain in the prone or "suplex" position.
  - c. No devices such as backboards, splints, or other devices will be placed on top of the patient.
  - d. Restraints should never pass over the face, neck, joints or genitalia
  - e. Restraints should never push on the chest or cause an impediment to breathing
5. The restrained patient must be under constant observation by a credentialed provider at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring as well as end-tidal CO<sub>2</sub> use if appropriate.

- a. Restrained extremities will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This **MUST** be documented on the PCR.
6. Documentation on the patient care report should include the reason for the use of restraints, the type of restraints used and the time restraints were placed. Use of a restraint checklist is highly recommended.
7. If the above actions are unsuccessful, or if restraint is causing injury or exacerbation to the patient, consider chemical relaxation via the **Chemical Relaxation** protocol.
8. 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 or be immediately available to release them (i.e. following immediately behind).

## End Physical Restraint

# Pleural Needle Decompression

**Approved Practice Level:** AEMT, Paramedic

**Associated Protocol:** TR.01

**Last Reviewed:** 1/2022

## **Clinical Indications:**

- For patients with clinical suspicion of tension pneumothorax or hemothorax.
- May be used in medical patients as well where decompression of a medical, iatrogenic or spontaneous pneumothorax is suspected.
- See clinical description below.

## **Contraindications:**

- Provider does not have documented clinical training verified by medical director.
- Patient too obese for needle to be effective (relative).

## **Clinical Considerations or Precautions:**

- Common symptoms include respiratory distress, compatible patient history and any of the following:
- Chest pain, agitation, sense of impending doom.
- Absent or decreased breath sounds, hyper resonance, increased tactile fremitus.
- Tachycardia, hypotension and falling SaO<sub>2</sub>.
- Neck vein distention (JVD), tracheal displacement away from affected side (late signs).

## **Procedure:**

1. Find Landmarks
  - a. Expose the entire chest, identify the second and third rib, located just inferior to the clavicle.
  - b. If approximation must be done, remember the “anatomical” nipple line corresponds roughly to the 4<sup>th</sup> intercostal space
  - c. When in doubt, move higher and lateral rather than lower
2. Preparation
  - a. Equipment (note pediatric vs. adult equipment changes)
    - i. Betadine, alcohol or Chloraprep cleaner
    - ii. 10mL syringe Luer Lock
    - iii. **Adults** – 3” angiocath, may use 10, 12 or 14ga angiocath or commercially manufactured needle SPEAR or NAR ACS needle
    - iv. **Children (< 12yo)** – Use standard 14 or 16ga 1.25” IV angiocath.
  - b. Connect the angiocath or needle to the syringe
  - c. Clean the site, use aseptic technique
3. Insertion
  - a. Insert the needle immediately superior to (over the top of) the third rib (in the 2<sup>nd</sup> or 3<sup>rd</sup> intercostal space), in the mid-clavicular line.

- b. Remember insertion just above the rib avoids the neurovascular bundle that runs underneath the rib
  - c. Aspirate on the syringe as you advance
  - d. Insert just far enough until a pop is felt and air is aspirated into the syringe
  - e. Carefully hold the needle still, slide the catheter off the needle into the chest, and stop if resistance is met
  - f. An immediate "hiss" of escaping air may be heard, or ventilation may become improved
  - g. Secure the catheter in place similar to an impaled object and apply one way valve (not necessary if patient is positive pressure ventilated)
  - h. Secure sharps
4. Rapid transport to a Trauma Center (or closest appropriate facility if unstable) is appropriate
  5. Pleural decompression catheters are thin and may become easily kinked or occluded. If you feel this has occurred, insert another catheter just adjacent to the existing catheter or if trained consider finger thoracostomy

## End Pleural Needle Decompression

# Rapid Cooling Procedure

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC.13

**Last Review Date:** 1/2022

## **Clinical Indications:**

- Indicated for rapid cooling of patients with heat stroke where indicated in the protocols.

## **Contraindications:**

- Rapid cooling may not be indicated for elderly or medically fragile patients with chronic or gradually induced heat stroke such as an elderly patient who has been in a hot house for 24 hours or more (relative).
- On scene cooling may be superseded in cases where transport must be immediate such as critical trauma. Cooling should be continued during transport.

## **Clinical Considerations or Precautions:**

- Clinical treatment must continue while cooling. The provider must be ready to provide airway management, IV therapy and when available monitoring during the cooling process.

## **Procedure:**

- **COOL THE PATIENT BEFORE TRANSPORT!!**
- Rapid and accurate determination of temperature is paramount. Anytime heat stroke is suspected a rectal or core temperature should be obtained. Agencies should have a rectal probe thermometer that is different from those used for oral or other use. Disposable thermometers are cheap and effective to use and dispose of but advanced devices such as DataTherm thermometers may be used as well.
- Patients with core temperature above **105° F** and any neurologic symptoms (AMS, seizure, unconsciousness) should be rapidly cooled.
- Preferred Method – Full Body Icewater Immersion
  - Construct a basin or tub to hold ice and water.
    - At sporting or endurance events there may be dedicated troughs or other pools for this purpose.
    - Anything may be used including salvage covers, kiddie pools or other items deep enough to hold water.
    - Even a shopping cart with a salvage cover inside has been used!
  - Mix ice and water and immerse the patient up to the tops of the shoulders.
    - Ideally a sheet should be placed under the shoulders and across the back to hold the patient up and head clear of the water, especially if they have altered mental status or have had seizures.
  - Immerse the patient until cooled below 102 F.
    - If active temperature monitoring cannot be done during cooling, the process should require 5-8 minutes.

- Generally once shivering is noted or the patient's mental status begins to improve the temperature has been reduced to a clinically significant point.
  - See protocol for further details.
- Alternate Method – Ice Sheets
  - In some circumstances full body immersion may not be possible. Thin sheets may be used to construct essentially a large “ice pack”.
  - Wet the sheets and place around the patient then covering with ice and wrapping with the wet sheet to hold in place.
  - Take care to make sure there is contact with the head and neck, avoiding the face.
  - Direct ice contact with the skin should not be longer than 20 minutes without reevaluating for signs of frostbite or skin injury.
- Least Effective Method – Passive Environmental Cooling
  - If none of the above can be accomplished, traditional cooling should be performed.
  - Remove the victims' clothing to the point of modesty
  - Apply ice packs over the major pulse points (neck, armpits, groin)
  - Mist or moisten the patient's skin with water and increase airflow with A/C, fanning the patient, etc.
  - This is the LEAST effective and SLOWEST method of cooling.

## End Rapid Cooling Procedure

# Sedation

**Approved Practice Level:** Paramedic

**Associated Protocols:** GC.07; GC.08; GC.12; AW.04; AW.06; AW.10; AW.11

**Last Review:** 1/2022

**Clinical Indications:**

- For any patient undergoing procedural or post-intubation sedation.
- This document also can be referenced for patients requiring chemical relaxation.

**Contraindications:**

- Situations or patients where risk of sedation outweighs the benefit.
- This may include situations where there is not adequate personnel to safely accomplish the task or medical co-morbidities pose too much risk (relative).

**Clinical Considerations or Precautions:**

- Safe procedural and post-intubation sedation requires planning, adequate preparation of equipment and good provider training and patient selection.
- Remember that the “enemy of good, is better”. If the patient’s clinical condition is stable, consider whether other procedures such as this one are required.
- Proper equipment is required, unless severe extenuating circumstances exist, patients must always be monitored with NIBP, SaO<sub>2</sub>, EKG and ETCO<sub>2</sub> when sedated.

**Procedure:**

1. Assemble appropriate equipment and staff, this must include:
  - a. At least one other provider who can provide airway and ventilatory assistance
  - b. All needed equipment for intubation if required (see intubation procedure)
  - c. Suction equipment
  - d. Cardiac monitor, BP, SaO<sub>2</sub> and ETCO<sub>2</sub> monitoring
  - e. Reliable IV access (2 sites preferred)
  - f. Appropriate medications, oxygen
  - g. All needed equipment and providers for additional needed procedure to be performed
2. If applicable and condition permits, inform the patient of the planned procedure and the possible risk and benefits. The provider should obtain verbal consent from the patient or family members when possible, although many of these procedures will be performed under emergent consent due to the emergent conditions encountered by EMS.
3. If applicable and condition permits, have a “time out” to quickly discuss the treatment plan and indications, medications with other providers present.
  - a. This should include expected need for airway intervention and a “backup plan” if complications arise.

4. Administer sedation medications carefully and in minimum doses needed to achieve desired effect. Complete procedure or intervention.
  - a. Continue to monitor the patient until no sedation is present or care is transferred. The following should be monitored until no evidence of sedation remains:
    - b. BP, EKG, SaO<sub>2</sub> and ETCO<sub>2</sub> q. 2-5 minutes
    - c. ETCO<sub>2</sub> should not vary beyond values between 30 and 50 without intervention.
    - d. If a patient is not intubated and ventilated such as for a procedure, the MOST dangerous time is following the procedure. The patient remains sedated but the painful stimulus helping them to breathe is gone. Monitor closely for apnea!
    - e. For intubated patients, increases in HR and BP may be the only indication that patients are not adequately sedated.
5. The patient should be monitored for any evidence of:
  - a. Abnormal or allergic reaction
  - b. Hypoxia, hypercarbia or inadequate breathing or airway concerns
  - c. Hypotension or cardiac related complications
6. Be sure to document the procedure and the outcomes on the ePCR. This should include any adverse effects or interventions performed.
7. If patients are hypotensive and require sedation:
  - a. Consider avoiding medications that will lower blood pressure unless the “procedure” is assured to fix the hypotension
  - b. Ketamine is considered a more hemodynamically neutral sedation agent than other choices such as narcotics and benzodiazepines.
  - c. Consider reducing the dose of sedation agents.
8. Always, calculate the risk and benefit analysis for any sedation, if doubt exists, contact Medical Control. In general, do NOT sedate patients that would likely be airway disasters or complex intubations. Consider other choices.

## End Sedation

# Spinal Motion Restriction

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** GC.03

**Clinical Indications:**

- For use to immobilize and perform spinal motion restriction on patients meeting the inclusion criteria specified in protocol.

**Contraindications:**

- Where risk of immobilization is greater than the benefit. This may be true in many cases such as patients that will rapidly deteriorate if laid flat (CHF, etc.).
- In cases where the steps or time required for immobilization will place the patient or rescuer at risk (sinking car, fire, tactical environment, etc.)

**Clinical Considerations or Precautions:**

- Recently there has been much debate regarding the utility of spinal motion restriction. Increasing research is demonstrating that SMR is not beneficial, specifically prolonged times supine on a long spine board, and may be harmful, causing complications in many patients. As such, patients should “rule in” for the use of SMR as opposed to “ruling out” as in the past.
- The provider should reference the SMR protocol to determine the need for SMR and the EMS provider may still use discretion to immobilize a patient not meeting the SMR “rule in” criteria if they deem necessary for good reason. Additionally the long spine board continues to have a role in patient moving and extrication, a good surface for CPR, etc.
- Remember that if a patient does not meet criteria for SMR, this does not mean they DON'T have a spinal injury. Providers should still apply a hard cervical collar and use caution if they suspect a spinal injury and carefully place patients on the EMS stretcher using spine neutral movements and secure them with minimal movement.
- For pediatric patients, providers should use an appropriate pediatric backboard, vacuum stretcher or other approved device. If not available, the provider should pad and package the patient appropriately.
- In many cases, a car-seat is an appropriate immobilization device for infants and small children. Remember to pad the head area and secure C-spine appropriately. This is not appropriate for children requiring acute or critical care.

**Procedure:**

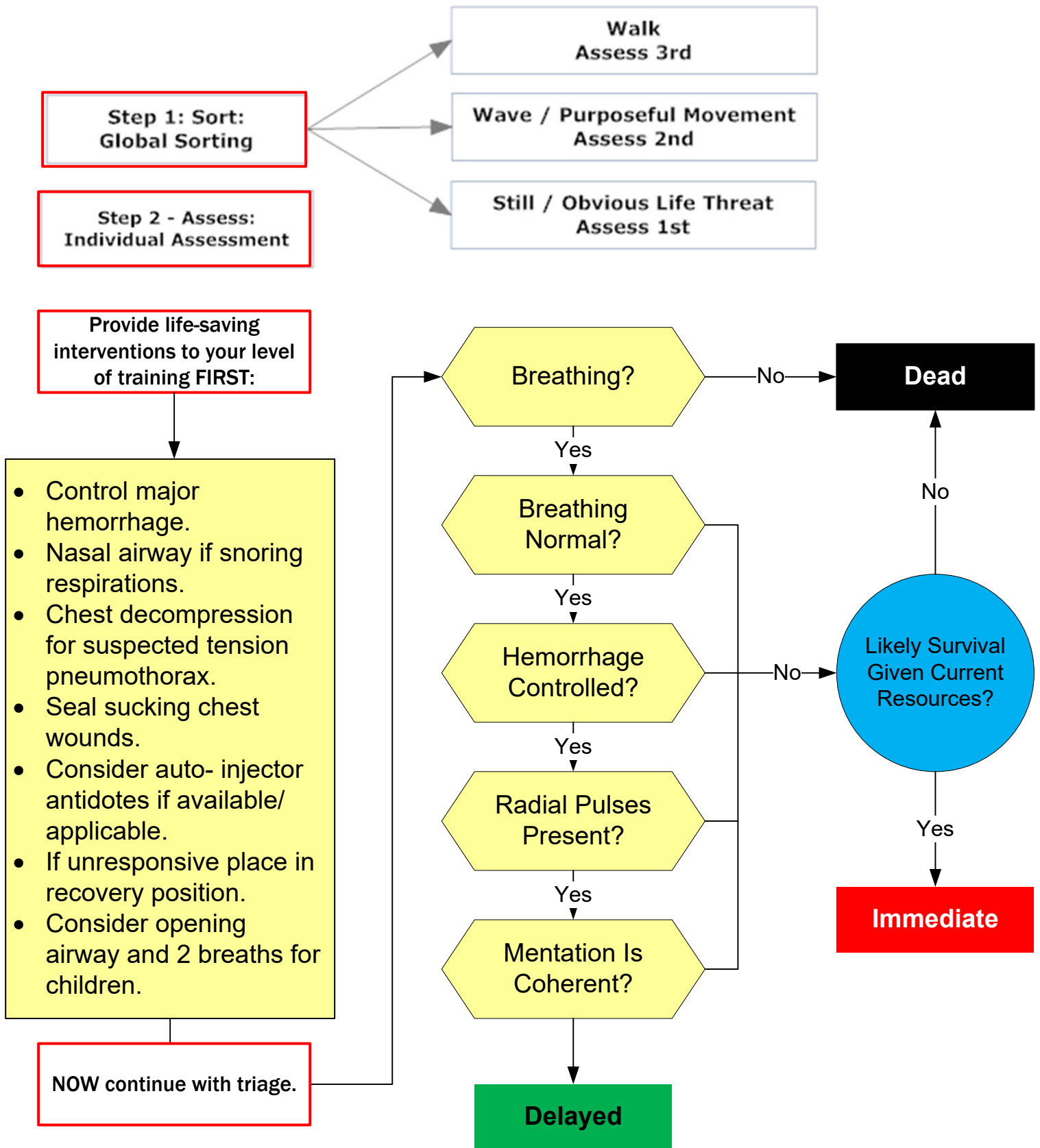
1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head and explain the procedure to the patient.
2. Second rescuer should maintain the head in a neutral position using in-line stabilization (not traction).
3. Assess peripheral motor/sensory function and distal pulses (PMS)

4. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. Once the collar is secure, the second rescuer should continue to maintain stabilization.
5. If needed, move patient to a long board using a technique appropriate for the patient position which maximizes maintenance of in-line spinal stability.
6. Secure the body to the long board followed by the head using straps and head rolls/tape or another similar device.
  - a. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
  - b. Generally, avoid straps or tape under the chin. These may put pressure on the throat and airway or cause complication if emergent airway procedures are needed.
7. Place padding in void spaces under and around patient, if time permits.
8. Reassess peripheral motor/sensory function and distal pulses (PMS).
9. Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars.
  - a. Never force a patient into a position to immobilize them.
  - b. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital and continual assessment of distal PMS.
10. Document the procedure in the patient care record.
11. Facilitate removal of the patient from the hard long spine board as soon as safely possible upon arrival at the receiving facility or before transport if appropriate.
12. In some cases, it may be appropriate to temporarily use the long spine board.
  - a. In those cases, the patient may be carefully moved to the EMS stretcher as above then carefully logrolled onto the EMS stretcher, removing the LSB.
  - b. Spine neutral movements should be ensured and then a team lift with caution should be used when moving the patient at the receiving facility to prevent excessive spinal movement.

