Andrew County Ambulance District

Treatment Guidelines

Version 6
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Revisions

The following revisions have been made since original publication:

Guideline #	Guideline	Type	Method of Approval
100-30	Non-Discrimination for Treatment/Transport	**ADD**	**2023 Update**
100-32	ALS Intercept for BLS Crews	**ADD**	**2023 Update**
100-34	QA Program	**ADD**	**2023 Update**
300-16	Tranexamic Acid (TXA) Administration	**ADD**	**Email**

How to Use These Guidelines

Each patient type you encounter will begin with the following Guideline:

- 100-02 Universal Patient Care

During or after completion of the General Assessment you will direct the remaining care to either a specific additional protocol or the On-Going Treatment & Transport Guideline.

On each Protocol there are Basic Life Support and Advanced Life Support Guidelines.

Basic Life Support may be used by Andrew County Ambulance District Emergency Medical Technicians, Paramedics, and Registered Nurses.

Advanced Life Support may be used after the Basic Life Support measures have been considered, by Andrew County Ambulance District Paramedics and Registered Nurses.

Indicated there is an ADULT DOSE listed within that Guideline.

Indicates there is a PEDIATRIC DOSE listed within that Guideline.

Adult Dose Used to show that line is the ADULT dose.

Ped Dose Used throughout to indicate a PEDIATRIC dose on that line

100 - ADMINISTRATIVE GUIDELINES

100-01 Treatment Guidelines / Standing Orders

Unless otherwise indicated, all guidelines are standing orders.

- Remember that good clinical assessment and judgment are always expected from the EMS crew.
- The guidelines are written with the "Classic" patient in mind. When presentation, assessment, judgement, and experience indicate other than the "Classic" condition or present multiple presentations, always use judgment when applying all guidelines and standing orders.
- The ultimate guideline is ***do no harm***.

Using the Standing Orders

- Guidelines are designed to be followed from top to bottom, but this could be modified based on situation and patient condition.
- It is acceptable at times not to provide a treatment listed due to circumstances
- It is acceptable at times to modify the order of treatments listed due to circumstances
- It is acceptable any time to contact Online Medical Control for different or additional orders.
- It is ***not acceptable*** to add to the guidelines without Online Medical Control orders.

Clear documentation of why any guideline was not followed as written will be noted in the narrative of the patient care report.

When orders are received from online Medical Control, clear documentation in the narrative of the patient care report will include the doctor ordering and what the order was.

All reports are subject to review by the Medical Director and Management of the Ambulance District. It is to the benefit of the attending staff member to make documentation as clear as possible to avoid any misunderstandings.

100-02 Universal Patient Care

Note: All patients begin with this guideline and move to additional appropriate guidelines based on findings during this guideline.

Scene Assessment

- Ensure scene safety for yourself, your partner, your patient, and bystanders.
- Universal precautions for you and your partner(s).
- Assess the need for additional help. (First Responders, Fire Department, law Enforcement, Additional Crews, etc.)
- Assess the number of patients and begin triage if MCI.

Primary Assessment

Consider Associated Trauma:

- Cervical spine precautions, if trauma is suspected, including manual in line immobilization and placement of an appropriately sized cervical collar.

Assess Level of Consciousness:

- Assess AVPU (Alert – Verbal Responsive – Painful Response – Unresponsive)
- Assess GCS
  - Eye Opening (4-Spontaneously 3-To Voice 2-To Pain 1-None)
  - Verbal (5-Oriented 4-Confused 3-Inappropriate Words 2-Incomprehensible 1-None)
  - Motor (6-Obeys 5-Localizes pain 4-Withdraws 3-Flexion 2-Extension 1-None)

Assess Airway

- Ensure a patent airway, if not consider:
  - [EMR/BLS/ALS] Head tilt or Jaw Thrust
  - [EMR/BLS/ALS] Oropharyngeal airway placement
  - [BLS/ALS] Nasopharyngeal airway placement
  - [BLS/ALS] King airway placement or I-Gel airway
  - [ALS] Endotracheal tube placement
  - [ALS] Cricothyrotomy

Assess Breathing

- Ensure adequate rate, depth, and effectiveness of breathing, if not consider:
  - [EMR/BLS/ALS] Assist ventilation with bag valve mask
- Ensure adequate oxygenation, if not consider:
  - [EMR/BLS/ALS] Oxygen Nasal Cannula 2 lpm to 6 lpm
  - [EMR/BLS/ALS] Oxygen via Non Rebreather Mask 10 lpm to 15 lpm
  - [ALS] CPAP
- Assess breath sounds

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Assess Circulation

- Ensure palpable pulse, if not perform immediately:
  - [EMR/BLS/ALS] Manual chest compressions based on current AHA guidelines
  - [EMR/BLS/ALS] Mechanical chest compressions based on current AHA guidelines
- Assess for arterial bleeding or uncontrolled bleeding

Transport Decision:

- If any abnormalities are found in the Primary Assessment, consider rapid transport to closest appropriate Emergency Department

Secondary Assessments:

- Initial Vital Signs with SAO2 monitoring
- Head to toe physical assessment and expanded focused assessment based on complaint or history.
- History of present illness
- SAMPLE history and OPQRST
- [ALS] Consider 4 lead EKG, 12 Lead, Right sided 12 lead or 15 Lead EKG if indicated
- [ALS] Consider ETCO2 monitoring if indicated
- [BLS/ALS] Consider Blood Sugar check if any decreased level of consciousness

Intravenous Access: (Performed by ALS)

- If one of the following conditions are met IV access may be performed:
  - Need for replacement of fluid
  - Need access for medications or anticipated need for medication
  - Traumatic Injuries
  - Discretion of the Paramedic/RN

***** Follow Appropriate Protocol based on findings during Primary & Secondary Assessment**

Ongoing Assessments and Transport:

- Unless contraindicated place patient into position of comfort
- Secure for transport
  - Secured with straps to stretcher (Preferred Method)
  - Secured with seatbelt in jump seat, CPR Seat, or Bench seat
- Monitor patient's condition as needed during transport and follow appropriate protocols as needed
- Reassess Vital Signs
  - Unstable patient requires every 5 to 10 minutes
  - Stable require every 15 to 20 minutes with a minimum of 2 total sets
- Contact receiving Emergency Department and give patient report

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100-03 Refusal Definitions

Right to Refuse: An adult patient who is conscious, mentally competent, and understands the consequences of his or her decision has the right to refuse are or transportation by EMS. A patient that refuses treatment or transport must be offered treatment or transport and advised of the benefits of treatment or transport and the specific risks of refusing treatment or transport. The offer of treatment or transport and description of the risks of refusal should be documented in the epcr and on the Refusal Form.

No Right to Refuse: Conversely, where a patient is a minor or otherwise not competent, or unable to understand the consequences of his or her decision, the patient may not refuse treatment or transport for himself, and EMS may have implied consent to treat or transport. In this situation, EMS must contact Medical Control for directions regarding treatment and transport (Mandatory Medical Control Contact).

Mandatory Medical Control Contact: Medical Control contact is mandatory if the crew believes that the patient may be at significant harm to him or herself by refusing treatment or transport. The purpose of mandatory Medical Control Contact is to:

1. Assist the paramedic in persuading a reluctant patient to be transported. Occasionally, a recommendation from a physician may be all that is needed to facilitate transport.
2. Serve to support the paramedic's judgment that the patient is acting against medical advice.

Capacity: Being of sound mind who is able to receive and evaluate information and to communicate a decision. If a patient is able to answer the following questions, the person would have the capacity to refuse care:

1. Recite three objects to the patient (apple, table, and penny). Ask patient to wait until you say all three words then have them repeat the three words. Tell the patient you will ask them to repeat the words later.
2. What year is this?
3. What month is this?
4. What is the day of the week?
5. How many Quarters in $1.50? (6)
6. What were the three objects I asked you to remember? 1. Apple 2. Table 3. Penny

Minor: A person who is less than 18 years of age

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Emancipated Minor: a minor who is:

- Married;
- A parent or legal custodian of a child;
- Enlisted or commissioned in the U.S. Armed Forces;
- Self-supporting and the custodial parent has relinquished the child from parental control by express or implied consent; or
- Declared an adult by a court of competent jurisdiction

EMS shall use reasonable care and judgment in ascertaining the age of the patient and determining if a minor is emancipated. EMS may treat or transport a minor patient who claims to be emancipated and is refusing treatment or transport if emancipation status cannot be reasonable determined and an emergency exists.

Suicidal Patient: There is reason to believe that the patient is at risk of self-inflicted physical harm as evidenced by, but not limited to, threats or attempts to commit suicide or to inflict physical harm on himself or herself.

Durable Power of Attorney for Health Care: a legal instrument that, if properly drafted and executed, has the effect of delegating legal authority to another in the case of incapacity. If a person at the scene presents a Durable Power of Attorney for Health Care, Medical Control shall be contacted for further advice and direction regarding the validity and effect of the instrument.

Implied Consent: consent to medical treatment is implied where an emergency exists if there has been no protest or refusal of consent by a person authorized and empowered to consent or, if so, there has been a substantial change in the condition of the person affected that is material and morbid and there is no one immediately available wo is authorized, empowered, willing, and capacitated to consent.

Incompetent Adult: (Intellectually Disabled, Mentally Ill, Dementia, Etc.): An adult patient who is chronically mentally unable to care for themselves.

Emergency: For purposes of implied consent, “emergency” is defined as a situation where, in competent medical judgment, the proposed medical treatment is immediately or imminently necessary and any delay occasioned by an attempt to obtain consent would reasonably jeopardize the life, health, or limb of the person affected or would reasonable result in disfigurement or impairment of faculties.

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100-04 Adult Patient Refusal of Medical Care

A patient shall be considered any person who is requesting and/or in need of medical attention or medical assistance of any kind. **All patients encountered will be offered transport to the nearest appropriate facility, regardless of nature of the complaint**. If a patient refuses medical care the following guidelines will be followed.

Emergency personnel will ensure that all refusals are "Informed refusals".

For the patient to refuse for themselves they must be:

- ≥18 years of age or an emancipated minor
- Have the capacity to refuse
- Not impaired by alcohol or other substances
- Not impaired by medical disorders or conditions
- Free from suicidal thoughts
- Can understand the risks/benefits from refusing care versus transport

In the case where the ambulance crew feels the patient is does not meet the criteria to refuse, and the patient is still refusing, contact medical control and police for assistance with taking the patient to the hospital under implied consent.

Refusal after ALS Intervention

Once an ALS intervention (IV, Medication, etc) has been provided for the patient and the patient refuses further care and transport, medical control should be contacted.

Once the patient has signed the refusal form and it is witness, all ALS and BLS interventions can be discontinued at that time.

In the event a patient refuses care after an IV has been established, paramedic may discontinue the IV and dress and bandage the IV site.

Refusal of treatment or exam only

A PCR shall be completed for all patients signing a refusal. Refusal forms should also be completed for transported patients refusing portions of indicated medical care (i.e. – cervical spine immobilization, IV, etc).

100-05 Minor / Mentally Incompetent Patient Refusal

For Minors or Incompetent Patients in an Emergency situation with no Parent or Guardian present, transport immediately under Implied consent.

For Minors or Incompetent Patients who are refusing in non-emergency situations:

- Parent or Guardian may refuse
- In some cases a person with a Durable Power of Attorney for Healthcare may refuse for patient, but Medical Control should be consulted for validity.
- If parent or guardian is not on scene try to contact the parent or guardian and have them come to the scene.
- If unable to come to the scene, explain over the phone the situation, if a parent or guardian refuses care for the patient, have a witness talk to the parent or guardian on the phone, preferably a police officer.
- If unable to contact the parent or guardian, contact another adult family member and medical control about the patient.

When a minor patient's parent, guardian, or other adult with approval from medical control, has been released the crew must ensure that patient leaves in the care of one of the following:

- Parent or guardian
- Adult family member, adult chaperone, or adult child care provider.
- Other person with approval of parent or guardian on the phone
- Police officer.

When the parent or guardian of a minor is present and competent, they will make the informed decisions for the minor patient. If the patient is in a potential life-threatening situation, and the parent or guardian is refusing transport, contact medical control and police for assistance.

If no one will accept responsibility for the patient, they should be transported.

100-06 Multiple Patient Incident Refusal

A minimum of three (3) patients per incident is necessary to utilize this guideline. Persons meeting the following criteria may be listed on a Multiple Patient Incident Form. In order to be listed on a Multiple Patient Incident Refusal Form the patient must meet all the following:

1) Have no complaints or symptoms present;
2) Have no acute findings upon exam;
3) Blood pressure, pulse, capillary refill and respirations are within normal range;
4) The patient must express a desire not to be transported;
5) Be able to communicate freely with EMS staff;
6) Not be currently under the influence of drugs or ETOH by history or exam;
7) The mechanism of injury must not include any criteria that would require treatment at a trauma center which include but are not limited to:
    a. Rollover
    b. Ejection
    c. Death of a person in the same vehicle
    d. Any other trauma center routing criteria
8) Minor patients must have an adult person acting “in loco parentis” for that patient.
    a. Note: “In loco parentis” can include school teachers, principals, members of the school bus company, family members, etc.

100-07 Ambulance Response

If a BLS crew is staffed they may respond to the following calls:

- Non-Injury fall
- Lift Assists
- Fire Standbys
- Community Engagement Events.

If an ALS crew is available, the ALS crew will respond to all calls not listed above. Once on-scene the ALS crew will perform ALS Assessment if deemed able to be downgraded to BLS and a BLS crew is available, they will respond to transport.

In the case of ALS crew downgrading to BLS, there will be 2 reports written. BLS must document in their report the ALS Assessment by the ALS crew and reference that trip number in the report.

100-09 Physician at the Scene

If needed, the following statement shall be shown to the Physician at the scene:

Thank you for your offer of assistance. Be advised these EMTs and Paramedics are operating under the authority of the Missouri State Statue Chapter 190. No Physician or other person may intercede in patient care without the Medical Control physician on duty relinquishing responsibility of the scene via radio or telephone. If such privileges are granted, you are mandated by the State of Missouri Statue to remain with the patient including transport to the Emergency Department. Transferring care back to the EMS crew once you have begun assessment / treatment is grounds for abandonment.

If responsibility is given to the Physician at a scene, the physician is responsible for any and all care given at the scene of the incident and en route to the hospital and must sign the patient's medical records. If the physician at the scene is the patient's primary physician, the Medical Control physician will be consulted first before granting or refusing responsibility to that physician.

100-10 Do Not Attempt Resuscitation Requests

Remember that DNR is essentially a refusal of Care expressed by the patient or their representative. It is the responsibility of the ambulance staff to ensure that DNR request is valid and if found to be valid, respect the wishes of the patient.

If a valid DNR order exists, no life support measures are to be performed under any circumstances in the event of a loss of pulse and/or respiration.

Do Not Resuscitate shall be honored in the following circumstances:

1. Official Missouri DNR order signed by physician and patient or patient representative.
2. Other written form of Do Not Attempt Resuscitation signed by a physician and the patient or patient representative.
3. The physical presence of the patient's physician at the scene or voice communication via telephone.

The emergency provider will NOT provide:

a. Perform chest compressions

b. Insert advanced airways (ETT, King Airway)

c. Administer ACLS drugs

d. Provide ventilator assistance

Emergency providers have limited legal training in the respect to end of life issues. If the following situations present themselves, begin resuscitation and contact medical control for further guidance:

- Unreadable, unclear, or defaced paperwork
- Living wills, Durable Power of Attorneys, and other end of life paperwork.
- Family present and indicating that DNR was not the wishes of the patient.

When in doubt, error on the side of beginning resuscitation and contact medical control immediately.

100-11 Patient Transportation

Due to the limited number of staffed ambulances and the geographic location, patients that we respond to on an emergency call within our Ambulance District boundaries will have the option of being transported to:

- Mosaic Life Care St. Joseph, MO
- Mosaic Life Care Maryville, MO

Transport to other destinations may be possible in extreme circumstances. In those circumstances the needs of the patient's condition, the resources available at above listed hospital, the need for resources not available at the above listed hospitals, current crew staff and availability, and time leaving the coverage area without an ambulance, all must be factored into the decision. Generally, this decision should only be made in consultation with medical control and the Administrator.

Based on the medical condition presented at the time of service, Andrew County Ambulance District may recommend that patient be transferred to a facility that is appropriate for their condition. If the patient insists on being transported to one of the above hospitals that is not recommended, the patient will need to sign a refusal of that recommendation. Patient can still be transported to one of the above hospitals.

When transporting to a facility and ambulance staff have a question or a request for treatment that falls outside of these guidelines, the receiving hospital emergency physician will be considered Online Medical Control. Even when orders are not being requested, ensure receiving facility is aware that you are transporting to their facility and afford them as much time as possible to accommodate that transport. Contact may be made:

- Direct Radio Contact
- Direct Cell Phone Contact
- Relayed contact through Dispatch

When transferring care to another transporting agency or receiving facility:

- Ensure care is transferred to an equal level staff or appropriate level staff.
- Give a verbal report about the patient.
- Give a written hand off report if available.
- Have the staff member sign for transfer of care.

100-12 Controlled Substances

Controlled substances, and other medications deemed by the District are to be secured in an appropriate manner to be determined by the ambulance district.

Controlled substances are as follows:

- Morphine
- Fentanyl
- Versed
- Valium
- Ketamine

Main Storage:

- Controlled Substances are to be in a locked cabinet that is stored in a locked room.

Ambulance Storage

- Controlled substances will be locked in a locked cabinet on the ambulance. Each container will also have a tracked number tag.

Controlled Substance Logs

- Each day that an ambulance is in use the controlled substances will be counted and documented by both members of the ambulance crew at the same time.
- Any additional ambulances not in service at the time will also be counted by two members of the staff and documented daily.

Replacement Controlled Substances

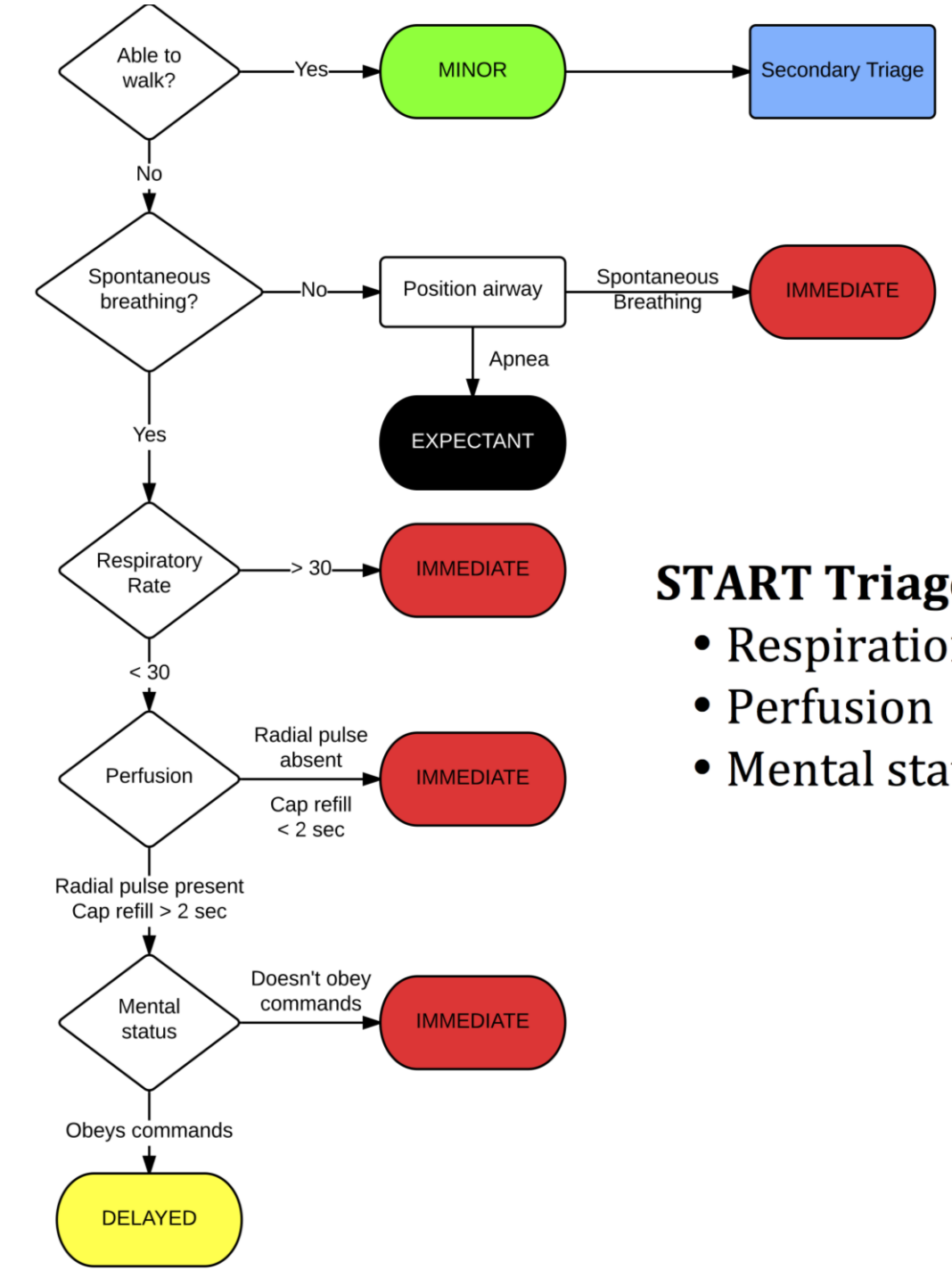
- Replacement from main storage will be done between the paramedic of the ambulance and the ambulance Director.
- Times when the Director is not available staff may transfer stock between ambulances.
- All transfers should be documented on the source and destination forms.

