ACADEMY OF MEDICINE OF CINCINNATI
2023 PROTOCOLS FOR SOUTHWEST OHIO
PREHOSPITAL CARE
CLINICAL PRACTICE GUIDELINES

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ACKNOWLEDGMENTS:

Thanks to Daniel Storer, MD, Mel Otten, MD, Don Locasto, MD, Hamilton Lempert, MD, and the previous authors of this operating protocol for providing the initial model.

Medical Director Approval: _____ **Date:** _____

Certificate of Acknowledgment of Notary Public

State of Ohio; County of _____

This document was acknowledged before me, a Notary Public, this _____ day of _____, 20 _____

_____ who personally appeared and is known to me to be a credible person of lawful age.

_____
Notary Public, State of Ohio

My commission expires: _____

THIS VERSION HAS BEEN EDITED TO REFLECT KENTUCKY SCOPE OF PRACTICE

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The purpose of this document is to create a protocol, in partnership with the Academy of Medicine of Cincinnati, that reflects and adheres Kentucky Board of EMS scope of practice, law, and revised statute.

Introduction

The Southwest Ohio Protocols Clinical Practice Guidelines have been designed not only to be practically applied but also to be used as a teaching tool. The full protocol will provide detailed explanations on patient management, while the quick reference sheets give a simplified version of the treatment options.

Where possible, evidence-based medicine (EBM) has been used to create the clinical care protocols you see in this document. When no formal EBM was applicable, a process of consensus building within the protocol committee was used to arrive at the final product.

There are several caveats in the protocol:

1. The Symptom Based protocol section does not cover all possible patient complaints. Make sure to do a thorough patient assessment and proceed to the appropriate protocol. Remember that whenever there is any question regarding medical treatment, medical control is available.
2. Those sections marked **ALL** are the responsibility of all levels of providers. **EMT** sections are for EMT-Basic providers specifically. **MEDIC** sections are for the paramedic providers specifically. If a paramedic does not have the proper medic equipment available, then they should function under the EMT section.
3. IV access means either a saline lock or a bag of saline at keep open rate. If after 3 unsuccessful attempts at an IV, then an IO or other access should be obtained if access is needed.
4. Where oxygen is called for, apply an appropriate oxygen delivery device and volume to maintain SpO2 at 95% unless the specific protocol indicates a different target oxygen saturation. Consider patient's previous medical conditions.
5. Any place that cardiac monitor is mentioned for an **EMT** or **ALL** it is only applicable if the equipment is available.
6. "If Available" is stated often. This means that for some departments the option being recommended may not be available. If it is not available, then disregard this part of the protocol.
7. Generic and Brand names of medications may be used interchangeably.
8. When "Inclusion Criteria" or "Physical Exam Criteria" are listed for a protocol, a patient may have some of the findings. A patient does not need to have all the findings unless the protocol specifically indicates that all must be present.
9. When a patient has nasal congestion, intranasal (IN) medications are ineffective and should not be used.
10. Review patient allergies, if possible, prior to medication administration and do not administer any medications to which the patient has a true allergy.

Nationally there are shortages of medications. The State will not allow the use of expired medications at the current time. Alternate medications that can be used can be found on the website. However, eventually there may be a situation where there is no substitute for a medication that is not available. In the current legal environment if you do not have a medication, then you cannot use it and must proceed with the protocol as best as possible. For drugs that are in short supply we recommend using them only when truly necessary. There is no intent that all listed medications must be carried.

These protocols are not SOP's. There are position statements from many other official agencies that can be used to augment these protocols. Examples include Active Shooter from Ohio EMFTS Board, Fire Scene Rehab from the NFPA and PPE recommendations from the CDC.

Lastly, the purpose of these protocols is to establish guidelines between EMS administration, the EMS provider and medical direction for the management, treatment, and transport of specific medical emergencies. The protocols are not designed nor intended to limit the EMS provider in the exercise of good judgment or initiative in taking reasonable action in extraordinary circumstances. These protocols are intended to assist in achieving excellent, consistent prehospital care for patients. The following protocols are not intended to provide a solution to every problem which may arise. Our objective is not only to serve the people of our area, but also to give them our best possible service. Part of that service is treating patients even when there is a short transport time. We will achieve the high standard required of emergency medical services only by coordinating our operations, working together, and maintaining a high degree of professionalism.

We welcome any input you may have to make these protocols better in the future.

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These protocols can be found at http://www.hamiltoncountyfirechiefs.com/southwest-ohio-protocol.html.

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On-Scene Medical Personnel

- The medical care provided at the scene is the responsibility of the highest level of EMS provider who has responded by usual dispatch systems to that scene. Passersby who stop to help, even though possibly more highly trained than the system providers, may not assume responsibility (except as outlined below) but may be allowed to help in care at the discretion of the lead EMS provider and assuming they have proof of licensure.

- When an EMS provider, under medical control (on- or off-line), arrives at the scene of an emergency, the provider acts as the agent of medical control.

- Any healthcare provider (MD, PA, RN, nurse midwife, non-KY licensed EMS provider, etc.) who is not an active member of the responding EMS unit, and who is either at the scene at the time of EMS‘ arrival or arrives after an EMS unit provider has initiated care, and who desires to continue to participate, should be put in touch with the on-line medical control physician.

- At no time should an EMS provider provide care outside of their scope of training and/or protocols.

- In the event that a Mass Casualty Incident (MCI) is declared, all Providers should follow the Mass Casualty Incidents Uniform Prehospital MCI Procedure outlined in this document or similar approved Incident Command System.

Use of Lights and Sirens

Purpose

The estimated EMS fatality rate (12.7 per 100,000 workers) is more than twice the national rate. Vehicles crashes of all types remain the leading cause of death in EMS. The use of Lights and Sirens in the transport of a patient from the scene to the hospital by EMS personnel should be consistent with "best practices", be medically defensible and conform to Kentucky state law. It is not without risk and should be used only when there is a likely benefit to the patient. This is to ensure the safety of our patients, our staff, our citizens and ourselves.

Policy

KRS 189.910 to KRS 189.950 outline the legal parameters under which an emergency vehicle may be exempt from certain traffic regulations. The vehicle operator should be familiar with these statutes. Specifically:

189.940 Exemptions from traffic regulations.

- The speed limitations set forth in the Kentucky Revised Statutes do not apply to emergency vehicles:
  - When responding to emergency calls; or
  - To police vehicles when in pursuit of an actual or suspected violator of the
  - law; or
  - To ambulances when transporting a patient to medical care facilities; and
  - The driver thereof is giving the warning required by subsection (5)(a) and (b) of this section.

No portion of this subsection shall be construed to relieve the driver of the duty to operate the vehicle with due regard for the safety of all persons using the street or highway.

The law permits such emergency vehicles only **on emergency calls or when transporting to a medical care facility** to utilize lights and sirens. EMS personnel are instructed to follow the state laws and use lights and sirens while going to the hospital only when it is medically necessary for the patient to be rapidly transported. Rapid transport to the scene may be necessary in certain instances to evaluate the situation for possible life threats. It is then that the EMS personnel in charge of patient care will make the appropriate transportation decision. Although time is typically saved, studies have shown the savings to be from less than one minute to less than four minutes and rarely clinically significant to the patient. Transport in this manner is not without risk to the patient. The EMS personnel in charge will have to weigh the risks and benefits to the patient, and document this rationale on the EMS run form. This policy does not restrict the EMS personnel from changing a non-emergency transport back into an emergency transport if conditions change.

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Determination of Death - Dead on Scene

If an EMS provider believes that a patient is irreversibly dead and resuscitative efforts should not be performed, this protocol shall be followed prior to final determination.

1. The EMS provider (EMT, AEMT, or paramedic) shall determine and document that the following signs of death are present:
-Unresponsiveness
-Apnea
-The absence of a palpable pulse at the carotid site
-Bilaterally fixed and dilated pupils
-Asystole on monitor (paramedic) or "No shock advised" on AED (EMT/ AEMT)

2. The EMS provider shall determine, in addition, that one (1) or more of the following signs of IRREVERSIBLE DEATH or DESIRE TO NOT HAVE RESUSCITATIVE EFFORTS exist:
-Lividity of any degree
-Rigor mortis of any degree (In the non-hypothermic patient)
-The presence of venous pooling in the body
-Damage or destruction of the body which is incompatible with life (such as decapitation, hemicorpectomy, evisceration of heart or lungs, body burned beyond recognition, or injury that does not allow resuscitative efforts to be performed)
Note: exposed brain matter is not an injury incompatible with life
- A standard form or identification evidencing a patient‘s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation) or 201 KAR 9:470 (MOST regulation).

3. If a Paramedic has determined and documented that the conditions above (sections 1 and 2) have been met, a Paramedic may declare the patient dead. If the Paramedic determines a patient to be dead, the paramedic shall remain on the scene until the arrival of a law enforcement
officer or until the Paramedic is released from the scene by the coroner.

4. If a paramedic is not available on scene but another qualified EMS provider (EMT/ AEMT) is able to determine that the conditions of section 1 and 2 above are met, the provider shall contact online medical control to request an order that resuscitative efforts be withheld based on medical futility and irreversible death. In this case, the jurisdiction’s coroner shall be called and make the final pronouncement of death. The EMS provider must remain with the patient until death is pronounced and observe for any changes in condition.

Determination of Death - Dead on Scene continued

5. The Paramedic shall document all items required in the patient care report including the usual patient assessment, medical history, and surrounding events information. It is especially important to note:

    - Body position and location when discovered, including differences from when last seen alive.
    - Patient condition when last seen alive.
    - Clothing and condition of clothing.
    - Conditions of residence/business/location found.
    - Statements made on the scene by significant individuals.
    - Any unusual circumstances.

IT IS TO BE EXPRESSLY UNDERSTOOD THAT IN THE EVENT OF ANY UNCERTAINTY AS TO THE PATIENT STATUS, THE CREW IS TO INITIATE NORMAL RESUSCITATIVE EFFORTS

Determination of Death - Discontinuance of Resuscitation by a Paramedic

1. An EMS provider may discontinue resuscitative efforts/ CPR if, prior to transport:
    a. The patient has suffered cardiac arrest.
    b. The patient meets all of the following criteria:
        i. Unresponsiveness
        ii. Apnea
        iii. The absence of a palpable pulse at the carotid site
        iv. Bilaterally fixed and dilated pupils,
        v. ONE OF THE FOLLOWING:
            The EMS provider is presented a standard form or identification evidencing a patient‘s desire not to be resuscitated in accordance with KRS 311.623 (DNR regulation) or 201 KAR 9:470 (MOST regulation)
            OR
            The EMS provider discovers that one (1) or more of the following factors or conditions exist:
    1. Lividity of any degree
    2. Rigor mortis of any degree (In the non-hypothermic patient)
    3. The presence of venous pooling in the body
    4. Damage or destruction of the body which is incompatible with life (such as decapitation, hemicorpectomy, evisceration of heart or lungs, body burned beyond recognition, or injury that does not allow resuscitative efforts to be performed)

2. A Paramedic may discontinue resuscitative efforts/ CPR if, prior to transport:
    a. The patient has suffered cardiac arrest.
    b. The Paramedic has attempted and documented the resuscitative efforts specified in the Asystole Protocol, including successful airway management, IV/IO access, and IV/ IO administration of epinephrine.
    c. The resuscitative efforts were unsuccessful after at least 20 minutes of ALS care; and
    d. The patient meets the following criteria:
        i. Unresponsiveness
        ii. Apnea
        iii. The absence of a palpable pulse at the carotid site
        iv. Bilaterally fixed and dilated pupils; and
        v. Asystole determined in two (2) leads on an electrocardiograph, except in cases of trauma

Note: Slow, wide complex agonal complexes are considered a variant of asystole
e. The paramedic shall make reasonable efforts to contact the on duty MEDICAL CONTROL to discuss the case and intention to discontinue resuscitative efforts, and may then pronounce the patient dead.

Determination of Death - Discontinuance of Resuscitation by a Paramedic continued

3. If a paramedic is not available on scene and unable to respond in a timely manner, but another qualified EMS provider (EMT/ AEMT) has performed all the above resuscitative efforts that are within their scope of practice including at least 20 minutes of resuscitative effort, and the requirements of section 2d above are met (excluding EKG determination), and

i. Arrest was not witnessed by EMS
ii. ROSC was not achieved in the field
iii. No AED shocks were delivered

the EMT/ AEMT shall contact online medical control to request CPR, ventilation, and drug/ fluid/ electrical therapy be withheld based on medical futility. In this case, the jurisdiction's coroner shall be called and make the final pronouncement of death. The EMS provider must remain with the patient until death is pronounced and observe for any changes in condition.

4. If the patient's medical power of attorney or legally authorized medical decision maker* is present on scene and wishes to revoke consent for further treatment (ie resuscitative efforts), medical control shall be contacted for consultation and orders. The medical control physician may order any treatment being provided to be withheld in accordance with the wishes of the medical decision maker speaking for the patient. If the patient remains in cardiac arrest, the patient may be pronounced dead by a paramedic if the patient meets the criteria laid out in section 1 above. If a paramedic is not on scene, the crew must remain on scene and evaluate for any changes in condition until the jurisdiction's coroner or a healthcare provider authorized to pronounce death arrives on scene and pronounces the patient dead.
*Authority for decision making when the patient is not able to express their own wishes is granted to the
following in descending order (KRS 311.631) : Legal guardian, medical power of attorney, spouse, adult
children, parents, closest reasonably available next of kin

5. The EMS provider shall document all items required on the run report including the usual patient assessment, medical history and surrounding events information. It is especially important to note:
• Body position and location when discovered, including differences from when last seen alive.
• Patient condition when last seen alive.
• Clothing and condition of clothing.
• Condition of residence/business/location found.
• Statements made on the scene by significant individuals.
• Any unusual circumstances.
IN THE EVENT OF ANY UNCERTAINTY AS TO THE PATIENT STATUS, THE CREW IS TO INITIATE NORMAL RESUSCITATIVE EFFORTS

Kentucky Emergency Medical Services
Do Not Resuscitate (DNR) Order

Person's Full Legal Name _____

Surrogate's Full Legal Name (if applicable) _____

I, the undersigned person or surrogate who has been designated to make health care decisions in accordance with Kentucky Revised Statutes, hereby direct that in the event of my cardiac or respiratory arrest that this DO NOT RESUSCITATE (DNR) ORDER be honored. I understand that DNR means that if my heart stops beating or if I stop breathing, no medical procedure to restart breathing or heart function, more specifically the insertion of a tube into the lungs, or electrical shocking of the heart or cardiopulmonary resuscitation (CPR) will be started by emergency medical services (EMS) personnel

I understand this decision will *not* prevent emergency medical services personnel from providing other medical care.

I understand that I may revoke this DNR order at any time by destroying this form, removing the DNR bracelet, or by telling the EMS personnel that I want to be resuscitated. Any attempt to alter or change the content, names, or signatures on the EMS DNR form shall make the DNR form invalid.

I understand that this form, or a standard EMS DNR bracelet must be available and must be shown to EMS personnel as soon as they arrive. If the form or bracelet is not provided, the EMS personnel will follow their normal protocols which could include cardiopulmonary resuscitation (CPR) or other resuscitation procedures. I understand that should I die, EMS personnel will require this form and/or bracelet for their records.

I give permission for information about this EMS DNR Order to be given to the prehospital emergency medical care personnel, physicians, nurses, or other health care personnel as necessary to implement this directive.

I hereby state that this ***'Do Not Resuscitate (DNR) Order'*** is my authentic wish not be resuscitated.

_____ _____
Person/Legal Surrogate Signature Date

Commonwealth of Kentucky County of _____

Subscribed and sworn to before me by _____ to be his/her own free act and deed, this _____ day of _____, 20_____.

_____, Notary Public

My commission expires: _____

In lieu of having this Form notarized, it may be witnessed by two persons not related to the individual noted above.

WITNESSED BY:
1. _____

2. _____

This EMS Do Not Resuscitate Form was approved by the Kentucky Board of Medical Licensure at their March 1995 meeting.

Complete the portion below, cut out, fold, and insert in DNR bracelet

_____

I certify that an EMS Do Not Resuscitate (DNR) form has been executed.
Person's Name (print or type) _____
Person's or Legal Surrogate's Signature _____

INSTRUCTIONS

PURPOSE

This standardized EMS DNR Order has been developed and approved by the Kentucky Board of Medical Licensure, in consultation with the Cabinet for Human Resources. It is in compliance with KRS Chapter 311 as amended by Senate Bill 311 passed by the 1994 General Assembly, which directs the Kentucky Board of Medical Licensure to develop a standard form to authorize EMS providers to honor advance directives to withhold or terminate care.

For covered persons in cardiac or respiratory arrest, resuscitative measures to be withheld include external chest compressions, intubation, defibrillation, administration of cardiac medications and artificial respiration. The EMS DNR Order does **not** affect the provision of other emergency medical care, including oxygen administration, suctioning, control of bleeding, administration of analgesics and comfort care.

APPLICABILITY

This **EMS DNR Order** applies only to resuscitation attempts by health care providers in the **prehospital** setting(i.e., certified EMT-First Responders, Emergency Medical Technicians, and Paramedics) — in patients' homes, in a long-term care facility, during transport to or from a health care facility, or in other locations outside acute care hospitals.

INSTRUCTIONS

Any adult person may execute an EMS DNR Order. The person for whom the Order is executed shall sign and date the Order and my either have the Order notarized by a Kentucky Notary Public or have their signature witness by two persons not related to them. The executor of the Order must also place their printed or typed name in the designated area and their signature on the EMS DNR Order bracelet insert found at the bottom of the EMS DNR Order form. The bracelet insert shall be detached and placed in a hospital type bracelet and placed on the wrist or ankle of the executor of the Order.

If the person for whom the EMS DNR Order is contemplated is unable to give informed consent, or is a minor, the person's legal surrogate shall sign and date the Order and may either have the form notarized by a Kentucky Notary Public or have their signature witnessed by two persons not related to the person for which the form is being executed or related to the legal health care surrogate. The legal health care surrogate shall also complete the required information on the EMS DNR bracelet insert found at the bottom of the EMS DNR Order form. The bracelet shall be detached and placed in a hospital type bracelet and placed on the wrist or ankle of the person for which this Order was executed.

The original, completed EMS DNR Order or the EMS DNR Bracelet must be readily available to EMS personnel in order for the EMS DNR Order to be honored. Resuscitation attempts may be initiated until the form or bracelet is presented and the identity of the patient is confirmed by the EMS personnel. It is recommended that the EMS DNR Order be displayed in a prominent place close to the patient and/or the bracelet be on the patient's wrist or ankle.

REVOCATION

An EMS DNR Order may be revoked at any time orally or by performing an act such as burning, tearing, canceling, obliterating or by destroying the order by the person on whose behalf it was executed or by the person's legal health care surrogate.

IT SHOULD BE UNDERSTOOD BY THE PERSON EXECUTING THIS EMS DNR ORDER OR THEIR LEGAL HEALTH CARE SURROGATE, THAT SHOULD THE PERSON LISTED ON THE EMS DNR ORDER DIE WHILE EMS PREHOSPITAL PERSONNEL ARE IN ATTENDANCE, THE EMS DNR ORDER OR EMS DNR BRACELET MUST BE GIVEN TO THE EMS PREHOSPITAL PERSONNEL FOR THEIR RECORDS

Trauma Triage

Purpose

Victims of major trauma have better outcomes when transported to a designated trauma center in a timely manner. The American College of Surgeons (ACS) has developed triage criteria that is useful in identifying patients that may benefit from evaluation at a trauma center.

In general consider the following guidelines:
It is in the best interest of the patient to be transported to a designated trauma center if the patient meets ACS criteria and a designated trauma center is within thirty minutes transport time.

Patients with a compromised airway may be best served by transport to the closest hospital with rapid transfer to a trauma center.
Consider air medical resources but do not delay transport unnecessarily. (See Helicopter Criteria for Scene Transport).

Trauma Triage Criteria Algorithm

National Guideline for the Field Triage of Injured Patients

RED CRITERIA
High Risk for Serious Injury

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

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

YELLOW CRITERIA
Moderate Risk for Serious Injury

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

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

Verified Trauma Centers in Kentucky

Air Medical/ Helicopter Safety

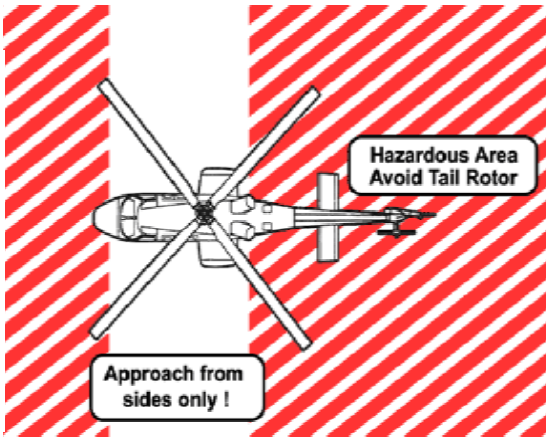
Landing Zone and Safety. Without exception, safety is air medical service's top priority.

Requesting a helicopter

- ► Private Citizens - call 9-1-1.
- ► Police, fire and EMS - Request a helicopter through the appropriate agency, such as your dispatch center, with the following information:
  - Location cross street
  - Location LAT/LONG coordinates
  - Any prominent features at the scene
  - Notify all involved communications centers if any other air medical service has been contacted and the status of that agency. Always inform all communications centers if other aircraft are anticipated to be in the area.
  - Your call-back number
  - Scene radio frequency and CTCSS tone
  - Call sign of LZ (Landing Zone) Command.. One person should be designated to coordinate LZ setup and communicate with responding aircraft. This person should not be involved with patient care.
  - Weather, including low ceilings, poor visibility, icing, and high winds
  - Patient status, such as number, condition, age, approximate patient weight, mechanism of injury, and hazards
  - LZ details. The preferred landing zone is 100 x 100 feet.
  - ALWAYS RELAY ANY INFORMATION PERTAINING TO HAZMAT TO THE COMMUNICATIONS CENTER WHEN REQUESTING AIR MEDICAL SERVICE.

Important Tips

- Never approach the aircraft until instructed to do so and only as instructed by the pilot or flight crew aboard
- Approach angles over obstacles should be less than 20 degrees
- Always keep LZ clear of people and other potential hazards
- Under no circumstances should you ever approach the aircraft from the rear



Landing Zone Setup

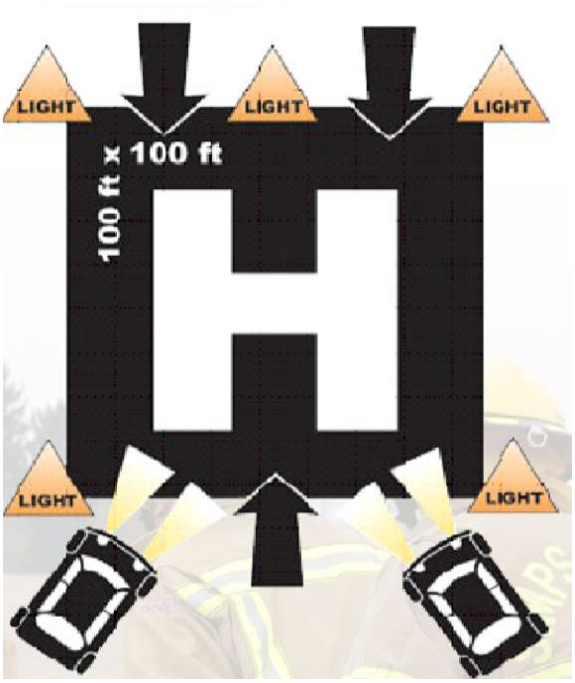
► Set up the LZ as follows:
- SIZE should be 100 feet by 100 feet
- LEVEL: Select a LZ as level as possible (minimal slope)
- LANDING SURFACE: Select a hard surface, grassy surface, or hard-packed snow. Avoid loose dirt, dust, or powder snow.
- CLEAR OVERHEAD free of obstructions such as wires, antennas, or poles
- CLEAR AREA free of debris, large rocks, posts, stumps, vehicles, people, animals, and other hazards
- MARK THE AREA clearly using five weighted cones or beacons, one at each corner of the LZ and one on the side that wind is coming from
- SELECT AN ALTERNATE LZ. Plan for an alternate LZ because the pilot may determine your LZ to be unsafe.
- HAZMAT: Always relay any information pertaining to HAZMAT to the communications center when requesting air medical service. Always inform the pilot and medical crew of HAZMAT. When selecting a LZ find a site at least 1/4 to 1 mile UPWIND from the incident depending on the type and materials involved. Avoid low areas where vapors may collect. The patient must be removed from the hot zone. All patients must be decontaminated PRIOR to flight.

When the helicopter is overhead

► Air medical service will establish radio contact on the assigned frequency with LZ Command three to five minutes out. Describe the following:
- LZ location
- Lighting
- Hazards
- Overhead wires, including wires along the approach path to the LZ
- Obstructions
- Slope
- Surface conditions
- Wind direction and speed if known
- Maintain radio contact at all times until the helicopter has landed, loaded, and departed the area.

Night Landing Zone

- ► DO NOT SHINE LIGHTS DIRECTLY AT THE HELICOPTER
- ► Set up night landing zones with five strobes or other secured lights. Do not use cones, flares, or tape to mark the site.
- ► Emergency vehicles may be parked so their headlights intersect the middle of the landing site and/or parked underneath wires to mark them. Turn strobes of emergency vehicles off as the aircraft approaches.
- ► Lights may be shown onto poles indicating wires between the poles
- ► Night landing zones always require good communications, lighting, and alertness
- ► Turn off all emergency lights after aircraft has started approach
- ► One strobe should be on the side that the wind is coming from
- ► If no strobes are available mark with other lighting systems
- ► If no other portable lights are available, cross headlight beams into the wind at the center of the landing zone



Helicopter Utilization Criteria for Scene Response

Purpose:

Air Medical Services (AMS) are a valuable, yet limited resource in the Commonwealth. It is important that Emergency Medical Service personnel utilize consistent and appropriate criteria when requesting an air medical service for assistance with patient care and transport.

Air Medical Services (AMS) are a valuable, yet limited resource. It is important that Emergency Medical Service personnel utilize consistent and appropriate criteria when requesting an air medical service for assistance with patient care and transport. The following represents a combination of the current criteria in use throughout the state. These criteria are consistent with national AMS utilization criteria. It is important that review of appropriate helicopter utilization be a part of EMS training, as well as a component of the agency and regional level retrospective quality assurance process.

Criteria:

1. The helicopter is an air ambulance and an essential part of the EMS system. It may be considered in situations wherein:
   - The use of the helicopter would speed a patient's arrival to the hospital capable of providing definitive care and this is felt to be significant to the patient's condition, or;
   - If specialized services offered by the air medical service would benefit the patient prior to arrival at the hospital.
2. The following criteria should be used when considering use of an air medical service:
   - The patient's condition is a "life or limb" threatening situation demanding intensive multidisciplinary treatment and care. This may include but not be limited to:
   - Patients with ***physical findings*** defined in the adult and pediatric major trauma protocols (see attached)
   - Critical burn patients (see attached)
   - Critically ill medical patients requiring care at a specialized center to include, but not be limited to: acute stroke or ST elevation MI.
   - ***Patients in cardiac arrest who are not hypothermic should be excluded from these criteria***
3. Dispatch, Police, Fire or EMS will evaluate the situation/condition and if necessary, may place the helicopter on standby.

4. The helicopter may be requested to respond to the scene when:
   - ALS personnel request the helicopter.
   - BLS personnel request the helicopter, when ALS is delayed or unavailable.
   - In the absence of an EMS agency, any emergency service may request the helicopter, if it is felt to be medically necessary.
5. When EMS arrive, they should assess the situation. If the MOST HIGHLY TRAINED EMS PERSONNEL ON THE SCENE determine, that the helicopter is not needed, it should be cancelled as soon as possible.
6. When use of air medical services is not specifically defined by the protocol, the on scene EMS provider should establish communication with medical control to discuss the situation with the on line physician.
7. Air medical services may be considered in situations where the patient is inaccessible by other means or, if utilization of existing ground transport services threatens to overwhelm the local EMS system.
8. The destination facility will be determined by the AMS crew based upon medical appropriateness with consideration for patient preference and on line medical direction, in compliance with regional protocols.
9. An EMS service should not wait on the scene or delay transport waiting for the helicopter to arrive. If the patient is packaged and ready for transport, the EMS service should initiate transport to the hospital and reassign the landing zone. The helicopter may intercept with an ambulance during transport at an alternate-landing site.

THIS IS A GUIDELINE AND IS NOT INTENDED TO SPECIFICALLY DEFINE EVERY CONDITION IN WHICH AIR MEDICAL SERVICES SHOULD BE REQUESTED. GOOD CLINICAL JUDGEMENT SHOULD BE USED AT ALL TIMES.

Transfer of Patient Care, Documentation and Quality Assurance:

1. As with other instances where care of a patient is transferred, it is expected that all patient related information, assessment findings and treatment will be communicated to the flight crew.
2. At the completion of the EMS call, all of the details of the response, including, but not limited to all patient related information, assessment findings and treatment must be documented.
3. As with all EMS responses, helicopter utilization, the treatment and transportation of patients will be reviewed as a part of a Quality Assurance process.

Guidelines for Helicopter Utilization Criteria for Scene Response

ADULT MAJOR TRAUMA

1. GCS less than or equal to 13
2. Respiratory Rate less than 10 or more than 29 breaths per minute
3. Pulse rate is less than 50 or more than 120 beats per minute
4. Systolic blood pressure is less than 90mmHg
5. Penetrating injuries to head, neck, torso or proximal extremities
6. Two or more suspected proximal long bone fractures
7. Suspected flail chest
8. Suspected spinal cord injury or limb paralysis
9. Amputation (except digits)
10. Suspected pelvic fracture
11. Open or depressed skull fracture

PEDIATRIC MAJOR TRAUMA

1. Pulse greater than normal range for patient's age
2. Systolic blood pressure below normal range
3. Respiratory status inadequate (central cyanosis, respiratory rate low for the child's age, capillary refill time greater than two seconds)
4. Glasgow coma scale less than 14
5. Penetrating injuries of the trunk, head, neck, chest, abdomen or groin
6. Two or more proximal long bone fractures
7. Flail chest
8. Combined system trauma that involves two or more body systems, injuries or major blunt trauma to the chest or abdomen
9. Spinal cord injury or limb paralysis
10. Amputation (except digits)

CRITICAL BURNS

1. Greater than 20% Body Surface Area (BSA) second or third degree burns
2. Evidence of airway/facial burns
3. Circumferential extremity burns

****Note that for patients with burns and coexisting trauma, the traumatic injury should be considered the first priority and the patient should be triaged to the closest appropriate trauma center for initial stabilization.**

CRITICAL MEDICAL CONDITIONS

1. Suspected Acute Stroke
   - Positive Cincinnati Pre-hospital Stroke Scale
   - Total prehospital time (time from when the patient's symptoms and/or signs first began to when the patient is expected to arrive at the Stroke Center) is less than two (2) hours.

2. Suspected Acute Myocardial Infarction
   - Chest pain, Shortness of breath or other symptoms typical of a cardiac event
   - EKG findings of
     - ST elevation 1mm or more in 2 or more contiguous leads OR
     - LBBB (QRS duration >.12msec and Q wave in V1 or V2

Patient Transport

An ill or injured child must be restrained directly to the cot in a manner that prevents ramping or sliding in a collision.

- ► A belt/strap looped over each shoulder and attached to a non-sliding cot member.
- ► A soft, sliding, or breakaway connector holding the shoulder straps together on chest.
- ► Belt/strap anchored to non-sliding cot member and routed over thighs, not around waist.

Note: Standard belt systems do not adequately secure child to the cot during a crash.

Ill or injured child/infant (5 to 80 lbs) who can tolerate a semi-upright position may be secured using a child passenger safety seat.

- ► Use a convertible child safety seat that has a front and rear belt path.
- ► Position safety seat on cot facing the foot-end with backrest fully elevated.
- ► Consider removing mattress.
- ► Secure safety seat with 2 pairs of belts in both the forward & rear positions.
- ► Place the shoulder straps of the harness through slots just below child‘s shoulders.
- ► For infants, place rolled towels on sides of child to maintain centered position.

Note: Non-convertible safety seats cannot be secured properly to the cot.

For infants who cannot tolerate a semi-upright position or who must lie flat:

- ► Use car bed, if available, that can be secured against both rearward and forward motion.
- ► Position car bed across cot so child lies perpendicular to cot.
- ► Fully raise cot‘s backrest and anchor car bed to cot with 2 belts.
- ► Fasten car bed harness snugly to infant.

Use of Child Passenger Safety Seat after Involvement in Motor Vehicle Crash

Child safety seats may be used after involvement in a minor crash. **All** of the following must apply to be considered a minor crash.

- ► Visual inspection including inspection under movable seat padding does not reveal any cracks or deformation.
- ► The vehicle in which the child safety seat was installed was capable of being driven from the scene of the crash.
- ► The vehicle door nearest the child safety seat was undamaged.
- ► There were no injuries to any of the vehicle occupants.
- ► The air bags (if any) did not deploy..

Safe Infants Act - Safe Infants Protocol for Prehospital Providers

Any parent or person acting on behalf of the parent may come to a police station, firehouse, EMS station, or hospital unannounced and leave a newborn infant. When this event occurs, the police officer, firefighter, EMS worker, or hospital worker ***SHALL*** accept the infant. This situation must meet the following criteria.

1. The newborn infant must be medically determined to be less than 72 hours old.
2. The newborn infant cannot have indicators of child abuse, maltreatment, or neglect after birth.

- ► Perform a primary and secondary survey of the infant and initiate any necessary procedure to protect the child‘s health and safety. Keep the newborn warm especially the head.
- ► Consider rapid glucose determination.
- ► Kentucky law requires that any care provider who suspects child abuse, neglect, or maltreatment SHALL report it. You should call the Department for Community Based Services (DCBS) hotline at 1-800-752-6200 to make your report. You have no authority to detain, follow or pursue the parent.
- ► Summon EMS for transport of the infant.
- ► Notify your supervisor and follow any policies and procedures your agency has implemented.
- ► Retrieve and open an "Abandoned Infant Pack”. Complete the enclosed checklist.
- ► Place the numbered band around the ankle of the infant.
- ► Ensure that the band‘s stub remains attached to the Medical Information Form and copy the stub number directly onto the Medical Information Form.
- ► You will offer the parent information regarding medical needs of the mother who is post partum, a written explanation of the parent‘s legal rights, and services available to the parent, which have been provided in the packet.
- ► Newborn infants should be transported in an age appropriate car seat if available. Otherwise, newborns should be transported using appropriate immobilization measures.
- ► Newborn infants may be fed with SIMILAC or ENFAMIL if a lengthy transport time is anticipated. Newborns normally eat 2-2.5 ounces of formula at feeding. Feeding is not advised for any infant that is experiencing any respiratory or circulatory abnormality.

Safe Infants Act - Safe Infants Protocol for Prehospital Providers

KRS211.951, 2216B.190, 311.6526, 405.075 and 620.355 is known as the Thomas J. Burch Safe Infants Act. The law provides a safe place for unwanted newborn babies. Parents may now leave an unwanted infant with any Kentucky EMS provider, police station, fire station or hospital without consequence. I hope that preventing any unwanted newborn from being left in a dangerous or deadly environment.

You've Just Had a Baby! "Copy and Provide to Mother"

You have made a courageous decision to leave your baby in the safe and good care of a hospital, police station, fire station or emergency medical services (EMS) provider. Your baby will be well taken care of and, eventually, be adopted into a safe, loving, permanent home. Now it's time to make sure that you are healthy.

It's a good idea to see a doctor or go to the health department for an examination. For information about your local health department, call (800) 462-6122.

What is normal after you've just had a baby? It takes your body about three to six weeks to return to its pre-pregnant state. You may experience several normal changes to your body during the first few days and weeks after delivery.

Vaginal bleeding: This is blood coming from the uterus. It is a sign that the uterus is healing. At first, it is like a heavy period. The bleeding will start out as bright red, change to pink, and then change to a clear or yellow discharge. You should stop bleeding after three weeks. There should never be large blood clots or a foul odor.

What to do: Use sanitary pads only (no tampons). Do not take tub baths until the bleeding stops. Call a doctor if the bleeding becomes bright red again, you pass large clots or there is a foul odor.

Abdominal cramping: This is a sign that the uterus is contracting back down to its normal size. These cramps are like mild menstrual cramps and will last a few days.

What to do: Take an over-the-counter pain reliever.

Breast engorgement: This means the breasts are becoming full and very sore, and it is a sign that the breasts are filling with milk. This happens around the third day after delivery. Your breasts will become swollen, firm, tender and warm to the touch. Severe breast engorgement should not last more than 36 hours.

What to do: Wear a good-fitting support bra at all times and remove it only for showers. Apply an ice pack to the breasts for 20 minutes, four times a day. Avoid things that will stimulate the breasts. Avoid heat and hot showers.

"Postpartum blues": Most women feel depressed for one to two weeks after delivery. You may feel angry, sad, tired and unable to sleep or eat during this time. These feelings are brought on by the many changes that take place in your body and brain during and after delivery.

You've Just Had a Baby! "Copy and Provide to Mother"

What to do: Know that this is normal and will go away. Find a family member or close friend to talk to about your feelings. Call a doctor if these feelings do not go away or if they intensify.

Call a doctor if you have any of these warning signs:

- Heavy, bright red vaginal bleeding
- Foul-smelling vaginal discharge
- Dizziness or fainting
- Fever above 100.4 degrees F
- Pain around your vaginal area that does not go away or gets worse
- Pain or burning when you empty your bladder
- Pain or swelling in your legs
- Red streaks or painful new lumps in your breasts
- Cramps that are more painful than normal menstrual cramps
- Nausea and vomiting
- Chest pain or cough
- Feeling so sad that you aren't able to take care of yourself
- Feelings that you might hurt yourself

Do these things to take care of yourself after your delivery:

- Rest as much as you can. Your normal energy will return in a few weeks.
- Eat healthy foods. Drink six to eight glasses of water a day. If you have prenatal vitamins, continue to take one a day.
- Continue to wear a good-fitting bra for about three weeks.
- Change your pad every time you go the bathroom to prevent infection in the vaginal area. Wipe yourself from front to back every time you urinate or have a bowel movement. Wash your hands every time you change your pad or go to the bathroom.
- Do not take a tub bath for three weeks. Take showers only.
- Gradually resume your normal physical activity. Don't lift anything over 10 pounds. Don't drive a car for one week. Don't climb stairs for one week (if you have to climb steps, climb one step at a time).
- Avoid sexual intercourse for at least six weeks after delivery. Do not have intercourse if you are still bleeding vaginally. It is possible to become pregnant before you start having periods again, so talk to a doctor about ways to prevent another pregnancy.

You've Just Had a Baby! "Copy and Provide to Mother"

- Get a medical examination four to six weeks after delivery. Your doctor or health department will keep your records confidential to protect you against any invasion of personal privacy.

For information about:

- Family planning and contraception, call (800) 462-6122.
- Substance abuse counseling, call, toll free, (888) 729-8028.
- Domestic violence and abuse, call (800) 752-6200.

For information about health care specific to women, log onto:
Http://chfs.ky.gov/dph/ach/mch.htm

Important!

If you left your baby at a safe place and have decided that you want your baby back, contact the Kentucky Cabinet for Health and Family Services at (800) 752-6200. If you do not contact the Cabinet within 30 days after leaving your newborn, the Cabinet will proceed with termination of parental rights and place your baby for adoption.

A copy of this material may be obtained from the following Web site:
http://chfs.ky.gov/dcbs/dpp/Child_Safety.htm
For more information about the Safe Infants Act, call (800) 752-6200

Bloodborne/Airborne Pathogens

BLOODBORNE PATHOGENS

Emergency Medical Services personnel should assume that all bodily fluids and tissues are potentially infectious with bloodborne pathogens including HIV (causing AIDS) and HBV (causing hepatitis), and must protect themselves accordingly by use of body substance isolation (BSI).

Body substance isolation procedures include the appropriate use of hand washing, protective barriers (such as gloves, masks, goggles, etc.), and care in the use and disposal of needles and other sharp instruments. EMTs are also encouraged to obtain the hepatitis B vaccine series to decrease the likelihood of hepatitis B transmission. EMTs who have exudative lesions, weeping dermatitis, or open wounds should refrain from all direct patient care and from handling patient-care equipment as they are at increased risk of transmission and reception of bloodborne pathogens through these lesions. Transmission of bloodborne pathogens has been shown to occur when the blood of the infected patient is able to come in direct contact with the blood of the health-care worker.

EMTs who have had a direct bloodborne pathogen exposure should immediately wash the exposed area with soap and water and a suitable disinfectant. The exposed area should then be covered with a sterile dressing. Upon arrival at the destination hospital, after responsibility for the patient has been transferred to the emergency department, the EMT should thoroughly cleanse the exposed site, complete a state of Kentucky Emergency Response/Public Safety Worker Incident Report Form, and sign in to the Emergency Department as a worker‘s compensation patient. The only exception to this latter step is when the squad has a designated exposure officer and medical advisor wherein the exposed EMT has definitive and immediate medical care elsewhere.

AIRBORNE PATHOGENS

EMTs who believe they have been exposed to an airborne pathogen may proceed as above in getting timely medical care. It is expected that a properly filled out Patient Care Report will allow hospital infection control staff to contact EMTs involved in patient care where that patient was subsequently found to have a potential airborne pathogen such as Tuberculosis, Neisseria meningitis, SARS, etc.

Airborne Personal Protective Equipment (APPE)

- ► Recommended APPE consists of a N95 respirator, prior fit testing is recommended.
- ► Apply PPE if the patient presents with the following signs or symptoms
  - ♦ Cough
  - ♦ Fever
  - ♦ Rash

- Limit the number of personnel in contact with suspected patients to reduce the potential of exposure to other providers and bystanders.
- Patients suspected of being infected with a possible airborne pathogen should be masked if tolerated.
- Patients requiring oxygen therapy should receive oxygen through a mask with a surgical mask placed over the oxygen mask to block pathogen release. Close monitoring of the patient‘s respiratory status and effort should be maintained.
- APPE should be in place when performing suctioning, airway management and ventilation assistance (Bag-Valve-Mask) for suspect patients.
- Limit procedures that may result in the spread of the suspected pathogen, e.g. nebulizer treatments.
- Exchange of fresh air into the patient compartment is recommended during transport of patient with a suspected airborne pathogen.
- Early notification to the receiving hospital should be made such that the receiving hospital may enact its respective airborne pathogen procedures.

DECONTAMINATION

- In addition to accepted decontamination steps of cleaning surfaces and equipment with an approved solution and proper disposal of contaminated disposable equipment, the use of fresh air ventilation should be incorporated (open all doors and windows to allow fresh air after arrival at the hospital).
- All personnel in contact with the patient should wash their hands thoroughly with warm water and an approved hand-cleaning solution.
- Ambulances equipped with airborne pathogen filtration systems should be cleaned and maintained in accordance with manufacturer guidelines

ALL

I. PURPOSE

A. To establish a systematic procedure for the handling of emergency medical calls to improve patient care of patients of all ages.

B. To ensure the proper and systematic documentation of EMS calls.

II. PROTOCOL SPECIFIC DEFINITIONS

A. Incident – a dispatch of 911 resources to a location by a person or third party. This should be documented as per individual departmental policies.

1. No Incident Found on Arrival – is defined as an incident that after being dispatched, the crews arrive on scene and find that there was no incident or reason for them to be there, i.e., a person was reported to be injured from a fall but was gone upon arrival of EMS.

B. Patient – any person who identifies him/herself as requiring medical assistance or evaluation, or any person who has a physical or medical complaint or condition from an illness or injury.

1. A pediatric patient is referred to as a patient younger than 16 years of age.
2. An adult patient is referred to as a patient 16 years and older.
3. A geriatrics patient is referred to as a patient 65 years and older.
4. No patient contact – is defined as a disregard by the requesting person or agency or an incident that EMS responds to and the patient or would be patient is gone upon arrival, i.e., EMS responds to a motor vehicle crash, where it is evident that someone was injured, but they are no longer on the scene.

C. Intoxicated – any person presenting with diminished physical or mental control or diminished ability to make decisions by reason of the influence of alcohol liquor, drugs, or other substance.

D. Patient Care Report (PCR) – this is the form (either electronic or manual) that documents the assessment and medical care provided to a patient.

III. SCOPE

A. This protocol shall apply to all departments utilizing these medical protocols to render medical care.

IV. POLICY

A. **Responsibility:** It is the responsibility of the member with the highest level of medical training at the scene to guide the medical decisions regarding patient care and transportation.

B. **Assessment:**

1. All subjects identified as a patient as defined above will be assessed using criteria consistent with the provider's level of training. This will include but is not limited to the following:
   a. Vital Signs – A complete set of vital signs will be assessed. This shall include evaluating blood pressure, pulse rate, respiratory rate, and pulse oximetry reading.
      i. Stable patients should have at least two sets of pertinent vital signs. Ideally, one set should be taken shortly before arrival at receiving facility.
      ii. Critical patients should have pertinent vital signs frequently monitored.
   b. Mental Status – all patients will be evaluated to establish the patient's level of consciousness (alert and oriented to person, place, time, and situation). The mental status of non-verbal pediatric patients should be assessed using the AVPU method within the context of the expected developmental level. Patients presenting with an altered mental status or level of consciousness shall have their blood glucose evaluated and documented.
   c. History of present illness/injury.
   d. History/Medications/Allergies – obtain patients past medical history, current medications, and any allergies to medications.
   e. Focused assessment/physical examination as described by the standard national EMT/Paramedic curriculum to include all pertinent positive or pertinent negative symptoms.

C. **Treatment**:

1. All patients assessed by EMS personnel will be treated as directed by the protocols contained herein. Based on the initial patient history of the presenting illness and physical exam, EMS personnel should apply the most appropriate medical protocol.
2. Appropriate body substance isolation precautions should be taken.
3. All patients regardless of age should be kept from eating or drinking anything during prehospital evaluation and transport. This aims to decrease the risk a patient will vomit and aspirate prior to arriving to the hospital. The following exceptions should be noted, however:
   a. Awake and alert patients who require their regularly scheduled oral medications.
   b. Other patients as directed specifically in the Academy of Medicine of Cincinnati Protocols for SW Ohio
4. Maintain Airway
   a. If the patient is in impending respiratory failure, follow the Airway Protocol T705.
5. Administer oxygen if appropriate for condition.
6. Establish IV if indicated or in patients who are at risk for clinical deterioration.
7. Apply appropriate monitoring equipment and if available; this may include:
   a. Continuous pulse oximetry
   b. Cardiac rhythm monitoring
   c. Waveform capnography
8. EMT's should request ALS back-up or intercept if they feel the patient's condition and needs exceed or may exceed their level of care.

D. **Communication with the Emergency Department**

E. **Documentation**: The Patient Care Report (PCR) is a legal document of the medical assessment and treatment of the patient. All aspects of the patient's medical assessment, treatment and transportation will be documented in the PCR. Each EMS unit that interacts with the patient shall complete a PCR on that patient.

1. Member completing the PCR will sign the form as a medical document.
2. Activities performed by any person involved with the patients' care will be documented on the PCR.
3. All patients will, as a minimum, have assessment criteria documented as in Section B-1 above. If assessment criteria are not obtained, documentation supporting the inability to gather an assessment will be included.
4. All records of cardiac rhythms (including cardiac monitor and AED tracings) should be collected and archived as part of the patient record.
5. If the incident is determined to be a No Patient Contact or a No Incident Found on Arrival, the EMS crew shall document the incident appropriately based on their departmental policies.

F. **Responsibilities at the Emergency Department**

1. Provide verbal report to appropriate ED personnel.
2. Provide access to a copy of the completed PCR.

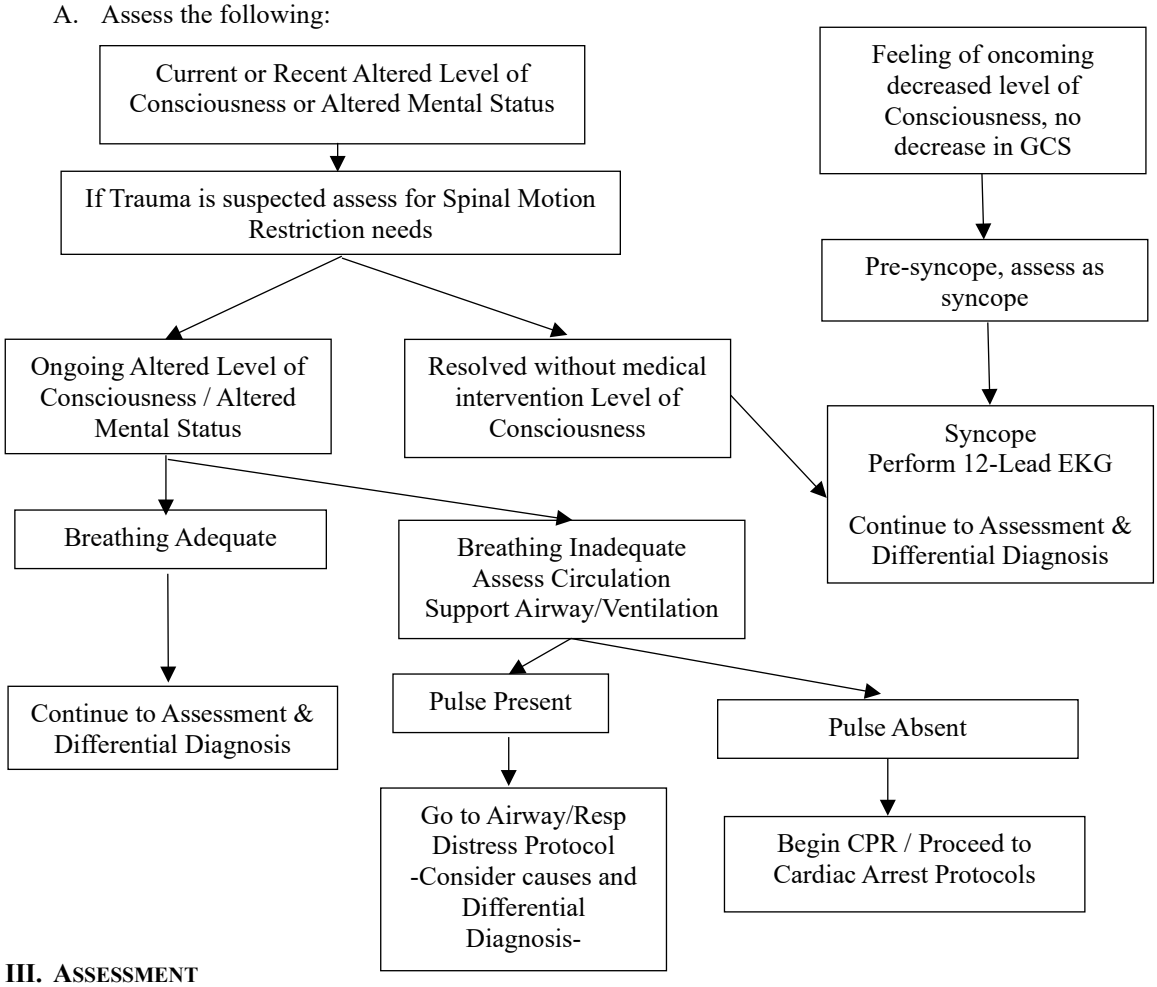
ALL

I. INCLUSION CRITERIA

A. Patient of any age
B. Patient has one of the following:
   1. Patient describes the feeling of impending loss of consciousness.
   2. Patient has a decreased Level of Consciousness of any length.
      a. Altered Level of Consciousness (ALOC) is a period where GCS less than 15.
   3. Patient has an Altered Mental Status
      a. Altered Mental Status (AMS) is a state where a patient is not alert and oriented to person, place, time, and situation within the context of the expected developmental level (Consistent with SB200)
   4. Syncope
      a. Syncope is Loss of consciousness that resolved without medical interventions and there was loss of postural tone (typically resolved prior to arrival of EMS)
   5. Pre-syncope
      a. Pre-syncope is Early signs/ symptoms of syncope. It usually lasts for seconds to minutes and may be described by the patient as "nearly blacking out" or "nearly fainting" (typically resolved prior to arrival of EMS)

II. PROTOCOL

A. Assess the following:



III. ASSESSMENT

A. Assessment of an ALOC/AMS patient or Syncope/Pre-Syncope Patient focuses on management of immediate needs and conducting a differential diagnosis to rule-in / rule-out potential causes.
B. In addition to standard assessment in accordance with SB200 Section IV. B. Assessment, consider

on all patients (but not limited to):
1. Stroke Assessment
2. EKG including 12-Lead EKG.

C. Ongoing ALOC/AMS Patients
1. Do not delay necessary resuscitation to conduct assessment.

D. Syncope / Pre-Syncope Patients
1. Cardiac issues are a common cause of Syncope / Pre-Syncope. A12-Lead EKG should be conducted even in absence of other cardiovascular symptoms. Monitoring should continue throughout care.
   a. Early application of Cardiac Monitor has a higher likelihood of catching an abnormal cardiac issue, EKG and 12-Lead EKG should be conducted as soon as possible.
2. Syncope / Pre-Syncope patients should be transported for evaluation even in absence of symptoms during Prehospital Care

IV. DIFFERENTIAL DIAGNOSIS

A. Anemia
B. Drugs and Alcohol
C. Dysrhythmias
D. Electrolyte Imbalance
E. Head Injury
F. Hypertension
G. Hyperglycemia
H. Hypoglycemia
I. Hypoxia
J. Infection, especially Meningitis
K. Myocardial Ischemia / Infarction
L. Pulmonary Embolism
M. Psychiatric
N. Seizure
O. Shock
P. Stroke, Intracranial Bleeding
Q. Toxic Ingestion

** Causes of Altered Level of Consciousness or Altered Mental Status may be from conditions not listed. Proper assessment and supportive care should not be limited to the following. **

A. **Anemia**
1. Assess/ treat supportively.

B. **Drugs and Alcohol**
1. Alcohol
   a. Although alcohol is a common cause of altered level of consciousness, it is rarely the cause of complete unresponsiveness. Do not let the patient's alcohol intoxication cloud your judgment. It is safer to assume that the intoxicated patient has a serious medical problem and treat accordingly than it is to conclude that the patient is "just drunk."
   b. Refer to M411 for treatment.
2. Narcotics
   a. Assess for signs of a possible narcotic overdose such as: pinpoint pupils, slow respirations, needle tracks or injection paraphernalia nearby.
   b. For suspicion of narcotic overdose refer to M411.
3. Other Drugs
   a. Attempt to obtain the type of exposure for the patient; maintain provider safety.
   b. Refer to M411 for treatment.

C. **Dysrhythmia**
1. Assess patient for abnormal pulse/perfusion.

MEDIC

2. Place patient on cardiac monitor.
3. Syncope / Pre-Syncope Patients
   a. Obtain 12-Lead EKG
   b. Assess for:
      i. Evidence of QT prolongation (generally over 500ms)
      ii. Delta waves
      iii. Brugada syndrome (incomplete RBBB pattern in V1/V2 with ST segment elevation)
      iv. Hypertrophic obstructive cardiomyopathy
4. Ongoing ALOC/AMS Patients
   a. Obtain 12 Lead EKG if other cause not determined for ongoing Altered LOC.

b. Consider even in presence of other cause based on presentation / history.

5. If dysrhythmia or cardiovascular issues present proceed to appropriate Treatment Protocol.

ALL

D. **Electrolyte Imbalance**
   1. Assess for dysrhythmias and treat as appropriate.

E. **Head Injury**
   1. If suspicion of head injury refer to S501, P613 and/or SB210 for treatment.

F. **Hypertension**
   1. Symptomatic HTN (BP systolic >200 and one of the following: headache, confusion, vomiting, blurred vision, chest pain, respiratory difficulty) should not be treated for the blood pressure the pre-hospital setting.
      a. Treat patient symptoms (vomiting, chest pain, respiratory difficulty, seizures, etc.) per the appropriate protocol.
      b. Assess Patient for Stroke (CVA/TIA) Symptoms; assess Blood Pressure in opposite arm of initial reading.
      c. If positive for Stroke Symptoms, refer M414 Stroke (CVA/TIA) protocol for treatment.

G. **Hyperglycemia**
   1. Glucose Level is greater 400 mg/dL or glucometer reads "HIGH".
   2. Refer to M406 or P608 for treatment.

H. **Hypoglycemia**
   1. Glucose Level is less than 60 mg/dL or glucometer reads "LOW".
   2. If unable to assay Glucose Level but history leads to suspicion of hypoglycemia as cause of Altered Mental Status refer to M406 or P608 for treatment.
   3. Refer to M406 or P608 Hyper/Hypoglycemic Protocol for treatment.