## End Spinal Motion Restriction

# MULTIPLE PATIENT TRIAGE

## SALT Mass Casualty Triage Algorithm (Sort, Assess, Lifesaving Interventions, Treatment/Transport)



# STEMI Notification & Transmission

**Approved Practice Level:** Paramedic

**Associated Protocols:** AC.01

**Last Review:** 1/2022

**Clinical Indications:**

- For patients with a 12-lead EKG suggesting an ST elevation myocardial infarction or where the provider suspects an abnormal EKG and needs assistance with interpretation.

**Contraindications:**

- None.

**Clinical Considerations or Precautions:**

- The provider should understand the technical and agency specific procedures to accomplish transmission of the EKG when so equipped and indicated.
- See considerations below regarding patients with “STEMI” who do not meet clinical indications.

**Procedure:**

1. STEMI criteria identified on GOOD quality 12-lead EKG, usually contain:
  - a. > 1mm of ST segment elevation in 2 or more contiguous anatomic limb leads (i.e. I, aVL, II, III, aVF, V4, V5, V6)
  - b. > 2mm of ST segment elevation in 2 or more contiguous anatomic precordial leads (i.e. V1, V2, V3)
  - c. An interpretation of \*\*\*ACUTE MI\*\*\* by EKG computer with correct clinical picture
2. Consultation with Medical Control to discuss other less common STEMI presentations, mimics or atypical patients is strongly encouraged. This may include:
  - a. New onset LBBB
  - b. LVH with possible STEMI repolarization mimic
  - c. Global-ST elevation concerning for pericarditis
  - d. Single lead elevation in aVR with ST depression in other leads
3. STEMI activation may be delayed until facility arrival and evaluation for:
  - a. Patients without clinical ACS picture (i.e. no chest pain or equivalents)
  - b. Extremes of age (e.g. > 90 years old)
  - c. Patients with advanced terminal disease such as severe dementia, terminal cancer or a valid DNR/DNI
  - d. All of the above will be discussed on a case by case basis, when in doubt contact Medical Control
4. Any patient with concerns for STEMI should be urgently transported to a STEMI receiving center with 24/7 cath lab and PCI services. See the regional facility list for capabilities or the RAC website.

5. EMS units should declare a STEMI alert to the receiving facility as soon as possible and if so equipped transmit the EKG in question to the receiving facility. See the regional facility list for EKG transmission specifics.
  - a. The goal patient contact to EKG obtained time should be less than 10 minutes with a stretch goal of 5 minutes
  - b. The provider should document reasons for delays such as other scene priorities, device failures, etc.
  - c. Transmission of a STEMI should be done as soon as the provider has device data connectivity and agencies should try to develop systems to optimize this.

## End STEMI Notification & Transmission

# Stroke Assessment & Notification

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** AM.03

**Last Review:** 1/2022

**Clinical Indications:**

- Use to identify and screen for potential stroke patients.

**Definitions:**

- Time last seen well – The time where a reasonable person can verify the patient was in their normal state of health. For example, a patient who went to bed normal at 10 pm and wakes up abnormal at 10 am has a 12 hour “last seen normal time”.

**Contraindications:**

- Patients who are unresponsive or clearly unable to complete the tests. Note that portions of the exam may be able to be completed.

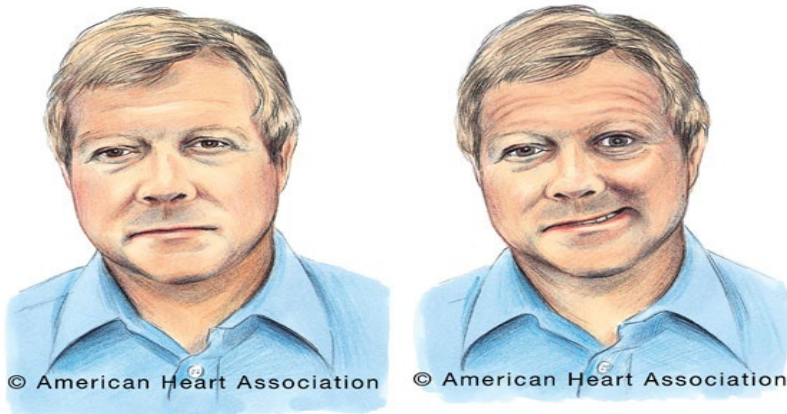
**Clinical Considerations or Precautions:**

- Do not assume they are NOT having a stroke if they cannot perform the listed screening procedures. In the correct clinical context patients with altered mental status and other complaints may be having a stroke.
- Make every attempt to have a family member or friend accompany the patient to the hospital who can give information and potentially consent to treatment for the patient.
- At minimum obtain a name and cell phone number for someone who can answer questions and give consent. Providers will ideally use a “stroke sticker” affixed to the patient with this information.
- If Cincinnati stroke screen is positive, proceed with evaluation using VAN. The VAN assessment is used to predict large vessel occlusion (LVO) that may respond to clot retrieval.
- For facilities that participate in an “EMS direct to CT plan” remember to evaluate and advise the facility on appropriateness for direct to scanner.

**Procedure:**

1. **STEP 1:** Evaluate Using Cincinnati Pre-Hospital Stroke Scale (same as FAST) **FIRST:**
  - a. Patients are evaluated in three areas as below. Any abnormality is a positive finding.
  - b. Facial droop
    - i. Evaluate for any facial asymmetry. Have the patient smile or try to look “surprised”.

- ii. The test is abnormal if the face does not remain symmetric. Ask about any history of facial palsy such as “Bell’s palsy”.



c. Arm drift

- i. Have the patient place both extended arms out in front of themselves, palms facing up. Advise them to pretend like they are holding a “tray of drinking glasses” and not to drop it. Then have them close their eyes and remain still.
- ii. If one arm drifts away or the palm rotates down, this is abnormal.



d. Speech testing

- i. Have the patient repeat a common phrase that you state, such as “you can’t teach an old dog new tricks”
- ii. It is abnormal if they cannot remember, slur words, incorrectly recount or cannot speak the words.

2. **STEP 2:** If Cincinnati scale is positive, administer the VAN exam **NEXT:**

- a. The VAN exam is a scoring tool to try and predict the presence of a large vessel occlusion, essentially a clot in the larger, more proximal brain arteries. These can often be opened up by mechanical removal through the blood vessel similar to a heart catheterization.

- b. Vision – this looks for any missing spots in the field of vision, better known as the normal visual area.
    - i. Ask the person to focus on an area near your face or upper chest, tell them not to look away.
    - ii. With them staring at the area of focus, hold up different numbers of fingers using one hand in each of the four visual areas, right upper, right lower, left upper and left lower.
    - iii. The patient should not “look” at your fingers but be able to see the numbers of fingers out of their peripheral vision.
    - iv. If they get the number wrong, try once again, if they cannot see in one of the areas, this test is abnormal.
    - v. Alternatively, in patients with altered mental status, the provider can use the “direct to threat” method where they may quickly flick their hand at the patient’s eye, hoping to elicit a “flinch” or blink. Use caution to inform onlookers or family what this test is and that you are not intending to hit or strike the patient.
  - c. Aphasia – this tests for the ability to hear, understand and speak words
    - i. Show the patient two common objects and have them name them, such as a pen or wristwatch
    - ii. Have the patient repeat a common phrase such as “It is a sunny day outside.”
    - iii. Have the patient follow two commands, these should be something the patient is able to do with their current stroke condition, i.e. don’t ask them to make a fist with a flaccid stroke affected extremity
      - 1. Show me a “thumbs up”
      - 2. Make a fist with one hand
  - d. Neglect – this tests that the brain is recognizing both sides of the body
    - i. Look at the patient, are their eyes or head fixed to one side? If the patient has a fixed gaze, this is an abnormal finding.
    - ii. If normal, touch each arm and ask them which side you are touching
      - 1. Touch left and right individually
      - 2. Then touch both at the same time
      - 3. The patient should be able to identify the correct side, if they only sense one side of the body this is an abnormal response.
  - e. The VAN test is positive if ANY of the above evaluations are abnormal. There is a very helpful training video: <https://www.youtube.com/watch?v=9g-1u3uiWb4>
3. **If acute stroke is suspected, begin prompt transport to a recognized primary or comprehensive stroke center.** Declare a stroke alert to the receiving facility as early as possible. See regional facility list for area hospital capabilities or RAC website.
- a. Evaluate blood glucose and correct if low, reconsider diagnosis if correction of hypoglycemia resolves the stroke symptoms.
  - b. Patients who can arrive at a treating facility with a “time last seen normal” less than 4 hours may be eligible for both tPA and/or endovascular treatments.
  - c. Patients inside a 4 - 24-hour window are not eligible for IV tPA but may in some cases benefit from interventional procedures. If both the Cincinnati (FAST) and VAN assessment are positive, consider transporting to a comprehensive or

primary plus center. Contact receiving facility or OLMC for advice on transport when needed.

**4. In cases where FAST and VAN are BOTH positive:**

- a. Evaluate current location and transport time to primary and comprehensive stroke centers
- b. If distance to comprehensive center is no more than 20 additional minutes, divert to comprehensive center
- c. If distance to comprehensive center is more than 20 additional minutes, transport to primary stroke center

**5. Advise receiving facility on appropriateness for “direct to CT scanner”. Ideal patient has:**

- a. Patent and stable airway
- b. Normal blood glucose
- c. Appropriate vital signs (no major hypotension, bradycardia, hypoxia)
- d. IV access (relative)
- e. No signs of rapid deterioration

## End Stroke Screening & Activation

# Surgical Cricothyrotomy

**Approved Practice Level:** Paramedic

**Associated Protocols:** AW.05; AW.08

## **Clinical Indications:**

- Failed airway in patient 12 years old and greater as indicated in the failed airway protocol.
- May be considered in patients as a primary airway when there is certainty that orotracheal intubation or use of supraglottic airway will not be successful (contact OLMC first).

## **Contraindications:**

- Any circumstance where airway can be managed by lesser means.
- Tracheal transection.
- Tracheal fracture or significant damage to anterior neck structures (relative).

## **Clinical Considerations or Precautions:**

- This should be considered an airway of last resort, however, once the decision has been made to cut, the procedure should be completed.
- Ideally this procedure requires good lighting, suction and helpers, ask for help early.

## **Procedure:**

1. Prepare patient, expose neck and identify landmarks (this should include the prominence of the thyroid cartilage, the sternal notch and the crico-thyroid membrane just inferior to the thyroid cartilage). Mark the locations if applicable and have someone stabilize the neck/trachea. Clean the area with alcohol, betadine or a Chloraprep.
2. Using a wide blade scalpel (#10), make a stab incision horizontally into the cricoid membrane through into the trachea. Do not “saw” with the blade. Insert a hemostat on either side of the blade and slide hemostat into the hole. Open hemostat to dilate and hold open the hole. Providers properly trained may use a ‘tracheal hook’ at this stage.
3. Take a bougie and slide into the hole with the bougie tip directed downward toward the feet. Similar to intubating with a bougie, the provider may feel the tracheal cartilage rings and then after insertion 6-8 more cm, may feel an “end point” at the carina. Insert until light resistance is felt and adequate bougie is inserted to ensure the tract is held open.
4. Once the tract is secured with the bougie, the incision may be extended **minimally** if needed. Introduce a well lubricated 6.0mm cuffed endotracheal tube into the opening directed toward the feet over the bougie into the trachea. Insert just until the ETT cuff disappears. Inflate the cuff and ventilate, using standard means (auscultation, ETCO<sub>2</sub>, chest rise, SaO<sub>2</sub>, etc.) to confirm placement.
  - a. Providers may use commercially packed short ET tubes or tracheostomy style tubes.

- b. Provider must have documented proficiency on that specific device and be approved by the medical director.
5. If needed, cut down the tube length to prevent kinking and secure appropriately. Use great lengths to protect the ETT from dislodgement.
  - a. Securing methods similar to an impaled object and application of a C-collar is advised.
    - i. Do not cut the ETT below where the balloon cuff tube starts or you will deflate the cuff.
6. Other commercially produced Surgical Airway devices may be used by the agency as long as the provider has been trained with documented in-service completion on its use AND the device has been approved by the medical director.

There are several good surgical cricothyrotomy videos. All demonstrate a slightly different technique but they are basically the same general approach. Some advocate putting your finger into the cricothyrotomy, others say to rotate the scalpel to open the incision. I prefer sliding curved hemostats into the incision along the scalpel and using the hemostats to dilate and hold open the incision until the bougie is in place. All techniques can be used, practice one and know it WELL!