Procedures

- Waste will be documented by a licensed person that is not a member of the crew
- All transactions of controlled substances will take place with two staff members present.
    - Exception: Administration to patients can be done individually if needed

100-14 Multiple Casualty Incident

Andrew County Ambulance District when encountering an MCI will have the most senior paramedic that responds to the scene begin immediate START triage. The most senior EMT will assume temporary Incident Management until relieved.



START Triage

- Respirations
- Perfusion
- Mental status

100-16 Air Ambulance

Air ambulance should be considered in the following situations.

- STEMI Patient that meets the guidelines for Air Transport based on the STEMI Transport Protocol.
- STROKE Patient that meets the guidelines for Air Transport based on the STROKE Transport Protocol.
- TRAUMA Patient that meets the guidelines for Air Transport based on the TRAUMA Transport Protocol
- MVA with Extrication > 20 min and ground drive time > 15 min. with injuries that warrant treatment at a trauma center.
- Need for transport for specialized service that is not available at Mosaic or St. Francis and time is a critical factor.
- Severely injured or ill patients located in any remote area where ground ambulance response and/or transport could be delayed or extended.
- Mass Casualty Incidents and/or whenever ground resources are exhausted or exceeded.
- Any other time a crew feels that the patient's illness or injury warrants air ambulance transport, and there is a clear time advantage to air transport, the Paramedic is responsible for evaluating the patient and contacting Medical Control for consult prior to requesting a helicopter response.

Remember when considering air ambulance, that there are many factors to weigh. Preparation time for air ambulance to respond, travel time for the air ambulance to travel to get to you, where the scene is in respect to where patient needs to go and how long it will take to get there, scene time waiting for air ambulance, stability of the patient, weather, and any other factors must be weighed in the decision to utilize air ambulance.

If crew decides that an air ambulance is appropriate for the situation:

- Request dispatch to respond the closest air ambulance that is available.
- Request the Fire Department for support with landing zone operations.
- Once one is assigned, check the estimated time for arrival.
- Prepare patient for air ambulance transport
- Upon arrival of air ambulance staff, give a patient handoff report, and assist them in getting patient to aircraft.
- If able have lead care giver sign a receiving person, but do not delay care for this. If you can't get a signature, get a full name of the provider, the air ambulance service name, and the DSN of the aircraft.

100-20 Emergency Ambulance Driver

Purpose:

To provide an extra person to drive the ambulance in an emergency situation where both licensed personnel are required to be in the back of the ambulance providing patient care.

In the situation listed above the following persons may drive the ambulance to the emergency department or landing zone:

- Police Officer with Emergency Driving Experience
- Fire Department Firefighter with Emergency Driving Experience
- Andrew County Ambulance District First Responder with Emergency Driving Experience
- NOTE: All must possess a valid Missouri Driver's License

100-22 ACAD Emergency Medical Responder

Requirements for Patient Care:

- Must hold a current issued Andrew County Ambulance District First Responder Card or EMR Card
- Must adhere to the guidelines set forth in the Andrew County Ambulance District EMR Guidelines
- Must adhere to the guidelines set forth in the Andrew County Ambulance District EMS Treatment Guidelines.

Requirements to Operate an Ambulance in an Emergency Situation:

- Meet Requirements above for Patient Care.
- Valid Missouri Driver's License
- Proof of experience in driving emergency vehicles

EMR's who meet the Requirements for Patient care may perform patient assessment to their level of training and utilize the following EMS Treatment Guidelines:

- 100-02 – General Patient (Treatments indicated with an [EMR])
- 200-02 – Adult Cardiac Arrest
- 200-04 – Pediatric Cardiac Arrest
- 200-26 – Environmental Emergency (Basic Life Support) Only
- 300-02 – Burns (Basic Life Support) Only
- 300-06 – Extremity Injuries (Basic Life Support) Only
- 300-08 – General Trauma (Basic Life Support) Only
- 800 – Any Procedure marked as Emergency Medical Responder or EMR under authorization

Any care rendered at the EMR Level will be documented and sent to the Ambulance District on a EMR Care form

100-30 Non-Discrimination for Treatment/Transport

Andrew County Ambulance District will treat all patients and visitors receiving services in a safe, welcoming setting that fosters comfort and dignity and is free from all forms of discrimination. Andrew County Ambulance District will not exclude, deny benefits to, refuse to assess, refuse to treat, refuse to transport, or otherwise discriminate against any person on the grounds of race, color, religion, veteran status, national origin (including ancestry, citizenship or any other subcategory of national origin recognized by applicable law), age, disability (physical, mental or other medical condition), sex (including marital status, family status, pregnancy, sexual orientation, gender identity, gender expression, or any other subcategory of sex recognized by applicable law) or any other basis prohibited by federal, state or local law.

100-32 ALS Intercept for BLS Crews

If a BLS Crew determines the need to ALS Assessment or Treatment of the patient they are providing care for, they should contact Andrew County Dispatch and either have an ALS Unit dispatched from Andrew County Ambulance District or if none are available, contact closest Mutual Aid Service.

When requesting ALS Intercept, consider loading patient and moving towards the direction of the emergency room if that is the same direction that ALS Intercept is coming from. Consider contacting a service that is in the same local as the emergency room, or on the way.

Generally, if Andrew County Ambulance District does not have a unit available, then contacting Buchanan County EMS when transporting to Mosaic in St. Joseph and Nodaway County Ambulance District when transporting to Mosaic in Maryville.

100-34 QA Program

The Andrew County Ambulance District QA/QI program will consist of 3 reviews:

Billing/Documentation Review: This is done by the Office Manager or designee and will review 100% of the written reports for completion and accuracy for billing purposes. If something needs changing or correction, report will be sent to Administrator to assign to the employee for correction.

Clinical Review: QA members are assigned by the Administrator. These members review 100% of all written reports. This review is looking for accuracy and adherence to EMS Treatment guidelines and standard of care. Reports that meet the following criteria are sent to the Administrator for further review:

- Patients under 13 years of age
- Respiratory and Cardiac Arrest
- Controlled Substance Administration
- Incomplete documentation
- Prolonged Response Time, Scene Times, or Transport Times
- Diversion from original Destination.
- Non-adherence to EMS Treatment Guidelines or the Standard of Care
- Any Report that the QA Team feels needs further review

Administrator Review: Reviews the reports sent from Billing/Documentation Reviews and reports sent from Clinical Reviews. After reviewing the Administrator will close report, visit with crew or crew member, send to Medical Director for review, perform in-depth investigation, or contact Medical Director to discuss case.

Medical Director will be assigned to:

- Resuscitation attempts
- Administration of Controlled substances for other purposes than pain control
- Any report the Administrator feels should be reviewed.

200 - MEDICAL GUIDELINES

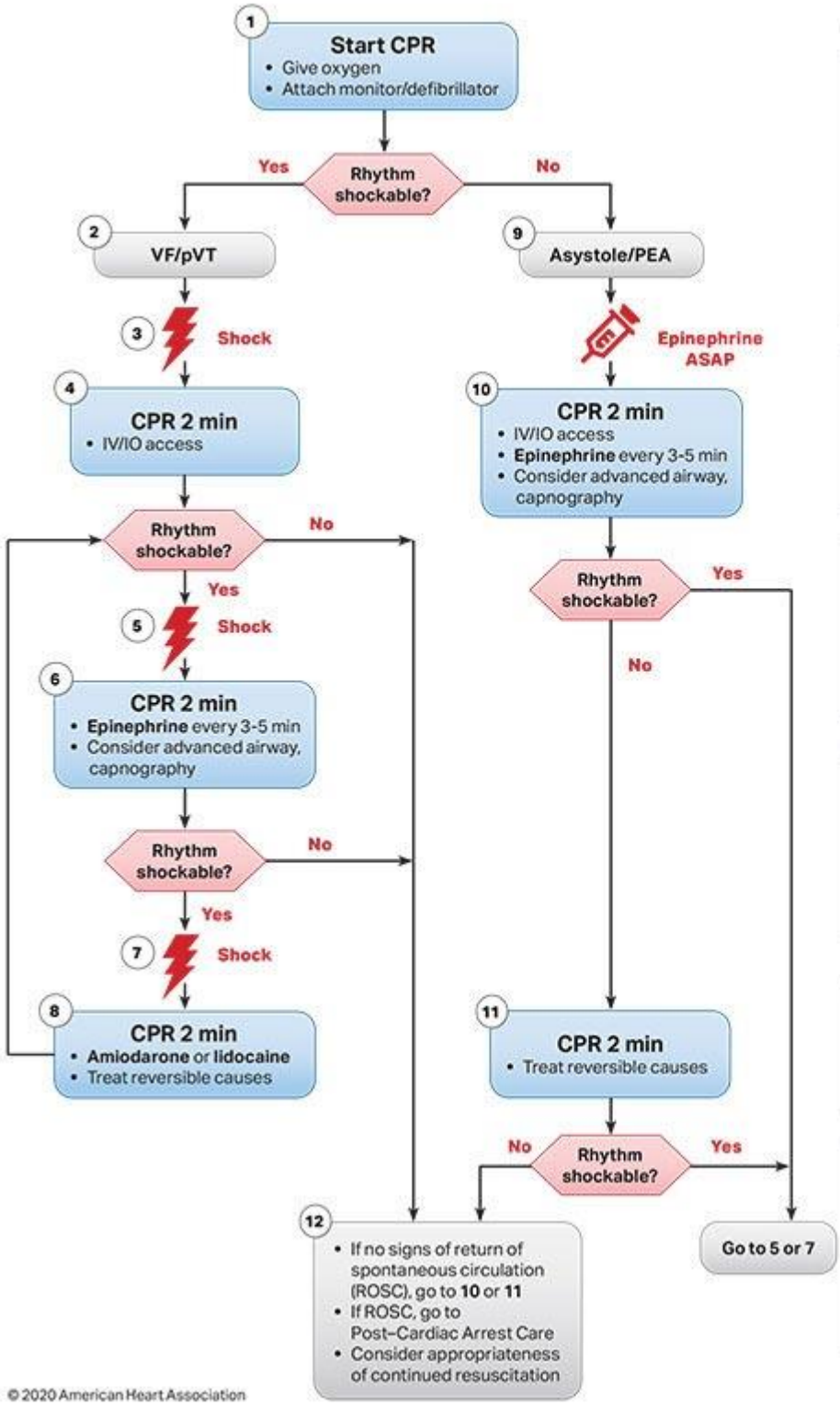
200-01 AHA Guidelines

Andrew County Ambulance District follows American Heart Association Basic Life Support, Advanced Life Support, and Pediatric Life Support guidelines.

The most current guidelines are shown in these Guidelines that are current when these guidelines are published. When there are updates in the AHA guidelines between revisions of this EMS Treatment Guidelines, providers may either use the new current guidelines or the ones listed in this manual.

200-02 Adult Cardiac Arrest

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P_{ETCO_2} is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic**: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic**: 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
  or
  Lidocaine IV/IO dose: First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

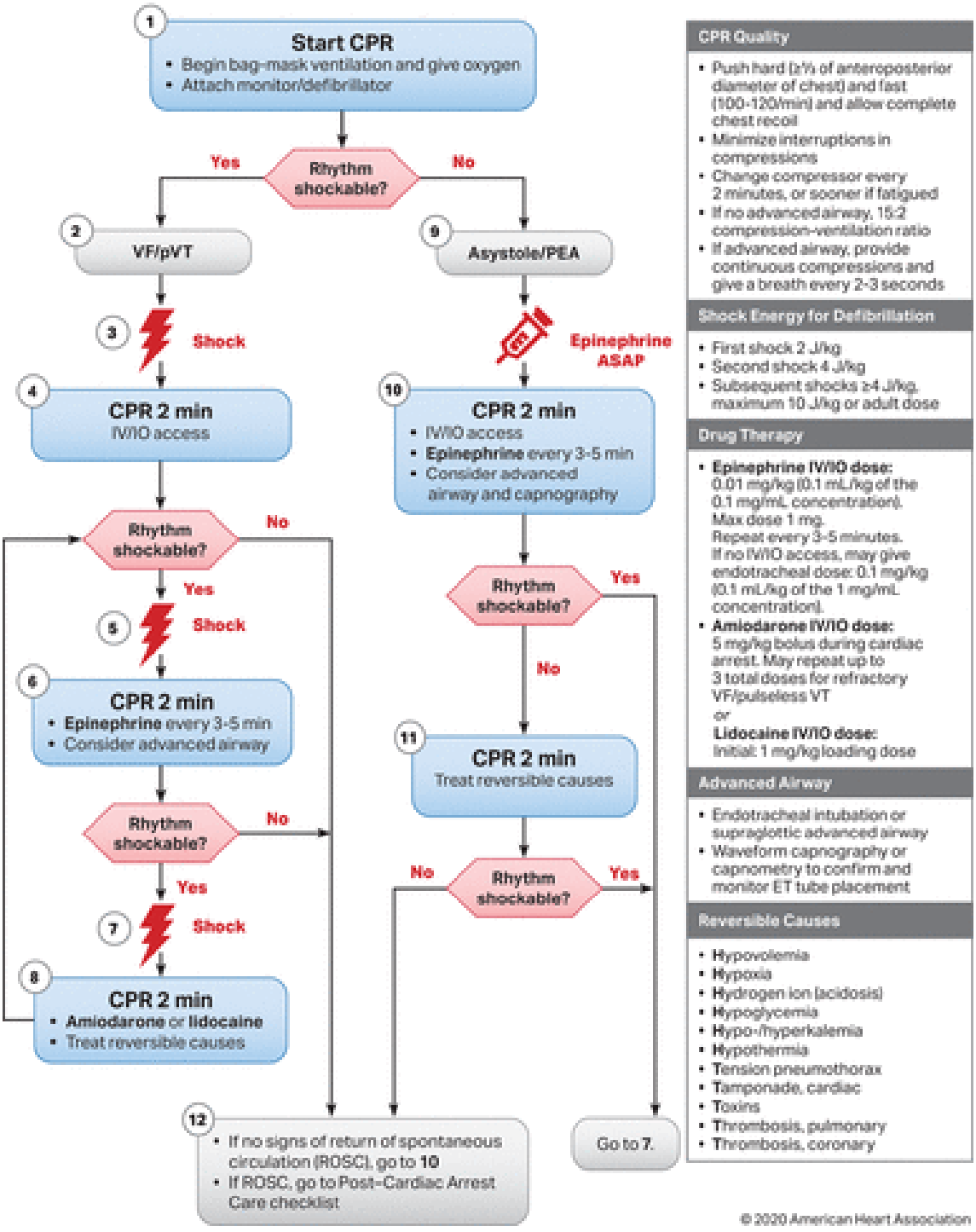
- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

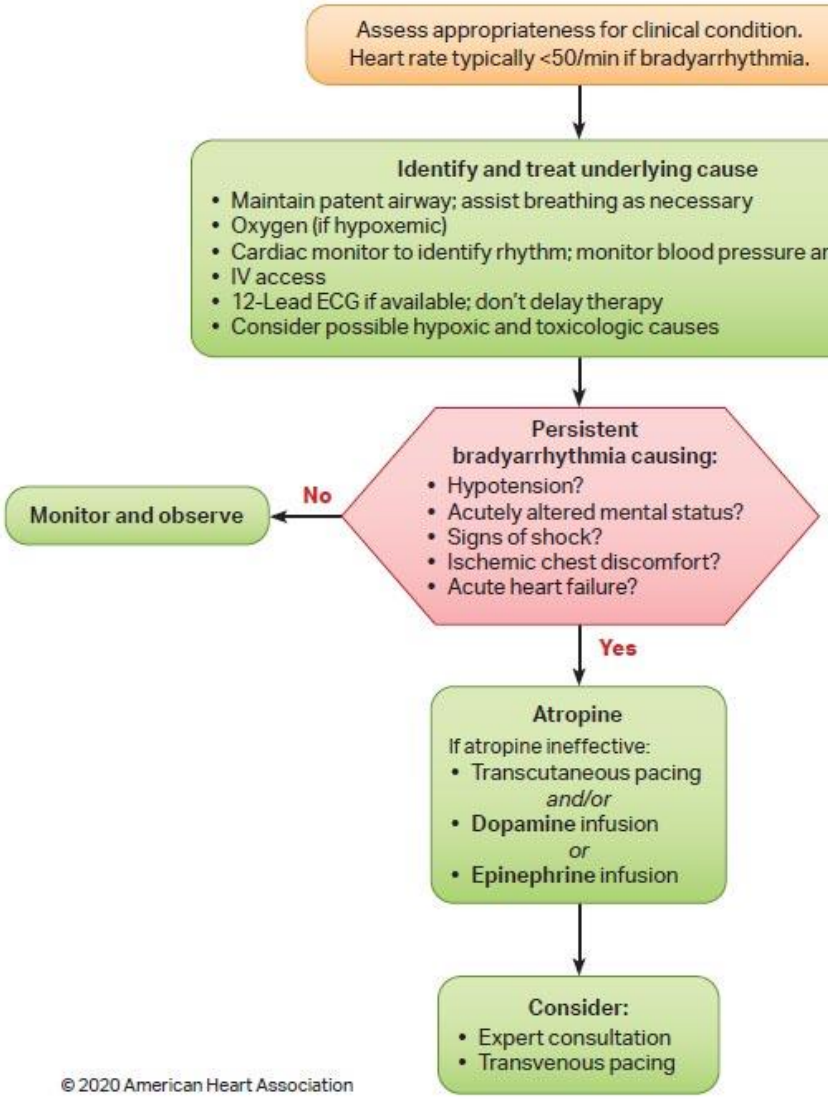
200-04 Pediatric Cardiac Arrest

Pediatric Cardiac Arrest Algorithm



200-06 Bradycardia

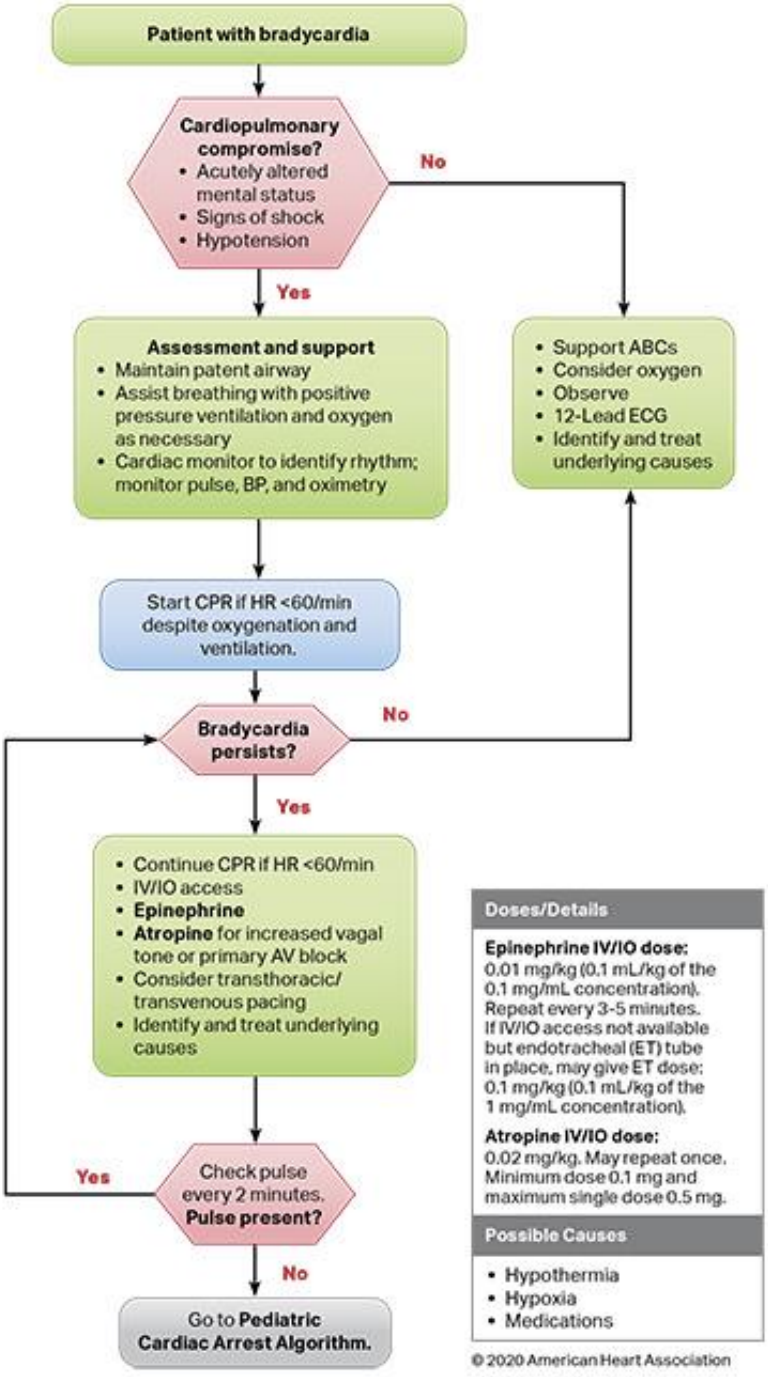
Adult Bradycardia Algorithm



Doses/Details
Atropine IV dose: First dose: 1 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg.
Dopamine IV infusion: Usual infusion rate is 5-20 mcg/kg per minute. Titrate to patient response; taper slowly.
Epinephrine IV infusion: 2-10 mcg per minute infusion. Titrate to patient response.
Causes: • Myocardial ischemia/ infarction • Drugs/toxicologic (eg, calcium-channel blockers, beta blockers, digoxin) • Hypoxia • Electrolyte abnormality (eg, hyperkalemia)