I. **Hypoxia**
   1. Administer oxygen to correct hypoxia <95%.
   2. Refer to SB202 for treatment.
   3. Consider alternate causes of Hypoxia including Carbon Monoxide poisoning.

J. **Infection, especially meningitis**
   1. Assess for fever, if capable.
   2. Utilize appropriate level of PPE for all patients/providers/bystanders.

K. **Myocardial Ischemia / Infarction**
   1. ALOC/AMS may be a symptom of an Acute Cardiac Event (such as Myocardial Infarction – STEMI or Non-STEMI) even if patient does not present with "Chest Pain." On suspicion of myocardial ischemia / infarction Refer to the M400 and perform 12 Lead EKG as soon as possible (MEDIC).
   2. Groups with Atypical AMI Presentations:
      a. Elderly
      b. Females
      c. Diabetics
      d. Chronically Hypertensive Patients

L. **Pulmonary Embolism**
   1. Treat patient supportively, including oxygenation.
   2. Limit fluid administration as possible

M. **Psychiatric**
   1. Rule out medical cause for ALOC/AMS using differential diagnosis.
   2. For medically stable patients manifesting unusual behavior including violence, aggression, altered affect, or psychosis refer to M407 for treatment.

N. **Seizure**
   1. Patient suspected to have had grand mal seizure based upon description of eyewitnesses, incontinence of urine or stool, or history of previous seizures.
   2. Patient may or may not have current seizure activity.
   3. Refer to M410 Seizure Protocol for treatment.

O. **Shock**
1. Identify possible causes of shock and treat via appropriate protocols.
    a. Hemorrhagic Shock refer to S500 or P614 for treatment.
    b. Cardiogenic Shock refer to M401 for treatment.
    c. Anaphylactic Shock (Allergic Reaction) refer to M409 or P609

P. **Stroke, Intracranial Bleeding**
1. Patient may NOT have altered level of consciousness.
2. Refer to M414 Stroke Protocol for treatment.

Q. **Toxins**
1. Refer to M411 Toxicological Emergencies Protocol.

ALL

I. **INCLUSION CRITERIA**
- A. Patients of any age.
- B. Patient complains of severe/worsening shortness of breath.
- C. Patient has a past medical history of Asthma, Emphysema, or COPD.
- D. Patient may be prescribed inhaler and/or other respiratory medications.
- E. Lung exam has stridor, rales, wheezing, decreased breath sounds, or poor air exchange.
- F. Pale, cyanotic, or flushed skin.
- G. Use of accessory muscles of respiration.
- H. MAY have retractions, nasal flaring, rapid respiratory rate (greater than 24), or pursed lip breathing.
- I. Tripod/positional breathing.
- J. Inability to speak in full sentences.
- K. Restlessness or anxiety.
- L. Altered/decreased mental status.
- M. MAY have jugular venous distention or peripheral edema.
- N. May have symptoms of Epiglottitis or Croup.

MEDIC

- O. If EKG findings are other than normal sinus rhythm, sinus tachycardia, or atrial fibrillation with controlled ventricular response, proceed to appropriate arrhythmia protocol.

ALL

II. PROTOCOL
- A. Maintain airway and administer oxygen to correct hypoxia <95%.
- B. If the patient is in impending respiratory failure, follow the T705 Airway Protocol.
- C. Allow patient to sit up in a position of comfort.
- D. Apply cardiac monitor, if available.
- E. Obtain a 12-lead EKG, if available.
- F. Consider early application of ETCO2 monitoring.

EMT

- G. If available, request ALS back-up for:
  1. Adult patient with pulse greater than120 and respiratory rate greater than 24.
  2. Patients less than 16 years old, with respiratory rate greater than 50 or who have wheezing, grunting, retractions, stridor and/or any other sign of respiratory distress.
  3. Patient who doesn't have a prescribed inhaler and the transport time is greater than 30 minutes.

ALL

- H. Consider CPAP (Protocol T709).
- I. Monitor Vital Signs.

MEDIC

- J. Establish IV access.

ALL

- K. If the patient has chest pain suggestive of cardiac origin, dyspnea, no evidence of trauma, AND
  1. Systolic blood pressure of less than 80 mm Hg, OR
  2. Systolic blood pressure of 80-100 mm Hg and a pulse greater than 120, skin changes suggestive of shock, or altered mental status,
  3. GO TO THE CARDIOGENIC SHOCK PROTOCOL M401.
- L. If the patient has a dysrhythmia,
  1. GO TO THE APPROPRIATE DYSRYTHMIA PROTOCOL.
- M. If the patient is unable to speak because of an airway obstruction or has a history suggestive of foreign body aspiration, i.e., sudden shortness of breath while eating, OR
  1. If the patient exhibits stridor lung sounds,
  2. GO TO THE OBSTRUCTION OR STRIDOR PROTOCOL M402 or P606.
- N. If the patient has a history of Asthma, Emphysema or COPD, AND complains of a worsening shortness of breath,
  1. GO TO THE ASTHMA – COPD PROTOCOL M403 or P607.
- O. If the patient has a history of heart disease, a respiratory rate greater than 24 and a systolic blood pressure greater than 100 mm HG.
  1. GO TO THE CONGESTIVE HEART FAILURE – CHF PROTOCOL M404
- P. If the patient has hives, itching or swelling
  1. GO TO THE ALLERGIC REACTION/ ANAPHYLAXIS PROTOCOL M409 OR P609

Q. If Pneumothorax is suspected be aware that this can develop into a Tension Pneumothorax.
1. GO TO THE TENSION PNEUMOTHORAX DECOMPRESSION PROTOCOL T701.

NOTES:

A. When attempting to differentiate between COPD and congestive heart failure, the medication history will usually give more valuable information than the physical exam.

B. Do not withhold high concentrations of oxygen from the COPD patient if oxygen is needed. The risks of oxygen therapy in these patients are usually overemphasized. Any rise in PCO2, which may occur is frequently more than offset by the beneficial effects of increased oxygen delivery to the tissue.

C. Transport to the hospital should be initiated immediately if the patient's airway is compromised or the patient needs advanced airway management. Otherwise, transport should be initiated as soon as possible taking into account the time required to begin pharmacologic therapy.

D. **Transport to the closest hospital if you are unable to open or maintain the airway.**

SB203	SYMPTOM BASED CHEST PAIN	SB203
Last Modified: 2020	Academy of Medicine of Cincinnati – Protocols for SW Ohio Prehospital Care Clinical Practice Guidelines	2023

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. Patient complains of discomfort that may be suggestive of cardiac origin.
C. Patient has a complaint that may be suggestive of pleuritic or of respiratory origin.
D. Patient has a complaint that may be of musculoskeletal origin.

II. DIFFERENTIAL DIAGNOSIS

A. Acute Coronary Syndrome
B. Dysrhythmias
C. Musculoskeletal complaints
D. Respiratory complaints
E. Gastrointestinal complaints

III. GENERAL CHEST PAIN ASSESSMENT

A. Provide care in a calm and reassuring manner.
B. Place the patient in a position of comfort.
C. Obtain a focused history and physical. If there is the complaint of chest pain, the history should include: onset, provoking factors, quality, radiation, severity, time, and pertinent negatives.
D. Maintain airway and administer oxygen to correct hypoxia <95%.
E. Patients who have a suspected diagnosis of Acute Coronary Syndrome should be treated utilizing the ACS Protocol M400.

EMT

F. If no Paramedic available, obtain12 Lead EKG (if available and appropriately trained) and transmit to receiving hospital.

MEDIC

G. Place the patient on a cardiac monitor. If the rhythm is not of sinus origin (between 60-140) go to the appropriate Dysrhythmia Protocol.
H. Obtain a 12-Lead EKG and transmit if appropriate.

ALL

NOTES:

A. Patients who have a suspected diagnosis of musculoskeletal chest wall pain should be treated utilizing the most appropriate related General Medical SB200 and/or Trauma Protocol SB210.
B. Patients who have chest discomfort related to a respiratory pathology should be managed utilizing the Respiratory Distress Protocol SB202.
C. Patients who have chest discomfort related to a gastrointestinal pathology should be managed utilizing the most appropriate related General Medical Protocol SB200.

ALL

I. INCLUSION CRITERIA

A. Patient of any age (except newborn)
B. No pulse

II. DIFFERENTIAL DIAGNOSIS (H'S AND T'S)

A. Potential causes should be considered and treated via the appropriate protocol simultaneously with Cardiac Arrest:
   1. Hypovolemia
   2. Hypoxia
   3. Hydrogen Ion (Acidosis)
   4. Hypo/Hyperkalemia
   5. Hypothermia
   6. Toxins (Drug Overdose)
   7. Tamponade (Cardiac)
   8. Tension Pneumothorax
   9. Thrombus (Cardiac or Pulmonary)
   10. Trauma

III. PROTOCOL

A. If Traumatic Cardiac Arrest, go to Protocol C308.
B. Initiate high-quality CPR with minimal interruptions.
   1. Begin the performance of 5 cycles (approximately 2 minutes) of CPR.
   2. Ensure that high-quality CPR is being performed with adequate compressions.
      a. Rotate compressors every 2 minutes to maintain high quality compressions.
      b. Push hard (>2 inches in adults, or >1/3 chest diameter in pediatrics)
      c. Push fast (100-120/minute)
      d. Allow for chest recoil with each compression.
      e. Minimize interruptions in compressions.
C. Provide good ventilations.
   1. Manage the airway per Protocol T705.
   2. Ventilate SLOWLY with each breath over 1 second.
   3. Monitor End Tidal CO2 throughout care
   4. Use supplemental oxygen flow rate >10 L/minute when available.
   5. Avoid excessive ventilations.
   6. Give a sufficient tidal volume to produce visible chest rise.
D. Without an Advanced Airway, ventilations may be performed either:
   1. Adults: 30:2 ratio with compressions, OR asynchronous to compressions at 10/minute
   2. Pediatrics: 15:2 ratio with compressions (30:2 if only one rescuer)
E. Upon placement of an Advanced Airway, compressions may occur without pauses for ventilation.
   1. Ventilate at 10/minute. *See Note E.
F. Continue resuscitation in 2-minute cycles of CPR, brief pulse/rhythm check, and defibrillation (if indicated) until either Return of Spontaneous Circulation occurs, or Termination of Resuscitation criteria are met.
G. Do not delay the use of an AED or Defibrillator. Use them as soon as they are available.

EMT

H. If available, request ALS back-up.
I. Apply AED and follow audio instructions.
J. If "Deliver Shock" is advised at any time by the AED, clear all people from the patient and shock.
   1. Immediately resume CPR for 2 minutes before another pulse or rhythm check is performed.
   2. Continue providing CPR per SB204 and following AED Instructions until transport or ALS care arrives.
   3. Refer to age-appropriate VF/VT Protocol C300 or P601 for additional information.
K. If "No shock" is advised, check pulse.
   1. If pulse is present, assess patient and provide post-ROSC care.
   2. If pulse is absent:
      a. Immediately resume CPR for 2 minutes before another pulse or rhythm check is performed.

b. Continue providing CPR per SB204 and following AED Instructions until transport or ALS care arrives.
c. Refer to age-appropriate PEA/Asystole Protocol C301 or P602 for additional information.

L. Special Transport Considerations
1. BLS transport unit on the scene with ALS resources responding, but not yet on the scene.
a. Continue care as outlined in protocol.
b. If ALS resources will be delayed more than 10 minutes, proceed with transport, and arrange to intercept the ALS unit, if possible.
2. No ALS resources responding or available.
a. Continue care as outlined in protocol.
b. Perform at least 10 cycles of CPR (20 minutes) on scene before moving to BLS transport unit.

M. If the patient has been successfully defibrillated (has a pulse) and then re-arrests, continue with rhythm analysis and follow directions of the AED for "Deliver Shock" or "No Shock" advisories.

N. The AED is to remain attached to the patient and left in the "on" position during the entire management of the patient, unless stated otherwise by the manufacturer's instructions.

MEDIC

O. Apply quick look paddles or pads if not already monitored. Do this IMMEDIATELY if arrest is witnessed by EMS or bystander CPR is in progress upon arrival.

P. Establish vascular access while continuing CPR and rhythm specific care.
1. IV access is preferred, and it is recommended to attempt IV access for drug administration.
2. IO access should be attempted if IV access is unsuccessful OR not feasible.

Q. During rhythm specific care, perform CPR for 2 minutes before another pulse or rhythm check is done.
1. Continue cycles of CPR throughout treatment.
2. Chest compressions should be interrupted for as short of a time period as possible.
3. Conduct brief pulse/rhythm checks after every cycle.
4. Deliver defibrillations at end of every cycle if rhythm remains shockable.
5. Defibrillators should be charged during CPR, with defibrillation delivered only when safe.

R. If VF/VT, proceed to age-appropriate VF/VT Protocol C300 or P601.

S. If PEA/Asystole, proceed to age-appropriate PEA/Asystole Protocol C301 or P602.

ALL

NOTES:

A. For High Quality CPR:
1. The 5 components of high-quality CPR are:
a. Ensuring chest compressions of adequate rate
b. Ensuring chest compressions of adequate depth
c. Allowing full chest recoil between compressions
d. Minimizing interruptions in chest compressions
e. Avoiding excessive ventilation
2. In order to maintain high quality compressions, the person doing compressions should consider change with either every 2-minute cycle or when end tidal CO2 goes down.

B. Given the time-sensitive nature of cardiac arrest, treatment is most effective when performed ON SCENE. Except when noted in this protocol, transportation to an Emergency Department should be delayed.

C. Whenever possible, provide family members with the option of being present during resuscitation.
1. If the presence of family members creates undue staff stress or is considered detrimental to the resuscitation, then family members should be respectfully asked to leave.

D. Literature indicates that the use of a mechanical "thumper" is not superior to high quality compressions by a sufficient number of rescuers.

E. When performing CPR in infants and children with an advanced airway, it may be reasonable to target a respiratory rate range of 1 breath every 2–3 s (20–30 breaths/min), accounting for age and clinical condition. Rates exceeding these recommendations may compromise hemodynamics.
1. This is based on one small, multicenter observational study of intubated pediatric patients found that ventilation rates (at least 30 breaths/min in children less than 1 year of age, at least

25 breaths/min in older children) were associated with improved rates of ROSC and survival.[1] However, increasing ventilation rates are associated with decreased systolic blood pressure in children. The optimum ventilation rate during continuous chest compressions in children with an advanced airway is based on limited data and requires further study.

MEDIC

F. In the setting of adrenal insufficiency, resuscitation efforts may be unsuccessful without the administration of steroids. See M417.

G. In the setting of hypothermia:
   1. Continue CPR
   2. Temperature < 30°C (86°F)
      a. Only administer one round of ACLS drugs.
      b. No more than three defibrillations
   3. Temperature 30 - 35°C (86 - 95°F)
      a. Double the interval of time between drug dosing
      b. Defibrillate normally

[1] Sutton RM, Reeder RW, Landis WP, Meert KL, Yates AR, Morgan RW, Berger JT, Newth CJ, Carcillo JA, McQuillen PS, Harrison RE, Moler FW, Pollack MM, Carpenter TC, Notterman DA, Holubkov R, Dean JM, Nadkarni VM, Berg RA; Eunice Kennedy Shriver National Institute of Child Health and Human Development Collaborative Pediatric Critical Care Research Network (CPCCRN). Ventilation Rates and Pediatric In-Hospital Cardiac Arrest Survival Outcomes. Crit Care Med. 2019;47:1627–1636. doi: 10.1097/CCM.0000000000003898

ALL

I. PURPOSE

A. Hypotension (low blood pressure) is a condition that if not addressed can lead to circulatory shock, a state of inadequate tissue perfusion. Shock can cause multi-organ failure and eventually death. There are four main categories of shock, and they have specific causes:
   1. Hypovolemic shock can be caused by blood loss (hemorrhage), third spacing of fluid (pancreatitis, ascites), or fluid loss (vomiting, diarrhea, burns, sweating).
   2. Cardiogenic shock can be secondary to myocardial infarction, arrhythmias, valvular disease, or cardiomyopathy.
   3. Obstructive shock is caused by pulmonary embolism, pericardial tamponade, or tension pneumothorax.
   4. Distributive shock by sepsis, anaphylaxis, neurogenic or adrenal crisis.

B. Hypotension Caveats
   1. Not all hypotension will lead to shock and not all hypotension needs to be treated in the field.
   2. Allowing a patient to have hypotension during resuscitation has been shown to improve outcome in some forms of trauma.
   3. Not all forms of hypotension can be treated with fluids, and some may be made worse with fluid administration.
   4. Level of consciousness and pulse character and/or presence can help determine if the patient is hypotensive or in shock.
   5. If the patient is thought to be in shock and the cause is known, then the appropriate treatment should be started.
   6. In an adrenal insufficiency patient, hypotension/shock can be signs of adrenal crisis. See M417.

II. TREATMENT OF HYPOTENSION DEPENDS ON THE TYPE AND WHETHER SHOCK IS PRESENT OR NOT

A. **Hypovolemic shock** (see S500 or P614 Hemorrhagic Shock with/without suspected head injury)
   1. With ongoing bleeding, should be treated if the mental status deteriorates (in the absence of head trauma) or the pulse is lost.
   2. Without bleeding or with controlled bleeding (fluid loss secondary to vomiting, >20% burns or amputation with a tourniquet in place) shock can be treated with crystalloid, colloid, or blood products. Elevating the legs can predict whether the blood pressure will respond to fluids. If the pressure increases, then fluids can be given as a bolus.

B. **Cardiogenic shock** – (see M401 Cardiogenic Shock)
   1. Treat with vasopressor drugs such as push dose epinephrine. The dose should be titrated to clinical effect. These agents increase blood pressure (increase heart rate, contractility, and systemic vascular resistance) but also increase the risk for tachyarrhythmias.

C. **Obstructive shock** from cardiac tamponade or pulmonary embolus may respond to a fluid bolus but the underlying cause must be addressed. Push dose epinephrine may maintain blood pressure but are not ideal drugs for this condition.

D. **Distributive shock** from anaphylaxis (see M409 or P609 Anaphylaxis Protocol), neurogenic, or septic shock can be treated with a fluid bolus and then push dose epinephrine.
   1. Septic shock (see M419 Sepsis) is the most common type of distributive shock and one of the most common types of shock overall. Sepsis is a deadly condition caused by a body's response to infection. It is critical for providers to suspect the presence of sepsis in any patient who is at high risk for infection regardless of vital signs. Patients may be in septic shock with a normal blood pressure. The key to improve patient outcomes in septic shock is early recognition of sepsis, IV fluid resuscitation, O_2 therapy, and alerting the receiving hospital staff.
   2. Septic shock is very difficult to identify. Systemic Inflammatory Response Syndrome (SIRS) criteria can be used to help identify patients before hypotension develops:
      a. Temp >38°C (100.4°F) or < 36°C (96.8°F)
      b. Elevated Heart Rate
      c. Elevated Respiratory Rate or PaCO2 < 32 mm Hg

MEDIC

III. PUSH DOSE EPINEPHRINE

A. All ages.
B. See mixing recommendations below.
C. Dose:
   1. 0.5-2 ml of a 10mcg/ml solution every 2-5 minutes (5-20 mcg)
   2. Pediatric-1mcg/kg of 10mcg/ml solution every 2-5 minutes (Max of 20mcg every 2-4 min)

NOTES:

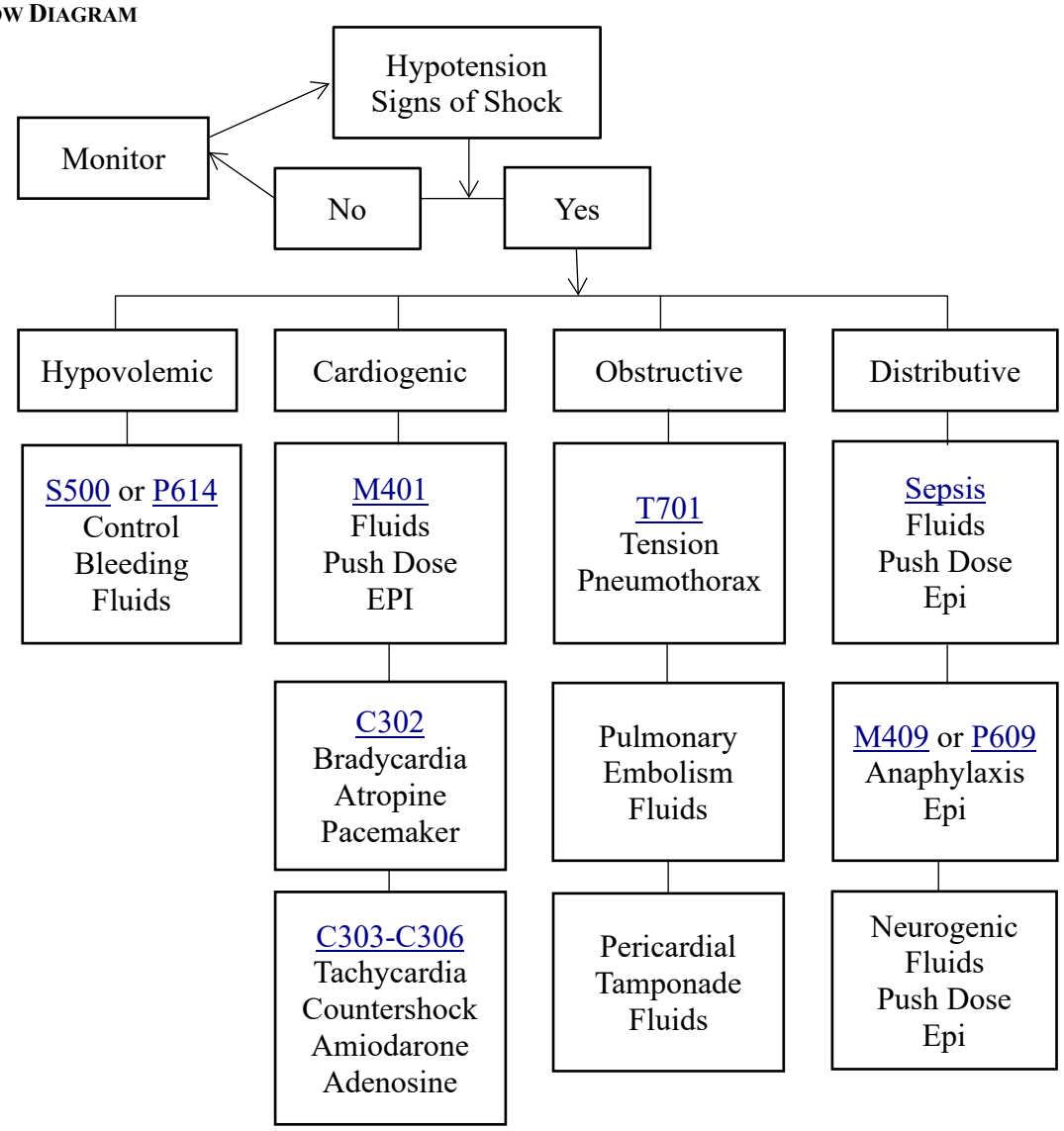
MIXING PUSH DOSE EPINEPHRINE

A. Method 1
   1. Take a 10 ml syringe with 9 ml of normal saline.
   2. Into this syringe, draw up 1 ml of epinephrine (0.1 mg/mL)
      a. This can be drawn up using a needle or stopcock.
   3. Now you have 10 mls of Epinephrine 10 mcg/ml.

B. Method 2
   1. Withdraw 10ml of normal saline from a 100 ml bag and discard.
   2. Inject 1 mg of epinephrine (0.1 mg/mL) into 100ml bag of normal saline.
   3. Withdraw 10 ml of solution.
   4. Now you have 10 mls of Epinephrine 10 mcg/ml.

C. Method 3
   1. Inject 1ml of 1 mg/ml epinephrine into 100ml normal saline.
   2. Withdraw 10 ml of solution.
   3. Now you have 10 mls of Epinephrine 10 mcg/ml.

FLOW DIAGRAM



ALL

I. INTRODUCTION

A. The goal of any trauma patient assessment and transportation guideline is to facilitate "whatever gets the patient to the most appropriate level of care in the most expeditious manner." There is strong evidence that shows that reducing the time interval from the moment of injury to delivery/arrival at a definitive care site will reduce morbidity and mortality.

B. These guidelines were developed to assist the emergency responder to determine what constitutes a trauma patient and where to transport the trauma patient.

C. In the prehospital care environment, time, distance, patient condition, and level of care are important variables when making decisions for transporting the trauma patient. These variables are frequently hard to assess in the field and are ever changing. These guidelines are meant to supplement, but not replace the judgment of the on-scene Medic/EMT.

D. *The Tri-state Trauma Coalition encourages all Fire and EMS Agencies and their personnel to review the Trauma Patient Assessment and Transportation guidelines on an annual basis.*

E. *The Ohio Prehospital Trauma Triage Decision Tree SB214 may be used as an aide in determining the appropriate facility for the patient.*

II. CONCEPTS

A. Rapid field evaluation, treatment, and transport are vital to the overall outcome of the trauma patient. After the trauma patient's extrication, the on-scene time should be limited to TEN MINUTES or less, except when there are extenuating circumstances.

B. Trauma Center means a facility with a current A.C.S. verification certificate, or a hospital meeting A.C.S. guidelines with a known A.C.S. verification in process. *

C. Use of on-line, active medical control for medical direction in the field, particularly for difficult cases, is encouraged.

A. Pre-arrival notification of the receiving facility is essential! **Use EXACT phrase "Trauma Alert"**

III. TRAUMA CENTER\ FACILITY CAPABILITIES: The Regional Trauma Plan is an inclusive model that integrates the resources of all facilities throughout the region in providing care to the severely injured trauma patient.

A. Level I and II Trauma Centers offer the same level of care for the incoming trauma patient and may be used interchangeably.

B. Level III Trauma Centers offer services, based on individual hospital resources that provide for initial assessment, resuscitation, and stabilization, which may include emergency surgery, for the trauma patient.

1. The Level III Trauma Center will have established Transfer Agreements with the NEAREST Level I and II Trauma Centers in the region.
2. In the areas of the region where the Level III Trauma Center is the only verified trauma facility, (within 30 minutes ground transport time), this hospital will act as the primary receiving facility for the critically injured patient.
3. *In areas where the trauma patient is in close proximity to a Level III trauma center and a Level I or II trauma center is still within the 30 minute transport guidelines established in this document, the EMS Provider should exercise professional judgment as to whether the patient would benefit more from an immediate evaluation and stabilization at the proximate Level III trauma center or from direct transport by ground EMS Provider or air to the Level I or II trauma center.*

C. Other general acute care hospitals not verified\designated as Trauma Centers, but having 24- hour Emergency Department capabilities, can and should be used in certain situations to stabilize the "critically injured" trauma patient. In areas of the region where there are no verified Trauma Centers (within 30-minute ground transport time) the general acute care hospital will act as the primary receiving facility for all critically injured trauma patients. (See air medical utilization guidelines).

D. *The general acute care hospital will have established Transfer Agreements with the NEAREST Level I and II Trauma Centers in the Region*

E. The pediatric trauma patient should be transported to the NEAREST Pediatric Trauma Center!

F. All pregnant trauma patients should be transported to the NEAREST Adult Trauma Center regardless of where they are supposed to deliver.

IV. USE OF GUIDELINES

A. Determine if the patient qualifies as a trauma patient.
   1. Note the differences in inclusion criteria for Pediatric (younger than 16 years) Adult (16-65 yrs.), and Geriatric (greater than 65 yrs.).
B. Determine where and how the trauma patient is to be transported.
C. Go to the appropriate facility.

V. HOSPITAL / INTER-HOSPITAL TRANSFER OF TRAUMA PATIENTS

A. Written protocols and agreements between facilities for transport/transfer of trauma patients are required.
B. EMS and local facility should have active discussion regarding each other's capabilities.
C. The ED Capability Study may be used as a resource.
D. The Division of EMS posts on the Internet the list of trauma centers recognized by the Ohio Department of Public Safety and the Ohio Department of Health

VI. EXCEPTIONS:

A. Emergency medical service personnel shall transport a trauma victim, directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:
   1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center.
   2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time.
   3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources.
   4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay.
   5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

NOTES:

A. If the state trauma triage protocols are amended to include criteria that do not appear in a region's (or organization's) protocols, such amendments will automatically be applied to the region's protocols until such time as the region amends their protocols.
B. The American College of Surgeons (ACS) Trauma Center Verification guidelines describe a range of clinical services that might be offered by Level II and level III trauma centers (for example – Level III trauma centers are not required to have neurosurgery or thoracic surgery, although a number of Level III centers may have these clinical services available). Information on how to obtain a copy of the Resources for Optimal Care of the Injured Patient: 2014 (ACS trauma center standards) can be found at https://www.facs.org/quality-programs/trauma/tqp/center-programs/vrc/resources.
C. Protocol SB214 is a document that EMS providers may find helpful with deciding who needs to be transported directly to a trauma center.

ALL

I. EVALUATION OF THE ADULT TRAUMA PATIENT - ANY OF THESE CONSTITUTE A "TRAUMA PATIENT"

A. AGE 16 TO 64 YEARS

B. PHYSIOLOGICAL CRITERIA

1. Significant signs of shock or evidence of poor perfusion (cold, clammy, decreased mental status, weak pulse, pallor) or:
   a. Pulse greater than 120 or less than 50 or
   b. Systolic blood pressure (SBP) less than 90
   c. Absence of radial pulse when carotid pulse is present or change in pulse character.
   d. Geriatric patients (>65 years old) may be in shock with a SBP less than 110.
2. Airway or Breathing Difficulties or evidence of respiratory distress or failure.
   a. Respiratory rate of less than10 or greater than 29
   b. Need for ventilator support.
3. Neurologic Considerations
   a. Evidence of Head Injury
      i. GCS scale ≤ 13 or AVPU scale that does not respond to Pain or Unresponsive.
      ii. Alteration in LOC during examination or thereafter; loss of conscious > 5 min.
      iii. Failure to localize pain.
   b. Suspected spinal cord injury (paralysis due to an acute injury, sensory loss)

C. ANATOMIC CRITERIA

1. Penetrating trauma (to head, chest or abdomen, neck, and extremities proximal to knee or elbow)
2. Injuries to the extremities where the following physical findings are present:
   a. Amputations proximal to the wrist or ankle
   b. Visible crush injury
   c. Fractures of two or more proximal long bones
   d. Evidence of neurovascular compromise
3. Tension pneumothorax that is relieved (an unrelieved tension pneumothorax would fit the definition of an unstable ABC needing immediate treatment at the closest ER)
4. Injuries to the head, neck, or torso where the following physical findings are present:
   a. Visible crush injury
   b. Abdominal tenderness, distention, or seat belt sign
   c. Suspicion of a Pelvic fracture
   d. Flail chest
   e. Open skull fracture
5. Signs or symptoms of spinal cord injury.
6. Submersion Injuries, Strangulation & Asphyxia
7. Second degree or third degree burns greater than ten percent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.

D. OTHER CRITERIA/CONSIDERATIONS THAT ALONE DO NOT CONSTITUTE A TRAUMA PATIENT

1. Significant Mechanisms of Injury Should Prompt a High Index of Suspicion
   a. ATV/Motorcycle crashes
   b. Significant Falls- 20'
   c. High Risk Auto crash
   d. MVC Ejection.
   e. Death in same compartment.
   f. Auto vs. pedestrian/bicycle thrown, ran over, > 20mph.
   g. Vehicle telemetry data consistent with high risk of injury.
2. Age greater than 65 Should Prompt a High Index of Suspicion
   a. See Geriatric Specific Inclusion Criteria listed in SB213 Geriatric Trauma Patients.
3. Anticoagulation and evidence of traumatic brain injury.
   i. GCS scale ≤ 13 or AVPU scale that does not respond to Pain or Unresponsive.
   ii. Alteration in LOC during examination or thereafter; loss of conscious > 5 min.
   iii. Failure to localize pain.

4. Pregnancy
    a. The best initial treatment of the fetus is the provision of optimal resuscitation of the mother (**babies don't do well if mothers don't do well**).
    b. Because of their increased intravascular volume, pregnant patients can lose a significant amount of blood before tachycardia, hypotension, and other signs of hypovolemia occur.
    c. The highest incidence of **fetal deaths occurs secondary to severe maternal shock**, which is associated with a fetal mortality rate of 80%.
    d. The fetus may be in distress and the placenta deprived of vital perfusion while the mother's condition and vital signs appear stable.
    e. Oxygen supplementation should be given to **maintain maternal oxygen saturation >95%** to ensure adequate fetal oxygenation.
    f. Because of their adverse effect on utero-placental perfusion, vasopressors in pregnant women should be used only for intractable hypotension that is unresponsive to fluid resuscitation.
    g. After mid-pregnancy, the gravid uterus should be moved off the inferior vena cava to increase venous return and cardiac output in the acutely injured pregnant woman. This may be achieved by **manual displacement of the uterus or left lateral tilt (30°)**. Care should be taken to secure the spinal cord when using left lateral tilt.
    h. Fetal loss can occur even when the mother has incurred no abdominal injuries.
    i. In a case-by-case analysis, severe injuries are MUCH more likely to result in fetal loss. However, because there is a much higher frequency of minor trauma during pregnancy most fetal losses due to trauma result from minor maternal injury mechanisms.
    j. Intubation is more difficult with failed intubations 8x more likely. **A smaller size ET Tube is recommended**.
    k. Insertion of **2 large bore IV's is recommended for all seriously injured pregnant trauma patients** to facilitate initial rapid crystalloid infusion, intravascular volume expansion, and possible further blood transfusion as required.
    l. **Avoid distractions** and avoid the urge to focus on the fetus.
    m. Every woman who sustains trauma should be questioned specifically about domestic or intimate partner violence.
    n. Call medical control if any questions. **Notify receiving hospital**.

II. TRANSPORTATION OF THE ADULT TRAUMA PATIENT

A. Ground Transportation Time Guidelines
    1. 30 minutes or less from a Trauma Center → TRAUMA CENTER (excluding uncontrolled airway or traumatic CPR)
    2. Greater than 30 minutes to a trauma center → may consider nearest appropriate facility.

B. Ground Transportation Guidelines
    1. Patients should be transported to the nearest appropriate facility if any of the following exists:
        a. Airway is unstable and cannot be controlled/managed by conventional methods
        b. Potential for unstable airway, i.e., (facial/upper torso burn)
        c. Blunt trauma arrest (no pulses or respirations) if indicated per C308.
        d. Patient does "NOT" meet criteria for a trauma patient as defined above.

        *** PRE-ARRIVAL NOTIFICATION OF THE RECEIVING FACILITY IS ESSENTIAL!!! ***

C. Air Medical Transportation
    1. General principles:
        a. Prolonged delays at the scene waiting for air medical transport should be avoided.
        b. If air medical transportation is unavailable (e.g., weather conditions), patient should be transported by ground guidelines as listed above.
        c. Air transport, if dispatched to the scene, should be diverted to the hospital if the patient appeared appropriate for air transport but the decision was made to transport to the nearest facility (non-trauma center) in the interim.
        d. Air Medical Programs share the responsibility to educate EMS units and facilities on appropriate triage. They should also institute an active utilization and quality review

program that provides feedback to EMS units.

e. Patients with uncontrolled ABCs should be taken to the closest appropriate facility (24-hour emergency department) if that can be achieved prior to the arrival of air medical transport.

f. Traumatic cardiac arrest due to blunt trauma is not appropriate for air transport.

2. Reasons to Consider a Call for Air Transport:
   a. Prolonged extrication
   b. Multiple victims/trauma patients
   c. Time/distance factors:
      i. If the transportation time to a trauma center by ground is greater than 30 minutes AND the transport time by ground to the nearest trauma center is greater than the total transport time** to a trauma center by helicopter.
      ii. **Total transport time includes any time at scene waiting for helicopter and transport time to trauma center.
      iii. In the rural environment, immediate transfer with severely traumatized patients by air medical transport may be appropriate and should be encouraged if it does not significantly delay intervention for immediate life-threatening injuries.

NOTES:

A. Exceptions to these Trauma Triage Guidelines are listed in the Trauma Patient Assessment and Transport Guidelines Protocol SB210 under Section VI. These same exceptions apply to pediatric, adult, and geriatric trauma patients.

ALL

I. EVALUATION OF THE PEDIATRIC TRAUMA PATIENT: AGE IS YOUNGER THAN 16 YEARS OLD

A. PHYSIOLOGICAL CRITERIA

1. Significant signs of shock or evidence of poor perfusion (cold, clammy, decreased mental status, weak pulse, pallor) or:
   a. Tachycardia or bradycardia
   b. Hypotension
2. Airway/Breathing difficulties; Evidence of respiratory distress or failure, including:
   a. Intubated patient
   b. Tachypnea
   c. Stridor
   d. Hoarse voice or difficulty speaking
   e. Significant grunting, retractions
   f. Respiratory rate less than 20 in infants less than 1 year old
   g. Cyanosis or need for supplemental oxygen.
   h. Unable to maintain or difficult airway.
3. Neurologic considerations
   a. Evidence of head injury
      i. Glasgow Coma Scale less than or equal to 13 or AVPU scale that does not respond to Pain or Unresponsive.
      ii. Alteration in LOC during examination or thereafter; loss of conscious greater than 5 minutes
      iii. Failure to localize pain.
   b. Suspected spinal cord injury (paralysis or alteration in sensation)

B. ANATOMIC CRITERIA

1. Penetrating trauma (to the head, chest or abdomen, neck, including groin and buttocks)
   a. GSW proximal to the knee and elbow.
2. Injuries to the extremities where the following physical findings are present:
   a. Amputations proximal to the wrist or ankle
   b. Visible crush injury
   c. Fractures of two or more proximal long bones
   d. Evidence of neurovascular compromise
3. Tension pneumothorax which is relieved (an unrelieved tension pneumothorax would fit the definition of an unstable ABC, needing immediate treatment at the closes ER)
4. Injuries to the head, neck or torso where the following physical findings are present:
   a. Visible crush injury
   b. Abdominal tenderness, distention, or seat belt sign
   c. Suspicion of a pelvic fracture.
   d. Flail chest
5. Signs or symptoms of spinal cord injury.
6. Submersion injury, Strangulation and Asphyxia.
7. Full thickness or partial thickness greater than ten percent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway. 1st degree burns are not calculated in TBSA.

C. OTHER CRITERIA/CONSIDERATIONS THAT ALONE DO NOT CONSTITUTE A PEDIATRIC TRAUMA PATIENT:

1. Significant mechanism of injury should prompt a high index of suspicion and should be considered in the evaluation. Mechanisms particularly dangerous for pediatric patients include:
   a. Improperly restrained child in MVC (airbag injuries included)
   b. ATV/Motorcycle crashes
   c. Significant Falls- 10' or 2 to 3 times body height
   d. High Risk Auto crash
   e. MVC with Ejection.

f. Death in same compartment.
g. Auto vs. pedestrian/bicycle thrown, ran over, greater than 20mph.
h. Vehicle telemetry data consistent with high risk of injury.

2. Special situations that may require the resources of a pediatric trauma center.
   a. Congenital defects
   b. Suspected Child Abuse
   c. Chronic respiratory illness
   d. Diabetes
   e. Bleeding disorder or anticoagulants
   f. Immuno-suppressed patients (i.e., patients with cancer, organ transplant patients, HIV/AIDS, long-term use of corticosteroids, etc.)

*****Pre-arrival notification to the receiving facility is essential! *****

II. TRANSPORTATION OF THE PEDIATRIC TRAUMA PATIENT:

A. Ground transportation guidelines – time considerations
   1. 30 minutes or less from a Pediatric Trauma Center (excluding uncontrolled airway or traumatic arrest): Transport to a Pediatric Trauma Center
   2. Greater than 30 minutes to a Pediatric Trauma Center: May consider transport to nearest appropriate facility.

B. Ground transportation guidelines
   1. Patients should be transported to the nearest appropriate facility if any of the following exists:
      a. Airway is unstable and cannot be controlled/managed by conventional methods.
      b. Potential for unstable airway, (i.e., facial/upper torso burn)
      c. Blunt trauma arrest (no pulses or respirations)
      d. Patient does NOT meet criteria for a trauma patient as defined above.

C. Air Medical Transportation
   1. General principles
      a. Prolonged delays at the scene waiting for air medical transport should be avoided.
      b. If air medical transportation is unavailable. (e.g., weather conditions), patient should be transported by ground guidelines as listed above.
      c. Air transport, if dispatched to the scene, should be diverted to the hospital if the patient appeared appropriate for air transport but the decision was made to transport to the nearest facility (non-trauma center) in the interim.
      d. Air Transport Programs share the responsibility to educate EMS units and facilities on program that provides feedback to EMS units.
      e. Patients with uncontrolled ABCs should be taken to the closest appropriate facility (24-hour emergency department) if that can be achieved prior to the arrival of air medical transport.
      f. Traumatic cardiac arrest due to blunt trauma is not appropriate for air transport.
   2. Reasons to consider a call for air transport:
      a. Prolonged extrication
      b. Multiple victims/trauma patients
      c. Time/distance factors:
      d. If the transportation time to a trauma center by ground is greater than 30 minutes AND the transport time by ground to the nearest trauma center is greater than the total transport time** to a trauma center by helicopter.
         i. **Total transport time includes any time at the scene waiting for a helicopter and transport time to the trauma center.
         ii. In the rural environment, immediate transfer with severely traumatized patients by air transport may be appropriate and should be encouraged if it does not significantly delay intervention for immediate life-threatening injuries.

NOTES:

A. Exceptions to these Trauma Triage Guidelines are listed in the Trauma Patient Assessment and Transport Guidelines Protocol SB210 under Section VI. These same exceptions apply to pediatric, adult, and geriatric trauma patients.

Age	Pulse Beats/min	Respirations Breaths/min	Avg. Systolic BP
Infant(1-12mo)	90-180	30-53	>70
Toddler (1-2 yrs)	80-140	22-37	>70
Preschool (3-5 yrs)	60-120	20-28	>80
School age (6-12 yrs)	58-118	18-25	>85
Adolescent (12+ years)	50-100	12-20	>90

SB213	GUIDELINE FOR ASSESSMENT/TRANSPORT OF GERIATRIC TRAUMA PATIENTS	SB213
Last Modified: 2019	Academy of Medicine of Cincinnati – Protocols for SW Ohio Prehospital Care Clinical Practice Guidelines	2023

ALL

I. TRAUMA PATIENTS GREATER THAN 65 YEARS OF AGE SHOULD BE DEFINED AS GERIATRIC TRAUMA.

A. The criteria listed below are in addition to the Adult Trauma Triage Guidelines. Geriatric trauma patients should be triaged for evaluation in a trauma center for:

1. Glasgow Coma Score less than or equal to 14 with known or suspected traumatic brain injury.
2. Systolic blood pressure less than 110 mmHg or pulse greater than 90.
3. Falls with from any height, including standing falls, with evidence of traumatic brain injury.
4. Pedestrian struck by motor vehicle.
5. Known or suspected proximal long bone fracture sustained in a motor vehicle crash.
6. Injury sustained in two or more body regions.
7. Anticoagulation and evidence of traumatic brain injury.
    a. GCS scale < 13 or AVPU scale that does not respond to Pain or Unresponsive.
    b. Alteration in LOC during examination or thereafter; loss of conscious > 5 min.
    c. Failure to localize pain.

NOTES:

A. Geriatric trauma patients should be given special consideration for evaluation at a trauma center if they have diabetes, cardiac disease, congestive heart failure, CVA, pulmonary disease (COPD), clotting disorder (including anticoagulants), immunosuppressive disorder (i.e., *HIV/AIDS, Organ Transplant, Chemotherapy, Long-term use of corticosteroids, etc),* or require dialysis.

B. The geriatric trauma recommendations were taken from the Geriatric Trauma Task Force report released in December of 2007 by the State of Ohio Board of Emergency Medical Services, Trauma Committee. The data used to make these recommendations came directly from the Ohio Trauma EMS Registry. Supplemental data from the CDC /MMWR Guidelines for Field Triage of Injured Patients, January 2012.

C. Exceptions to these Trauma Triage Guidelines are listed in the Trauma Patient Assessment and Transport Guidelines Protocol SB210 under Section VI. These same exceptions apply to pediatric, adult, and geriatric trauma patients.

PEDIATRIC (< 16 y/o)	ADULT (16-64 y/o)	GERIATRIC (≥ 65 y/o)
GCS ≤ 13 Failure to localize pain Altered level of consciousness Loss of consciousness > 5 min Poor perfusion Resp distress/failure	GCS ≤ 13 Failure to localize pain Altered level of consciousness Loss of consciousness > 5 min SBP < 90 Pulse < 50 or > 120 Resp < 10 or > 29 Tension pneumothorax Needs ventilatory support	GCS ≤ 13 or GCS ≤ 14 w/ TBI Failure to localize pain Altered level of consciousness Loss of consciousness > 5 min SBP < 110 Pulse < 50 or > 90 Resp < 10 or > 29 Tension pneumothorax Needs ventilatory support

NO

YES

Assess Anatomy of Injury (All ages)
-Penetrating injury to head, neck or torso
-Crush injury of head, neck or torso
-Open skull fracture
-Flail chest
-Abdominal tenderness, distention, or seatbelt sign
-Pelvic fracture
-Spinal cord injury
-Penetrating injury proximal to knee or elbow w/neurovascular compromise
-Amputation proximal to wrist or ankle
-Crush of arm or leg
-2 humerus and/or femur fractures
-Arm or leg injury with neurovascular compromise
-2° and 3° burn injury > than 10% TBSA (refer to S502)
-Significant burns of face/hands/feet/genitals/airway
-Drowning, near-drowning, strangulation, and asphyxia are defined as trauma and should be transported to a trauma center

Geriatrics (>65 y/o) only:
-MVC with 1 humerus or femur fracture
-Injury of 2 or more body regions

-Criteria developed for use by EMS personnel in the prehospital setting. Not intended to determine candidates for interfacility transfer.

**Special circumstances are additional factors to consider and shouldn't be the sole reason for triaging a patient to a trauma center.*

NO

YES

Transport to a Trauma Center

Consider Special Circumstances*
-Adult falls > 20 ft.
-Geriatric falls with TBI
-Pediatric falls > 10 ft. or 2-3 times patient height
-High-risk auto crash:
- Ejection
- Death in the same passenger compartment
- Vehicle telemetry data consistent with high risk of injury

-Auto vs. pedestrian/bicycle thrown, run over or with significant (>20 mph) impact
-Geriatric pedestrian struck
-Motorcycle crash >20 mph
-Co-morbid conditions
- Pregnancy
- Bleeding disorder or anticoagulants
- Dialysis
- Diabetes
- Immune system compromised

YES

NO

Transport per protocol

ALL

I. PURPOSE

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

B. Parents or guardians of minor children may refuse on behalf of a minor child but must meet capacity requirements for informed refusal and allow examination of the minor patient to allow for informed refusal. In the absence of a parent or guardian, a minor can be left in the care of a responsible adult such as family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, or another person. Contact medical control, if necessary, for assistance.

C. Legal guardians/caregivers of adult patients with proper documentation of medical power of attorney may also refuse care on behalf of adult patients if capacity requirements are met for the caregiver.

D. This protocol does NOT apply in mass casualty incidents.

II. PATIENT REFUSAL

A. If a patient (or the parent or legal guardian of the patient) refuses care and/or transport to a hospital after EMS have been called to the scene, EMS should determine the patient's capacity to make decisions. Competency is a legal definition that is determined by the court of law.

B. Assessment

1. Decision-Making Capacity
   a. A patient (or the parent or legal guardian of the patient) who is alert, oriented, and can understand the circumstances surrounding his/her illness or impairment, as well as the possible risks associated with refusing treatment and/or transport, typically is considered to have decision-making capacity.
   b. The patient's (or the parent or legal guardian of the patient) judgment must also not be significantly impaired by illness, injury, or drugs/alcohol intoxication. Individuals who have attempted suicide, verbalized suicidal intent, or had other factors that lead EMS to suspect suicidal intent, should not be regarded as having decision-making capacity and may not decline transport to a medical facility. It is highly recommended to discuss the best course of action with the police.
2. Treatment and Interventions
   a. Obtain a complete set of vital signs and complete an initial assessment, paying particular attention to the individual's neurologic and mental status.
   b. Determine the patient's capacity (or the parent or legal guardian of the patient) to make a valid judgment concerning the extent of his/her illness or injury; if EMS has doubts about whether the individual has the mental capacity to refuse or if the patient lacks capacity, EMS should contact medical control.
   c. If patient (or the parent or legal guardian of the patient) has capacity, clearly explain to the individual and all responsible parties the possible risks and overall concerns with regards to refusing care and that they may reengage the EMS system if needed.
   d. Perform appropriate medical care with the consent of the patient.
   e. Complete the patient care report, including patient refusal form, clearly documenting the initial assessment findings and the discussions with all involved individuals regarding the possible consequences of refusing additional prehospital care and/or transportation.
      i. Example: "The patient (or parent, guardian, Medical POA) currently has an emergency medical condition for which he/she is making an informed refusal of medical service/transportation AND is not impaired or incapacitated by any substance or medical/trauma condition which makes their medical decision making unreasonable."

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ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. Patient is unresponsive.
C. Patient is without a pulse (pulse should be checked for a maximum of 10 seconds, when in doubt start CPR).

II. AED Findings

A. Shock Advised

MEDIC

III. EKG FINDINGS

A. Ventricular fibrillation, or
B. Ventricular tachycardia without a pulse

ALL

IV. PROTOCOL

A. Continue CPR and care per SB204.

MEDIC

B. If rhythm is ventricular fibrillation or ventricular tachycardia, DEFIBRILLATE IMMEDIATELY AT 360 JOULES (biphasic equivalent or manufacturers' recommendation – see Notes) and immediately resume CPR.
C. Perform CPR for 2 minutes before another pulse or rhythm check is done.
D. Search for possible causes as listed in SB204.
E. Administer Epinephrine 1 mg (10 ml of 0.1 mg/mL) IV/IO push. Repeat every 3 to 5 minutes as long as arrest continues.
F. Administer Amiodarone 300 mg IV/IO push. Repeat Amiodarone 150 mg IV/IO push in 3 - 5 minutes if still in VF/VTach
   1. Lidocaine may be substituted as: Lidocaine 1.5 mg/kg IV/IO push. Repeat Lidocaine 0.5 to 0.75 mg/kg IV/IO in 3-5 minutes if still in VF/VTach
G. Recheck rhythm after each 2-minute cycle of CPR is complete and defibrillate at 360 Joules biphasic equivalent or manufacturers' recommendation *), if indicated.
H. If transporting, notify receiving hospital.
I. If return of spontaneous circulation is achieved, continue care per Protocol C307 (Post-Return of Spontaneous Circulation Care).
J. If rhythm changes to another rhythm, go to the appropriate protocol.

ALL

NOTES:

A. High Quality CPR (SB204) is considered the mainstay of therapy for Cardiac Arrest victims.
B. If a pulseless patient is found to have agonal or gasping-type respirations that have no pattern and occur very infrequently, the AED or quick-look paddles should be applied immediately.

MEDIC

A. Consider H's and T's (see SB204)
B. Endotracheal (ET) administration of drugs is acceptable but not preferable. Amiodarone cannot be given ET. ET administration is double the normal dose with 10 ml NS flush afterwards.
C. Medications given through a peripheral vein or IO should be followed by a 10 mL bolus of fluid.
D. Waveform End Tidal CO2, if available, should be routinely used in cardiac arrests.
E. An abrupt sustained increase in ETCO2 may indicate ROSC.
F. ETCO2 (<10) should prompt re-evaluation of endotracheal tube's correct placement, quality of compressions, or consideration that future treatment is futile.
G. "See-through CPR" monitor technology is still developing. It is recommended to continue compressions until scheduled pulse checks per ACLS.
H. Manufacturers' Recommendations (see owner's manual for programming instructions):
   1. Physio-Stryker –recommends 200-300-360J for Adult Dosing in increasing increments. However, local protocols and Medical Direction supersede their manufacture recommendations.
   2. Zoll – Defaults to biphasic defibrillation with increasing energy dosing at 120J, 150J, 200J. However, local protocols and Medical Direction supersede their manufacture recommendations.
   3. Phillips – recommends biphasic defibrillation at 150J for Adult Dosing. However, local protocols and Medical Direction supersede their manufacture recommendations

C301	ASYSTOLE – PULSELESS ELECTRICAL ACTIVITY (PEA)	C301
Last Modified: 2019	Academy of Medicine of Cincinnati – Protocols for SW Ohio Prehospital Care Clinical Practice Guidelines	2023

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. Patient is unresponsive.
C. Patient has no pulse (pulse should be checked for a maximum of 10 seconds, when in doubt start CPR).

II. AED FINDINGS

A. No shock advised.

MEDIC

III. EKG FINDINGS

A. Organized cardiac rhythm with QRS complexes indicating PEA, or
B. Asystole on the cardiac monitor in two or more leads.

ALL

IV. PROTOCOL

A. Continue CPR and care per SB204.

MEDIC

B. Administer Epinephrine 1 mg (10 ml of 0.1 mg/mL) IV/IO push.
   1. Repeat every 3 to 5 minutes as long as cardiac arrest continues.
C. Search for possible causes of Asystole/PEA as listed in SB204.
D. Consider the following:
   1. In the setting of renal failure/ESRD, consider management of hyperkalemia early in resuscitation. See protocol M418.
   2. For preexisting metabolic acidosis or tricyclic antidepressant overdose, administer sodium bicarbonate 1 mEq/kg IV/IO push.
   3. For hypovolemic arrest, administer 1-liter normal saline bolus. Chilled saline may be used if available.
   4. For suspected pneumothorax, perform needle thoracostomy.
E. After 30 minutes, consider termination of resuscitative efforts as detailed in the Determination of Death / Discontinuance of Resuscitation protocol .
F. If transporting, notify receiving hospital.
G. If return of spontaneous circulation is achieved, continue care per Protocol Post-Return of Spontaneous Circulation Care C307.

If rhythm changes to another rhythm, go to the appropriate protocol

ALL

NOTES:

A. High Quality CPR (SB204) is considered the mainstay of therapy for Cardiac Arrest victims.
B. A main cause of PEA is hypoxia, and the effectiveness of ventilation should be evaluated constantly.

MEDIC

C. Consider H's and T's (see SB204)
D. Endotracheal (ET) administration of drugs is acceptable but not preferable. ET administration is double the normal dose with 10 ml NS flush afterwards.
E. Medications given through a peripheral vein or IO should be followed by a 10 mL bolus of fluid.
F. Waveform End Tidal CO2 if available should be routinely used in Cardiac Arrests.
G. An abrupt sustained increase in ETCO2 may indicate ROSC.
H. ETCO2 (<10) should prompt re-evaluation of endotracheal tube's correct placement, quality of compressions or consideration that future treatment is futile.
I. "See-through CPR" monitor technology is still developing. It is recommended to continue compressions until scheduled pulse checks per ACLS.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. Chest pain, shortness of breath or inability to give history due to alteration in level of consciousness, which is thought to be related to the slow heart rate.
C. Pulse rate less than 60.
D. Systolic blood pressure less than 80 mmHg, cardiogenic shock, or pulmonary edema.
E. Signs of inadequate perfusion such as acute heart failure, delayed capillary refill, diaphoresis, or altered mental status.

MEDIC

II. EKG FINDINGS

A. Ventricular rate less than 60.
B. Evaluate for Heart Block.

ALL

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Check vital signs frequently.

EMT

C. If available, request ALS back-up for:
   1. Systolic Blood Pressure <100mmHg.
   2. Patient complains of chest pain, trouble breathing, or dizziness.
   3. Patient has altered mental status.
   4. Patient has suffered syncope.
   5. Patient has a pacemaker or defibrillator in place.

MEDIC

A. Apply quick look paddles if not already monitored.
B. Place on cardiac monitor, obtain 12 lead EKG. If patient demonstrates Acute MI on EKG, call medical control before administering medications or pacing.
C. Initiate IV/IO access.
D. Administer atropine 1 mg IV/IO push.
   1. If no response to initial measures, repeat atropine 1 mg IV/IO push every 3-5 minutes up to a total of 3 mg.
E. Repeat 12-lead EKG after any clinically significant rhythm change.
F. Consider external pacing if patient is unstable on initial assessment or if remains symptomatic (Hypotension, altered mental status, syncope, shock, etc) after attempting atropine
   1. Contraindications
      a. Patient's age is younger than 16 years.
      b. Cardiac arrest.
   2. Procedure
      a. Connect pacing electrodes and cables.
      b. Do not place over existing implanted pacemaker or defibrillator
      c. Cardiac monitor/pacer/defib devices require the limb leads to be placed for demand mode pacing.
      d. Asynchronous (non-demand) pacing mode is generally not desired, pacer should normally be in demand-mode.
      e. Begin pacing at a rate of 60-80 with current output at 20 mA. Increase current output every 10 seconds until either cardiac (electrical and mechanical) capture occurs or maximal output is reached.
      f. Do not discontinue pacer if the patient complains of significant pain from the pacemaker when treatment is necessary for stability.
      g. Do NOT delay initial treatment of unstable patients for IV/IO access or drug administration.
      h. For sedation, consider administration of midazolam 2-5mg IV/IM/IN/IO if blood pressure allows.
      i. If capture occurs, reassess peripheral pulses and vital signs.
G. If bradycardia and hypotension continue consider push dose epi per SB205 Hypotension/Shock.