<https://www.youtube.com/watch?v=SbhEyGlf9Y4>

<https://www.youtube.com/watch?v=wVQFJR7qmrQ>

## End Surgical Cricothyrotomy

# Taser Barb Removal

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocols:** None, not required.

**Last Review:** 1/2022

## **Clinical Indications:**

- Patient with embedded Taser probe/barb in non-concerning areas of skin (see contraindications) without other complications necessitating further medical evaluation.

## **Contraindications:**

- Embedded in concerning body area (anywhere above clavicles, genitalia, female breast, hands or feet)
- Embedded in other concerning area (over pacemaker, pain pump, ostomy site, etc.)
- Patient otherwise coming to hospital for medical evaluation

## **Clinical Considerations or Precautions:**

- Treat probe as biohazard sharp, likely law enforcement will want it returned
- Ensure weapon de-energized and disconnected prior to manipulation

## **Procedure:**

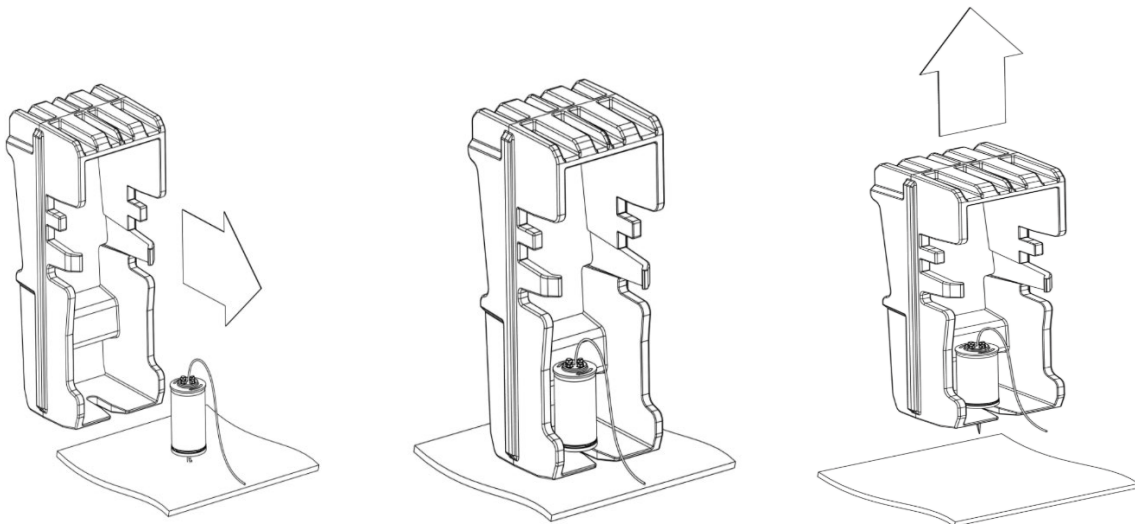
1. Provide gentle traction to the skin around the barb area.
  - a. Make an "L" with your non-dominant hand and stabilize the extremity (or area) in the general proximity of the probe.
  - b. Keep your hand several inches away from the probe itself, and do not attempt to stretch the skin immediately around the probe.
  - c. Avoid raking the barbed probe against your hand during removal.
2. Method 1: Holding tension, grasp the end of the barb protruding out of the skin near the wire lead and firmly pull out the barb with one quick jerking motion.
  - a. Do not pull on the wires.
  - b. Do not twist or bend the barb while removing.
3. Method 2: Use the Taser cartridge safety clip (see pictures below).
  - a. The notch in the cartridge can be used to remove the barb instead of fingers.
  - b. The process is the same, one brisk jerking motion to remove.
4. Inspect the barb to ensure that all portions have been removed (see typical picture)
  - a. There are two major varieties of barbs now, single barb (X26) and double barb (X2).
  - b. See pictures below, LEO should know which kind they have.
  - c. If concern remains that a portion is still embedded, transport to ED.
  - d. Remember to remove both barbs.
5. Assess the skin where the barb was removed. Control any bleeding and dress the wound with antibiotic ointment and a Band-Aid if available.

6. Return barb to law enforcement if they desire, otherwise dispose of carefully as sharps.

X26 Barb



X26 vs. X2 barb (respectively)



## End Taser Barb Removal

# Termination of Resuscitation: Deceased Patients & DNRs

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Associated Protocol:** AA.06

**Last Reviewed:** 4/2026

## **Clinical Indications:**

- To be used for decision making in not initiating or terminating cardiac arrest efforts.
- When CPR has not been started by EMS and resuscitation is to be withheld.
- When EMS resuscitation has become medically futile and is to be terminated.

## **Definitions**

- Termination of resuscitation (TOR) – The process of discontinuing resuscitation efforts, either BLS or ALS, that have already been initiated by an EMS provider or FRO.
- Withholding resuscitation – A decision made by the EMS provider or FRO not to start resuscitation efforts due to conditions outlined in this procedure below.

## **Contraindications:**

- Situations where crew safety would be an issue if resuscitation is stopped.
- Crewmembers are uncomfortable with scene termination.
- Major objection from family members not responsive to education and concern.
- Patients who are already in transit to the hospital with EMS.

## **Clinical Considerations or Precautions:**

- Remember that termination of resuscitation in the field is a significant responsibility and accurate and appropriate implementation is paramount.
- If at any time the pre-hospital provider is uncomfortable with field termination or other extenuating circumstances exist (i.e. violent family members on scene, questionable circumstances of death, etc.), resuscitation should continue and transport be initiated to the nearest appropriate facility.
- Termination of advanced life support in the prehospital setting will apply **ONLY** to the situations indicated below.

## **Procedure:**

- 1. Withholding Resuscitation “Do Not Initiate” Criteria – EMS will not begin resuscitation under these circumstances.**
  - a. In some situations, EMS providers will be called to care for patients who are no longer appropriate for resuscitation. Consider the following:
  - b. Injuries are clearly incompatible with life. These may include:
    - i. Decapitation or massive head/neck trauma with massive disruption of blood flow to the brain or massive disruption of brain tissue.

- ii. Amputation of portions of the thorax and abdomen with massive destruction of internal organs.
    - iii. Mechanism of injury clearly incompatible with life (i.e., a fall from 100 feet, etc.)
    - iv. Warm water submersion (> 43 F) longer than 20 minutes with no expectation of rescue (i.e. air pocket, etc.).
  - c. Patients with BLUNT traumatic mechanism found in cardiac arrest generally are not salvageable. In the absence of recent (10 min) confirmed vital signs by a trained responder, termination of efforts may be appropriate. See **Trauma Arrest protocol**.
  - d. Patients with PENETRATING traumatic mechanism found in cardiac arrest may be salvageable. Rapid transport may be considered for these patients especially if vital signs were recently lost. See **Trauma Arrest protocol**.
    - i. Consider massive hemorrhage, pneumothorax or pericardial tamponade for all patients with penetrating chest trauma.
    - ii. Intervene early with volume replacement (blood preferably) and chest decompression (thoracostomy if trained).
  - e. Multiple casualty scenarios (MCI) where patients outnumber and over-stress the EMS system.
    - i. This should **exclude cases of lightning strike** where some patients may be recovered quickly, sometimes with a single defibrillation.
  - f. Obvious signs of irreversible death are present. These may include decomposition of the body, clear and apparent rigor mortis accompanied by dependent lividity. Remember that some medical problems produce “stiffness” that may mimic rigor mortis, use appropriate caution.
    - i. Remember all patients must be warm to be ‘dead’ (core body temperature > 90 degrees Fahrenheit) to apply these guidelines.
    - ii. Medical control should be contacted to discuss resuscitation of hypothermic patients with suspected prolonged down time.
  - g. The patient has a valid Texas or other state out-of-hospital DNR order or a legible copy or a State issued DNR bracelet or necklace. (See DNR information below)
  - h. Direct orders from medical control to withhold resuscitation.
2. **“Orders to Terminate Resuscitation” Criteria – Resuscitation may begin but at some point, becomes medically futile.** EMS may contact medical control for consultation regarding cessation of resuscitation.
- a. Presence of terminal illness or advanced age – Often patients may expire from advanced age or terminal illness before or without a DNR. Family members may express a desire for EMS not to resuscitate the family member. Consultation with medical control is appropriate given:
    - i. Legal decision-makers are present requesting termination of efforts on behalf of the patient. These persons may include the patient’s spouse, adult siblings, parents or adult children or other legally appointed decision makers (POA, State guardianship, etc.).
    - ii. If the clinical situation seems appropriate to the EMS provider (i.e. terminal illness, etc.) and cardiac arrest is apparent, BLS should be

initiated and Medical Control may be contacted for termination of efforts orders.

- iii. If there is disagreement among the family present or the situation does not “make sense”, full resuscitation should be initiated.

b. Medical Futility of Ongoing Resuscitation - Continued AHA and other cardiac arrest research suggests that patients who fail to respond to adequate ACLS and other resuscitative measures in the pre-hospital setting, generally will not have meaningful recovery even if transported for emergency department care.

- i. This guideline is designed for implementation by the paramedic level provider (unless not reasonably available) to terminate resuscitation and with the assistance of Medical Control determine death in the field setting.
- ii. Consider contacting Medical Control for termination of efforts in patients meeting the following criteria:
  - 1. Ongoing unsuccessful resuscitation of the patient going beyond 40 minutes of ALS care (or 20 minutes in agonal PEA / asystole with ETCO<sub>2</sub> < 15).
  - 2. The patient should not be the victim of a suspected criminal act or act of self-harm.
  - 3. The patient must have received “adequate” resuscitation, including good CPR, ventilation/oxygenation, vascular access and pharmacologic therapy in accordance with protocol standards.
  - 4. The provider should have adequately addressed the probable underlying cause for cardiac arrest. I.e. given antiarrhythmic medications in VF/VT and addressed the “H’s and T’s” in patients. Please see the appropriate treatment protocols.
- iii. If any doubt exists as to the adequacy of resuscitation efforts or EMS team members are uncomfortable with utilizing this guideline, prompt transport should be considered or Contact Medical Control.
- iv. If termination of efforts in the field might endanger the well-being of the EMS provider, such as violent family members, dangerous scene factors, etc., prompt transport should be initiated and those factors relayed to the receiving facility.

### **3. Contacting Medical Control**

- a. If the patient remains unresponsive to advanced life support measures and meets the criteria above, the paramedic should contact medical control to request orders for termination. Depending on agency policy this will either be direct contact with the medical director or the appropriate contracted entity (base station ER, etc.)
- b. Resuscitative efforts shall be continued until the medical control physician gives the order to terminate.
- c. Medical control, based on the clinical situation may request additional treatment measures, may order transport of the patient or may give a time and stop the resuscitation.
- d. Note that online medical control physicians cannot sign out of hospital death certificates. Those deaths always must be attended by a medical examiner, justice of the peace or the patient’s own treating physician, APP, etc.

### **4. DNR Paperwork and Information**

- a. EMS personnel will honor Texas Out of Hospital Do Not Resuscitate Orders (OOH-DNR) in accordance with TDH Rule 157.25 for any patient in cardio-pulmonary arrest. If any doubt exists, begin resuscitative measures using the appropriate protocol and contact Medical Control immediately.
- b. A valid Texas OOH-DNR includes the following:
  - i. A complete, authentic Texas OOH-DNR form, OR photocopy, that can be identified to the patient.
  - ii. An authentic Texas OOH-DNR identification device including; plastic ID bracelet, metal ID bracelet or the approved necklace medallion.
- c. In the presence of a valid OOH-DNR form or identification device, the following procedures MUST be omitted (unless specific exception is made in writing):
  - i. CPR
  - ii. Defibrillation or transcutaneous pacing
  - iii. Endotracheal intubation or other advanced airway management including artificial ventilation
- d. EMS will NOT honor the OOH-DNR in cases where:
  - i. Suspicion of suicide, homicide, or other non-natural cause of death.
  - ii. The patient is suspected of being pregnant.
  - iii. The order or ID device has been destroyed or revoked. Texas Health and Safety Code Sec. 674.012. Revocation of Out-of-Hospital DNR. States, a declarant may revoke an out-of-hospital DNR order at any time without regard to the declarant's mental state or competency.
  - iv. An order may be revoked by:
    - 1. The declarant or someone in the declarant's presence and at the declarant's direction destroying the order form and removing the DNR identification device, if any.
    - 2. A person who identifies himself/herself as the legal guardian, as a qualified relative, or as the agent of the declarant having a durable power of attorney for health care who executed the out-of-hospital DNR order or another person in the person's presence and at the person's direction destroying the order form and removing the DNR identification device, if any.

#### **5. Out-of-State DNR orders**

- a. If a DNR order is presented from another state, territory, or possession of the United States, the field personnel will honor the out of state DNR unless there is reason to doubt its authenticity.
- b. This does include copies of the out of state DNR.

#### **6. Conflict Resolution Procedure**

- a. *In the event the scene situation is unclear or conflict at the scene occurs, the field personnel will:*
  - i. Initiate Basic Life Support procedures during the resolution process.
  - ii. Contact Medical Control and consult with the family members to resolve the conflict.
  - iii. EMS will transport with CPR in progress and full ALS resuscitation if the conflict cannot be resolved.