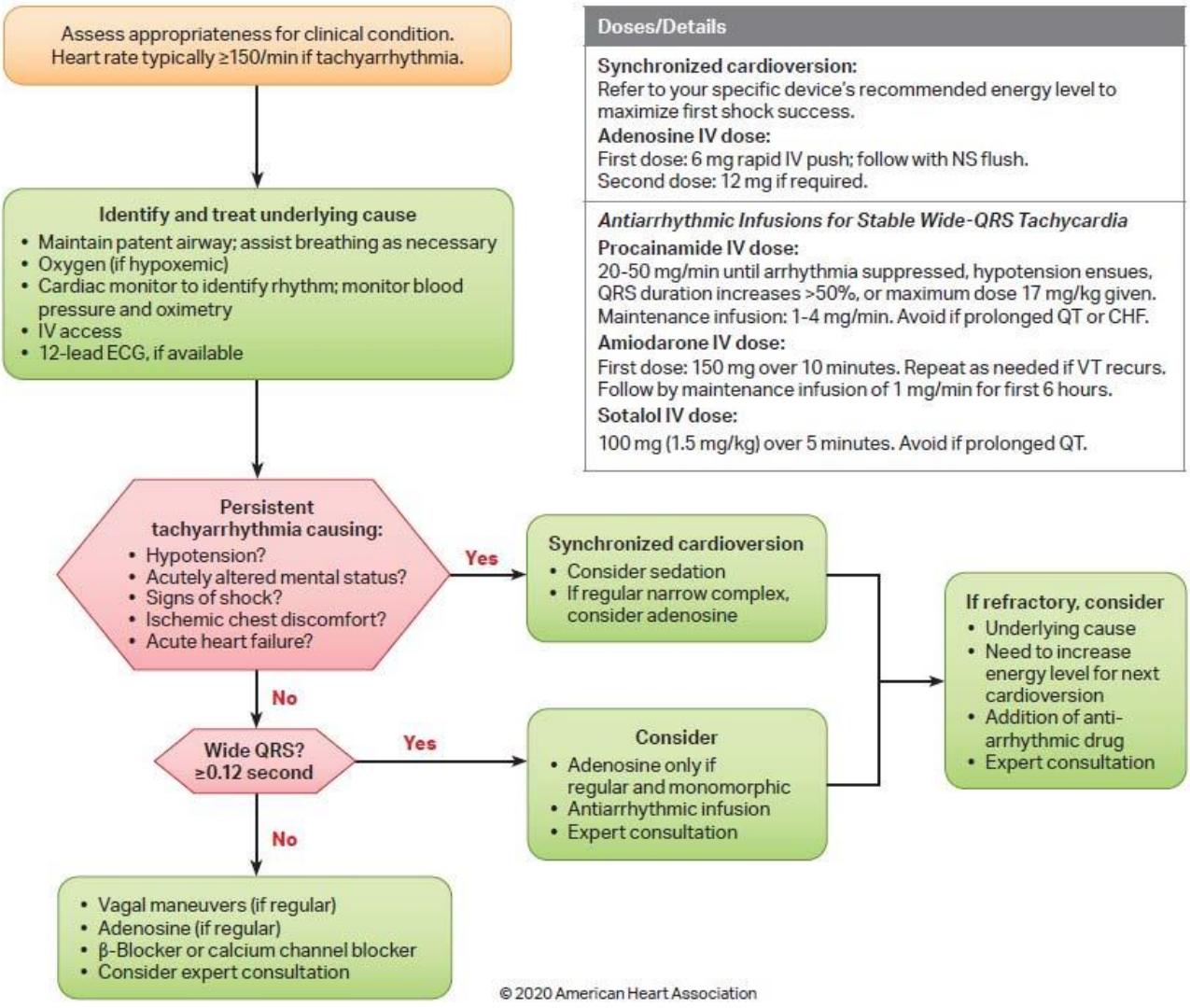
200-08 Pediatric Bradycardia

Pediatric Bradycardia With a Pulse Algorithm



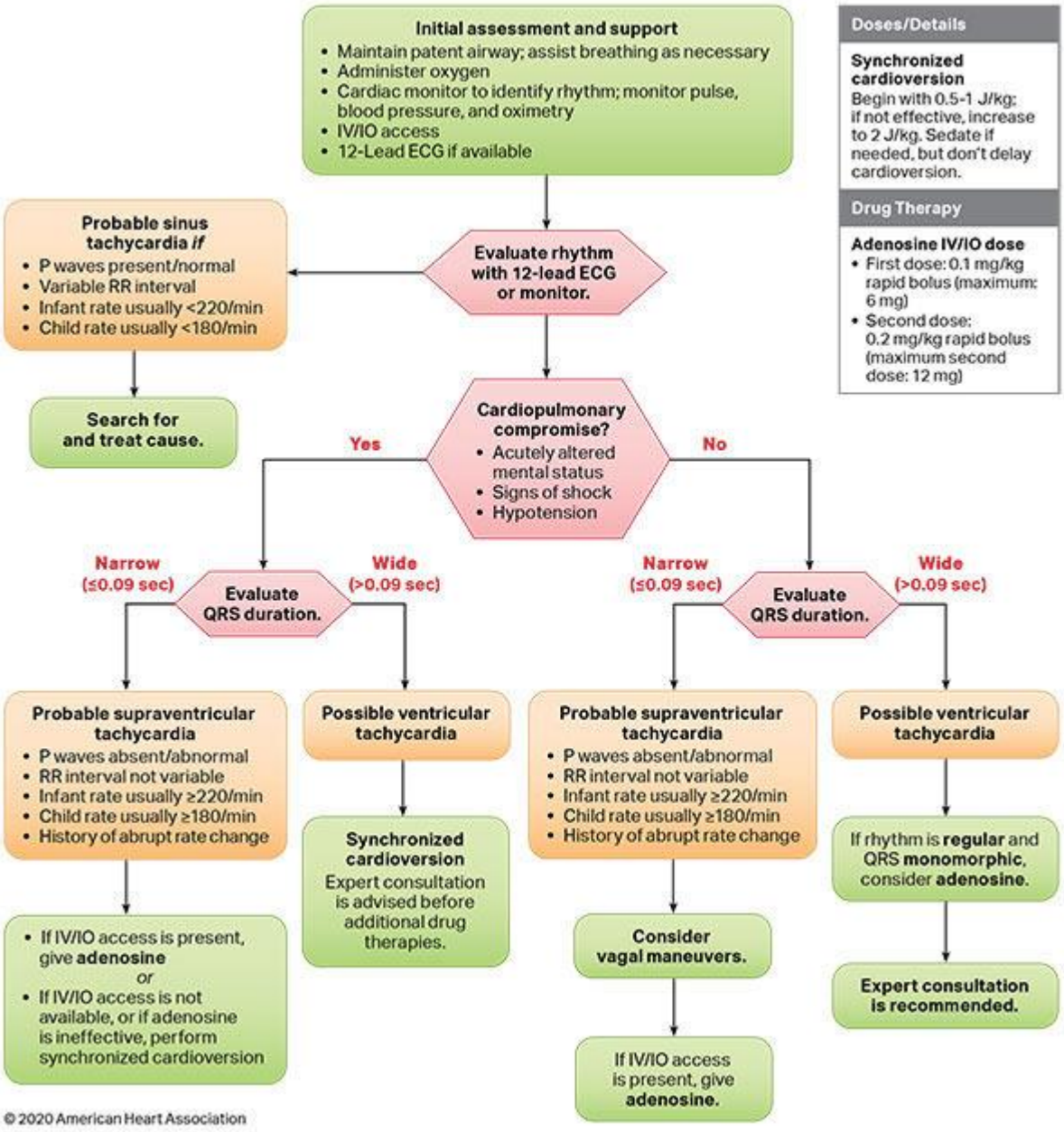
200-10 Tachycardia

Adult Tachycardia With a Pulse Algorithm



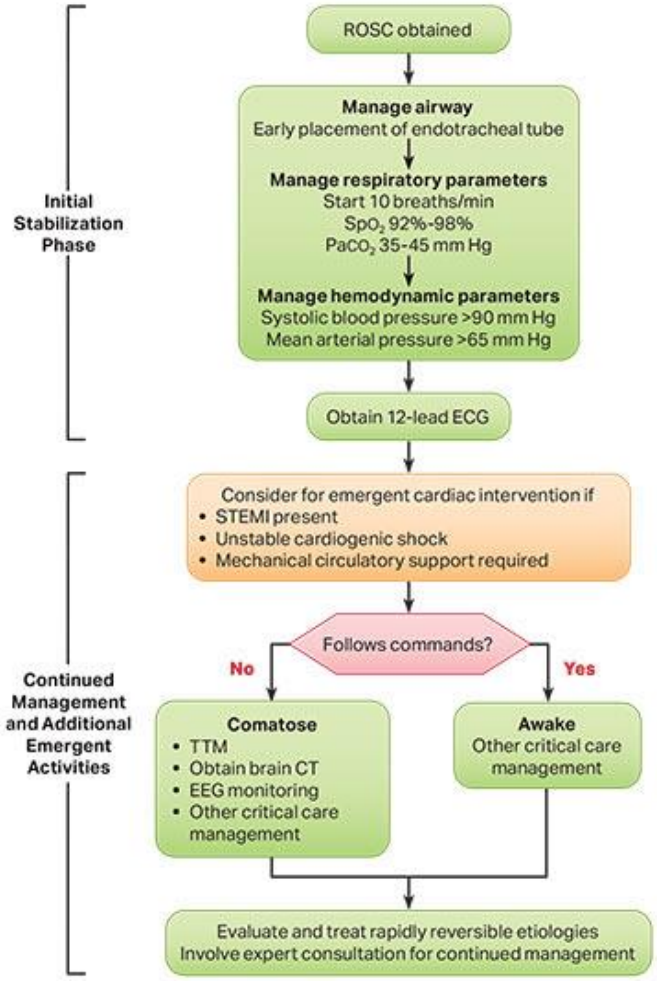
200-12 Pediatric Tachycardia

Pediatric Tachycardia With a Pulse Algorithm



200-14 ROSC – Post Arrest

Adult Post–Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/**h**yperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

200-16 Chest Pain / Cardiac Etiology

Basic Life Support

- Administer O2 to maintain a Oxygen Saturation of >93%.
- Adult Dose: Administer ***Aspirin 324mg*** (4 Baby Aspirin) PO (Chewed) in non-allergic patients.
- If ALS is not available you may assist the patient in taking their prescribed Nitroglycerin tablets up to 3 tablets, 5 minutes apart as long as systolic blood pressure is > 100mm/hg.
  - If patient's medications include phosphodiesterase inhibitors (Examples: Viagra® or Cialis®), contact Medical Control prior to administration.

Advanced Life Support

- Perform a 12 Lead EKG. If EKG identifies ST elevation in two contiguous leads or new or presumed new Left Bundle Branch Block **Move to STEMI TRANSPORT Protocol** for Transport Decision.
- Perform a 15 lead/Right Sided EKG with Inferior Leads Elevation to r/o STEMI / RVI.
- If the patient is hypotensive (less than 90 systolic), infuse 500mL of NS as long as the patient is not in CHF.

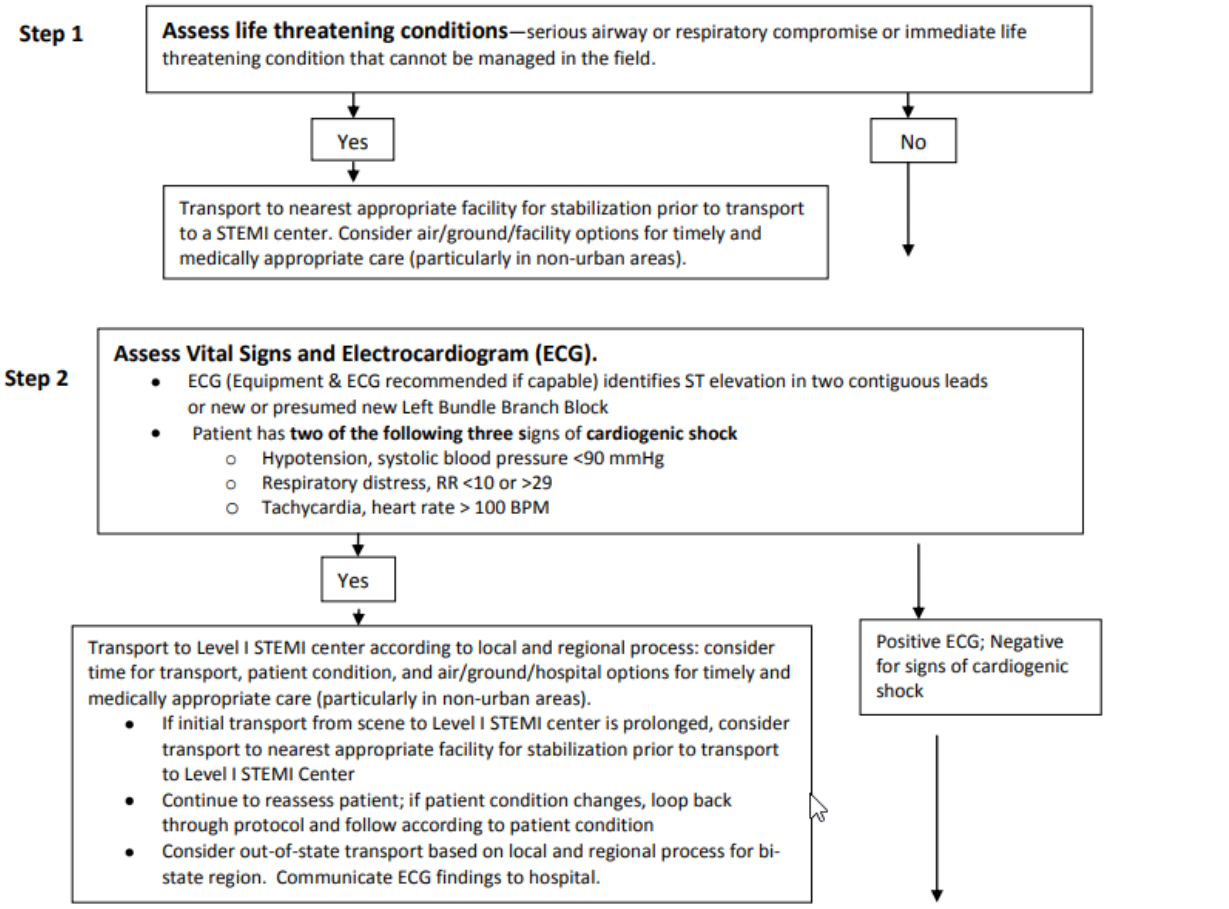
- Nitrates are to be administered with CAUTION for any suspected inferior MI.
- **Nitrates are CONTRAINDICATED in suspected RVI.**

- Adult Dose: If systolic BP > 90 - ***Nitroglycerin 0.4mg (400mcg) SL for Chest Pain/Pressure***. Re-administer every 5 minutes up to 3 doses total.
  - If patient's medications include phosphodiesterase inhibitors (Examples: Viagra® or Cialis®) and used in the last 48 hours, contact Medical Control prior to administration.

- Continued Pain Control:
  - Adult Dose: If systolic BP > 100 ***Morphine Sulfate 2mg SIVP for Chest Pain/Pressure.*** Can re-administer dose every 5 minutes up to a total of 10mg, **OR**
  - Adult Dose: ***Fentanyl 25 to 50mcg*** Slow IVP**.** May repeat up to a max of 200mcg total.

- Nausea/Vomiting:
  - Adult Dose: ***Zofran (Ondansetron) 4mg IV/PO***. Can re-administer at same dose if necessary.

200-17 STEMI Transport



Go to Step 3 on Page 2

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200-17 STEMI Transport

Step 3

Calculate estimated time from STEMI identification to Percutaneous Coronary Intervention (PCI). Communicate ECG findings to hospital. (*If no ST-elevation or new or presumed new left bundle branch block, consider 15-lead ECG, if available)*

Group 1	**Group 2**
Within PCI Window OR Chest Pain> 12 hours OR Lytic/Thrombolytic Ineligible	Outside PCI window and within lytic Window, OR outside both windows AND No other know complications

Yes

Transport to Level I or II STEMI center according to local and regional process: consider time for transport; air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas); patient condition; and all treatment windows.

- Consider ischemic time and potential role for lytics (w/in lytic window) at intervening STEMI center in route to PCI center if approaching longer times within PCI window
- Continue to reassess patient; if patient condition changes, loop back through protocol and follow according to patient condition
- Consider out-of-state transport based on local and regional process for bi-state regions.

Yes

Transport to the STEMI center (Level I, II, III or IV) according to local and regional process: consider time for transport; air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas); patient condition; and all treatment windows.

- Consider lytic window and potential for STEMI center lytic administration when determining destination(s)
- Continue to reassess patient; if patient condition changes, loop back through protocol and follow according to patient condition
- Consider out-of-state transport based on local and regional process for bi-state regions.

(3) When initial transport from the scene of illness or injury to a STEMI or stroke center would be prolonged, the STEMI or stroke patient may be transported to the nearest appropriate facility for stabilization prior to transport to a STEMI or stroke center.

(4) Nothing in this rule shall restrict an individual patient's right to refuse transport to a recommended destination. All ground and air ambulances shall have a written process in place to address patient competency and refusal of transport to the recommended destination.