ALL

NOTES:

A. Consider bradycardia to be a *symptom* of an underlying problem and not a diagnosis.

	B. If a transcutaneous pacemaker is available, its use may be preferable to the administration of atropine for the patient with chest pain and a Mobitz II second-degree heart block or third-degree heart block with wide QRS complexes. C. Do not delay initiation of transcutaneous pacing while awaiting IV access or for atropine to take effect in the patient with serious signs or symptoms. D. Transport patients with transcutaneous pacing to a hospital with cath lab capabilities (see Hospital Capabilities Survey). E. Consider 3rd degree Heart Block as an MI until proven otherwise. Administer Aspirin 324mg by mouth (unless contraindicated) and transport patient to a hospital with cath lab capabilities (see Hospital Capabilities Survey). F. It is important to treat the patient and not the number. Remember that athletes may have heart rates of 40-60.
MEDIC	H. Remove any nitroglycerin or other transdermal patches or pads before pacing or defibrillating. I. Consider sedating fully conscious patients prior to pacing. 1. Consider other treatment options for fully conscious patients prior to sedation solely for pacing treatment. 2. Initially unconscious patients may require sedation after treatment due to improving mental status.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. Patient complains of chest pain, or shortness of breath, dizziness, or syncope.
C. Palpable pulse with a rate greater than 150.
D. Systolic blood pressure less than 90 mm Hg, or
E. Signs of inadequate perfusion such as acute heart failure, delayed capillary refill, diaphoresis, or altered mental status.

MEDIC

II. EKG FINDINGS

A. Ventricular Rate above 150.
B. Wide QRS (greater than 0.12 sec or 3 little blocks).
C. Absent P waves.

ALL

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Monitor vital signs frequently.

EMT

C. If available, request ALS back-up.
D. If no ALS available, initiate rapid transport to closest appropriate facility and provide pre-notification.
E. Apply AED.
   1. If patient is conscious and has a palpable pulse, do not shock.
   2. If patient becomes unconscious or loses a palpable pulse, press "Analyze" and follow AED instructions. Provide care per Protocol C300 (Ventricular Tachycardia/Ventricular Fibrillation).

MEDIC

F. Initiate rapid transport to closest appropriate facility with pre-notification.
G. Maintain cardiac monitoring at all times.
H. Initiate IV/IO access.
I. If rhythm is Torsades de Pointes then give magnesium sulfate 2 g IV/IO diluted in at least 10mL normal saline over 10-15 minutes.
J. If the patient is to be cardioverted and does not have an altered level of consciousness, administer Midazolam (Versed) 2-4 mg IV/IO/IM until patient's speech slurs or a total of 8 mg is given.
K. If VT persists, cardiovert at 100 joules (or biphasic equivalent). Cardioversion should be synchronized unless it is impossible to synchronize a shock (i.e., the patient's rhythm is irregular).
L. If VT persists, repeat cardioversion at 200 joules (or biphasic equivalent).
M. If VT persists, repeat cardioversion at 300 joules (or biphasic equivalent).
N. If VT persists, repeat cardioversion at 360 joules (or biphasic equivalent).
O. If ventricular tachycardia recurs, repeat synchronized cardioversion at previously successful energy level. If cardioversion is not successful, repeat at next higher energy level and continue with the protocol.
P. Obtain a 12-lead EKG after successful cardioversion.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. No associated symptoms such as chest pain, shortness of breath, depressed or altered level of consciousness.
C. Patient is conscious.
D. Pulse rate is greater than 150.
E. Systolic blood pressure greater than 90 mmHg.
F. Patient is without signs of inadequate perfusion (heart failure, delayed capillary refill, and diaphoresis).

MEDIC

II. EKG FINDINGS

A. Rate above 150.
B. Wide QRS (greater than 0.12 sec or 3 little blocks).
C. Absent P waves.

ALL

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Obtain vital signs frequently.

EMT

C. If available, request ALS back-up.
D. If no ALS available, initiate rapid transport to closest appropriate facility and provide pre-arrival notification.
E. Do not apply AED to a conscious patient or a patient with a palpable pulse.
   1. If patient becomes unconscious or loses a palpable pulse, apply AED, press "Analyze" and follow AED instructions. Provide care per Protocol C300 (Ventricular Tachycardia/Ventricular Fibrillation).

MEDIC

F. Maintain cardiac monitoring at all times.
G. Obtain 12-Lead EKG of initial rhythm.
H. Initiate IV/IO access.
I. If rhythm is Torsades de Pointes then give magnesium sulfate 2 g IV/IO diluted in at least 10mL normal saline over 10-15 minutes.
J. If the wide complex tachycardia persists, administer Amiodarone 150 mg IV/IO over 10 minutes.
K. If the wide complex tachycardia persists, Amiodarone may be repeated after 3-5 minutes at 150 mg over 10 minutes.
L. Obtain a 12-lead EKG after any rhythm change.

ALL

N. If the patient becomes unstable, then proceed to the Wide Complex Tachycardia with Pulse (Unstable) Protocol (C303).

NOTES:

A. The trial of adenosine was removed in 2023.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. No history of trauma or fever.
C. Patient is alert.
D. Pulse rate is greater than 150.
E. Systolic blood pressure is above 90 mm Hg.
F. Patient is without signs of inadequate perfusion (for example: acute heart failure, delayed capillary refill, diaphoresis or altered mental status).
   1. For patients with signs of inadequate perfusion go to C306 Narrow Complex Tachycardia w/Pulse (Unstable).

MEDIC

II. EKG FINDINGS

A. Rapid (greater than 150), regular atrial rate.
   1. If irregular consult medical control prior to any antiarrhythmic treatment
B. QRS duration of less than 0.12 seconds.
C. P waves are usually absent.

ALL

III. PROTOCOL

A. Assure airway patency and administer oxygen to correct hypoxia <95%.
B. Place patient on cardiac monitor.
C. Have patient perform Valsalva and evaluate for any changes.
   1. AHA guidelines suggest augmenting the Valsalva maneuver with passive leg raise is more effective.

EMT

D. If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.
E. If no ALS available, initiate rapid transport to closest appropriate facility and provide pre-notification.

MEDIC

F. Establish vascular access. Proximal IV access is preferred.
G. Perform a 12 lead EKG. Repeat a 12-lead EKG after any rhythm change.
H. Administer adenosine. If tachycardia persists and is still thought to be narrow complex tachycardia continue to administer adenosine to a maximum of three doses.
   1. First dose: adenosine 6 mg rapid IV push followed by 10-20 ml of normal saline.
   2. Second dose: adenosine 12 mg rapid IV push followed by 10-20 ml of normal saline.
   3. Third dose: adenosine 12 mg rapid IV push followed by 10-20 ml of normal saline.
I. Notify the receiving hospital.
J. Monitor patient frequently. If patient deteriorates, move to C306 Narrow Complex Tachycardia w/Pulse (Unstable)

NOTES:

A. Adenosine has a short half-life of about ten seconds. For the drug to be effective, it must be able to reach the heart prior to being metabolized in the bloodstream. To achieve a high concentration of drug at the heart, a large IV, preferably in the antecubital fossa, should be established. Then when the adenosine is given, it should be followed by a bolus of saline that will swiftly empty the intravenous catheter of the drug and push it on its way to the cardiac circulation.
B. If there is a significant AV nodal block after a dose of adenosine and if an underlying atrial rhythm of atrial fibrillation or atrial flutter is observed, then an additional dose of adenosine is NOT indicated.
C. If the initial rhythm is tachycardic and irregular, then an atrial fibrillation rhythm is likely. Do not treat with adenosine.
D. Adenosine side effects include flushing, chest pain, and dizziness, impending doom. These last only a short time because of adenosine's short half-life.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years and older.
B. No history of trauma or fever.
C. Pulse rate greater than 150.
D. Patient has signs of inadequate perfusion (for example: acute heart failure, delayed capillary refill, diaphoresis or altered mental status).

MEDIC

II. EKG FINDINGS

A. Rapid (greater than 150), regular atrial rate.
B. Normal QRS duration of less than 0.12 seconds.
C. P waves are usually absent.

ALL

III. PROTOCOL

A. Assure airway patency and administer oxygen to correct hypoxia <95%.
B. Place patient on cardiac monitor.

EMT

C. If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.
D. If no ALS available, initiate rapid transport to closest appropriate facility and provide pre-notification.

MEDIC

E. Assess stability and if patient requires sedation prior to synchronized cardioversion consider following C305 Narrow Complex Tachycardia w/Pulse (Stable) Protocol
F. Do not delay Synchronized cardioversion for an unstable patient. Start with initial energy levels:
   1. Narrow regular: 50-100 J;
   2. Narrow irregular: 120-200 J biphasic or 200 J monophasic
G. If initial energy level fails, energy should be increased in a stepwise fashion from starting point for each subsequent shock: 100 J, 200 J, 300 J, and 360 J.
H. If the patient is to be cardioverted and does not have an altered level of consciousness, consider the administration of midazolam (Versed).
   1. Administer 2-5 mg IV/IO/IM/IN
I. Perform a 12 lead EKG when possible
J. If still no change, contact medical control for treatment options.
K. Notify the receiving hospital.
L. Establish proximal IV access when feasible
M. If patient converts out of Narrow Complex Tachycardia, perform 12 Lead EKG.

NOTES:

A. Do not delay cardioversion if symptoms are severe.
B. Severe symptoms related to tachycardia are uncommon if heart rate less than 150.

ALL

I. INCLUSION CRITERIA

A. Recent cardiac arrest.
B. Patient has a palpable pulse.
C. Patient's mental status may range from awake/alert to unresponsive.
D. Patient of any age.

MEDIC

II. EKG FINDINGS

A. May vary from bradycardia to ST-segment elevation or depression.

ALL

III. PROTOCOL

A. Continue to follow protocol covering presumptive underlying cause of arrest.
B. Maintain patent airway as needed and administer oxygen to correct hypoxia <95%.
   1. Until reliable measurement of SpO2 is established, it is reasonable to use the highest available oxygen concentration
C. Provide ventilatory support as needed. Avoid hyperventilation.
   1. Adults – Respiratory rate of 10/minute
   2. Pediatrics – Respiratory rate for age/weight (utilize chart or see Appendix I)
   3. Ventilation may be titrated with capnography once effective perfusion & ventilation have been established and maintained

Age	Pulse Beats/min	Respirations Breaths/min	Avg. Systolic BP
Infant(1-12mo)	90-180	30-53	>70
Toddler (1-2 yrs)	80-140	22-37	>70
Preschool (3-5 yrs)	60-120	20-28	>80
School age (6-12 yrs)	58-118	18-25	>85
Adolescent (12+ years)	50-100	12-20	>90

D. Keep defibrillator pads on patient.
E. Monitor vital signs frequently. Rearrest after initial return of spontaneous circulation is common.
F. Notify receiving hospital and transport the patient.

EMT

G. If available, request ALS back-up.
H. If no ALS available, initiate rapid transport to closest appropriate facility.

ALL

I. Transport destination determination
   1. Refer to the AOM ED capabilities survey for appropriate hospitals.
   2. Follow Trauma Triage Guidelines if applicable.
   3. If cause of arrest is presumed cardiac, the patient should go to a hospital with 24-hour cardiac catheter lab availability.
   4. If patient is unresponsive and not following commands, transport to a hospital capable of therapeutic hypothermia / targeted temperature management.

MEDIC

J. Initiate IV/IO access if not complete. Second access point is beneficial if possible.
K. Patients age 16 years old and older: aggressively treat hypotension (systolic blood pressure less than 90) with fluid bolus and push dose epinephrine per SB205 Hypotension.
L. Maintain cardiac monitoring and continuous capnography.
   1. Treat arrhythmias per appropriate protocol
M. A 12-lead ECG should be obtained as soon as feasible after ROSC.
   1. If a STEMI is identified, the patient should go to a hospital with 24-hour cardiac catheter lab availability.

ALL

NOTES:

A. Over-ventilation reduces cerebral perfusion and may worsen neurologic outcomes after cardiac arrest. Maintaining a normal ventilation rate may be helpful. Monitoring capnography can assist in the evaluation of ventilation.
B. Acute Coronary Syndromes (including ST-elevation myocardial infarction) are common causes of sudden cardiac arrest. Coronary thrombosis is one of the "T's" to consider when managing a

patient in cardiac arrest. Urgent reperfusion in a cardiac catheter lab with percutaneous coronary intervention (PCI) is safe and effective in survivors of cardiac arrest. Thrombolytics are relatively contra-indicated after prolonged CPR, and urgent cardiac catheterization is better for those in cardiogenic shock.

C. Prehospital administration of a 2-liter bolus of chilled saline after ROSC is no longer recommended.

ALL

I. INCLUSION CRITERIA

A. Patients of all ages.
B. Patient is without a palpable pulse.
C. Obvious traumatic mechanism of injury (blunt or penetrating).
D. Trauma as the cause of arrest.

II. DO NOT INITIATE RESUSCITATIVE EFFORTS IF

A. Patient has injuries not compatible with life such as:
   1. Decapitation or hemicorporectomy.
   2. Burn beyond recognition.
   3. Obvious signs of prolonged death including rigor mortis (in the absence of hypothermia), decomposition, or lividity.
   4. Isolated penetrating trauma should rarely be considered incompatible with life.

III. TRANSPORTATION/DISPOSITION

A. Initiate rapid transport (expedite scene time and provide treatment enroute) for the following patients:
   1. Penetrating trauma causing cardiac arrest with arrest witnessed by EMS providers – rapid transport to nearest Trauma Center.
   2. Traumatic arrest in a female patient with known pregnancy >24 weeks or with uterine fundus palpable at or above the umbilicus – rapid transport to nearest Emergency Department for potential of post-mortem Caesarean section.
   3. Traumatic arrest patients that are under 18 can be transported to a Pediatric Trauma Center.

IV. PROTOCOL

A. If patient is unresponsive and has no palpable pulse and has evidence of trauma being the most likely cause of cardiac arrest:
   1. Position patient in position where resuscitative efforts can be initiated.
      a. Apply manual c-spine stabilization or c-collar (T704) if situation allows.
   2. Start chest compressions at a rate of 100 per minute.
   3. Control obvious external hemorrhage by application of pressure dressing or tourniquet as needed (T710).

MEDIC

   4. If the mechanism of injury was blunt trauma or penetrating injury to the torso, perform bilateral needle thoracostomy for decompression of tension pneumothorax (T701).
   5. Provide oxygenation and ventilation through bag-valve-mask or advanced airway as indicated (T705).
   6. Obtain vascular access through placement of intravenous or intraosseous line (T711) and initiate fluid resuscitation with normal saline (1 liter or 20ml/kg for pediatric patients) with open flow or on pressure bag (IO).
   7. Apply cardiac monitor and treat the displayed rhythm as per table 1.
   8. Contact Medical Control for Termination of Resuscitation.
   9. Transport immediately if ROSC is achieved.

V. CARDIAC RHYTHM INTERPRETATION

A. Table 1 illustrates recommendations on treatment and termination of resuscitative efforts.

Table 1

Cardiac Rhythm on Monitor		
Asystole or PEA < 40 bpm	**PEA >40 bpm**	**VFib/VTach**
Contact Medical Control regarding Termination of Resuscitation	Fluid Resuscitation, Consider repeat needle decompression, Transport to nearest trauma center	Defibrillate per protocol C300 or P601, Fluid Resuscitation, Consider repeat needle decompression, Transport to nearest trauma center

ALL

VI. POST-TERMINATION BODY MOVEMENT (a good faith effort to categorize the cause of death is reasonable)

A. Likely homicide or child abuse – avoid body movement unless necessary for life safety.
B. Likely natural causes – body may be relocated as appropriate for the situation and public good.
C. Unclear cause – avoid disturbance unless necessary for life safety; consider involving law enforcement and/or the coroner's office.

MEDIC

I. TERMINATION OF RESUSCITATION (TOR) INSIDE AN AMBULANCE

A. TOR within an ambulance is reasonable if the patient meets C308 criteria (unless < 16 years old).
B. After TOR, the ambulance should continue to the destination hospital.
C. Body may be removed from the ambulance after TOR, assuming the ambulance is not the site of homicide.

ALL

NOTES:

A. Traumatic arrest from both blunt and penetrating trauma carries high rates of mortality with poor rates of resuscitation in the prehospital setting.
B. The preferred management of the traumatic arrest patient is surgical intervention at an appropriate verified trauma center.
C. Due to the mechanism of injury and cause of cardiopulmonary arrest, traumatic arrest is approached in a separate fashion from primary cardiac arrest. A state of post-traumatic circulatory arrest may exist due to severe hypovolemia, tension pneumothorax, or cardiac tamponade, conditions that may be treatable in the prehospital setting.
D. The protocol aims to delineate patients who would benefit best from resuscitative efforts and recommend termination of unnecessary resuscitative efforts and transports on patients with minimal chance of survival through a systematic approach.
E. Currently there is significant controversy concerning the use of ACLS/PALS-type medications including epinephrine/atropine in the setting of traumatic, hypovolemic, arrest. At present time, we DO NOT recommend the use of these drugs in the treatment approach described above.
F. In a situation where the mechanism of injury appears inconsistent with the patient's condition and not severe enough to induce traumatic arrest, consider a primary medical cause for the patient's cardiac arrest and defer to protocol SB204.
G. All patients that are being transported should go to the nearest verified trauma center, except the situation described in III.A.2 above.
H. Post-ROSC cooling as described in C307 is CONTRAINDICATED in the traumatic arrest patient and should NOT be initiated.
I. The use of a backboard for full spinal immobilization can be foregone in favor of rapid transport in the traumatic arrest patient if manual c-spine stabilization or collar is applied.
J. In ambulance TOR should be an exceedingly rare event, and the ability to do so should not alter sound principles of field resuscitation.

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ALL

I. INCLUSION CRITERIA

A. Patient's age is 25 years or older.

B. Patient complains of discomfort suggestive of cardiac origin (heaviness, pressure, tightness, or dull sensations with or without radiation to other body areas) and may be accompanied by other associated signs and symptoms such as: dyspnea, diaphoresis, nausea, vomiting, or general weakness.

C. If any doubt about pain/discomfort or related symptoms, treat as cardiac.

D. Patient may have a history of cardiac disease.

E. Patient may have risk factors associated with cardiac disease.

F. Atypical signs and symptoms that may be seen in women, the elderly, chronic hypertensives, and diabetics.

II. TREATMENT

A. Obtain a 12-Lead EKG as soon as possible.

1. Goal is within 10 minutes of EMS arrival.
2. If no paramedic is available, transmit to receiving hospital.
3. If STEMI is present:
   a. Immediately initiate transportation to a facility that offers percutaneous coronary interventions. Refer to the ED Capability survey for guidance of facility capabilities.
   b. Goal scene time is <15 minutes.
   c. Transmit EKG to receiving hospital if possible.
   d. Pre-notify the receiving hospital, use the word "STEMI" and request cath lab activation.
   e. Provide all treatment en route to the hospital.
   f. Refer to treatment pearls in Notes.
4. If STEMI is not present:
   a. Initiate transport to an appropriate facility as soon as possible in concert with treatment.
   b. Transmit EKG to receiving hospital if possible.

B. Administer/assist patient with chewing four chewable baby aspirin (total dose 324mg) if the patient is not allergic. Aspirin should be withheld if the patient has had gastrointestinal bleeding, active ulcer disease, hemorrhagic stroke, or major trauma within the past two weeks.

C. Administer oxygen to correct hypoxia <95%.

EMT

D. Consider immediate ALS back-up.

MEDIC

E. Place the patient on a cardiac monitor. If the rhythm is not of sinus origin (between 60-140) go to the appropriate arrhythmia protocol. Once arrhythmia is resolved then proceed.

F. Establish IV access.

EMT

G. Interview patient if they have prescribed Nitroglycerin and if it is present. Verify medication prescription, date, and proper condition.

H. If there are no contraindications (see Notes), and the patient is alert and responsive, assist the patient in taking 1 dose of nitroglycerin (1 tablet or spray; 0.4mg).

I. Reassess the blood pressure and chest discomfort in 5 minutes. Evaluate the patient for feeling faint, lightheaded, dizzy, and/or hypotension. If the patient is symptomatic after administration of nitroglycerin, place the patient flat or in the shock position, if tolerated by the patient.

J. If the patient experiences no relief and the BP remains greater than 100 mm Hg systolic, contact medical command for direction regarding assisting with additional doses of nitroglycerin.

MEDIC

K. If there are no contraindications to nitroglycerin (see III), and the patient is alert and responsive, administer either:

1. Nitroglycerin 0.4 mg sublingual every 3-5 minutes to a max of 3 doses only if SBP remains greater than 100.
2. Topical nitroglycerin (Nitropaste) may be used in lieu of sublingual nitroglycerin. Apply 1 inch of nitropaste to the anterior chest wall one time.

L. If an Inferior MI is suspected, do **NOT** administer nitroglycerin as it can cause life-threatening hypotension.

M. Reassess the blood pressure and chest discomfort in 5 minutes. Evaluate the patient for feeling faint, lightheaded, dizzy, and/or hypotension. If the patient is symptomatic after administration of

nitroglycerin, place the patient flat or in the shock position, if tolerated by the patient. Remove nitropaste.

N. If the patient is experiencing symptomatic hypotension and their lungs are clear, administer 500-ml normal saline fluid bolus. If lungs are not clear, run IV at keep open rate.

O. For persistent symptomatic hypotension or pulmonary edema, see Cardiogenic Shock Protocol M401.

P. For chest pain not relieved by nitrates, administer either:

1. Fentanyl 25-100 micrograms IV/IO as long as systolic BP greater than 100 and pain persists. May repeat every 5 min to a total of 200 micrograms.
2. Morphine sulfate 1-5 mg IV/IO over 2 minutes as long as systolic BP greater than 100 and pain persists. May repeat every 5 minutes to a total of 10 mg.

Q. Nausea and vomiting may be managed with ondansetron (Zofran) 4mg PO/IM/IV/IO. See Nausea & Vomiting Protocol M405.

ALL

III. NITROGLYCERIN CONTRAINDICATIONS:

A. Systolic BP < 100mmHg
B. Patient has taken sildenafil (Viagra) in the last 24 hours.
C. Patient has taken vardenafil (Levitra, Staxyn) in the last 48 hours.
D. Patient has taken tadalafil (Cialis) in the last 72 hours.
E. Patient is on medication for Pulmonary Hypertension (ex: Flolan, Revatio, Adcirca).

MEDIC

NOTES:

A. Nitroglycerin administration may change a patient's 12-Lead EKG. Acquisition prior to nitroglycerin administration may help in patient's end outcome.

B. There is very little evidence for narcotic pain medication in STEMI and actually a slight recommendation against its use in non-STEMI. The protocol however includes the use of pain medication for patient comfort and anxiolysis.

C. STEMI Treatment Pearls:

1. Inferior Wall:
   a. (Leads II, III, aVF; supplied by the Right Coronary Artery)
   b. Aggressive fluid administration may be required (i.e., Fluid boluses) due to cardiogenic shock, reassess lungs frequently.
   c. Attempt to capture Lead V4R to determine right ventricular involvement.
   d. Patient may be sensitive to Fentanyl/Morphine administration, monitor BP frequently.
   e. If 2nd degree type II or 3rd degree block, prepare to pace immediately see C302 and T700.
   f. Push dose epi use is discouraged.
2. Anterior Wall:
   a. (Leads V1-V4; supplied by Left Anterior Descending Artery)
   b. ST elevation in more than 2 leads is at higher risk for sudden cardiac death.
   c. High risk for developing CHF or cardiogenic shock.
   d. May also develop bundle branch blocks, PVCs or 3° blocks.
   e. Push dose epi per SB205 Hypotension/Shock should be the first treatment for significant hypotension rather than fluid boluses.
3. Lateral Wall:
   a. (Leads I, aVL, V5-V6; supplied by Circumflex)
   b. May have some LV dysfunction but not as severe as Anterior Wall AMI.
   c. May also develop AV Nodal Block.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. The patient has chest pain suggestive of cardiac origin, dyspnea, no evidence of trauma, AND
C. Systolic blood pressure less than 80mm Hg supine, OR
D. Systolic blood pressure 80-100mm Hg and one of the following:
   1. Pulse greater than 120,
   2. Skin changes suggestive of shock, OR
   3. Altered mental status, agitation, or restlessness.

MEDIC

II. PROTOCOL

A. Initiate large bore IV and administer 500ml normal saline fluid challenge if lungs are clear. If lungs are not clear, run IV at keep open rate. May repeat if lungs remain clear.
B. Consider Push dose epi per SB205 Hypotension. Multiple doses of fluid are preferred if the patient has an inferior MI.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.

B. The patient is unable to speak because of an airway obstruction or has a history suggestive of foreign body aspiration, i.e., sudden shortness of breath while eating.

C. The patient exhibits stridor lung sounds.

MEDIC

D. EKG Findings indicate normal sinus rhythm, sinus tachycardia or atrial fibrillation with controlled ventricular response. If other rhythm is present, then refer to the appropriate arrhythmia protocol.

ALL

II. PROTOCOL

A. If the patient is alert but obviously choking from a presumed foreign body:

1. Have the patient cough forcefully, if possible.
2. Provide supplemental oxygen.
3. Perform the Heimlich maneuver until successful.
   a. If Heimlich successful, encourage transport for evaluation.

B. If the patient is found unconscious or becomes unconscious:

1. Begin CPR and attempt to bag valve mask ventilate while preparations are made to intubate. Visually inspect upper airway prior to delivering all breaths during CPR in case foreign body has been successfully dislodged from airway.
2. Consider early transport.

MEDIC

3. Using the laryngoscope, visualize the posterior pharynx and vocal cords for evidence of a foreign body. Utilize video laryngoscopy, if available.
4. Remove any foreign bodies very carefully with suction device or Magill forceps. If available, use large bore suction tubing and tip.
5. If no foreign body is seen or patient does not begin breathing spontaneously, intubate the trachea. If you suspect a foreign body is below the vocal cords but above the carina, it may be necessary to push the foreign body down the right mainstem bronchus with the ET tube in order to aerate at least the left lung.

C. If unable to pass an orotracheal tube due to obstruction, perform a surgical airway as described in the Airway Protocol (T705).

D. If wheezing and no stridor, consider an albuterol nebulizer treatment.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. The patient has a history of asthma, emphysema or COPD AND complains of a worsening shortness of breath.
C. Lung exam has wheezing, rales/rhonchi, or poor air exchange.

MEDIC

D. EKG Findings indicate normal sinus rhythm, sinus tachycardia or atrial fibrillation with controlled ventricular response. If other rhythm is present, then proceed to the appropriate arrhythmia protocol.

EMT

II. PROTOCOL

A. If available, request ALS back-up/intercept.
B. Assist patient with his/her own MDI, if appropriate; only MDIs containing beta adrenergic bronchodilators (e.g. albuterol, Ventolin, Proventil, Combivent) 2-8 puffs inhaled, may repeat as needed.
C. Nebulized bronchodilators: if MDI not available, give albuterol 2.5 mg in 3 ml normal saline via nebulizer PRN every 5 minutes x 4 total doses.
    1. May combine albuterol with Ipratropium 0.5mg in 2.5 ml normal saline.
D. Consider NIPPV (CPAP/ BIPAP), if available and trained to use if respiratory distress persists
E. Do not use the inhaler if any of the following are present:
    1. Inability of patient to use device.
    2. Inhaler is not prescribed for the patient.
    3. Medication is expired.
    4. If the patient has met the maximum prescribed dose of their inhaler according to prescription label, contact medical control.
F. To assist with administration of a metered-dose inhaler:
    1. Make sure inhaler is at room temperature and shake several times to mix the medication.
    2. Take oxygen mask off the patient.
    3. Tell the patient to exhale deeply and put the mouthpiece in front of the mouth. If the patient has a spacer device, it should be used.
    4. Have patient depress the metered-dose inhaler as they begin to inhale deeply.
    5. Instruct the patient to hold their breath for as long as comfortable, so the medication can be absorbed.
    6. Put oxygen mask back on the patient.
    7. Repeat a dose after one minute. If further medication is necessary beyond the patient's prescribed number of doses, contact medical control.
    8. Recheck vital signs (including pulse oximetry if available) and perform focused assessment.

MEDIC

G. Administer Albuterol (Proventil) aerosol 2.5mg/2.5ml via nebulizer. Consider adding 1 vial Ipratropium Bromide (0.5mg of 0.017%) to the Albuterol aerosol. May substitute Duoneb (Albuterol plus Ipratropium Bromide that is premixed) for all Albuterol treatments.
H. If the patient is in impending respiratory failure, obtain IV access.
I. If multiple Albuterol treatments are anticipated, administer Prednisone 60 mg PO or Solu-Medrol (Methylprednisolone) 125 mg IV or PO.
J. If signs of impending respiratory failure (see notes):
    1. Consider initiating non-invasive positive pressure ventilation (BIPAP or CPAP). Start at 5 cmH_2O and titrate higher as tolerated by patient.
    2. **ASTHMA ONLY**: Consider administering epinephrine 0.3 mg IM (1mg/ml) followed by magnesium sulfate 2 g IV/IO diluted in 100 ml normal saline over 20 minutes.
K. Consider repetitive Albuterol treatments if needed, up to a total of three treatments.

ALL

L. Consider PAP, reference protocol T709.

NOTES:

A. When attempting to differentiate between COPD and congestive heart failure, the medication history will usually give more valuable information than will the physical exam.

B. Ipratropium Bromide is an anticholinergic medication and may cause tachycardia. Do not use on patients with narrow angle glaucoma or patients with bladder neck obstruction (history of urinary retention).

C. There is growing evidence that steroids (Prednisone or Solu-Medrol (Methylprednisolone) for adults may be beneficial.

D. Solu-Medrol (Methyprednisolone) can be given orally to adult patients, though the IV route is preferred.

E. Signs of impending respiratory failure
   1. Depressed mental status or excessive sleepiness
   2. Agitation, panic, or sensation of drowning
   3. Inability to maintain respiratory effort.
   4. Cyanosis or worsening hypoxia

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. History of heart disease.
C. Respiratory rate greater than 20.
D. Systolic pressure greater than 100mm Hg.
E. Rales on lung exam.
F. Evidence of respiratory insufficiency such as air hunger, accessory muscle use or altered mental status.
G. MAY have jugular venous distention or peripheral edema.

MEDIC

H. EKG Findings indicate normal sinus rhythm, sinus tachycardia or atrial fibrillation with controlled ventricular response. If other rhythm is present, then proceed to the appropriate arrhythmia protocol.

ALL

II. EXCLUSION CRITERIA

A. Clinical impression consistent with an infection (e.g., fever)
B. Clinical impression consistent with asthma/COPD – See protocol M403.

III. PROTOCOL

A. Consider advanced airway management if required.
B. Consider PAP, reference protocol T709.
C. Nitroglycerin Contraindications:
   1. Systolic BP < 100mmHg
   2. Patient has taken sildenafil (Viagra) or avanafil (Stendra) in the last 24 hours.
   3. Patient has taken vardenafil (Levitra, Staxyn) in the last 48 hours.
   4. Patient has taken tadalafil (Cialis) in the last 72 hours.
   5. Patient is on medication for Pulmonary Hypertension. (ex: sildenafil (Revatio), macitentan/tadalafil (Opsynvi), tadalafil (Adcirca), vardenafil (Levitra, Staxyn), riociguat (Adempas), vericiguat (Verquvo)).

MEDIC

D. Establish IV access.
E. Obtain 12 Lead EKG.
F. Consider nitroglycerin.
   1. For patients with mild symptoms (eg. HR < 100, SBP 100-150, RR <25, no accessory muscle use, retractions, fatigue or O2 sats >94%) administer LOW DOSE nitroglycerin 0.4 mg sublingual every 3-5 minutes to a max of 3 doses.
   2. For patients with moderate to severe symptoms (eg. HR >100, SBP >150mmHg, RR >25, accessory muscle use, retractions, fatigue, O2 sats <94%) consider HIGH DOSE nitroglycerin 0.8 mg SL (2 tablets or 2 sprays of 0.4mg nitroglycerin) q 3-5 minutes for max 3 doses. Don't remove CPAP to provide additional doses of nitroglycerine.
   3. Topical nitroglycerin (nitropaste) may be used in lieu of sublingual nitroglycerin. Apply the nitropaste to the anterior chest wall one time. Dosing is 1" for SBP 100-150, 1.5" for 150-200, and 2" for SBP>200.
   4. Blood pressure must be reassessed after each dose of nitroglycerin is given. Repeat doses should not be given if SBP is less than 100mmHg. The goal is for a 20% reduction in patient's blood pressure.
   5. In addition to blood pressure, carefully monitor level of consciousness and respiratory status. Do not administer NTG tablets if decreased respiratory rate, level of consciousness or other concerns for aspiration exist based on patient's clinical status.

ALL

NOTES:

A. When attempting to differentiate between COPD and congestive heart failure, the medication history will usually give more valuable information than will the physical exam.
B. Transport to the hospital should be initiated immediately if the patient's airway is compromised. Otherwise, transport should be initiated as soon as possible taking into account the time required for pharmacologic therapy.

MEDIC

I. INCLUSION CRITERIA

A. Patient's age is 12 months or older.
B. Patient has nausea or vomiting.

II. EXCLUSION CRITERIA

A. Known allergy to ondansetron (Zofran).
B. Known allergies to 5-HT(3) receptor antagonists such as Kytril (granisetron) and Aloxi (palonosetron).
C. History of prolonged QTc at baseline; electrolyte abnormalities such as hypokalemia or hypomagnesemia (which can lead to prolonged QTc); on other medications that prolong the QT interval.

III. PROTOCOL

A. Administer ondansetron (Zofran):
   1. Dosing:
      a. Adult: 4 mg IV/IO/IM or PO (orally disintegrating tablet) if IV access not available; May repeat 4 mg dose IV/IO in 5 minutes if symptoms persist (do not repeat IM/PO doses).
      b. Pediatric: 0.15 mg/kg (max 4 mg) IV/IO/IM or 4 mg PO for patients 15 kg and above (as the ODT, orally disintegrating tablet); do not repeat.
   2. Pharmacokinetics
      a. Onset of IM is approximately 30 minutes with half-life similar to IV dose.
      b. Onset of PO dose is more rapid than IM.
   3. Administration: IV/IO slow IV push (over at least 30 seconds, preferably over 2-5 minutes).

NOTES:

A. May be used safely in pregnancy.
B. Use with caution in patients with impaired liver function.
C. The frequency of side effects is extremely low, but may include:
   1. Headache and/or dizziness, fever, urinary retention, rash, agitation, mild sedation and extra pyramidal (dystonic) reaction; may cause bronchospasm and arrhythmias, but incidence is uncommon.
   2. Ondansetron does not prevent motion sickness.
D. The side effect profile of ondansetron is extremely low favoring the use of this medication.
E. Ondansetron can increase the QT interval and should be used with caution in patients who are on other medications that can increase the QT interval.
F. In an adrenal insufficiency patient, nausea and vomiting can be signs of adrenal crisis. See M417.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.

B. Patients identified or suspected of diabetic problems - hyper/hypoglycemia.

II. PROTOCOL

A. **Assess Blood Glucose**

1. If unable to assess blood glucose use history and other assessment means to proceed with treatment. Treatment can be life saving for a hypoglycemic patient but will not necessarily cause a hyperglycemic patient excessive harm.

B. **Hypoglycemia**

1. Glucose Level is less than 60 mg/dL or glucometer reads "LOW."
2. For hypoglycemia defined above, treat in one of the following manners until an improvement in mental status:
   a. If patient is able to swallow and protect airway administer oral glucose 15g or appropriate rapidly absorbed carbohydrate (high sugar content) fluid or food (such as orange juice). Dispense in small amounts; keep fingers out of mouth; EMS provider can lightly massage the area between the cheek and gum to enhance swallowing.

MEDIC

3. If patient is unable to protect airway, administer the following until an improvement in mental status:
   a. 6.25-25g (62.5-250mL) Dextrose 10% IV/IO
   b. Only if Dextrose 10% is not available one of the following methods may be used. Dextrose 10% is the preferred medication.
      i. Mix Dextrose 10% by diluting Dextrose 50% with normal saline to make Dextrose 10%. 1-part D50 and 4 parts normal saline. Ex: 50 mL D50 and 200 mL normal saline makes 250mL D10.
      ii. Administer 6.25-25g (12.5-50mL) Dextrose 50% IV/IO.
      iii. Administer 6.25-25g (25-100mL) Dextrose 25% IV/IO.
   c. Doses may be repeated if repeat blood glucose assessment remains below levels noted above.
   d. Dextrose must be given through a patent IV/IO. If any suspicion of extravasation is present notify receiving Emergency Department.
   e. It is acceptable to dilute Dextrose with normal saline due to the high viscosity based on IV size and vein conditions.
4. If unable to establish IV/IO access, administer 1mg Glucagon (Glucagen) IM.

ALL

5. Glucagon (given prior to EMS or by EMS providers) should improve the patient's level of consciousness within about 10 minutes of administration. However, Glucagon must be followed with some Dextrose either IV/IO, if the patient does not awaken, or orally as noted above.
6. Treatment with Dextrose via IO device should be a last resort or coincide with a patient that requires an IO for other reasons. All patients with an IO should be seen at an Emergency Department.
7. See "Non-Transport of Diabetics" section below for "Treat and Release" Criteria.

C. **Hyperglycemia**

1. Glucose Level is greater than 400 mg/dL or glucometer reads "HIGH."

MEDIC

2. If no evidence of pulmonary edema, administer a fluid bolus of 500-1000mL IV/IO during transport.
3. Place patient on cardiac monitor for possibility of dysrhythmia.

ALL

NOTES:

A. D10 is made by mixing D50 1:4 with normal saline.

B. D25 is made by mixing D50 1:1 with normal saline.

C. It is very important that you verify that you have a working IV/IO. Dextrose which infiltrates into the surrounding tissues can be damaging to the tissues and blood vessels.

D. Blood glucose level can be measured in mmol/l as well as mg/dl.
Conversion: mmol/l x 18 = mg/dl or mg/dl ÷ 18 = mmol/l

E. In an adrenal insufficiency patient, hypoglycemia can be a sign of adrenal crisis. See M417.
F. Hyperglycemic patients with a BGL > 400 mg/dL often are profoundly hypovolemic. A fluid bolus will start replenishing the volume, encourage diuresis, and facilitate the glucosuria that is already occurring.
G. Hyperglycemia can be secondary to underlying processes such as Sepsis/infection, Myocardial Infarction, Stroke, and trauma, among others. Refer to the respective protocols if you suspect any underlying process.

Non-Transport of Hypoglycemic Patients – Treat and Release Criteria

1. Patient must be able to refuse transport as per the SB215 Refusal of Treatment and/or Transport.
2. Following treatment of a hypoglycemic state, patient is conscious, alert to time, date and place, and requests that they not be transported to the hospital.
3. Certain patients (see below) should be informed that their hypoglycemic state may not be an isolated issue and it is recommended that they be transported.
    a. Patients with other associated findings of serious illnesses or circumstances that may have contributed to the hypoglycemic episode, including excessive alcohol consumption, shortness of breath, chest pain, headaches, fever, etc.
    i. Patients on oral hypoglycemic medication such or long-acting insulin (hypoglycemic episode may last hours or days). Examples:
        i. Oral hypoglycemia medication: glipizide, glyburide, or chlorpropamide.
        ii. Intermediate Insulin Types: NPH (Humulin N, Novolin N).
        iii. Long-acting Insulin Types: Insulin detemir (Levemir) and insulin glargine (Lantus).
    b. Patients who when treated with Dextrose take greater than 10 minutes to return to a normal level of consciousness (treatment with other concentrations of dextrose may have different times until resolution of symptoms).
    c. Patient's history does not reveal circumstances that may have contributed to the hypoglycemic episode such as recent illness, lack of oral intake, or insulin reaction.
4. Repeat rapid glucose test is greater than or equal to 100 mg/dL.
5. The patient has a repeat systolic blood pressure of at least 100 mm Hg, pulse rate is greater than or equal to 60.

Protocol for Treat and Release

6. If the criteria above are met, then the patient is a candidate for Treat and Release.
7. The patient must be released to the care of a responsible individual who will remain with the patient as an observer for a reasonable time and can request assistance (i.e., Call 911) should the symptoms recur.
8. The patient should be given instructions for follow-up care prior to being released. They should be able to repeat back the instructions.
    a. Instructions for follow-up care should include the following or similar:
    b. Take action to prevent a recurrent episode such as:
        i. Remain in the care of a responsible individual.
        ii. Consume a meal immediately.
        iii. Monitor their blood glucose.
        iv. Advise their personal physician of this episode.
    c. Watch for signs and symptoms of another episode. Those signs and symptoms include:

Anxiousness	Impaired vision
Dizziness	Personality change
Excessive Sweating	Pounding heartbeat
Extreme hunger	Trembling
Faintness	Unable to awaken
Headache	Weakness & fatigue
Irritability	

    d. If another episode occurs, request medical assistance (i.e., Call 911) immediately.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. A medically stable patient who is manifesting unusual behavior including violence, aggression, altered affect, or psychosis.
C. Patient demonstrates behavior including violence, delirium, altered effect, or psychosis.
D. If obtainable, serum blood sugar greater than or equal to 70 mg/dl (if assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so).
E. If obtainable, systolic blood pressure greater than or equal to 90 mm Hg and less than180 mm Hg (if assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so).
F. If obtainable, heart rate greater than or equal to 50 bpm (if assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so).

II. EXCLUSION CRITERIA AND DIFFERENTIAL DIAGNOSIS

A. Anemia
B. Cerebrovascular accident
C. Drug / Alcohol intoxication
D. Dysrhythmias
E. Electrolyte imbalance
F. Head Trauma
G. Hypertension
H. Hypoglycemia
I. Hypoxia
J. Infection (especially meningitis / encephalitis)
K. Metabolic disorders
L. Myocardial ischemia / infarction
M. Pulmonary Embolism
N. Seizure
O. Shock

III. PROTOCOL

A. If EMS personnel have advanced knowledge of a violent or potentially dangerous patient or circumstance, consideration should be given to staging in a strategically convenient but safe area prior to police arrival. If staging is indicated and implemented, dispatch should be notified that EMS is staging, the location of the staging area, and to have police advise EMS when scene is safe for EMS to respond.
B. If EMS intervention is indicated for the violent or combative patient, patients should be gently and cautiously persuaded to follow EMS personnel instructions. If EMS has cause to believe the patient's ability to exercise an informed refusal is impaired by an existing medical condition, EMS shall, if necessary, cause the patient to be restrained for the purpose of providing the EMS intervention indicated. Such restraint shall, whenever possible, be performed with the assistance of police personnel (see Restraint Protocol). It is recognized that urgent circumstances may necessitate immediate action by EMS prior to the arrival of police.
    1. Urgent circumstances requiring immediate action are defined as:
        a. Patient presents an immediate threat to the safety of self or others.
        b. Patient presents an immediate threat to EMS personnel.
C. Urgent circumstances authorize, but do not obligate, restraint by EMS personnel prior to police arrival. The safety and capabilities of EMS is a primary consideration. Police shall immediately be requested by EMS in any urgent circumstance requiring restraint of a patient by EMS personnel.
D. If police initiate restraint inconsistent with the medical provisions of the Restraint Protocol, with the intent that EMS will transport the patient, police must prepare to submit an APPLICATION FOR EMERGENCY ADMISSION, or the patient must

be placed under arrest with medical intervention indicated. Police shall, in either instance, accompany EMS to the hospital.

E. APPLICATION FOR EMERGENCY ADMISSION can only be implemented by a:
   1. Psychiatrist
   2. Licensed clinical psychologist
   3. Licensed physician
   4. Health or police officer
   5. Sheriff or deputy sheriff

F. EMS shall not be obligated to transport, without an accompanying police officer, any patient who is currently violent, exhibiting violent tendencies, or has a history indicating a reasonable expectation that the patient will become violent.

G. If the patient is medically stable, then he/she may be transported by police in the following circumstances:
   1. Patient has normal orientation to person, place, time, and situation.
   2. Patient has no evidence of medical illness or injury.
   3. Patient has exhibited behavior consistent with mental illness.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.

B. This protocol is intended to address the need for medically indicated and necessary restraint. It shall not be used to regulate, or restrict in any way, operational guidelines adopted by a provider agency addressing use of force related to non-medical circumstances (i.e., civil disturbances, legitimate self-defense relative to criminal behavior).

C. Patient restraints are to be used only, when necessary, in situations where the patient is violent or potentially violent and may be a danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of a medical condition such as but not limited to:

1. Anemia
2. Cerebrovascular accident
3. Drug / Alcohol intoxication
4. Dysrhythmias
5. Electrolyte imbalance
6. Head Trauma
7. Hypertension
8. Hypoglycemia
9. Hypoxia
10. Infection (especially meningitis / encephalitis)
11. Metabolic disorders
12. Myocardial ischemia / infarction
13. Pulmonary Embolism
14. Seizure
15. Shock
16. Toxicological ingestion

II. PROTOCOL

A. Patient health care management remains the responsibility of the EMS provider. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that the evaluation of many patient parameters requires patient cooperation and thus may be difficult or impossible.

B. It is recommended to have Law Enforcement on scene.

C. Refer to Psychiatric Emergencies Protocol (M407) for aid in dealing with the combative patient.

D. **The least restrictive means shall be employed.**

E. Verbal de-escalation

1. Speak in a calm, normal volume voice. Engage the patient by their name.
2. Validate the patient's feelings by verbalizing the behaviors the patient is exhibiting and attempt to help the patient recognize these behaviors as threatening.
3. Openly communicate, explaining everything that has occurred, everything that will occur, and why the imminent actions are required.
4. Respect the patient's personal space (i.e., asking permission to touch the patient, take pulse, examine patient, etc.).

III. PHYSICAL RESTRAINTS

A. All restraints should be easily removable by EMS personnel without the use of a key.

B. Restraints should be secured to the stretcher and not to the vehicle.

C. Restraints applied by law enforcement (i.e., handcuffs) require a law enforcement officer to remain available to adjust the restraints as necessary for the patient's safety. The protocol is not intended to negate the ability for law enforcement personnel to use appropriate restraint equipment to establish scene control. Handcuffs should not be applied to the stretcher or other equipment and should only be applied to the patient by law enforcement.

D. Departments are encouraged to work with their respective law enforcement agencies to develop restraint processes that respect patient and provider safety and comfort, while permitting medical care. The goal is to maximize safety to the provider while providing care to the patient.

E. To ensure adequate respiratory and circulatory monitoring and management, patients shall NOT be transported in a face down prone position.

F. Restrained extremities should be monitored for color, nerve, and motor function, pulse quality and capillary refill at the time of application and at least every 5 minutes. Providers should document every 5 minutes a GCS/AVPU score along with vital signs. If vitals are unable to be obtained because of agitation, this should be noted.

MEDIC

IV. CHEMICAL RESTRAINTS

A. Chemical restraints may be required before, after, or in place of physical restraints. Any patient who continues to be a danger to themselves or others despite physical restraints, or those who present a danger while attempting physical restraint, may be chemically restrained as follows.

1. Determine the patient's level of agitation.
   a. Mild to moderate agitation is the most encountered type. This can be characterized in the patient by the presence of verbal outbursts, grabbing at or attempting to physically engage with others.
   b. Severe agitation can be characterized by the presence of pain tolerance, tachypnea, sweating, agitation, tactile hyperthermia, police non-compliance, lack of tiring, unusual strength, inappropriately clothed, mirror or glass attraction.
   c. Patients suffering from severe agitation may have pre-existing psychiatric illness, and/or drug or alcohol intoxication
2. EMS should plan and prepare for advanced airway management regardless of medication used. In patients receiving ketamine, laryngospasm or hypersalivation necessitating oral suctioning may occur.
3. For agitation: Administer midazolam (Versed) 10 mg IM. A lower dose of 5mg IM may be used for smaller adults or the elderly. Exposure and cleaning of skin is highly recommended but may not be feasible; injection through clothing and prior to skin cleaning is allowed if crew safety would be compromised. Repeat dose(s) of midazolam (Versed) may be ordered by on-line medical control. Ensure that the on-line medical control physician understands the level of agitation the patient is experiencing and whether this compromises patient or provider safety.

-OR-

4. In SEVERE agitation, consider administering ketamine 4mg/kg IM ideal body weight or as indicated in the chart below (of at least 50mg/1mL concentration), instead of midazolam (Versed), once into a large muscle when possible. Exposure and cleaning of skin is highly recommended but may not be feasible; injection through clothing and prior to skin cleaning is allowed if crew safety would be compromised.
   a. Patients that have ketamine administered should only be taken to a hospital-based Emergency Department, which does not include UC PES.
5. When able and safe, place patient on cardiac monitor, continuous pulse oximetry and ETCO2.
6. When able and safe, administer oxygen to correct hypoxia <95%.
7. When able and safe, check blood glucose level.
8. When chemical restraint is used, vitals, including GCS/AVPU should be assessed and recorded every 5 minutes.
9. At no time shall a patient be left unattended after receiving chemical restraint.
10. Any patient receiving chemical restraint must be attended to and transported by a paramedic.
11. Pre-arrival notification is highly recommended so the receiving Emergency Department can be prepared for the safe transfer of a combative or violent patient.

KETAMINE SEVERE AGITATION DOSING

Height	Dose (IM) 4mg/kg	mLs (50mg/mL)	mLs (100mg/mL)
<4'11"	150mg	3mL	1.5mL
5'-5'5"	220mg	4.4mL*	2.2mL
5'6"-5'11"	290mg	5.8mL*	2.9mL
6'-6'5"	365mg	7.3mL*	3.65mL*
>6'5"	425mg	8.5mL*	4.25mL*
*** Ideally should be given in more than one IM site**			

ALL

V. DOCUMENTATION OF RESTRAINTS

A. Patient restraint shall be documented on the run sheet and address any or all the following appropriate criteria:
   1. That an emergency existed and the need for treatment was explained to the patient.
   2. That the patient refused treatment or was unable to consent to treatment (such as unconscious patient).
   3. Evidence of the patient's incompetence (or inability to refuse treatment).
   4. Failure of less restrictive methods of restraint (e.g., if conscious, failure of verbal attempts to convince the patient to consent to treat).
   5. Assistance of law enforcement officials with restraints, or orders from medical control to restrain the patient, or any exigent circumstances requiring immediate action, or adherence to system restraint protocols.
   6. That the treatment and/or restraint were for the patient's benefit and safety.
   7. The type of restraint employed (soft, mechanical, chemical).
   8. Any injuries that occurred during or after the restraint.
   9. The limbs restrained ("four points").
   10. Position in which the patient was restrained.
   11. Circulation checks every 5 minutes or less (document findings and time).
   12. The behavior and/or mental status of the patient before and after the restraint.

MEDIC

NOTES:

A. Intramuscular midazolam is more rapidly absorbed than other benzodiazepines, including diazepam and lorazepam, making it uniquely ideal for treatment of the acutely agitated patient. Onset 5-10 minutes.

B. Midazolam is as effective as haloperidol in acutely agitated and combative patients (Am J Emerg Med 8:97) and has less potential cardiovascular side effects and drug-drug interactions than haloperidol.

C. Respiratory depression is a known side effect of benzodiazepines and ketamine. Monitor and treat respiratory depression as needed. The use of flumazenil is not recommended and is potentially harmful because it may cause uncontrollable seizures. The risk of harm is especially present when the patient history is unknown, unclear, or incomplete.

D. Midazolam may be administered intranasal (IN); however, its efficacy in agitated and combative patients is unknown.

E. Use of benzodiazepines, including intramuscular Midazolam, for acutely agitated and combative patients is supported by American College of Emergency Physicians clinical policy [Ann Emerg Med 47(1): 79, 2006].

F. In rare cases, patients receiving ketamine for chemical restraint may experience an emergence delirium. This is characterized by: hallucinations, flashbacks, unusual thoughts, extreme fear, excitement, and irrational behavior. If this occurs, immediately contact medical control. Treatment typically is a small dose of a benzodiazepine but must be approved by medical control.

G. Positional asphyxia has been implicated in prior restraint-associated deaths. The patient must be

given adequate room and positioning to avoid interfering with normal respiration. Patients while restrained or sedated should never be transported prone, hog-tied, compressed, or otherwise prevented from repositioning to ensure adequate normal respiration.

H. Agencies opting to utilize ketamine are suggested to have training on its' indications, contraindications, side effects, and dosing. Robust medical director support is recommended.

I. Ketamine use for pre-hospital chemical restraint is supported by ACEP and NAEMSP. [ACEP task force report on hyperactive delirium with severe agitation in emergency settings. (2021)] and [PHEC 21(3): 395-6, (2017)]

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. Suspected exposure to allergen (insect sting, medications, foods, or chemicals).
C. Patient has or complains of any of the following:
   1. Respiratory difficulty
   2. Wheezing or stridor
   3. Tightness in chest or throat, weakness, or nausea.
   4. Flushing, hives, itching, or swelling.
   5. Anxiety or restlessness.
   6. Pulse greater than 100 or Systolic Blood Pressure less than 80 mm Hg.
   7. Gastrointestinal symptoms
   8. Swelling of the face, lips, or tongue

II. ANAPHYLAXIS DEFINITION

Serious, rapid onset (minutes to hours) reaction to a suspected trigger **AND**

A. Two or more body systems involved (e.g., skin/mucosa, cardiovascular, respiratory, GI) **OR**
B. Hemodynamic instability **OR**
C. Respiratory compromise

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. **Airway assessment and management are extremely important since airway compromise may develop rapidly at any time during the call.**

EMT

C. Request ALS back-up for a patient who has any of the following:
   1. Hypotension
   2. Tachycardia
   3. Noisy/difficult breathing (including but not limited to wheezing & stridor)
   4. Received epinephrine by auto-injector, if indicated
D. Administer epinephrine 0.3 ml (1 mg/ml) intramuscularly (IM) if patient is in anaphylaxis. May repeat dose every 5 – 15 minutes as needed.
E. This is an epinephrine concentration of 1:1,000.

ALL

F. Remove allergen if possible (stinger from skin, etc).
G. Check vital signs frequently, reactions may quickly grow more severe.

EMT

H. For patients with anaphylaxis, epinephrine should be administered as soon as possible.
   1. For patients who have been prescribed an auto-injector administer it in accordance with manufacturer's directions after obtaining patient consent.
   2. If there is no patient-supplied auto-injector immediately available, you may administer an EMS supplied auto-injector in accordance with the manufacturer's directions after obtaining patient consent.
   3. Auto-injector administration may be repeated every 5 – 15 minutes as needed.
I. If epinephrine auto-injector is to be administered, then:
   1. Assure injector is prescribed for the patient. (If patient's personal injector).
   2. Check medication for expiration date.
   3. Check medication for cloudiness or discoloration.
   4. Remove safety cap from injector.
   5. Select appropriate injection site (see notes). If possible, remove clothing from the injection site. If removing the clothing would take too much time, the auto-injector can be administered through clothing.
   6. Push injector firmly against site.
   7. Hold injector against the site for a minimum of ten seconds.
   8. Keep injector to give to hospital personnel upon arrival.
   9. If bronchospasm or wheezing is present assist patient with inhaler if they have one per

	Respiratory Distress Protocol M403.
MEDIC	K. Administer epinephrine 0.3 ml (1 mg/ml) intramuscularly (IM) if patient is in anaphylaxis. (See notes) May repeat dose every 5 – 15 minutes as needed. L. Monitor cardiac rhythm. M. If bronchospasm or wheezing is present, administer albuterol (Proventil) 2.5mg via nebulizer, and treat per Respiratory Distress protocol M403. Albuterol may be used without preceding epinephrine in patients with isolated, very minimal respiratory symptoms. N. Initiate IV access. If the patient is hypotensive, begin 1-liter normal saline IV wide open. O. Administer diphenhydramine 25 - 50 mg IV/IM/PO. Diphenhydramine may be used without preceding epinephrine in patients with isolated rash and no other symptoms. P. If hypotension still persists, consider SB205 Hypotension/Shock. If push-dose IV epinephrine initiated, discontinue IM dosing. Q. For persistent symptoms in a patient taking a β-blocker, consider 1 mg glucagon IM/IV.
ALL	**NOTES:** A. Anterolateral thigh is the preferred IM administration site for 1mg/ml epi autoinjector. Other sites may be used if preferred site would cause unneeded delay. Absorption is fastest with IM injection in the thigh.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. Patient has a decreased Level of Consciousness (GCS less than 15).