#### **7. Documentation guidelines for DNR orders**

- a. In the event of an OOH-DNR order or identification device is encountered or if any other situations as noted above occur, the following information will be documented in addition to the standard demographic information:
    - i. History and assessment of the patient's physical condition.
    - ii. Name of the patient's attending physician or physician on scene (if any).
    - iii. Full name, address, telephone number, and relationship to patient of any witness used to identify the patient.
    - iv. Unique identification number on the DNR form or identification device.
    - v. Situations or conflict at scene and the resolution.
  - b. If available, the OOH-DNR form should accompany the patient to the receiving facility. EMS personnel should not delay transport waiting for the form to become available. Identification devices SHOULD remain on the patient even in the event of death.
8. **Scene and Family Care Following Termination of Resuscitation** - Once the approval to terminate the resuscitation efforts is given by medical control, the EMS crew shall ensure the following:
  - a. The EMS crew shall clamp off any established invasive lines and other access routes. The BVM may be disconnected and disposed of but the endotracheal tube and all other invasive lines shall remain in place. This shall also include stickers, patches and other applied treatments.
  - b. EMS may use an appropriate cardiac "magnet" to disable internal defibrillator functions after termination of resuscitation at the direction of medical control.
  - c. The EMS crew shall contact their communications center for notification of the cardiac arrest being terminated and to notify law enforcement or the JP. Early involvement of law enforcement is encouraged at all cardiac arrest scenes to facilitate scene turnover and management of family and bystanders.
  - d. At all times the EMS personnel shall be attentive to the psychological needs of the other care givers and "survivors" and provide support as needed.
9. **AT NO TIME shall the deceased person be left unattended** or the scene departed before arrival of appropriate law enforcement or other legal representatives to assume custody of the deceased and control of the scene.
  - a. Note, according to the Texas Code of Criminal Procedure 49.041, a facility such as a nursing home or a hospice agency who has a physician who will medically certify the death, is not required to notify law enforcement or the Justice of the Peace. In those cases, EMS may release control of the decedent to the appropriate facility or hospice representative. If there is any concern about accidental trauma, mistreatment or suspicious activity, law enforcement should be asked to respond.
  - b. Exceptions to this are cases of imminent danger to the EMS crew due to bystanders or on-scene factors, or multiple patient scenarios where patient status dictates immediate transport of other involved parties.
  - c. In these cases the Communications Center should be immediately advised of the situation and in cases of danger, the EMS crew withdrawn to a safe staging area until the situation is cleared.
10. **Sample Texas DNR Bracelets and Form** (see below)

(1) An intact, unaltered, easily identifiable plastic identification OOH DNR bracelet, with the word "Texas" (or a representation of the geographical shape of Texas and the word "STOP" imposed over the shape) and the words "Do Not Resuscitate", shall be honored by qualified EMS personnel in lieu of an original OOH DNR Order form.

OR

(2) An intact, unaltered, easily identifiable metal bracelet or necklace inscribed with the words, "Texas Do Not Resuscitate - OOH" shall be honored by qualified EMS personnel in lieu of an OOH DNR Order form.



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

### TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Print Form



This document becomes effective immediately on the date of execution by health care professionals acting in non-hospital settings. It remains in effect until the person is pronounced dead by authorized medical or legal authority or the document is voided. Consider 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 this  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 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 \_\_\_\_\_

**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 the treatment decision under Health and Safety Code §19A.001.

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 for a person who is incompetent or otherwise incapable of communication, by the physician or a competent proxy:** I am the above-noted person's attending physician and have:

seen evidence of having previously issued directives to physicians by the adult, now incompetent, OR  obtained full disclosure before me of an OOH-DNR in a non-written 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 \_\_\_\_\_ Last \_\_\_\_\_

**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 \_\_\_\_\_

**WITNESSESS:** (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 non-written 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 of notary \_\_\_\_\_ Notary's printed name \_\_\_\_\_ Notary Seal \_\_\_\_\_

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

**PHYSICIAN STATEMENTS:** 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 non-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. Signature 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 only in reasonable medical judgment, consistent with the person's best interests or are otherwise not in the best interests of the person. I direct health care professionals acting in non-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 \_\_\_\_\_ Last \_\_\_\_\_

Signature of second physician \_\_\_\_\_ Date \_\_\_\_\_ Printed name \_\_\_\_\_ Last \_\_\_\_\_

Physician's electronic or digital signature must be certified under Health and Safety Code §19A.001(b).

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 higher medical transport.

# END

# TERMINATION OF RESUSCITATION

# CAT Gen 7 Tourniquet Application

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Clinical Indications:**

- Life threatening hemorrhage not controlled by other means
- Serious or life-threatening hemorrhage where conditions prevent control via normal means such as entrapment, severe multi-injury, care under fire, etc.

**Contraindications:**

- Non-extremity hemorrhage, minor hemorrhage

**Clinical Considerations or Precautions:**

- Tourniquet placement will generate severe pain in alert patients. Consider analgesia as soon as possible.
- Do not forget other bleeding control techniques such as wound packing, pressure, etc.

**Procedure:**

1. Provider must use a commercially available trauma tourniquet approved by the medical director. Those currently include the CAT Gen 7 and SOF-T or for children or canines a SWAT-T wrap style tourniquet. Unless absolutely necessary, do not improvise tourniquets unless in austere location.
2. Place tourniquet proximal to wound according to manufacturer instructions.
  - a. Hasty tourniquet – A tourniquet placed as high and tight on the extremity as possible. This is meant for situations where rapid placement is critical and the exact location of the injury cannot be determined via exposure and exam.
  - b. Deliberate tourniquet – A tourniquet placed approximately 2 inches above the intended injury and tightened just enough to stop bleeding and occlude arterial flow. These are placed when the extremity can be exposed and examined.
  - c. Hasty tourniquets can be later converted to a deliberate tourniquet as dictated by the situation and clinical picture.
3. Generally, tighten until there is a loss of distal pulses and bleeding stops
  - a. Failure to adequately tighten the tourniquet to stop arterial inflow may result in increased venous back pressure making even venous injuries appear arterial.
  - b. This may also contribute to development of compartment syndrome.
4. Secure the tourniquet.
  - a. Use the included approved method to secure the windlass.
  - b. If patient movement is expected the provider may wish to 'reinforce' the tourniquet with Coban or tape, etc. Keep visible when able to monitor.
5. Note time of tourniquet application and communicate this to receiving care team.
6. If delayed or prolonged transport (> 30 minutes) **and** in the absence of amputation or continued hypotension/shock the tourniquet may be **LOOSENED** to assess for bleeding.
  - a. Do NOT remove the tourniquet. If bleeding continues re-tighten the tourniquet to loss of distal pulses and notify the receiving facility.
7. Remember to provide pain management.

# AAJT Tourniquet Application

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

**Clinical Indications:**

- Life threatening hemorrhage into the pelvic cavity/abdomen, and/or massive lower extremity injury.
- Junctional use where injury to the inguinal or axillary region is not amenable to CAT tourniquet application or it is ineffective.

**Contraindications:**

- Visible pregnancy, known abdominal aortic aneurysm (AAA).

**Clinical Considerations or Precautions:**

- Application in conjunction with blood administration may have additive positive results.
- Do not forget other bleeding control techniques such as wound packing, pressure, etc.
- Patients needing the AAJT need level 1 or 2 trauma center care.

**Procedure:**

1. Remove any clothing or objects from the application site (cell phone, wallet, etc.) and prepare the device per manufacturer training (see quick reference card w/AAJT).
2. For abdominal application:
  - a. Place the patient on a firm surface and place the AAJT with the bladder centered over the umbilicus.
  - b. Place the strap around the patient and secure going 'red to red' and remove all slack from the strap.
  - c. Ratchet the strap until tight and then inflate the bladder until the pressure indicator indicates the 'green' range.
3. For junctional application:
  - a. Place the AAJT in the appropriate inguinal or junctional position according to the manufacturer's guidelines (see quick reference card).
  - b. As above, secure 'red to red' and tighten the slack and ratchet the strap until tight.
  - c. Inflate the bladder until the pressure indicator indicates the 'green' range.
4. Verify efficacy and improved bleeding, continue to monitor the AAJT.
5. Do not DEFLATE without OLMC order or after arrival and turnover of care to hospital team physician.
6. Contact OLMC for prolonged field care needs.
7. Remember to provide pain management.

# END Tourniquet Application

# Transcutaneous Pacing

**Approved Practice Level:** **Paramedic**

**Associated Protocols:** AC.03; PD.05

**Last Review:** 1/2022

## **Clinical Indications:**

- Adult patients with unstable bradycardia unresponsive to catecholamine infusion or if infusion contraindicated.
- Pediatric patients with unstable bradycardia unresponsive to treatment (oxygenation, ventilation, etc.), defined as abnormal perfusion and BP < 70 + (age in years x2).

## **Contraindications:**

- Severe hypothermia (<85F)
- Valid DNR

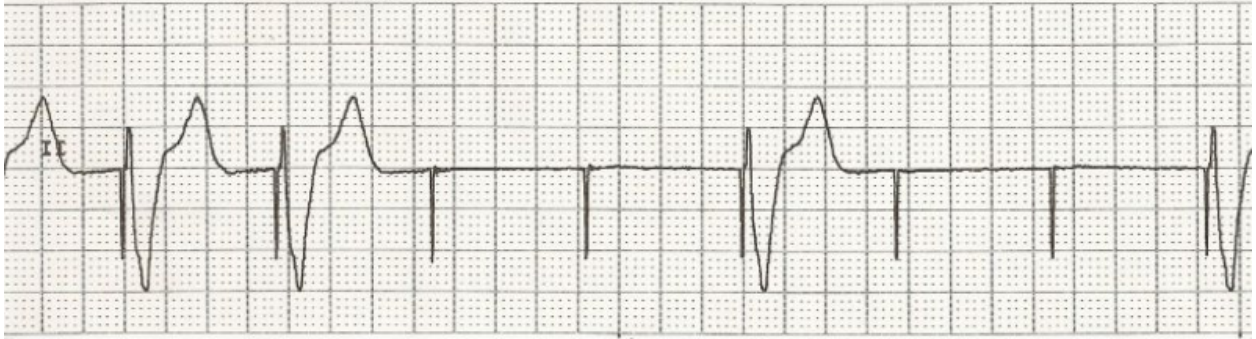
## **Clinical Considerations or Precautions:**

- Consider sedation in patients when awake and perceiving pain. Ketamine is an ideal agent since most patients requiring TCP will not have adequate BP for other medication and Ketamine may actually increase HR and BP but not always.

## **Procedure:**

1. Attach remote pacing patches in anterior-posterior position (one just left of sternum and one just left of the spine and just underneath scapula) on the front and back of the patient. Any moisture or hair should be appropriately removed prior to placement. Anterior lateral placement is permissible as well if A/P position cannot be obtained.
2. If awake and condition permits, inform the patient/family of the intended procedure and acknowledge possible discomfort. Consider administration of pain management.
3. The responder must know the proper procedure for their specific device and have documented training for TCP.
4. General pacing basics:
  - a. The monitor limb leads must be attached and the monitor be on its setting to pace
  - b. The energy settings should be dialed down to its lowest setting, commonly 60 mA and the rate should be set between 60-80 bpm.
  - c. When ready the pacer should be turned on and “spikes” should be noted on the EKG readout.
  - d. The mA setting should be increased in intervals of 20 mA until electrical “capture” is seen on the monitor. This should be an aberrant, wide-complex appearing rhythm that occurs after each pacer “spike”. It may look like a PVC or a ventricular paced rhythm. Generally, do not exceed 200 mA.
5. Once this is noted, the patient MUST be checked for a corresponding mechanical pulse. If a pulse is not present, mA settings must be increased until one is noted.

6. Once a mechanical pulse is noted, settings should be documented and treatment continued. Do not discontinue TCP until advised by the accepting facility physician.
7. Remember that if no MECHANICAL pulse is felt, pacing is NOT working!
8. Continue to provide sedation and/or pain management as needed.



In the strip above, note the narrow pacer spike and then a wide QRS looking similar to a PVC. This is compared to the spike with no complex following showing a lack of electrical capture. This strip demonstrates “intermittent electrical capture”.

Remember there **MUST** be an associated palpable pulse that correlates to confirm MECHANICAL capture for pacing to work.

## End Transcutaneous Pacing

# Valsalva (Modified) Procedure

**Approved Practice Level:** EMR, EMT, AEMT, Paramedic

Associated Protocol: AC.04; PD.06

**Last Review Date:** 1/2022

## **Clinical Indications:**

- For patients with inappropriate tachycardia where indicated in the treatment protocols.

## **Contraindications:**

- No absolute.

## **Clinical Considerations or Precautions:**

- There are many acceptable techniques to promote increased vagal tone. Generally carotid massage and any pressure applied to the eyes should be avoided without specific OLMC instruction.
- If concern for traumatic or potential spinal injury where movement would aggravate the underlying condition, omit the torso movement and leg raise.

## **Procedure:**

- 1) Obtain a 3, 5 or 10-mL syringe, loosen but do not remove the plunger. Draw up 2-3 mL of air to create an air gap.
- 2) Instruct the patient to place the syringe (no needle) in the mouth and blow into the end of the syringe to try and “blow the plunger out”
  - a) Generally, the patient will not dislodge the plunger.
  - b) Have them blow until physically unable to continue.
- 3) Once the patient stops and inhales:
  - a) Quickly lay them flat and elevate the legs.
  - b) Hold their legs upright for approximately 15-20 seconds.
- 4) Looking for changes in heart rate or rhythm conversion.
- 5) Patients who are unable to understand or participate in this may receive the typical Valsalva or “bearing down” instructions.
- 6) <https://rebelem.com/the-revert-trial-a-modified-valsalva-maneuver-to-convert-svt/>

# End Valsalva Procedure

# Mechanical Ventilation

**Approved Practice Level:** Paramedic

**Associated Protocols:** All associated airway management.

**Clinical Indications:**

- Intubated patients requiring mechanical ventilation.

**Contraindications:**

- Cardiac arrest or extreme hemodynamic instability (relative).
- Routine pre-hospital transport (relative).

**Clinical Considerations or Precautions:**

- For IFTs, remember that patients have a tendency to destabilize during out-of-hospital transport. Carefully evaluate all factors associated with the patient's current hemodynamic status before beginning the transfer process.
- If already on mechanical ventilation, discuss the ongoing ventilation and sedation strategy with the hospital or transferring provider before beginning the process.
- Contact the agency medical director or OLMC for consultation if conditions appear complex or outside or normal operating parameters.

**Procedure:**

1. Pre-Planning Process
  - a. Evaluate patient's current status if patient already on ventilator
    - i. What are current ventilator settings? Are they working well?
    - ii. Is the patient on simple or complex settings?
    - iii. Why is the patient intubated?
      1. Airway protection w/normal lungs (TBI, overdose, etc.)
      2. Sick or injured lungs (pneumonia, ARDS, trauma, etc.)
      3. Diseased lungs w/failure (COPD, asthma, CHF)
    - iv. Will your ventilator provide the current ventilation strategy?
  - b. Are the current ventilator settings appropriate?
    - i. Look at overall minute ventilation (RR X TV), appropriate?
      1. Remember usually 5 – 8 LPM for normal adult
      2. May need to be more if patient very acidotic or high CO<sub>2</sub>
    - ii. Are tidal volumes appropriate?
      1. Lung protective strategy 6-8 mL/kg ideal body weight (IBW)
      2. Reference ideal body weight table
    - iii. Is rate appropriate?
      1. Typically rates of 10-12 are appropriate
      2. Obstructive lung disease patients must have exhalation time
      3. Look at ETCO<sub>2</sub> waveform to make sure exhalation is complete (ETCO<sub>2</sub> returns to 0) before next breath, no stacking, etc.
      4. Look at the I: E times, adequate? (ratio of at least 1:2)
  - c. Is patient sedation adequate?