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200-18 Pain Management

Indications:

- Pain from acute illness or injury not addressed by other specific protocols
- Chronic pain where patient's prescribed medications are ineffective

Contraindications:

- Hemodynamically unstable (Morphine / Fentanyl)
- Patient under the care of a pain management specialist – Contact Medical Control

Basic Life Support

- Place patient in position of comfort
- Placement of Icepacks and or splints for pain secondary to Trauma
- Verbal Reassurance and distraction techniques to distract from pain.

Advanced Life Support

Acute Illness/Injury & Uncontrolled Chronic Pain:

- Adult Dose: ***Fentanyl 25mcg to 100mcg*** **Slow IVP / IM / IN.** May repeat up to a max of 200 mcg total.
  - Contraindications (Allergy; Myasthenia Gravis)
  - Precautions (Elderly; Seizure Disorders; CNS depressants; w/ Amiodarone)
- Adult Dose: ***Morphine Sulfate 2-5 mg*** SIVP may repeat every 5 min up to 10 mg
  - Contraindications (Allergy; Respiratory Depression; RVI; Hypotension; Asthma; ICP)
- Adult Dose: ***Ketamine 0.25 – 0.5 mg/kg*** IV/IO; May repeat 10-20 min as needed at half doses..
  - Contraindications (Allergy; patient where elevated BP could cause harm ex: ICP, CAD)

Urinary Tract Pain, Mild to Moderate Muscular Skeletal Pain, and Pain from Inflammation

- Adult Dose: ***Toradol 30mg Slow*** IVP

Pediatric Patients:

- Ped Dose: ***Fentanyl 1mcg/kg up to 25 mcg*** Slow IVP
- Ped Dose: ***Fentanyl 0.5 to 1 mcg/kg intranasal***. The total volume to be administered should be divided equally between the two nares (not to exceed 0.5 mL per nare).
- Ped Dose: ***Ketamine 0.1mg/kg IV to a max of 10mg.***

200-20 Anaphylaxis

Advanced Life Support

Mild (Severe Rash / Hives Poss Wheezing with good air exchange and no cyanosis)

- Adult Dose: ***Diphenhydramine (Benedryl)*** 12.5 mg - 25 mg SIVP/IM/IO up to a max of 50 mg
- Ped Dose: ***Diphenhydramine (Benedryl)*** 1-2 mg/kg SIVP/IM/IO (Max 25mg) Once

- Adult Dose: ***Albuterol 2.5mg*** Nebulizer if bronchospam
- Ped Dose: ***Albuterol 2.5mg*** Nebulizer if bronchospam

- Adult Dose: ***Solu-Medrol 125mg*** Slow IVP

Severe (Respiratory Distress with Poor Air Exchange or Hypotensive)

- Adult Dose: ***Epinephrine 1:1000 0.3mg*** Subcutaneous for severe anaphylaxis repeat every 5 minutes if needed.
- Ped Dose: **Epinephrine 1:1000 0.01 mg/kg (0.01 ml/kg) max 0.3 mg** IM repeat every 5 min if needed.

- Adult Dose: ***Diphenhydramine (Benadryl)*** 12.5 mg - 25 mg SIVP/IM/IO up to a max of 50 mg
- Ped Dose: ***Diphenhydramine (Benadryl)*** 1-2 mg/kg SIVP/IM/IO (Max 25mg) Once

- Adult Dose: ***Solu-Medrol 125mg*** Slow IVP

- Adult Dose: ***Albuterol 2.5mg*** Nebulizer if bronchospasm remains
- Ped Dose: ***Albuterol 2.5mg*** Nebulizer if bronchospasm remains

- If Patient is Hypotensive (Systolic BP <90)
  - Fluid Bolus 250cc to 500cc
  - Adult Dose: **Dopamine 5-20 mcg/kg/min** IVPB if signs of shock are present.

200-22 Altered Level of Consciousness / Syncope

Includes: Altered Level of Consciousness, Syncope, Altered Mentation, Fainting, and confusion

Basic Life Support:

- Extensive Patient History to try to Determine Cause
- Assess and document AVPU and Level of orientation
- Consider:
  - A – Acidosis / Alcohol
  - E – Epilepsy
  - I – Infection
  - O – Overdose
  - U – Uremia
  - T – Trauma / Tumor
  - I – Insulin
  - P – Psychosis
  - S – Stroke

- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline.

Advanced Life Support

- Consider 4 Lead / 12 Lead EKG
- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline.

200-24 Behavioral / Psychiatric

Basic Life Support:

- Ensure patient is protected from self and ensure others are protected

Advanced Life Support:

- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline.
- Attempt physical restraint and “Talk Down” techniques
- Chemical Restraints should only be used as a last resort.
- Adult Dose: ***Midazolam 2.5mg IV/IN or 5mg IM***. May repeat once in 10 minutes.
  OR
- Adult Dose**:** **Ketamine 2mg/kg SLOW IV/IO or 4mg/kg IM**; May Repeat @ half dose after 10 minutes

200-26 Hyperthermia / Heat Exposure

Definitions

- **Heat Cramps**: are minor muscle cramps usually in the legs and abdominal wall. Patient temperature is normal.
- **Heat Exhaustion**: has both salt and water depletion usually of a gradual onset. As it progresses tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur. Heat exhaustion can progress to heat stroke
- **Heat Stroke**: occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and/or electrolyte imbalances. Patient temperature is usually
- **Heat Syncope**: is a transient loss of consciousness with spontaneous return to normal mentation attributable to heat exposure

Basic Life Support:

- Move patient to cooler area if possible.
- Remove restrictive clothing.
- Passive cooling techniques
- If alert and oriented small sips of cool liquids

Advanced Life Support:

- If temperature is > 104°F consider active cooling
  - Misting with tepid water and fanning
  - Ice packs to truncal areas (Not directly to skin)
- 250cc to 500cc Fluid bolus if lungs are clear.

200-27 Hypothermia / Cold Exposure

Hypothermia

Mild: normal body temperature 35-32.1°C/95-89.8°F
Moderate: 32°-28°C – 89.7°-82.5°F
Severe: 28°-24°C – 82.4°- 75.2°F
Profound: less than 24°C (75.2°F)

Basic/Advanced Life Support:

- Remove from environment
- Passive rewarming techniques
  - Remove wet clothing
  - Turn up ambulance compartment heater
  - Cover with blankets
- Do no shake patients, rub patients or allow them to walk.
- If moderate or severe consider Active rewarming
  - Hot packs (Not Directly to skin)

Frostbite

- Treat Frostbitten extremities as burns and wrap with sterile dressings
- Do not rub or attempt rewarming of frost bitten areas.

200-28 Hyperglycemia

Basic Life Support:

- Supportive

Advanced Life Support:

- If glucose is greater than 250mg/dl, assess lung sounds and if clear, administer 250cc to 500cc fluid bolus. May repeat if signs of dehydration are present.

200-30 Hypoglycemia

Hypoglycemia is defined as a blood sugar less than 60mg/dl or a blood sugar less than 80mg/dl in a diabetic patient with decreased level of consciousness.

Basic Life Support:

- Adult Dose: Oral Glucose 15g-25g PO if patient can maintain airway and swallow without difficulty.

Advanced Life Support:

- Dextrose IV – administer in incremental doses until mental status improves or maximum field dosing is reached:
  - Maximum field Adult Dose: 25 g of 10-50% dextrose IV
    a. 50 mL of 50% dextrose
    b. 100 mL of 25% dextrose
    c. 250 mL of 10% dextrose
  - Maximum field Ped Dose: 0.5-1 g/kg of 10-25% dextrose IV
    a. 2 – 4 mL/kg of 25% dextrose
    b. 4 – 8 mL/kg of 12.5% dextrose
    c. 5 – 10 mL/kg of 10% dextrose

- Continuously Monitor glucose and repeat Dextrose if needed.

Note for Refusals:

If a patient wishes to refuse further treatment and transportation, ensure that you witness them eating some type of protein before leaving. Preferably they should have a competent adult with them to monitor them. Remind them to check their glucose frequently as the sugar you gave was a quick fix and their sugar could drop again quickly.

200-32 Hypertensive Crisis

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care.

The clinical picture of a patient experiencing a hypertensive crisis includes:

BP of greater than 220mm/hg systolic or 120mm/hg diastolic and include one or more of the following:

a. Decreased / Altered LOC
b. Headache, blurred vision, dizziness, weakness
c. Dyspnea, pulmonary or peripheral edema
d. Cardiac dysrhythmia
e. Neuro deficits

Basic Life Support:

- Supportive
- Obtain 2 Blood Pressure readings at least 5 minutes apart
- Obtain Blood Pressures in both arms.
- Transport with Head of cot at a minimum of 30 degrees elevation

Advanced Life Support:

- If patient is experiencing Chest Pain move to Chest Pain Guideline
- If patient is experiencing symptoms of CHF move to Pulmonary Edema/CHF Guideline
- If patient meets the Hypertensive Crisis criteria above and you are more than 10 minutes from the Emergency Department contact Medical Control for guidance and medication orders if needed.

200-34 Nausea / Vomiting

Basic Life Support:

- Supportive

Advanced Life Support:

- Adult Dose: ***Zofran 4mg*** Slow IVP or PO. May repeat once.

200-36 Respiratory Distress

Basic Life Support:

- Ensure High Flow Oxygen and Supportive.
- May Assist patient with their prescribed Metered Dose Inhaler (MDI) if wheezes are present in lungs. May use up to 3 doses as long as alert and oriented.

Advanced Life Support:

BRONCHOSPASM (Includes Emphysema & Asthma)

- Adult Dose: ***Albuterol 2.5 mg*** nebulized
- Ped Dose: ***Albuterol* 2.5 mg** nebulized
- Adult Dose: ***Atrovent 0.5 mg*** nebulized
- Adult Dose: ***Solu-Medrol 125mg*** Slow IVP

PULMONARY EDEMA (caused by Congestive Heart Failure)

If Hypotensive refer to Hypotension / Shock Guideline

- Adult Dose: ***Nitroglycerine 0.4mg SL.*** May repeat twice as long as Systolic BP > 100mm/hg
- CPAP 5-15 cm/H2O – Continuously monitor for worsening patient or tired patient.
- Adult Dose: ***Lasix 40mg*** Slow IVP

RESPIRATORY FAILURE

- Monitor for Insufficient respiration and Assist if needed.
- If narcotic overdose is suspected treat as per Medication Overdose Guideline.

200-38 Hypotension / Shock

Basic Life Support:

- Supportive.

Advanced Life Support:

Hypotension due to Hypovolemia

- Adult Dose: Titrate IV Fluids to maintain systolic blood pressure of 90 mmHg to a max of 1000ml.
- Ped Dose: 20 ml/kg repeated up to 3 times to maintain a systolic Blood Pressure of 90 mm/hg

Hypotension due to Distributive Shock (Cardiogenic / Spinal / Septic / Neurogenic)

- Adult Dose: Titrate Fluid bolus of 250cc to 500cc continuously monitoring lung sounds
- Adult Dose: ***Dopamine 5-20 mcg/kg/min*** IV Drip titrated to a systolic BP of 90mm/hg.
- Ped Dose: 20 ml/kg repeated up to 3 times to maintain a systolic Blood Pressure of 90 mm/hg

Dopamine (Intropin) 2 - 20 mcg/kg/min

A mixture of 400 mg Dopamine in 250 ml = 1,600 mcg/ml

mcg/kg/ minute	Patient's Weight in Kilograms											
	2.5	5	10	20	30	40	50	60	70	80	90	100
2 mcg	-	-	1	2	2	3	4	5	5	6	7	8
5 mcg	-	1	2	4	6	8	9	11	13	15	17	19
10 mcg	1	2	4	8	11	15	19	23	26	30	34	38
15 mcg	1	3	6	11	17	23	28	34	39	45	51	56
20 mcg	2	4	8	15	23	30	38	45	53	60	68	75

With a 60 drop per ml drip set this is the number of drops/minute (or ml/hr)

Observe for extravasation - swelling, pallor, pain, etc. at IV site.

200-40 CVA / TIA

Obtain Last Known Well Time

Cincinnati Stroke Scale

- Arm Drift – Eyes closed palms up. POSITIVE if patient cannot keep both arms up.
- Facial Droop – Stick tongue out. POSTIVE if tongue deviates or displays facial droop.
- Speech - "You can't teach an old dog new tricks". POSITIVE if patient cannot repeat.

***** If Positive Cincinnati Stroke Scale is Positive Move to Stoke Transport Protocol.**

Basic Life Support:

- Document EXACT time that patient was seen normal.
- If less than 6 hours initiate rapid transport if patient has an abnormal Cincinnati Stroke Scale.
- Alert hospital that you have a "Stroke Alert" and give findings.

Advanced Life Support:

- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline.
- If patient is severely hypertensive consult online Medical Control for advice.
- If time and patient's condition allow, person RACE Exam and report findings to the receiving facility.

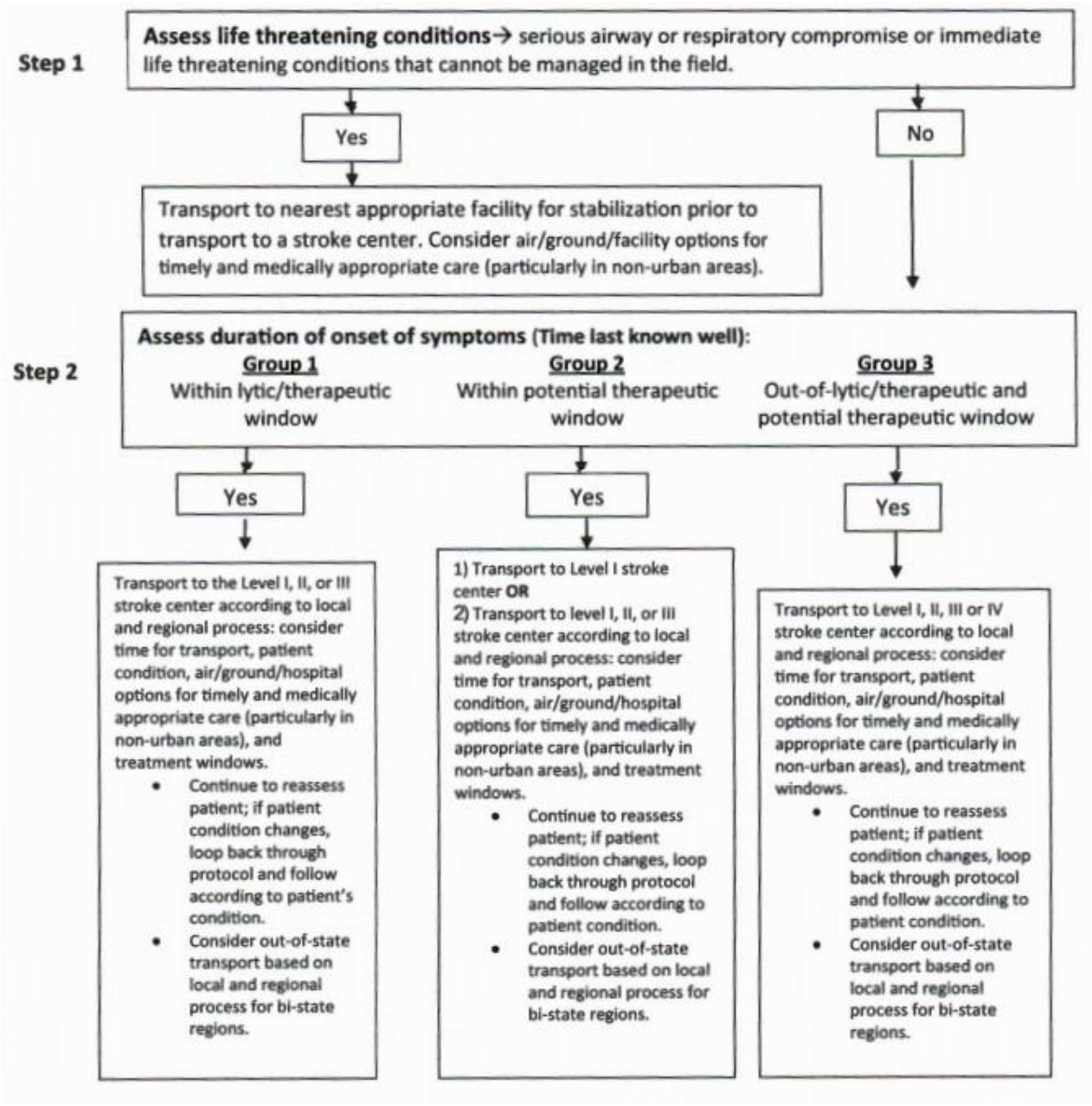
200-40 CVA / TIA (RACE)

Rapid Arterial Occlusion Scale (RACE)

- Facial Palsy
  - Absent = 0
  - Mild (Some Facial Droop) =1
  - Moderate to Severe = 2
- Arm Motor Function
  - Normal = 0
  - Moderate (able to lift but not hold up for 10 sec) = 1
  - Severe (Unable to raise arm) = 2
- Leg Motor Function
  - Normal = 0
  - Moderate (able to lift but not keep up for 10 sec) = 1
  - Severe (Unable to raise leg) = 2
- Head Gaze (Move eyes from one side to the other)
  - Normal = 0
  - Present (Unable to shift past midline) = 1
- If Right sided Deficit is noted: (Ask patient to close eyes and make a fist)
  - Performs both correctly = 0
  - Performs 1 only = 1
  - Performs neither = 2
- If Left sided Deficit is Noted: (Touch affected arm and ask whose arm is this amm raise both arms and clap
  - Patient recognized their arm = 0
  - Does not recognize arm or can't clap = 1
  - Does not recognize arm and can't clap = 2

Stroke is highly likely if RACE score is 1 or greater.
Emergent Large Vessel Occlusion (ELVO) highly suggestive is RACE is greater than 5.

200-41 Stroke Transport Protocol



(3) When initial transport from the scene of illness or injury to a STEMI or stroke center would be prolonged, the STEMI or stroke patient may be transported to the nearest appropriate facility for stabilization prior to transport to a STEMI or stroke center.

(4) Nothing in this rule shall restrict an individual patient's right to refuse transport to a recommended destination. All ground and air ambulances shall have a written process in place to address patient competency and refusal of transport to the recommended destination.

200-42 Seizure

Basic Life Support:

- For active seizures protect patient from harm.

Advanced Life Support:

For Grand-Mal Seizures:

- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline.
- For active full body tonic/clonic convulsions
  - Adult Dose: ***Valium 5mg*** Slow IVP; May repeat once if continues to convulse.
  - Adult Dose: ***Versed 2.5 mg*** Slow IVP or IN; May repeat once if continues to convulse.

  - Ped Dose: ***Versed 0.1mg/kg*** IVP / IN or ***Valium 0.2mg/kg*** IVP ***(Max – 5mg) or***
  - Ped Dose: ***Valium 0.4mg/kg per rectum via catheter (Max – 10mg)***.
  - Ped Dose: Can re-administer at same dose if necessary. If additional administration is required after this, consult Medical Control first.

200-44 Overdose / Toxic Ingestion

Basic Life Support:

- Supportive.
- Try to ascertain substance ingested, time ingested, amount ingested, and any other additional ingestion.
- Adult Dose: ***Narcan (Naloxone) 2 mg intranasally*** If respirations are ineffective and an opiate overdose is suspected, in the absence of an ALS provider and providing that BLS provider has received training in the administration.

Advanced Life Support:

- Ensure patient is not hypoglycemic and treat as per Hypoglycemia Guideline**.**

Narcotic Overdose

- If respiration is inefficient:
  - Adult Dose: ***Narcan (Naloxone) 0.4 mg to 2 mg*** pushed very slowly and only use enough Narcan to increase respiration. Remember the goal is to return effective respiration, NOT wake them up or cause withdrawal symptoms.
  - Adult Dose: ***Narcan (Naloxone) 2 mg intranasally*** if IV access is delayed.

NOTE: Narcan is not used to treat altered level of consciousness, it is used for respiratory depression.

200-46 Procedural Sedation

Advanced Life Support:

- Adult Dose: ***Midazolam 2.5mg IV/IN or 5mg IM***. May repeat once in 10 minutes.