II. DIFFERENTIAL DIAGNOSIS

A. Refer to Altered Level of Consciousness Protocol.
B. Identify and rule out possible causes.

III. PHYSICAL FINDINGS (ONE OR MORE)

A. Patient suspected to have had grand mal seizure based upon description of eyewitnesses, incontinence of urine or stool, or history of previous seizures.
B. Patient may or may not have current seizure activity.
C. May have altered mental status.
D. May be incontinent of urine or stool.
E. May be salivating.
F. May have depressed respiratory status.

IV. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Assess for spinal injuries and treat/immobilize appropriately. Refer to Spinal Motion Restriction Protocol T704.

EMT

C. If available, request ALS back-up for a patient who meets one or more of the following criteria:
   1. Is actively seizing.
   2. Has been seizing for 15 minutes or longer.
   3. Has airway compromise.
   4. Has had more than two seizures without gaining consciousness.
   5. Has a history of diabetes and is seizing.
   6. Is in the third trimester of pregnancy and seizing.

MEDIC

D. If patient is actively seizing give Versed (midazolam) 10 mg IM.
   1. Alternately Versed (midazolam) can be given 2-4 mg/min IV/IN/IO until seizure resolves or a total of 10 mg is given.
   2. Be prepared to support the patient's respirations and place patient on continuous ETCO2 monitoring.

ALL

E. Check Glucose per M406.
F. Place on Cardiac monitor if available.
G. If suspicious for overdose refer to M411 Toxicological Emergencies.

NOTES:

A. If seizures develop for the first time in a patient over the age of 50, suspect a cardiac cause.
B. Trauma to the tongue is unlikely to cause serious problems, but trauma to the teeth may. Attempts to force an airway into the patient's mouth can completely obstruct the airway. Use of a nasopharyngeal airway may be helpful.
C. Most seizures that patients experience are self-limited to 1-3 minutes and will need only oxygen and attention to airway management and will not need treatment with Versed (midazolam).
D. Each department should have training on using Intranasal Versed with an atomizer device. This route may take longer for a response than the IV method.
E. Be aware that rectal Valium (Diastat) may have been administered to some patients with known seizure disorders prior to EMS arrival. Adding Versed on top of rectal Valium will exacerbate respiratory depression.

ALL

I. INCLUSION CRITERIA

A. Patients of any age.
B. History of actual poisoning either through ingestion, inhalation, injection, or absorption.
C. Scene size-up that indicates possible poisoning.
D. Presentation may vary depending on the concentration and duration of exposure. There could be a long list of signs and symptoms. There are thousands of chemicals, drugs, plants, and animals that can cause poisoning in humans.

II. RELATED APPENDICES

A. Appendix A: Chemical Agent Exposure
B. Appendix B: Transport of Contaminated Patients

III. PROTOCOL

A. First priority is scene safety.
B. Evaluate scene for provider safety and take appropriate precautions.
   1. Remove or have patients removed from trigger area once appropriate safety standards have been implemented.
   2. Park vehicles a safe distance away, uphill and upwind of incident.
   3. Utilize appropriate monitoring and safety equipment.
   4. Decontaminate patient as called for depending on agent and exposure.
   5. Consider requesting additional appropriate resources (HAZMAT, etc.).
C. Assess airway, breathing, circulation, and disability.
D. Maintain airway and administer high flow oxygen as appropriate.
E. Obtain vital signs, including temperature, end tidal-carbon dioxide, finger stick blood glucose, and apply cardiac monitor, if available.
   1. All patients with abnormal mental status should be considered hypoglycemic until proven otherwise.
F. If patient has ingested toxins, medications or other substances obtain container(s), if available, and bring them with the patient.
   1. Try to ascertain how much has been consumed, strength, formulation (immediate release IR or extended-release ER) and time of ingestion.
   2. Be aware of poly-pharmacy overdoses and lack of patient compliance with the intentional overdose patient.
   3. Be prepared for the possibility of patients who have may have multiple intoxicants on board.
G. If suicide notes are present, take to hospital or leave with police as appropriate.
H. The mainstay of treatment is supportive care of ABCDs.
   1. Treat hypotension with Push Dose Epinephrine as outlined in SB205 Hypotension/Shock.
   2. If patient has seizure activity reference appendices C and D. If seizure is not due to chemical agent exposure treat according to M410 or P610.
I. When in doubt contact Poison Control/Medical Control (**Local Cincinnati Poison Center: 513-636-5111; National Poison Control Center: 1-800- 222-1222**).
   1. EMS may contact medical command or Poison Control for toxin information.
   2. Direct contact with EMS to poison control for treatment orders is discouraged, medical command must give treatment orders. If necessary medical command will contact Poison Control.
J. Because of the wide variety of possible adverse effects of assorted toxins, it is not practical to detail the management of various toxic exposures. Consultation with the medical control physician can enhance the prehospital care of patients with potentially dangerous exposures and is encouraged.
K. All Toxicological Emergency Patients should be transported as soon as possible EXCEPT ref to next section L.
   1. Transport via police is not appropriate in many situations.
   2. Reassess frequently and notify receiving facility if there are changes in patient condition or decontamination will be necessary.

L. If exposure is an unintentional pediatric patient who is less than 12 years old AND has stable ABCs and vital signs:
   1. Obtain all history of ingestion, including time, all substances, amounts, strengths, formulations as applicable.
   2. Have legal guardian or parent contact the **Local Cincinnati Poison Center at 513-636-5111 or the National Poison Control Center (PCC) at 1-800-222-1222** for further assessment and treatment recommendations including referral to the emergency department. Once they obtain the recommendation from the poison center, allow them to make informed decision on treatment and transport.
      a. EMS provider may make contact with PCC but must relay all pertinent information from the PCC back to the legal guardian or parent for an informed decision.
      b. Up to 90% of all unintentional pediatric exposures do not need immediate referral to the emergency department.

EMT

M. If available, request ALS back-up for patient who has any of the following:
   1. An exposure that will require ALS intervention prior to arrival at the Emergency Department.
   2. Is unresponsive.
   3. Airway compromise.
   4. Is an adult with a pulse rate of less than 50 or greater than 130 beats per minute, or a systolic blood pressure less than 90 or greater than 180 mmHg.
   5. Is a pediatric patient with a respiratory rate greater than 50 or a heart rate less than 60 or greater than 180.
   6. A patient with blood glucose less than 60 mg/dL.

MEDIC

N. Establish IV/IO Access.

ALL

O. If toxins remain on the patient wash, brush, and remove clothing as appropriate and depending on type of toxic exposure.

IV. EXTERNAL EXPOSURE (SKIN AND EYE CONTACT)

A. If eye exposure, flush the eyes with normal saline or clean water.
B. If patient has been sprayed with pepper spray (OC spray) or tear gas Sudecon® wipes can assist in decontamination.
C. Encourage patient not to rub skin or eyes as this will spread the toxin and cause increase irritation.

V. INHALED POISONS

A. Remember that many inhaled toxins can also be absorbed through the skin and that further decontamination may be necessary depending on toxic agent.
B. Detect and treat any life-threatening problems immediately.

VI. INGESTED POISONS

A. Be prepared to manage the airway if ingested poison is corrosive or caustic.

VII. SPECIFIC TOXINS:

A. **CARBON MONOXIDE (SUSPICION OF)**
   1. Common human exposures occur through inhalation. Toxicity results in cellular hypoxia and ischemia.
   2. Treatment should occur when any of the following are present:
      a. CNS depression
      b. Nausea
      c. Vomiting
      d. Headache
   3. Treatment
      a. You can assess carboxyhemoglobin level (COHb) device assessment, if available. But understand some of these devices may be inaccurate.
      b. If carbon monoxide is suspected administer oxygen at 10-15 LPM regardless of oxygen saturation or COHb.

B. **CYANIDE (SUSPICION OF)**
   1. Cyanide poisoning can occur through inhalation, ingestion, and absorption.
   2. Treatment should occur when any of the following are present:

a. CNS depression
b. Hypotension
c. Tachypnea

3. There are no absolute contraindications to treatment.

MEDIC

4. If patient was exposed to fire/smoke in confined space and cyanide poisoning is suspected or known, then administer Cyanokit® if available (this is an optional drug). (There is a difference between Cyanokit® and Nithiodote®. Nithiodote should not be used. See notes)
   a. Cyanokit: Adult dose is 5 g (both 2.5 g vials or one 5 g vial) IV/IO over 15 minutes (~15 mL/minute or 7.5 minutes/vial) as per Manufacturer's recommendations (see below).
   b. Cyanokit: Pediatric dose is 70 mg/kg (max 5 g) IV/IO.
   c. The 5 g vial must be reconstituted with 200 mLs of 0.9% NaCl using supplied sterile transfer spike. Use the transfer spike to transfer the contents of two (2) 100 mL bags of normal saline into the Cyanokit® bottle (Normal Saline is the recommended diluent)
   d. Once filled gently rock or invert the vial to mix until the powder goes into solution. DO NOT shake the vial.
   e. If solution does not turn dark red or particulate is still present after mixing dispose of solution and do not administer.
   f. Spike the bottle and run the solution from the bottle over 15 minutes.
   g. Depending on severity or clinical response a repeat dose of 5 g (adults) or 70 mg/kg, max 5 g (pediatrics) may be given. The infusion rate for this dose can range from 15 minutes to 2 hours.
   h. Due to potential incompatibility with drugs commonly used in resuscitation effort and drugs in the cyanide antidote kit, DO NOT administer other drugs through the line supplying the Cyanokit®.
5. Treatment will temporarily turn the victim's skin and bodily secretions (tears, urine, etc) red.
   a. If patient has seizure activity reference Appendices A and B.

ALL

C. **OPIATE OVERDOSE**

1. Consider restraining patient before administration of Naloxone especially if patient is unconscious upon initial contact.
2. If patient is able to self-maintain their airway and hemodynamically stable, treatment should be supportive.
3. If patient has a pulse but is unconscious and there is suspicion of opiate overdose (evidenced by miosis, CNS depression, hypotension, hypoxia), perform basic airway maneuvers (assisted respiration with BVM and NP/ OP airway) to maintain airway and ventilation. **Assisted respirations and basic airway maneuvers are the mainstay of treatment in an otherwise stable patient until the overdose can be reversed with naloxone.**
   a. Advanced airway management with supraglottic/extraglottic airway or intubation should be deferred until appropriate dose of naloxone can be given as long as the patient is otherwise stable.
4. Patients in extremis may require advanced airway management (i.e., if vomiting or not able to maintain airway with good basic maneuvers and good BVM), patients in cardiac arrest should be managed per protocol (SB204).

EMT

5. Administer Naloxone
   a. Intranasal (IN)
      i. Do not use more than 1 ml of medication per nostril (0.2 to 0.3 is the ideal volume). If a higher volume is required, apply it in two separate doses allowing a few minutes between for the previous dose to absorb.
      ii. Always deliver half the medication dose up each nostril. This doubles the available mucosal surface area (over a single nostril) for drug absorption and increases rate and amount of absorption.
      iii. Naloxone may be administered by intranasal atomizer in the 0.4mg to 4 mg range. The IV/IM/IO dose remains the same.
   b. Auto Injector - follow manufacturer recommendations.

MEDIC

6. Administer Naloxone with an initial dose of 0.4 mg - 4 mg IV/IM/IN/IO (adult) or 0.1 mg/kg (max 4 mg) for pediatrics. EMT's may administer IN naloxone (see note below).
   a. *The clinical goal of naloxone administration is improvement in the patient's respirations, not complete resolution of their mental status*. Starting with a lower dose is preferred to prevent negative side effects. Example dosing sequence: 0.4 mg, then 1mg then 2 mg until respiratory status improves.
   b. While IV/ IO naloxone may be effective within 1-2 minutes, IM and IN may take up to 5 minutes or more for full clinical effect.
   c. Naloxone may be administered by intranasal atomizer in the 0.4 mg to 4 mg range for adults and pediatrics. The IV/IM/IO dose remains the same.
   d. In patients who are completely apneic or peri-arrest (ie. bradycardic, hypotensive), a larger first dose may be appropriate (ie. 1-2 mg IV).
   e. In a patient who has a pulse and whose respirations can be assisted without difficulty via BVM, the preferable route of naloxone administration initially is intranasal 2 mg (1 mg per nostril) or 4 mg using a pre-dosed atomizer. If patient condition allows, allow at least 5 minutes after IN administration before redosing.
7. If breathing is not improved after 3-5 minutes, administer a second dose of naloxone. Continue to repeat as necessary up to total of 10 mg.
   a. If no improvement after 10 mg total of naloxone has been given, consider other possible causes for patient's symptoms.
   b. IV naloxone typically has onset (ie. improvement in breathing) within 1-2 minutes, while the time to onset of IN/ IM naloxone is generally 5-8 minutes. As long as the airway can be maintained with basic maneuvers and BVM, a second dose of naloxone may be delayed beyond 5 minutes if the initial dose was IM/ IN, though up to 25% of patients may need an additional dose.
8. Be cautious to avoid aggressive use of Naloxone in patients with suspected opiate overdose as a rapid administration may cause acute withdrawal symptoms. The opiate may also be controlling aggressive side effects of other drugs that have been consumed.
9. After naloxone administration, transport to an emergency department is recommended.
   a. The effective half-life of naloxone is between 45 and 90 minutes depending on the dose. The half-life of many narcotic agents is longer (2-3 hours up to 20+ hours, ie. Methadone, Fentanyl, Talwin, Oxycontin), and patients generally warrant observation to avoid rebound respiratory depression when the naloxone wears off.
10. If after giving naloxone the patient refuses transportation to the hospital for observation, they must sign to leave against medical advice per protocol SB200.

ALL

D. **ORGANOPHOSPHATE POISONINGS**
   1. Refer to Hamilton County Fire Chief's Website.
   2. Keep in mind tachycardia is not a contraindication for Atropine administration in the Organophosphate poisoning patient.

E. **SODIUM CHANNEL BLOCKERS OVERDOSE**
   1. Benadryl (diphenhydramine).
   2. Tricyclic antidepressants are used to treat patients with major depressive disorders and bipolar disorder. Tricyclic drugs may be found under the following names:
      a. Amitriptyline (Elavil, Endep, Etrafon, Limbitrol)
      b. Nortriptyline (Palelor, Aventyl)
      c. Amoxapine (Asendin)
      d. Clomipramine (Anafranil)
      e. Desipramine (Norpramine
      f. Doxepin (Sinequan)
      g. Imipramine (Tofranil)
      h. Protriptyline (Vivactil)
      i. Trimipramine (Surmontil)
   3. Initial treatment is supportive if patient is conscious.

MEDIC

4. Observe patient for hypotension and a monitor cardiac rhythm for symptomatic bradycardia or tachycardia with a prolongation of the QRS complex.
   a. If patient has prolonged QRS, is hypotensive, or has Ventricular Tachycardia administer Sodium Bicarbonate 1 mEq/kg, slow IV/IO over 2 minutes.
   b. Repeat Sodium Bicarbonate 0.5 mEq/kg, IV/IO for persistent QRS prolongation.
5. Consider push dose epi per SB205 Hypotension titrated to maintain systolic blood pressure greater than 100 mmHg for hypotension unresponsive to fluids or sodium bicarbonate.

ALL

NOTES:

A. There is a difference between **Cyanokit®** (a B12 vitamin derivative) and **Nithiodote®** (Sodium Nitrate and Sodium Thiosulfate). The sodium nitrate in Nithiodote® is contraindicated for use in patients with smoke inhalation and CO poisoning.
B. For more information on Cyanokit® refer to www.cyanokit.com
C. Evzio (naloxone) is an auto-injector for treating suspected opioid overdose, (analogous to an EpiPen). Evzio comes in a kit with two auto-injectors and a "trainer" device that also has voice guidance. As of 2019, the AWP for Evzio is $2250 for 0.4 mg in 0.4 mL and $2460 for 2 mg in 0.4 mL. The standard 2 mg / 2 mL injectable dose of naloxone, which can be given intranasally, has an AWP of ~$20.
D. For more information on Cyanokit® refer to www.cyanokit.com.
E. Evzio (naloxone) is an auto-injector for treating suspected opioid overdose, (analogous to an EpiPen). Evzio comes in a kit with two auto-injectors and a "trainer" device that also has voice guidance. As of 2019, the AWP for Evzio is $2250 for 0.4 mg in 0.4 mL and $2460 for 2 mg in 0.4 mL. The standard 2 mg / 2 mL injectable dose of naloxone, which can be given intranasally, has an AWP of ~$20.

ALL

I. DEFINITIONS

A. True hypothermia is a body temperature less than 95° F (35°C).
B. Mild hypothermia is a body temperature from 86 to 93°F (30-34°C).
C. Severe hypothermia is less than 86°F (less than 30°C).

II. INCLUSION CRITERIA

A. Patients of all ages
B. High risk groups: elderly, infants, outdoor workers, homeless individuals, patients with central nervous system disorders and alcoholics/drug abusers.
C. Predisposing factors
   1. Decrease of body heat due to:
      a. Prolonged exposure to cold
      b. Inadequate clothing
      c. Intoxication
      d. Illness and injury
   2. Decrease heat production due to:
      a. Malnutrition
      b. Endocrine disorders
   3. Impaired thermoregulation due to:
      a. Hypoglycemia
      b. Alcohol or drug abuse (barbiturates, phenothiazines)
      c. Sepsis
      d. Central nervous system disorders
D. Hypothermia can occur under relatively mild weather conditions.
E. Variable presentations with a range of presenting symptoms from mild non-specific complaints to unresponsiveness.
F. Mild symptoms include decreases in coordination, reflexes, and alertness.
G. If unresponsive, the patient may appear pulseless with pupils fixed and dilated.
H. Pulse rate may be severely bradycardic making a radial pulse difficult to palpate. Pulse rates should be obtained with palpation of central pulses, carotid or femoral, for at least one minute.
I. Extremities may be stiff and resemble rigor mortis or they may be cyanotic or edematous (Frost bite).
J. Altered/decreased mental status.

MEDIC

K. Bradycardia
L. If the core temperature falls below 89.6°F (32°C), a characteristic "J" wave, Osborne wave, can be seen. The J wave occurs at the junction of the QRS complex and the ST segment.

EKG IN HYPOTHERMIA

ALL

III. DIFFERENTIAL DIAGNOSIS

A. Cardiac arrest
B. Coma
C. Narcotic abuse
D. Severe shock

IV. PROTOCOL

A. Gentle handling of the patient is important to avoid introducing ventricular fibrillation.

MEDIC	B. If a rapid glucose test is less than 60 mg/dL, refer to M406 or P608. C. If considering opiate overdoes, refer to M411 Toxicological Emergencies.
	D. **Absent pulse and breathing** 1. Follow Cardiac Arrest Protocol SB204. a. Continue CPR. b. Temperature < 30°C (86°F) i. Only administer one round of ACLS drugs. ii. No more than three defibrillations. c. Temperature 30 - 35°C (86°F -95°F) i. Double the interval of time between drug dosing. 2. Defibrillate normally. 3. Maintain airway and administer oxygen to correct hypoxia <95%. If available heat to 108-155°F (42-46°C).
EMT	4. If available request ALS.
ALL	5. If possible, a patient's temperature should be documented. 6. Notify the receiving hospital. E. **Spontaneous respirations and pulses** 1. Maintain airway and administer oxygen. (Heated to 42 C – 46 C {108 F – 115 F} if possible). 2. If the patient is unconscious and not able to protect their airway, refer to Airway Protocol T705.
MEDIC	3. Initiate IV/IO access and begin to administer 1 Liter of normal saline (child 20 ml/kg) fluid bolus. 4. Monitor cardiac rhythm.
ALL	5. Notify the receiving hospital. 6. Do not massage extremities as it will cause increased cutaneous vasodilatation and decrease shivering. 7. Do not use hot packs, these can cause serious burns as well as possibly increase mortality. 8. Gentle evacuation is needed. Remove the victim from the cold environment, remove wet clothing, insulate with dry warm covering, cover patient's head (not face) and immobilize the patient to prevent exertion by patient. 9. If patient also presents with frost bite: a. Protect injured areas. b. Remove clothing and jewelry from injured parts. c. Do not attempt to thaw injured parts with local heat. d. Maintain core temperature. e. Severe frost bite should be transported to a burn center.
MEDIC	f. Consider vascular access and consider warmed fluids. g. Apply cardiac monitor. h. For pain relief when the patient is conscious, alert, not hypotensive, and is complaining of severe pain, consider pain management protocol S505 and P612.

ALL

I. INCLUSION CRITERIA

A. Patients of all ages
B. High risk groups: elderly, infants, outdoor workers, and athletes.
C. Impaired thermoregulation due to:
   1. Hypoglycemia
   2. Drugs (Anticholinergic, phenothiazines, antidepressants)
   3. Infection
   4. Central nervous system disorders.
D. Hyperthermia can occur with strenuous physical exertion and/or severe environmental conditions.

II. PHYSICAL FINDINGS

A. Variable presentations with a range of presenting symptoms from mild nonspecific complaints to unresponsiveness.
B. Heat cramps are characterized by:
   1. Muscle cramps
   2. Hyperventilation
C. Heat exhaustion is characterized by:
   1. Volume depletion
   2. Fatigue
   3. Lightheadedness
   4. Headache
   5. Tachycardia
   6. Hyperventilation
   7. Hypotension
   8. Body temperature may be normal
D. Heat Stroke is a true medical emergency, it is characterized by:
   1. Elevated temperature
   2. Neurological symptoms:
      a. Syncope
      b. Irritability
      c. Combativeness
      d. Bizarre behavior
      e. Hallucinations
      f Hemiplegia
      g. Seizures
      h. Coma
      i. Decorticate/Decerebrate posturing
   3. Classic lack of sweating can be delayed.

III. PROTOCOL

A. Remove patient from external heat sources and remove patient's clothing.
B. If possible, document a temperature.
C. Promote evaporative cooling by positioning fans close to undressed patient and spraying patient with tepid water. **Do Not** cover patient with wetted sheets as this will impair evaporation.
D. Promote conductive cooling by applying ice bags, if available, to axilla, groin, and neck.
E. In cases of heat stroke, the patient should be cooled as quickly as possible. Immersion cooling is the most effective method to lower core body temperature. If the resources are readily available (ex. ice bath, swimming pool, high-flow cold water dousing) and no other emergency intervention is needed (seizure, airway compromise, etc.), then it is preferable to cool the patient prior to transport.

MEDIC

F. Establish IV access.
G. Apply cardiac monitor.
H. If patient appears dehydrated administer 500-1000 ml saline bolus or 20 mL/kg for children.

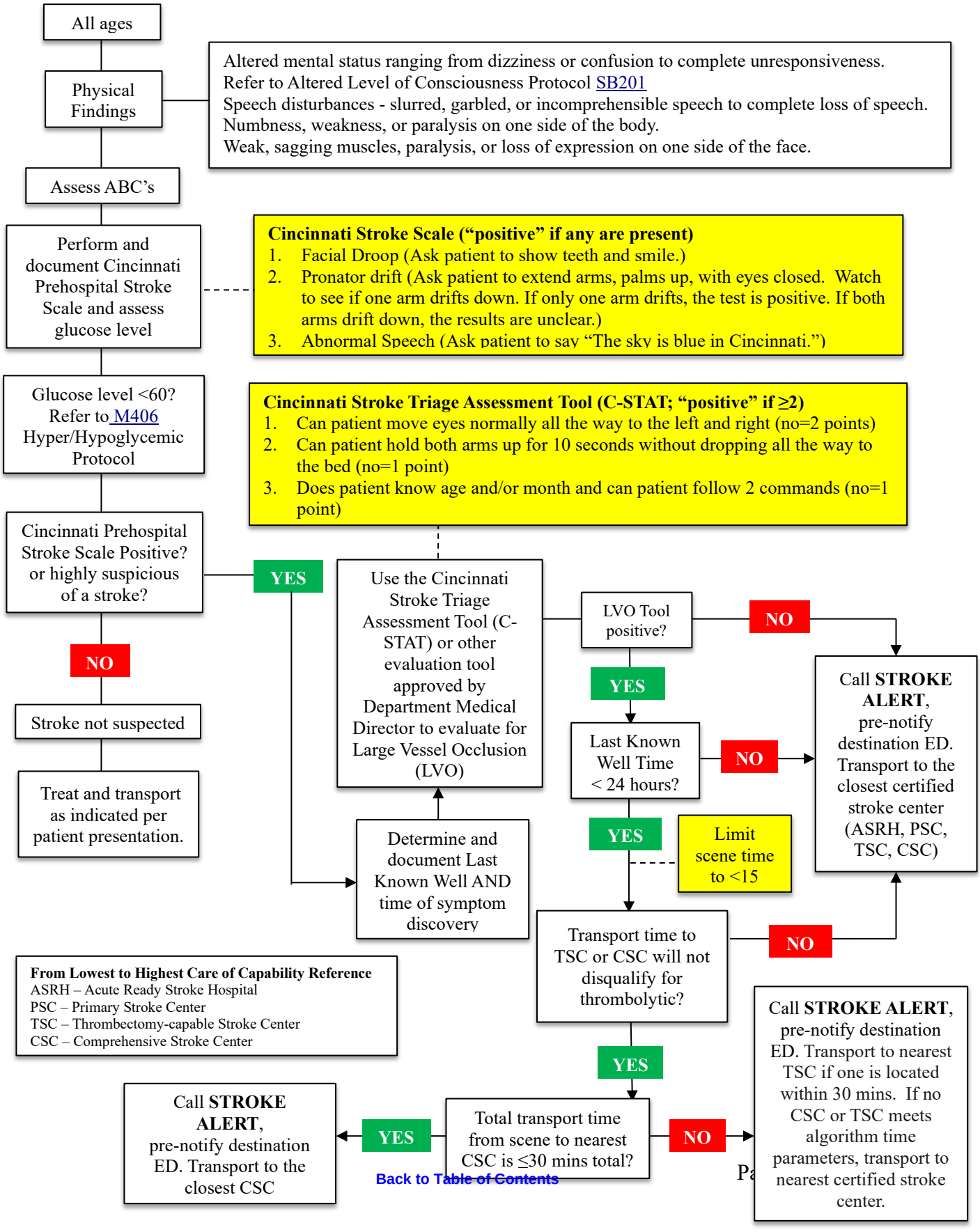
ALL

I. When core temperature (if available) reaches 101°F (38°C) discontinue cooling efforts to prevent "overshoot" hypothermia.

NOTES:

A. There is no minimum body temperature for heat related illnesses. Patients can be normo-thermic with heat cramps and heat exhaustion but are usually hyperthermic with heat stroke.
B. Many patients with true heat stroke are not dehydrated, while heat exhaustion patients usually are.
C. Shivering can begin when the skin temperature drops but the core temperature remains high.
D. Measuring core temperature in the prehospital setting is difficult and does not correlate well to skin/temporal/tympanic temperature.
E. If the conditions for on-site cooling are not met, particularly if the patient has additional problems requiring medical intervention, the patient should be transported immediately to the closest ED.

	Cooling should be initiated during transport in the most effective manner possible.to skin/temporal/tympanic temperature.



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MEDIC

I. Obtain IV access (20 gauge or larger) in the right arm proximal to the wrist, if possible
   1. This specific access is required for advanced neuroimaging.

ALL

NOTES:

A. Refer to ED Capability Survey for stroke center certifications.
B. Stroke Center means one of the following: Joint Commission Certified Comprehensive (CSC), Thrombectomy-Capable Stroke Center (TSC), Primary Stroke Center (PSC), Acute Stroke Ready Hospital (ASRH).
C. The **Last Known Well time** is the time that the patient, or others, confirm that they were completely normal (or normal for them) prior to the onset of symptoms. This is NOT the time that the patient or bystanders first noted symptoms. If a patient woke up with symptoms present, then establish the last time the patient was noted to be at their baseline prior to going to sleep. (For example, the patient may have woken up in the middle of the night to go to the bathroom. This is the last known normal time.) If possible, bring a witness of last known normal time to the ED with the patient, and/or gather their contact information for the Stroke Team.
D. **Time of Symptom Discovery** refers to the time at which the symptoms were first noticed by a reliable witness. These terms are often mistakenly used interchangeably, and so explicit capture of both ensures accuracy. Among patients with a witnessed stroke onset, these two times will be the same.
E. Patients who experience transient ischemic attack (TIA) develop most of the same signs and symptoms as those who are experiencing a stroke. The signs and symptoms of TIAs can last from minutes up to one day. Thus the patient may initially present with typical signs and symptoms of a stroke, but those findings may progressively resolve. The patient needs to be transported to the hospital for further evaluation.
F. Some patients who have had a stroke may be unable to communicate but can understand what is being said around them.
G. Place the patient's affected or paralyzed extremity in a secure and safe position during patient movement and transport.
H. In general, hypertension in stroke patients should not be treated in the prehospital setting. Treatment should only be at the direction of online medical control.
I. Do not discount rapid transport just because the "window" is over; allow the ED to determine timeframes for treatment.
J. Patients under 16 years of age, consider preferential transport to Cincinnati Children's Hospital.
K. A Mobile Stroke Unit (MSU) is able to diagnose and treat acute ischemic stroke and intracranial hemorrhage patients and may be an available prehospital resource for patients with suspected stroke. EMS may hand-off patient care to the MSU in the same way an ED hand-off occurs. If the MSU is en route but not yet on scene, EMS will assess the risk/benefit of immediate transport vs. a minor extension of scene time. The <15-minute scene time guidance does not apply to the MSU.
L. Stroke stickers should be used to improve communications between EMS and the hospital.

REFERENCES:

American Heart Association. American Heart Association Mission Lifeline: Stroke Severity-based Stroke Triage Algorithm for EMS. 2020; https://www.heart.org/-/media/files/professional/quality-improvement/mission-lifeline/2_25_2020/ds15698-qi-ems-algorithm_update-2142020.pdf?la=en. Accessed July 7, 2020.

ALL

I. INCLUSION CRITERIA

A. Patients of any age.
B. Patient has a Pre-Existing Medical Device or Drug Administrations.
C. Prehospital patient with a pre-existing physician-ordered medical device or drug administration ("MDDA") not covered in the provider's scope of practice.
D. These may include but are not limited to: ventilatory adjuncts (CPAP, BiPAP), continuous or intermittent IV medication infusions (analgesics, antibiotics, chemotherapeutic agents, vasopressors, cardiac drugs), and nontraditional out-of-hospital drug infusion routes (subcutaneous infusaports, central venous access lines, direct subcutaneous infusions, self-contained implanted pumps).
E. Patient may have implanted adjuncts or other accompanying mechanical devices.

II. PROTOCOL

A. When encountering a patient who has medical treatments that a Prehospital Provider has not been trained on it is the responsibility of the provider to determine the best course of treatment by utilizing (but not limited to) the following resources:
1. The patient themselves.
2. The patient's family.
3. Online Medical Control.
4. MDDA product literature/company representative (in person or via telecommunication).
5. Other patient care staff such as MD, RN, LPN, CNA, etc.
6. Any other individual who has been trained in the specific care of the patient (i.e., Day Care Worker).

EMT

7. EMT-Basics should request ALS back-up or intercept if they feel the patient's condition and needs exceed or may exceed their level of care.

ALL

B. Pre-existing MDDA functioning normally:
1. The Prehospital Provider should provide usual care and transportation while maintaining the pre-existing MDDA.
C. Pre-existing MDDA not functioning normally:
1. Provider is to determine if it is in the patient's best interest to re-establish the treatment or allow the preexisting MDDA to remain as found. The Prehospital Provider is to take all reasonable steps to support the course of treatment decided upon.
D. The best course of treatment may include medication administrations outside the provider's normal operations and prior training.
1. The Prehospital Provider is to determine the appropriate course of medical administration by utilizing available resources.
E. If appropriate transport any extra resources/persons with the patient.
1. Some medications may not be safe for an EMT-Basic or Paramedic to continue to administer without accompaniment by appropriately trained personnel most likely from a treatment clinic. If no personnel will accompany the EMS crew, discontinue medication administration. (Ex: Chemotherapy)
2. If transporting a patient from the care of a higher-level provider the Prehospital Providers may, if comfortable, use on-scene training during transport without the accompaniment of the higher-level provider (MD, RN). The Prehospital Providers have the right to request the higher-level provider accompany the patient during transport.

III. SPECIAL SITUATIONS

A. Ventricular Assist Devices (LVAD, RVAD, BiVAD)
1. Appropriate interventions vary by device, recommend using a reference such as the Mechanical Circulatory Support Organization EMS Guide.
2. Always contact the appropriate VAD program coordinator
a. Cincinnati Children's Hospital Medical Center 513-926-6788
b. St. Elizabeth 859-301-4823
c. The Christ Hospital 859-572-1609
d. TriHealth 513-865-5823

e. University of Cincinnati Medical Center 513-264-3841

3. **The VAD program may be difficult to reach during the time constraints of EMS care. If unable to contact the patient's VAD Program coordinator immediately, contact medical control at receiving ED**

B. Adrenal Insufficiency – follow M417

NOTES:

A. This protocol intends to supply the framework for Prehospital Providers to support existing medical care to provide the best outcome for patient.

B. This protocol serves to provide this capability for patients with a pre-existing MDDA. EMT-Basics cannot exceed their particular scope of medications for patient care.

C. In the ever-evolving realm of medical care, it is not practical to create specific guidelines for each individual pre-existing MDDA, the provider should utilize all resources necessary to assist with patient care.

D. Some hospitals/emergency departments are not equipped to handle complications of certain pre-existing MDDAs. The provider should make an effort to transport to the appropriate facility based on each particular patient's situation.

E. **This protocol is NOT intended to give EMT-Basics or Paramedics authorization to attempt procedures or administer medicines outside of a patient's previously established course of care as determined by a physician**.

F. For patients with a Central Venous Access Device in situations requiring emergent venous access due to patient's life being in imminent danger or if patient is in cardio-respiratory arrest refer to the protocol, Emergency Use of Central Venous Access Device.

G. The best way to handle patients with special situations is proper identification and pre-incident planning. This will allow for the appropriate training and potential to carry pertinent supplies and information should they be needed.

MEDIC

I. INCLUSION CRITERIA

A. The patient expressly requests treatment for a minor medical concern by a specific over the counter (OTC) medication.
B. No sign or symptom of a significant medical condition exists.
C. The paramedic has access to the official manufacturer's list of indications, contraindications, and administration instructions.

II. DEFINITION

A. OTC medications are those that can be obtained by non-medical personnel without prescription.
B. These may include, but are not necessarily limited to:
   1. NSAIDS (ibuprofen and naproxen)
   2. Acetaminophen
   3. Antihistamines
   4. Decongestants
   5. Antacids
   6. Loperamide
   7. Antibiotic ointment

III. PROTOCOL

A. Medication allergies, current medications, and medical diagnoses must be reviewed immediately prior to medication administration.
B. OTC medications may be used only for those conditions indicated in writing on the medication's original manufacturer's packaging and insert.
C. OTC medications should not be used if any contraindications / warnings indicated on the medication's original manufacturer's packaging and/or insert apply.
D. OTC medications should ONLY be used in dosages and frequencies indicated on the medication's original manufacturer's packaging and/or insert.
E. Official documentation should be produced and maintained for ALL medical care rendered in the course of a paramedic's duties.
F. This documentation should include, at a minimum: patient identifier, complaint, medical history including allergies and medications, evaluation performed, and treatment rendered.
G. This protocol is not intended for use with patients being transported to the hospital, but instead for patients seeking care at "special events" where paramedics are stationed or for emergency personnel on critical scene assignments.

ALL

I. DEFINITIONS

A. *Adrenal Insufficiency (AI)* – potentially life-threatening condition in which the adrenal glands do not produce sufficient quantities of the hormone's cortisol and aldosterone. Addison's Disease and Congenital Adrenal Hyperplasia are two forms of the disease.

B. *Adrenal Crisis* – life threatening condition in which someone with AI fails to mount an adequate response to acute physiologic stress.

1. Early symptoms – non-specific, may resemble viral illness or hypoglycemia.
2. Late symptoms – altered mental status, hypotension, hypoglycemia, seizures, dysrhythmia, cardiopulmonary failure.

II. INCLUSION CRITERIA

A. All patients with known diagnosis of AI who exhibit signs/symptoms of adrenal crisis.

B. Evidence of AI diagnosis may include medical alert tags, patient, or family statement, notes or care description letter from physician, possession of injectable corticosteroids for self or family administration.

III. PROTOCOL

A. If available, allow patient/family to SELF-ADMINISTER steroid therapy (usually in the form of injectable hydrocortisone sodium succinate / Solu Cortef 100mg IM).

MEDIC

B. If self-administration not possible or undesirable, immediately give:

1. Solu-Medrol (Methylprednisolone) 125 mg IM/IV/IO (Adult).
2. Solu-Medrol (Methylprednisolone) 2 mg/kg IM/IV/IO (Pediatric).

ALL

C. Assess blood glucose. If glucose < 60 mg/dl, follow protocol M406 / P608.

D. Manage airway as appropriate.

E. Initiate supplemental oxygen by nonrebreather mask to correct hypoxia <95%.

MEDIC

F. Place patient on cardiac monitor and obtain 12-Lead EKG.

G. Administer IV bolus.

1. 500 - 1000 ml normal saline IV/IO (Adult).
2. 20 ml/kg normal saline IV/IO (Pediatric).

H. If hypotension or signs of shock persist, follow protocol SB205.

I. Consider antiemetic treatment M405.

ALL

J. Notify receiving facility and transport patient.

NOTES:

A. Paramedic administration of the patient's own injectable steroid (hydrocortisone sodium succinate 100mg IM) is allowed if the patient/family are unable to do so, EMS agency supplied Solu-Medrol (methylprednisolone) is not available, AND the medication is in a factory sealed container (e.g. vial) with valid expiration date.

B. Any patient-supplied medications given by the patient, family, or EMS should be brought to the hospital with the patient.

ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. Symptomatic hyperkalemia with EKG changes.

II. PROTOCOL

EMT

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Place on cardiac monitor.
C. Obtain 12 lead if able and transmit.

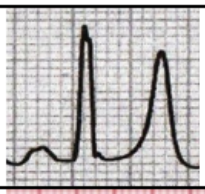
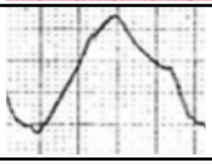
MEDIC

D. Obtain IV/IO access.
E. Treat with the following:
   1. Calcium gluconate 1 gram IV/IO (mix in 100 mL of 0.9% Normal Saline and infuse).
   2. Sodium bicarbonate 1 mEq/kg IV/IO.
   3. Albuterol/duoneb nebulized continuously (may discontinue with EKG improvement).

ALL

NOTES:

A. Hyperkalemia is the serum potassium above the reference range of 5.5 mmol/L that can lead to severe cardiac, hemodynamic, and metabolic dysfunction. Signs and symptoms of severe hyperkalemia include:
   1. Peaked T waves, QRS > 0.12 ms, +/- hypotension
   2. Bicarbonate and calcium can precipitate in same line, therefore, must be given with adequate flushing of the line or in a separate line.

Serum potassium	Typical ECG	Possible ECG abnormalities
Mild (5.5-6.5 mEq/L)		•Peaked T waves •Prolonged PR segments
Moderate (6.5-8.0 mEq/L)		•Loss of P waves •Prolonged QRS complex
Severe (>8.0 mEq/L)		•Widening of QRS complex •Sine wave

B. Consider these treatments early in known end-stage renal disease (ESRD) that are in cardiac arrest.
   1. In these situations, substitute Calcium chloride 20mg/kg (max 1000mg) IVP.

ALL

I. INCLUSION CRITERIA

A. All ages
B. Provider suspects infection and
C. Adults: At least one (1) of the following abnormalities:
   1. SBP ≤ 90 mmHg
   2. HR ≥ 90 bpm
   3. Visible tachypnea
   4. Acute altered mental status / confusion
D. Pediatrics: At least one (1) of the following abnormalities:
   1. Hypotension → a sign of uncompensated shock
      a. Neonates (0-28 days): SBP < 60 mmHg
      b. Infants (1 mo – 12 months): SBP < 70 mmHg
      c. Children (1 yr – 10 years): SBP < 70 + (2 x age in years) mmHg
      d. Children (>10 years): SBP ≤ 90 mmHg
   2. Sustained tachycardia for age
   3. Tachypnea for age
   4. Cool/pale/mottled skin
   5. Delayed capillary refill (>2 seconds)
   6. Altered mental status – sleepy, drowsy, fussy, irritable.
   7. Weak peripheral pulses.
   8. In warm shock: flash capillary refill, bounding pulses.

II. PROTOCOL

A. Place patient on continuous $ETCO_2$ monitor and record both the $ETCO_2$ and measured respiratory rate.
B. Record temperature
C. If altered mental status, check fingerstick glucose and treat per M406 or P608.

III. HOSPITAL PRE-NOTIFICATION

If the following criteria are met, pre-notify the receiving hospital with a "**Sepsis Alert**":

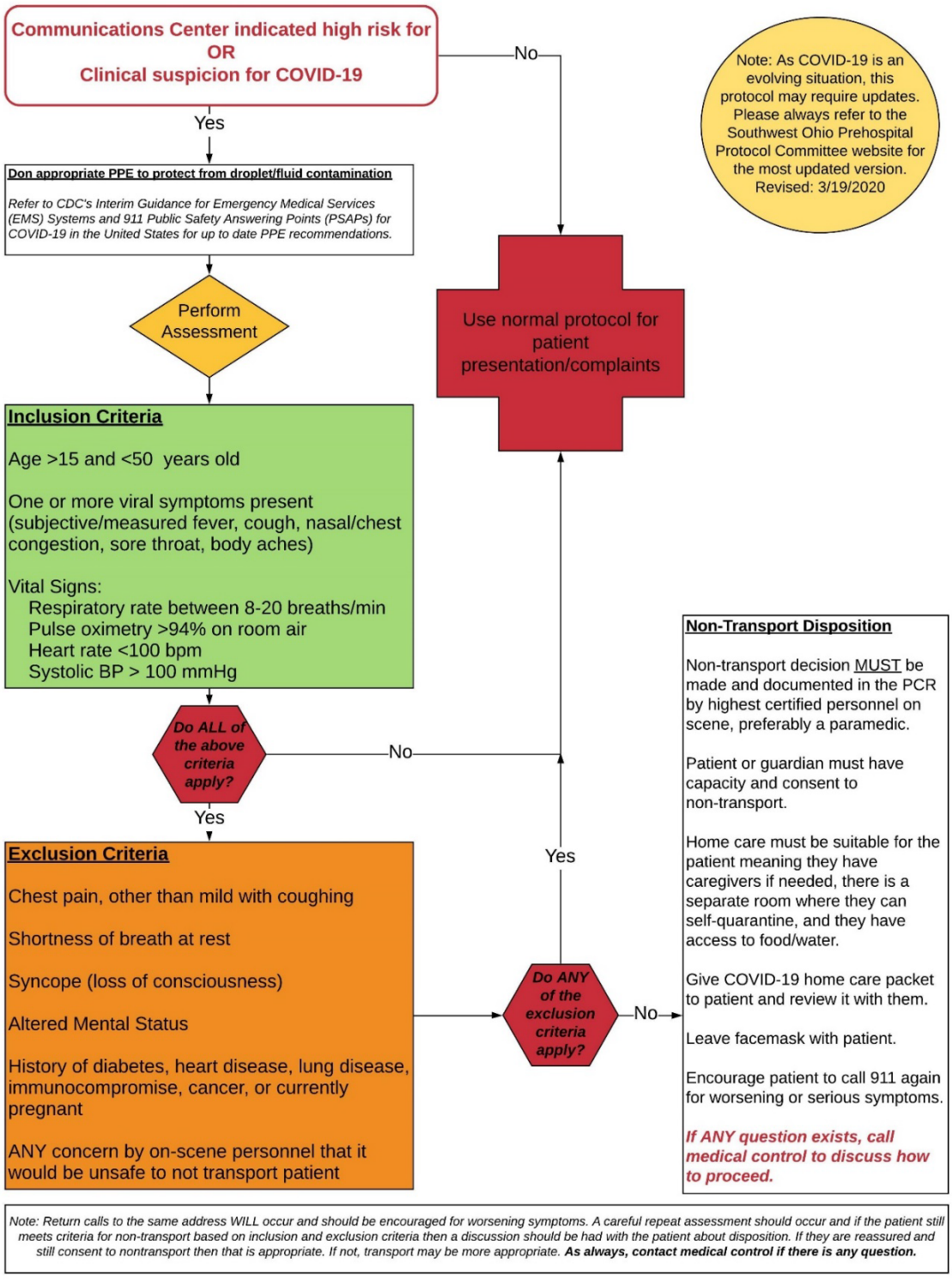
A. $ETCO_2$ ≤ 25 and
B. At least two (2) of the following:
   1. T ≥ 100.4 F (38 C) OR ≤ 96.0 F (~36 C)
   2. Hypotension
      a. Adults: SBP ≤ 90 mmHg
      b. Pediatric:
         i. Neonates (0-28 days): SBP < 60 mmHg
         ii. Infants (1 mo – 12 months): SBP < 70 mmHg
         iii. Children (1 yr – 10 years): SBP < 70 + (2 x age in years) mmHg
         iv. Children (>10 years): SBP ≤ 90 mmHg
   3. HR ≥ 90 bpm for adults; sustained tachycardia for age in pediatric patients (see chart above)
   4. RR ≥ 20 bpm for adults; tachypnea for age in pediatric patients
   5. Altered mental status / confusion

MEDIC

IV. If "Sepsis Alert" criteria met:

A. Establish IV (or IO if indicated)
   1. Initiate IV fluids:
      a. Adult: (30 mL/kg crystalloid fluid; maximum of 500 milliliters) over less than 15 minutes.
      b. Pediatric: (20mL/kg crystalloid fluid; using a push-pull method of drawing up the fluid in a syringe and pushing it through the IV (preferred for pediatric patients) - may repeat up to 3 times based on patient's condition and clinical impression.
   2. Do not delay transport to initiate IV/IO or fluid bolus.
   3. For persistent/worsening hypotension in non-pediatric patients, consider Push-Dose Epinephrine per SB205 Hypotension/Shock.

	a. Most pediatric patients in the prehospital arena will need FLUIDS pushed/pulled and have not been adequately fluid resuscitated to the point of needing pressors administered by a Paramedic.
ALL	**NOTES:** A. There are many disease processes that can cause abnormal vital signs. History and physical are important to inform your suspicion of an infection (inclusion criteria): 1. Urinary: Indwelling catheter, history of UTI, urinary symptoms, etc. 2. Pulmonary: Cough, shortness of breath, aspiration, etc. 3. Bloodstream: IV drug use, wounds, indwelling lines, recent infections, etc. 4. Skin: Decubitus ulcer, diabetic wounds, cellulitis, etc. 5. CNS: Confusion, seizures, photophobia, neck stiffness, etc. 6. Abdomen: Ascites with worsening abdominal pain or confusion, recent surgery, etc. B. When obtaining temperature, oral or rectal measurements are likely to be more accurate than superficial measurements, which often underestimate core temperature. C. Any crystalloid fluid is appropriate for initial bolus (Normal Saline, Lactated Ringers, Normosol, Plasmalyte, etc.).


Communications Center indicated high risk for
OR
Clinical suspicion for COVID-19
No
Yes
Note: As COVID-19 is an evolving situation, this protocol may require updates. Please always refer to the Southwest Ohio Prehospital Protocol Committee website for the most updated version. Revised: 3/19/2020
Don appropriate PPE to protect from droplet/fluid contamination
Refer to CDC's Interim Guidance for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points (PSAPs) for COVID-19 in the United States for up to date PPE recommendations.
Perform Assessment
Use normal protocol for patient presentation/complaints
Inclusion Criteria
Age >15 and <50 years old
One or more viral symptoms present (subjective/measured fever, cough, nasal/chest congestion, sore throat, body aches)
Vital Signs:
Respiratory rate between 8-20 breaths/min
Pulse oximetry >94% on room air
Heart rate <100 bpm
Systolic BP > 100 mmHg
Do ALL of the above criteria apply?
No
Yes
Exclusion Criteria
Chest pain, other than mild with coughing
Shortness of breath at rest
Syncope (loss of consciousness)
Altered Mental Status
History of diabetes, heart disease, lung disease, immunocompromise, cancer, or currently pregnant
ANY concern by on-scene personnel that it would be unsafe to not transport patient
Yes
Do ANY of the exclusion criteria apply?
No
Non-Transport Disposition
Non-transport decision MUST be made and documented in the PCR by highest certified personnel on scene, preferably a paramedic.
Patient or guardian must have capacity and consent to non-transport.
Home care must be suitable for the patient meaning they have caregivers if needed, there is a separate room where they can self-quarantine, and they have access to food/water.
Give COVID-19 home care packet to patient and review it with them.
Leave facemask with patient.
Encourage patient to call 911 again for worsening or serious symptoms.
If ANY question exists, call medical control to discuss how to proceed.
Note: Return calls to the same address WILL occur and should be encouraged for worsening symptoms. A careful repeat assessment should occur and if the patient still meets criteria for non-transport based on inclusion and exclusion criteria then a discussion should be had with the patient about disposition. If they are reassured and still consent to nontransport then that is appropriate. If not, transport may be more appropriate. As always, contact medical control if there is any question.

ALL

I. INCLUSION CRITERIA

A. Age: 6 months and up.

B. Presence of fever is defined as oral, temporal, tympanic or non-contact thermometer reading obtained by EMS of >100.4°F.

C. Patient has the ability to swallow liquids.

II. EXCLUSION CRITERIA

A. Patient received acetaminophen or acetaminophen-containing products within the last six hours.

B. The patient is allergic to acetaminophen.

III. PROTOCOL

A. Obtain temperature and document method used to obtain temperature.

B. If the patient is febrile, remove excessive blankets and clothing to facilitate passive cooling.

C. If the patient or guardian has provided a room temperature wet washcloth, EMS is permitted to continue its' use.

D. If the patient is suspected of being septic, refer to M419 Sepsis.

MEDIC

E. If the patient's weight is known, utilize that weight for dosing.

F. If the patient's weight is unknown, utilize length-based tape to determine weight.

G. Dosing questions should be directed to medical control.

H. **PEDIATRIC DOSING** - Administer acetaminophen orally per the dosing chart below.

PEDIATRIC DOSING	
Patient Weight (kg)	Children's Acetaminophen Suspension Liquid (160mg/5mL)
6-12 lbs. (3-5 kg)	¼ tsp or 1.25 mL (40 mg)
13-16 lbs. (6-7 kg)	½ tsp or 2.5 mL (80 mg)
17-25 lbs. (8-11 kg)	¾ tsp or 3.75 mL (120 mg)
26-31 lbs. (12-14 kg)	1 tsp or 5 mL (160 mg)
32-51 lbs. (15-23 kg)	1.5 tsp or 7.5 mL (240 mg)
52-64 lbs. (24-29 kg)	2 tsp or 10 mL (320 mg)
65-79 lbs. (30-35 kg)	2.5 tsp or 12.5 mL (400 mg)
80+ lbs. (36+ kg)	3 tsp or 15mL (480mg)

I. **ADULT DOSING** - Adults may be given oral tablet or caplet form.

1. Administer 650-1000mg PO with a sip of water.

ALL

NOTES:

A. As a reminder, hyperthermia has causes other than fever. Assess the patient for other factors, such as environmental causes, and treat per relevant protocol.

B. Do not split tablets or caplets to give to children. Only use the liquid formulation as the dosing is more exact.

ALL

I. INTRODUCTION

A. The purpose of this protocol is to provide a reference for EMS when dealing with the legal system. This can include but is not limited to suspected abuse or neglect, crime scene management, sexual assault.

II. SUSPECTED CHILD ABUSE

A. The State of Kentucky made healthcare professionals "mandatory reporters" when dealing with suspected child abuse.

B. Abuse is defined as a victim of sexual activity, is endangered, exhibits evidence of physical or mental injury inflicted other than by accidental means, suffers physical or mental injury because of a guardian's acts.

C. A form of abuse is neglect: abandoned, lacks adequate parental care, guardian neglects to provide subsistence, education, medical/surgical care, or other necessary care; guardian refuses to provide special care; guardian has attempted to place the child in permanent custody of an institution or foster agency; because of parental neglect suffers physical or mental injury.

D. In cases of suspected abuse, one member of the crew must report the suspected abuse to the proper authorities. This may include local law enforcement, a state department tasked with this responsibility, or to an investigator with Child Protective Services.

1. Ohio Dept. of Job and Family Services: 855-642-4453
2. Kentucky Child/Adult Protective Services: 877-597-2331
3. Indiana Child Abuse Hotline: 800-800-5556

E. When documenting physical findings, avoid attempting to document the age of the bruising or injury, and what you suspect caused the injury. Document objectively what you find. You are not required to perform an investigative exam with measurements and photographs.

F. The EMS crew must report their suspicions of abuse to either the nurse or physician assuming care of the patient in the Emergency Department.

G. Investigators may request additional information following a verbal report. These disclosures are expressly permitted by HIPAA.

H. Information that you may be asked to provide include:

1. The name and address of the child
2. Age
3. Name and address of the guardian
4. Name of the person(s) you suspect are abusing or neglecting the child.
5. The reason you suspect the child is being abused or neglected.
6. Any other information you believe may be helpful to the investigation.

I. If you have suspicion of child abuse, you believe the patient needs medical care, and the guardian is refusing transport, get local police involved immediately. Medical control can also be engaged to help with decision making.

III. ELDER ABUSE

A. The State of Kentucky made all firefighters and EMS professionals "mandatory reporters" of suspected elder abuse or neglect.

B. Elder abuse refers to any knowing, intentional, or negligent act by a caregiver or any other person that causes harm or a serious risk of harm to a vulnerable adult.

C. Neglect or isolation occurs when someone's basic needs are not being med, putting them at higher risk for getting sick or hurt. Neglect can result from the patients' own wishes, or the inaction of another.

D. Financial abuse and exploitation occur when one person uses another person's money, information, or belongings for their own personal benefit.

E. In cases of suspected abuse, exploitation, or neglect, one member of the crew must report the suspected abuse to the proper authorities. This may include local law enforcement, a state department tasked with this responsibility, or to an investigator with Adult Protective Services.

F. The following numbers are for reference but are not for emergency requests. These should still be made with local law enforcement.

1. Ohio Dept. of Job and Family Services: 855-644-6277

2. Kentucky Child/Adult Protective Services: 877-597-2331
3. Indiana Child Abuse Hotline: 800-992-6978

G. When documenting physical findings, avoid attempting to document the age of the bruising or injury, and what you suspect caused the injury. Document objectively what you find. You are not required to perform an investigative exam with measurements and photographs.

H. The EMS crew must report their suspicions of abuse to either the nurse or physician assuming care of the patient in the Emergency Department.

I. Investigators may request additional information following a verbal report. These disclosures are expressly permitted by HIPAA.

J. Information that you may be asked to provide include:
1. The name and address of the person
2. Name and address of the person responsible for the victim's care
3. Name of the person(s) you suspect are abusing or neglecting the elder
4. The reason you suspect the elder is being abused, exploited, or neglected.
5. Any other information you believe may be helpful to the investigation.

K. If you have suspicion of elder abuse, you believe the patient needs medical care, and a guardian is refusing transport, get local police involved immediately. Medical control can also be engaged to help with decision making.

IV. CRIME SCENE MANAGEMENT

A. Patient care is prioritized over evidence preservation. However, every attempt should be made to preserve evidence when doing so does not interfere with patient care.

B. Only enter and exit through one location, trying to keep footsteps within one path.

C. Do not walk in fluids present on scene when able.

D. If you must move something (furniture, personal effects), note its location prior to movement.

E. Avoid touching anything without gloves. Minimize surfaces touched.

F. Leave the victim undisturbed as able if attempting to determine death.

G. If clothing must be cut, avoid cutting through any holes, slits, or other damage/contamination to the clothing. Cut along seams if possible.

H. Any removed clothing should be placed into a paper grocery type bag, or onto a clean sheet and presented to law enforcement when able. If unable to hand over to law enforcement, sign the clothing over to the ED RN or hospital security. Note the time and person you handed it over to.

I. Avoid cleaning skin except as needed for patient care.

J. Do not remove garbage generated on scene or attempt to clean the scene in any way. Sharps generated as part of patient care should be placed into a sharps container.

V. SUSPECTED SEXUAL ASSAULT

A. Medical or trauma complaints take priority over destination or care modification as below.

B. Pediatric victims of suspected sexual assault should preferentially be transported to Cincinnati Children's Hospital Main Campus.

C. Adult victims of suspected sexual assault should be taken to an emergency department. All local emergency departments have Sexual Assault Nurse Examiners on-call.

D. Have the patient remain in their current clothing. If the patient has changed since the assault, have the patient bring the prior clothes.

E. Avoid letting the patient use the restroom, wash anything, eat, drink, use chewing gum, brush teeth, or use mouthwash as these actions may contaminate or wash away evidence.