- i. Remember patient stimulus will increase during transport.
    - ii. RASS of anything more than -3 probably will not be adequate
    - iii. Consider additional sedation if
      - 1. Patient currently opens eyes to voice or light touch
      - 2. Patient intermittently coughing, bucking or over-breathing the vent
  - d. Discuss transfer ventilation settings with the sending provider (MD or RT)
    - i. Do we anticipate changes?
    - ii. Do they need you to adjust for any current issues? (I.e. low PaO<sub>2</sub>, etc.)
  - e. Use expected FiO<sub>2</sub> setting to calculate oxygen consumption rates and need
    - i. Unit should have full O<sub>2</sub> tanks before taking vent transfer.
    - ii. Use oxygen consumption table provided w/this guideline for the AHP 300
    - iii. Unit may request to have additional large cylinder placed in ambulance compartment
- 2. Set Up Ventilator and Establish Settings
  - a. Turn on ventilator and verify that unit passes self-test
  - b. Attach test lung and input settings
  - c. Ventilator settings
    - i. Using facility settings when appropriate
      - 1. It is appropriate to let the sending facility dictate settings as long as they seem appropriate
      - 2. See section 1.b above
    - ii. EMS provider-initiated settings
      - 1. When no guidance is given, EMS provider will begin with standard settings in accordance with patient disease process and condition
      - 2. See ventilation setup templates below, select the most appropriate condition
    - iii. If doubt exists as to appropriate settings, ask the sending physician or contact agency medical director or OLMC.
  - d. Remember
    - i. Stay connected to facility O<sub>2</sub> source until ready to leave the room
    - ii. Do not turn off or clear settings from facility ventilator until you are certain the patient tolerates the transport vent
- 3. Connect the Patient
  - a. With the assistance of the sending facility staff, pause the facility ventilator and attach the agency ventilator
  - b. Verify that the ventilator is functioning properly and monitor
    - i. ETCO<sub>2</sub> waveform and value
    - ii. SaO<sub>2</sub>
    - iii. Patient comfort on settings, chest rise, over-breathing, etc.
  - c. Do not move the patient or leave the room for 10 minutes unless there is a highly critical patient need (i.e. urgent surgical issue, etc.)
    - i. This allows the patient to demonstrate any issues with vent
    - ii. Ensures settings continue to be appropriate
    - iii. Use this time to complete paperwork, patient movement to stretcher, etc.
  - d. When the entire clinical team is confident the patient is tolerating the vent, connect to EMS O<sub>2</sub> source and move to EMS unit.
- 4. Verify all components upon reaching EMS unit

- a. Verify tube placement, ETCO<sub>2</sub> waveform, SaO<sub>2</sub>, connect O<sub>2</sub> to fixed source
  - i. Verify adequate pressure again before leaving
  - ii. Secure ventilator for transport
- b. Verify sedation is ongoing and adequate

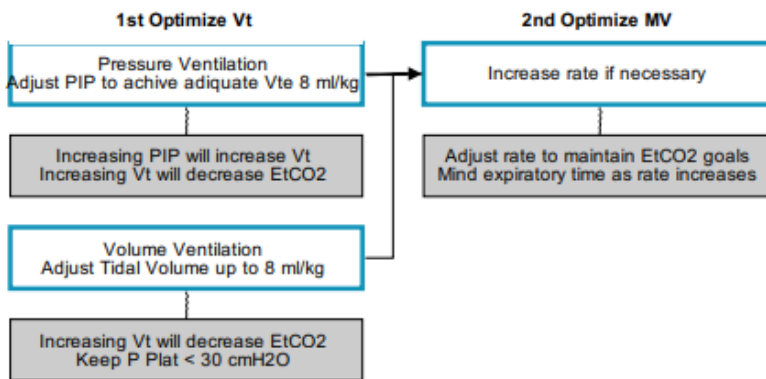
### Routine Initial Settings

Setting	Adult		Ped 10-40 kg		Infant < 10 kg
Mode / Type	AC Pressure	AC Volume	AC Pressure	AC Volume	AC Pressure
Pressure Control	15 cmH <sub>2</sub> O	N/A	15 cmH <sub>2</sub> O	N/A	15 cmH <sub>2</sub> O
Tidal Volume	VTe 5-8 mL / kg	Vt 8 mL / kg	VTe 5-8 mL / kg	Vt 8 mL / kg	Vte 5-8 mL / kg
Rate	16 / min		20 / min		30 / min
PEEP	8 cmH <sub>2</sub> O		5 cmH <sub>2</sub> O		5 cmH <sub>2</sub> O
I-time	1 sec		0.7 sec		0.5 sec
FiO <sub>2</sub>	1.0		1.0		1.0

Ideal / normal body weight must be used to calculate VT and monitor VTe. See weight chart.

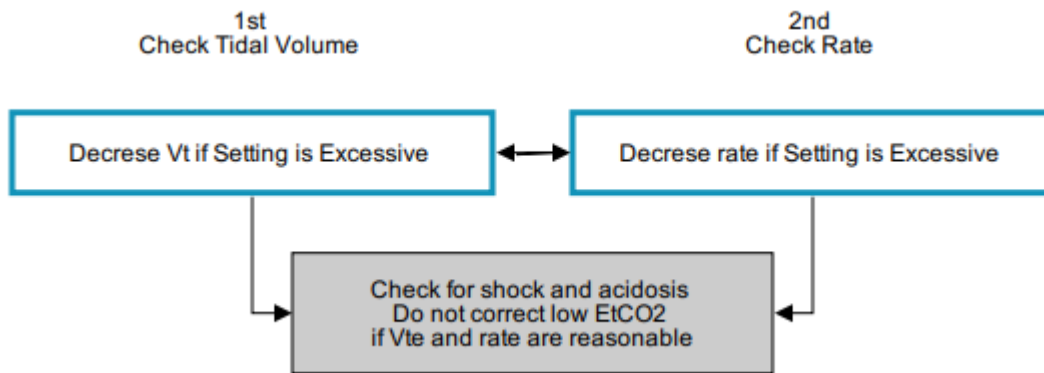
In most cases the EMS provider should continue settings already established by the sending facility as long as they make clinical sense. If the EMS provider must initiate settings, for routine patients the above should be a good starting point. In most cases EMS providers using these protocols should not be transporting critical pediatric patients. This information is provided for extenuating circumstances.

### Adjustments for Hypercapnia (High ETCO<sub>2</sub>)



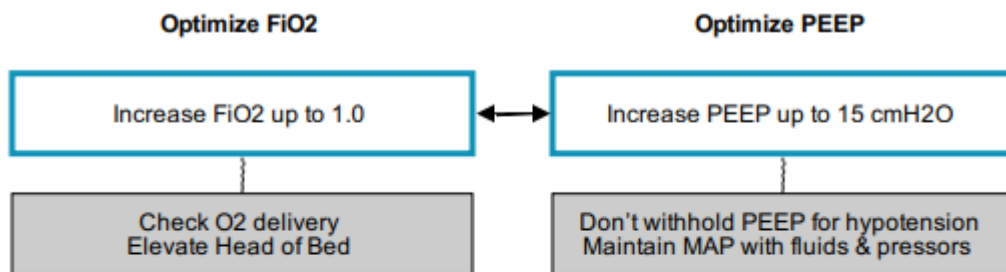
- Overall goal is to increase minute ventilation, start with tidal volume. In pressure mode increase your PIP to increase Vte. In volume mode increase tidal volume up to 8 mL/kg.
- Keep close eye on PIP and Plateau pressures.
- If not effective or hitting high pressure, increase rate, keep close eye on exhalation times to make sure no auto peep or breath stacking.
- If having problems with auto peep or breath stacking, reduce inspiratory time.

### Adjustments for Hypocapnia (Low ETCO<sub>2</sub>)



- Make sure ventilatory settings seem normal. If they are reasonable, do not worry about the low ETCO<sub>2</sub>, this is likely due to the patient compensating for metabolic acidosis or due to poor perfusion.

### Adjustments for Hypoxia (Low O<sub>2</sub>)



Use one of the PEEP and FiO<sub>2</sub> escalation ladders below to guide FiO<sub>2</sub> and PEEP titration

Higher FIO <sub>2</sub>	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0
Lower PEEP	5	5	8	8	10	10	10	12	14	14	14	16	18	20

Lower FIO <sub>2</sub>	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0
Higher PEEP	5	8	10	12	14	14	16	16	18	20	22	22	24	24

### **High Pressure Alarms (High PIPs & Plats)**

- Confirm airway placement, security. Check for tube/tubing kinks, bends, biting, etc.
- Assess for airway obstruction w/mucus or other secretions, suction, etc.
- Make sure patient is adequately sedated, not bucking vent, etc.
- Evaluate PIP (peak inspiratory pressure) and plateau pressure
  - Plateau pressure can be checked usually by a manual breath hold button or by occluding the exhalation (patient outflow) valve during and for a short time after inspiration
  - The inspiratory pressure will first show the PIP then as the valve is held it will decrease to the plateau pressure
- Concern for air trapping, high PEEP
  - Usually high PIP ( $> 35$ ) and acceptable Plat ( $< 30$ )
  - Means high airway resistance but ok lung compliance
  - Disconnect circuit and allow for exhalation
  - Make sure tube is not kinked and exhalation valve is not blocked
  - Treat bronchospasm with albuterol
  - Make sure airway is suctioned
- Concern for poor lung compliance
  - Usually high PIP ( $> 35$ ) and high Plat ( $> 30$ )
  - Airway obstruction, mainstem bronchus intubation
  - Pneumothorax, pulmonary edema
  - Significant abdominal distention causing thoracic pressure
- Other actions to take
  - Ensure adequate sedation, consider calling medical control to re-paralyze
  - If ETCO<sub>2</sub> and ventilation is adequate, reduce tidal volume
  - If oxygenation is ok, reduce PEEP (do not reduce below 5)

### **Low Pressure Alarm**

- Look immediately for leak in circuit or airway, i.e. ETT cuff deflated, etc.
- Evaluate ventilator and make sure delivering intended volume/pressure
- Shorten inspiratory time if long to increase flow rate

### **Alarm Settings**

- High pressure alarm
  - In most cases this should be 10 cmH<sub>2</sub>O above the PIP
  - Set high for initial few moments to see what patient PIP is, always remember to re-set at correct value
  - Remember the ventilator generally will stop delivery of a ventilation once the high pressure limit it set, although this is protective it can also mean your patient is not getting adequate minute ventilation.
- Low pressure alarm
  - In most cases this should be 10 cmH<sub>2</sub>O below your PIP
  - Set low for initial few moments to see what patient PIP is, always remember to re-set at correct value

- Setting too low can result in undetected hypoventilation, circuit leaks and low minute ventilation.

### **Ideal Body Weight**

Male			Female		
Height	Inches	Ideal Kg	Height	Inches	Ideal Kg
4'6"	54	36.2	4'6"	54	31.7
4'8"	56	40.8	4'8"	56	36.3
4'10"	58	45.4	4'10"	58	40.9
5'0"	60	50	5'0"	60	45.5
5'2"	62	54.6	5'2"	62	50.1
5'4"	64	59.2	5'4"	64	54.7
5'6"	66	63.8	5'6"	66	59.3
5'8"	68	68.4	5'8"	68	63.9
5'10"	70	73	5'10"	70	68.5
6'0"	72	77.6	6'0"	72	73.1
6'2"	74	82.2	6'2"	74	77.7
6'4"	76	86.8	6'4"	76	82.3
6'6"	78	91.4	6'6"	78	86.9
6'8"	80	96	6'8"	80	91.5

Calculations based on Devine formula.

### Oxygen Depletion Charts (min)

These times are approximate and assume full cylinder capacity. Always monitor the cylinder pressure and low pressure alarm to make sure you do not run out of oxygen.

**E Cylinder      Capacity = 682 Liters Oxygen Capacity  
(4.6 Liters Water Capacity)**

#### Breaths per Minute

Tidal Volume	8	9	10	12	14	15	18	20
<b>1200</b>	67	60	54	46	39	37		
<b>1000</b>	80	72	65	54	47	44		
<b>800</b>	98	88	80	67	58	54		
<b>600</b>	127	115	104	88	76	72	60	54
<b>500</b>	149	135	123	104	90	85	72	65
<b>400</b>	180	163	149	127	111	104	88	80
<b>300</b>	225	206	189	163	143	135	115	104
<b>200</b>	293	274	256	225	200	189	163	149

**Jumbo D Cylinder      Capacity = 637 Liters Oxygen Capacity  
(4.0 Liters Water Capacity)**

#### Breaths per Minute

Tidal Volume	8	9	10	12	14	15	18	20
<b>1200</b>	63	56	51	43	37	34		
<b>1000</b>	75	67	61	51	44	41		
<b>800</b>	92	82	75	63	54	51		
<b>600</b>	119	107	97	82	71	67	56	51
<b>500</b>	139	126	115	97	85	79	67	61
<b>400</b>	168	152	139	119	104	97	82	75
<b>300</b>	210	192	177	152	134	126	107	97
<b>200</b>	274	256	239	210	187	177	152	139

### M Cylinder Consumption Table

*Assumes 2100 psi in tank and 100% FiO2*

TV / BPM	6	8	10	12	14	16	18	20	22	24	26
1200	493	370	296	246	211	185	164	148	134	123	114
1000	592	444	355	296	254	222	197	177	161	148	137
800	739	555	444	370	317	277	246	222	202	185	171
700	845	634	507	423	362	317	282	254	230	211	195
600	986	739	592	493	423	370	329	296	269	246	228
500	1183	887	710	592	507	444	394	355	323	296	273
400	1479	1109	887	739	634	555	493	444	403	370	341
300	1972	1479	1183	986	845	739	657	592	538	493	455
200	2958	2218	1775	1479	1268	1109	986	887	807	739	683

# BLOOD PRODUCT ADMINISTRATION

**Approved Practice Level:** Paramedic

**Last Review Date:** 5/2023

**Clinical Indications:**

- For patients with hemodynamic impairment and shock most likely related to hemorrhage.

**Contraindications:**

- Personal or religious objection to receiving blood products.
- Pediatric patient under the age of 3. (Relative, contact OLMC)

**Clinical Considerations or Precautions:**

- Blood and blood products should always be warmed during administration.
- Blood is only compatible with normal saline and should not be mixed with LR or other similar IV fluids.
- Patients needing blood should also most likely receive TXA and calcium gluconate.
- Patients receiving blood must have vital sign monitoring including temperature.