  OR

- Adult Dose**:** **Ketamine 1mg/kg SLOW IV/IO**; May Repeat @ 0.5mg/kg after 10 minutes

200-48 Abuse / Neglect

Definitions

- **Abuse/Maltreatment**: Any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential for harm, or threat of harm to a patient
- **Child Maltreatment/Abuse**: Child maltreatment includes any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child. An act of commission (child abuse) is the physical, sexual or emotional maltreatment or neglect of a child or children. An act of omission (child neglect) includes, but is not limited to, failure to provide for the child's needs (e.g. physical, emotional, medical/dental, and educational neglect) and failure to supervise (e.g. inadequate supervision or safety precautions, lack of appropriate car seat use, and exposure to violent or dangerous environments)
- **Human Trafficking**: when people are abducted or coerced into service and often transported across international borders. Signs may include, but are not limited to: patient with branding/tattoos and environmental clues such as padlocks and/or doorknobs removed on interior doors, and intact windows that are boarded up

Advanced & Basic Life Support:

- Address life-threatening issues
- Remove the patient to a safe place even if no medical indication for transport
- Report concerns about potential abuse/maltreatment to law enforcement immediately, in accordance with state law, about:
    - Caregivers impeding your ability to assess/transport patient
    - Caregivers refusing care for the patient
- For patients transported, report concerns to hospital and/or law enforcement personnel per mandatory reporting laws

1-800-392-3738 – Child

1-800-392-0210 – Elderly

1-844-487-0492 – Human Trafficking

200-50 Sepsis

Patients that present with the signs and symptoms of systemic inflammatory response syndrome (SIRS) and have a documented or identifiable infection.

For entry into this protocol the following criteria must be met:

1. Identifiable infection
2. Vital signs that meet 2 of the following criteria
    a. Temperature <36°C (96.8°F) or >38°C (101.0°F)
    b. Heart rate >90
    c. Respiratory Rate >20
    d. Serum Glucose >119 mg/dl in the non-diabetic patient
    e. Altered LOC

Basic Life Support

- Supportive
- Rapid Transport

Advanced Life Support

- If Systolic BP > 90 then Adult Dose: 250cc to 500cc Fluid Bolus
- If Systolic BP < 90 then Adult Dose: Titrate IV to maintain systolic blood pressure of 90 mmHg max of 1000ml
- If Systolic BP < 90 then Ped Dose: Titrate IV to maintain systolic blood pressure of 90 mmHg max of 20cc/kg
- If hypotension remains after fluid max, contact medical control

Sepsis Notification

Notify Receiving Facility if the following additional criteria is met and advise them of a "Sepsis Notification".

- End-Tidal CO2 reading of <25 measured 2 reading consistent 5 minutes apart

300 – Trauma Guidelines

300-01 TRAUMA Transport

If any of the following conditions are met, patient should be transported to a Trauma Center if possible. Patients should be transported by either Ground Ambulance or Air Ambulance based on time factors and conditions at the time of the call. Goal should be to have the patient arrive at the highest-level Trauma Center available in a 20 Minute transport time window.

All efforts should be made to keep scene times to a minimum knowing that 10 minutes is a good goal for all trauma scenes

Definition of Major Trauma

- Multisystem Blunt or Penetrating Trauma with Unstable vital signs:
    - Blood Pressure < 90 mm/hg
    - Heart Rate > 120
    - RTS < 11
    - GCS < 13
- Penetrating Injury of head, neck, torso, or groin
- Burns > 20% TBSA (2^{nd} or 4rd degree) or involving face, airway, hands, feet, or genitalia
- Amputation (with reimplantation potential)
- Paralysis or other signs of spinal cord injury
- Flail chest
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected pelvic fracture
- Two or more long bone fractures
- High energy event, such as:
    - Ejection from a vehicle
    - Significant fall of > 20 ft
    - Rollover mechanism
    - Bent Steering wheel
    - Auto-Pedestrian impact
    - Motorcycle or bicycle involvement
    - Significant assault

300-02 Burns

Basic Life Support:

- Ensure patient is removed from heat source or chemical source – Your safety is first!
- Initiate IMMEDIATE RAPID Transport if any of the following present:
  - Singed nasal hair
  - Soot in or around mouth
  - Hoarseness or stridor
- Chemical burns: Remove clothing and flush with copious amounts of water for 20 minutes.
- Calculate type of burns and amount affected.
- Cover affected areas with burn dressings

Advanced Life Support:

- Fluid replacement is essential on all burns greater than first degree. Use Lactated ringers and ensure that you document how much you give so ED can figure into their fluid replacement.
- Pain control as per Pain Control Guideline

300-04 Chest Injuries

Basic Life Support:

- Supportive

Open Chest Injury
- Stabilize penetrating objects. Do not remove.
- Apply sterile, 3-sided, occlusive dressing for sucking chest wounds.
- Watch for signs of tension pneumothorax and treat accordingly.

Flail Chest
- Place patient on affected side if not contraindicated by possible C-Spine injury.
- Watch for signs of hypoxia / hypercarbia due to possible ineffective tidal volumes due to pain.

Sucking Chest Wound
- Seal wound immediately after patient exhalation with 3-sided, occlusive dressing.
- Place patient on affected side if not contraindicated by possible C-Spine injury.
- Watch for signs of tension pneumothorax and treat accordingly.

Advanced Life Support:

- Follow Fluid Replacement from Trauma Guideline.
- Aggressive pain management per Pain Control Guideline

Tension Pneumothorax (Diminished / Absent breath sounds, hypotension)
- 12 or 14 gauge needle (3.25 inch) attached to a syringe inserted over the 2nd or 3rd rib mid-clavicular line on affected side. Look/listen for rush of air and observe for pt improvement.

Cardiac Tamponade
- Treat signs/symptoms of shock as indicated.

Cardiac Contusion
- Monitor for shock and arrhythmias.

Thoracic Aortic Rupture
- Treat signs/symptoms of shock as indicated.
- Do not allow BP to exceed 90 systolic with fluid resuscitation.

300-06 Extremity Injuries

Basic Life Support

- Evaluate all extremities for potential injury (blunt/open soft tissue injuries, fractures, dislocations, and neurovascular impairment). Monitor the patient for signs/symptoms of shock especially if pelvic or long bone fractures exist.
- Cover wounds with dry, sterile dressing.
- Control external hemorrhage with direct pressure. If direct pressure proves ineffective, consider immediately applying a tourniquet to affected limb.
- Splint obvious/potential fractures in place if time allows and monitor distal neurovascular status. Extremity fractures with vascular compromise require attempted reduction prior to definitive splinting and transport.

Amputations:

- Wound care, hemorrhage control, and splinting per above.
- Amputated or avulsed parts should be wrapped dry in gauze, placed in a sealed plastic bag or wrapped in plastic and kept cool by placing on ice or a cold pack and transported with the patient to the hospital.
- Transport to Trauma Center with re-attachment capabilities.

Advanced Life Support:

- Follow Fluid Replacement from Trauma Guideline.
- Aggressive pain management per Pain Control Guideline

300-08 General Trauma

Includes but not limited to:

- Head Injuries
- Hemorrhagic Shock

Basic Life Support

- Control Major Bleeding
- Cover minor lacerations / Abrasions as needed

Advanced Life Support:

- Follow Fluid Replacement from Trauma Guideline.
- Aggressive pain management per Pain Control Guideline

300-10 Spinal Immobilization

Advanced & Basic Life Support

Indications:

- Spinal immobilization is indicated in trauma patients who sustain a mechanism of injury sufficient to cause a neck or back injury and who display at least one of the following criteria:
    - Unreliable physical exam, such as GCS < 15, inability to fully cooperate, evidence of intoxication or acute stress reaction
    - Pain, deformity or tenderness to the neck or back
    - A distracting or painful injury
    - Neurological deficit
    - Pain produced on unassisted rotation of the head 45 degrees in each direction
    - Blunt trauma patients or patients that experience axial load, fall > 3 feet, rollover, ATV, cycle or pedestrian/vehicle accidents will be immobilized
    - neurologic deficit is noted on physical examination

Spinal immobilization techniques:

- Stabilize the head and neck in neutral position unless movement causes pain, deformity, or resistance. If so, immobilize the head and neck in position found
- If the patient is ambulatory, place an appropriate sized cervical collar and position the patient directly on the ambulance cot in the position of comfort, limiting movement of the spine during the process
- Patients that are stable, alert and without neurological deficits may be allowed to self-extricate to the ambulance cot after placement of a cervical collar. Limit movement of the spine during the process.
- If a long spine board or scoop stretcher is used for extrication or patient movement, the patient should be taken off the long spine board or scoop stretcher and placed directly on the ambulance cot using an appropriate technique that minimize movement.

Full Spinal Immobilization with c-collar and Scoop Stretcher/Long Spine Board may be used in the following circumstances:

- Unconscious Level 1 trauma
- Any situation the attending staff member feels the benefits outweigh the longer term risk of full spinal immobilization.

Pulse, motor, sensory shall ALWAYS be checked (and documented) before and after full immobilization of spine and re-checked after each patient move, and confirmed upon arrival to receiving hospital.

300-12 Fluid Replacement From Trauma

When replacing fluid from traumatic injuries use the following guidelines listed below. These are only guidelines and are not to replace good judgment of the care provider.

When initiating fluid replacement start with 1 or 2 large bore IV's

For Adults give fluids with a goal of maintaining the diastolic blood pressure at 90 mm/hg.

For pediatrics give fluid bolus of 20cc/kg and reassess. This should be done up to 60cc/kg total for bolus.

If two IV's are established one should be Normal Saline and the other Lactated Ringers if able.

Make sure to constantly assess lungs sounds to watch for fluid overload.

300-14 Smoke Inhalation / CO2 Poisoning

Includes: Smoke Inhalation, Carbon Monoxide (CO) Poisoning, and other inhalation injuries.

Advanced & Basic Life Support

- Remember crew safety!
- Remove patient from toxic environment
- Support ventilation
- Provide 100% oxygen via non-rebreather mask

300-16 Tranexamic Acid (TXA) Administration

ALS Only

Indications:

- Known or suspected hemorrhage (Shock) after blunt, crush, or penetrating trauma:
  - Sustained Systolic Blood Pressure < 90 mmhg and/or
  - Sustained Heartrate > 110 bpm.
- Post Partum bleeding following loss of >500ml of blood

Contraindications:

- Patient <16 years of age or weight < 150 lbs
- Onset > 3 hours
- Active thromboembolic disease, such as DVT, PE, and/ or cerebral thrombosis.
- Isolated Head Injury
- Pregnancy

Adult ALS Procedure:

- Complete Assessment of Patient
- Control bleeding by all other methods available.
- Initiate IV Access.
- Adult Dose: Administer Tranexamic Acid (TXA) 1gram mixed in 100ml or 250ml normal saline and infused over 10 minutes.

400 OB / NEWBORN GUIDELINES

400-01 Pregnant Patient

Basic and Advanced Life Support

Note: Severe bleeding with hypotension should be treated for shock as in the shock protocol

Note: Pregnant patients in cardiac arrest should be treated as normal cardiac arrest patients, but rapid transport is mandatory and field termination is NOT TO BE CONSIDERED.

History Questions for all Pregnant Patient (Should be included in documentation)

- Number of Pregnancies
- Number of Live Births
- Number of spontaneous or non-spontaneous abortions
- Due Date
- Problems with pregnancy
- History of prenatal care
- History of multiple births
- If currently in labor
    - Onset of labor
    - Timing of contractions
        - Frequency
        - Length
        - Strength
    - If Ruptured membranes
        - Time
        - Color of fluid
    - Check for Crowning or other presentations
    - Check for Significant vaginal bleeding
- Previous Perinatal Complications

400-02 General Childbirth

Basic and Advanced Life Support

Note: Severe bleeding with hypotension should be treated for shock as in the shock protocol

Note: Pregnant patients in cardiac arrest should be treated as normal cardiac arrest patients, but rapid transport is mandatory and field termination is NOT TO BE CONSIDERED.

Delivery Not Imminent:

- Monitor Contractions including length, strength and frequency
- Transport in position of comfort preferably on left side or left side tilted
- If patient becomes hypotensive move to left lateral recumbent
- Notify hospital of impending arrival as soon as possible
- Be prepared to stop transport to deliver infant if indicated

Imminent Delivery

- If Breech presentation, Prolapsed Cord, or Nuchal cord, refer to Complicated Delivery Protocol
- Do not attempt to impair of delay delivery
- Support and control delivery of the head as it emerges
- Protect perineum with gentle hand pressure
- Suction mouth then nose as soon as head is delivered
- Guide head and neck downward to deliver anterior shoulders
- Rest and deliver passively – Be sure to secure child as they will be slippery!
- Gentle uterine massage can decrease bleeding after delivery
- Do not pull-on cord for placenta

Newborn

- Suction mouth then nose
- Dry baby and place in warm blanket
- After cord stops pulsating, double clamp cord 6 inches from baby and cut between clamps
- Document APGAR at 1 and 5 min
- If infant is apneic, cyanotic, or HR <100 refer to Neonatal Resuscitation guideline

400-04 Complicated Birth

Basic and Advanced Life Support

Note: Severe bleeding with hypotension should be treated for shock as in the shock protocol

Breech Presentation

- Discourage pushing from mother
- DO NOT PULL infant by presenting part
- If legs are delivered, gently elevate truck and legs to aid in delivery of head
    - If head does not deliver in 30 seconds, reach 2 fingers into vagine and press vaginal wall away to access airway
    - Rapid Transport

Prolapsed Cord

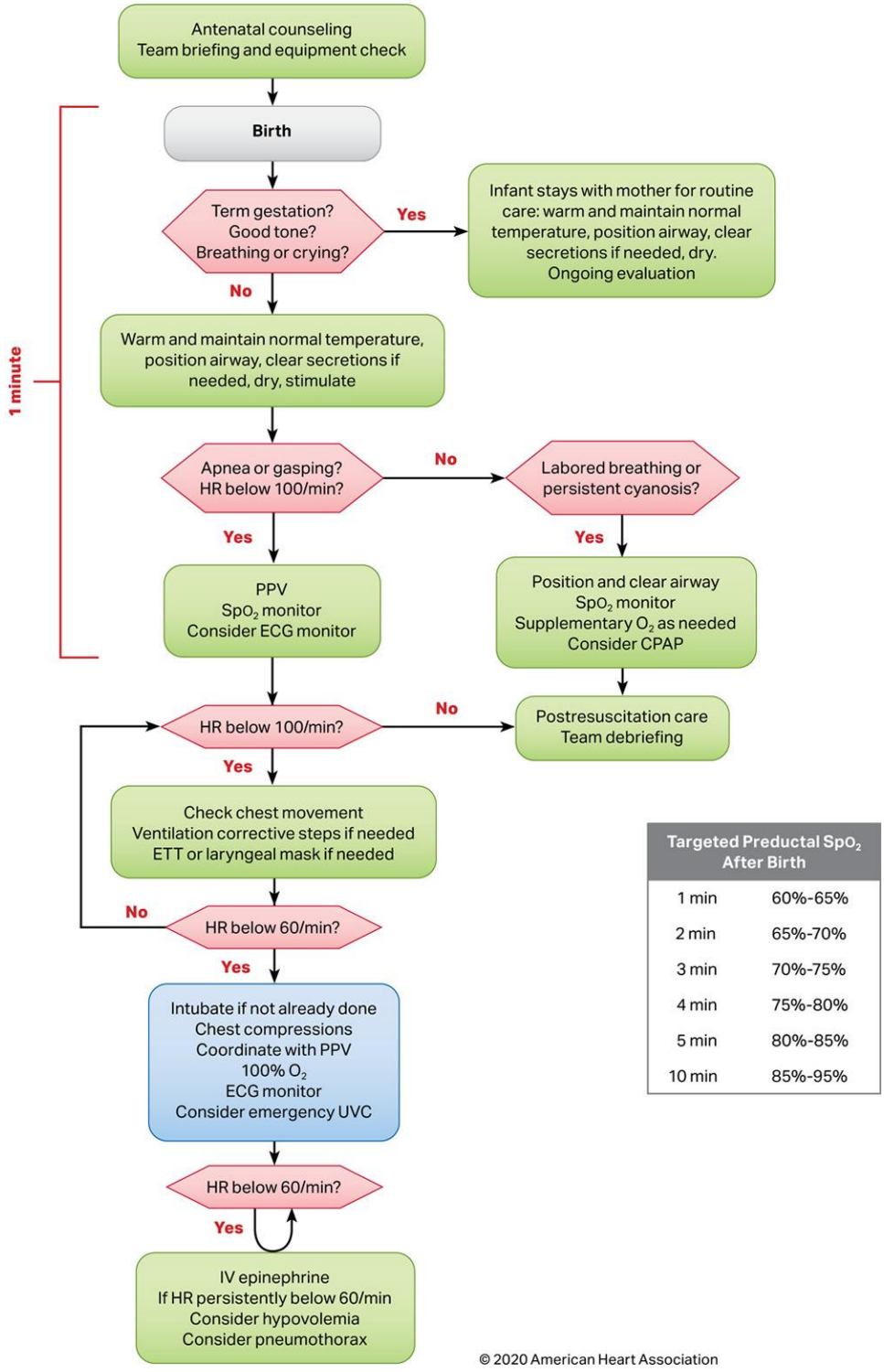
- Discourage mother from pushing
- Elevate Mother's hips
- Place gloved hand in mother's vagina and ensure pressure is removed from cord
- Keep cord moist and warm
- Rapid immediate transport

Nuchal Chord

- Reduce by using 2 gloved fingers and slip under chord and gently remove from around neck
- If unable to reduce, clamp chord in 2 places and cut cord between clamps
- Rapid transport

400-06 Neonatal Resuscitation

Neonatal Resuscitation Algorithm



Targeted Preductal SpO_2 After Birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

800 – PROCEDURES

800-02 General Considerations

 Created: September 2018

- In these procedures Paramedic is used to designate use by ACAD Paramedics and Register Nurses
- The medical procedures are designed to give general instructions to the provider.
- All personnel should be well versed in the utilization of all medical procedures contained here within based on the providers level of training and authorization to perform each procedure.
- The following medical procedures are approved local guidelines only and are not meant to replace current manufacturer recommendations for use.
- All medical procedures listed should be initiated based on instruction of the appropriate protocol in preceding sections.
- Any time the provider encounters the need for a medical procedure that is not specifically outlined in this section, they should rely on their professional training and/or contact Medical Control for a consult.
- At no time should a provider initiate a critically invasive procedure that is not contained in the medical procedure section without contacting Medical Control first.
- If for any reason certain modalities of patient care are not proceeding as they should, crews are expected to continue good, effective basic life support and proceed to the nearest hospital.
- The importance of thorough documentation cannot be over-emphasized both when providers are acting “under protocol,” and when acting directly from on-line Medical Control.

800-04 Airway

Created: September 2018

Airway maneuvers may be performed without on-line Medical Control where the patient does not have a patent airway or is not breathing. The simplest method that will maintain the patient's airway without compromising care should be utilized. Manual airway maneuvers (i.e. head tilt-chin lift, jaw thrust, or modified jaw thrust) should be utilized before invasive airway maneuvers are attempted. Monitor the airway continuously to be sure your treatment remains effective.

800-06 Oropharyngeal Airway

 | Created: September 2018

Authorization: All Paramedics, EMT-Basics, and Emergency Medical Responder

Indications: Unconscious, unresponsive patients.

Contraindications: Gag reflex present.

Procedure:
1. Pre-oxygenate patient if possible.
2. Measure airway from corner of mouth to earlobe and select proper size.
3. Grasp the tongue and jaw, lifting anteriorly.
4. Insert airway inverted and rotate 180º into place.
5. A tongue depressor may also be used.
6. Ventilate patient and listen for lung sounds.

800-08 Nasopharyngeal Airway

 | Created: September 2018

Authorization: All Paramedics and EMT-Basics,

Indications: Conscious or semiconscious patients unable to control their airway. Clenched jaws, altered LOC, with a gag reflex.

Contraindications: Fluid or blood from ears or nose. Signs of a basilar skull fracture.

Procedure:
1. Pre-oxygenate patient if possible.
2. Measure the tube from the tip of the nose to the earlobe.
3. Lubricate the airway with water-soluble jelly (KY, surgilube, or Xylocaine jelly).
4. Insert tube (attempt right nare first) with bevel of tube toward the septum, angling toward the base of the floor of the nasopharynx, re-assess the airway. If resistance is met in right nare, attempt insertion in left nare.
5. Ventilate patient as needed and listen for lung sounds.