F. Avoid performing any medical treatment, including invasive procedures (such as FSBG, IV access) unless necessary. Avoid contact with the patient to avoid disturbing possible evidence. You may take vital signs but note which arm you performed a BP and which finger for pulse ox.

G. Avoid going into detail about the assault. This will be done by the SANE nurse and law enforcement. The patient may omit important information if they tell the story repeatedly. Always document patient statements in quotation marks.

H. Drug-facilitated sexual assault may occur. Refer to M411 Toxicological Emergencies if needed.

I. Patients have the right to receive a medical screening examination, prophylaxis for sexually transmitted diseases and pregnancy, and medical evidence collection without filing a police report. Criminal investigations are separate from this process in adults.

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ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.

B. Any significant extremity or truncal wound (neck, chest, abdomen, pelvis), with or without obvious blood loss or hypotension, irrespective of blood pressure. If the patient is coherent, and has a palpable radial pulse, the blood loss has likely stopped.[1]

C. The trauma patient **with a head injury** requires special consideration.

1. Hypotension (Systolic Blood Pressure (SBP) less than 90 mmHg) and hypoxia (oxygen saturation (SpO_2) less than 90%) are known to exacerbate secondary brain injury.
2. The target SBP is 90 mmHg or greater, and improvement in any initial altered mental status.

D. Patients experiencing hemorrhagic shock **without a head injury** are only volume resuscitated when they have a decreased mental status or absent radial pulses.

II. PROTOCOL

A. Aggressively manage the airway and administer oxygen to correct hypoxia <95%.

B. If the patient is a victim of trauma, immobilize the patient as per T704 Spinal Immobilization Protocol.

MEDIC

C. If the patient is not maintaining adequate respirations, intubate with C-spine precautions if the patient will tolerate the attempt. No more than one minute should be spent attempting endotracheal intubation in patients with spontaneous breathing.

D. Identify and treat life-threatening respiratory problems (i.e., open chest wounds, flail chest, etc.). For treatment of tension pneumothorax see T701 Tension Pneumothorax Decompression Protocol.

ALL

E. Control all external bleeding.

F. Begin transport as soon as possible to appropriate hospital as directed in SB211 Guidelines for Assessment/Transport of Adult Trauma Patients Protocol. Unless the patient is entrapped, scene time should be less than 10 minutes. Hospital notification should be made whenever possible.

MEDIC

G. Without delaying transport, initiate 2 large bore IVs of Normal Saline (NS). Begin with a fluid bolus of 500 mL NS and reassess the patient's mental status. If no improvement, continue with an additional fluid bolus of 500 mL NS.

H. In patients that do not respond to fluid resuscitation, consider untreated tension pneumothorax as possible cause of refractory shock.

ALL

I. In patients with penetrating trauma who are mentating normally and/or have a palpable radial pulse, it is acceptable to initiate and continue transport without the administration of IV fluids.

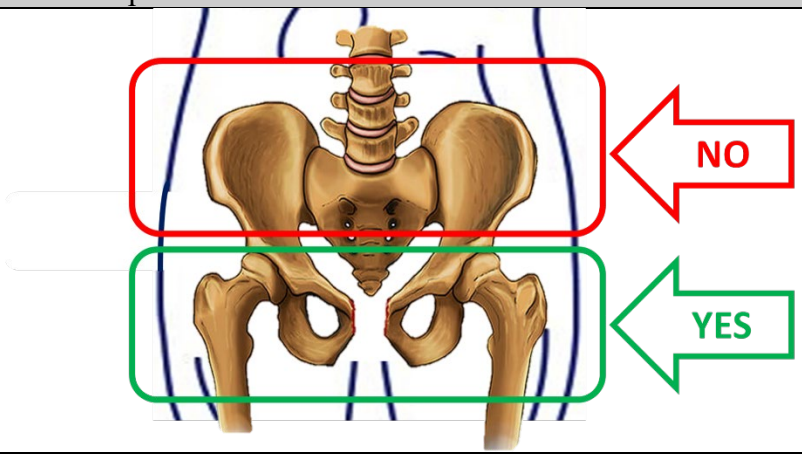
J. Hypothermia prevention measures should be initiated while fluid resuscitation is being accomplished including removal of wet clothing, blankets, or anything that will retain heat and keep patient dry.

K. Patients who are hypovolemic quickly become hypothermic. All patients should be aggressively managed to decrease body-heat loss.

L. Continue secondary assessment throughout transport and continuously reassess mental status, perfusion and vital signs, and breath sounds at least every 5 minutes.

M. In patients with blunt trauma and pelvic pain or who have altered mental status and a mechanism consistent with possible open book pelvic fracture (i.e., high-speed MVC, motorcycle/ATV crashes, pedestrian struck, and falls from significant height), consider the placement of a pelvic binder.

1. A pelvic binder SHOULD NOT be used in elderly patients with isolated falls from standing height with hip or pelvic pain.
2. Any commercially available pelvic binder may be used.
3. If no commercial pelvic binder is available, a properly placed improvised pelvic binder with a bed sheet can be substituted.

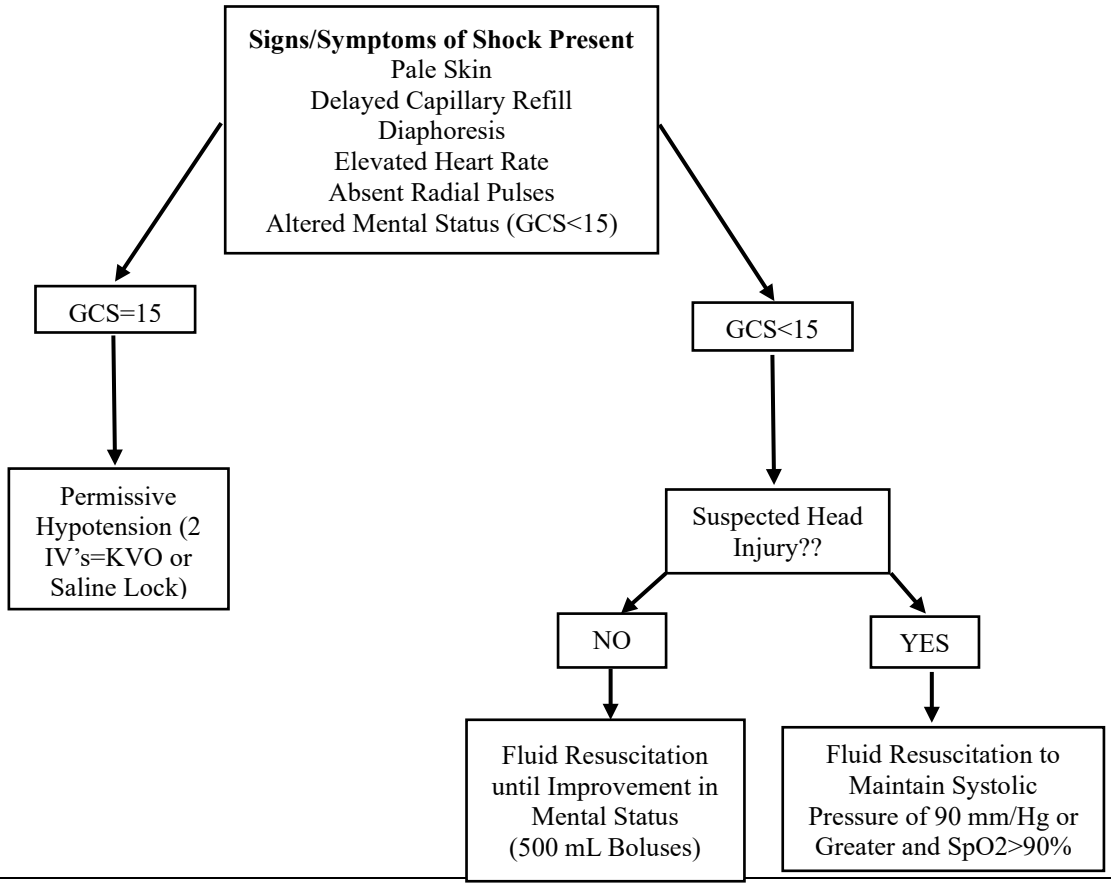


NOTES:

A. A reasonable performance goal for an EMS system is that 90% of patients who have traumatic shock and are not entrapped should be delivered to a definitive trauma care facility within 30 minutes from the time of injury.

B. Patients with penetrating chest trauma, abnormal mental status, and absence of a radial pulse are especially in need of immediate transport to definitive care. Early airway management per T705.

Fluid Management for Suspected Hemorrhagic Shock from Trauma



ALL

I. INCLUSION CRITERIA

A. Patient's age is 16 years or older.
B. History of loss of consciousness following head injury, OR
C. History of motor vehicle accident, diving accident, fall, or other trauma.
D. Head contusions, abrasions, or lacerations, OR
E. Evidence of significant facial trauma (i.e., fractures) OR
F. Fluid or blood from nose, ears, or mouth, OR
G. Altered mental status.
H. May have loss of sensation or movement.
I. May have pain in back or neck.
J. No signs of shock. If shock is present, refer to S500 Hemorrhagic Shock and/or Suspected Head Injury Protocol.

II. PROTOCOL

A. Aggressively manage the airway:
   1. Assess for hypoxemia (SpO2 <95%) continuously. Hypoxemia should be avoided.
   2. If the patient has a patent airway and is breathing adequately, administer oxygen to maintain SpO2 > 95%. If hypoxemia cannot be corrected with supplemental oxygen, initiate Airway Management Protocol (T705).
   3. If the patient does not have a patent airway, is not breathing adequately or has an altered mental status initiate Airway Management Protocol (T705).
   4. Maintain normal breathing rates (RR= 10-12). Monitor ETCO2 and note value after effective ventilation has been initiated.
   5. ONLY if patient has asymmetric pupils (>1mm difference) and is comatose, hyperventilate to an ETCO2 of 3-5 mmHg lower than established value. STOP if pupils normalize.
B. Frequently monitor VS (approximately every 5 minutes) and reassess for signs of shock. If shock becomes present, refer to S500 Hemorrhagic Shock and/or Suspected Head Injury Protocol.
C. Immobilize the patient with full spinal precautions as per T704 Spinal Motion Restriction Protocol. Elevate the head of the bed/top of the backboard whenever possible.
D. Measure GCS initially and after airway management. Measure GCS before any sedative drugs are given.
E. Measure pupil size initially. Reassess pupil size frequently.
F. Begin transport as soon as possible to appropriate hospital as directed in SB211 or Geriatric Guidelines for Assessment/Transport of Adult Trauma Patients Protocol SB213.
G. If GCS is less than 14, or spinal cord injury is suspected, then hospital notification should be made whenever possible.
H. If signs and symptoms of altered mental status are present (i.e., suspected hypoglycemia or narcotic overdose), then check Blood Glucose and refer to SB201 Altered Mental Status Protocol.

MEDIC

I. Place patient on cardiac monitor. If a dysrhythmia is present, then proceed to the appropriate protocol.
J. Establish IV/IO access.
K. If patient has signs of cerebral herniation which include coma and unilateral or bilateral blown pupil, posturing, or decline in GCS during transport >2 points then consider administration of 500 mL 3% saline solution if available.

ALL

NOTES:

A. Shock is not usually due to head injuries. If patient is in shock, consider another cause for the hypotension.
B. Remember that restlessness can be due to hypoxia and shock, not just head injury.

ALL

I. INCLUSION CRITERIA

A. Patient of any age.
B. Patient complains of shortness of breath, cough, or hoarseness.
C. Any patient with electrical injury.
D. Second degree burns greater than 20% of body surface area, **OR**
E. Third degree burns greater than 15% of body surface area, **OR**
F. Singed nasal or facial hair, soot or erythema of mouth, or respiratory distress.

MEDIC

G. If EKG findings are other than normal sinus rhythm, sinus tachycardia, or atrial fibrillation with controlled ventricular response, proceed to appropriate arrhythmia protocol.

ALL

II. PROTOCOL

A. Evaluate scene for safety.
B. Remove patient from source of burn including clothing.
C. Maintain airway and administer oxygen to correct hypoxia <95%. If there is suspicion for carbon monoxide or cyanide poisoning, provide supplemental oxygen regardless of pulse oximetry reading.
D. If patient is pulseless and apneic, intubate immediately.

MEDIC

E. If patient is unconscious or has any respiratory distress, intubate immediately.

ALL

F. Remove all prostheses, rings, and constricting bands from all extremities.
G. Cover burns with loose dry sterile dressing or a clean, dry sheet.
H. Cover with blankets and decrease exposure to cool/cold elements to avoid hypothermia.

MEDIC

I. Initiate IV/IO access. Provide crystalloid fluid bolus.
J. If hypovolemic, fluid resuscitate per hypotension/shock protocol SB205.
K. Consider the administration of pain medication in alert and hemodynamically stable patients, per protocol S505.

ALL

L. Transport patient to an appropriate facility capable of treating major burns.
M. Notify the receiving facility.
N. Consider Carbon Monoxide and Cyanide poisoning refer to M411 Toxicological Emergencies.
O. Burn Gel Gauze Pads (Hydro Gel) may be used as a dressing on most 1st and 2nd degree burns. These products may provide a soothing/cooling effect to the burn area without the risk of hypothermia that may be induced by a moist saline dressing(s). Many of the Hydro Gel pads require a secondary dressing (Kerlix/Kling Gauze Roll, etc) to secure the pad over the wound.

ALL

NOTES:

A. Two methods to estimate the percentage of body burned (*This includes second and third degree burns only. Exclude first degree burns*

Rule of 9's		
	Adults	**Children**
Head	9%	18%
Anterior Trunk	18%	18%
Posterior Trunk	18%	18%
Each Upper Extremity	9%	9%
Each Lower Extremity	18%	14%
Genitals/Perineum	1%	-

Rule of Palm

Utilize the patient's palm – 1%

ALL

I. INCLUSION CRITERIA

A. History of actual or suspected eye injury.
B. May have recent head or periocular trauma.
C. MAY have foreign body sensation or pain in eye.
D. MAY have visible foreign body or visible globe laceration.
E. MAY have light sensitivity.
F. MAY have poorly reactive, misshapen, or non-reactive pupil.

II. PROTOCOL

A. OPEN GLOBE INJURY:
   1. If there is an impaled object, stabilize it in place and cover other eye to prevent movement.
   2. If there is evidence of a penetrating eye injury such as visible globe laceration or fluid draining from the globe, cover the affected eye with a metal eye patch or other similar ridged, non-absorbent material. Do not wrap eye under pressure or press on the globe.
   3. Do not use Morgan Lens, proparacaine, or topical medications if open globe injury is suspected.
   4. Displacement of eye should be treated with moist sterile dressing and prehospital notification made.
B. CHEMICAL EXPOSURE OR NO EVIDENCE OF OPEN GLOBE INJURY:
   1. If the patient has a chemical exposure to the eye or a non-penetrating foreign body in the eye, proceed in the following manner:
   2. Begin irrigation by instilling copious amounts of tap water, sterile water, or normal saline.
   3. Use of an on-site commercial eye-wash station is also acceptable prior to transport.

MEDIC

C. Administer Pain Medication per S505.
D. Administer Ondansetron per M405.
E. If **no** suspected open globe injury:
   1. Instill two drops of 0.5% proparacaine (Alcaine) or tetracaine into the affected eye.
   2. Warn the patient not to rub the eye while the cornea is anesthetized, since this may cause corneal abrasion and greater discomfort when the anesthesia wears off.
   3. After 20 minutes, a second dose of proparacaine may be given if needed.
   4. Do not use Morgan Lens, proparacaine, or topical medications with an open globe injury.

ALL

NOTES:

A. Proparacaine administration may cause burning or stinging of the eye initially. The time until onset of anesthesia after proparacaine instillation ranges from 6 to 20 seconds.
B. Local instillation in the eye rarely produces adverse effects. Systemic reactions are unlikely when used in recommended doses.
C. Remember that eye injuries can cause a great deal of patient anxiety. Provide reassurance.
D. When not contraindicated by other injuries or need for spinal immobilization, then transport the patient with the head of the bed elevated at least 30 degrees.
E. Morgan Lens, bulb syringes, nasal cannulas, or IV tubing can be used to flush eyes.

ALL

I. GENERAL CONSIDERATIONS

A. This protocol is for the management of acute pain, including pain from suspected trauma, including but not limited to thermal and chemical burns, frostbite, crush injuries, fractures, dislocations, sprains, and abdominal pain including unilateral flank pain.
B. This protocol is NOT for the treatment of chronic pain.
C. Medical Control must be contacted if you feel that narcotics are needed for pain from a chronic condition or disorder.
D. There must be documentation of patient's pain during the initial patient contact, during treatment, and after any interventions made for pain, as well as vital signs before each administration of medications.
E. Always consider the weight of your patient when dosing pain medication, especially in the elderly.

II. HISTORICAL FINDINGS

A. Patient's age is 16 years and old. (Ketamine is not to be given to patients less than 16 years of age.)
B. Patient is experiencing acute moderate to severe pain.

III. PHYSICAL FINDINGS (applies to Fentanyl and Morphine ONLY)

A. No signs or symptoms of circulatory shock.
B. Systolic BP is greater than 100 mmHg.
C. No signs of respiratory depression.
D. No altered level of consciousness, mental status change, or suspected head injury.

IV. PROTOCOL

EMT

A. Consider calling for ALS response to the scene or set up a rendezvous if transport to the hospital is longer than 10 minutes.
B. Determine patient's pain score assessment using standard pain scale.
C. Consider initial use of non-pharmaceutical pain management techniques.
    1. Position of comfort.
    2. Use of ice packs and/or splints
    3. Verbal reassurance or distraction to minimize anxiety.
D. **Mild Pain**
    1. Administer acetaminophen (Tylenol®) 650-1000mg PO.
        a. Only consider if patient able to swallow and maintain patent airway.
        b. Do not administer if patient has taken acetaminophen (Tylenol®) or acetaminophen-containing products (e.g., Vicodin, Norco, Percocet, or certain cold/flu remedies) within the past six hours or if actively vomiting.
        c. Acetaminophen (Tylenol®) when used in conjunction with opioids can result in more effective pain control and lower total opioid requirements.

MEDIC

A. **Moderate to Severe Pain**
    1. Administer acetaminophen as directed above and/or one of the following:
    2. Fentanyl 25-100 micrograms IV/IO/IN/IM/SC, repeated every 5 minutes as needed (IV/IO/IN) or every 15 minutes as needed (IM/SC) **OR**
    3. Morphine Sulfate 2-10 mg IV/IO/IM/SC, repeated every 5 minutes as needed (IV/IO) or every 15 minutes as needed (IM/SC) **OR**
    4. Ketamine can be administered according to the dosing chart below or 0.2mg/kg IV/IO (SLOW PUSH OVER 1 MINUTE or infusion in 100ml NS or D5W over 15 minutes) or 0.5-1 mg/kg IM/SC
        a. Ketamine dosing is based on ideal body weight.
        b. Use first when there is a concern for opioid addiction or if already on high doses of opioids for pre-existing medical conditions.
        c. Ketamine when used in conjunction with opioids can result in more effective pain control and lower total opioid requirements.
B. Perform continuous pulse oximetry and closely monitor patient's respiratory status.
C. Recheck BP, respirations, and mental status.
D. Consider administration of antiemetics to prevent nausea (See M405 Nausea and Vomiting)

E. If the patient experiences persistent respiratory depression after receiving Fentanyl or Morphine, Naloxone can be administered 0.4 to 4 mg IV/IO/IN/IM. Refer to M411 Toxicological Emergencies protocol.

KETAMINE PAIN DOSING					
	IV DOSING			*IM DOSING*	
Height	**Dose**	***mLs (10mg/mL)***	***mLs (50mg/mL)***	**Dose**	**mLs (50mg/mL)**
<4'11"	7.5mg	0.75Ml	0.15mL	30mg	0.6mL
5'-5.5"	10mg	1mL	0.2mL	40mg	0.8mL
5.5'-5'11"	15mg	1.5mL	0.3mL	60mg	1.2mL
6'-6'5"	17.5mg	1.75mL	0.35mL	70mg	1.4mL
>6'5"	20mg	2mL	0.4mL	80mg	1.6mL

ALL

NOTES:

A. Care should be taken when administering narcotics IM/SC to avoid dose stacking. Only administer one dose except in cases of prolonged extrication or transport.

B. Parental medications come in various concentrations — double check all calculations prior to administration.

C. If indicated, pain medication should be given prior to splinting.

MEDIC

I. INCLUSION CRITERIA

A. **Evidence of significant blunt or penetrating trauma** based on the history of present illness and or physical exam findings. (ex: ejection from automobile, rollover MVC, fall > 20 feet, pedestrian struck, penetrating injury to neck, torso, etc.)

AND

B. **Age All** (pediatrics and adult) with evidence of or concern for severe internal or external hemorrhage. (ex: bleeding requiring a tourniquet, unstable pelvic fracture, two or more proximal long-bone fractures, flail chest etc.)

AND

C. **Presence of hemodynamic instability as evidenced by**

1. Sustained systolic blood pressure < 90mmHg or <100mmHg if patient age is > 55 years (sustained is defined as 2 independent blood pressure measurements)
2. Sustained heart rate > 110 beats per minute
3. Pediatric

   Hypotension → a sign of uncompensated shock
   - Neonates (0-28 days): SBP < 60 mmHg
   - Infants (1 mo – 12 months): SBP < 70 mmHg
   - Children (1 yr – 10 years): SBP < 70 + (2 x age in years) mmHg
   - Children (>10 years): SBP ≤ 90 mmHg

   Sustained tachycardia for age (see chart below)

   Tachypnea for age (see chart below)

   Cool pale skin with cap refill >2 seconds

Age	Pulse Beats/min	Respirations Breaths/min	Avg. Systolic BP
Infant (1-12mo)	90-180	30-53	>70
Toddler (1-2 yrs)	80-140	22-37	>70
Preschool (3-5 yrs)	60-120	20-28	>80
School age (6-12 yrs)	58-118	18-25	>85
Adolescent (12+ years)	50-100	12-20	>90

AND

D. **Time since the initial injury is KNOWN to be less than 3 hours.** It is preferable that TXA be administered as soon as possible after the initial traumatic insult. The greatest benefit to patients is seen when TXA is administered within 1 hour of injury.

II. PROTOCOL

A. Aggressively manage the airway and administer oxygen to correct hypoxia <95%.

B. Control all external bleeding and manage hemorrhagic shock per protocol S500

C. If the patient meets the above inclusion criteria administer TXA as follows:

1. **Mix 1 g of TXA in 100 mL of 0.9% Normal Saline and infuse over approximately 10 minutes IV or IO.** (If given as an IV push, may cause hypotension)
   Pediatric < 12 years: 15 mg/kg IV over 10 mins (max 1 g)
   Pediatric ≥ 12 years: 1 g IV over 10 mins
2. Use dedicated IV/IO line if possible and ***Do NOT administer in the same IV or IO line as blood products, factor VIIa, or Penicillin***
3. During radio report, notify the receiving trauma center that TXA was initiated during transport per protocol.
4. When transferring care to hospital staff and completing PCR: note the time of injury and time of TXA administration.

III. EXCLUSION CRITERIA:

A. Time elapsed from initial injury is unknown or is known to be greater than 3 hours.
B. Patients with clear contraindications for anti-fibrinolytic agents (evidence of active intravascular thrombotic disease or disseminated intravascular coagulation, etc.).
C. TXA should not be given to isolated closed head injury.
D. TXA should NOT be given to a patient who has received or will receive prothrombin \ complex concentrate (PCCs), factor VIIa, or factor IX complex concentrates as this may increase the risk of thrombotic events.
E. TXA should be used carefully in the setting of urinary tract bleeding as ureteral obstruction due to clotting has been reported.
F. TXA should NOT be given to women who are known or suspected to be pregnant with a fetus of viable gestational age (≥24 weeks)
G. Previous allergic reaction to TXA
H. Medical control discretion as to the appropriateness of TXA administration in any particular patient.

NOTES:

A. Tranexamic Acid is an anti-fibrinolytic synthetic lysine analogue that inhibits clot breakdown and thus reduces hemorrhage.[1,2,3] Other potential beneficial mechanisms of action including decreasing the systemic inflammatory response to trauma are currently being explored.[3]
B. Part of the physiologic response to surgery or trauma in any patient is the formation and subsequent breakdown (fibrinolysis) of intravascular clots.[4] In some cases, clot break down can become excessive (hyper-fibrinolysis) thus causing increased hemorrhage and blood loss.[4]
C. Since 2010, two large clinical trials (CRASH-2 and MATTERs) have examined the specific role for TXA in adult trauma patients with evidence of or concern for severe hemorrhage. These studies found significantly favorable reductions in all-cause mortality when victims of trauma received TXA.[4,6]
D. TXA is now a Class I recommendation in the U.S. Military's Tactical Combat Casualty Care Guidelines and is included in the World Health Organization list of essential medicines.[1,7]
E. There have been some questions about how to administer TXA over 10 minutes. This is an approximate time. Infusing 100 mL over approximately 10 minutes can be done by a variety of methods including but not limited to: counting drops of a macro or mico drip set; on a pump; or just estimating. The range of infusion should be between 5 and 15 minutes.

REFERENCES:

1. Roberts I, Kawahara T. Proposal for the inclusion of Tranexamic acid (anti-fibrinolytic-lysine analogue) in the WHO model list of essential medicines. June 2010.
2. Roberts I, Shakur H, Ker K, Coats T, on behalf of the CRASH-2 Trial Collaborators. Antifibrinolytic drugs for acute traumatic injury. Cochran Database of Systematic Reviews 2011, Issue 1. Art. No.: CD004896.
3. Pusateri AE, Weiskopf RB. et al. Tranxexamic Acid and Trauma: Current Status and Knowledge Gaps with Recommended Research Priorities. *Shock* 2013;39:121-126.
4. CRASH-2 collaborators. Effects of Tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant Haemorrhage (CRASH-2): a randomized placebo controlled trial. *Lancet* 2010; 367:23-32.
5. CRASH-2 collaborators. Effects of Tranexamic acid in traumatic brain injury: a nested randomized, placebo controlled trial (CRASH-2 Intracranial bleeding study). *BJM* 2011.
6. Morrison JJ, Dubose JJ, Ramussen TE, and Midwinter MJ. Military application of tranexamic acid in trauma emergency resuscitation (MATTERs) study. *Arch Surg* 2011;287.
7. Tactical Combat Casualty Care Guidelines available from URL: https://www.naemt.org/education/naemt-tccc/tccc-mp-guidelines-and-curriculum

The below checklist is offered as a quick reference for use in the field that can be printed and placed with the actual medication. Also suggested is to place hard stops in your electronic medical record to go through this checklist.

Tranexamic acid (TXA) Checklist

Administration of TXA is indicated if all of the following criteria are present

1) Age = ALL	
2) Evidence of significant blunt or penetrating traumatic injury (MVC with ejection, rollover MVC, fall > 20 ft., pedestrian struck, penetrating injury to head, neck, torso, etc.)	
3) Evidence of or concern for severe internal or external hemorrhage (bleeding requiring a tourniquet, unstable pelvic fracture, two or more proximal long-bone fractures, flail chest etc.)	
4) Sustained Systolic BP (defined as 2 independent BP measurements) a. < 80mmHg if less than 5 years old b. < 90mmHg if ≥ 5 years old c. < 100mmHg if older than 55 years old	
5) Sustained heart rate > 110 bpm	
6) Time since the initial injury is known to be < 3 hours	

Age ≥ 12 years: Mix 1g of TXA in 100ml of 0.9% Normal Saline & infuse over 10 minutes IV or IO. *(If given as an IV push, may cause hypotension)*

Age < 12 years: Mix 15mg/kg (max 1 g) in 100mL of 0.9% Normal Saline or & infuse over 10 minutes IV or IO. *(If given as an IV push, may cause hypotension)*

Use dedicated IV/IO line if possible and Do NOT administer in the same IV or IO line as blood products, factor VIIa, or Penicillin

ALL

I. INTRODUCTION

A. The following situations may develop rapidly into a long-term technical rescue event involving complicated medical and extrication techniques. This requires constant reevaluation of treatments with the overall goal being the safety, treatment, removal, and rapid transport of the patient.
B. Trapped extremities should be considered for those involving lower and upper long-bone areas and not finger/toe injuries.
C. Providers should consider consultation with on-scene experts in removal/disassembly of articles entrapping patients. Providers should also consider early consultation with:
   1. On-line Medical Control physician.
   2. HEMS activation for evacuation and/or on-scene physician.
   3. Early treatment collaboration with industrial response teams, technical rescue teams, and fire-based responders.

II. INCLUSION

A. Patients of any age
B. Mechanism of injury concerning for any/all of the following:
   1. Suspension Trauma
      a. Patient suspended above the ground with or without a harness.
   2. Crush Injury
      a. Patient currently or recently with one or more trapped extremity.
   3. Compartment syndrome
      a. Victim with injury to an extremity that may cause bleeding into a closed compartment of same extremity.
   4. Rhabdomyolysis
      a. Victim unable to move for an extended period of time or as a consequence of the above situations.

III. TREATMENT

A. <u>Suspension Trauma Management:</u>
   1. Ensure scene safety and remove victim to ground safely and quickly as possible.
   2. If unable to get to ground quickly, have victim assume a horizontal position, or take pressure off legs.
   3. When victim on ground place patient in POC and initiate rapid transport.
   4. Recheck neurological status and PMS on frequent basis.
B. <u>Crush injury Management:</u>
   1. While attempting to extricate:
      a. Ensure scene safety and remove victim as safely and quickly as possible.
      b. Consider early application of PPE to patient to prevent further injury including coverings for debris and respirator for airway protection.
      c. Maintain patent airway & ventilation status with emphasis being placed on freeing space around patients' chest.
      d. Coach patient/provide hemorrhage control as situation and safe access allows.
      e. Consider early temperature management.
      f. Coordinate with Rescue Team Leader/Incident Command for administration of oxygen/nebulized treatments if this can be done without creating dangerous atmosphere or consider fresh air delivery system during rescue operation.
      g. Assess mentation and PMS status on frequent basis.

MEDIC	h. Obtain vascular access. i. Give initial bolus of 1-2L crystalloid solution if active hemorrhage not found. j. Coordinate with Rescue Team Leader/Incident Command for application of EKG to monitor patient for further complications of hyperkalemia/dysrhythmias and treat if found according to appropriate protocols. This must be in consultation with Rescue Team Leader/Incident Command so as not to create dangerous situation or interfere with rescue operation. k. Follow pain management protocols as appropriate. 2. Prolonged Extrication equal or greater to 60 minutes should then include the following: a. Initiate IV fluid therapy with sodium bicarbonate at 1-2L/hr. b. 1 Amp Sodium Bicarbonate (50mEq) into 1L crystalloid solution is preferred but IV bolus is also acceptable. c. Sodium Bicarbonate is preferred through a dedicated IV line, if second line is unavailable administer pain medications IM/IN due to drug incompatibility concerns. 3. Immediately prior to extrication a. Apply tourniquet(s) to the trapped extremity(s) prior to the extremity being freed. b. **Give 1 mEq/kg Sodium Bicarbonate *bolus.* 4. Immediately following patient extrication. a. Prepare for hyperkalemia complications, dysrhythmia, or cardiac arrest upon extrication and treat according to appropriate protocols. b. Transport to trauma center and notify receiving facility of situation. c. Consider releasing of applied tourniquets only in conjunction with on-line or on-scene medical control physician.
ALL	C. <u>Rhabdomyolysis Management:</u> 1. May be caused by the above situations or other etiologies such as drugs, exercise, infection, or prolonged periods down such as in fall/geriatric patients, patients may also present with dark urine (coca cola urine).
MEDIC	2. Treatment a. Obtain IV/IO access. b. Initiate fluid administration of crystalloid solution of 1-2L bolus to prevent renal injury. c. EKG to monitor patient for further complications of hyperkalemia/dysrhythmias and treat if found according to appropriate protocols.
ALL	3. Immediately transport patient.

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ALL

I. INCLUSION CRITERIA

A. Newborn infant.
B. Not crying, poor or no respiratory effort, and limp muscle tone.

II. PROTOCOL

A. Ensure adequate airway. Suction mouth, oropharynx, and then nose.
B. Dry infant to provide stimulation and prevent chilling. Keep the infant warm, especially the head.
C. Check heart rate by palpating the umbilical cord or listening to the heart with a stethoscope. If less than 100, bag-valve-mask (BVM) with **ROOM AIR** at a rate of 60 per minute. If heart rate is less than 60 beats/min, despite 30 seconds of adequate BVM ventilation, begin chest compressions at a ratio of 3:1 with breaths.
D. Consider use of a pulse-oximeter, with the probe attached to the right upper extremity (if possible), to assess any need for supplementary oxygen.
E. Once positive-pressure ventilation or supplementary oxygen administration is begun, reassessment should consist of simultaneous evaluation of 3 clinical characteristics: heart rate, respiratory rate, and evaluation of the state of oxygenation (optimally determined by pulse oximetry rather than assessment of color). If heart rate remains less than 100 after 30 seconds of BVM ventilation, request ALS back-up.

MEDIC

F. If heart rate remains less than 100 after 30 seconds of BVM ventilation, reassess airway and consider intubation per T705.
   1. FULL TERM: 3.0 - 3.5 ET tube
   2. PREMATURE: 2.5 - 3.0 ET tube
G. Assess response to intubation, again using the 3 clinical characteristics. Check the position of the endotracheal tube using an exhaled CO2 detector and document the centimeter mark at the gum line. If heart rate less than 60, initiate cardiac compressions (1/2 – 1-inch depth) at 120 per minute. In the newborn, a chest compression to ventilation ratio of 3:1 is used. It is important that you use only enough bag pressure to move the chest. This limits the chance for pneumothorax.
H. If heart rate is still less than 60 after 30 seconds of chest compressions and adequate assisted ventilation, consider epinephrine 0.04 mg of 0.1 mg/ml (0.4 mL IV, 0.2 mL for preterm newborn). If vascular access is not available, then give epinephrine 0.08 mg (0.1 mg/ml at 0.8 mL via ET, 0.4 mL for preterm newborn). Repeat epinephrine every 3 to 5 minutes until heart rate is greater or equal to 60.
I. If hypovolemia is suspected due to blood loss at delivery, then give normal saline 20 ml/kg (roughly 40 mL IV: 20 mL for preterm newborn).
J. Provide medical control with patient update.

ALL

NOTES:

A. Every effort should be made to transport both the mother and infant to the same hospital.
B. Resuscitations on newborns should begin with a BVM without supplemental oxygen. Even healthy newborns that do not require resuscitation can take more than 10 minutes to reach SpO2 of greater than 90%. Using supplemental oxygen for newborns requiring resuscitation may worsen their neurological outcomes because of injury due to oxygen free radicals.
C. Newborns lose heat rapidly and need to be kept warm to decrease oxygen demands and prevent metabolic acidosis.
D. When dealing with such a short trachea, remember that slippage of even a centimeter in endotracheal tube position can result in inadvertent extubation. Reassess the airway frequently.
E. Intubation and suctioning are reserved for newborns with thick meconium who are NON-VIGOROUS (poor respiratory effort, decreased muscle tone, AND heart rate less than 100).
F. It is important that you inform medical control of the length of your resuscitation since the new AHA guidelines (Dec. 2010) support the PHYSICIAN discontinuation of resuscitation for newborns born without a heartbeat and respirations after 10 minutes.
G. Decisions about resuscitating newborns with stigmata of extreme prematurity (i.e., very small, fused eyelids, gelatinous skin, etc.) should involve online medical control.
H. Term infants who have undergone prolonged resuscitation should not be actively warmed in the prehospital setting.

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ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. Patient is unconscious.
C. Patient is apneic.
D. Patient has no pulses.

MEDIC

II. EKG FINDINGS

A. Ventricular fibrillation, or
B. Ventricular tachycardia without a pulse.

ALL

III. PROTOCOL

A. Continue CPR and care per SB204.

MEDIC

B. If rhythm is ventricular fibrillation or ventricular tachycardia without a pulse, defibrillate immediately at 2 joules/kg (not to exceed the adult dose).
C. Perform CPR for 2 minutes before another pulse or rhythm check is done.
D. Defibrillation energy sequence should continue as follows:
   1. Second dose: 4 joules/kg not to exceed the adult dose.
   2. Third and successive doses: Defibrillation at 4 joules/kg up to 10 joules/kg not to exceed the adult dose.
E. Search for possible causes as listed in SB204.
F. Administer Epinephrine 0.01 mg/kg IV/IO (0.1 mL/kg of 0.1 mg/ml, maximum 1 mg). If IV or IO is unattainable, give Epinephrine 0.1 mg/kg via endotracheal tube (0.1 mL/kg of 1 mg/ml, maximum 2.5 mg). Repeat Epinephrine every 3 to 5 minutes.
G. Administer Amiodarone 5 mg/kg (max 300 mg) IV/IO.
   1. Amiodarone dose may repeat up to 2 times for refractory VF/pulseless VT.
   2. Lidocaine may be substituted as: Lidocaine 1 mg/kg IV/IO push
H. If transporting, notify receiving hospital.
I. If return of spontaneous circulation is achieved, continue post-resuscitative care.
J. If rhythm changes to another rhythm, go to the appropriate protocol.

ALL

NOTES:

A. High Quality CPR (SB204) is considered the mainstay of therapy for Cardiac Arrest victims.
B. As in all pediatric cardiac arrests, airway control is a key factor in improving the odds of successful resuscitation.
C. AEDs may be used on children of ALL ages. For infants, a manual defibrillator is preferred to an AED for defibrillation. If a manual defibrillator is not available, an AED equipped with a pediatric dose attenuator is preferred. If neither is available, an AED without a pediatric dose attenuator may be used.

MEDIC

D. Unlike adults, ventricular fibrillation is rare in children. Cardiac arrest is usually due to hypoxia or cardiac disease.
E. Both cuffed and uncuffed endotracheal tubes are acceptable for intubating infants and children. Training in inflating cuffed tubes to minimal airway occlusion pressure is important. In certain circumstances (e.g., poor lung compliance, high airway resistance, or a large glottic air leak) a cuffed endotracheal tube may be preferable to an uncuffed tube, provided that attention is paid to endotracheal tube size, position, and cuff inflation pressure.
F. Consider the use of a stopcock for the administration of Amiodarone and fluid boluses.
G. When choosing joules for defibrillation in pediatric patients, round up.

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P602	**PEDIATRIC PULSELESS CARDIAC ARREST (ASYSTOLE, PEA)**	P602
Last Modified: 2019	Academy of Medicine of Cincinnati – Protocols for SW Ohio Prehospital Care Clinical Practice Guidelines	2023

ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. Patient is unconscious.
C. Patient is apneic.
D. Patient has no pulse.

MEDIC

II. EKG FINDINGS

E. Organized cardiac rhythm with QRS complexes indicating PEA, or
F. Asystole on the cardiac monitor in two or more leads.

ALL

III. PROTOCOL

G. Continue CPR and care per SB204.
H. Reassess airway and breathing frequently, as hypoxia is a common cause of PEA/asystole.

MEDIC

I. Search for possible causes of Asystole/PEA as listed in SB204.
J. Epinephrine 0.01 mg/kg IV/IO (0.1 mL/kg of 0.1 mg/ml, maximum 1 mg).
   1. Repeat every 3-5 minutes.
   2. If vascular access is not available, then give Epinephrine 0.1 mg/kg via endotracheal tube (0.1 mL/kg of 1 mg/ml, maximum 2.5 mg).
K. Administer normal saline 20 ml/kg IV/IO.
L. Contact medical control. Medical control may consider the following:
   1. Additional 20 mL/kg fluid boluses.
   2. Needle decompression of the chest.
M. After 30 minutes, consider termination of resuscitative efforts as detailed in the Determination of Death / Discontinuance of Resuscitation protocol .
N. If transporting, notify receiving hospital.
O. If return of spontaneous circulation is achieved, continue post-resuscitative care.
P. If rhythm changes to another rhythm, go to the appropriate protocol.

ALL

NOTES:

A. High Quality CPR (SB204) is considered the mainstay of therapy for Cardiac Arrest victims.
B. As in all pediatric cardiac arrests, airway control is a key factor in improving the odds of successful resuscitation.

MEDIC

C. Since a main cause of PEA/asystole is hypoxia, airway management with adequate bag-valve-mask (BVM) ventilation is a priority. Intubation should be considered if ventilation and oxygenation with BVM is difficult to maintain.
D. Both cuffed and uncuffed endotracheal tubes are acceptable for intubating infants and children. Training in inflating cuffed tubes to minimal airway occlusion pressure is important. In certain circumstances (e.g., poor lung compliance, high airway resistance, or a large glottic air leak) a cuffed endotracheal tube may be preferable to an uncuffed tube, provided that attention is paid to endotracheal tube size, position, and cuff inflation pressure.

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ALL	**I. INCLUSION CRITERIA** A. Age is younger than 16 years. B. Alteration of level of consciousness OR C. Evidence of poor circulation (delayed capillary refill, or weak peripheral pulses) OR D. Evidence of respiratory distress or failure.
MEDIC	**II. EKG FINDINGS** A. Cardiac rhythm is sinus bradycardia for child's age. B. **General Guide for Pediatric Bradycardia:** 1. 0-3 years old: HR < 100 bpm 2. 3-9 years old: HR < 60 bpm 3. 9-16 years old: HR < 50 bpm
ALL	**III. PROTOCOL** ***THE PATIENT MUST BE SYMPTOMATIC BEFORE PROCEEDING WITH THIS PROTOCOL.*** A. Ensure airway, apply 100% oxygen, bag-valve-mask (BVM) ventilate as needed, and recheck pulse rate. B. If despite adequate oxygenation and ventilation, the heart rate is less than 60 in a newborn or child, perform chest compressions at a rate of 100 per minute.
EMT	C. If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.
MEDIC	D. Establish IV/IO access. E. Epinephrine (0.1 mg/ml) 0.01 mg/kg (0.1 ml/kg IV/IO). If vascular access is not available, then give epinephrine (1 mg/ml) 0.1 mg (0.1 mL/kg via ETT, maximum dose 2 ml).
ALL	F. Reassess airway and breathing frequently. G. Contact medical control.
MEDIC	H. If symptomatic bradycardia persists, repeat epinephrine IV/IO every 3 to 5 minutes. I. If symptomatic bradycardia persists, give atropine 0.02 mg/kg (min 0.1 mg, max 0.5 mg) IV/IO. ETT-0.04 mg/kg (max 2mg).
ALL	J. Reassess airway and breathing.
MEDIC	K. If hypotensive, normal saline 20 mL/kg IV push.
ALL	**NOTES:** A. The most common cause of bradycardia in the child is hypoxia. Therefore, attention to airway is the most important intervention. B. It is important to treat the patient and not the number. Remember that athletes may have heart rates of 40-60.

ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. Older child may complain of chest pain or rapid heartbeat.
C. Heart rate in infants less than 2 years is usually greater than 220. Heart rate in older children is usually greater than 180.
D. The unstable patient displays signs of shock with weak or no distal pulse, delayed capillary refill, poor skin perfusion, and change in mental status.

MEDIC

II. EKG FINDINGS

A. QRS duration less than 0.08 (2 little boxes).
B. P waves may or may not be seen.
C. Little variability in heart rate noted with respiration and movement.

ALL

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.

EMT

B. If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.

MEDIC

C. Obtain 12 lead EKG if available.
D. ***STABLE PATIENT WITH ADEQUATE PERFUSION***
   1. Consider one attempt at vagal maneuvers (crushed ice to the mid face for 15 seconds in infants; ask older patient to blow into occluded straw or bear down like having a bowel movement).
   2. Attempt vascular access preferably in an antecubital vein (placing an IV sometimes converts the rhythm)
   3. Contact medical control.
   4. Administer Adenosine 0.1 mg/kg (max 6 mg) rapid IV push followed by rapid 10 mL NS flush. Adenosine should be administered as close to the heart as possible, preferably in the antecubital vein. Consider use of a stopcock to administer 10 mL normal saline flush immediately following adenosine.
   5. May double the dose (0.2 mg/kg, max 12 mg) and repeat Adenosine administration once via rapid IV push followed by rapid 10 mL normal saline flush immediately following adenosine.
E. ***UNSTABLE PATIENT (POOR PERFUSION):***
   1. Contact medical control.
   2. If IV access has been established, preferably in an antecubital vein, medical control may consider administration of adenosine (see above – stable patient with adequate perfusion).
   3. If IV has not been established, prepare for immediate cardioversion.
   4. If the patient is conscious and **only on the order of a medical control physician** give midazolam 0.1 mg/kg (max 5 mg) IV/IO or other medications as directed by medical control.
   5. **Only on the order of a medical control physician**: synchronized cardioversion 0.5 J/kg.
   6. If unsuccessful, repeat synchronized cardioversion at 1 J/kg.
   7. If unsuccessful, repeat synchronized cardioversion at 2 J/kg.
   8. Reassess ABCs, consider CPR, and transport.

ALL

NOTES:

A. Children without underlying heart disease or myocardial dysfunction will often tolerate SVT for up to 24 hours without compromise.
B. Round up when selecting joules on a defibrillator for cardioversion

- Age 6 months to 6 years.
- Barky "seal" sounding cough with hoarse voice and stridor.
- May have fever and cold symptoms.
- No history suggesting foreign body aspiration.
- Inspiratory and expiratory stridor at rest.
- Chest wall retractions.

DIFFERENTIAL DIAGNOSIS

- Asthma
- Anaphylaxis
- Bacterial tracheitis
- Croup
- Epiglottitis
- Foreign body aspiration
- Pneumonia

- Keep the patient calm. You may have a parent or other trusted adult administer oxygen.

- If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.

- Consider normal saline mist via nebulizer. This can be very helpful in croup patients.
- Place the patient on a cardiac monitor.
- Contact medical control if considering nebulized epi.
  - Medical control may order epinephrine 0.5 mg of 1 mg/ml mixed in 2.5 mL of normal saline, administered via hand-held nebulizer with oxygen and a facemask.
- Continue normal saline mist via nebulizer when the epinephrine nebulizer is complete. Keep the patient calm. You may have a parent or other trusted adult administer oxygen.

NOTES

Pediatric patients with fever, drooling, and stridor should be suspected to have epiglottitis or other potential source of airway obstruction. Epiglottitis is a bacterial infection of the epiglottis that sometimes obstructs the tracheal opening. These may worsen from sticking objects such as fingers or tongue depressors in the patient's throat. These patients are best treated by reassurance and immediate transportation to the hospital. Have the patient breathe oxygen by mask or blow-by as long as this does not cause the patient to become upset.

NOTES

The purpose of the medical control call is to allow the medical control physician input into the decision to administer nebulized epinephrine. The potential downside to giving nebulized epinephrine is that the patient will need to be observed for 3-4 hours. If the case of croup is mild and receives nebulized epinephrine, the patient will require an unnecessarily longer emergency department stay.

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ALL

I. INCLUSION CRITERIA

A. Patient's age is younger than 16 years
B. Sudden onset shortness of breath in a previously well pediatric patient
C. Patient MAY have history suggestive of foreign body (FB) aspiration such as sudden onset of shortness of breath while eating or playing with a small toy/object.
D. May have on exam:
   1. Unilateral, decreased, or no air movement
   2. Retractions and accessory muscle use
   3. Drooling
   4. Cyanosis or unconsciousness secondary to hypoxia.

II. DIFFERENTIAL DIAGNOSIS

A. Anaphylaxis
B. Croup
C. Epiglottitis
D. Bacterial tracheitis
E. Asthma

III. PROTOCOL

A. If the patient is alert, awake, and still breathing on his or her own (partial airway obstruction) minimize upsetting procedures:
   1. Perform patient assessment. Do NOT perform a throat exam (may convert partial to full obstruction).
   2. Administer oxygen to correct hypoxia <95%. If patient is a young child, have the parent help administer the oxygen.
   3. Allow patient to sit up in a position of comfort. If the patient is a young child, keep the patient with the parent and avoid unduly upsetting the child.
   4. Apply cardiac monitor.

MEDIC

   5. Do not start an IV to avoid aggravating the child and worsening the airway obstruction.
   6. If wheezing with known FB aspiration, consider an albuterol nebulizer treatment.
   7. For diffuse wheezing **without** known FB aspiration, consider Pediatric Respiratory Distress (Wheezing or Asthma) Protocol P607 or Pediatric Anaphylaxis Protocol P609.

ALL

B. If the patient is alert, awake, and obviously choking (complete airway obstruction):
   1. For the infant less than one year, give 5 back slaps and up to 5 chest thrusts. Repeat this until the obstruction is relieved or the patient is unconscious.
   2. For the child from older than 1 year old, give abdominal thrusts or Heimlich maneuver until obstruction is relieved or patient is unconscious.
   3. If the obstruction is relieved, follow Protocol Section III, 1 through 4 above.
C. If the patient is unconscious:
   1. Begin CPR and attempt to bag-valve-mask ventilate while preparations are made to intubate.

MEDIC

   2. Using the laryngoscope, visualize the posterior pharynx and vocal cords for evidence of a foreign body.
   3. Remove any foreign bodies very carefully with a suction device or Magill forceps.
   4. If no foreign body is seen or patient does not begin breathing spontaneously, intubate the trachea. If you suspect a foreign body is below the vocal cords but above the carina, it may be necessary to push the foreign body down the right main stem bronchus with the ET tube to aerate at least the left lung.
   5. If above methods fail, perform needle cricothyrotomy (See Needle Cricothyrotomy—Pediatrics Protocol T708).

EMT

   6. If available, request ALS back-up or arrange to intercept an ALS unit as appropriate.

- Age 3-15 years
- Patient complains of worsening shortness of breath or trouble breathing.
- Patient USUALLY has a past medical history of asthma or seasonal allergies.
- Lung exam has wheezing, decreased breath sounds, or poor air exchange.
- May have retractions, rapid respiratory rate, or pursed lip breathing.

DIFFERENTIAL DIAGNOSIS

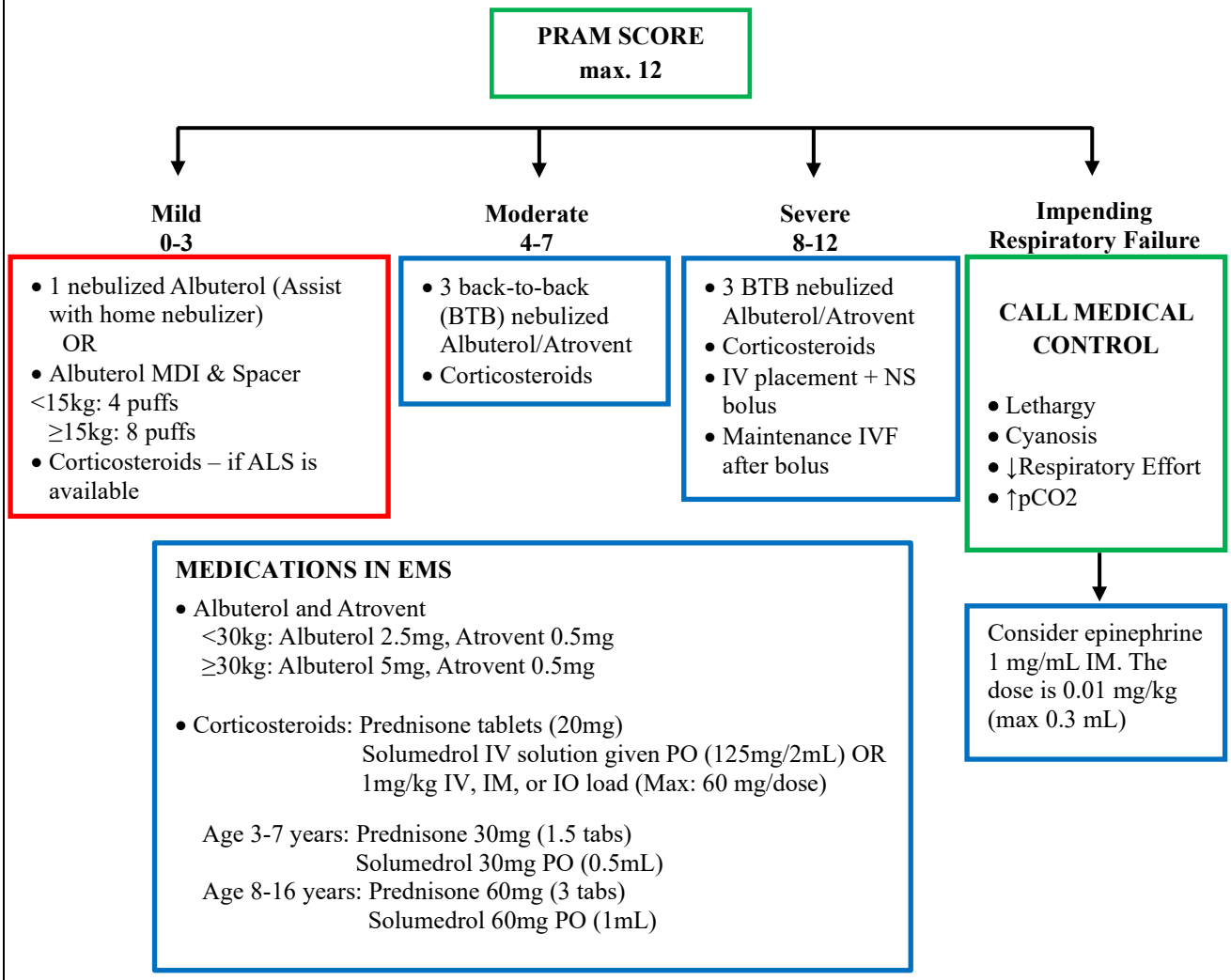
- Bronchiolitis
- Foreign body aspiration
- Pneumonia

- Maintain airway and administer oxygen to correct hypoxia <95%.
- If the patient is in impending respiratory failure (i.e., extreme retractions, pale or cyanotic skin, and slow respirations), begin bag-valve-mask ventilation, consider intubation.
- Allow patient to sit up in a position of comfort.
- Apply cardiac monitor.

PRAM Scoring Table

Criterion	Description	Score
O2 saturation	≥ 95%	0
	92-94%	1
	< 92%	2
Suprasternal retraction	Absent	0
	Present	2
Scalene muscle contraction	Absent	0
	Present	2
Air entry	Normal	0
	↓ at the base	1
	↓ at the apex and the base	2
	Minimal or absent	3
Wheezing	Absent	0
	Expiratory only	1
	Inspiratory (± expiratory)	2
	Audible without stethoscope or silent chest (minimal or no air entry)	3
	PRAM score: (max. 12)	

Score	0-3	4-7	8-12
Severity	Mild	Moderate	Severe



EMT

A. If available, request ALS back-up for:
B. Assist patient with his/her own MDI, if appropriate; only MDIs containing beta adrenergic bronchodilators (e.g. albuterol, Ventolin, Proventil) may be used: 2 puffs; repeated every 5 minutes as needed while transporting; contact medical control if delayed.
C. Consider albuterol 2.5 mg (0.5ml of 0.5% solution) in 3ml normal saline solution via nebulizer every 5 minutes x 4 total doses.
D. Check to see if the patient has already taken any breathing treatments prior to arrival. Note time and amount.

E. Do not use the inhaler if any of the following are present:
   1. Inability of patient to use device.
   2. Inhaler is not prescribed for the patient.
   3. Medication is expired.
   4. If the patient has met the maximum prescribed dose of their inhaler according to prescription label, contact medical control.

F. Make sure inhaler is at room temperature and shake several times to mix the medication.

G. Take oxygen mask off the patient.

H. Tell the patient to exhale deeply and put the mouthpiece in front of the mouth. If the patient has a spacer device, it should be used.

I. Have patient depress the metered-dose inhaler as they begin to inhale deeply.

J. Instruct the patient to hold their breath for as long as comfortable, so the medication can be absorbed.

K. Put oxygen mask back on the patient.

L. Repeat a dose after one minute. If further medication is necessary beyond the patient's prescribed number of doses, contact medical control.

M. Recheck vital signs (including pulse oximetry if available) and perform focused reassessment.

ALL

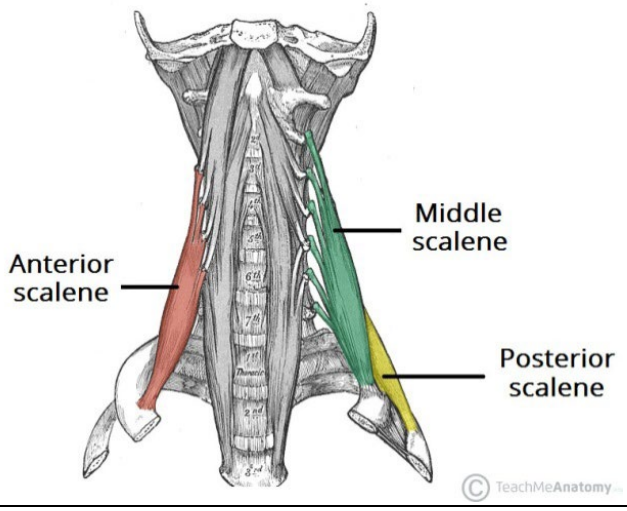
NOTES:

A. Wheezing in a patient WITHOUT a past medical history of asthma, may still be asthma, but should alert you to the possibility of a foreign body aspiration or pneumonia.