**Procedure:**

1. Review the blood product administration protocol to ensure the patient meets eligibility criteria for administration.
2. Prepare the patient
  - a. Obtain adequate IV or IO access. Blood is not compatible with anything other than normal saline, as such the blood must have its own dedicated IV or IO access.
  - b. If not already done, consider administration of tranexamic acid (TXA) per protocol. Do not delay blood administration.
3. Prepare administration set
  - a. Use only a blood administration Y-set for blood product administration.
  - b. Using normal saline ONLY, prime the Y-set with saline including the second arm of the Y that will eventually connect to the blood unit bag.
4. Prepare the blood warmer
  - a. Connect the warmer tubing from the Compact Disposable Unit (CDU) onto the end of the Y-set and prime this tubing with normal saline as well.
  - b. Connect the CDU to the power supply but do not turn on yet.
5. Check the blood unit and prepare for administration
  - a. ONLY when you are immediately ready to give blood do you proceed with this step.
  - b. Open the blood thermal insulated container (TIC) and remove the blood unit.
  - c. Check and make sure you have on hand type O whole blood. The unit most likely will be Rh+ so the unit will be low titer type O whole blood (LTOWB).
  - d. Ensure the blood is in date and that the temperature indicator on the blood indicates appropriate temperature storage (see example below). Do not

- administer the unit if the temperature safety indicator shows unacceptable storage. Cross check this blood unit and information with your partner.
- e. Very gently agitate the blood unit for a moment rocking it back and forth 3 to 4 times.
  - f. Spike the blood unit using the second, primed Y-set administration port.
6. Administer the blood unit.
    - a. Power up the blood warmer unit and start administration of the blood by closing the roller clamp to the saline and opening fully the roller clamp to the blood.
    - b. Unless otherwise specified by a transferring physician or OLMC, blood administration will be IV/IO bolus. In most cases patients receiving EMS blood will be in extremis and pressure infusion is acceptable.
    - c. Once the blood unit has completely infused, shut off the blood roller clamp and open the normal saline. Flush the IV line until no blood remains in the line.
  7. Monitor for any reactions to the blood administration.
    - a. EMS will generally not encounter the minor to moderate reactions to blood product administration. Those are described in detail below; the EMS provider should be alert for a major transfusion reaction
      - i. Major transfusion reactions may look similar to anaphylaxis.
      - ii. Patients may have respiratory distress, tachycardia, hypotension, fever and unexplained back or abdominal pain.
      - iii. In many cases this may be masked by the patient's already altered physiology due to shock related to the primary problem (trauma, etc.).
    - b. Minor blood product reactions
      - i. Patients may have reactions to minor antibodies in blood.
      - ii. These reactions can cause fever, mild joint pain and inflammation and certain lab abnormalities.
    - c. TRALI - Transfusion associated lung injury.
      - i. Again, EMS will seldom see this. TRALI is lung injury from an inflammatory response in the lungs caused by blood administration.
      - ii. Symptoms are similar to ARDS with respiratory distress, hypoxia and infiltrates. TRALI is more common with transfusion of plasma.
    - d. TACO – Transfusion associated circulatory overload.
      - i. Similar to an acute episode of congestive heart failure, may be delayed a few hours post transfusion.
      - ii. Respiratory distress, hypertension, rales, JVD and S3 heart sound, usually no fever.
  8. Complete necessary forms and paperwork
    - a. Complete all parts of the prehospital blood product transfusion record.
      - i. This should include agency ID, whether transfusion was completed and any suspected transfusion reactions.
      - ii. Patient name, product unit number and sticker, type and start time.
    - b. Prior to leaving the hospital
      - i. Leave product bag and tubing with receiving facility (do not dispose).
      - ii. Get signatures on blood forms from facility representative.

## END BLOOD PRODUCT ADMINISTRATION

## DESTINATION MATRIX - 2024

	ADULT MEDICAL	STEMI/ROSC	STROKE LEVEL	TRAUMA LEVEL	PEDS MEDICAL	PEDS TRAUMA	NICU LEVEL	CATEGORY II	BURN CENTER
BSW Lakeway	X	X	PRIMARY	LEVEL 4			LEVEL I		
BSW Llano	X								
BSW Marble Falls	X		PRIMARY	LEVEL 4			LEVEL I		
BSW McLane Children's					X	LEVEL 2	LEVEL IV		
BSW Pflugerville	X								
BSW Round Rock	X	X	PRIMARY	LEVEL 4			LEVEL I		
BSW Taylor	X			LEVEL 4					
BSW Temple	X	X	COMP	LEVEL 1					
CPRMC	X	X	PRIMARY	LEVEL 4			LEVEL II		
CPRMC Freestanding ER	X							X	
Dell Children's					X	LEVEL 1	LEVEL IV		
Dell Children's North					X				
Dell Seton Medical Center	X	X	COMP	LEVEL 1					X
Seton Highland Lakes	X								
Seton Main	X	X	COMP	LEVEL 4			LEVEL III		
Seton Northwest	X			LEVEL 4			LEVEL II		
Seton Southwest	X			LEVEL 4					
Seton Williamson	X	X	PRIMARY PLUS	LEVEL 2			LEVEL II		
St. David's Austin (main)	X	X	COMP	LEVEL 4			LEVEL IV		
St. David's Children's					X				
St. David's Freestanding, Leander	X							X	
St. David's Georgetown	X		PRIMARY	LEVEL 4			LEVEL I		
St. David's Heart Hospital	X	X		LEVEL 4					
St. David's NAMC	X	X	PRIMARY	LEVEL 4			LEVEL III		
St. David's RPMC	X	X	PRIMARY PLUS	LEVEL 2			LEVEL II		
St. David's SAMC	X	X	PRIMARY	LEVEL 2			LEVEL II		
Texas Children's					X				

Trauma designated levels: Level 1 - highest level of care; Level 4 - lowest level of care

NICU designated levels: Level I - lowest level of care; Level IV - highest level of care

Stroke designated levels (lowest to highest): Primary --> Primary Plus --> Comprehensive

# TEXAS NICU DESIGNATIONS

<p><b>LEVEL I</b> Well Newborn Nursery (Lowest level of care)</p>	<p><b>LEVEL II</b> Level I Capabilities Plus</p>	<p><b>LEVEL III</b> Level II Capabilities Plus</p>	<p><b>LEVEL IV</b> Level III Capabilities Plus (Highest level of care)</p>
<p>Evaluate &amp; provide postnatal care to stable term newborns.</p> <p>Stabilize &amp; provide care for infants born 35-37 wk gestation who remain physiologically stable</p> <p>Stabilize newborn infants who are ill &amp; those born &lt;35 wk gestation until transfer</p>	<p>Care for infants born <math>\geq 32</math> wk gestation &amp; weigh <math>\geq 1500</math> g who have physiologic immaturity or are moderately ill</p> <p>Provide care for infants convalescing after intensive care</p> <p>Provide mechanical ventilation for &lt;24 hrs, CPAP, or both</p> <p>Stabilize infants born &lt;32 wk gestation &amp; weigh &lt;1500 g until transferred</p>	<p>Provide sustained life support</p> <p>Provide comprehensive care for infants born &lt;32 wk gestation &amp; weigh &lt;1500 g AND infants born at all gestational ages/weights w/critical illness</p> <p>Provide full range of respiratory support - may include conventional &amp;/or high-frequency ventilation &amp; inhaled nitrous oxide</p> <p>Perform advanced imaging w/interpretation on an urgent basis, including CT, MRI, &amp; echocardiography</p>	<p>Provide surgical repair of complex congenital or acquired conditions</p> <p>Maintain full range of peds medical subspecialists, peds surgical subspecialists, &amp; peds anesthesiologists on site</p> <p>Facilitate transport of critically ill infants</p> <p>Provide outreach education</p>

# WilCo EMS MICU Equipment List

*Note: If the "Restock" section is blank, it is assumed to be a 1 for 1 restock from the shelf/bin stock.*

## Bins

Item	Unit	Stock	Restock
<b>CARDIAC MONITOR BIN 1</b>			
Pediatric EtCO2 Cannula	ea.	3	0
Disposable Pedi SpO2 Sensor	ea.	3	0

<b>CARDIAC MONITOR BIN 2</b>			
Adult EtCO2 Cannula	ea.	15	1

<b>CARDIAC MONITOR BIN 3</b>			
Adult Electrodes (10 pack)	ea.	20	2
Razors	ea.	2	0
ECG Paper	ea.	2	0
Tincture of Benzoin	ea.	4	0

<b>CARDIAC MONITOR BIN 4</b>			
Adult Multi-Function Pads	ea.	2	0
Pediatric Multi-Function Pads	ea.	1	0

<b>MEDICATION BIN 1</b>			
Albuterol	ea.	10	2
Aspirin	Bottle	1	0
Dexamethasone	ea.	2	0
Ipratropium Bromide	ea.	3	0
Ketorolac	ea.	3	0
Nitroglycerine Paste	ea.	1	0
Nitroglycerine Tablets	Bottle	1	0
Zofran ODT	ea.	8	1
Zofran Vial	ea.	8	1

<b>MEDICATION BIN 2</b>			
Adenosine	ea.	2	0
Amiodarone	ea.	3	0
Calcium Gluconate	ea.	2	0
Diphenhydramine Vial	ea.	2	0
Droperidol	ea.	3	0
Epinephrine 1:1,000	ea.	3	1
Labetalol	ea.	1	0
Magnesium Sulfate	ea.	2	0
Norepinephrine	ea.	1	0

<b>MEDICATION BIN 3</b>			
Epinephrine 1:10,000	ea.	6	0
Sodium Bicarbonate	ea.	2	0

<b>MEDICATION BIN 4</b>			
Glucometer Test Strips	pkg.	1	0
Dextrose 10%	ea.	2	0
Glucose Gel	ea.	2	0
100mL Normal Saline	ea.	2	0
IV Tylenol 100mL	ea.	1	0
Afrin Spray	ea.	1	0

<b>MEDICATION BIN 5 *Not Sealed*</b>			
Liquid Tylenol	ea.	1	0
Tylenol Bottle	bottle	1	0
Liquid Benadryl	ea.	1	0
Benadryl Bottle	bottle	1	0

<b>MEDICATION BIN 6 *Not Sealed*</b>			
Nitroglycerin IV 25mg/250ml	ea.	1	0
Duo-Dotes	ea.	2	0

<b>AIRWAY BIN 1 *Not Sealed*</b>			
Adult BVM	ea.	2	0
B/V Filter	ea.	2	0

<b>AIRWAY BIN 2</b>			
14F NPA	ea.	1	0
16F NPA	ea.	1	0
18F NPA	ea.	1	0
20F NPA	ea.	1	0
22F NPA	ea.	1	0
24F NPA	ea.	1	0
26F NPA	ea.	1	0
28F NPA	ea.	1	0
30F NPA	ea.	1	0
32F NPA	ea.	1	0
36F NPA	ea.	1	0
50mm OPA	ea.	1	0
60mm OPA	ea.	1	0
70mm OPA	ea.	1	0
80mm OPA	ea.	1	0
90mm OPA	ea.	1	0
100mm OPA	ea.	1	0
Lubricating Jelly	ea.	3	0

<b>AIRWAY BIN 3</b>			
Adult Intubation kit (See appendix)	ea.	1	0
UE Scope Channeled Blade	ea.	1	0
UE Scope Non-Channeled Blade	ea.	1	0
Adult Intubated EtCO2	ea.	2	0
ET Tube 6.0	ea.	1	0
ET Tube 7.0	ea.	1	0
Elbow Connector	ea.	1	0
BiPap Elbows	ea.	2	0

<b>AIRWAY BIN 4</b>			
Adult Non-Rebreather	ea.	5	1

<b>AIRWAY BIN 5</b>			
Adult Nebulizer Mask	ea.	3	0
In-line Nebulizer	ea.	1	0

<b>AIRWAY BIN 6</b>			
Adult Nasal Cannula	ea.	5	1

<b>AIRWAY BIN 7</b>			
Pediatric Nebulizer	ea.	2	0
Pediatric Non-Rebreather	ea.	2	0
Pediatric Nasal Cannula	ea.	2	0

<b>AIRWAY BIN 8</b>			
10F NG Tube	ea.	1	0
12F NG Tube	ea.	1	0
18F NG Tube	ea.	1	0
6F ET Suction Catheter	ea.	1	0
8F ET Suction Catheter	ea.	1	0
10F ET Suction Catheter	ea.	1	0
12F ET Suction Catheter	ea.	1	0
14F ET Suction Catheter	ea.	1	0
16F ET Suction Catheter	ea.	1	0
18F ET Suction Catheter	ea.	1	0

<b>AIRWAY BIN 9</b>			
Suction Tubing	ea.	2	0
Suction Tip	ea.	2	0
Suction Canister	ea.	2	0
Suction Canister Lid	ea.	2	0

<b>IV BIN 1</b>			
Lactated Ringers 1000mL	ea.	5	1

<b>IV BIN 2</b>			
IV Drip Set, 15gtt	ea.	10	2

IV BIN 3			
Normal Saline 1000mL	ea.	2	0

IV BIN 4			
Pen Light	ea.	1	0
Mucosal Atomizer Device	ea.	2	0
1" Clear Tape	ea.	1	0
2" Coban	ea.	1	0
Emesis Bags	ea.	8	2
Blunt Tip Needles	ea.	15	2
Sharp Shuttle	ea.	2	0
25g Needle	ea.	2	0
21g Needle	ea.	8	1
20cc Syringe	ea.	2	0
10cc Syringe	ea.	5	2
3cc Syringe	ea.	15	2
1cc Syringe	ea.	5	0

IV BIN 5			
IV arm board	ea.	1	0
60cc Syringe (cath tip)	ea.	1	0
IV Pump Full Set	ea.	2	0
Ring Cutter	ea.	1	0
Oxygen Wrench	ea.	1	0
Nasal Clamps	ea.	2	0

IV BIN 6			
Band-Aids	ea.	10	0
Non-sterile 4x4s	ea.	15	0
Veniguard	ea.	15	2
Providine Prep	ea.	5	1
Alcohol Prep	ea.	40	5
Saline Locks	ea.	15	2
Saline Flushes	ea.	20	2
Tourniquet, IV	ea.	15	2
Lancets	ea.	15	2
14g IV Catheter	ea.	2	0
16g IV Catheter	ea.	2	0
24g IV Catheter	ea.	3	0
22g IV Catheter	ea.	5	2
20g IV Catheter	ea.	10	2
18g IV Catheter	ea.	10	2

TRAUMA BIN 1 *Not sealed*			
Pelvic Binder	ea.	1	0
Burn Sheet	ea.	1	0
KTD	ea.	1	0

TRAUMA BIN 2			
Disposable Warming Device	ea.	1	0
Filtered Y-set	ea.	1	0
Calcium Gluconate	ea.	2	0
Normal Saline	ea.	1	0
Blood Administration Protocol	ea.	1	0