800-10 Oral Endotracheal Intubation

 | Revised: September 2018

Authorization: Paramedics

Indications: Cardiopulmonary arrest, need for definitive airway, positive pressure ventilation, risk of aspiration, aid for assisting ventilation.

Precautions: Can induce hypertension and increased intracranial pressure (ICP) in head injured patients. Can induce vagal response and bradycardia. Can also induce hypoxia related dysrhythmias.

Procedure:

- Prepare, position, and oxygenate the patient with 100% O2.
- If patient is in cardiac arrest, monitor pre-intubation ETCO2 for post-intubation comparison.
- Select proper ETT and stylette and have suction ready. For pediatrics, use Braslow Tape for proper ETT size and blade size.
- Have Gum Elastic Bougie ready if available.
- Using laryngoscope, visualize vocal cords (Miller blade inserted under epiglottis and lifting up on epiglottis visualizing vocal cords / Macintosh blade inserted into vallecula and lifting up visualizing epiglottis and subsequent vocal cords). Use Sellick maneuver/BURP to assist you.
- Limit each intubation attempt to 30 seconds with BVM between attempts.
- Visualize ETT passing through vocal cords and inflate cuff with air if applicable (follow guidelines per ETT for amount of air).
- If difficult airway consider Gum Elastic Bougie and introduce ET tube with it if able.
- Auscultate for absence of breath sounds over epigastrium and then presence of bilateral and equal breath sounds. If present unilateral or unequal, adjust tube position and consider whether this may be the patient's baseline. If unsure of placement, remove tube and ventilate patient with BVM.
- Immediately attach End Tidal CO2 Monitoring cable.
- Document ETT size, result (success), and location at the teeth/gums/lips. Document all devices used to confirm initial tube placement. Also, document negative or positive breath sounds after each movement of the patient. Since ETT's have a high incidence of being misplaced during patient moves, ensure that nothing is attached to the ETT (BVM, vent circuit) during moves. If moving the intubated patient is a very involved process (i.e. – multiple steps or hill), stop periodically to ventilate the patient.
- Secure the ETT with a commercial device or tape.

800-12 King Airway

 | Revised: September 2018

Authorization: Paramedics and EMT-Basics

Indications: Failed intubation or anticipated difficult intubation in patient without a gag reflex.

Precautions: Patients that have ingested caustic substances.

Procedure:

- Select the most appropriate size tube (measured by patient height):
  - Size 3: 4-5 feet (122-155 cm) in height
  - Size 4: 5-6 feet (155-180 cm) in height
  - Size 5: >6 feet (>180 cm) in height
- Apply chin lift and introduce King LTS-D into corner of mouth
- Advance tip under base of tongue, while rotating tube back to midline.
- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
- Inflate cuffs to 60 cmH20. Typical inflation volumes:
  - Size 3: 40-55 ml
  - Size 4: 50-70 ml
  - Size 5: 60-80 ml
- Attach bag-valve device. While gently bagging the patient to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing.
- Check cuff volume. If air is leaking around the cuff, add a small amount of additional air to the cuff.
- When using the gastric access lumen: Lubricate gastric tube (up to an 18Fr) prior to inserting into the King LTS-D.
- When moving a patient with an ETT in place, ensure that nothing is connected to the device during patient move and document tube confirmation after each patient move.

800-13 I-Gel Airway

Revised: September 2018

Procedure:

1. Grasp the lubricated i-gel firmly along the integral bite block (tube portion of the device). Position the device so that the i-gel cuff outlet is facing toward the chin of the patient.
    a. NOTE: be sure that there is only a thin layer of lubricant on the end of the i-gel to avoid blowing it into the lungs with bagging
    b. Suction the upper airway PRIOR to insertion as needed
2. The patient should be in the "sniffing" position, with head extended and neck slightly flexed forward. If cervical injury is suspected, use modified "jaw thrust" instead of any flexion at the neck. The chin should be gently pressed down/inferior before proceeding to insert the igel.
3. Introduce the leading soft tip into the mouth of the patient in a direction toward the hard palate.
4. Glide the device downwards and backwards along the hard palate with a continuous, but gentle push until a definitive resistance is felt.
5. WARNING: Do not apply excessive force on the device during insertion. It is not necessary to insert your fingers or thumbs into the oral cavity of the patient during insertion of this device. If there is resistance during insertion, a 'jaw thrust' and slight rotation of the device is recommended.
6. At this point, the tip of the device should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite block.
7. Auscultate breath sounds, check for chest rise and confirm placement with ETCO2 monitoring and SpO2 monitoring.
8. Secure the tube
9. Place NG tube in side port and advance to appropriate position, apply suction to decompress the stomach
10. Ventilate and continue to monitor tube placement.

800-14 Surgical Cricothyrotomy

 | Created: September 2018

Authorization: Paramedics

Indications: Patients needing emergency airway access and control when they are unable to be adequately ventilated or intubated due to trauma or other causes. This procedure is a last resort airway technique when attempts at ventilation and intubation or other airway devices have failed.

Precautions: Complications include hemorrhage from great vessel or thyroid gland lacerations, damage to surrounding structures, false passage, perforation of the esophagus, subcutaneous or mediastinal emphysema, and/or aspiration.

Procedure:

- Quickly assemble, check, and prepare all equipment. Have suction equipment ready.
- Place patient supine. If patient has a possible spinal injury, maintain in-line immobilization and have second provider assist with c-spine control during surgical cricothyrotomy.
- Cleanse the neck with Betadine swabs.
- Stabilize the larynx using the thumb and middle finger of one hand. Palpate the cricothyroid membrane and pull the skin taut.
- Make a 1 cm horizontal incision at the cricothyroid membrane. A small amount of bleeding is to be expected and you can use sterile 4 × 4's to control bleeding. If severe hemorrhaging ensues apply direct pressure to site.
- Open the airway by inserting the scalpel blade into the incision and rotate it 90° (hemostats or a tracheal spreader can also be used).
- Direct the tube distally in the trachea until the cuff disappears. Inflate the cuff and ventilate the patient.
- Observe chest rise and use all confirmation methods used to confirm traditional ETT placement.
- Secure the tube to the patient.
- Control local hemorrhage with direct pressure.

800-16 Pulse Oximetry

 | Created: September 2018

Authorization: All Paramedics, EMT-Basics, and Emergency Medical Responder

Indications: Obtaining a complete set of vital signs.

Precautions: Accuracy is dependent on adequate perfusion at probe site. Can also be affected by bright lights, carbon monoxide poisoning, cyanide poisoning, nail polish, and cases of polycythemia. Oxygen administration should not be determined by a pulse oximetry reading. It should be administered based on clinical presentation.

Procedure:
1. Find a suitable place for probe; such as finger tips, toes, or earlobes.
2. Attach probe and record reading.
3. May also be used to monitor circulation in extremities with traumatic injuries.
4. If readings are erratic, try a different probe site.

800-18 End Tidal CO2 Monitoring

 | Created: September 2018

Authorization: Paramedics
Indications: All intubated patients and any patient with significant respiratory distress.
Contraindications: Do not use on patients younger than 3 years of age or less than 22 lbs.
Procedure:

- Prepare capnography function on cardiac monitor by plugging adaptor into monitor.
- Place airway adapter between ETT and bag-valve device or apply nasal cannula device to patients with their own respiratory drive.
- $ETCO_2$ level will be measured at each patient expiration.

Capnography pearls:

TUBE PLACEMENT: Confirm via presence of a *square* waveforms only, not by the measured ETCO2 value, and document accordingly.
APNEA ALARM: Capnography will monitor and alarm you if the patient becomes apneic for any reason. Common causes that warrant this include narcotic or benzodiazepine overdose, sedative or anxyolitic administration, and generalized seizures.
BRONCHOSPASM: A sloped upstroke into the plateau phase is indicative of bronchospasm as is most commonly seen in asthma patients. Shark fin morphology indicates severe bronchospasm.

Capnometry pearls:

SHOCK : ETCO2 of 20 is generally accepted as the threshold in the transition between compensated and decompensated shock.
Can be helpful with ACS patients when determining stable vs. unstable.
DKA:
ETCO2 ≥35 with glucometry reading of "High" ≠ DKA.
ETCO2 ≤ 21 with glucometry reading of "High" = DKA
SEPSIS:
ETCO2 <25 with 2 or more SIRS criteria is highly predictable of sepsis.
SIRS criteria:
Temp NOT between 96.8 – 100.4F
RR > 20
HR > 90

800-20 Oxygen Delivery

 | Created: September 2018

Authorization: All Paramedics, EMT-Basics, and Emergency Medical Responder

Indications: Any patient standing to benefit from higher levels of tissue oxygenation. Patients presenting with or at risk for ventilatory compromise.

Procedure:
1. Explain the procedure to the patient.
2. Select appropriate adjunct and connect to oxygen port.
3. Flush the device with oxygen before application.
4. Apply the device to the patient and set the appropriate flow rate:
    a. 2 – 6 lpm for nasal cannula (24 – 44% Fi O_2).
    b. 10 – 15 lpm for nonrebreather mask (80 – 100% Fi O_2).
    c. 15 lpm flush for bag-valve mask device (100% Fi O_2).
5. Monitor patient for effects.

800-22 Blood Glucose Test

 | Created: September 2018

Authorization: Paramedics and EMT-Basics

Indications: Suspected hypo- or hyperglycemia

Procedure:

- Determine the appropriate site for obtaining a blood sample.\
- Prepare blood glucose monitor and necessary equipment.
- Prepare the site of puncture by cleaning with an alcohol swab.
- Puncture site with approved instrument and obtain blood sample.
- Clean site of puncture and control any excess bleeding as necessary.
- Allow glucose monitor to process blood sample and document the numerical reading.
- Repeat this process as needed to obtain an accurate reading or after medical treatment produces a change in patient's condition.

800-24 12 Lead Electrocardiogram

 | Created: September 2018

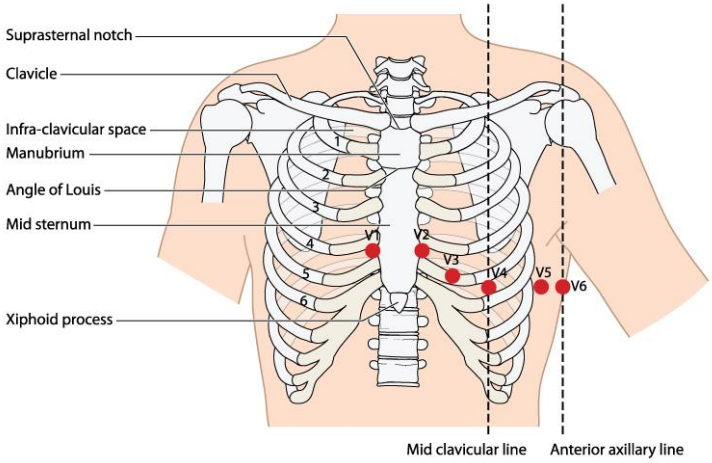
Authorization: Paramedics and EMT-Basics

Indications:

- All patients being treated for chest pain, syncope, or a suspected cardiac event.
- Any patient with return of spontaneous circulation following cardiac arrest.
- Suspected drug/medication/poly-pharmacological overdose.
- Electrical injuries, including application of taser by law enforcement.

Procedure:

- Assess patient and monitor cardiac status with limb leads.
- Prepare ECG monitor and connect patient cable with electrodes.
- Enter the required patient information into the monitor.
- Expose and prep chest. Modesty of the patient should be respected.
- Apply chest leads and extremity leads using the following landmarks:
  a. RA -Right arm
  b. LA -Left arm
  c. RL -Right leg
  d. LL -Left leg
  e. V1 -4th intercostal space at right sternal border
  f. V2 -4th intercostal space at left sternal border
  g. V3 -Directly between V2 and V4
  h. V4 -5th intercostal space at midclavicular line
  i. V5 -Level with V4 at left anterior axillary line
  j. V6 -Level with V5 at left midaxillary line
- Instruct patient to remain still.
- Press the appropriate button to acquire the 12 lead ECG
- EMT-Basic may perform and Transmit or Handoff copy of 12 lead, not interpret



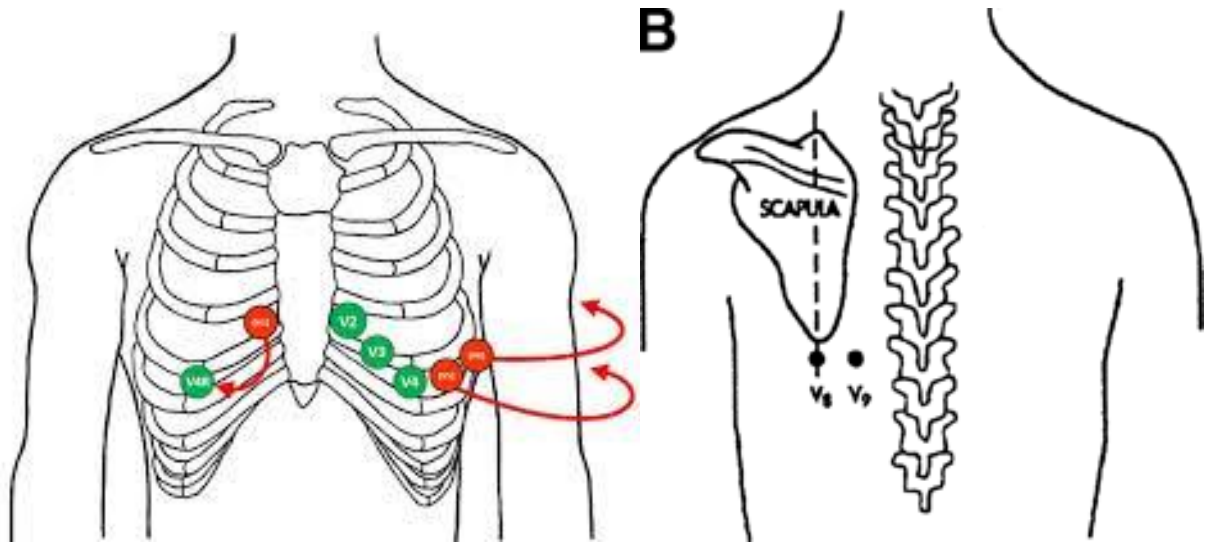
800-26 15 Lead Electrocardiogram

 | Created: September 2018

Authorization: Paramedics

Indications:
1. Should be done on all Inferior MIs (ST-elevation in leads II, III, aVf)
2. Used to locate isolated Posterior MI (ST-depression in lead V1 is good indicator)
3. No ST-segment changes in presence of chest discomfort

Procedure:
1. Obtain 12-lead ECG
2. Move lead V1 or V4 to V4R (5th intercostal space midclavicular line on right side of patient)
3. Move lead V5 to V8 (On the back, 5th intercostal space, mid-scapular line)
4. Move lead V6 to V9 (On the back, 5th intercostal space, between V8 and the spine)
5. Run second 12-lead
6. Label the different leads



800-28 Temperature

 Created: September 2018

Authorization: Paramedics and EMT-Basics only

Indications: Patients with suspected increased or decreased body temperature.

Contraindications: Blood or body fluids in the ear canal, or trauma to the ear or temporal region of the head.

Precautions: Temperature may need to be taken 3 times and the highest temperature documented. The ear must be free from obstructions or excess earwax. Temperature may differ in each ear and should be taken in the same ear each time. External factors may influence ear temperatures.

Procedure:

- Select Location for temperature
  - Verify that the oral model icon is selected by observing the flashing head icon on the instrument's display. If this icon is not flashing, press the Mode Selection button until the head icon appears.
  - Verify that the axillary mode is selected by observing the correct flashing axillary icon on the instrument's display. If this icon is not flashing, press the Mode Selection button to select the Adult Axillary or Pediatric Axillary icon is displayed.
- Load a probe cover by inserting the probe into a probe cover and pressing the probe handle down firmly. The probe handle will move slightly to engage the probe cover.
- With the Oral Mode indicator flashing, quickly place the probe tip under the patient's tongue on either side of the mouth to reach the rear sublingual pocket. Have the patient close his/her lips around the probe.
- Hold the probe in place, keeping the tip of the probe in contact with the oral tissue throughout the measurement process. Rotating "walking" segments appear on the display, indicating that measurement is in progress.
- The unit will beep three times when the final temperature is reached.
- After the temperature measurement is complete, remove the probe from the patient's mouth. Eject the probe cover by firmly pressing the ejection button on the top of the probe.
- Return the probe to the probe well. The LCD display will go blank.

Adult Oral Icon	*Adult Axillary*	*Pediatric Axillary*
		

800-30 Automated External Defibrillator

 | Revised: September 2018

Authorization: All Paramedics, EMT-Basics, EMRs

1. Make sure you, the victim, and any bystanders are safe.
2. If the victim is unresponsive and not breathing normally, send someone for the AED and to call for an ambulance.
3. Start CPR according to the guidelines for BLS.
4. As soon as the defibrillator arrives
5. switch on the defibrillator and attach the electrode pads. If more than one rescuer is present, CPR should be continued while this is carried out.
6. follow the spoken/visual directions
7. Note: ACAD EMT's are allowed to utilize the AED mode of the Lifepak 12 or 15 by pressing the analyze button once the pads are on the patient.
8. ensure that nobody touches the victim while the AED is analyzing the rhythm
9. If a shock is indicated
    1. ensure that nobody touches the victim
    2. push shock button as directed (fully automatic AEDs will deliver the shock automatically)
    3. continue as directed by the voice/visual prompts
10. If no shock indicated
    1. immediately resume CPR, using a ratio of 30 compressions to 2 rescue breaths
    2. continue as directed by the voice/visual prompts
11. Continue to follow the AED prompts until
    1. qualified help arrives and takes over
    2. the victim starts to breathe normally
    3. you become exhausted

Note: There may be outside agencies that are allowed to fall under Andrew County Ambulance District's Automated External Defibrillator guideline as long as there is a written agreement between the ambulance District and the agency. In all cases the person operating the AED must have had training to operate the device.

800-32 EZ-IO Insertion

Authorization: Paramedics

- Select Insertion Site
  - Proximal Tibia : Identify anteromedial aspect of the proximal tibia (bony prominence below knee cap). The insertion location will be 1-2 cm (2 finger widths) below this.
  - Humeral Head : Place the patient palm on the umbilicus and elbow on the stretcher. Use your thumb to identify the humeral shaft, slide thumb towards humeral head with firm pressure. Locate tubercule by prominent bulge. Use the opposite hand to pinch inferior and superior humerus ensuring that you are midline on the humerus.
- Prep the site with Iodine.
- Remove EZIO device from container and ensure appropriate needle is attached (Blue for Adults, Yellow for Bariatric, and Pink for Pediatrics). DO NOT remove IO from the shuttle – EZIO gun will attach to the device when they are connected.
- Remove the EZIO gun from the needle shuttle and remove the protective cap from the needle. DO NOT TOUCH NEEDLE FOR ANY REASON.
- Hold the needle at a 60 to 90 degree angle and pierce skin until bone resistance is felt (aim away from nearby joint and epiphyseal plate).
- Power the driver and while applying gentle pressure until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
- Remove the stylette and place in a sharps container.
- Attach the syringe filled with at least 5mL of NS. Aspirate for bone marrow and inject the NS to clear the lumen of the needle. Watch for signs of misplacement.
- Consider administration of Adult Dose ***Lidocaine 10 to 20mg (1 to 2mL)*** in patients who experience infusion-related pain.
- Place NS on pressure bag – IO’s do not flow to gravity;
- Any medication that can be infused via a peripheral IV can be infused IO.

800-34 Intravenous Access

Authorization: Paramedics

- Select Tubing
  - Macrodrip (10 or 15 gtt Tubing) most cases, especially trauma
  - Microdrip (60 gtt Tubing) – pediatrics, fluid restriction
  - Saline Lock – Route of Medication only
- Apply tourniquet and cleanse site area.
- Insert needle into skin, noting blood return (flashback).
- Advance catheter.
- Attach tubing
- Check patency with 10mL bolus.
- Secure with tape or veniguard.
- Adjust rate as desired.

Notes:

Trauma IV catheters should be a minimum of 18 gauge.