B. Steroids work by reducing airway inflammation, mucous plugging, and secretions, which can be seen within 1-2 hours after administration. Oral corticosteroids have been proven to reduce rates of hospital admission and length of ED stay if given early for children presenting to the ED with asthma exacerbations.

C. For patients who vomit their oral steroids, please document the episode and make sure it is part of handoff to the receiving institution, but do not re-dose the medication.

D. The scalene muscles are three paired muscles (anterior, middle and posterior), located in the lateral aspect of the neck. Collectively, they form part of the floor of the posterior triangle of the neck.



ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. Neonates less than 30 days with a blood glucose level less than 45 mg/dL.
C. Pediatric patients older than 30 days with a blood glucose level less than 60 mg/dL.

II. HYPOGLYCEMIA

A. Consider possible reasons for hypoglycemia including but not limited to toxic ingestion.

MEDIC

B. Place patient on cardiac monitor and obtain rhythm strip. If dysrhythmia is present, proceed to the appropriate protocol.
C. Although the patient may have a normal systolic blood pressure, if he or she is tachycardic for their age or shows other signs of hemodynamic shock, start a 20 mL/kg IV/IO bolus of normal saline (max 1 liter).

ALL

D. For hypoglycemia defined above, treat in one of the following manners until an improvement in mental status:
   1. If patient is able to swallow and protect airway administer oral glucose 5 - 15g or appropriate rapidly absorbed carbohydrate (high sugar content) fluid or food (such as orange juice). Dispense in small amounts; keep fingers out of mouth; EMS provider can lightly massage the area between the cheek and gum to enhance swallowing.
   2. If oral glucose administration is not feasible due to patient age proceed to IV/IO method.

MEDIC

E. If patient is unable to protect airway, administer the following until an improvement in mental status:
   1. 5mL/kg of Dextrose 10% IV/IO
   2. For children less than 3 years of age or less than 15kg, use D10 only.
   3. Only if Dextrose 10% is not available one of the following methods may be used. Dextrose 10% is the preferred medication.
      a. Mix Dextrose 10% by diluting Dextrose 50% with normal saline to make Dextrose 10%. 1-part D50 and 4 parts normal saline. Ex: 50 mL D50 and 200 mL normal saline makes 250mL D10.
      b. 1 mL/kg of Dextrose 50% IV/IO
      c. 2 mL/kg of Dextrose 25% IV/IO
F. Doses may be repeated if repeat blood glucose assessment remains below levels noted above.
G. If peripheral IV/IO access is unobtainable, administer Glucagon 1 mg IM for children 6 years of age and older. For children less than 6 years of age, use 0.5 mg of Glucagon IM. Glucagon does not work reliably in younger children, however; so, after Glucagon administration, continue to attempt IV/IO access.

III. HYPERGLYCEMIA

A. Glucose Level is greater 400 mg/dL or glucometer reads "HIGH."
B. If no evidence of pulmonary edema, administer a fluid bolus of 20mL/Kg not to exceed 1000mL IV/IO during transport.
C. Place patient on cardiac monitor for possibility of dysrhythmia.

ALL

NOTES:

A. D10 is made by mixing D50 1:4 with normal saline.
B. D25 is made by mixing D50 1:1 with normal saline.
C. It is very important that you verify that you have a working IV/IO. Dextrose which infiltrates into the surrounding tissues can be damaging to the tissues and blood vessels.
D. Especially for adolescent patients, although alcohol is a common cause of altered level of consciousness, it is rarely the cause of complete unresponsiveness. Do not let the patient's alcohol intoxication cloud your judgment. It is safer to assume that the intoxicated patient has a serious medical problem and treat accordingly than it is to conclude that the patient is "just drunk."
E. Younger children are particularly prone to developing hypoglycemia from alcohol ingestions.
F. Anticipate nausea/vomiting after administration of Glucagon.

ALL

I. INCLUSION CRITERIA

A. Patient's age under 16 years.
B. Suspected exposure to allergen (insect sting, medications, foods, or chemicals).
C. Patient has or complains of any of the following:
   1. Respiratory difficulty, wheezing, or stridor
   2. Tightness in chest or throat
   3. Tachycardia or hypotension for age
   4. Flushing, hives, itching
   5. Swelling of the face, lips, or tongue
   6. Gastrointestinal symptoms: nausea, vomiting, diarrhea
   7. CNS symptoms: anxiety, restlessness, weakness

II. ANAPHYLAXIS DEFINITION

A. Serious, rapid onset (minutes to hours) reaction to a suspected trigger **AND**
B. Two or more body systems involved (e.g., skin/mucosa, cardiovascular, respiratory, GI) **OR**
C. Hemodynamic instability **OR**
D. Respiratory compromise.

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. **Airway assessment and management are extremely important since airway compromise may develop rapidly at any time during the call.**

EMT

C. Request ALS back-up for a patient who has <u>any</u> of the following:
   1. Hypotension
   2. Tachycardia
   3. noisy/difficult breathing (including but not limited to wheezing & stridor)
   4. received epinephrine by auto-injector, if indicated
D. Administer epinephrine 0.1mg/kg (1 mg/ml) intramuscularly (IM) up to 0.3mg if patient is in anaphylaxis. May repeat dose every 5 – 15 minutes as needed. This is an epinephrine concentration of 1:1,000.

ALL

E. Remove allergen if possible (stinger from skin, etc.).
F. Check vital signs frequently, reactions may quickly grow more severe.

EMT

G. For patients with anaphylaxis, epinephrine should be administered as soon as possible.
   1. For patients who have been prescribed an auto-injector administer it in accordance with manufacturer's directions after obtaining patient consent.
   2. For EMS supplied epinephrine auto-injectors, VERBAL MEDICAL DIRECTION must be obtained.
      a. For patients 7.5 kg-10 kg, Auvi-Q® 0.1 mg, is appropriate. Otherwise, no auto-injector available for patients <10 kg.
      b. For patients ≥10 kg and <25 kg, an 0.15 mg epinephrine auto-injector (i.e., EpiPen Jr®) is appropriate.
      c. For patients ≥25 kg, 0.3 mg epinephrine auto-injector (i.e., EpiPen®) is appropriate.
   3. Auto-injector administration may be repeated every 5 – 15 minutes as needed.
H. If epinephrine auto-injector is to be administered, then:
   1. Assure injector is prescribed for the patient (if patient's personal injector).
   2. Check medication for expiration date (do not use if expired).
   3. Remove safety cap from injector and double-check safety versus needle side.
   4. Select appropriate injection site (see notes). If possible, remove clothing from the injection site. If removing the clothing would take too much time, the auto-injector can be administered through clothing avoiding seams.
   5. Ensure injection site is properly restrained.
   6. Push injector firmly and hold against the site for a <u>minimum of 2-3 seconds then massage for 10 seconds</u>.

	I. If bronchospasm or wheezing is present assist patient with inhaler if they have one per Pediatric Respiratory Distress Protocol P607.
MEDIC	J. Administer epinephrine (1 mg/mL) 0.01 mg/kg (0.01 mL/kg, max 0.3 mL) intramuscularly (IM) in the anterolateral thigh if patient is in anaphylaxis. May repeat dose every 5 – 15 minutes as needed. K. Monitor cardiac rhythm L. If bronchospasm or wheezing is present, administer albuterol (Proventil) 2.5 mg (<30 kg) or 5 mg (≥30kg) via nebulizer, and treat per Pediatric Respiratory Distress protocol P607. Albuterol may be used without preceding epinephrine in patients with isolated, very minimal respiratory symptoms. M. Administer diphenhydramine 1 mg/kg IV/IM/PO (max 50 mg). Diphenhydramine may be used without preceding epinephrine in patients with isolated rash and no other symptoms. N. Initiate IV access. If the patient is hypotensive, begin 20 mL/kg normal saline or ringer's lactate IV bolus (max 1 L) wide open.
ALL	**NOTES:** A. Anaphylaxis is extremely rare in babies. Without the history of sudden onset of rash and difficulty breathing, most babies with rashes and tachypnea have respiratory infections responsible for their symptoms. B. Epinephrine is the drug of choice and the first drug that should be given in acute anaphylaxis. C. Intramuscular injection leads to faster and more consistent blood levels than subcutaneous administration and is thus the standard of care. D. Anterolateral thigh IM injection is preferred over deltoid IM injection. E. As injection into purely adipose tissue may be less effective, it may be preferable to use the distal anterolateral thigh rather than the proximal anterolateral thigh in obese patients. F. In the absence of reliable weight estimates, age 1 year may be used to initiate the use of the 0.15 mg auto-injector (i.e., EpiPen Jr®), and age 7 years may be used to initiate the use of the 0.3 mg auto-injector (i.e., EpiPen®).

ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. Recent suspicion of seizure activity based upon description from eyewitnesses, parents, or caretakers.
C. Patient may or may not have a known history of seizure disorder.
D. The patient may currently display seizure activity.
E. The patient may now be postictal ("after seizure") with a decreased level of consciousness.
F. The patient may have focal neurological deficits, which should be noted.
G. The patient may have a fever.

II. DIFFERENTIAL DIAGNOSIS

A. Refer to Altered Level of Consciousness Protocol SB201.

III. PROTOCOL

A. Maintain airway and administer oxygen to correct hypoxia <95%.
B. Immobilize C-spine if evidence or history of significant trauma, otherwise position the patient in the lateral recumbent position to reduce the risk for aspiration with vomiting.
C. Suction as needed.

MEDIC

D. If no IV or IO established, and patient is actively seizing administer midazolam (Versed)
   1. ≤ 12 kg = 0.2 mg/kg IM/IN
   2. 13-40 kg = 5 mg IM/IN
   3. Above 40 kg treat with adult dosing M410-10mg IM.
E. If IV/IO has been established midazolam (Versed) can be given 0.1 mg/kg IV/IO (max 5 mg).
F. Be prepared to support the patient's airway (nasopharyngeal airway) and breathing (bag valve-mask ventilation with 100% O2). Monitor ventilations with capnography.

ALL

G. Check Glucose per protocol P608.
H. Place on cardiac monitor (if available).
I. For suspicion of overdose go to the Toxicological protocol M411.

NOTES:

A. Trauma to the tongue is unlikely to cause serious problems, but trauma to teeth may. Attempts to force an airway into the patient's mouth can completely obstruct the airway. Use of a nasopharyngeal airway may be helpful.
B. Most patients will be postictal upon your arrival, needing only oxygen and airway maintenance.
C. In children and especially infants, seizure activity may not always be in the form of generalized tonic-clonic activity (i.e., grand-mal). Sometimes eye-deviation or unusual repetitive movements like lip smacking may be the only indication of seizure. Trust the parent's or caretaker's impressions of what is and is not seizure activity in a child with a known seizure disorder (e.g., children with special needs).

MEDIC

D. Please be aware that rectal Valium (Diastat) may have been administered to children with known seizure disorders prior to EMS arrival. This is especially true of children with special healthcare needs. Adding Versed on top of rectal Valium will exacerbate respiratory depression.
E. Most typical febrile seizures last less than 5 minutes and stop on their own without medications. A seizure, which has lasted longer than 5 minutes and is associated with fever, may not be a typical febrile seizure, and should be treated with Versed just as any other seizure lasting longer than 5 min.

ALL

I. INCLUSION CRITERIA

A. **Ages 5 to less than 16 years of age**
B. Patients experiencing acute pain.
C. No signs or symptoms of hemodynamic shock
D. Normo-/hypertensive
   1. Children (5-10 years): SBP > 70 + (2 x age in years) mmHg
   2. Children (>10 years): SBP > 90 mmHg
E. No signs of respiratory depression
F. No altered level of consciousness, mental status change, or suspected head injury

II. PROTOCOL

EMT

A. Consider calling for ALS response to the scene or set up a rendezvous if transport to the hospital is longer than 10 minutes.
B. Administer acetaminophen (Tylenol®) 15 mg/kg (max 975 mg) PO; see Pediatric Medication Chart for weight-based dosing.
   1. Only consider if patient able to swallow and maintain patent airway.
   2. Do not administer if patient has taken acetaminophen (Tylenol®) or acetaminophen-containing products (e.g., Vicodin, Norco, Percocet, or cold/flu remedies) within the past six hours or if actively vomiting.
   3. Acetaminophen (Tylenol®) when used in conjunction with opioids can result in more effective pain control and lower total opioid requirements.
C. Perform continuous pulse oximetry and closely monitor patient's respiratory status.

MEDIC

D. For moderate to severe pain, administer a **single dose** of one of the following:
   1. Fentanyl 1 microgram/kg IV/IO/IM/SC (max 50 mcg) – administer over 3-5 minutes slow IV push to prevent rigid chest.
   2. Fentanyl 2 micrograms/kg Intranasal (max 100 mcg) – Use the undiluted injectable fentanyl product (100 mcg/2 mL), draw up an extra 0.1 mL of drug solution to prime the atomizer and administer a max of 1 mL per nostril (if giving to larger kid and need to use 100 mcg, you should use the same atomizer for both nostrils).
   3. Morphine sulfate 0.1 mg/kg IV/IO/IM/SC (maximum dose 5 mg).
E. Recheck blood pressure, respirations, and mental status.
F. If the patient experiences a drop in systolic blood pressure to less than (2 x age in years) + 70, give a 20 mL/kg (max 500 mL) normal saline IV bolus.
G. **If patient has an allergy to Opioids, pain is not relieved, or for subsequent doses, contact online medical control.**

ALL

NOTES:

A. It is appropriate to give acetaminophen and fentanyl or morphine concurrently for moderate to severe pain.
B. Care should be taken when administering Morphine IM/SC to avoid dose stacking. Only administer one dose except in cases of prolonged extrication or transport.
C. Parenteral medications come in various concentrations – double check all calculations prior to administration.
D. If indicated, pain medications should be given prior to splinting.
E. **When dosed appropriately, complications such as respiratory depression and hypotension are rare in children.**
F. Pain control is an important medical intervention. Studies show that children are treated for pain much less often than adults with the same injuries. It is the intention of the Protocol Subcommittee that pediatric patients with burns and isolated fractures/dislocations who meet the above criteria be given pain relief medication.

ALL

I. INCLUSION CRITERIA

A. Age is younger than 16 years.
B. History of MVC, diving accident, fall or other trauma.
C. History of a loss of consciousness following head injury.
D. Infant "found down" from unknown etiology or infant with suspicion of physical abuse.
E. Head contusions, abrasions, or lacerations.
F. Fluid or blood from nose, ears, or mouth.
G. Altered mental status.
H. May have loss of sensation or movement.
I. May have pain in back or neck.
J. No signs of shock. If shock is present, refer to Hemorrhagic Shock Protocol P614.

II. PROTOCOL

A. Control the airway and administer oxygen to correct hypoxia <95%.
B. If altered mental status, assure good oxygenation and ventilation of the patient and maintain control of the C-spine.
1. Elevate the head to 30 degrees while following T704 Spinal Motion Restriction Protocol.
2. Ventilate the patient normally with a goal of $EtCO_2$ of 35-45 mmHg.

MEDIC

3. ONLY if the patient has obvious asymmetric pupils with altered mental status, administer 3% saline solution if available.
PEDIATRIC DOSE: 4 mL/kg IV/IO ONCE; max 500 mL.

ALL

C. Immobilize patient with appropriately sized equipment.
D. Begin transport as soon as possible to destination hospital as directed in Trauma Triage Protocol SB212.
E. Obtain vital signs and monitor cardiac rhythm.
F. Assess a GCS or level of consciousness using the AVPU scale.
G. If hypoglycemia is suspected, then check glucose. If glucose is less than 60 mg/dL then refer to Pediatric Hypoglycemia protocol P608.
H. If GCS is less than 14 or the patient is not an "A" on the AVPU scale or spinal cord injury is suspected, then contact the receiving hospital.
I. If narcotic overdose is suspected, then refer to M411 Toxicological Protocol.

NOTES:

A. Cardiovascular shock is not usually due to head injuries. If patient is in shock, consider another cause for hypotension.
B. Remember that restlessness can be due to hypoxia and shock, not just head injury.
C. In any multiple injury or multi-organ trauma patient, spine trauma should be assumed until proven otherwise in a hospital emergency department.

ALL

I. INCLUSION CRITERIA

A. Patient's age is younger than 16 years

B. Significant penetrating injury to extremities or trunk (neck, chest, abdomen, pelvis), with suspected blood loss and risk for hypotensive shock.

C. The trauma patient with suspected head injury in addition requires special considerations.

1. Hypotension and Hypoxia (Oxygen Saturation (SpO2) less than 90%) are known to secondarily exacerbate brain injury.
2. The target SBP is [70+ (2 x age)] or greater, with a goal of improvement in any initial altered mental status.

II. PROTOCOL

A. Aggressively manage the airway; if patient is maintaining adequate respirations, administer Oxygen.

1. If patient is not maintaining adequate respirations, support with bag-valve-mask ventilations.

B. Identify and treat life-threatening respiratory problems (i.e., open chest wounds, flail chest). See Protocol T701 for management of Tension Pneumothorax.

C. If patient is a victim of any blunt trauma, or a penetrating injury to the head or neck, immobilize patient with full spinal precautions as per Protocol T704.

D. Control all external bleeding.

E. Aggressively manage to decrease body-heat loss. Hypovolemic patients rapidly become hypothermic.

F. Transport as soon as possible to appropriate hospital as directed in Trauma Triage Protocol. Unless the patient is entrapped, scene time should be less than 10 minutes. Hospital notification should be made whenever possible.

G. Continuously reassess mental status, breath sounds, perfusion, and vital signs at least every 5 min.

H. Continue secondary assessment throughout transport.

I. For patients with penetrating trauma and no suspected head injury who are mentating normally with palpable peripheral pulses, it is acceptable to initiate and continue transport without IV/IO fluids.

MEDIC

J. For patients whose mental status and/or peripheral pulses require IV/IO fluids resuscitation, initiate a minimum of one IV/IO without delaying transport. Syringe push 20 mL/kg of normal saline and reassess the patient's mental status and/or peripheral pulses. If no improvement, repeat fluid bolus and contact medical control.

ALL

I. INCLUSION CRITERIA

A. Patient's age under 16 years

B. Patients submerged under water or recently pulled from the water with coughing, respiratory distress, or lifelessness.

II. EXCLUSION CRITERIA

A. The victim shows signs of rigor mortis, lividity, or injury incompatible with life.

III. PROTOCOL

A. Remove the victim from the water if still required. Perform warming as described in protocol M412.

B. If there is suspicion that the events involved a diving accident or axial load to the head, apply cervical spine precautions as described in protocol T704.

C. Ensure adequate airway, breathing, and oxygenation.

1. Note coughing, cyanosis, or respiratory distress.
2. Administer oxygen via non-rebreather mask for all patients with cough, cyanosis, hypoxia, or respiratory distress. Consider BVM ventilating if patient remains hypoxic despite this or is not breathing adequately.
3. All victims of submersion events for which EMS responds should be transported for medical evaluation. Even patients with mild residual symptoms may develop significant pulmonary edema in the hours to come.

D. **For patients with lifelessness,** establish if the water has obvious signs of ice and, if possible, an estimate of the duration of submersion. Proceed with one of the following pathways:

1. ***If there are obvious signs of ice on the water (or in the area in the case of moving water)***, ensure ALS back-up and proceed with protocols M412 Hypothermia and Cold Emergencies and SB204 Cardiac Arrest.
   a. Maintain airway and administer oxygen to correct hypoxia <95%.
   b. Initiate transport to a Pediatric Level 1 Trauma Center capable of performing pediatric extracorporeal membrane oxygenation (ECMO). In our region, this is Cincinnati Children's in Cincinnati.
   c. Notify receiving facility.
2. ***If there are NO obvious signs of ice, and the patient has been submerged for 30 minutes or longer***, the evidence suggests the patient is unlikely to survive. Ensure ALS back-up and proceed with the cardiac arrest protocols P601 or P602 depending on whether their initial presentation is VF/VT or PEA/asystole. Contact medical control to discuss CPR limits and destination.
3. ***If there are NO signs of ice, and the patient has been submerged for less than 30 minutes or the time is unknown***, ensure ALS back-up and proceed with the cardiac arrest protocols P601 or P602 depending on whether their initial presentation is VF/VT or PEA/asystole). Transport to the closest Pediatric Level 1 Trauma Center. Notify receiving hospital.

NOTES:

A. Patients experiencing drowning have been noted to have their largest fall in temperature after being removed from the water. Efforts should be made to remove wet clothing, insulate with dry warm covering, and cover patient's head (not face) to begin the rewarming process.

B. It is unnecessary to perform spinal immobilization on every submersion injury patient. Patients at highest risk for spinal injury tend to be adolescents and those who drown after diving and horse playing.

C. Evidence for survival after ice water submersion exists in the form of case reports, with variable outcome. These patients may benefit from ECMO. Although there are hospitals in the region capable of performing ECMO on infants and adults, **currently, Cincinnati Children's Burnet Campus is the only hospital prepared to perform ECMO on children.**

D. Submersion time has been noted in literature to be the most important factor related to patient outcome.

E. Hypoxic arrest is the most common etiology of arrest in drowning victims.

F. It is generally unnecessary to obtain the victim's temperature in the field.

ALL

I. INCLUSION CRITERIA

A. Patient's age is under 16 years.
B. A medically stable patient who is manifesting unusual behavior including violence, aggression, altered affect, or psychosis.
C. Patient demonstrates behavior including violence, delirium, altered effect, or psychosis.
D. Normal vital signs and blood glucose for the patients' age. (see Appendix I)

II. EXCLUSION CRITERIA AND DIFFERENTIAL DIAGNOSIS

A. Anemia
B. Cerebrovascular accident
C. Drug / Alcohol intoxication
D. Dysrhythmias
E. Electrolyte imbalance
F. Head Trauma
G. Hypertension
H. Hypoglycemia
I. Hypoxia
J. Infection (especially meningitis / encephalitis)
K. Metabolic disorders
L. Myocardial ischemia / infarction
M. Pulmonary Embolism
N. Seizure
O. Shock

III. PROTOCOL

A. If EMS personnel have advanced knowledge of a violent or potentially dangerous patient or circumstance, consideration should be given to staging in a strategically convenient but safe area prior to police arrival. If staging is indicated and implemented, dispatch should be notified that EMS is staging, the location of the staging area, and to have police advise EMS when scene is safe for EMS to respond.
B. If EMS intervention is indicated for the violent or combative patient, patients should be gently and cautiously persuaded to follow EMS personnel instructions. If EMS has cause to believe the patient's ability to exercise an informed refusal is impaired by an existing medical condition, EMS shall, if necessary, restrain the patient for purposes of providing appropriate care. Such restraint shall, whenever possible, be performed with the assistance of police (see Restraint Protocol P618). It is recognized that urgent circumstances may necessitate immediate action by EMS prior to the arrival of police.
    1. Urgent circumstances requiring immediate action are defined as:
    2. Patient presents an immediate threat to the safety of self or others.
    3. Patient presents an immediate threat to EMS personnel.
C. Urgent circumstances authorize, but do not obligate, restraint by EMS personnel prior to police arrival. The safety and capabilities of EMS are a primary consideration. Police shall immediately be requested by EMS in any urgent circumstance requiring restraint of a patient by EMS personnel.
D. If police initiate restraint inconsistent with the medical provisions of the Restraint Protocol P618, with the intent that EMS will transport the patient, police must prepare to submit an APPLICATION FOR EMERGENCY ADMISSION, or the patient must be placed under arrest with medical intervention indicated. Police shall, in either instance, accompany EMS to the hospital.
E. APPLICATION FOR EMERGENCY ADMISSION can only be implemented by a:
    1. Psychiatrist
    2. Licensed clinical psychologist
    3. Licensed physician
    4. Health or police officer

5. Sheriff or deputy sheriff

F. EMS shall not be obligated to transport, without an accompanying police officer, any patient who is currently violent, exhibiting violent tendencies, or has a history indicating a reasonable expectation that the patient will become violent.

G. If the patient is medically stable, then he/she may be transported by police in the following circumstances:
   1. Patient has normal orientation to person, place, time, and situation.
   2. Patient has no evidence of medical illness or injury.
   3. Patient has exhibited behavior consistent with mental illness.

ALL

I. INCLUSION CRITERIA

A. Patient's age is under 16 years.

B. This protocol is intended to address the need for medically indicated and necessary restraint. It shall not apply to regulate, or restrict in any way, operational guidelines adopted by a provider agency addressing use of force related to non-medical circumstances (i.e., civil disturbances, legitimate self-defense relative to criminal behavior).

C. Patient restraints are to be used only, when necessary, in situations where the patient is violent or potentially violent and may be a danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of a medical condition such as but not limited to:

1. Anemia
2. Cerebrovascular accident
3. Drug / Alcohol intoxication
4. Dysrhythmias
5. Electrolyte imbalance
6. Head Trauma
7. Hypertension
8. Hypoglycemia
9. Hypoxia
10. Infection (especially meningitis / encephalitis)
11. Metabolic disorders
12. Myocardial ischemia / infarction
13. Pulmonary Embolism
14. Seizure
15. Shock
16. Toxicological ingestion

II. PROTOCOL

A. Patient health care management remains the responsibility of the EMS provider. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that the evaluation of many patient parameters requires patient cooperation and thus may be difficult or impossible.

B. It is recommended to have Law Enforcement on scene.

C. Refer to Pediatric Psychiatric Emergencies Protocol (P617) for aid in dealing with the combative patient.

D. **The least restrictive means shall be employed.**

E. Verbal de-escalation

1. Validate the patient's feelings by verbalizing the behaviors the patient is exhibiting and attempt to help the patient recognize these behaviors as threatening.
2. Openly communicate, explaining everything that has occurred, everything that will occur, and why the imminent actions are required.
3. Respect the patient's personal space (i.e., asking permission to touch the patient, take pulse, examine patient, etc.).

III. PHYSICAL RESTRAINTS

A. All restraints should be easily removable by EMS personnel.

B. Restraints applied by law enforcement (i.e., handcuffs) require a law enforcement officer to remain available to adjust the restraints as necessary for the patient's safety. The protocol is not intended to negate the ability for law enforcement personnel to use appropriate restraint equipment to establish scene control.

C. To ensure adequate respiratory and circulatory monitoring and management, patients shall NOT be transported in a face down prone position.

D. Restrained extremities should be monitored for color, nerve, and motor function, pulse quality and capillary refill at the time of application and at least every 15 minutes.

MEDIC

IV. CHEMICAL RESTRAINTS

A. Chemical restraints may be required before, after, or in place of physical restraints. Any patient who continues to be a danger to themselves or others despite physical restraints, or those who present an extreme danger while attempting physical restraint, may be chemically restrained as follows.
B. Administer midazolam (Versed) 0.1 mg/kg (max 5 mg) IV/IO or 0.2 mg/kg (Max 10mg) IN/IM Exposure and cleaning of skin is highly recommended but may not be feasible; injection through clothing and prior to skin cleaning is allowed if crew safety would be compromised.
C. When able and safe, place patient on cardiac monitor and continuous pulse oximetry and end-tidal capnography.
D. When able and safe, administer oxygen to correct hypoxia <95%.
E. When able and safe, check blood glucose level.
F. At no time shall a patient be left unattended after receiving chemical restraint.
G. Any patient receiving chemical restraint must be attended to and transported by a paramedic.
H. Repeat dose(s) of midazolam (Versed) may be ordered by on-line medical control.
I. Pre-arrival notification is highly recommended so the receiving Emergency Department can be prepared for the safe transfer of a combative or violent patient.

ALL

V. DOCUMENTATION OF RESTRAINTS

A. Patient restraint shall be documented on the run sheet and address any or all the following appropriate criteria:
1. That an emergency existed and the need for treatment was explained to the patient.
2. That the patient refused treatment or was unable to consent to treatment (such as unconscious patient).
3. Evidence of the patient's incompetence (or inability to refuse treatment).
4. Failure of less restrictive methods of restraint (e.g., if conscious, failure of verbal attempts to convince the patient to consent to treat).
5. Assistance of law enforcement officials with restraints, or orders from medical control to restrain the patient, or any exigent circumstances requiring immediate action, or adherence to system restraint protocols.
6. That the treatment and/or restraint were for the patient's benefit and safety.
7. The type of restraint employed (soft, leather, mechanical, chemical).
8. Any injuries that occurred during or after the restraint.
9. The limbs restrained ("four points").
10. Position in which the patient was restrained.
11. Circulation checks every 15 minutes or less (document findings and time).
12. The behavior and/or mental status of the patient before and after the restraint.

MEDIC

NOTES:

A. Intramuscular midazolam is more rapidly absorbed than other benzodiazepines, including diazepam and lorazepam, making it uniquely ideal for treatment of the acutely agitated patient. Onset 5-10 minutes.
B. Midazolam is as effective as haloperidol in acutely agitated and combative patients (Am J Emerg Med 8:97) and has less potential cardiovascular side effects and drug-drug interactions than haloperidol.
C. Respiratory depression is a known side effect of benzodiazepines. Monitor and treat respiratory depression as needed. The use of flumazenil is not recommended and is potentially harmful because it may cause uncontrollable seizures. The risk of harm is especially present when the patient history is unknown, unclear, or incomplete.
D. Midazolam may be administered intranasal (IN); however, its efficacy in agitated and combative patients is unknown.
E. Use of benzodiazepines, including intramuscular Midazolam, for acutely agitated and combative patients is supported by American College of Emergency Physicians clinical policy [Ann Emerg Med 47(1): 79, 2006].

ALL

I. INTRODUCTION

A. Patients < 1 year of age

B. Some infants have transient events involving a combination of altered consciousness, respiration and muscle tone that are alarming for caregivers. In the past these events have been referred to as an "apparent life-threatening event" (ALTE). However, the American Academy of Pediatrics recommended removing the term “life-threatening” so that caregivers are not unnecessarily alarmed. The new term is "brief, resolved, unexplained event" (BRUE).

C. Indications:

1. In general, BRUE refers to events lasting < 1 minute with one or more of the following:
   a. Absent, decreased, or irregular breathing
   b. Cyanosis or pallor
   c. Altered level of responsiveness.
   d. Marked change in muscle tone.
2. In addition, infants must otherwise appear well and be back at their baseline state of health at the time of presentation. Thus, infants who are febrile, coughing or showing any signs of distress or other deviations from their baseline are not considered to have a possible BRUE.

D. The term BRUE only applies to events for which there is no underlying cause, which can be determined after a thorough history and physical examination.

II. PROTOCOL

A. Ensure adequate airway.

B. Perform a thorough history and physical examination. Routine monitoring should include Pulse Oximetry. Blood sugar and capnography assessment should be conducted when patient condition indicates.

MEDIC

C. Establish cardiac monitoring when patient condition indicates.

ALL

D. Determine if the event was high risk by one or more of the following:

1. Criteria of a high-risk BRUE:
   a. Age < 60 days
   b. The patient was born before 32 weeks gestation or has a corrected gestational age (post-conception age) < 45 weeks.
      i. Gestational weeks at birth plus weeks since birth equals corrected age.
      ii. Example: Born at 36 weeks gestation. Now 7 Weeks old. Corrected age = 43 weeks
   c. CPR was performed by a trained medical professional.
   d. Event lasted >1 minute.
   e. Has had a BRUE/ALTE in the past
   f. Features of concern in the patient’s history such as concern for child abuse, family history of sudden death or SIDS.

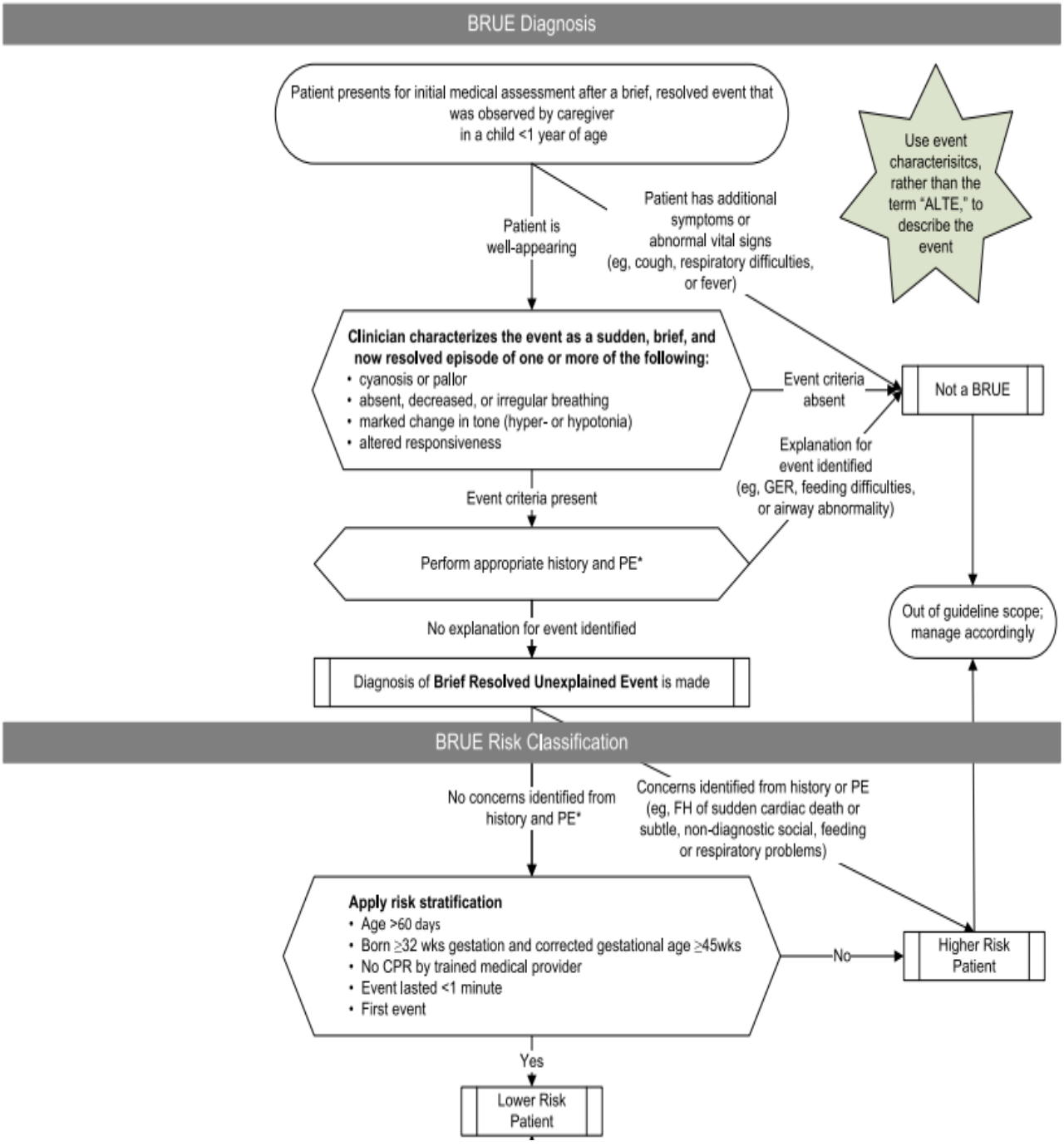
E. High risk BRUE should be transported to a pediatric hospital / pediatric Emergency Department as they may be admitted for observation.

F. **BRUE not established as High Risk by above criteria, routine transport is recommended for evaluation at an Emergency Department – contact Medical Control prior to obtaining refusal. Consider letting patient guardian talk with Medical Control Physician if they insist on refusal. All refusals obtained should be advised to follow up with primary care and report BRUE.**

G. Continually reassess throughout transport

MEDIC

H. Do NOT establish IV/IO Access unless specific indicator noted, or treatment required.



ALL

NOTES:

A. The BRUE Definition has a strict age limit.
B. The BRUE diagnosis is based on characterization of features for the event not on the caregiver's perception that the event was life threatening.
C. A determination should be made whether the infant had cyanosis or pallor, rather than determining whether "color change" occurred. Episodes of flushing or redness are not consistent with BRUE.

D. Child abuse is a serious and common cause of a BRUE. Patients who have experienced abusive head trauma may present with a BRUE. Consider child abuse when the event is inconsistently reported or is incompatible with the child's developmental age. Also consider child abuse when the patient has unexplained bruising and/ or a torn frenulum in the mouth.

MEDIC

I. INDICATIONS

A. Patients of all ages.
B. Patient with one or more signs and symptoms of Tension Pneumothorax
   1. Absent or markedly decreased breath sounds on affected side (possible to be both sides simultaneously)
   2. Severe or progressive respiratory distress (most common sign)
   3. Severe or progressive tachypnea
   4. Hypotension
   5. Asymmetric chest rise and fall.
   6. Jugular Vein Distention (JVD)
   7. Tracheal Shift away from affected side (late sign)
   8. Difficulty with manual ventilation, decreased tidal volume.
   9. Hypoxia including less than 90% on pulse oximetry.
   10. Traumatic cardiac arrest without obviously fatal wounds

II. DIFFERENTIAL DIAGNOSIS

A. Simple pneumothorax without tension
B. Hemothorax
C. Cardiac tamponade

III. COMPLICATIONS

A. Hemorrhage from vessel laceration.
B. Creation of a pneumothorax if one was not already present.
C. Laceration of the lung.
D. Infection.

IV. PROCEDURE

A. Maintain airway and administer oxygen to correct hypoxia <95%. Discontinue automatic ventilator if using.
B. Fully expose the entire chest and clean the procedure area of the affected side.
C. Prepare for the procedure using appropriate commercial device or one of three techniques:
   1. Attach a 3.25” 10-14G IV catheter and needle to a large syringe.
   2. Use the 3.25” 10-14G IV catheter and needle with a one-way, multiposition valve (3-way stopcock), or commercial device.
   3. Use the 3.25” 10-14G IV needle and catheter alone leaving it open to air.
   4. For pediatrics use following devices:
      a. ≤12 years of age: standard 14g or 16g 1.5” needle into 4th ICS anterior axillary line
      b. Morbidly obese patients may require longer needles when necessary.
D. Insert the IV catheter and needle assembly in one of two locations:
   1. Over the top of the rib in the 2nd intercostal space in the midclavicular line (MCL) and not inserted medial to the nipple line or
   2. The 5th intercostal space in the anterior axillary line (AAL).
E. Ensure needle entry is not medial to the nipple line or directed toward the heart and is inserted all the way to the hub.
F. If a tension pneumothorax is present, then a rush of air may be heard, or the plunger of the syringe will be easy to pull back.
G. After waiting 5-10 seconds to allow for decompression to occur, remove the needle from the catheter and leave the plastic catheter in place.
H. Consider repeat needle decompression based on mechanism of injury and physical findings.

NOTES:

A. Tension pneumothorax is rare; but when present, it must be treated promptly. If not treated patient may progress quickly from respiratory distress to shock and traumatic cardiac arrest.
B. Non-tension (simple) pneumothorax is relatively common, is not immediately life threatening and should not be treated in the field.
C. Positive pressure ventilation may lead to the development of a pneumothorax and to rapid progression to tension pneumothorax.

D. Should symptoms develop with a chest seal in place, providers should "burp" the seal or ensure vented system is not occluded before decompressing chest.
E. In patients with shock that does not respond to fluid resuscitation, consider UNTREATED tension pneumothorax as possible cause of refractory shock.
F. **PEDIATRIC DECOMPRESSION SHOULD STILL BE PERFORMED USING IV ANGIOCATH DEVICES OR CONSULT MEDICAL CONTROL.**

MEDIC

I. INDICATIONS

A. Patient of any age.
B. Patient has existing central venous access device (CVAD) present.

II. DEVICES

A. Indwelling Catheter – Examples are PICC Line and Midline. Venous access devices whose ports are Luer-locked or capped. Tip of the catheter is located in large vein or superior vena cava.
B. Large bore, short length double catheters (may have third tail or lumen). "Arterial" and "venous" labeled lumens are side-by-side in subclavian, internal jugular, or femoral vein. CAUTION: These devices contain high concentrations of heparin. This must be discarded prior to use.
C. Gortex Graft or AV Fistula — Natural or plastic connection between vein and artery usually located under skin on arm. The examiner may feel a "thrill" or auscultate a bruit. These sites have high backpressure due to arterialization of vessel.
D. Implanted Ports – Example includes Port-a-Cath. Requires specialized equipment to access. Single or double (oval) reservoir located under skin on chest wall or forearm. To access, one must insert a Huber needle through skin into the rubber septum. The catheter tip is located in large vein or superior vena cava.

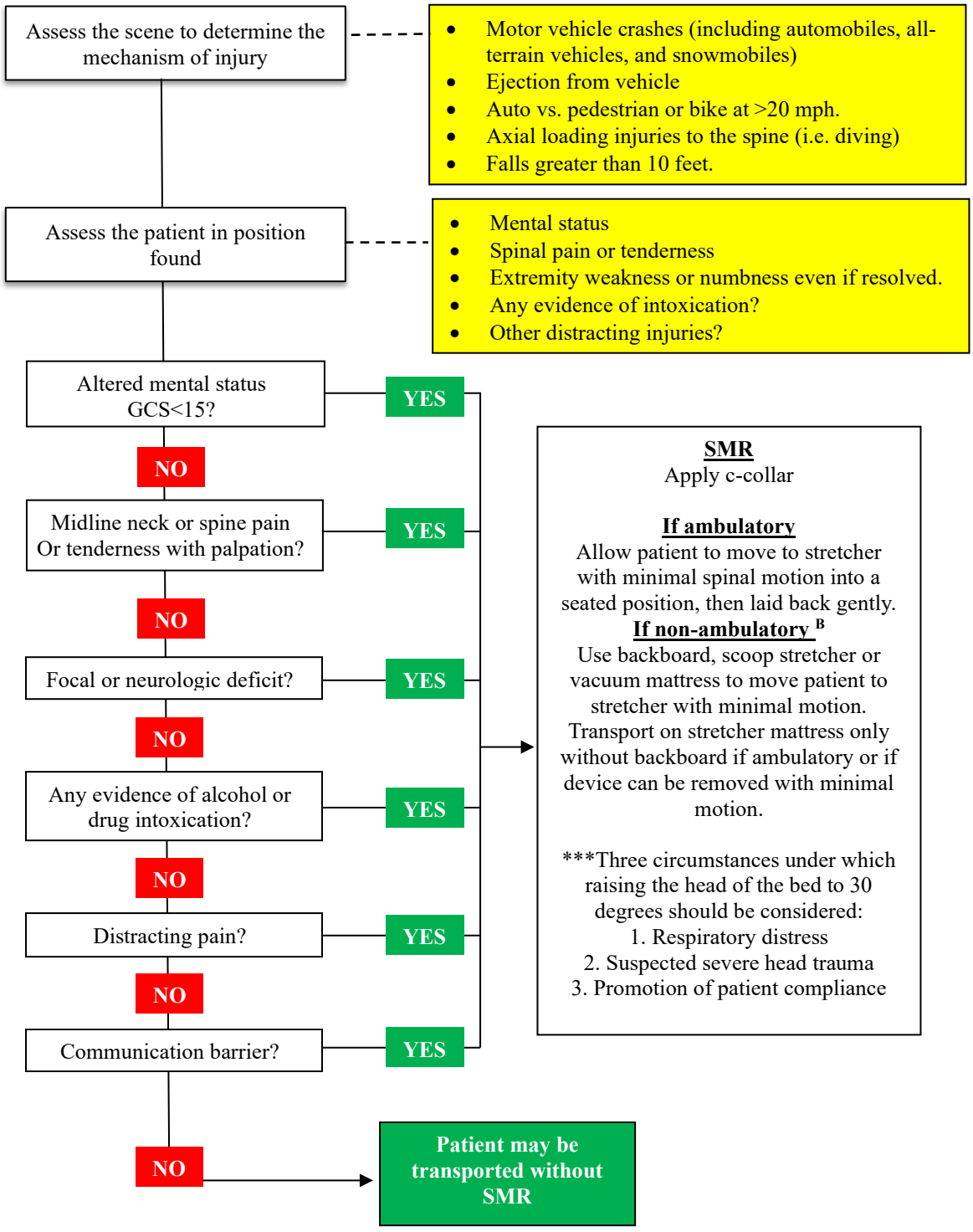
III. PROCEDURE

A. Identify if CVAD is accessible with standard prehospital equipment.
B. Identify shut-off clamps, caps, heparin/saline lock and clamp if disconnecting or opening an existing line.
C. Scrub the access port for 15 seconds with alcohol.
D. Access the device after cleansing.
E. Aspirate with 10 ml syringe until blood return, but site may be functional without return. Only use venous access devices that have a blood return unless the patient or family can verify that the device is functional despite the lack of blood return.
F. Discard aspirated fluid.
G. Flush lumen or port with 10-ml saline, avoiding excessive pressure.
H. Establish tubing connection avoiding air entry.
I. Secure connections

NOTES:

A. Do not access immature grafts.
B. Arterial bleeding will result if the needle is dislodged from a dialysis graft or fistula.
C. Dialysis fistulas and grafts (located under skin or arm) may have high back pressure and require positive pressure to infuse.
D. When attempting to insert a needle into a dialysis fistula, avoid the scar line or any lumpy areas. Follow the track marks that are present from previous use of the site for dialysis.

ALL


Assess the scene to determine the mechanism of injury
Motor vehicle crashes (including automobiles, all-terrain vehicles, and snowmobiles)
Ejection from vehicle
Auto vs. pedestrian or bike at >20 mph.
Axial loading injuries to the spine (i.e. diving)
Falls greater than 10 feet.
Assess the patient in position found
Mental status
Spinal pain or tenderness
Extremity weakness or numbness even if resolved.
Any evidence of intoxication?
Other distracting injuries?
Altered mental status GCS<15?
YES
NO
Midline neck or spine pain Or tenderness with palpation?
YES
NO
Focal or neurologic deficit?
YES
NO
Any evidence of alcohol or drug intoxication?
YES
NO
Distracting pain?
YES
NO
Communication barrier?
YES
NO
SMR
Apply c-collar
If ambulatory
Allow patient to move to stretcher with minimal spinal motion into a seated position, then laid back gently.
If non-ambulatory B
Use backboard, scoop stretcher or vacuum mattress to move patient to stretcher with minimal motion. Transport on stretcher mattress only without backboard if ambulatory or if device can be removed with minimal motion.
***Three circumstances under which raising the head of the bed to 30 degrees should be considered:
1. Respiratory distress
2. Suspected severe head trauma
3. Promotion of patient compliance
Patient may be transported without SMR

I. TREATMENT

A. Patients with penetrating injury to the neck should **NOT** be placed in a cervical collar or other spinal precautions regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromise and has been associated with increased mortality.

B. If extrication is required:

1. From a vehicle: After placing a cervical collar, if indicated, children in a booster seat and adults should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat.
2. Other situations requiring extrication: A padded long board may be used for extrication, using the lift and slide (rather than a logroll) technique.

C. Football helmet removal

1. If a helmet needs to be removed, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet while keeping the neck manually immobilized - occipital and shoulder padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning. (Facemasks can be removed without removing the helmet.)
2. Evidence is lacking to provide guidance about other types of helmet removal.

D. Do **NOT** transport patients on rigid long boards unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. **In these situations, long boards should ideally be padded or have a vacuum mattress applied to minimize secondary injury to the patient.**

E. Patients with severe kyphosis or ankylosing spondylitis may not tolerate a cervical collar. These patients should be immobilized in a position of comfort using towel rolls or sandbags.

NOTES:

A. Children are abdominal breathers, so immobilization straps should go across chest and pelvis and not across the abdomen, when possible

B. Children have disproportionately larger heads. When securing pediatric patients to a spine board, the board should have a recess for the head, or the body should be elevated approximately 1-2 cm to accommodate the larger head size and avoid neck flexion when immobilized.

C. In an uncooperative patient, avoid interventions that may promote increased spinal movement.

D. Evidence is lacking to support or refute the use of manual stabilization prior to spinal assessment in the setting of a possible traumatic injury when the patient is alert with spontaneous head/neck movement. Providers should not manually stabilize the alert and spontaneously moving patients, since patients with pain will self-limit movement, and forcing immobilization in this scenario may unnecessarily increase discomfort and anxiety.

E. Certain populations with musculoskeletal instability may be predisposed to cervical spine injury. However, evidence does not support or refute that these patients should be treated differently than those who do not have these conditions. These patients should be treated according to the Spinal Motion Restriction protocol like other patients without these conditions.

F. Age alone should not be a factor in decision-making for prehospital spine care, yet the patient's ability to reliably be assessed at the extremes of age should be considered. Communication barriers with infants/toddlers or elderly patients with dementia may prevent the provider from accurately assessing the patient.

G. Spinal precautions should be considered a treatment or preventive therapy.

H. Patients who are likely to benefit from immobilization should undergo this treatment.

I. Patients who are not likely to benefit from immobilization, who have a low likelihood of spinal injury, should not be immobilized.

J. Ambulatory patients may be safely immobilized on stretcher with cervical collar and straps and will not generally require a spine board.

K. Reserve long spine board use for the movement of patients whose injuries limit ambulation and who meet criteria for the use of spinal precautions. Remove from the long board as soon as is practical.

L. If your jurisdiction responds to organized school sporting events, it is suggested that you make contact with the athletic trainer / medical staff at the school to review their spinal immobilization procedure / E.A.P; and if possible, practice these procedures interdepartmentally and or with the Schools medical team prior to or at the beginning of the school year / sport season (football, hockey, lacrosse).

REFERENCES:

A. NASEMSO. National Model EMS Clinical Guidelines V2.1. June 2018.
B. National Association of EMS Physicians/American College of Surgeons Committee on Trauma. Position statement: EMS spinal precautions and the use of the long backboard. Prehosp Emerg Care. 2014;18:306-314.
C. "EMS Spinal Precautions and the Use of the Long Backboard—Resource Document to the Position Statement of the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma. http://www.naemsp.org/Pages/Standards-and-Clinical-Practices.aspx
D. Peter E. Fischer, Debra G. Perina, Theodore R. Delbridge, Mary E. Fallat, Jeffrey P. Salomone, Jimm Dodd, Eileen M. Bulger & Mark L. Gestring (2022) Spinal Motion Restriction in the Trauma Patient – A Joint Position Statement, Prehospital Emergency Care, DOI: 10.1080/10903127.2022.1481476

ALL

I. INTRODUCTION

A. Patients of all ages.

B. Airway skills are essential to all providers. This protocol is developed to guide the provider through the progressive and complicated steps of appropriate airway management. The protocol is designed to provide progressively more aggressive airway techniques dependent upon the patient's condition. The paramedic should always be mindful that BASIC AIRWAY SKILLS ARE ESSENTIAL! Most airways can be managed with well performed basic airway maneuvers.

C. Indications:

1. In general, the need for airway management or ventilatory support should be identified using rapid "global assessment" techniques. Except for apnea, there is no isolated single indicator of the need for airway or ventilatory management. Therefore, the patient should be globally assessed for any of the following indicators of airway obstruction and/or ventilatory insufficiency/failure.
    a. Airway patency and respiratory effort (breathing) must be assessed in all patients.
    b. Indications of airway compromise MUST be recognized at the earliest opportunity.
    c. Indications of failure to maintain or protect the airway may include:
        i. Lack of air movement at the mouth/nose.
        ii. Stridorous or snoring respirations.
        iii. Gurgling sound with breathing.
        iv. Failure of a normal gag reflex.
        v. Adventitious breath sounds (wheezing, rhonchi, rales).
        vi. Absent breath sounds.
        vii. Loss of end-tidal carbon dioxide readings.
    d. Indications of respiratory insufficiency/failure may include:
        i. Decreased mental status.
        ii. Apprehension or agitation.
        iii. Increased respiratory rate.
        iv. Obvious respiratory fatigue.
        v. Accessory muscle use (suprasternal, intercostal, abdominal muscles).
        vi. Apnea.
        vii. Shortness of breath.
        viii. Pallor, Cyanosis, low pulse oximetry readings.
        ix. Nasal flaring.
        x. Abnormal breathing pattern: rapid, slow, or shallow (This may be age specific).
        xi. Asymmetric chest wall movement.
        xii. Increasing end-tidal carbon dioxide readings.

II. PROTOCOL

A. This protocol presents an algorithmic approach to this important procedure in emergency medicine.[1]

B. Establish the need for airway intervention based on assessment (see indications above)

C. Apply basic airway techniques.

1. Head-tilt chin-lift
    a. Use Jaw thrust technique in trauma patients suspected of having a cervical spine injury.
        i. Utilize the Head-tilt chin-lift only as a last resort basic airway technique in the trauma patient. Immobilization of a patient with a compromised airway using a c-collar and backboard should only be considered / performed in the trauma patient. Utilizing the reverse Trendelenburg position by elevating the head of the cot / backboard 20 degrees has shown benefits to both patients with a compromised airway and during intubation by facilitating better laryngeal exposure during direct laryngoscopy and reducing atelectatic collapse of the posterior lungs.
    b. Jaw thrust.
    c. Use this technique for patients suspected of having a cervical spine injury.
2. Basic airway adjuncts should always be used during BVM ventilations.

a. Nasopharyngeal airway should be used for obtunded or unconscious patients.
b. Oropharyngeal airway should be used in patients that are unconscious only.
c. Both airway techniques may stimulate the patients gag reflex and cause vomiting. Be prepared to suction.

3. Basic Airway attempt failure.
   a. If a patent airway is not obtainable after basic skills attempts (chest rise and/or audible bilateral breath sounds), default immediately to supraglottic/extraglottic airway device.

D. After successful basic airway techniques, a decision to provide a more definitive airway should be based on the following indications:
1. The patient's mental status will not maintain a sufficient airway.
2. Concern for potential vomiting and aspiration.
3. Excess oropharyngeal fluids not well managed by the patient (blood)
4. Excessive work of respiratory effort indicating impending respiratory failure.

MEDIC

E. Tracheal Intubation
   1. See T706 Orotracheal Intubation Protocol
   2. See T714 Nasotracheal Intubation

F. Tracheostomy Dislodgement
1. Most of the time, a dislodged tracheostomy tube does not require any extraordinary measures by EMS providers besides assessment and transport for evaluation.
2. Assessment:
   a. Determine if the patient is in respiratory distress.
      i. If yes, determine length of time the tracheostomy tube has been in place.
      ii. If no, transport in position of comfort.
   b. Was the tracheostomy performed in the last 7 days?
      i. If yes, control the airway with a supraglottic/extraglottic device or oral intubation (if the patient has not had a laryngectomy).
      ii. If no,
         a. If the patient is able to ventilate adequately through the stoma, may trial oxygenation through stoma with NRB mask,
         b. Make sure tracheostomy tube is clean and clear and attempt to re-insert it or a cuffed ETT of equal size (if unknown, size 6) through the stoma, advancing the cuff just past the opening.
         c. If this fails, attempt orotracheal intubation if patient has not had a laryngectomy.
         d. iii. Confirm tube placement with capnography, continually monitor during transport.

ALL

III. RESCUE AIRWAY (ALTERNATIVE AIRWAY DEVICE)2 SUPRAGLOTTIC/EXTRAGLOTTIC AIRWAY DEVICE

A. In the case of a failed attempt at intubation, reversion to basic airway skills is essential. A rescue airway/alternate airway device should be employed as needed to maintain the airway. There are numerous types of rescue/alternate airway devices available. Each emergency medical service Medical Director will approve the device to be used by the service and provide the appropriate training in the use of that device.

B. Use of an alternative rescue airway device may proceed or substitute for endotracheal intubation when patient anatomy or the situation indicates.

C. Per scope of practice EMT's may use many alternate airway devices.

IV. END TIDAL CO2 DETECTION

A. Waveform capnography must be used to confirm and monitor endotracheal tube and rescue airway placement in the field, in the transport vehicle, on arrival at the hospital, and after any patient transfer to reduce the risk of unrecognized tube misplacement or displacement.

B. Studies on waveform capnography have shown 100% sensitivity and 100% specificity in identifying correct endotracheal tube placement.

MEDIC

V. SURGICAL AIRWAY

A. In rare cases when an airway cannot be managed by either basic, advanced or rescue airway techniques, a surgical airway may need to be performed.

B. Indications

1. Acute upper airway obstruction, which cannot be relieved by basic airway obstruction skills or the utilization of Magill forceps for direct removal.
2. Respiratory arrest with facial or neck anatomy or injury that makes endotracheal intubation impossible.

C. Each emergency medical service Medical Director will approve the surgical airway device to be used by the service and provide the appropriate training in the use of that device.

ALL

VI. DOCUMENTATION

A. A complete record of each airway attempt should be placed in the patient care record. Each airway intervention (including basic skills) should include the following (if applicable):

1. Precautions taken (i.e., in-line stabilization).
2. Size of device.
3. The number of intubation attempts shall not exceed 2 attempts at oral tracheal intubation, if that attempt fails, secure the airway with a supraglottic/extraglottic airway rescue airway or use a simple airway with BVM ventilations.
4. Depth of insertion (i.e., "X" number of centimeters at the lips/teeth).
5. Complications encountered.
6. Method of confirmation of correct placement (e.g., esophageal intubation detector, clinical exam).