TRAUMA BIN 3			
Commercial Arm Restraints	set	1	0
Commercial Leg Restraints	set	1	0
Soft Restraints	set	1	0

TRAUMA BIN 4			
Sterile Water	ea.	3	0
Cold Packs	ea.	4	0

TRAUMA BIN 5			
Multi-Trauma Pad	ea.	1	0
Kerlix	ea.	10	0

TRAUMA BIN 6			
Triangular Bandages	ea.	5	0
Trauma Shears	ea.	2	0
SAM Splints	ea.	2	0

TRAUMA BIN 7			
Tefla Bandage	ea.	5	0
Non-sterile 4x4s	pkg.	1	0

OB BIN 1S *Not sealed*			
OB Kit	ea.	2	0
Warming Blanket	ea.	1	0

PPE BIN 1S *Not sealed*			
Surgical Masks (10 pack)	ea.	2	0
N95/KN95 Masks	ea.	4	2
Safety Glasses	ea.	2	0
Hand Sanitizer	ea.	1	0
Bio Bags	ea.	4	1

IO BIN 1			
IO Dressing	ea.	2	0
Bariatric IO Needle (Yellow)	ea.	2	0
Adult IO Needle (Blue)	ea.	2	0
Pressure Infuser	ea.	1	0
Lidocaine PFS	ea.	2	0

<b>BANDS &amp; LABELS BIN</b>			
State Wristbands	ea.	160	2
Rocuronium Med Labels	Roll	1	
Ketamine Med Labels	Roll	1	
Generic/Blank Med Labels	Roll	1	

<b>Equipment Bags</b>			
<b>PAX Jump Bag (Red) See below for Stat Pack List</b>			
<b>Item</b>	<b>Unit</b>	<b>Stock</b>	<b>Restock</b>
<b>Front Zipper Pocket</b>			
Adult C-Collars	ea.	1	
Pediatric C-Collars	ea.	1	
<b>Top Outside Pocket</b>			
Adult Blood Pressure Cuff	ea.	1	
Stethoscope	ea.	1	
Emesis Bags	ea.	1	
Glucometer Kit:	ea.	1	
Glucometer	ea.	1	
Glucometer Test Strips	ea.	6	
Alcohol Preps	ea.	6	
Non-sterile 4x4s	ea.	3	
Lancets	ea.	3	
Band-aids	ea.	3	
Oral Glucose	ea.	2	
<b>Left Outside Pocket - Zipper Flap</b>			
Pen Light	ea.	1	
Nose Clamp	ea.	1	
<b>Left Outside Pocket - Left Pocket</b>			
Trauma Dressing	ea.	1	
<b>Left Outside Pocket - Middle Pocket</b>			
Trauma Shears	ea.	1	
Gauze Pads	ea.	20	
Tefla Pads	ea.	2	
Roller Gauze	ea.	2	
<b>Left Outside Pocket - Right Pocket</b>			
CAT Tourniquets	ea.	2	
Flushes for irrigation	ea.	2	
1" Clear Tape	ea.	1	
<b>Right Outside Pocket - Top Pocket</b>			
Triangular Bandages	ea.	4	
Roller Gauze	ea.	2	
<b>Right Outside Pocket - Bottom Pocket</b>			
3 Hole Punch Kit	ea.	1	
Finger Thorocotomy Kit	ea.	1	
Trauma Shears	ea.	1	
Safety Glasses	ea.	1	
SAM Split	ea.	1	
<b>Med Kit - Outer Pocket</b>			
ICD Magnet	ea.	1	

<b>Med/IV Kit - Top Flap</b>		
Atropine	ea.	1
Albuterol	ea.	2
Atrovent	ea.	1
Adenosine	ea.	4
Amiodarone	ea.	3
Calcium Gluconate	ea.	2
Dexamethasone	ea.	1
Benadryl	ea.	1
Droperidol	ea.	3
Epi 1:1,000	ea.	3
Labetalol	ea.	1
Magnesium Sulfate	ea.	4
Narcan (Not in boxes)	ea.	2
Narcan Syringe	ea.	2
Nitro Paste & Ruler paper	ea.	1
Nitro Tabs	ea.	1
Oxytocin	ea.	2
Toradol	ea.	1
TXA	ea.	2
Zofran	ea.	2
ODT Zofran	ea.	2
<b>Med/IV Kit - Bottom Flap</b>		
Tylenol Bottle	ea.	1
Aspirin Bottle	ea.	1
Afrin Bottle	ea.	1
Sharps Shuttle	ea.	1
IV Roll (with 18g & 20g IVs)	ea.	2
Sodium Bicarb PFS	ea.	2
Lidocaine PFS	ea.	2
Medication Label Pouch (Ketamine, Roc, blank)	ea.	5
<b>Med/IV Kit - Center Flap</b>		
16g IV	ea.	1
22g IV	ea.	2
24g IV	ea.	1
Flushes	ea.	4
<b>Syringe Flap - Top Pocket</b>		
MAD Atomizer	ea.	1
1in Clear Tape	ea.	1
Band-Aids	ea.	5
Alcohol Preps	ea.	5
4x4s	ea.	5
Providine Preps	ea.	2

Syringe Flap - Bottom Pocket - Left			
10cc Syringe	ea.		2
20cc Syringe	ea.		1
Syringe Flap - Bottom Pocket - Middle			
1cc Syringes	ea.		4
3cc Syringes	ea.		4
Syringe Flap - Bottom Pocket - Right			
Blunt Tip Needles	ea.		5
21g IM Needles	ea.		2
25g IM Needles	ea.		2
EZ IO Kit			
EZ IO Drill	ea.		1
Pediatric IO Needle	ea.		1
Adult IO Needle	ea.		2
Bariatric IO Needle	ea.		2
Providine Prep	ea.		2
Securing Devices	ea.		2
Lidocaine	ea.		1
Epi 1:10,000	ea.		3
Saline Flushes	ea.		2
Pressure Infuser	ea.		1
1L Lactated Ringers	ea.		1
15gtts Drip Set	ea.		1
IV Pump Kit			
IV Pump	ea.		1
100mL NS Bag	ea.		1
IV Tylenol	ea.		1
Push Dose Epi Kit	ea.		1
Levo Infusion Kit (3cc & Blunt)	ea.		1
Full Pump Set	ea.		1
Interior Side Wall Pocket			
Emesis Bag	ea.		1
Biohazard Bag	ea.		1
D10	ea.		1
15gtts Drip Set	ea.		1

PAX Airway Bag (Blue Bag) See below for Stat Pack List			
Item	Unit	Stock	Restock
Front Zipper Pocket			
Adult C-Collars	ea.		1
Pediatric C-Collars	ea.		1
Top Outside Pocket			
Large Adult Blood Pressure Cuff	ea.		1
Stethoscope	ea.		1
Emesis Bags	ea.		1
Left Outside Pocket - Left Pocket			
In-Line Neb	ea.		1
Left Outside Pocket - Middle Pocket			
Adult Nasal Cannula	ea.		1
Adult Non-Rebreather	ea.		1

<b>Left Outside Pocket - Right Pocket</b>		
Adult Nebulizer	ea.	1
<b>Left Outside Pocket - Flap</b>		
BiPap Elbow	ea.	1
<b>Right Outside Pocket - Top Pocket</b>		
Safety Glasses	ea.	2
Surgical Masks	ea.	2
N95 Masks	ea.	2
<b>Right Outside Pocket - Bottom Pocket</b>		
Size 3 i-Gel	ea.	1
Size 4 i-Gel	ea.	1
Size 5 i-Gel	ea.	1
<b>Center Inside</b>		
D-Tank with Regulator	ea.	1
Adult BVM	ea.	1
Lubricating Jelly	ea.	2
NPA 26FR	ea.	1
NPA 28FR	ea.	1
NPA 30FR	ea.	1
NPA 32FR	ea.	1
NPA 36FR	ea.	1
OPA 70	ea.	1
OPA 80	ea.	1
OPA 90	ea.	1
OPA 100	ea.	1
*All OPAs and NPAs in BVM bag*		
Medium CPAP Kit	ea.	1
<b>Interior Side Wall Pocket</b>		
Large Biohazard Bag	ea.	1
Emesis Bag	ea.	1
<b>Advanced Airway Kit - Outside Pocket</b>		
Surgical Mask	ea.	1
N95 Mask	ea.	1
<b>Advanced Airway Kit - Left Inside Flap</b>		
UE Scope in case	ea.	1
DSI Kit	ea.	1
UE Channeled Blade	ea.	1
UE Non-Channeled Blade	ea.	1
Safety Glasses	ea.	1
<b>Advanced Airway Kit - Right Inside Flap</b>		
6.0 ET Tube	ea.	1
7.0 ET Tube	ea.	1
McGill Forceps	ea.	1
Cric Kit	ea.	1

Pediatric Airway Bag			
Item	Unit	Stock	Restock
Bulb Syringe	ea.	1	
Infant BVM	ea.	1	
Pedi BVM Mask	ea.	1	
Neonate BVM Mask (Mask attachment only)	ea.	1	
Pediatric Intubated EtCO2	ea.	1	
Pediatric Non-Intubated EtCO2	ea.	1	
Single Needle Cric Kit (See appendix)	ea.	1	
Size 1 iGel	ea.	1	
Size 1.5 iGel	ea.	1	
Size 2 iGel	ea.	1	
Size 2.5 iGel	ea.	1	
Laryngoscope Handle/Blade, Disp. (Miller 1)	ea.	1	
Lubricating Jelly	ea.	5	
Pediatric Magill Forceps	ea.	1	
Pediatric Nasal Cannula	ea.	1	
Pediatric Nebulizer Mask	ea.	1	
Pediatric Non-Rebreather	ea.	1	
10FR NG Tube	ea.	1	
14F NPA	ea.	1	
16F NPA	ea.	1	
18F NPA	ea.	1	
20F NPA	ea.	1	
22F NPA	ea.	1	
24F NPA	ea.	1	
26F NPA	ea.	1	
28F NPA	ea.	1	
30F NPA	ea.	1	
50mm OPA	ea.	1	
60mm OPA	ea.	3	
70mm OPA	ea.	1	
80mm OPA	ea.	2	
6F ET Suction Catheter	ea.	1	
8F ET Suction Catheter	ea.	1	
10F ET Suction Catheter	ea.	1	
C-Collar - Pediatric	ea.	1	
Stethoscope	ea.	1	
Manual BP - Pediatric	ea.	1	

RTF Bags x 2 (stock reflected is per bag)			
Item	Unit	Stock	Restock
CAT Tourniquet	ea.	1	
Pressure bandage	ea.	1	
Kerlix	ea.	3	
Triangular Bandage	ea.	2	
Trauma Shears	ea.	1	
Tape 1"	ea.	1	
14g IV Catheter (5.25")	ea.	1	
Chest Seal (2pk or 1pk)	ea.	2 individual seals	
Non-sterile 4x4	pkg.	1	
Triage Tag Streamer Ribbon	set	1	
Quick Clot	ea.	1	
State Wristbands	ea.	10	

Equipment			
Cardiac Monitor			
Item	Unit	Stock	Restock
Lifepak 15 ECG/Monitor	ea.	1	
Monitor Battery	ea.	2	
Therapy Cable	ea.	1	
4-Lead Limb Leads	ea.	1	
Precordial Leads	ea.	1	
SpO2 Trunk Cable	ea.	1	
SpO2 Sensor-Nondisp Adult	ea.	1	
NIBP Pneumatic Hose	ea.	1	
NIBP, Auto - Adult	ea.	1	
NIBP, Auto - Large Adult	ea.	1	
NIBP, Auto - Adult Small/Pediatric	ea.	1	
NIBP, Auto - Infant	ea.	1	
NIBP, Auto - Child	ea.	1	
SpO2 Sensor - Disposable Pedi	ea.	1	
Tincture of Benzoin	ea.	4	
ECG Paper	ea.	2	
Electrodes - Adult (10 pack)	ea.	2	
Multi-Function Pads Pediatric	ea.	1	
Multi-Function Pads Adult	ea.	2	
Emesis Bag	ea.	1	
EtCO2 - Adult Cannula	ea.	1	
EtCO2 - Adult Intubated	ea.	1	
EtCO2 - Pediatric Cannula	ea.	1	
Razors	ea.	2	
Modem	ea.	1	

Portable Suction Unit			
Item	Unit	Stock	Restock
Portable Suction Unit	ea.	1	
Suction Tubing	ea.	1	
Suction Tip	ea.	1	
Suction Canister	ea.	1	
Suction Canister Lid	ea.	1	
60cc Syringe	ea.	1	
ET Suction Caths 12F	ea.	1	
ET Suction Caths 14F	ea.	1	
NG Tube 12F	ea.	1	
NG Tube 18F	ea.	1	

Ventilator			
Item	Unit	Stock	Restock
Portable Vent & Circuit pre-attached	ea.	1	
Portable Vent O2 supply line	ea.	1	
Portable Vent Test Lung	ea.	1	

Stretcher			
Item	Unit	Stock	Restock
Stretcher	ea.	1	
Stretcher Straps, Chest/Shoulder	ea.	2	
Stretcher Straps, Waist	ea.	3	
D Tank Oxygen Cylinder	ea.	1	
Oxygen Regulator, Small	ea.	1	
Technimount Monitor Pole	ea.	1	
Technimount Monitor Mount Base	ea.	1	
Slide Board	ea.	1	
Adult Non-Rebreather	ea.	1	
Adult Nasal Cannula	ea.	1	
Adult Nebulizer	ea.	1	

Thermometer			
Item	Unit	Stock	Restock
Thermometer	ea.	1	
Thermometer Probes	ea.	2	1
Medication Labels (On wall near thermometer)			
Rocuronium Med Labels	ea.	5	
Ketamine Med Labels	ea.	5	
Generic/Blank Med Labels	ea.	5	

Oxygen Regulators			
Item	Unit	Stock	Restock
Oxygen Regulator, Wall Mount	ea.	2	1
Oxygen Regulator, Vent Outlet Connector	ea.	1	