If more than 3 attempts are required for initiation of an IV, the patient should be transported with further attempts as necessary en route.

800-36 Medication Administration

General Considerations

- All medication administrations must be carefully documented including times, route, dosage, site and effects.
- Medication administration should strictly follow protocol. Any deviation from protocol requires direct Medical Control and should be documented according to policy.
- Any medication administration requires accurate and complete assessment of patient's known drug allergies.
- Select the correct medication. Confirm orders, dosage, expiration date, and check drug for cloudiness or particulates.

Intramuscular (IM) Injection

Authorization: Paramedics
Indications: Patient requiring medication when IV access is hindered.
Contraindications: Shock or cases of decreased perfusion, severe burns, patients with cardiac complaints.
Procedure:

- Assemble appropriately sized equipment:
  a. Syringe of sufficient size to hold medication.
  b. Needle: 21 – 25 gauge, 1" to 1½" in length.
- Select appropriate site
  a. Maximum 1 ml (at one site) into deltoid.
  b. Maximum 3 ml (at one site) into gluteus.
- Cleanse site with aseptic technique.
- Stretch skin taut and press down to facilitate entry into muscle.
- Enter skin at a 90 degree angle.
- Aspirate the syringe to assure you are not in a vein. If blood return is seen, withdraw and try at another site.
- Inject medication slowly. Remove syringe and dispose in sharps container.
- Cover injection site with an adhesive strip.
- Observe patient for effects and document them on patient's report form.

Intravenous (IV) Drip

Authorization: Paramedics
Indications: To facilitate administration of a mixed medication drip or to administer IV fluids through a saline lock.
Procedure:

- Calculate appropriate dosage and flow rate.
- Select appropriate tubing for administration of medication. Spike the bag with the tubing; flush tubing with the drug solution.
- Secure and label the medication drip bag.
- Lower the primary infusion bag below the secondary line of the medication being infused.
- Open piggyback line and set rate. Stop flow from primary line.
- Observe patient for effects and document them on the patient's report form.

Intravenous (IV) Push

Authorization: Paramedics
Indications: For rapid IV bolus or slow IV push as indicated by the specific drug.
Procedure:

- Cleanse the injection port closest to the injection site.
- Puncture the injection port with needle.
- Pinch off tubing above injection port.
- Inject drug at appropriate rate.
- Flush medication with IV fluid and resume IV flow rate.
- Evaluate patient's response to the medication.
- Document the time, dose, route, site, and patient's response to therapy.

Inhalation (Small Volume Nebulizer)

Authorization: Paramedics
Indications: Bronchodilator therapy as indicated by protocol.
Procedure:

- Add medication to reservoir of nebulizer. Add saline solution if necessary to equal 3 ml total volume. Albuterol medication vials do not need saline added.
- Connect oxygen tubing to nebulizer and set flow rate at 6 – 8 lpm.
- Have patient take deep breaths, holding for a second, and then exhaling through the tube.
- If patient is unable to hold nebulizer, use the nebulizer mask.
- Medication is delivered in 5 - 10 minutes.
- Assess and record lung sounds before and after treatments.

Mucosal Atomization Device (MAD)

Authorization: Paramedics
Indications: To facilitate administration of a specific medications in a quick manner when IV/IO administration is delayed.
Procedure:

- Draw up desired dose of medication to be administered in a syringe.
- Attach MAD atomizer to syringe and expel any air in syringe.
- Insert atomizer into nostril 1.5 cm and briskly compress syringe plunger to properly atomize half of the dose into the nostril.
- Apply atomizer to remaining nostril and repeat step 3.
- Have working suction available for possible run-off and to protect the airway.
- If no improvement after 3 minutes, establish an IV if not already done and administer medication IV.
- Observe patient for effects and document them on patient's report form.
- Administration of the medication may be inhibited due to trauma and/or bleeding from the nose, previous surgery to the nasal cavity, or excessive mucous build up in the nasal passages.
- Inhalation of narcotics that may constrict blood flow in the mucous membranes, and patients with perfusion compromise such as severe hypotension and severe vasoconstriction.

Endotracheal Tube (ETT) Push

Authorization: Paramedics

Indications: Intubated patients who require Epinephrine or Atropine and provider has attempted but failed to gain IV/IO access.

Precaution: ETT medication delivery has shown varied degrees of effectiveness and should be considered a last resort route. The medication in the tube may also interfere with capnography device readings by partially or completely clogging the device's gas intake port.

Procedure:

- Prepare desired medication (Epinephrine, Atropine, or Naloxone) at twice the dosage indicated for IV/IO route.
- Hyperventilate the patient with several consecutive ventilations and 100% oxygen.
- Disconnect the bag-valve mask from the endotracheal tube connector and instill no more than 5 ml (adults) or *2 ml (pediatrics)* of medication at any one time into tube.
- Reconnect the BVM and rapidly hyperventilate the patient with several full breaths before administering any remaining amount of medication.
- After administering the required amount of medication, ventilate the patient for a minimum of one minute before repeating any medication to allow complete dispersal of remaining medications in the lungs.

800-38 Needle Decompression

 | Created: September 2018

Authorization: Paramedics

Indications: Increased ventilatory pressure resulting in difficulty ventilating the patient (with an open airway). Signs of a tension pneumothorax, including:

- Absent lung sounds on affected side.
- JVD (may not be present with massive blood loss).
- Hypotension (no radial pulses).
- Increasing respiratory distress.

Contraindications: None in the presence of a tension pneumothorax.

Procedure:

- Eliminate ½ the volume from a 10ml pre-filled saline syringe and attach to hub of decompression needle
- Identify the 2nd or 3rd intercostal space along the mid-clavicular line of the affected side.
- Quickly prep the area with an aseptic technique.
- Insert decompression needle in a 90_0 angle to the chest wall just over the top of the 3rd rib. If that anatomical location is not available, place the decompression needle in the same manner in the 5th intercostal space along the mid-axillary line.
- Insert the needle into the parietal pleura until air escapes. (Note: If a steady flow of blood escapes, withdraw decompression needle.) As the trapped air is expelled you will see air bubbles in the syringe and the plunger will be forced outward. Do not advance the needle any further than the point at which you achieved air release. The catheter alone should be advanced at this point until the hub is seated against the chest wall.
- Remove the needle completely from the catheter and dispose of properly.
- Assess patient. Relief from a tension pneumothorax should be almost immediately evident by the patient's clinical presentation as well as improved vital signs.
- Re-assess frequently for re-development of this condition.
- In the event the tension pneumothorax returns, the procedure may be repeated.

800-40 Rapid Extrication

 | Created: September 2018

Authorization: All Paramedics, EMT-Basics, and Emergency Medical Responder

Indications: Unstable patients with immediate life threats who also have indications for spinal motion restriction.

Procedure:
1. One rescuer must stabilize the c-spine in neutral position.
2. Do a rapid primary survey and initiate interventions as necessary.
3. Apply the correctly sized c-collar.
4. Slide long backboard under the patient's buttocks.
5. Rescuer standing outside of the vehicle takes control of c-spine stabilization.
6. A rescuer positions themselves on the opposite side of the vehicle ready to rotate the legs around.
7. Another rescuer, positioned beside the patient. By holding the upper torso, works together with the rescuer holding the legs to carefully turn the patient as a unit.
8. The patient is turned so that their back is towards the backboard. The legs are lifted and the back is lowered to the backboard. The neck and back are not allowed to bend during this procedure.
9. Carefully slide the patient to the full length of the backboard and straighten legs.
10. Move the patient to the ambulance stretcher (cot), then remove the long backboard from beneath the patient while limiting movement of the patient. Transport patient secured to the ambulance stretcher.

800-41 Optimum Traction Splint

Authorization: Paramedics and EMT-Basics

Indications - Suspected closed femur fracture.

Contraindication - Open femur fracture.

Procedure:
1. Check CPMS
2. One Rescuer must stabilize and pull traction on affected leg
3. Expose injured leg
4. Attach ankle hitch
5. Place Ischial strap (2 plastic tube holders on lateral aspect of leg)
6. Measure pole 3-3 inches below foot and fold pole as needed to make proper length
7. Attach yellow loop to traction pole
8. Pull red tipped strap to pull traction
9. Place Support Straps
    a. Red – Thigh
    b. Yellow – Below Knee
    c. Green – Above Ankle
10. Reassess CPMS

800-42 Hare Traction Splint

 | Created: September 2018

Authorization: Paramedics and EMT-Basics

Indications - Suspected closed femur fracture.

Contraindication - Open femur fracture.

Procedure

1. Upon recognizing the injury, Rescuer One should stabilize leg in the position found.
2. Rescuer Two will then expose the injured leg.
   a. Assess neurological function distal to injury site.
   b. Assess circulatory function distal to injury site.
3. Rescuer Two should prepare traction splint.
   a. Position splint against uninjured leg.
   b. Place the ischial pad against the iliac crest.
   c. Adjust splint to length, extending the splint so that the bend is even with the heel of the foot.
   d. Tighten locking collars.
   e. Open and position the Velcro straps along the splint.
   f. Release the ratchet, extending the entire length of the traction strap.
   g. Place the splint next to the injured leg.
4. Rescuer Two should apply the ankle hitch to the patient and apply gentle but firm traction.
5. Rescuer One will now move the splint into position. The splint should be firmly seated against the ischial tuberosity.
6. Rescuer One secures the pubic strap. The strap is brought over the groin and high over the thigh and secured.
7. Rescuer One attaches the ankle hitch to the traction strap.
8. The traction strap is taken in, applying mechanical traction until the pain and muscle spasms are relieved.
   a. Maintain manual traction until the mechanical traction takes over.
   b. Traction can be stopped when the injured leg is approximately the same length as the uninjured leg.
9. Secure the remaining Velcro straps around the leg.
10. Reevaluate all of the straps. When splint is properly applied, the patient's foot should be upright.
11. Reassess circulatory and neurological function distal to injury site. Compare to original findings and note any changes.
12. Transport patient on firm surface, such as a long spine board, so that the splint is supported.

800-44 Sager Traction Splint

 | Created: September 2018

Authorization: TCAD Paramedics and EMT-Basics only

Indications: Closed mid-shaft and distal femur fractures

Contraindication: Open femur fracture. Hip, pelvic and/or knee fractures and dislocations

Procedure:

1. Apply manual stabilization to the injured leg and assess motor, sensory, and distal circulation.
2. Properly measure the splint to the unaffected leg, lengthening it approximately to the heel of the unaffected leg.
3. Place the splint at the inner thigh, apply the ischial strap underneath the patient's leg, pressing the half ring pad up firmly against the ischial tuberosity.
4. Secure the ischial strap snugly.
5. Secure the ankle hitch.
6. Apply mechanical traction until pain is relieved or 10% of body weight is achieved. Maximum traction applied should not exceed 15 pounds. The Sager splint may be used for immobilization of bilateral fractures. In this situation, both ankle hitches must be utilized and the maximum traction applied should not exceed 30 pounds. The legs should be secured together using the large Velcro strap.
7. Apply Velcro support straps.
8. Fold lever down to maintain traction.
9. Velcro straps should not be placed over injury sites or joints.
10. Reassess motor, sensory and distal circulation.
11. Secure the patient to a long board and assess motor, sensory, and distal circulation frequently.

800-46 Scoop Stretcher

 | Created: September 2018

Authorization: All Paramedics and EMT-Basics

Indications: Patients requiring assisted movement to the stretcher.

Procedure:
1. Maintain manual in-line c-spine stabilization.
2. After application of appropriate cervical collar, place extra rescuers to control the thorax, pelvis, and legs.
3. Adjust the length of the scoop stretcher.
4. Separate the two sides of the scoop stretcher.
5. Place one piece of the scoop stretcher on each side of the patient.
6. Leave the patient's arms at their side.
7. Lift the patient slightly and slide the stretcher into place, one side at a time.
8. Lock the two pieces of the stretcher together starting with the foot end, then the head. Be careful not to pinch the patient.
9. Move the patient to the ambulance stretcher (cot). Remove the scoop stretcher, in the opposite manner in which it was applied, while limiting movement of the patient. Secure with cot straps and transport in position of comfort.

800-48 Physical Restraints

 | Created: September 2018

Authorization: Paramedics

Indications:
1. A patient who needs to be transported for medical care and has been determined by law enforcement or by physician orders to require restraint.
2. To facilitate treatment of a patient who is or may become a threat to themselves.
3. Patient whose actions may interfere or prevent the provider to perform or maintain medically necessary interventions for that patient.

Precautions:
1. Any attempt at restraint involves risk to patient and provider. Do not attempt to restrain a patient without adequate assistance.
2. Physical restraints are a last resort. All possible means of verbal persuasion should be attempted first.
3. Never restrain a patient in a prone position, but rather in a supine position (or lateral position if there is risk of aspiration).

Contraindications:
1. A patient who is alert, oriented, aware of their condition, and capable of understanding the consequences of their refusal is entitled to refuse treatment. They may not be restrained and treated against their will.
2. Patients may only be restrained by medical providers for medically-necessary care and interventions. Patients may not be restrained *solely* for provider safety or preference; that may only be performed by law enforcement.

Procedure:
1. Obtain adequate manpower for assistance. Organize your help in advance. Assign at least one person to each limb. A fifth person can coordinate the procedure.
2. Have all equipment ready.
3. Treat the patient with respect. Explain to the patient why they are being restrained.
4. Restrain arms and legs by utilizing only soft restraints manufactured for use in the healthcare setting. Do not utilize “improvised” restraints.

800-50 TASER Dart Removal

Authorization: All Paramedics and EMT-Basics

Removing TASER Darts in the Field without Transport to an Acute Care Facility Criteria for treatment and subsequent refusal of transport:

- After a fifteen-minute observation period in the field (starting from arrival at patient's side) all of the following criteria must be met:
  - Patient must have a GCS of 15
  - Patient must have a heart rate of <110 bpm, respiratory rate >12, O2 saturation >94%, systolic blood pressure >100mmHg and <180mmHg
  - No dart has penetrated the eye, face, neck, breasts (females), axilla or genitals
  - Patient has no other acute medical or psychiatric condition requiring medical evaluation, such as:
    - Traumatic injury sustained in TASER induced fall or police encounter
    - Hypoglycemia
    - Acute psychiatric disturbance or agitated delirium
  - No tetanic muscle contractions
  - Patient is not requesting transport to hospital.
  - Patient is 17 years of age or older
  - Patient has had tetanus booster in last ten years. If tetanus status is unknown, the patient may be taken to hospital by police if all other treat and release criteria are met. (Police are to be informed that it is the responsibility of the police service to ensure that the patient receives a tetanus booster within 72 hours. This advice must be documented in the PCR.)
  - All darts which have been deployed are accounted for

TASER Dart Removal

- Ensures that the TASER device is no longer applying electrical charge prior to contacting the patient, darts, or wires.
- Use scissors to cut the wire at the base of each dart cylinder to disconnect the dart(s).
- Wearing gloves, grasp the cylinder of the TASER dart between the thumb and index finger of one hand. Remove the dart with a quick, firm pull directed perpendicular to the skin surface. Dispose of the dart in a dispense cap of TASER and give to law enforcement for evidence, being careful not to poke oneself with the barb. Repeat this step for each embedded dart.
- Cleanse each dart wound and the surrounding skin with alcohol pad.
- Cover each area with a Band-Aid or other sterile dressing. Inform the patient and police that this may be removed in 24 – 48 hours.
- Ask the patient if they would like to be taken to the hospital. If the patient refuses, Document refusal

800-52 Trauma Tourniquet

Authorization: All Paramedics and EMT-Basics

Indications:

- Life threatening arterial hemorrhage
- **Serious or life threatening** extremity hemorrhage and tactical consideration prevent the use of standard hemorrhage control techniques

Contraindications:

- Non – Extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

Procedure:

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappears
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds
6. If delayed or prolonged transport and tourniquet application time greater than 2 hours, contact medical control
7. Include Tourniquet in use in your report to the Trauma Center as soon as practical and in your documentation for the PCR
8. If bleeding persists consider applying second tourniquet

800-54 CPAP

Authorization: All Paramedics

Indications:

- 16 years old
- Alert with an intact airway and ventilatory drive
- Respiratory distress in the conscious patient with impending respiratory failure (accessory muscle use, retractions, abdominal breathing, tri-pod positioning, unable to speak in full sentences)
- Refractory to conventional Oxygen therapy (does not respond to non-rebreather)
- Tachypnea (Respiratory rate > 24)
- Presumed Pulmonary Edema, COPD, Asthma, or Near Drowning

Contraindications:

- Hypotension
- Aspiration Risk (Inability to control their own airway)
- Decreased LOC (Unable to follow commands)
- AMI or Unstanble cardicac arrhythmia
- Extreme Anxiety

Procedure:

- Check oxygen supply, set up CPAP and connect circuit to oxygen source.
- Explain procedure to patient.
- Place CPAP mask over the patient's mouth and nose.
- If medication is indicated i.e. NTG administer prior to securing mask.
- Secure mask with provided straps and ensure there is an airtight seal. Some patient's may need coaching or may need to hold the mask themselves prior to securing straps to avoid anxiety.
- Monitor patient's respiratory status and vital signs with frequent reassessment. If the patient's respiratory status does not improve remove CPAP, assist ventilations with a BVM and consider intubation.
- Document time and response on patient care report (PCR)

Medication Formulary

The information contained in this formulary was compiled from; ACAD Medical Director, Stephanie Davis, D.O.; ACAD Director, Blake Rudel, EMT-P; The American Heart Association's Advanced Cardiac Life Support and Pediatric Advanced Life Support courses; The 2016 Children's Mercy Hospitals and Clinics, Kansas City, Pediatric & Neonatal Resuscitation Guidelines; The 36th Edition of *Nursing Drug Handbook*, 2016 Wolters Kluwer; The 8th Edition of *Pharmacology: A Patient-Centered Nursing Process Approach*, 2015 Saunders.

Note:

Doses are not listed in the Medication Formulary, they are listed in each individual protocol. The formulary is intended as a reference only.

Adenosine

(Adenocard, Adenoscan)

Class:

Pharmacological class – Nucleosides
Therapeutic class – Antiarrhythmic

Description:

Adenosine is a naturally occurring nucleoside that slows AV conduction through the AV node. It has an exceptionally short half-life and relatively good safety profile.

Mechanism of Action:

Naturally occurring nucleoside that acts on the AV node to slow conduction and inhibit reentry pathways. Drug is also useful in treating paroxysmal supraventricular tachycardia's (PSVT), including those with accessory bypass tracts (Wolf-Parkinson-White syndrome).

Onset IV: Immediate Peak: Immediate Duration: Unknown

Indications:

Adenosine is used to convert paroxysmal supraventricular tachycardia (PSVT) to sinus rhythm.

Contraindications:

Adenosine is contraindicated in patients with symptomatic bradycardia, second or third degree heart blocks, sick sinus syndrome, asthma, emphysema, bronchitis or those with known hypersensitivity to the drug.

Precautions:

Adenosine typically causes arrhythmias at the time of cardioversion; in extreme cases transient asystole may occur.

Side Effects:

Facial flushing, headache, shortness of breath, chest pain, dizziness and nausea, hypotension, arrhythmias, heart blocks.

Interactions:

Carbamazepine may cause high-level heart block. Digoxin and verapamil may cause ventricular fibrillation. Methylxanthines (Aminophylline and Theophylline) may decrease the effectiveness of Adenosine, requiring larger doses. Dipyridamole (Persantine) can potentiate the effects of Adenosine.

Albuterol

(AccNeb, Airomir, ProAir HFA, Proventil-HFA, Salbutamol, Ventolin HFA, VoSpire ER)

Class:

Pharmacological class – Adrenergic
Therapeutic class – Bronchodilator

Description:

Albuterol is a sympathomimetic that is selective for $Beta_2$ adrenergic receptors.

Mechanism of Action:

Albuterol relaxes bronchial, uterine, and vascular smooth muscle by stimulating $Beta_2$ receptors.

Onset Inhalation: 5–15 minutes Peak: 30-120 minutes Duration: 2-6 hours

Indications:

To prevent or treat bronchospasm.

Contraindications:

Known hypersensitivity to the drug.

Administration:

Adult – 2.5 mg nebulized

Pediatric – 2.5 mg nebulized

Precautions:

Use caution with those with cardiovascular disease or hypertension.