MEDIC

VII. PEDIATRIC VENTILATOR DEPENDENT & TRACHEOSTOMY DEPENDENT

A. These patients can develop an airway occlusion due to a mucus plug. In the event of an occlusion the following interventions should be followed:

1. Suction the trach. In the event this does not clear the airway, then
2. Change the trach. If you are not able to reinsert the trach, then
3. Insert the next smaller size. If not able to insert the next smaller size, then
4. An ET of the smaller size can be inserted. (Note ET can only be inserted the length of the trach and needs to be secured.

VIII. PEDIATRIC VENTILATOR DEPENDENT & TRACHEOSTOMY DEPENDENT NOTES:

A. Some of these patients can NOT be orally intubated or may be difficult to intubate.

B. Most of these patients respond better to being on a ventilator than being bagged. These patients have portable ventilator with their setting preset.

C. The parents or care givers of these patients are going to be your best resource for history and care of these patients.

D. Many parents will have trach's of various sizes.

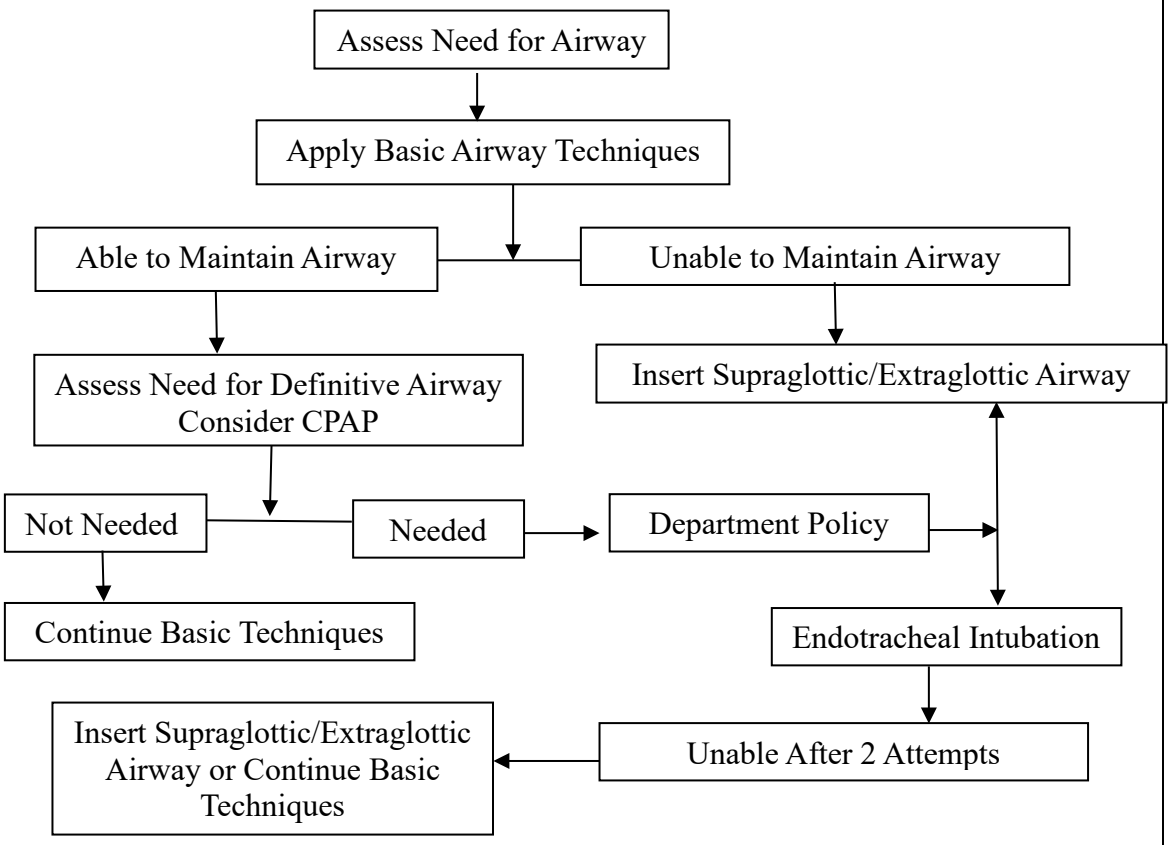
NOTES:

J. Once airway is established assure high flow oxygen delivery.

K. In a suspected opioid overdose, utilization of successful basic airway skills will allow your patient to be treated with naloxone therefore avoiding the need for advanced airway placement.

L. It is recommended that inline end tidal CO2 (when available) be used in the following settings:

1. Patients
2. Intubated patient.



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2. Alternate Airways in the Out-of-Hospital Setting Position Statement of the National Association of EMS Physicians, Prehospital Emergency Care, 2007:11:1, 55\

MEDIC

I. INDICATIONS

A. Patients of all ages.
B. After basic airway management skills, advanced airway skills become essential for management of the critically ill patient and are a primary function of the paramedic.

II. CONTRAINDICATIONS

A. Suspected epiglottitis characterized by a sore throat, fever, and drooling.

III. COMPLICATIONS

A. Unrecognized esophageal intubation with subsequent hypoxic brain injury
B. Orotracheal bleeding
C. Injury to vocal cords, epiglottis, or other airway structures
D. Vomiting and subsequent aspiration

IV. PROTOCOL

A. Pre-oxygenate the patient if time allows, studies have shown that use of oxygen by nasal cannula at 15 lpm during intubation and insertion of an SGA aid in the pre oxygenation of the patient. Pre oxygenation using a nasal cannula with BVM ventilations also increases the oropharyngeal FiO2 (fraction of inspired oxygen).
B. Chest compressions shall not be interrupted for any airway intervention including intubation or insertion of a supraglottic/extraglottic airway.
C. Assemble and check equipment:
    1. Ventilation equipment, including oxygen by nasal cannula.
    2. Laryngoscope, if available may utilize video laryngoscope
    3. Choose an appropriate size endotracheal tube (ETT).
        a. To size a pediatric ETT the Broselow tape should be used.
    4. Stylet
    5. Syringe
    6. Stethoscope
    7. Endotracheal tube placement verification device
        a. Continuous capnography MUST be utilized.
        b. Color change EtCO2 detector, EID, or EDD may be used in conjunction.
    8. Suction equipment
    9. Intubation facilitation equipment as available
        a. May include (but not limited to):
            i. Intubating Stylet (Bougie)
            ii. Video laryngoscope
            iii. Intubating LMA
D. Position head in "sniffing" position and elevation of the head of the cot by 20 degrees
    1. Contraindicated in patients with a known/suspected cervical spine injury. These patients require continuous manual in-line cervical stabilization which is superior to c-collar) during any intubation attempt, if possible, place the patient in reverse Trendelenburg position by elevating the head of the backboard 20 degrees.
E. Consider use of a second rescuer or bimanual technique (use of free hand to maneuver trachea) to aid intubation attempt.
    1. BURP (Backwards, upwards, rightwards, pressure) technique.
F. Insert laryngoscope blade on the right side of the mouth, displacing the tongue to the left (when using a Mac blade).
G. Lift tongue and mandible with laryngoscope
    1. Avoiding a "prying" action and laryngoscope contact with teeth.
H. Visualize vocal cords and pass the ETT tip through cords to proper depth (approx. 1cm past proximal end of the cuff)
    1. Use of adjuncts or intubation facilitation equipment may not require direct visualization of cords. Proper technique and documentation of method used should be followed.
I. Inflate cuff with 5-10mL of air.
J. Ventilate patient via bag-valve device.
K. Confirm proper placement as per the "Intubation Verification" in the Airway protocol.

L. Secure endotracheal tube BEFORE any patient movement.

V. DOCUMENTATION IN THE PATIENT'S RECORD SHOULD INCLUDE AT LEAST THE FOLLOWING:

A. Precautions taken (i.e., in-line stabilization)
B. Size of tube
C. Number of attempts did not exceed 2 attempts and document use of SGA or BVM with airway adjunct.
D. Depth of insertion (i.e., "X" number of centimeters at the lips/teeth)
E. Complications
F. Method of confirmation of correct placement (e.g., esophageal intubation detector, clinical exam) and ETCO2
G. Adjuncts used.

NOTES:

A. If positive pressure ventilation with the bag-valve device produces sounds of air leakage around the cuff, check the cuff inflation and the tube placement.
B. Whenever possible, pulse oximetry should be used during the procedure to monitor the patient's oxygenation status.
C. If the patient can vocalize, then the endotracheal tube has not passed through the vocal cords.
D. If there is enough time to intubate the patient in the prehospital setting, then there is enough time to secure the tube. A frequently stated reason for accidental esophageal intubation is "the tube moved." After each patient movement (e.g., board to stretcher, stretcher to ambulance), the tube position should be rechecked. ETCO2 use provides continuous placement monitoring.
E. When in doubt, take it out; and assure oxygenation by another attempt or method.
F. Both cuffed and uncuffed endotracheal tubes are acceptable for intubating infants and children. Training in inflating cuffed tubes to minimal airway occlusion pressure is important. Over-inflation even for a short time can cause severe damage in certain circumstances (e.g., poor lung compliance, high airway resistance, or a large glottic air leak) a cuffed endotracheal tube may be preferable to an uncuffed tube, provided that attention is paid to endotracheal tube size, position, and cuff inflation pressure (Class IIa, LOE B).

MEDIC

I. INDICATIONS

A. **Patient's age is younger than 16 years**
B. Acute upper airway obstruction which cannot be relieved using basic airway maneuvers, visualized finger sweep, endotracheal visualization with Magill forceps removal, or endotracheal intubation.
C. Respiratory arrest with facial or neck anatomy or injury that makes endotracheal intubation impossible.
D. Causes of Upper Airway Obstruction
   1. Airway burns with edema
   2. Epiglottitis or other life-threatening local infections with swelling of upper airway structures
   3. Foreign body aspiration
   4. Laryngeal fractures
   5. Laryngoedema or angioedema from allergic reactions
   6. Massive facial trauma

II. COMPLICATIONS

A. Subcutaneous emphysema
B. Bleeding (minimized by puncturing in the lower third of the cricothyroid membrane to avoid vessels)
C. Pneumothorax (from allowing insufficient time for passive exhalation in between breaths)

III. PROTOCOL

A. EQUIPMENT NEEDED:

<5 years old	**≥5 years old**
14g (if >5kg) or 18g (if <5kg) Angiocath type without safety/locking mechanism	14g Angiocath type without safety/locking mechanism
IV tubing attached to 2.5mm ET tube adapter	Jet ventilator device -OR- Oxygen tubing with 3 way stop-cock attached
BVM with pop-off valve safety deactivated	

   1. Saline flush
   2. Cleaning swab
   3. Sterile gloves
   4. Clean towel
   5. Oxygen source

B. Following exposure of the neck, identify the trachea, cricoid cartilage, and cricothyroid membrane below it.
C. Prep the skin, if time permits.
D. Attach a 5 mL syringe with 2-3 mL of saline to a 16- or 18-gauge angiocatheter.
E. Hold the trachea in place and provide skin tension with the thumb and fingers of non-dominant hand.
F. Puncture the cricothyroid membrane with the angiocatheter attached to the syringe. This should be at a 30–45-degree angle from the skin and directed downward toward the patient's feet.
G. Advance the needle with continual aspiration. The appearance of bubbles confirms tracheal placement. Proceed to slide the cannula off the needle until the hub rests securely on the skin surface.
H. <u>If patient is <5 years of age:</u>
   1. Remove 2.5mm endotracheal tube adapter from endotracheal tube
   2. Cut standard IV connection tubing so that the 2.5mm adapter can be connected to the open end and the Luer lock can be connected to the angiocatheter
   3. Attach bag-valve-mask to the endotracheal tube and ventilate the patient at a rate of at least 20 breaths per minute (1 breath every 3 seconds)
I. <u>If patient is ≥5 years of age:</u>
   1. Remove the needle with the syringe and connect the cannula to either:
      a. Manual jet ventilator device.
         i. If patient <12 yo, use 25 PSI

ii. If patient ≥12 yo, use 50 PSI

2. Oxygen tubing attached to 3-way stopcock, with all stopcock channels open
   a. Set flow to 1LPM/year-of-life up to 15LPM max
   b. Occlude open channel once every 3 seconds to deliver 20 breaths per minute

J. Ventilate the patient at a rate of at least 20 breaths per minute (1 breath every 3 seconds).

NOTES:

A. Because children vary greatly in size, many commonly used rescue airway devices for adults such as QuickTrach by Rusch, Inc. are not approved for use in pediatric patients.

B. Prepackaged kits for tracheal access using a Seldinger-type technique are available. For example, Pertrach by Pertrach Inc. can be used for pediatric patients with airway obstruction. However, this type of product should be used only upon the direction of medical control.

C. If the cricothyroid membrane cannot be located, the catheter may be safely inserted in a lower intercartilaginous tracheal space.

D. Surgical cricothyroidotomy is typically preferred instead of needle cric in children over 10-12 years of age because of the larger diameter tube used and more effective ventilation.

ALL

I. INTRODUCTION

A. Positive Airway Pressure (PAP) which entails Continuous Positive Airway Pressure (CPAP) and Bilevel Positive Airway Pressure (BiPAP) work by "splinting" the airways with a constant pressure of air, which reduces the work of breathing. In CHF it forces the excess fluid out of the alveoli and interstitial space back into the vasculature which decreases venous return to the heart thereby lessening its workload. In COPD/asthma, it is thought to splint the constricted airways open allowing air exchange. CPAP/BiPAP can also be a palliative intervention for patients with DNR orders due to the non-invasion nature of pressure support versus ventilatory support.

1. CPAP vs. BiPAP
   a. The difference between inspiratory and expiratory pressure in a BiPAP setting helps the patient to ventilate off carbon dioxide. If available, BiPAP is preferential in COPD patients. BiPAP may also provide benefit with work of breathing in fatigued patients.

B. Indications

1. Age 16 years and older
   a. If indicated and size appropriate equipment is available for under 16 years old, consult medical control
2. Patient is awake and oriented.
3. Patient has the ability to maintain an open airway (GCS greater than 10).
4. Systolic blood pressure above 90 mmHg.

C. Contraindications

1. Respiratory arrest.
2. Suspected pneumothorax.
3. Patient has a tracheostomy.
4. Patient is at risk for aspiration i.e.: vomiting, foreign body airway occlusion.
5. The patient is intubated. (The PAP device is not configured for use with ETT).

D. Physical Findings

1. Acute Respiratory Distress due to Asthma-COPD per Protocol M403 or Congestive Heart Failure per Protocol M404
2. Respiratory Failure of any etiology if a valid DNR is present.
3. Other indications (ex: carbon monoxide poisoning) consult medical control

II. PROTOCOL

A. The PAP device should be applied as soon as it is indicated.

1. Ensure that the patient is on continuous cardiac monitor and pulse oximetry.
2. Select the CPAP device or CPAP mode on a dual function device to be used

MEDIC

3. If available, BiPAP device or BiPAP mode on a dual function device may be used by a Medic.

ALL

4. Explain the procedure to the patient.
5. Ensure adequate oxygen supply and assemble PAP mask, circuit, and device.
6. Assemble required equipment and personnel for intubation in the event the patient deteriorates or is unable to tolerate PAP.
7. Attach quick connect device to a portable or fixed oxygen source.
8. Place an end-tidal capnography monitor device that will not break mask seal, if available
9. Place the mask over the mouth and nose.
10. Secure the mask with straps.
11. Check for air leaks and adjust mask as needed.
12. CPAP settings – follow device and medical director recommendations. Some prehospital devices may provide limited pressure information due to design. This limitation should not prevent use when indicated.
13. Standard starting settings are a minimum of 5-10 cmH2O
    a. Continue to coach patient to keep mask in place

MEDIC

14. If the patient is experiencing increasing anxiety versed 1-2 mg IV/IO/IM/IN every 5 minutes to a maximum of 10 mg may be administered
    a. The goal of versed is to decrease anxiety enough so that the patient tolerates PAP
15. BiPAP settings – follow device and medical director recommendations. Some prehospital

	devices may provide limited pressure information due to design. This limitation should not prevent use when indicated. a. Standard starting settings are 10 cmH20 for inspiratory positive airway pressure (IPAP) and 5 cmH2O for expiratory positive airway pressure (EPAP).
ALL	16. Reassess patient's vital signs and response to PAP every 5 minutes 17. Continue therapies as indicated by other protocols a. Do not break the mask seal to administer nitroglycerin (nitro lingual) SL. b. Inhaled medications (ex: bronchodilators) may be administered in conjunction with the PAP device if capable. 18. If the patient's status improves continue PAP until the patient is transferred to the care of the receiving hospital. 19. If patient's status deteriorates discontinue PAP and assess the patient for the need to intubate. 20. Notify destination hospital that PAP has been used. 21. PAP is only to be removed at the receiving hospital under the following circumstances. a. Personnel are present to transfer the patient to their equipment, or b. The receiving ED PHYSICIAN is present and requests that PAP be discontinued.

ALL

I. TOURNIQUETS

A. Indications: Potentially life-threatening hemorrhage from a limb

B. Contraindications:

1. Non-life-threatening hemorrhage
2. Hemorrhage from a junctional (axillary or groin), torso, or head / neck wound

C. Definition: A compressive device used to stop all blood flow distal to the device. This includes improvised techniques as well as commercially available products. High quality, effective devices include the: Combat Application Tourniquet™, Special Operations Forces Tactical Tourniquet – Wide™, Emergency Military Tourniquet™, and the Mechanical Advantage Tourniquet™.

D. Protocol:

1. Tourniquet application may be performed by providers of all levels who have received specialized training in general tourniquet use and the specific device to be utilized.
2. The tourniquet should be placed 2-3 inches proximal to the site of hemorrhage. In some situations, it may be appropriate to place the tourniquet as proximal as possible on the limb for expediency. A tourniquet should never be placed on a joint.
3. Tourniquets may be placed over typical clothing. Pockets should be empty and overlying objects, such as holsters, should be removed.
4. The tourniquet should be tightened until hemorrhage is controlled. A second, preferably immediately proximal tourniquet may be required, particularly on the thigh.
5. Assure that the tourniquet is well secured and will not accidentally loosen.
6. Application time should be recorded.
7. Tourniquets may be loosened (do not remove, as reapplication may be required) if the situation necessitating their use has resolved, e.g., vehicle extrication completed, no longer in the care-under-fire setting. An alternative hemorrhage control technique should be in place first.
8. The receiving facility and providers MUST be made clearly aware of the use of a tourniquet and any tourniquets should be exposed and clearly marked with time of application/reapplication.

II. WOUND PACKING

A. Indications: Potentially life-threatening hemorrhage from a wound to the groin, axilla, or neck.

B. Contraindications:

1. Non-life-threatening hemorrhage
2. Hemorrhage treatable by tourniquet

C. Definition: Using gauze to thoroughly fill a hemorrhaging penetrating wound cavity and produce hemostasis through moderate continuous pressure. This may be performed using standard sterile gauze, commercially available hemostasis products such as Combat Gauze™, Celox gauze™, Hemcon Chito Gauze™, or commercially available junctional tourniquet devices.

D. Protocol:

1. Wound packing may be performed by providers of all levels who have received specialized training in the technique.
2. Gauze should be placed as deeply in the wound as possible using a gloved digit and continuous pressure ensured. Excessive force is not necessary and may be harmful.
3. A pressure dressing should be applied, and manual direct pressure should be place over the packed wound for at least 3 minutes.
4. Wound packing should never be removed in the prehospital setting.
5. The receiving facility and providers MUST be made clearly aware of the use of wound packing.

MEDIC

III. TRANEXAMIC ACID

A. Refer to S506 Administration of Tranexamic Acid (TXA).

NOTES:

A. Well-aimed direct pressure will control most hemorrhage. However, some situations necessitate more aggressive techniques discussed here, potentially as first-line interventions. Examples of such situations may include Tactical EMS operations, CPR in progress, mass casualty incidents, and active vehicle extrications.

B. Permanent damage to the limb caused by an appropriate tourniquet is nearly non-existent for tourniquets left in place for less than two hours.

C. An inadequately tightened tourniquet can actually worsen blood loss.

D. Periodic loosening of a tourniquet to "allow limb perfusion" should never be performed.

E. Packing a wound can lead to provider injury due to sharp objects in the wound cavity such as bone or projectile fragments.

F. Wound packing to the head or neck should only be done with caution. Packing should not occur into the cranial vault or orbits. Packing should never impede the airway.

MEDIC

I. INTENTION

A. To allow a means of vascular access when intravenous access (IV) is unavailable.

B. This protocol does not specify the type of device to be used, which may include, but not limited to EZ-IO, FAST1, Cook IO needles, Jamshidi IO needles, Bone Injection Gun. Agencies that elect to carry IO equipment must provide instruction on the device per manufacturer's guideline. It is important to note, that the sites eligible for IO vary depending on the device used and Medical Director's approval.

II. INCLUSION CRITERIA

A. Patient requiring vascular access and unable to obtain IV access.

B. For patients deemed to be critical, entrapped, or for patients undergoing resuscitation it may be appropriate to place an IO without searching for an IV site at the discretion of the providers. Consider consult with medical control if unsure.

III. CONTRAINDICATIONS

A. Fracture or previous orthopedic procedure at site: consider alternatives.

B. Previous IO at the same site within 24 hours prior: consider alternatives.

C. Unable to distinguish site due to patient anatomy or significant edema: consider alternatives.

D. Infection at the insertion site: consider alternatives.

E. Patient is alert (relative contraindication pending device and provider discretion).

IV. PROTOCOL

A. Explain procedure and apply anesthetic, if available, in alert patients.

B. Ascertain the site per Medical Director approval to be used (device specific) and prepare the site using sterile technique.

C. Follow all device specific protocols for insertion of catheter.

D. Confirm device placement and proper positioning. Attach extension tubing or device specific connection tubing.

E. Consider 2% Lidocaine (preservative free) for conscious patients prior to flushing or administering fluids/drugs via IO. Slowly administer 20-40mg 2% Lidocaine (1-2 mL for adults) or 0.5mg/kg 2% Lidocaine (pediatrics). Follow device recommendations.

F. Flush with 10 mL (adults) or 5 mL (pediatrics) fluids or follow device recommendation for flushing.

1. It is important to flush the IO after attaching an extension, a common complication of poor flow is thought to be due to failure to immediately flush the catheter.

G. Attach IV tubing, secure catheter, and check surrounding area for extravasation.

H. Establish a TKO rate for fluids when not administering medication/fluids.

1. All medication administrations should be followed with a 10mL NaCl flush due to IO anatomy.
2. For continuous infusions, if flow rates are slower than desired with gravity only, utilize a pressure infusion device or BP cuff to increase rate.
3. If flow appears to have stopped, administer a 10mL NaCl flush to reopen catheter.

I. Continuously monitor patient for complications to the procedure.

NOTES:

A. It is difficult to establish a specific detailed protocol due to the number and type of IO devices available. Agencies are recommended to publish a department specific protocol for the IO device they use.

B. IO access has been proven to be as effective as IV access for a broad range of medication/fluid administration.

1. Dye injection studies in normal circulating studies have shown drugs reach the heart in 1 second from the proximal humerus or sternum and 4 seconds from the tibia. In cases of cardiac arrest, with proper CPR, it can take drugs 28 seconds from the sternum and 51 seconds from the tibia.

C. Patients do not need to be unconscious for insertion but be wary of the psychological effects of the procedure of establishing IO access.

1. Of the three major adult devices: EZ-IO, FAST1, and, Bone Injection Gun, none of the manufacturers list the patient's level of consciousness as a contraindication to insertion.

However, the FAST1 and EZ-IO both recommend local anesthetic prior, and all three devices recommend Lidocaine flush post insertion.

D. Some devices have sites that are being used off-label (without FDA approval). Providers should only utilize sites that have received their Medical Director's approval.
E. When transferring patient to another medical provider highlight the use of and ensure that they are familiar with the specific IO device used.
F. It is common practice to look/attempt IV access without success in at least 2 locations before establishing IO access but is not required.
G. All uses of IO devices should be reviewed as part of a department's quality assurance process.

ALL

I. INCLUSION CRITERIA

A. Any patient who has been subjected to a TASER or similar conducted energy weapon.

II. PHYSICAL FINDINGS

A. Patient will likely be hand-cuffed and in Police custody.

B. May have TASER barb(s) embedded in skin or clothing.

1. Barbs are similar to barbed style fishhooks and are extremely sharp. Use caution when handling to avoid contaminated needle stick exposure.

C. Minor/inactive bleeding and redness may be present at/near site of TASER barb penetration.

D. May present with secondary injuries associated with an un-supported fall such as, but not limited to:

1. Lacerations, abrasions, bruising or possibly stress fractures associated with involuntary muscle contractions.

E. Altered level of consciousness.

1. If needed refer to SB201 Altered Level of Consciousness.

F. May be anxious, agitated or combative.

1. If needed refer to M407 Psychiatric Protocol or M408 Restraint Protocol.

G. Chest pain and/or respiratory distress are not commonly associated symptoms but may present.

1. If needed refer to SB203 Chest Pain or SB202 Respiratory Distress protocols.

III. PROTOCOL

A. Assure that scene is safe and patient has been restrained by Police.

B. Maintain airway and administer oxygen to correct hypoxia <95%.

C. Assess for spinal injury.

1. Refer to T704 Spinal Motion Restriction Protocol.

D. Obtain vital signs.

1. Pulse, B/P and respiratory rate may be initially elevated but should return to age specific normal ranges within a reasonable time.

MEDIC

2. Apply cardiac monitor if warranted; refer to appropriate cardiac protocol if dysrhythmia exists.

ALL

E. Assess patient's neurological status; examine for signs/symptoms of a potential head injury.

F. Complete a secondary exam, looking for secondary injuries associated with an un-supported fall.

1. Bandage, dress, splint or otherwise treat all injuries/wounds as needed.

G. If patient again becomes agitated or combative; consider physical or chemical restraint as outlined in M408 Restraint Protocol.

1. Involve Police personnel when restraining.
2. Be aware that patient may be exhibiting behavior consistent with Excited Delirium, refer to notes below.

H. Removal of TASER probe barb:

1. Prior to TASER probe barb removal, patient must be cooperative and non-combative.
2. Cartridge must be removed from TASER gun body by Police prior to touching TASER probe barb(s) or removal from patient. TASER wires should not be cut or pulled from probe barb assembly unless absolutely necessary for patient care.
3. Patient with TASER barb embedded in eye, eye lid, female breast tissue, genitalia, face, neck or other body areas of concern should be transported, accompanied by Police, for removal by hospital staff.
4. Grasp the probe portion of the barb assembly firmly (with gloved hand, forceps, or manufacturer removal tool) holding skin taut between two fingers. At a 90° angle to the skin, quickly remove the probe barb from the patient's skin and bandage wounds accordingly.
5. Probe barb(s) should be inspected to ensure assembly is complete. Police will be able to assist in confirming entire barb was removed from the patient as length may vary by model.
6. Once removed, TASER barb(s) should be considered a contaminated sharp and handled accordingly. The TASER cartridge usually contains a slot/hole to insert the deployed barb for safe storage.

7. Deployed barbs shall be given to Police. If not given to the Police, they should be disposed of in an appropriate sharps container.

NOTES:

A. Delirium is a mental state characterized by an acute circumstance or disorientation, disorganized thought process and disturbances in speech. When the mental state involves violent behavior, it is called excited delirium. In the state when there is sudden death and autopsy fails to reveal a cause, it becomes excited delirium syndrome.

B. Essentially three things initiate excited delirium:
   1. Overdose on hallucinogenic, cocaine or other stimulant drugs.
   2. Drug withdrawal.
   3. Psychiatric patient not taking prescribed medications.

C. Signs and symptoms of excited delirium include:
   1. Bizarre, aggressive behavior.
   2. Elevated body temperature.
   3. Fear and Panic.
   4. Excessive tear production.
   5. Nakedness.
   6. Head trauma.
   7. Dilated pupils.
   8. Incoherent speech.
   9. Profuse sweating.
   10. Shivering.
   11. Hypoglycemia.

D. A key symptom to the potential onset of sudden death from excited delirium is "instant tranquility." The patient who was initially very violent and combative suddenly becomes calm and docile. This is a serious and ominous sign; patient should be constantly monitored and transported for further evaluation.

MEDIC

I. INDICATIONS

A. Age greater than or equal to 16 years.
B. Mechanical ventilation may be initiated after a patient has been intubated.
C. Mechanical ventilation may be continued if it was initiated prior to EMS contact. Refer to M415 for continuation of pre-existing medical devices.

II. CONTRAINDICATIONS

A. Cardiac arrest is relative contraindication, if short of manpower and use of mechanical ventilation would facilitate patient care then refer to "Six Dial Setup" in the notes.

III. INITIAL VENTILATOR SETUP

A. If patient has been on ventilator prior to EMS assuming care, it is appropriate to continue ventilator settings that were previously established.
B. There are many ventilator strategies that exist. Consideration of all these strategies based on clinical scenario is felt to be unnecessary for the brief duration of mechanical ventilator support during EMS care. This initial setup is basic by design.
C. Mode – Assist Control
D. Rate – 12 breaths per minute
E. FiO2 – 100%
F. PEEP – 5 cm H2O
G. Tidal Volume – 450ml for female patient and 500ml for male patient
    1. These volumes are meant to reflect volume of 7ml/kg for the "average size" adults
    2. There are charts that would allow more specific tidal volumes based on height and ideal body weight for males and females. Asking medics to estimate height and to calculate ideal body weight seems unnecessary since these settings will be temporary and can be adjusted by provider at receiving facility.
H. All patients placed on mechanical ventilator must have continuous end tidal CO2 monitoring performed.

IV. VENTILATOR ADJUSTMENTS AND ETCO2 MONITORING

A. Ventilator adjustments are usually made based on analysis of arterial blood gas.
B. Ideal EtCO2 is 35-45mmHG for patients who are not in cardiac arrest. If your intubated patient has EtCO2 outside this range for greater than 10 minutes after being placed on the ventilator you should consider contacting medical control for recommendations to adjust ventilator settings.
C. Goal EtCO2 is >10mmHG during CPR, an abrupt rise in EtCO2 is often an indication of ROSC
D. If the medic has questions or concerns about ventilator settings during transport, they should contact medical control for further instruction.

V. WHAT TO DO IN VENTILATOR EMERGENCY

A. First thing to do if the patient has declining oxygen saturations or change in ventilatory status is to take them off the mechanical ventilator and ventilate manually.
B. Next consider potential causes of the ventilator emergency using the DOPE is acronym.
    1. D – Dislodged or disconnected tube
    2. O – Obstruction
    3. P – Pneumothorax
    4. E – Equipment failure
C. Once the patient stabilizes and problem has been addressed the patient may be placed back on the mechanical ventilator.

NOTES:

A. There are different models of mechanical ventilators on the market. Medics must be trained on the specific model used by their department.
B. EMS providers should only be responsible for use of the ventilator that their agency provides and trains with. In other words, the EMS provider should not be responsible for a patient's own ventilator or a ventilator from a facility where a patient is being transported from.
C. This protocol is intended to apply to the emergency transport of patients requiring immediate medical care and evaluation. It is not intended to apply to the non-emergent transport of chronically ventilated patients.
D. Six Dial Setup

1. Mode – Volume Control Ventilation
2. PEEP – 0 cm H_2O
3. Tidal Volume – 8mL/lg
4. FIO2 – 100%
5. Respiratory Rate – 10 Breaths per Minute
6. Maximum Peak Inspiratory Pressure (Pmax Alarm) – 60cm of H_2O
7. Ventilation Trigger – Off
8. Adequate Inspiratory Time – 1 second

REFERENCES:

Sahu AK, Timilsina G, Mathew R, Jamshed N, Aggarwal P. "Six-dial Strategy"-Mechanical Ventilation during Cardiopulmonary Resuscitation. Indian J Crit Care Med. 2020;24(6):487-489. doi:10.5005/jp-journals-10071-23464

MEDIC

A. INDICATIONS

a. Adult spontaneously breathing patient requiring intubation.

B. CONTRAINDICATIONS

A. Apnea
B. Severe maxillofacial injuries
C. Abnormal pharyngeal/supraglottic anatomy (mass, abscess, etc).

C. PROTOCOL

A. Preoxygenate with 100% oxygen by NRB mask.
B. For the awake patient consider applying Lidocaine gel to the ETT and nasal airways and spray the nasopharynx with Lidocaine or Cetacaine spray.
C. Assemble equipment
    i. ETT (0.5-1.0 mm size smaller than for an oral intubation), BVM, Suction, Syringe, Securing device, Laryngoscopes and Rescue Airway Devices.
    ii. An Endotrol ETT is often useful.
D. Monitor the patient with EKG, B/P, Sp02, and prepare ETC02 detector device.
E. Maintain manual cervical spine motion restriction if trauma is suspected.
F. Apply a vasoconstrictor spray to both nares. Lubricate and insert progressively larger sizes of nasal air ways to dilate the nasal passage.
G. Gently insert a lubricated ETT and pass the ETT using steady, firm pressure.
H. While advancing the ETT, use a jaw thrust or chin lift maneuver to elevate the epiglottis. This may be performed by an assistant. Listen for continuous breath sounds coming through the ETT. Try to close the mouth with a gloved hand and occlude the opposite nare allowing for maximal breath sounds through the ETT.
I. Apply cricoid pressure to minimize risk of regurgitation and aspiration and to manipulate larynx to obtain maximum breath sounds.
J. Just proximal to the glottis, the breath sounds will become louder. Advance the ETT with inspiration.
K. Inflate the ETT cuff, ventilate, and verify correct ETT position by two clinical methods and presence of ETCO2. (See oral intubation protocol)
L. Secure the ETT in place (approximately 26 cm in females, 27 cm for males at nare).
M. Consider the use of a cervical collar to limit head movement.
N. Re-check ETT position with each patient movement
O. Assist ventilations with a BVM or use a mechanical ventilator (if approved).Confirm proper placement as per the “Intubation Verification” in the Airway protocol.

ALL

I. INCLUSION CRITERIA

A. Pregnant woman who is in active labor as defined by regular, frequent, painful uterine contractions and who feels the urge to push.
B. Presence of fetal part at vaginal opening.

II. PROTOCOL

C. If patient is in labor but not showing signs of imminent delivery transport rapidly to hospital with maternity services, preferably the hospital associated with the patient's obstetrician. If you arrive on scene and delivery is imminent, deliver on scene prior to transport.
D. Call for additional manpower if needed.
E. Obtain brief obstetrical history.
    1. Estimated date of confinement (EDC) – due date.
    2. Gestational Age
        a. Less than 23 weeks is a non-viable baby.
            i. Babies delivering earlier than 23 weeks do not benefit from transport to a Level 3 nursery.
        b. 23 weeks and greater is a viable baby.
        c. 23 - 31 6/7 weeks is a severely premature baby.
            i. These babies due best if they are delivered at a hospital that has a Level 3 nursery.
        d. 32 – 36 6/7 weeks is a premature baby (can deliver at any hospital with obstetric services).
        e. 37 weeks and greater is a term baby (can deliver at any hospital with obstetric services).
    3. Gravidity – number of pregnancies.
    4. Parity – number of deliveries after the 20th week of pregnancy.
    5. Complications during this or previous pregnancies or anticipated problems with delivery such as pre-eclampsia, gestational diabetes, drug use, twins or higher order multiples, etc.
F. Prepare for delivery.
G. Prepare for neonatal care.
H. Wear personal protective equipment (PPE).
I. Maintain patient privacy, when feasible.

MEDIC

J. If time permits, establish IV access.

ALL

K. Assist with normal spontaneous vaginal delivery if head is the presenting part.
    1. As the baby crowns, support the head and the perineum with gentle pressure to control the emergence of the head and minimize perineal trauma.
    2. If amniotic membrane is still intact as the head is crowning, rupture with your fingers, forceps, or clamp to allow amniotic fluid to leak out, Note the color and viscosity of the fluid. If, after rupturing the fetal membranes, the fetal membranes are covering the head and face at the time of delivery wipe them away with a clean towel.
    3. Check for the presence of the umbilical cord around the baby's neck. If cord is around the neck, attempt to slip it over the head. Alternatively, it may be possible to slip it back over the shoulders and deliver the body through the loop. The cord should only be clamped and cut to relieve a nuchal cord as a last resort.
    4. If the cord is too tight to slip over the head or around the shoulders during delivery, apply 2 umbilical cord clamps 1 inch (2.5cm) apart and cut between them.
    5. Instruct the mother to push and support the baby's head as it rotates.
    6. After the head rotates to face the mother's thigh, guide the head and neck downward to encourage the top shoulder to deliver.
    7. When you can see the baby's top shoulder deliver, guide the head and neck upward to deliver the bottom shoulder. The rest of the baby should follow quickly.
    8. If the infant is vigorous, delay clamping of the umbilical cord for 60 seconds. This helps to prevent neonatal anemia, but resuscitation takes priority if the infant has respiratory or circulatory depression. Clamp the umbilical cord by placing the first clamp approximately 4 inches (10 cm) from the baby. Place the second clamp approximately 2 inches (5 cm) further

from the baby (closer to the mother) than the first clamp, cut the umbilical cord between the clamps.

9. Hand the infant to a second provider to establish neonatal care if needed. If the infant is stable, breathing and has good tone, place the infant on the mother's chest, skin to skin for transport.

L. Assist with delivery of the placenta.
   5. DO NOT pull on the umbilical cord to facilitate delivery of the placenta.
   6. DO NOT delay transport waiting for the placenta to deliver.
   7. If the placenta delivers spontaneously, place in a plastic bag and transport to the hospital with the mother and the infant.

M. If baby is delivering in a mal-presentation (e.g. buttocks, foot, or arm first), elevate the hips of the mother and transport immediately.
   1. If the baby is breech (feet or buttocks presenting) and delivery is imminent, support the baby as it delivers.
   2. "Breakdown" the legs (insert finger into the patellar fossa and flex knees and hips one at a time.
   3. After the legs and buttocks have delivered, support the baby wrapped in a towel as a sling until the arms and shoulders are visible.
   4. "Breakdown" the arms (insert finger into the cubital fossa and flex arms one at a time).
   5. After the shoulders have delivered, gently elevate trunk and legs to aid in delivery of head (if face down).
   6. Head should deliver in 30 seconds. If not, reach 2 fingers into the vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway.
   7. Apply gentle pressure to mother's fundus.

N. Potential delivery complications
   1. If cord is prolapsed:
      a. Relieve pressure on the cord. This can be accomplished by placing a gloved hand in the vagina and lifting the presenting fetal part off of the cord and cervix.
      b. Elevate hips of mother.
      c. Keep cord moist.
      d. Apply high flow oxygen to mother and transport.
   2. Shoulder dystocia: when the head delivers, and shoulders fail to deliver.
      a. Hyperflex mother's hips to knee to chest position while lying supine (McRoberts Maneuver).
      b. Apply firm suprapubic (NOT FUNDAL) pressure to attempt to dislodge shoulder.
      c. Apply high flow oxygen and transport to closest available receiving facility if these maneuvers do not work. NEVER pull on the head in an attempt to extract the baby.

O. After complete delivery, provide routine newborn care with special attention to maintenance of infant body temperature. Place infant on oxygen and suction if needed. Refer to P600 Pediatric Newborn Resuscitation if needed.

P. Examine for excessive bleeding **(Post-Partum Hemorrhage).**
   1. Post-Partum Hemorrhage is blood loss >500 ml following a vaginal delivery. If present:
      a. Obtain assistance.
      b. Continue to monitor vital signs and blood loss.

MEDIC

      c. Establish adequate IV access (Adequate intravenous access should be provided with two lines, at least one of which should be a large bore catheter.
      d. Resuscitate with crystalloid.

ALL

      e. Examine and apply pressure to any active bleeding sites.
      f. Rapidly assess uterine tone.
         i. Aggressively massage uterine fundus.
         ii. Be aware that there can still be significant bleeding from a poorly contracted and dilated lower segment despite adequate upper segment contraction.

iii. Massage should be maintained while other interventions are being initiated and continued until the uterus remains firm and bleeding has abated. If the fundus is well contracted but bleeding continues unabated, then further massage is not likely to be effective and progression to other methods of hemorrhage control should occur promptly.

MEDIC

g. **Administer Tranexamic acid (TXA)** per protocol S506.

h. Notify receiving hospital.

Q. Resume transport of mother and baby to hospital with labor and delivery service.

R. If a complication such as massive bleeding or neonatal distress occurs, proceed to nearest appropriate hospital.

S. If the mother or infant have any evidence of hemodynamic instability and/or if the delivery is difficult, call for immediate ALS back up.

NOTES:

A. Under most circumstances it is preferable that the patient be transported to the hospital where she was planning to deliver.

B. Women that are believed to be 23- 31 6/7 weeks pregnant (viable and severely premature) should preferentially be transported to a hospital with a Level 3 NICU. Hospitals with Labor and Delivery and a Level 3 NICU in Hamilton County are listed below:
   1. University of Cincinnati Medical Center
   2. Good Samaritan Hospital

C. Please be familiar with the capabilities of hospitals in your region that provide obstetric services.

D. Pregnant teenagers being transported to the hospital for any issues related to the pregnancy (i.e., vaginal bleeding, imminent delivery, abdominal pain, elevated blood pressure, seizure, etc.) should be taken to a hospital with a labor and delivery service. If uncertain where patient should be taken, then contact medical control.

E. The Committee on Obstetric Practice agrees with the recommendation of the American Academy of Pediatrics and the American Heart Association that all infants with meconium-stained amniotic fluid should no longer routinely receive intrapartum suctioning. If the newborn is vigorous, defined as having strong respiratory efforts, good muscle tone, and a heart rate greater than 100 beats per minute, there is no evidence that tracheal suctioning is necessary. Injury to the vocal cords is more likely to occur when attempting to intubate a vigorous newborn.

F. If meconium is present and the newborn is depressed, refer to P600 Pediatric Newborn Resuscitation.

G. The American College of Obstetricians and Gynecologists (ACOG) now recommends a delay in umbilical cord clamping for all healthy infants for at least 60 seconds after birth given the numerous benefits to most newborns.

H. Kangaroo Care, or skin to skin contact (SSC) between mother and newborn immediately following birth has been shown to be beneficial in assisting newborn transition to extrauterine life and promoting maternal-infant attachment.

ALL

I. INCLUSION CRITERIA

A. Trauma in pregnant females of any gestational age **OR**
B. Seizure in pregnant females of any gestational age **OR**
C. Vaginal bleeding in pregnancy and postpartum hemorrhage **OR**
D. Cardiac arrest in a pregnant female

II. PROTOCOL

A. **Trauma -** This section serves to supplement the current trauma guidelines with some caveats and specific recommendations for pregnant patients.

1. The best initial treatment of the fetus is the provision of optimal resuscitation of the mother.
2. Because of their increased intravascular volume, pregnant patients can lose a significant amount of blood before tachycardia, hypotension, or other signs of shock or hypovolemia appear.
3. The highest incidence of fetal death occurs secondary to severe maternal shock, which is associated with a fetal mortality rate of 80%.
4. The fetus may be in distress and the placenta deprived of vital perfusion while the mother's condition and vital signs appear stable.
5. Oxygen supplementation should be given at 5-8 lit/min via non-rebreather mask to maintain maternal oxygen saturation >95% to ensure adequate fetal oxygenation.
6. Because of their adverse effect on utero-placental perfusion, vasopressors in pregnant women should be used only for intractable hypotension that is unresponsive to fluid resuscitation.
7. After mid-pregnancy, the gravid uterus should be moved off of the inferior vena cava to increase venous return and cardiac output in the acutely injured pregnant woman. This may be achieved by manual displacement of the uterus or left lateral tilt (30 degrees). Care should be taken to secure the spinal cord when using left lateral tilt if spinal motion restriction is indicated. In the case of maternal cardiac arrest, CPR must be performed in this position. Laying the patient flat significantly inhibits venous return.
8. Fetal loss can occur even when the mother has incurred no abdominal injuries.
9. Severe injuries are much more likely to result in fetal loss. However, there is a much higher frequency of minor trauma during pregnancy and thus most fetal losses due to trauma are due to minor maternal mechanism of injury.

MEDIC

10. Intubation is more difficult with failed intubations 8x more likely. A smaller size ET tube is recommended.
11. Insertion of 2 large bore IV's is recommended for all seriously injured pregnant trauma patients to facilitate initial rapid crystalloid infusion, intravascular volume expansion, and possible blood transfusion as required.

ALL

12. Avoid the urge to focus on the fetus; babies do not do well if mothers do not do well.
13. Every pregnant woman who sustains trauma should be asked questions specifically about domestic or intimate partner violence.
14. Call medical control for questions. Notify receiving hospital in all cases of pregnant trauma patient. Patient should be transported to a trauma center with labor and delivery services available.
15. All pregnant trauma patients past the age of viability (>/= 23 weeks) should be monitored on an obstetrical unit for signs of increased uterine activity which could indicate placental injury (placental abruption). If the patient refuses transport by EMS, they should be encouraged to contact their obstetric provider as soon as possible.

B. **Seizure**

1. Eclampsia is a clinical diagnosis based on the occurrence of new-onset tonic-clonic, focal, or multifocal seizures in a pregnant or recent postpartum patient, in the absence of other causative conditions (i.e., epilepsy, cerebral arterial ischemia and infarction, intracranial hemorrhage, drug use).
2. Most women have premonitory signs/symptoms in the hours before their initial seizure, such as hypertension, headache, visual disturbances, and/or right upper quadrant or epigastric pain. Patients with these symptoms should be transported to a hospital with obstetric services.

3. Eclampsia can occur at any time during the pregnancy. Approximately 90 percent of postpartum seizures occur within one week of delivery.
4. Key management issues are prevention of maternal hypoxia and trauma, treatment of severe hypertension (if present), prevention of recurrent seizures with magnesium sulfate, and rapid transport to an appropriate hospital with maternity services.
    a. If the patient is actively seizing, treat and or prevent hypoxia, trauma, and recurrent seizures as per the general seizure protocol.

MEDIC

    b. IV access should be obtained as soon as possible.

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    c. If the patent is pregnant place in or maintain a left lateral tilt.

MEDIC

    d. If actively seizing, give Versed (midazolam) first line as per the general seizure protocol.
    e. For women with eclampsia, administer magnesium sulfate even if the patient is no longer seizing.
    f. We suggest using an intravascular magnesium sulfate regimen rather than an intramuscular regimen or IO regimen when IV access is available. Administer a 4-6-gram loading dose over 20 to 25 minutes.
        i. One method of diluting Magnesium Sulfate is to mix 4-6 grams in 100 ml of normal saline and run in over 20-25 minutes.
        ii. Alternatively give 10g deep IM "Z track" in 2 divided 5g injections with a 3" 20-gauge needle in each buttock. Gently massage the site after administration.
        iii. Be cautious of hypotension caused by Magnesium Sulfate.
    g. Magnesium Sulfate is contraindicated in a patient with a known history of myasthenia gravis.
    h. Beware the combination of Versed and Magnesium Sulfate can lead to severe respiratory depression.
    i. A common threshold for initiating antihypertensive therapy is sustained diastolic pressures greater than 110 mmHg or systolic blood pressures ≥160 mmHg.

ALL

C. **Vaginal bleeding in pregnancy and postpartum hemorrhage**

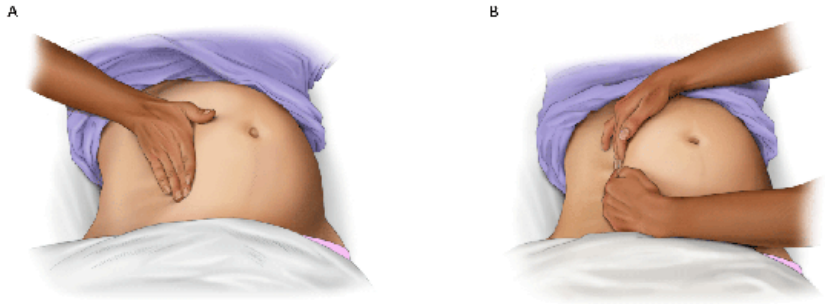
1. Vaginal bleeding can signal serious complications at any point in pregnancy, including in women that do not yet know that they are pregnant. A pregnancy related complication should be considered in any patient complaining of vaginal bleeding (or pelvic/abdominal pain) from early teens until mid-to-late 50s.
2. The causes of bleeding in pregnancy vary depending on gestational age.
    a. First trimester (conception to 12 weeks gestation):
        i. Vaginal bleeding occurs in up to 40% of pregnant women in the first trimester, many go on to have normal pregnancies.
        ii. Causes of vaginal bleeding in early pregnancy include miscarriage and ectopic pregnancy. These can occur before a woman knows that she is pregnant.
    b. Second and third trimester causes of bleeding include:
        i. Placenta previa - this is where the placenta is positioned partially or totally over the cervix. This condition can lead to significant blood loss and can become life threatening. This is often described as "painless bleeding."
        ii. Placental abruption - this is where the placenta prematurely detaches from the uterine wall; this can be life threatening for the mother and the fetus. Anything that elevates blood pressure, including chronic hypertension, gestational hypertension (pre-eclampsia/eclampsia) and use of drugs such as cocaine, increases the risk of developing this condition. This is often described as "painful bleeding." Trauma is a leading cause of placental abruption. Placental abruption can occur without evidence visible bleeding (occult abruption).
    c. Post-partum hemorrhage can occur up to 12 weeks following delivery, but the vast majority occurs in the minutes following delivery and management is covered in detail in the imminent delivery protocol.
3. Assessment
    a. History

b. Physical exam

4. Treatment
   a. The hallmark of treating bleeding during pregnancy is support, resuscitation, and transport.

D. **Cardiac Arrest**

1. All pregnant patients greater than 24 weeks (or a fundal height palpated at or above the level of the umbilicus) in cardiac arrest should be transported as soon as possible to the nearest emergency department for a resuscitative hysterotomy (also known as a peri-mortem cesarean section). [Also See Protocol C308 Traumatic Cardiac Arrest (Adults & Pediatrics) III. A. 2.]
2. Management of the pregnant cardiac arrest patient is similar to the non-pregnant patient; this includes high-quality chest compressions with minimally interrupted CPR, administration of ACLS medications, and defibrillation. Please refer to Protocol SB204 – Cardiac Arrest.
3. If not limited due to body habitus and/or a gravid uterus, chest compressions can be performed with a mechanical device (ie LUCAS®).
4. When performing chest compressions, apply manual left uterine displacement to relieve pressure off the inferior vena cava to allow blood flow back to the heart. This can be performed via a one-handed or two-handed technique:
   a. One-handed technique (A): With patient flat on her back and the provider standing on the woman's right side, the provider pushes the women's uterus away (toward the patient's left side)
   b. Two-handed technique (B): With the patient on her back, the provider standing on the woman's left side, the provider uses two hands to pull the women's uterus towards (toward the patient's left side)



5. Airway management in the pregnant patient can be difficult and strong consideration should be for the placement for supraglottic device to reduce the risk of hypoxia to mother and fetus.

MEDIC

a. If symptomatic hypotension and/or tachycardia, altered mental status, or other signs of shock place 1 or 2 large bore IV's and initiate fluid resuscitation. Refer to SB205 (Hypotension/Shock).

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b. If the patient is >20 weeks gestation place in left lateral decubitus position or left lateral tilt to increase venous return.
c. Transport to a hospital with maternity services. If the patient is estimated to be 23 – 31 6/7 weeks gestation and maternal condition allows, proceed to a facility with a level 3 NICU as noted in the imminent delivery protocol.
d. Every effort should be made to transport both the mother and infant to the same hospital.
e. Notify the receiving hospital when in route.

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ALL

PROTOCOL FOR USE OF THE DUODOTE AND MARK-1 NERVE AGENT ANTIDOTE KITS

I. HISTORICAL FINDINGS

A. Patients exhibiting signs and symptoms of nerve agent or organophosphate poisoning.
B. Known terrorist incident involving chemical agents.
C. Multiple patients presenting from a single location, especially a previously designated vulnerable target (federal building, mass gathering, abortion center, etc.) or intelligence indicates high probability of terrorist incident involving chemical agents.

II. PRECAUTIONS

A. SELF PROTECTION OF THE RESCUER/PROVIDER IS THE FIRST PRIORITY. Withdraw all EMS assets to a safe distance and notify the appropriate Hazardous Materials response team. Continually assess the situation from a safe distance. Be aware of additional disseminating devices. Proceed with appropriate hazardous material guidelines and procedures. Assure proper decontamination has been performed.

III. PHYSICAL FINDINGS

A. Over-stimulation of muscarinic sites increases secretion. Two acronyms which help identify the presence of an organophosphate nerve agent or insecticide exposure are:
   1. SLUDGE – **S**alivation, **L**acrimation (Tearing), **U**rination, **D**efecation, **G**astrointestinal distress, **E**mesis
   2. SLUGBAM – **S**alivation, **L**acrimation (Tearing), **U**rination, **G**astrointestinal emptying, **B**radycardia and **B**ronchial constriction, **A**bdominal effects, **M**iosis (constricted pupils)
B. Over-stimulation of nicotinic sites causes severe muscle twitching, cramping, and weakness.
C. Release of or exposure to possible chemical agent.

IV. CHEMICAL AGENT CONSIDERATIONS

A. The effects caused by a mild vapor exposure, namely rhinorrhea and tightness in the chest, may easily be confused with an upper respiratory malady or an allergy.
B. Miosis (constricted pupils), if present, will help to distinguish this as a nerve agent incident, but the eyes must be examined in a very dim light to detect this.
C. GI symptoms from another illness may be confused with those from nerve agent effects.
D. Exposure to organophosphates will produce the same signs and symptoms as exposure to nerve agents.
E. History is the best indicator of nerve agent exposure:
   1. Large number of patients exhibiting signs and symptoms of nerve agent poisoning.
   2. Known terrorist incident.

V. INDICATIONS

A. Poisoning by organophosphorus nerve agents or insecticides with accompanying symptoms.

VI. CONTRAINDICATIONS

A. The DuoDote AND Mark 1 Kit are intended for adult use. It is not recommended that they be used for patients less than 90 pounds. Consult medical control for further direction related to use with children.
B. For adults, in the presence of life-threatening poisoning by organophosphorus nerve agents or insecticides, there are no absolute contraindications to the use of the DuoDote or Mark 1 Kit Auto- Injectors. When symptoms of poisoning are not severe, DuoDote or Mark 1 Kit Auto-Injectors should be used with extreme caution in people with heart disease, arrhythmias, recent myocardial infarction, severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal insufficiency, chronic pulmonary disease, or hypersensitivity to any component of the product.

II. RELATIVE CONTRAINDICATIONS

A. Patients with poor muscle mass at injection site.
B. Asymptomatic nerve agent exposure.

III. GUIDELINES

A. Medication administration using the DuoDote Nerve Agent Antidote Kit involves the administration of Atropine (2.1 mg / 0.7 mL) and 2-PAM (Pralidoxime Chloride-600 mg / 2 mL) via a single auto-injector to a victim of Nerve Agent Exposure.

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B. Medication administration using the Mark 1 Nerve Agent Antidote Kit involves the administration of Atropine (2.0 mg / 0.7 mL) and 2-PAM (Pralidoxime Chloride-600 mg / 2 mL) contained in two separate auto-injectors to a victim of Nerve Agent Exposure.

IV. PHYSICAL PROCEDURES:

A. In the situation of known or suspected organophosphorus poisoning:

B. **FOR PATIENTS EXHIBITING <u>MILD SYMPTOMS</u>**

1. MILD SYMPTOMS
   a. Blurred vision, miosis (excessive constriction of the pupils)
   b. Excessive, unexplained teary eyes
   c. Excessive, unexplained runny nose
   d. Increased salivation, such as sudden drooling
   e. Chest tightness or difficulty breathing
   f. Tremors throughout the body or muscular twitching
   g. Nausea and/or vomiting
   h. Unexplained wheezing, coughing, or increased airway secretions
   i. Acute onset of stomach cramps
   j. Tachycardia or bradycardia
2. FIRST DOSE: Administer **<u>one (1) DuoDote or Mark 1 Kit</u>** injection if the patient experiencing **<u>2 or more MILD</u>** symptoms.
   a. ***<u>Emergency medical services personnel with mild symptoms may self-administer a single dose of DuoDote or Mark 1 Kit</u>***.
3. Wait 10 to 15 minutes for DuoDote or Mark 1 Kit to take effect. If, after 10 to 15 minutes, the patient does not develop any SEVERE symptoms, no additional DuoDote or Mark 1 Kit injections are recommended.
   a. *For emergency medical services personnel who have self-administered using a DuoDote or Mark 1 Kit, an individual decision will need to be made to determine their capacity to continue to provide emergency care.*
4. ADDITIONAL DOSES: If, at any time after the first dose, the patient develops any **SEVERE** symptoms, administer 2 additional DuoDote or Mark 1 Kit injections in rapid succession, and immediately seek definitive medical care.