## Interior Cabinets

### Front/ALS Cabinet

Item	Unit	Stock	Restock
<b>Top Shelf:</b>			
Cardiac Monitor Bins 1-4			
Accessories Bin:			
Spare Lifepak 15 Battery	ea.	1	
ECG/Monitor Test Load	ea.	1	
SpCO probe - Adult	ea.	1	
SpCO probe - Pedi	ea.	1	
UE Scope Charger	ea.	1	
IV Pump Charger	ea.	1	
Glucometer Control Solution	ea.	1	
Stryker Stretcher Battery Charger	ea.	1	
Stryker Stretcher Spare Battery	ea.	1	
<b>Middle Shelf:</b>			
Pediatric Bag (See Appendix)	ea.	1	
Pediatric ACR	ea.	1	
Portable Suction Unit (See Appendix)	ea.	1	
IV Pump Clip	ea.	1	
<b>Bottom Shelf:</b>			
Airway Bag (See Appendix)	ea.	1	
Jump Bag (See Appendix)	ea.	1	
Portable IV Pole	ea.	1	

### Spare Vent/CPAP Supplies

Item	Unit	Stock	Restock
CPAP, Adult, Medium	ea.	2	
CPAP, Adult, Large	ea.	1	
Vent Circuits	ea.	2	

### Bench Seat

Item	Unit	Stock	Restock
Stethoscope (hanging at head of bench seat)	ea.	1	
M-3 - M-6 Medication Bins			
Pet Oxygen Mask Kit	ea.	1	
Pillow	ea.	2	1
Pillow Case	ea.	2	1
BP Cuff Bin:			
Manual BP - Infant	ea.	1	
Manual BP - Pediatric	ea.	1	
Manual BP - Adult	ea.	2	1
Manual BP - Large Adult	ea.	1	
Suicide Kit *As available*	kit	1	0
Give away narcan bin *As available*	ea.	1	0
Trash Can	ea.	1	
Trash Bag, Small	roll	1	

CPR Seat			
Item	Unit	Stock	Restock
Urinal	ea.	1	
Bed Pan	ea.	1	
Hyperthermia Kit	ea.	1	
Isolation Gowns	ea.	4	

Refrigerator			
Item	Unit	Stock	Restock
Diltiazem	ea.	2	
Rocuronium	ea.	2	

Narcotic Cabinet			
Item	Unit	Stock	Restock
Large Narcotic Safe			
Fentanyl	ea.	8	1
Midazolam	ea.	3	1
Ketamine	ea.	2	1
Small Narcotic Safe			
Fentanyl	ea.	2	1
Midazolam	ea.	2	1
Ketamine	ea.	2	1
Narcotic Log Binder	ea.	1	

Provider License			
Item	Unit	Stock	Restock
Active License visble on wall	ea.	1	

Over Door Glove Holders			
Item	Unit	Stock	Restock
Gloves, X-Small	Box	PRN	PRN
Gloves, Small	Box	2	
Gloves, Medium	Box	2	
Gloves, Large	Box	2	
Gloves, X-Large	Box	PRN	PRN
Gloves, XX-Large	Box	PRN	PRN

Exterior Compartments			
Oxygen Compartment - Compartment #1			
Item	Unit	Stock	Restock
Stair Chair	ea.	1	
Stair Chair Straps	ea.	3	
Oxygen Cylinder - K	ea.	1	
Oxygen Regulator, Large	ea.	1	
Oxygen Wrench, Large	ea.	1	
Broom	ea.	1	

Vest Compartment - Compartment #2			
Item	Unit	Stock	Restock
Ballistic Vests	ea.	2	
RTF Bags (See appendix)	ea.	2	
Traffic Triangles	ea.	3	
Fire Extinguisher	ea.	1	

Linen Compartment - Compartment #3			
Item	Unit	Stock	Restock
<b>Top Shelf:</b>			
Sheets, Fitted (Package of 5)	pkg.	4	1
Blankets	ea.	6	2
<b>Middle Shelf:</b>			
Cleaning Supplies Bin:			
Disinfecting Wipes	ea.	1	
Disinfectant Spray (Lysol)	ea.	1	
Disinfectant Foam (Lysol)	ea.	1	
Mega-Movers	ea.	3	
Blankets, Wind/Water Resistant (Yellow Sheets)	ea.	3	
<b>Bottom Shelf:</b>			
D Tank - Oxygen Cylinder	ea.	3	1
Oxygen Regulator, Small	ea.	1	
Crew Gear Bags	ea.	2	

Backboard Compartment - Compartment #4			
Item	Unit	Stock	Restock
Scoop Stretcher	ea.	1	
Spine Board, Long	ea.	2	1
Spine Board, Long, Restraint	ea.	1	
Backboard Straps	ea.	6	
Head Immobilizer	ea.	2	

C-Collar Compartment - Compartment #5			
Item	Unit	Stock	Restock
Spare Adult C-Collars	ea.	3	
Spare Pediatric C-Collars	ea.	3	
Spare Backboard Straps	ea.	3	

Front Cab			
Item	Unit	Stock	Restock
Binder, Rehab & Resource forms	ea.	1	
HIPAA Notification	ea.	1	
Insurance Card	ea.	1	
Safety Vest	ea.	2	
Gloves, X-Small	Box	PRN	PRN
Gloves, Small	Box	1	
Gloves, Medium	Box	1	
Gloves, Large	Box	1	
Gloves, X-Large	Box	1	
Gloves, XX-Large	Box	PRN	PRN
ERG Book/App	ea.	1	
Hand Sanitizer, Liquid	ea.	1	
Hand Sanitizer, Towelette	ea.	2	
Binoculars	ea.	1	
Cell Phone & Charger	ea.	1	
Flashlight/Maglight	ea.	2	

## Equipment List Appendix

### 3 Hole Punch Kit

Item	Unit	Stock
14g IV Catheter (5.25")	ea.	3
Providine Prep	ea.	3
20cc Syringe	ea.	1

### Adult Intubation Kit

Item	Unit	Stock
Adult Tube Tamer	ea.	1
Adult Intubated EtCO2	ea.	1
ET Tube 8.0	ea.	1
Lubricating Jelly	ea.	3
10cc Syringe	ea.	1
ET Tube Adapter Elbow	ea.	1
Bougie, Adult	ea.	1
NC, Adult	ea.	1

### Pediatric DSI Kit

Item	Unit	Stock
Pediatric Nasal Cannula	ea.	1
Pediatric Intubated EtCO2	ea.	1
i-Gel Strap	ea.	1
Pediatric DSI Checklist	ea.	1

### Finger Thoracostomy Kit

Item	Unit	Stock
Scalpel	ea.	1
Curved Forceps	ea.	1
Providine Prep	ea.	2

<b>Cricothyrotomy Kit</b>		
<b>Item</b>	<b>Unit</b>	<b>Stock</b>
ET Tube 6.0 (modified)	ea.	1
Bougie, Adult	ea.	1
Adult Tube Tamer (modified)	ea.	1
Non-sterile 4x4	ea.	6-8
Lubricating Jelly	ea.	1
Betadine	Bottle	1
20cc Syringe	ea.	1
Scalpel	ea.	1

<b>Single Needle Cric Kit</b>		
<b>Item</b>	<b>Unit</b>	<b>Stock</b>
14g IV Catheter	ea.	1
3.0 ET Tube Adapter	ea.	1
1" Tape	ea.	1

<b>Epi Push Dose Kit</b>		
<b>Item</b>	<b>Unit</b>	<b>Stock</b>
Epinephrine 1:10,000 PFS	ea.	1
Saline Flush	ea.	1
21g Needle	ea.	1

<b>Hyperthermia Kit</b>		
<b>Item</b>	<b>Unit</b>	<b>Stock</b>
Patient Bag	ea.	1
Thermometer	ea.	1

<b>Optional/Backorder Medications</b>		
<b>Item</b>	<b>Unit</b>	<b>Stock</b>
Hypertonic Saline	ea.	0
Metoclopramide	ea.	0
Haloperidol	ea.	0

## Stat Pack Bags (See above for PAX List)

### PAX Jump Bag (Red) See below for Stat Pack List

Item	Unit	Stock	Restock
<b>Front Zipper Pocket</b>			
Adult Blood Pressure Cuff	ea.	1	
Large Adult Blood Pressure Cuff	ea.	1	
Stethoscope	ea.	1	
Emesis Bag	ea.	1	
Biohazard Bag	ea.	1	
Sharps Shuttle	ea.	1	
Glucometer Kit:	ea.	1	
Glucometer	ea.	1	
Glucometer Test Strips	ea.	6	
Alcohol Preps	ea.	6	
Non-sterile 4x4s	ea.	3	
Lancets	ea.	3	
Band-aids	ea.	3	
Oral Glucose	ea.	2	
<b>Left Outside Pocket - Zipper Flap</b>			
1" Clear Tape	ea.	1	
2" Coband	ea.	1	
Trauma Shears	ea.	1	
Pen Light	ea.	1	
Flushes for irrigation	ea.	2	
Nose Clamp	ea.	1	
<b>Left Outside Pocket - Left Pocket</b>			
Roller Gauze	ea.	4	
4x4 Gauze	ea.	20	
Tefla Pads	ea.	2	
<b>Left Outside Pocket - Right Pocket</b>			
SAM Splint	ea.	1	
Triangular Bandages	ea.	4	
<b>Right Outside Pocket - Left Pocket</b>			
CAT Tourniquets	ea.	2	
<b>Right Outside Pocket - Right Pocket</b>			
Trauma Dressing	ea.	1	
<b>Right Outside Pocket - Zipper Flap</b>			
3 Hole Punch Kit	ea.	1	
Finger Thorocotomy Kit	ea.	1	
Trauma Shears	ea.	1	
Safety Glasses	ea.	1	
<b>Main Pouch - Bottom</b>			
Adult C-Collar (on bottom)	ea.	1	
Pediatric C-Collar (on bottom)	ea.	1	
<b>Med Kit - Outer Pocket</b>			
ICD Magnet	ea.	1	

<b>Med/IV Kit - Top Flap</b>			
Atropine	ea.		1
Albuterol	ea.		2
Atrovent	ea.		1
Adenosine	ea.		4
Amiodarone	ea.		3
Calcium Gluconate	ea.		2
Dexamethasone	ea.		1
Benadryl	ea.		1
Droperidol	ea.		3
Epi 1:1,000	ea.		3
Labetalol	ea.		1
Magnesium Sulfate	ea.		4
Narcan (Not in boxes)	ea.		2
Narcan Syringe	ea.		2
Nitro Paste & Ruler paper	ea.		1
Nitro Tabs	ea.		1
Oxytocin	ea.		2
Toradol	ea.		1
TXA	ea.		2
Zofran	ea.		2
ODT Zofran	ea.		2
<b>Med/IV Kit - Bottom Flap</b>			
Tylenol Bottle	ea.		1
Aspirin Bottle	ea.		1
Afrin Bottle	ea.		1
Sharps Shuttle	ea.		1
IV Roll (with 18g & 20g IVs)	ea.		2
Sodium Bicarb PFS	ea.		2
Lidocaine PFS	ea.		2
Medication Label Pouch (Ketamine, Roc, blank)	ea.		5
<b>Med/IV Kit - Center Flap</b>			
16g IV	ea.		1
22g IV	ea.		2
24g IV	ea.		1
Flushes	ea.		4
<b>Syringe Flap - Top Pocket</b>			
MAD Atomizer	ea.		1
1in Clear Tape	ea.		1
Band-Aids	ea.		5
Alcohol Preps	ea.		5
4x4s	ea.		5
Providine Preps	ea.		2

Syringe Flap - Bottom Pocket - Left			
10cc Syringe	ea.		2
20cc Syringe	ea.		1
Syringe Flap - Bottom Pocket - Middle			
1cc Syringes	ea.		4
3cc Syringes	ea.		4
Syringe Flap - Bottom Pocket - Right			
Blunt Tip Needles	ea.		5
21g IM Needles	ea.		2
25g IM Needles	ea.		2
EZ IO Kit			
EZ IO Drill	ea.		1
Pediatric IO Needle	ea.		1
Adult IO Needle	ea.		2
Bariatric IO Needle	ea.		2
Providine Prep	ea.		2
Securing Devices	ea.		2
Lidocaine	ea.		1
Epi 1:10,000	ea.		3
Saline Flushes	ea.		2
Pressure Infuser	ea.		1
1L Lactated Ringers	ea.		1
15gtts Drip Set	ea.		1
IV Pump Kit			
IV Pump	ea.		1
100mL NS Bag	ea.		1
IV Tylenol	ea.		1
Push Dose Epi Kit	ea.		1
Levo Infusion Kit (3cc & Blunt)	ea.		1
Full Pump Set	ea.		1
Mesh Inside Pocket			
D10	ea.		1
15gtts Drip Set	ea.		1

Stat Pack Airway Bag (Blue Bag) See above for PAX List			
Item	Unit	Stock	Restock
Front Zipper Pocket			
Stethoscope	ea.		1
Left Outside Pocket - Left Pocket			
Adult Nasal Cannula	ea.		1
Left Outside Pocket - Right Pocket			
Adult Non-Rebreather	ea.		1
Left Outside Pocket - Zipper			
Adult Nebulizer	ea.		1
In-Line Neb	ea.		1
BiPap Elbow	ea.		1
Right Outside Pocket - Left Pocket			
Safety Glasses	ea.		2
Right Outside Pocket - Right Pocket			
Emesis Bag	ea.		1
Biohazard Bag	ea.		1

<b>Right Outside Pocket - Zipper</b>			
N95 Masks	ea.		2
Surgical Masks	ea.		2
<b>Center Inside Mesh</b>			
Size 3 i-Gel	ea.		1
Size 4 i-Gel	ea.		1
Size 5 i-Gel	ea.		1
*All OPAs and NPAs in ziplock bag*			
Lubricating Jelly	ea.		2
NPA 26FR	ea.		1
NPA 28FR	ea.		1
NPA 30FR	ea.		1
NPA 32FR	ea.		1
NPA 36FR	ea.		1
OPA 70	ea.		1
OPA 80	ea.		1
OPA 90	ea.		1
OPA 100	ea.		1
<b>Center Inside</b>			
D-Tank with Regulator	ea.		1
Adult BVM	ea.		1
BV Filter	ea.		1
Medium CPAP Kit	ea.		1
<b>Main Pouch - Bottom</b>			
Adult C-Collar (on bottom)	ea.		1
Pediatric C-Collar (on bottom)	ea.		1
<b>Advanced Airway Kit - Outside Pocket</b>			
Surgical Mask	ea.		1
N95 Mask	ea.		1
<b>Advanced Airway Kit - Left Inside Flap</b>			
UE Scope in case	ea.		1
DSI Kit	ea.		1
UE Channeled Blade	ea.		1
UE Non-Channeled Blade	ea.		1
Safety Glasses	ea.		1
<b>Advanced Airway Kit - Right Inside Flap</b>			
6.0 ET Tube	ea.		1
7.0 ET Tube	ea.		1
McGill Forceps	ea.		1
Cric Kit	ea.		1

**LAST PAGE**