C. **PATIENTS EXHIBITING <u>SEVERE SYMPTOMS</u>**

1. SEVERE SYMPTOMS:
   a. Strange or confused behavior
   b. Severe difficulty breathing or copious secretions from lungs/airway.
   c. Severe muscular twitching and general weakness
   d. Involuntary urination and defecation
   e. Convulsions
   f. Loss of consciousness
   g. Respiratory arrest
2. FIRST DOSE: Immediately administer **<u>three (3) DuoDote or Mark 1 Kit</u>** injections in rapid succession if a patient has any **<u>SEVERE</u>** symptoms.
3. ADDITIONAL DOSES: No more than 3 doses of DuoDote or Mark 1 Kits should be administered unless definitive medical care (e.g., hospitalization, respiratory support) is available.
   a. *The limit of 3 doses is specific to the pralidoxime component of the DuoDote and Mark 1 Kit. If necessary, additional doses of atropine can be administered if the 3 doses of the DuoDote or Mark 1 Kit do not produce an adequate response.*

D. Emergency care of the severely poisoned individual should include removal of oral and bronchial secretions, maintenance of a patent airway (including advanced airway devices/intubation), IV/IO access, supplemental oxygen, and, if necessary, assist ventilation.

E. An anticonvulsant such as midazolam (Versed) may be administered to treat convulsions if suspected in the unconscious individual. The effects of nerve agents and some insecticides can mask the motor signs of a seizure.

F. Close supervision of all severely poisoned patients is indicated for at least 48 to 72 hours.

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ALL

I. HISTORICAL FINDINGS

A. Patient states they have had direct contact or exposure to a known hazardous material, toxin, or an unknown potentially hazardous substance.

II. PHYSICAL FINDINGS

A. Patient has signs and symptoms consistent with some form of chemical inhalation or exposure.

III. PROTOCOL

A. Attempt to ascertain the:
   1. Type and name of material involved.
   2. Form of the material – liquid, gas or solid
   3. Amount of material the patient contacted or inhaled.

B. Attempt to obtain an MSDS and other pertinent information sheets on material(s)

C. Determine whether the patient was exposed versus contaminated.
   1. *Exposure* indicates the patient has inhaled a gas or had minimal contact with a potentially hazardous or toxic substance.
   2. *Contamination* indicates the patient has come in direct contact with or inhaled a significant quantity of the substance involved.
   3. Exposed patients seldom need decontamination. In some cases, such as those involving inhalation of a known or unknown gaseous material, decontamination may not be possible.

D. Be aware that prior to decontamination, secondary contamination of rescuers may occur due to hazardous materials still being present on the patient's clothing and skin.
   1. Substances with a high risk for secondary contamination include:
      a. acids, alkalis, corrosives (if concentrated)
      b. asbestos (large amounts, crumbling)
      c. cyanide salts and related compounds (e.g., nitriles) and hydrogen cyanide
      d. hydrofluoric acid solutions
      e. nitrogen containing and other oxidizers which may produce methemoglobinemia (aniline, aryl amines, aromatic nitro-compounds, chlorates, etc.)
      f. pesticides
      g. PCBs (polychlorinated biphenyls)
      h. phenol and phenolic compounds
      i. radioactive materials/waste
      j. many other oily or adherent toxic dusts and liquids
   2. Although rare, in some cases, the patient's exhalation may contain hazardous gases.

E. If field decontamination is indicated, consult a hazardous materials team and/or poison control for guidance.

F. Notify the receiving hospital as soon as possible of the situation and consider activation/dispatch of Regional Decontamination Units. Information relayed should include, but is not limited to:
   1. Number of patients
   2. Name of the material involved if known.
   3. Form of the material the amount of material the patient contacted or inhaled.
   4. Length of the exposure (time)
   5. Whether field units consider this an *exposure* or *contamination*
   6. Whether field decontamination is indicated, and if so, what level of decontamination is being performed and/or if mass-decontamination will be needed.
   7. Patient condition including specific signs and symptoms.
   8. Whether field units feel further decontamination will be needed at the hospital
   9. ETA to the receiving hospital

NOTES:

A. This protocol is not intended as a field decontamination protocol. However, since decontamination may need to be accomplished prior to the arrival of a Hazardous Materials Team, the following should be considered:
   1. The personal safety of EMS crewmembers and other emergency response personnel is paramount.
   2. Consider whether there is time to wait for a Hazardous Materials Team or engine company.

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3. What resources to perform decontamination are readily available on the scene (i.e., garden hose or other water source) or on the ambulance (i.e., pour solutions or IV fluids)
4. To adequately decontaminate a patient, clothing should be removed and sealed in bags.
5. In most cases, bleach should not be used on skin; Plain water and a soap (such as Simple Green®, Dawn®, or Tide®) is often all that is needed.
6. Powdered chemicals should first be brushed off the skin, then the skin should be flushed with copious amounts of water.
7. If adequate quantities of water are not available, applying a minimal quantity of water to a hazardous material may cause more damage than if the skin was not flushed.
8. Consult field references if available for guidance.

B. The practice of placing contaminated or decontaminated patients in body bags to contain any contaminants is discouraged. This practice can cause heat stress for the patient and can also increase absorption of hazardous materials.

C. Remember that contact with some common materials may result in the need for field decontamination. Prime examples include patients who have been significantly contaminated with gasoline or diesel fuel.

Contamination by organophosphates (i.e. pesticides) often presents with gastrointestinal signs and symptoms. Chemical warfare agents also produce a similar clinical picture. The following acronyms may be helpful in recognizing organophosphate poisoning.

S- Salivation
L- Lacrimation (Tearing)
U- Urination
D- Defecation
G- Gastrointestinal Distress
E- Emesis

S- Salivation
L- Lacrimation (Tearing)
U- Urination
G- Gastrointestinal Emptying
B- Bradycardia; Bronchial constriction
A- Abdominal effects
M- Miosis (Constricted pupils)

If these signs and symptoms are present and a chemical warfare agent is suspected, see Appendix A: Mark 1 Kit Protocol

ALL

I. INTRODUCTION

A. A Mass Casualty Incident (MCI) poses considerable challenges for first responding EMS units. For purposes of this protocol, an MCI is defined as an incident that generates a large number of patients and overwhelms first responding EMS units. In addition, the underlying cause of the incident (natural disaster, terrorist attack, etc.) may further decrease the initial effectiveness of traditional EMS response. It is recognized that these special circumstances will be varied and that the EMS agency itself will be responsible for defining exactly what meets the criteria of an MCI.

B. Successful scene management of an MCI occurs in a standardized, predictable fashion. The procedures, tactical objectives and operational approach must be consistent across various EMS agencies to ensure maximum effectiveness and optimum patient outcome when operating at major medical incidents. The following is intended to provide first responders with general direction in the management of an MCI, including basic tactical objectives for EMS command and guidelines for the triage of patients. It is **not** intended to limit or supersede the local incident command system or local medical control but rather to provide broad guidelines that are common from community to community.

II. MCI MANAGEMENT CONSIDERATIONS:

A. Generally, an incident with 10 or more patients constitutes an MCI. Depending upon the size of the incident, command personnel and first responders should consider performing the following upon confirmation of an MCI:

1. Assign a Triage Unit
   a. Can be first-in units; depends on hazard mitigation concerns.
2. Notify area hospitals that an MCI has occurred.
   a. Utilize the Disaster Net radio system through local communications center.
3. Request additional transport units as necessary.
   a. Consider establishing a Staging Area for incoming units and resources.
4. If appropriate, move patients to a Treatment Area.
   a. The Treatment Area is under the direction of a Treatment Unit Leader
   b. Consider personnel and equipment required to move victims.
5. Establish a Transportation Unit or Group
   a. The Transportation Unit or Group will handle hospital coordination and communication.
6. Report completion of EMS Tactical Benchmarks
   a. All patients triaged.
   b. All patients tagged as "IMMEDIATE" transported.
   c. Other benchmarks as determined by local authority.
7. For a larger MCI, Command personnel should also consider the following:
   a. Request additional resources such as the Red Cross Medical Assistance Team (MAT) and other MCI equipped units (e.g., supply trailers / vehicles)
   b. Establish a medical supply sector.
   c. Establish multiple Treatment Areas as necessary.
   d. Request ancillary support services.
   e. Request buses for transport of patients or for use as holding areas or rehab areas at the scene.

III. GUIDELINES FOR TRIAGE

A. Simple Triage and Rapid Treatment (START) provides an easy-to-use procedure allowing for the rapid sorting of patients into specific categories. START does not require a specific diagnosis; rather it focuses on specific signs or symptoms. **The following guideline represents only a brief outline of the START triage system and in no way replaces the need for a course to fully describe the system.**

B. The first step is to order all ambulatory patients to walk to an assigned area. These patients are initially tagged MINOR (green).

C. Begin the second step by moving from where you stand in an orderly and systematic manner through the remaining victims, stopping at each person for assessment and tagging. Each patient should NEVER take more than one minute.

D. Evaluate each patient using RPM:

1. R = Respiration
    a. If the victim is NOT breathing quickly clear the mouth and open the airway
    b. If the victim resumes breathing tag the patient as IMMEDIATE (red)
    c. If the victim needs help maintaining an airway tag as IMMEDIATE (red)
    d. If medically appropriate, insert an oropharyngeal airway.
    e. If you doubt the patient's ability to breathe tag as IMMEDIATE (red)
    f. If apnea persists despite simple maneuvers tag as DEAD (black)
    g. If the victim is breathing greater than30 bpm tag as IMMEDIATE (red)
    h. If the victim is breathing less than30 bpm move on to "P=Perfusion (Pulse/Circulation)"
2. P = Perfusion (Pulse/Circulation)
    a. Control severe bleeding.
    b. Check a radial pulse for five to ten seconds.
    c. If irregular or absent tag the victim as IMMEDIATE (red)
    d. If the radial pulse is present move on to "M=Mental Status"
3. M = Mental Status
    a. Performed on patients who have adequate breathing and adequate circulation.
    b. Test by having the patient follow a simple command:
    c. Open your eyes, close your eyes, and squeeze my hand.
    d. Patients who can follow these commands are tagged DELAYED (yellow)
    e. Patients who are unresponsive or cannot follow simple commands are tagged IMMEDIATE (red)

NOTES:

To the extent possible, EMS agencies should utilize a tagging system endorsed by their respective county Fire and EMS organizations (e.g., fire chiefs' association, academy of medicine, EMA, etc.) to aid in familiarity of the tags, consistent delivery of care and accountability of all victims.

A. Colored ribbons have been successfully used in the past and are an acceptable alternative for the initial response of crew that is overwhelmed in the early stages of an event. However, proper tagging of patients with triage tags should occur as soon as possible afterwards (normally when the patient is re-triaged upon entering the Treatment Area) for purposes of accountability and maintenance of a patient care record.

B. When performing triage at an MCI, EMS providers are encouraged to use discretion when directing MINOR (green) patients to walk from the scene. For example, a minor collision involving a bus may dictate c-spine evaluation and immobilization be accomplished prior to moving patients so long as no other threats to patient health and welfare exist. In such a case, initial Triage Group personnel would NOT order all victims who can get up and walk to move to a specific area.

C. All patients initially categorized under the START triage system must be regularly reevaluated. This is especially true of the MINOR (green) patients. Although initially ambulatory, these victims may have more significant underlying injuries that are not immediately discernible. When re-triaging, some patients may be upgraded to a higher priority while others may be downgraded to a lower priority as medically appropriate.

D. The primary goal in the management of multi-patient or mass casualty incidents is to do the best for the greatest number of victims. In general, early triage and transport improves survivability. However, in some cases mitigation of a hazard may take precedence over the triage and/or removal of victims. Nothing in this protocol should be interpreted as limiting the ability of the Incident Commander to manage the situation.

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ALL

I. INTRODUCTION

A. If a patient looks like a young adult, use START; if he/she looks like a child, use JumpSTART.

II. PROCEDURE

A. STEP 1

1. All children who are able to walk are directed to the area designated for minor injuries, where they will undergo secondary triage. Infants who are developmentally unable to walk should be screened at the initial site, using the JumpSTART. If they satisfy all of the physiologic "delayed" criteria and appear to have no significant external injury, infants may be triaged to the minor category.
2. Note: Children with special health care needs are often chronically unable to ambulate. These children can be triaged similarly to infants who are developmentally unable to walk. A caregiver with knowledge of the children involved would be of invaluable assistance in assessing neurologic status.

B. STEP 2

1. Non-ambulatory pediatric patients are initially assessed for presence/absence of spontaneous breathing. Any patient with spontaneous respirations is then assessed for respiratory rate (see STEP 3). Any patient with absolute apnea or intermittent apnea must have their airway opened by conventional positional technique, including BLS airway foreign body clearance if indicated. If the patient resumes spontaneous respirations, a red ribbon (immediate) is applied, and the triage officer moves on.
2. If upper airway opening does not trigger spontaneous respirations, the rescuer palpates for a peripheral pulse (radial, brachial). If there is no peripheral pulse, the patient is tagged as deceased (black ribbon) and the triage officer moves on.
3. If there is a palpable pulse, the rescuer gives 5 breaths (about 15 sec) using mouth to mask/barrier technique. *This is the pediatric "jumpstart*." If the ventilatory trial fails to trigger spontaneous respirations, the child is classified as deceased (black). If spontaneous respirations resume, the patient is tagged as immediate (red) and the triage officer moves on without providing further ventilations. The child may or may not still be breathing on arrival of other non-triage personnel. Appropriate intervention can then be determined based upon the resources available at the designated treatment site.

C. STEP 3

1. All patients at this point have spontaneous respirations. If the respiratory rate is roughly 15-45 breaths/min proceed to Step 4 (assess perfusion). If the respiratory rate is less than 15 or faster than 45 or very irregular, the patient is classified as immediate (red) and the triage officer moves on.

D. STEP 4

1. All patients at this point have been judged to have "adequate" respirations. Assess perfusion by palpating peripheral pulses on an uninjured limb. This has been substituted for capillary refill (CR) because of variation in CR with body and environmental temperature and because it is a tactile technique more adaptable to poor environmental conditions.
2. If there are palpable peripheral pulses, the rescuer assesses mental status (Step 5). If there are no peripheral pulses, the patient is categorized as an immediate (RED) patient and the triage officer moves on.

E. STEP 5

1. All patients at this point have "adequate" ABCs. The rescuer now performs a rapid "AVPU" assessment, keeping in mind the apparent developmental stage of the child. If the patient is alert, responds to voice or responds appropriately to pain, the patient is triaged in the delayed category (yellow ribbon). If the child does not respond to voice and responds inappropriately to pain, has decorticate or decerebrate posturing, or is truly unresponsive, a red ribbon (immediate) is applied and the triage officer moves on.

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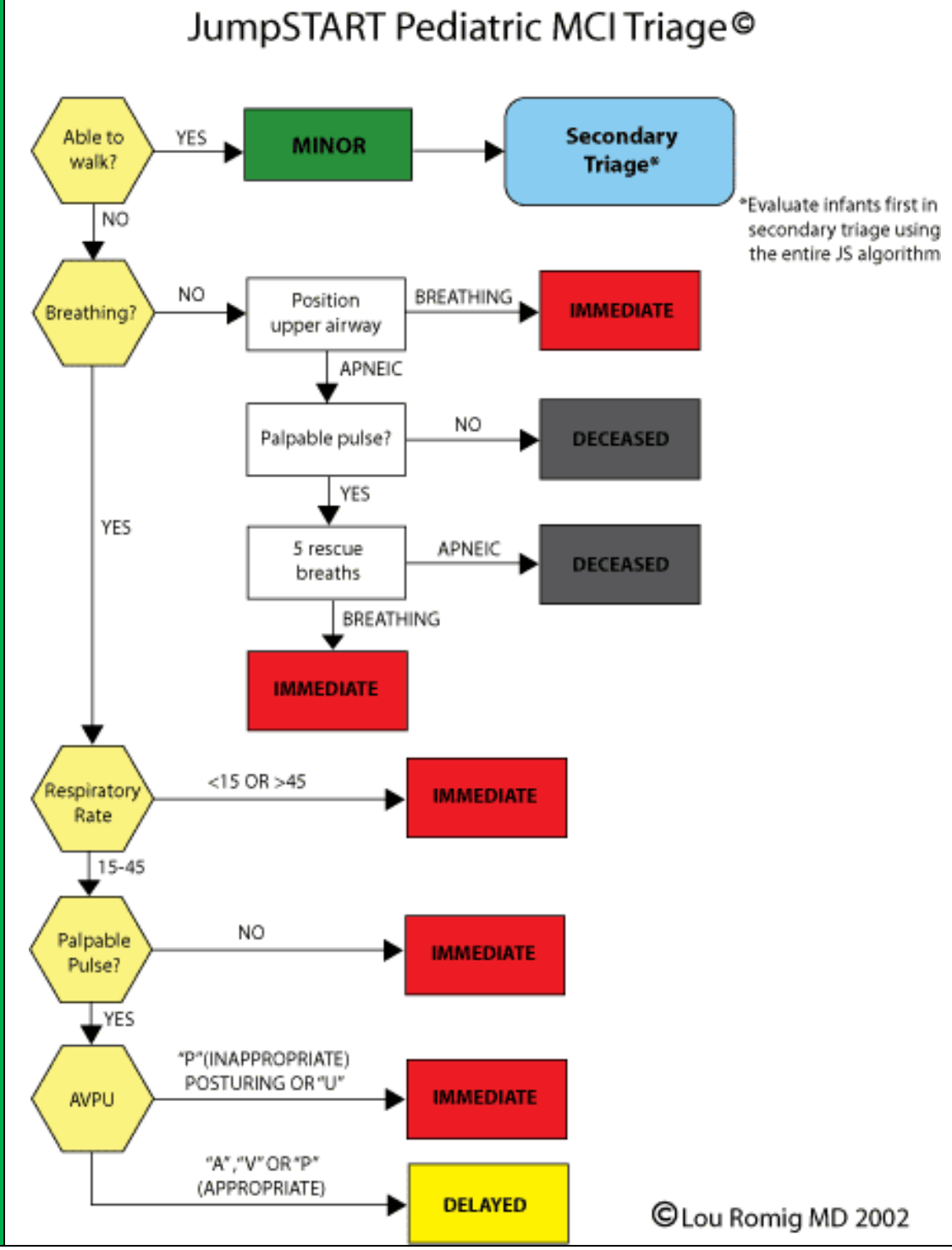

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I. The medical director for each emergency medical service may authorize EMS professionals within the organization to administer immunizations whose route is within their scope of practice. The EMS professional administering the immunization shall, not later than thirty days after the immunization is administered, do either of the following:

A. Provide notice of the immunization administration to the board of health of the city or general health district in which the individual receiving the immunization resides or, if there is no board of health for that district, the authority having the duties of a board of health.

B. Submit the immunization administration information to the state immunization registry maintained by the department of health.

II. **PROCEDURE**

A. Identify adults with no history of this vaccination, or an influenza vaccination for the current influenza season, or as otherwise indicated by the medical director or public health recommendations.

1. For children, please reference the CDC Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2020. https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html
2. For adults, please reference the CDC Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2020. https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html

B. Screen all patients for contraindications and precautions to vaccinations:

1. Contraindications:
   a. Serious systemic or anaphylactic reaction to a prior dose of the vaccine or to any of its components.
   b. For a list of vaccine components, go to http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/excipient-table-2.pdf
   c. Do not give live attenuated influenza vaccine (LAIV; nasal spray) to a person who has a history of either an anaphylactic or non-anaphylactic hypersensitivity to eggs; who is pregnant, is age 50 years or older, or who has chronic pulmonary (including asthma), children receiving salicylate therapy, children ages 2-4 who have asthma or who have had a history of wheezing in the past 12 months, cardiovascular (excluding hypertension), renal, hepatic, neurologic/ neuromuscular, hematologic, or metabolic (including diabetes) disorders; immunosuppression, including that caused by medications or HIV, people caring for severely immunocompromised individuals, persons without a spleen or a non-functional spleen, people with cochlear implants, people with active cerebrospinal fluid (CSF) leaks.
2. Precautions:
   a. Moderate or severe acute illness with or without fever
   b. History of Guillain Barré syndrome within 6 weeks of a previous vaccination
   c. For live attenuated vaccines only, close contact with an immunosuppressed person when the person requires protective isolation.
   d. Receipt of antivirals (e.g., amantadine, rimantadine, zanamivir, or oseltamivir) within the previous 48 hours or possibility of use within 14 days after vaccination.
3. Other considerations:
   a. Onset of hives only after ingesting eggs: healthcare providers familiar with the potential manifestations of egg allergy should administer inactivated vaccine and observe patient for 30 minutes after receipt of the vaccine for signs of a reaction.
   b. Refer to the CDC or manufacturers website regarding the types of vaccines available, and specifically whether it is egg derived.

C. Provide all patients with a copy of the most current federal Vaccine Information Statement (VIS). Documentation must include the publication date of the VIS and the date it was given to the

patient. Non-English speaking patients must be provided with a copy of the VIS in their native language, if available and preferred; these can be found at www.immunize.org/vis .

D. Administer the vaccine using the appropriate procedure per the manufacturer based on the vaccine supplied: (below are 2 examples)
   1. Injectable quadrivalent influenza vaccine:
      a. For adults of all ages, give 0.5 mL of intramuscularly (22–25g, 1–1½" needle) in the deltoid muscle. (Note: A 5/8" needle may be used for adults weighing less than 130 lbs. [<60 kg] for injection in the deltoid muscle only if the subcutaneous tissue is not bunched and the injection is made at a 90 degree angle.
   2. Intranasal live-attenuated influenza vaccine:
      a. For healthy adults younger than age 50 years, 0.1 mL is sprayed into each nostril while the patient is in an upright position. (Total dose of 0.2 ml)

E. Document each patient's vaccine administration information and follow up in the following places:
   1. Record the date the vaccine was administered, the manufacturer and lot number, the vaccination site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reasons(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
   2. Personal immunization record card: Record the date of vaccination and the name/location of the administering facility.

F. Patients should be observed for ten minutes after immunization for any allergic reaction.
   1. Report all adverse reactions to a vaccine to the federal Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or (800) 822-7967. VAERS report forms are available at www.vaers.hhs.gov or http://vaers.hhs.gov/resources/vaersmaterialspublications.

NOTES:

G. Refer to the manufacturer's guidance regarding appropriate storage, transportation, and administration of the vaccine.

H. The Ohio Department of Health Vaccines for Children (VFC) website has multiple resources for temperature logging forms, how to vaccinate, Vaccine Information Statements and other materials. https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/Immunization/Vaccines-for-Children-VFC/

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I. INCLUSION CRITERIA

A. Dogs and cats ONLY

B. Dogs and cats encountered in the course of other emergency medical response

II. PROTOCOL

EMT

A. Ensure provider safety. Utilize animal handler as necessary.

B. Airway management

1. Open and manually maintain airway if respiratory compromise suspected.
2. Administer supplemental oxygen as needed for suspected hypoxia.
3. Provide manual ventilation as needed by mouth-snout, mouth-barrier, or BVM.

C. Hemorrhage management

1. Apply direct pressure as needed.
2. Bandaging as needed

D. Fracture immobilization by standard methods, as needed.

E. Naloxone – for suspected symptomatic opiate exposure

1. 0.04 mg/kg IN (dogs and cats)

MEDIC

2. 0.04 mg/kg IM / SC (dogs and cats)

ALL

NOTES:

A. Nothing in this protocol expands a provider's scope of practice beyond that which is allowed in the care of human patients.

B. Providers utilizing this protocol should receive appropriate training in animal care techniques.

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ACS/CHEST PAIN M400
- 12-Lead EKG ASAP
- ASA 324 mg (chewed)
- ***Determine erectile dysfunction drug use***
- Nitroglycerin 0.4 mg SL q 5 min X 3 **OR** 1" Topical Nitroglycerin (Nitro Paste) – Do **NOT** administer in an Inferior MI
- Fentanyl 25-100mcg IV/IO (200mcg total) or Morphine Sulfate **1-5** mg IV (10mg total)

ADRENAL INSUFFICIENCY M417
- Allow pt./family to self-administer steroid therapy if available.
- If self-administration not possible,
  - Adult- immediately give Methylprednisolone 125 mg IM/IV/IO
  - Pedi- immediately give Methylprednisolone 2 mg/kg IM/IV/IO
- Assess BGL
- 12-lead
- IV Bolus of Normal Saline (NS)
  - Adult- 500-1000ml IV/IO
  - Pedi- 20ml/kg IV/IO

ALLERGIC REACTION - ANAPHYLAXIS M409
- Epinephrine 0.3 mg, (1 mg/ml) IM – may repeat every 5-15 min.
- Albuterol (Proventil) 2.5 mg HHN
- Hypotensive - infuse 1 liter NS IV/IO WO rate.
  - If hypotension persist, refer SB205
- Benadryl 25-50 mg IV/IM/PO
- β-blocker persistent symptoms 1 mg glucagon IM/IV

ALTERED LEVEL OF CONSCIOUS SB201
- Perform 12-Lead as soon as possible
- Consider differential diagnosis
- Hypoglycemia (M406 or P608)
  - BGL < 60
- Suspected Opioid Overdose (M411)
  - Naloxone 0.4 to 4 mg IV/IO/IM/IN

ASTHMA/COPD M403
- Albuterol (Proventil) 2.5 mg Nebulized **OR COMBINE WITH** Ipratropium bromide, may substitute DuoNeb. Repeat x2.
- If multiple treatments anticipated, administer 60 mg Prednisone PO or Solumedrol 125mg IV or PO
- **Impending Respiratory Failure**, Consider Positive Airway Pressure Protocol (see T709)
- **ASTHMA ONLY**
  - Epinephrine 0.3mg (1 mg/ml) IM followed by Mag Sulfate 2 g IV/IO in 100 ml of saline

CARDIOGENIC SHOCK M401
- 500 ml bolus of 0.9 NS fluid challenge if lungs are clear, otherwise TKO
- Consider push dose Epi

CONGESTIVE HEART FAILURE M404
- Consider Positive Airway Pressure Prot., refer T709
- ***Determine erectile dysfunction drug or pulmonary hypertension drug use***
- Nitroglycerin 0.4 mg sL q 5 min x3 for mild symptoms **OR** 0.8 mg sL q 5 min X 3 for moderate to severe symptoms **OR**
- Topical Nitroglycerin (Nitro-Paste)
  - 1" for SBP 100-150
  - 1.5" for SBP 150-200
  - 2" for SBP > 200

FEVER M421
- 6 months or older
- Temp of > 100.4
- See chart in M421 for acetaminophen dosing

HYPERGLYCEMIA M406
- BGL > 400 or HIGH on meter
- Fluid bolus of 500-1000 ml IV/IO
- Cardiac monitor

HYPERKALEMIA M418
- 12-lead EKG
- Calcium gluconate 1 g IV/IO
- Sodium bicarbonate 1mEq/kg IV/IO
- Albuterol/DuoNeb nebulized continuously (may stop with EKG improvement)

HYPOGLYCEMIA M406
- BGL < 60
  - 6.25-25g of D-10 IV
  - 6.25-25g of D-50 IV
  - if no, IV then Glucagon 1 mg IM
- **BGL must be ≥ 100mg/dL for Treat/Release**

HYPOTHERMIA M412
- Remove wet clothing
- 1 liter of NS IV/IO
  - Pedi 20 ml/kg
- Warm blankets

IMMINENT DELIVERY O800
- > 23 weeks = viable baby
- O2 & IV (if time permits)
- Assist with delivery if head is presenting
- Elevate hips and transport if delivering is mal-presentation
  - Breech - support and deliver baby if delivery is imminent
  - Prolapsed cord – relieve pressure on cord, elevate hips, keep cord moist
- Notify receiving hospital
- Hemorrhage administer TXA, refer to S506

PREGNANCY COMPLICATIONS O801
- Actively Seizing
  - Versed per M410
  - 4-6g Magnesium Sulfate IV over 15-20 min
  - 10g Magnesium Sulfate IM "Z track" divided in 5g injections, administer one in each buttock

NAUSEA & VOMITING M405
- Zofran 4 mg IM/PO single dose **OR**
- Zofran 4 mg slow IV/IO, may be repeated

HYPERTHERMIA M413
- Remove clothing and from external heat source
- Ice packs to axilla, groin & neck
- IV for dehydration

STROKE M414
- Assess using Cincy Stroke Scale
- BGL <60, refer to M406
- Perform C-STAT if Cincy Stroke Scale is +
- Rapid transport & **"STROKE ALERT"** notification to appropriate facility for positive C-Stat

RESTRAINT M408
- Age >16
- Use least restrictive means
  - Verbal → Physical → Chemical
- Do NOT transport face down.
- Versed 5-10 mg IM/IN (Chemical)

SEIZURE M410
- If actively seizing, give Versed 10 mg IM.
- Alternately Versed 2-4 mg/min IV/IM/IO, until seizure resolves or a total of 10 mg is given
- Check Glucose per M406.
- Overdose – refer to M411.

SEPSIS M419
- All Ages
- Suspected Infection
- Notification of **"SEPSIS ALERT"**
- Consider IV/IO fluid bolus

ASYSTOLE or PEA C301
- Search and treat possible causes
- Epinephrine 1mg (0.1mg/mL) IV/IO q 3-5 min
- Consider
  - Sodium bicarbonate 1 mEq/kg IV/IO (metabolic acidosis or tricyclic OD)
  - Calcium gluconate 1 gram IV/IO (renal failure/ESRD)
  - 1 lite normal saline bolus (hypovolemic)
- Consider termination after 30 min.

BRADYCARDIA C302
- Atropine 1 mg IV/IO q 3-5 min (3 mg max)
- Consider pacing - Consider sedation - Versed 2-5 mg/min IV/IM until patient's speech slurs or a total of 8 mg.
- Consider push dose Epi for Hypotension

NARROW COMPLEX TACH (STABLE) C305
- Valsalva.
- 12 lead EKG
- Adenosine 6 mg RAPID IVP
- Adenosine 12 mg RAPID IVP
- Adenosine 12 mg RAPID IVP

NARROW COMPLEX TACH (UNSTABLE) C306
- Consider sedation - Versed 2-5 mg IV/IO/IM/IN.
- Synchronized cardioversion at 50-100 joules.
- If no change, repeat synchronized cardioversion at 100/200/300/360 joules

V-FIB/ PULSELESS V-TACH C300
- Defibrillate at 360J or manufactures recommend.
- Epinephrine 1mg (0.1mg/mL) IV/IO every 3 to 5 minutes
- Defibrillate at 360 joules if still VF or VT.
- Amiodarone 300 mg IV/IO. May Repeat 150 mg IV/IO in 3-5 min **OR**
- Lidocaine 1.5 mg/kg IV/IO. May Repeat lidocaine in 3 to 5 min 0.5 – 0.75 mg/kg
- Recheck rhythm after each 2 min cycle of CPR and defibrillate if needed.

WIDE COMPLEX TACH W/ PULSE (STABLE) C304
- Consider Magnesium 2 g IV/IO for Torsade's
- Amiodarone 150 mg IV/IO over 10 min
- If VT persists, may repeat Amiodarone 150mg IV/IO over 10 min

WIDE COMPLEX TACH W/ PULSE (UNSTABLE) C303
- Consider Magnesium 2 g IV/IO for Torsade's
- Consider sedation- Versed 2-4 mg IV/IO/IM until patient's speech slurs or a total of 8 mg.
- Synchronized cardioversion at 100 joules.
- If no change, repeat synchronized cardioversion at 200/300/360 joules.

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REGIONAL TRAUMA GUIDELINES SB211

- Pulse >120 or < 50 or SBP <90
- RR <10 or >29
- Intubated
- Evidence of Head Injury
  - GCS < or equal to 13
  - Alteration in LOC or LOC > 5 min
  - Failure to localize pain
- Suspected Spinal Cord injury
- Penetrating Trauma to Head, chest, abd, neck, proximal to knee or elbow
- Amputation proximal to wrist or ankle
- Fractures of 2 or more proximal long bones
- Evidence of neurovascular compromise
- Tension pneumothorax that is relieved
- Head, neck or torso visible crush injury
- Abd tenderness, distention or seat belt sign
- Pelvic fracture
- Flail Chest
- Burn injury > 10% TBSA and other traumatic injuries
  - Significant mechanism of injury = high index of suspicion
  - Ground < 30 min transport time to level 1 trauma

SPINAL MOTION RESTRICTION T704

- Altered mental status GCS<15?
- Mid-line spine pain/tenderness on palpation of spinous processes?
- Focal or neurological deficit?
- Any evidence of alcohol or drug of intoxication?
- Distracting injuries?
  - Obvious fracture/dislocation
  - Suspected fracture requiring splint
  - Injury needing IV/IO pain medication
- Communication barrier?
- If **YES** to any of the above – apply c-collar

GERIATRIC TRAUMA IS 65 YEARS OR OLDER SB213

- GCS < 14
- SBP < 110 or pulse >90
- Fall with evidence of Traumatic Brain injury, even from standing
- Pedestrian struck by motor vehicle
- Suspected long bone fx from MVC
- Multiple body regions injured

HEAD OR SPINAL TRAUMA S501

- Airway
  - Administer O2 to maintain SpO2 > 95%
  - Maintain normal breathing rates (10-12)
  - Monitor ETCO2 and note value after effective ventilation has been initiated.
- ONLY with asymmetric pupils (>1mm dif) and comatose
  - Hyperventilate to 3-5 mmHg lower than above established value.
  - STOP if pupils normalize
- Signs of herniation (comatose, unilateral or bilateral blown pupil, posturing, decline in GCS >2 points)
  - Consider 500 ml of 3% saline

HEMORRHAGE CONTROL T710

- Tourniquets
  - 2-3" proximal to hemorrhage
  - Tightened until controlled
  - Record application time
  - Notify facility
- Wound Packing
  - Wound to groin, axilla, or neck
  - Place gauze as deeply as possible
  - Apply pressure dressing
  - Apply manual direct pressure for at least 3 min.
- Tranexamic Acid (TXA)
  - Refer to S506

HEMORRHAGIC SHOCK W/W/O SUSPECTED HEAD INJURY S500

- Trauma **WITH** a head injury
  - Fluid resuscitation to maintain a SBP ≥ 90 and
  - O2 sat >90%
- Trauma
  - 2 large bore IV's of NS
  - Fluid bolus of 500 mL
  - Reassess mental status
  - Repeat fluid bolus
- Consider pelvic binder with blunt trauma and pelvic pain or altered mental status and mechanism consistent with possible open book pelvic fracture

PREHOSPITAL PAIN MANAGEMENT S505

- Acetaminophen (Tylenol) 650-1000mg PO if able to sallow
- Fentanyl 25-100 mcg IV/IO/IN/IM repeat every 5 min if needed **OR**
- Morphine Sulfate 5 mg IV/IM/IO repeat every 5 min if needed **OR**
- Ketamine 0.2 mg/kg IV/IO, 0.5-1mg/kg IM (See Chart in Protocol)
  - **Use first with suspected Opioid addiction or prior high doses of opioids**
- Naloxone 0.4 to 4 mg IV/IO/IM/IN for Fentanyl or Morphine if patient experiences respiratory depression

TRANEXAMIC ACID (TXA) S506

- Evidence of significant blunt or penetrating trauma AND
- All Ages with:
  - Presence of hemodynamic instability
  - Sustained SBP <90 or <100 if age >55
  - Sustained heart rate > 110
- Time since injury is KNOWN to be <3 hours
- **Adult**
  - Mix 1 g of TXA in 100 ml of 0.9% NS or LR and infuse over approximately 10 min. IV or IO
- **Pedi**
  - < 12 years: 15mg/kg IV over 10 mins (max 1 g)
  - ≥ 12 years: 1 g IV over 10 mins
- Use dedicated IV/IO line
- Notify receiving trauma center

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ANAPHYLAXIS / ALLERGIC REACTION P609
1. Remove exposure to allergen, if possible (bee stinger, for example).
2. For respiratory symptoms **or** low blood pressure, give:
- Epinephrine (1 mg/mL) 0.01 mg/kg IM (0.01 mL/kg, max 0.3 mL)
- AND Normal Saline 20 mL/kg IV/IO pushed (max 1 L)

3. If wheezing, give Albuterol nebulizer treatment-2.5 mg in 3 mL of normal saline.
4. Diphenhydramine 1 mg/kg IV/IM (max 50 mg) may be given.

FEVER M421
1. 6 months or older
2. Temp of > 100.4
3. See chart in M421 for acetaminophen dosing

HYPOGLYCEMIA AND HYPERGLYCEMIA P608
1. If Glucose is less than 60, administer
- 5mL/kg of D10 IV/IO
- If <3 years of age **OR** <15 kg: 2 mL/kg of D25W IV push. (D25W is made by mixing D50 1:1 with normal saline.)
- If no IV, then give Glucagon.
  - < 6 years of age: 0.5 mg IM
  - ≥ 6 years of age: 1 mg IM for

2. If Glucose level is greater 400 mg/dL or glucometer reads "HIGH"
- Administer a fluid bolus of 20 mL/kg (max 1 L) IV/IO during transport if no evidence of pulmonary edema

NAUSEA & VOMITING M405
1. For children 12 months or older.
2. Give:
- Zofran 0.15 mg/kg (max 4 mg) IV/IO/IM **OR** Zofran 4 mg PO for pts above 15 kg

3. Do NOT repeat.

NEWBORN RESUSCITATION P600
1. Suction mouth, then nose.
2. Dry infant, keep warm.
3. BVM for HR < 100 at rate of 60 breaths per minute.
4. Apply pulse ox to determine oxygen requirement.
5. Chest compressions for HR < 60, 3:1 ratio with breaths. 120 compressions/minute.
6. After 30 seconds of BVM ventilation and HR <100, consider intubation.
FULL TERM: 3.0 - 3.5 ET tube
PREMATURE: 2.5 - 3.0 ET tube
7. Contact medical control.
8. After 30 seconds of chest compressions, consider Epinephrine
- IV (0.1 mg/mL): 0.04 mg (0.4 mL) (0.2 mL for preterm newborn)
- ETT (1 mg/mL): 0.08 mg (0.8 mL) (0.4 mL for preterm newborn)

Repeat epinephrine every 3 to 5 minutes until HR > 60.
9. If significant blood loss at delivery, give Normal Saline 40 mL IV/IO (20 mL for preterm newborn).

OBSTRUCTION OR FOREIGN BODY ASPIRATION P606
1. Alert & not choking
- Transport with pt. as comfortable as possible.
- If wheezing, albuterol nebulized treatment.

2. Alert & choking
- < 1 year: 5 back slaps and 5 chest thrusts. Repeat.
- 1 year to puberty, abdominal thrusts

3. Unconscious
- Begin BVM/CPR.
- With laryngoscope, look for foreign body & remove with Magill Forceps.
- If no foreign body, intubate.
- If still no chest rise, consider pushing tube in right mainstem or needle cric
- Contact medical control and transport to the **closest** appropriate facility.

PAIN MANAGEMENT P612
1. For children 5-16 years of age
2. Give:
- Acetaminophen 15 mg/kg (max 975 mg) PO
- Moderate – Severe Pain:
  a. Morphine 0.1 mg/kg IV/IO/IM/SC (max 5 mg) **OR**
  b. Fentanyl 1 mcg/kg IV/IO/IM/SC (max 50 mcg) **OR**
  c. Fentanyl 2 mcg/kg IN (max 100 mcg)

3. If patient experiences a drop in systolic blood pressure to < (2 x age in years) + 70, give:
- Normal Saline 20 mL/kg IV push (max 1 L)

4. For pain not relieved or for subsequent doses, contact medical control.

RESPIRATORY DISTRESS P607
1. Assess need for assisted ventilation.
2. Administer O2 and allow patient to sit up in a position of comfort. Determine PRAM score.
3. If wheezing, albuterol 2.5mg in 3 mL normal saline nebulized.
4. Begin transport.
5. May give 3 albuterol nebulized treatments. Contact medical control if additional treatments are needed.
6. For severe respiratory distress, contact medical control while BVM ventilating.
7. Epinephrine (1 mg/mL) 0.01 mg/kg IM (0.01 mL/kg, max 0.3 mL)
8. Administer one of the following corticosteroids:
Prednisolone 3 mg/mL oral liquid
a. Age 3-7 years: 30 mg (10 mL)
b. Age 8-16 years: 60 mg (20 mL)
Prednisone 20 mg tablets
a. Age 3-7 years: 30 mg (1.5 tabs)
b. Age 8-16 years: 60 mg (3 tabs)
Solu-Medrol (methylprednisolone) IV solution to be administered PO (125 mg/2 mL)
a. Can be given IV/IM/IO 1mg/kg (60 mg/dose)
b. Age 3-7 years: 30 mg (0.5 mL)
c. Age 8-16 years: 60 mg (1 mL)

RESTRAINT P618
1. Patient restraints are to be used only when necessary in situations where the patient is violent or potentially violent and may be a danger to themselves or others.
2. Administer Midazolam (Versed)
- IV/IO: 0.1 mg/kg (max 5 mg) **OR**
- IN/IM: 0.2 mg/kg (max 10 mg)

3. When able and safe, place patient on cardiac monitor and continuous pulse oximetry and end-tidal capnography.
4. Administer oxygen.

SEIZURES P610
1. 100% O_2 with BVM; monitor ventilation-with capnography
2. Consider nasopharyngeal airway.
3. Seizing > 5 minutes, give Midazolam.
- IV/IO: 0.1 mg/kg (max 5 mg)
- IM/IN <12 kg: 0.2 mg/kg
- IM/IN 13 – 40 kg: 5 mg
- IM/IN ≥ 40 kg: 10 mg

4. Contact medical control for seizing > 15 minutes.

SEPSIS M419
1. Suspect infection
2. At least one of the following: hypotension, sustained tachycardia for age, tachypnea, cool/pale/mottled skin, delay cap refill, altered mental status, weak peripheral pulses.
3. Place on ETCO2 and record temp.
4. **Sepsis Alert** if ETCO2<25 and two of the following: temp, hypotensive, tachycardia for age, tachypnea for age, altered mental status.

STRIDOR P605
1. Keep the patient calm.
2. Contact medical control.
3. Epinephrine (1 mg/mL) 0.5 mg (0.5 mL) mixed in 2.5 mL of normal saline, nebulized.
4. Continuing nebulized normal saline afterwards may be beneficial.

SUBMERSION INJURY P616
1. Perform warming.
2. C-spine precautions for diving accidents or unknown
3. Administer oxygen.
4. Proceed with cardiac arrest protocols.
5. Remember, submersion is a trauma and needs to be transported to a trauma center.

ASYSTOLE OR PEA P602
1. After 2 minutes of chest compressions and BVM, check cardiac rhythm and pulse, then consider intubation.
2. Epinephrine every 3-5 minutes
- IV/IO (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg) max 1 mg/dose
- ETT (1 mg/mL): 0.1 mg/kg (0.1 mL/kg); max 2.5 mg/dose

3. Contact medical control.
4. Normal saline 20 mL/kg IV/I0 pushed (max 1 L)

BRADYCARDIA P603
1. The most common cause of bradycardia in pediatrics is hypoxia.
2. General Guide for Pediatric Bradycardia:
a. 0-3 years old: HR < 100 bpm
b. 3-9 years old: HR < 60 bpm
c. 9-16 years old: HR < 50 bpm
3. Epinephrine every 3 to 5 minutes
- IV/IO (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg); max 1 mg/dose
- ETT (1 mg/mL): 0.1 mg/kg (0.1 mL/kg); max 2.5 mg/dose (maximum dose 2 mL)

4. Contact medical control.
5. After epinephrine, consider 1 dose of Atropine
- IV/IO: 0.02 mg/kg (max 0.5 mg/dose) rapid push
- ETT: 0.04 mg/kg (max 2 mg/dose)

6. If hypotensive, Normal Saline 20 mL/kg IV push.

PSVT P604
1. Obtain 12 lead EKG
Stable Patient
2. Vagal maneuvers.
3. Contact medical control.
4. Adenosine
- 1st dose: 0.1mg/kg rapid IV push (max 6 mg)
- 2nd dose: 0.2 mg/kg rapid IV push (max 12 mg)
Follow each dose with 10 mL NS flush.

Unstable Patient
2. Contact medical control.
3. Midazolam 0.1 mg/kg IV/IO (max 5 mg)
4. Synchronized cardioversion at 0.5 J/kg. May repeat with 1 J/kg, then 2 J/kg. Round the Joules up.

PULSELESS ARREST (V FIB & V TACH) P601
1. Defibrillate at 2 J/kg (max 200 J) and resume CPR.
2. Defibrillate at 4 J/kg (max 360 J) and resume CPR
3. Consider intubation.
4. Epinephrine every 3 to 5 minutes followed by 2 minutes of CPR.
- IV/IO (0.1 mg/mL): 0.01 mg/kg (0.1 mL/kg); max 1 mg/dose
- ETT (1 mg/mL): 0.1 mg/kg (0.1 mL/kg); max 2.5 mg/dose

5. If still in pulseless V Fib or V Tach, defibrillate at 4 J/kg then resume CPR.
6. Amiodarone 5 mg/kg (max 300 mg) IV/IO then resume CPR.
7. Lidocaine 1 mg/kg IV/IO then resume CPR.
8. Contact medical control and transport to **closest** appropriate facility.

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AGE		0-3 m	6 m	9-24 m	3 y	6 y	8 y	10 y	12 y	14 y
WEIGHT	lbs	6-7	11	20	30	40	50	60	80	100
	kg	3	5	10	15	20	25	30	40	50
VITAL SIGNS	Low Limit Systolic BP	60-70	70	70-75	75-80	80	80	85	85	90
	Pulse	100-180	100-180	90-160	80-140	70-130	70-130	60-120	60-120	60-120
AIRWAY		3.0-3.5	3.5	4.0-4.5	5.0	5.5	6.0	6.5	7.0	7.0
DEFIBRILLATION		6 J	10 J	20 J	30 J	40 J	50 J	60 J	80 J	100 J
DRUGS/IV FLUIDS										
Acetaminophen – PO (*PAIN Management Only*)		45 mg	75 mg	150 mg	225 mg	300 mg	375 mg	450 mg	600 mg	750 mg
Acetaminophen – PO (*FEVER Management Only*)		See protocol M421 for dosing								
Adenosine 3 mg/mL IV (0.1 mg/kg)		0.3 mg (0.1 mL)	0.5 mg (0.17 mL)	1 mg (0.33 mL)	1.5 mg (0.5 mL)	2 mg (0.67 mL)	2.5 mg (0.83 mL)	3 mg (1 mL)	4 mg (1.33 mL)	5 mg (1.67 mL)
Amiodarone 50 mg/mL IV/IO (5 mg/kg)		15 mg (0.3 mL)	25 mg (0.5 mL)	50 mg (1 mL)	75 mg (1.55 mL)	100 mg (2 mL)	125 mg (2.5 mL)	150 mg (3 mL)	200 mg (4 mL)	250 mg (5 mL)
Atropine 0.1 mg/mL IV/IO (0.02 mg/kg)		0.06 mg (0.6 mL)	0.1 mg (1 mL)	0.2 mg (2 mL)	0.3 mg (3 mL)	0.4 mg (4 mL)	0.5 mg (5 mL)	0.5 mg (5 mL)	0.5 mg (5 mL)	0.5 mg (5 mL)
Atropine 0.1 mg/mL ETT (0.04 mg/kg)		0.12 mg (1.2 mL)	0.2 mg (2 mL)	0.4 mg (4 mL)	0.6 mg (6 mL)	0.8 mL (8 mL)	1 mg (10 mL)	1.2 mg (12 mL)	1.6 mg (16 mL)	2 mg (20 mL)
Bicarbonate (Sodium) 8.4% (1 mEq/mL) IV/IO (1 mEq/kg)		3 mEq (3 mL)	5 mEq (5 mL)	10 mEq (10 mL)	15 mEq (15 mL)	20 mEq (20 mL)	25 mEq (25mL)	30 mEq (30 mL)	40 mEq (40 mL)	50 mEq (50 mL)
Dextrose 10% - IV/IO (5 mL/kg) (0.5 gm/kg)		1.5 gm (15 mL)	2.5 gm (25 mL)	5 gm (50 mL)	7.5 gm (75 mL)	10 gm (100 mL)	12.5 gm (125 mL)	15 gm (150 mL)	20 gm (200 mL)	25 gm (250 mL)
Dextrose 25% IV/IO (2 mL/kg) (0.5 gm/kg) *Mix ½ amp of D50 (25 mL) with 25 mL of normal saline = D25%*		1.5 gm (6 mL)	2.5 mg (10 mL)	5 gm (20 mL)	N/A	N/A	N/A	N/A	N/A	N/A
Dextrose 50% IV/IO (1 mL/kg) (0.5 gm/kg)		N/A	N/A	N/A	7.5 gm (15 mL)	10 gm (20 mL)	12.5 gm (25 mL)	15 gm (30 mL)	20 gm (40 mL)	25 gm (50 mL)
Diphenhydramine 50 mg/mL IM/IV (1 mg/kg)		N/A	N/A	10 mg (0.2 mL)	15 mg (0.3 mL)	20 mg (0.4 mL)	25 mg (0.5 mL)	30 mg (0.6 mL)	40 mg (0.8 mL)	50 mg (1 mL)
Epinephrine 0.1 mg/mL IV/IO (0.01 mg/kg)		0.03 mg (0.3 mL)	0.05 mg (0.5 mL)	0.1 mg (1 mL)	0.15 mg (1.5 mL)	0.2 mg (2 mL)	0.25 mg (2.5 mL)	0.3 mg (3 mL)	0.4 mg (4 mL)	0.5 mg (5 mL)
Epinephrine 1 mg/mL ETT (0.1 mg/kg)		0.3 mg (0.3 mL)	0.5 mg (0.5 mL)	1 mg (1 mL)	1.5 mg (1.5 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)
Epinephrine 1 mg/mL IM (0.01 mg/kg)		N/A	0.05 mg (0.05 mL)	0.1 mg (0.1 mL)	0.15 mg (0.15 mL)	0.2 mg (0.2 mL)	0.25 mg (0.25 mL)	0.3 mg (0.3 mL)	0.3 mg (0.3 mL)	0.3 mg (0.3 mL)
Epinephrine 10 mcg/mL IV – **Push Dose** (1 mcg/kg)		3 mcg (0.3 mL)	5 mcg (0.5 mL)	10 mcg (1 mL)	15 mcg (1.5 mL)	20 mcg (2 mL)	20 mcg (2 mL)	20 mcg (2 mL)	20 mcg (2 mL)	20 mcg (2 mL)
Fentanyl 50 mcg/mL IV/IO/IM/SC (1 mcg/kg)		N/A	5 mcg (0.1 mL)	10 mcg (0.2 mL)	15 mcg (0.3 mL)	20 mcg (0.4 mL)	25 mcg (0.5 mL)	30 mcg (0.6 mL)	40 mcg (0.8 mL)	50 mcg (1 mL)
Fentanyl 50 mcg/mL IN (2 mcg/kg)		N/A	10 mcg (0.2 mL)	20 mcg (0.4 mL)	30 mcg (0.6 mL)	40 mcg (0.8 mL)	50 mcg (1 mL)	60 mcg (1.2 mL)	80 mcg (1.6 mL)	100mcg (2 mL)
Glucagon 1 unit/mL IM		0.5 mg (0.5 mL)	0.5 mg (0.5 mL)	0.5 mg (0.5 mL)	0.5 mg (0.5 mL)	1 mg (1 mL)	1 mg (1 mL)	1 mg (1 mL)	1 mg (1 mL)	1 mg (1 mL)
Hypertonic 3% saline ONCE; max 500mL (For Increased Intracranial Pressure)		12 mL	20 mL	40 mL	60 mL	80 mL	100 mL	120 mL	160 mL	200 mL
Lidocaine 2% (20 mg/mL) IV/IO (ARREST DOSE) (1 mg/kg)		3 mg (0.15 mL)	5 mg (0.25 mL)	10 mg (0.5 mL)	15 mg (0.75 mL)	20 mg (1 mL)	25 mg (1.25 mL)	30 mg (1.5 mL)	40 mg (2 mL)	50 mg (2.5 mL)
Lidocaine 2% (20 mg/mL) (for numbing before IO infusions)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 mL	1 mL

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AGE		0-3 m	6 m	9-24 m	3 y	6 y	8 y	10 y	12 y	14 y
WEIGHT	lbs	6-7	11	20	30	40	50	60	80	100
	kg	3	5	10	15	20	25	30	40	50
VITAL SIGNS	Low Limit Systolic BP	60-70	70	70-75	75-80	80	80	85	85	90
	Pulse	100-180	100-180	90-160	80-140	70-130	70-130	60-120	60-120	60-120
AIRWAY		3.0-3.5	3.5	4.0-4.5	5.0	5.5	6.0	6.5	7.0	7.0
DEFIBRILLATION		6 J	10 J	20 J	30 J	40 J	50 J	60 J	80 J	100 J
DRUGS/IV FLUIDS										
Methylprednisolone 62.5 mg/mL – IV/IO/IM/PO		N/A	N/A	N/A	30 mg (0.5 mL)	30 mg (0.5 mL)	60 mg (1 mL)	60 mg (1 mL)	60 mg (1 mL)	60 mg (1 mL)
Midazolam 5 mg/mL (Seizures – IM/IN/Buccal)		0.6 mg (0.12 mL)	1 mg (0.2 mL)	2 mg (0.4 mL)	5 mg (1 mL)	5 mg (1 mL)	5 mg (1 mL)	5 mg (1 mL)	10 mg (2 mL)	10 mg (2 mL)
Midazolam 5 mg/mL (Seizures – IV) (0.1 mg/kg)		0.3 mg (0.06 mL)	0.5 mg (0.1 mL)	1 mg (0.2 mL)	1.5 mg (0.3 mL)	2 mg (0.4 mL)	2.5 mg (0.5 mL)	3 mg (0.6 mL)	4 mg (0.8 mL)	5 mg (1 mL)
Midazolam 5 mg/mL (Sedation – IV/IO) (0.1 mg/kg)		0.3 mg (0.06 mL)	0.5 mg (0.1 mL)	1 mg (0.2 mL)	1.5 mg (0.3 mL)	2 mg (0.4 mL)	2.5 mg (0.5 mL)	3 mg (0.6 mL)	4 mg (0.8 mL)	5 mg (1 mL)
Midazolam 5 mg/mL (Sedation – IM/IN) (0.2 mg/kg)		0.6 mg (0.12 mL)	1 mg (0.2 mL)	2 mg (0.4 mL)	3 mg (0.6 mL)	4 mg (0.8 mL)	5 mg (1 mL)	6 mg (1.2 mL)	8 mg (1.6 mL)	10 mg (2 mL)
Morphine sulfate 10 mg/mL IV/IM (0.1 mg/kg)		N/A	N/A	N/A	1.5 mg (0.15 mL)	2 mg (0.2 mL)	2.5 mg (0.25 mL)	3 mg (0.3 mL)	4 mg (0.4 mL)	5 mg (0.5 mL)
Naloxone 1 mg/mL All Routes (0.1 mg/kg)		0.3 mg (0.3 mL)	0.5 mg (0.5 mL)	1 mg (1 mL)	1.5 mg (1.5 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)	2 mg (2 mL)
Normal Saline Bolus (20 mL/kg)		60 mL	100 mL	200 mL	300 mL	400 mL	500 mL	600 mL	800 mL	1000mL
Ondansetron 2 mg/mL IV		N/A	N/A	1.5 mg (0.75 mL)	2 mg (1 mL)	3 mg (1.5 mL)	4 mg (2 mL)	4 mg (2 mL)	4 mg (2 mL)	4 mg (2 mL)
Ondansetron 4 mg tablet		N/A	N/A	N/A	4 mg	4 mg	4 mg	4 mg	4 mg	4 mg
Prednisolone 3 mg/mL liquid		N/A	N/A	N/A	30 mg (10 mL)	30 mg (10 mL)	60 mg (20 mL)	60 mg (20 mL)	60 mg (20 mL)	60 mg (20 mL)
Prednisone 20 mg tablets		N/A	N/A	N/A	30 mg (1.5 tabs)	30 mg (1.5 tabs)	60 mg (3 tabs)	60 mg (3 tabs)	60 mg (3 tabs)	60 mg (3 tabs)
Tranexamic Acid 10 mg/mL *Mix 1-gram Tranexamic Acid in 100 mL of normal saline = 10 mg/mL*		45 mg (4.5 mL)	75 mg (7.5 mL)	150 mg (15 mL)	225 mg (22.5 mL)	300 mg (30 mL)	375 mg (37.5 mL)	450 mg (45 mL)	1000 mg (100 mL)	1000 mg (100 mL)

Updated September 2020. Use of a commercial product is also acceptable for dosages.

N/A = Do not use in this age category; call Medical Control

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