Side Effects:

Tachycardia, palpitations, stimulation, anxiety, dizziness, headache, nervousness, tremors, hypertension, arrhythmias, chest pain, nausea, vomiting, altered taste.

Interactions:

When used with other sympathetic agonists, side effects can be increased. Beta-blockers may blunt the effects of Albuterol.

Amiodarone Hydrochloride

(Cordarone, Nexterone, Pacerone)

Class:

Pharmacological class – Benzofuran derivatives
Therapeutic class – Antiarrhythmics

Description:

Amiodarone is a class III antiarrhythmic agent used to treat ventricular arrhythmias.

Mechanism of Action:

Effects result from blockade of potassium chloride, leading to a prolongation of action potential duration.

Onset IO/IV: Unknown Peak: Unknown Duration: Variable

Indications:

Ventricular fibrillation. Ventricular tachycardia.

Contraindications:

Known hypersensitivity to the drug or iodine. Cardiogenic shock, Bradycardia, second or third degree heart blocks.

Precautions:

Use cautiously with other antiarrhythmics, beta-blockers, and calcium channel blockers.

Side Effects:

Hypotension, bradycardia, arrhythmias, heart failure, heart blocks, nausea, and vomiting. Monitor for signs of pulmonary toxicity such as dyspnea and cough.

Interactions:

Warfin, Digoxin, Procanamide, Quinidine, and Phenytoin.

Aspirin

Class:

Pharmacological class – Salicylates
Therapeutic class – NSAIDs/Aggregator Inhibitor

Description:

Aspirin is an anti-inflammatory agent and an inhibitor of platelet function.

Mechanism of Action:

Aspirin blocks the formation of the substance thromboxane A_2, which causes platelets to aggregate and arteries to constrict.

Onset PO: 5-30 minutes Peak: 25-40 minutes Duration: 1-4 hours

Indications:

Aspirin is used for new chest pain suggestive of acute myocardial infarction.

Contraindications:

Known hypersensitivity to the drug. Bleeding disorders.

Precautions:

Aspirin can cause gastrointestinal upset and bleeding. Aspirin should be used with caution in patients who report allergies to NSAIDS.

Side Effects:

Heartburn, gastrointestinal bleeding and distress, prolonged bleeding.

Interactions:

When administered with ACE inhibitors and Beta-blockers, may decrease antihypertensive effects. When given with other NSAIDS, may cause an increased incidence of side effects.

Atropine Sulfate

Class:

Pharmacological class – Anticholinergics – Belladonna Alkaloids
Therapeutic class – Antiarrhythmics

Description:

Atropine is a parasympatholytic that is derived from parts of the Atropa Belladonna plant.

Mechanism of Action:

Inhibits acetylcholine at parasympathetic neuroeffector junction, blocking vagal effects on SA and AV nodes, enhancing conduction through AV node and increasing heart rate.

Onset IO/IV: Immediate Peak: 2-4 minutes Duration: 4 hours

Indications:

Hemodynamically significant bradycardia.

Contraindications:

Known hypersensitivity to the drug. Acute angle glaucoma. Asthma.

Precautions:

Use caution with down-syndrome patients.

Side Effects:

Blurred vision, dilated pupils, dry mouth, tachycardia, bradycardia, drowsiness, confusion, palpitations, anxiety, dizziness, headache, nervousness, rash, nausea, and vomiting.

Interactions:

Anticholinergics, drugs with anticholinergic effects (amantadine, antiarrhythmics, antiparkinsonians, glutehimide, meperidine, phenothiazines, TCAs). Ketoconazole, Levodopa.

Calcium Chloride 10%

Class:

Pharmacological class – Calcium salts
Therapeutic class – Calcium supplements

Description:

Calcium Chloride provides elemental calcium in the form of cation. Calcium is required for many physiological activities.

Mechanism of Action:

Replaces calcium and maintains calcium.

Onset IO/IV: Immediate Peak: Immediate Duration: 30 minutes – 2 hours

Indications:

Acute hyperkalemia, acute hypocalcemia, calcium channel blocker toxicity.

Contraindications:

Cancer patients with bone metastases. Ventricular Fibrillation.

Precautions:

Check vein patency prior to administration. Use cautiously with Digitalis.

Side Effects:

Bradycardia, heat waves, hypotension, arrhythmias, syncope, nausea, vomiting, cardiac arrest.

Interactions:

Atenolol, tetracyclines, cardiac glycosides, Verapamil.

Dextrose

(Oral Glucose, Glutose)

Class:

Pharmacological class – Carbohydrate
Therapeutic class – Antihypoglycemic

Description:

Dextrose also known as glucose is a simple sugar that is used to increase the level of blood glucose when the level falls to low.

Mechanism of Action:

Increases blood glucose level.

Onset PO: 1 minute Peak: Unknown Duration: Varies

Indications:

Hypoglycemia.

Contraindications:

Unprotected airway. Patient cannot swallow.

Precautions:

Make sure that the patient can swallow and protect their airway.

Side Effects:

Aspiration.

Interactions:

None.

Dextrose 5%

(D5W)

Class:

Isotonic crystalloid intravenous solution

Description:

5% Dextrose in water is packaged as an isotonic carbohydrate (sugar solution) that contains glucose (sugar) as the solute.

Mechanism of Action:

An intravenous sugar solution that is used for intravenous therapy, where it may function both as a means of maintaining tissue hydration and a means of parenteral nutrition. D5W is a isotonic crystalloid solution that is used to dilute IV medications for administration.

Indications:

To dilute IV medications for administration.

Contraindications:

There are no significant contraindications for IV administration of 5% Dextrose in water.

Precautions:

Compatibility of medication and dextrose must be checked as dextrose can affect the stability and tonicity of some medications.

Side Effects:

There are no significant side effects for 5% Dextrose in water in emergency care.

Interactions:

There are no significant interactions for 5% Dextrose in water in emergency care.

Dextrose 10%

(D10)

Class:

Pharmacological class – Carbohydrate caloric agents
Therapeutic class – Nutritional supplements

Description:

10% Dextrose is a concentrated, high-carbohydrate solution given to treat hypoglycemia or insulin shock.

Mechanism of Action:

Dextrose increases blood glucose levels, it may decrease body protein, and nitrogen losses, promote glycogen deposition, and decrease or prevent ketosis if sufficient doses are given. It is a hypertonic solution and, when administered intravenously, causes cellular dehydration.

Onset IV: 1 minute Peak: Depends Duration: 30 minutes

Indications:

Hypoglycemia.

Contraindications:

There are no significant contraindications for IV administration of 10% Dextrose in emergency care.

Precautions:

10% Dextrose is highly irritating to veins. Phlebitis can occur. Extravasation of the solution can cause tissue sloughing and necrosis.

Side Effects:

There are no significant side effects for 10% Dextrose in emergency care.

Interactions:

There are no significant interactions for 10% Dextrose in emergency care.

Dextrose 25%

(D25)

Dilute 50% Dextrose 1:1 with Normal Saline

Class:

Pharmacological class – Carbohydrate caloric agents
Therapeutic class – Nutritional supplements

Description:

25% Dextrose is a, high-carbohydrate solution given to treat hypoglycemia or insulin shock.

Mechanism of Action:

Dextrose increases blood glucose levels, it may decrease body protein, and nitrogen losses, promote glycogen deposition, and decrease or prevent ketosis if sufficient doses are given. It is a hypertonic solution and, when administered intravenously, causes cellular dehydration.

Onset IV: 1 minute Peak: Depends Duration: 30 minutes

Indications:

Pediatric Hypoglycemia.

Contraindications:

There are no significant contraindications for IV administration of 25% Dextrose in emergency care.

Precautions:

25% Dextrose is highly irritating to veins. Phlebitis can occur. Extravasation of the solution can cause tissue sloughing and necrosis.

Side Effects:

There are no significant side effects for 25% Dextrose in emergency care.

Interactions:

There are no significant interactions for 25% Dextrose in emergency care.

Dextrose 50%

(D50)

Class:

Pharmacological class – Carbohydrate caloric agents
Therapeutic class – Nutritional supplements

Description:

50% Dextrose is a concentrated, high-carbohydrate solution given to treat hypoglycemia or insulin shock.

Mechanism of Action:

Dextrose increases blood glucose levels, it may decrease body protein, and nitrogen losses, promote glycogen deposition, and decrease or prevent ketosis if sufficient doses are given. It is a hypertonic solution and, when administered intravenously, causes cellular dehydration.

Onset IV: 1 minute Peak: Depends Duration: 30 minutes

Indications:

Hypoglycemia.

Contraindications:

There are no significant contraindications for IV administration of 50% Dextrose in emergency care.

Precautions:

50% Dextrose is highly irritating to veins. Phlebitis can occur. Extravasation of the solution can cause tissue sloughing and necrosis.

Side Effects:

There are no significant side effects for 50% Dextrose in emergency care.

Interactions:

There are no significant interactions for 50% Dextrose in emergency care.

Diazepam

(Valium)

Class:

Pharmacological class – Benzodiazepines (controlled substance schedule IV)
Therapeutic class – Anxiolytics

Description:

Diazepam acts as a tranquilizer, anticonvulsant, and skeletal muscle relaxant.

Mechanism of Action:

A benzodiazepine that probably potentiates the effects of GABA, depresses the CNS, and suppresses the spread of seizure activity.

Onset IM: Unknown	Peak: 2 hours	Duration: Unknown
Onset IV: 1-5 minutes	Peak: 1-5 minutes	Duration: 15-60 minutes
Onset PR: Unknown	Peak: 90 minutes	Duration: Unknown

Indications:

Status seizures, sedation.

Contraindications:

Known hypersensitivity to the drug. Less than six months of age. Shock, coma, or acute alcohol intoxication. Acute angle-closure glaucoma.

Precautions:

Respiratory depression, hypotension.

Side Effects:

Sedation, apnea, respiration depression, confusion, dizziness, arrhythmias, hypotension, slurred speech, amnesia, paradoxical anxiety, hallucinations.

Interactions:

Metoprolol, CNS depressants, Digoxin, Diltizaem, Phenobarbital.

Diphenhydramine Hydrochloride

(Benadryl)

Class:

Pharmacological class – Ethanolamines
Therapeutic class – Antihistamines

Description:

Diphenhydramine is a potent antihistamine that blocks H_1 and H_2 histamine receptors.

Mechanism of Action:

Competes with histamine for H_1 receptor sites. Prevents, but doesn't reverse, histamine-mediated responses, particularly those of the bronchial tubes, GI tract, uterus, and blood vessels.

Onset IV: Immediate	Peak: 1-4 hours	Duration: 6-8 hours
Onset IM: Unknown	Peak: 1-4 hours	Duration: 6-8 hours

Indications:

Anaphylaxis, allergic reactions.

Contraindications:

Known hypersensitivity to the drug. Nursing mothers.

Precautions:

Use cautiously with MAO inhibitors.

Side Effects:

Sedation, hypotension, dries bronchial secretions, blurred vision, headache, palpitations, tachycardia.

Interactions:

CNS depressants, MAO inhibitors, Alcohol use.

Dopamine Hydrochloride

Class:

Pharmacological class – Adrenergic
Therapeutic class – Vasopressors

Description:

Dopamine is a naturally occurring catecholamine. It acts on alpha, beta$_1$, and dopaminergic adrenergic receptors. Its effect on alpha-receptors is dose dependent.

Mechanism of Action:

Stimulates dopaminergic and alpha and beta-receptors of the sympathetic nervous system, resulting in a positive inotropic effect and increased cardiac output. Action is dose related; large doses cause mainly alpha stimulation.

Onset IO/IV: 5 minutes Peak: Unknown Duration: < 10 minutes after infusion

Indications:

To treat shock and correct hemodynamic imbalances; improve profusion, increase cardiac output, correct hypotension.

Contraindications:

Uncorrected tachyarrhythmias. Pheochromocytoma. Ventricular fibrillation.

Precautions:

Dopamine can induce or worsen SVT and ventricular arrhythmias.

Side Effects:

Nervousness, anxiety, headache, dysrhythmias, palpitations, chest pain, dyspnea, nausea, and vomiting.

Interactions:

Alpha and beta-blockers, diuretics, Ergot alkaloids, MAO inhibitors, Phenytoin, TCA's.

Epinephrine

(Adrenaline)

Class:

Pharmacological class – Adrenergics
Therapeutic class – Vasopressors

Description:

Epinephrine is a naturally occurring catecholamine. It is a potent alpha and beta-adrenergic stimulant with more profound beta effects.

Mechanism of Action:

Relaxes bronchial smooth muscle by stimulating $beta_2$ receptors and alpha and beta-receptors in the sympathetic nervous system.

Onset IO/IV: Immediate	Peak: 5 minutes	Duration: Short
Onset IM: Variable	Peak: Unknown	Duration: 1-4 hours
Onset SQ: 5-15 minutes	Peak: 30 minutes	Duration: 1-4 hours

Indications:

Anaphylaxis, Cardiac arrest, Bradycardia.

Contraindications:

None in cardiac arrest. Narrow angle glaucoma. Hypertension. Hypovolemic shock.

Precautions:

Epinephrine tends to be deactivated by alkaline solutions.

Side Effects:

Palpitations, anxiety, tremors, headache, dizziness, nausea, vomiting, myocardial oxygen demand, Stroke, cerebral hemorrhage, subarachnoid hemorrhage, ventricular fibrillation, shock, dyspnea, urticaria.

Interactions:

Alpha-blockers, antihistamines MAO inhibitors, TCAs.

Fentanyl Citrate

Class:

Pharmacological class – Opioid agonists (controlled substance schedule II)
Therapeutic class – Opioid analgesics

Description:

A narcotic analgesic that is approximately 100 times more potent than morphine.

Mechanism of Action:

Unknown. Binds with opioid receptors in the CNS, altering the perception of and emotional response to pain.

Onset IN: 15-21 minutes	Peak: 25-35 minutes	Duration: Unknown
Onset IM: 7-15 minutes	Peak: 20-30 minutes	Duration: 1-2 hours
Onset IV: 1-2 minutes	Peak: 3-5 minutes	Duration: 30-60 minutes

Indications:

Short duration analgesia for procedures or treatment, analgesic.

Contraindications:

Known intolerance to Fentanyl.

Precautions:

Use caution in the elderly, debilitated patients, impaired hepatic and renal disease, COPD, decreased respirations.

Side Effects:

Sedation, apnea, respiration depression, confusion, hallucinations, anxiety, dizziness, arrhythmias, congestion, abdominal pain, dry mouth, vomiting.

Interactions:

Amiodarone, CNS depressants, MAO inhibitors, other anesthetics, hypnotics, opioid analgesics, sedatives, TCAs.

Furosemide

(Lasix)

Class:

Pharmacological class – Loop diuretic
Therapeutic class – Antihypertensive

Description:

Furosemide is a potent diuretic that inhibits sodium and chloride reabsorption in the kidneys and causes venous dilation.

Mechanism of Action:

Inhibits sodium and chloride reabsorption at the proximal and distal tubules and the ascending loop of Henle.

Onset IV: within 5 minutes Peak: 30 minutes Duration: 2 hours

Indications:

Congestive Heart Failure. Pulmonary Edema.

Contraindications:

Known hypersensitivity to the drug. Anuria.

Precautions:

Dehydration, electrolyte depletion, and hypotension.

Side Effects:

Headache, vertigo, transient deafness, blurred vision, tinnitus, dizziness, hypotension, volume depletion, potassium depletion, arrhythmias, diarrhea, nausea, and vomiting.

Interactions:

Antidiabetics. Aminoglycoside antibiotics, NSAIDs.

Glucagon

(GlucaGen)

Class:

Pharmacological class – Antihypoglycemics
Therapeutic class – Diagnostic agents

Description:

Glucagon is a hormone secreted by the alpha cells of the pancreas. It is used to increase the blood glucose level in cases of hypoglycemia in which an IV cannot immediately be placed.

Mechanism of Action:

Induces liver glycogen breakdown and glucose release. Relaxes GI smooth muscle.

Onset IM: 4-7 minutes Peak: 10 minutes Duration: 20-30 minutes

Indications:

Hypoglycemia.

Contraindications:

Known hypersensitivity to the drug.

Precautions:

Cardiovascular disease. Renal disease. Liver failure.

Side Effects:

Hypotension, dizziness, headache, nausea, and vomiting.

Interactions:

None in the emergency setting.

Ipratropium Bromide

(Atrovent, Atrovent HFA)

Class:

Pharmacological class – Anticholinergics
Therapeutic class – Bronchodilators

Description:

Ipratropium is an anticholinergic that is chemically related to atropine.

Mechanism of Action:

Inhibits vagally mediated reflexes by antagonizing acetylcholine at muscarinic receptors on bronchial smooth muscle.

Onset Inhalation: 5-15 minutes Peak: 1-2 hours Duration: 3-6 hours

Indications:

Bronchospasm.

Contraindications:

Known hypersensitivity to the drug, atropine or its derivatives.

Precautions:

Use with caution in patients with angle closure glaucoma.

Side Effects:

Palpitations, anxiety, dizziness, headache, tremor, hypertension, chest pain, nausea.

Interactions:

Anticholinergics.

Ketamine

(Ketalar)

Class:

Pharmacological class – Dissociative anesthetics (controlled substance schedule III)
Therapeutic class – Anesthetic

Description:

Ketamine is used as an anesthetic induction agent for diagnostic and surgical procedures, prior to the administration of general anesthetics. It is also used as a short-acting general anesthetic for children and elderly patients.

Mechanism of Action:

Ketamine's primary mechanism of action is N-methyl-D-aspartate (NMDA) receptor blockade (antagonism) for anesthesia. However, Ketamine dissociates and affects many different receptors such as opioid channels, L-type calcium channels, nicotinic acetylcholine ion channels, and hyperpolarization-activated cyclic nucleotide channels.

Onset IN: 1-5 minutes	Peak: Unknown	Duration: 10-20 minutes
Onset IO/IV: 30 seconds	Peak: Unknown	Duration: 10-15 minutes
Onset IM: 3-5 minutes	Peak: Unknown	Duration: 15-20 minutes

Indications:

Chemical restraint. Pain Control.

Contraindications:

Known hypersensitivity to the drug. Chest Pain.

Precautions:

Watch vital signs, IV bolus must be given over 60 seconds.

Side Effects:

Increased saliva, heart rate and blood pressure, laryngospasms, impaired motor function and memory, nystagmus, numbness, nausea, and vomiting, hallucinations or emergence reaction.

Interactions:

CNS depressants, Opioids, Benzodiazepines.

Ketorolac Tromethamine

(Toradol, Sprix)

Class:

Pharmacological class – NSAIDs
Therapeutic class – NSAIDs

Description:

Ketorolac is a non-steroidal anti-inflammatory drug (NSAID). Ketorolac works by reducing hormones that cause inflammation and pain in the body.

Mechanism of Action:

May inhibit prostaglandin synthesis, to produce anti-inflammatory, analgesic, and antipyretic effects.

Onset IM: 10 minutes	Peak: 30-60 minutes	Duration: 6-8 hours
Onset IV: Immediate	Peak: 1-3 minutes	Duration: 6-8 hours

Indications:

Short-term management of moderately severe, acute pain for single-dose treatment.

Contraindications:

Known hypersensitivity to the drug, pediatric patients, active peptic ulcer disease, any type of bleeding disorder or condition, and renal failure.

Precautions:

NSAIDs may increase the risk of thrombotic events, MI, or stroke.

Side Effects:

Headache, dizziness, drowsiness, sedation, arrhythmias, GI pain, nausea, and vomiting.

Interactions:

ACE inhibitors, angiotensin II receptor blockers, anticoagulants, anticonvulsants, antihypertensives, diuretics, Lithium, Salicylates, SSRIs.

Labetalol Hydrochloride

Class:

Pharmacological class – Alpha-beta blockers
Therapeutic class – Antihypertensives

Description:

Labetalol is a non-selective beta-blocker and selective alpha$_1$ blocker.

Mechanism of Action:

May be related to reduced peripheral vascular resistance, as a result of alpha and beta blockade.

Onset IV: 2-5 minutes Peak: 5 minutes Duration: 2-4 hours

Indications:

Acute management of hypertensive crisis.

Contraindications:

Known hypersensitivity to the drug, bronchial asthma, pulmonary edema, CHF, heart blocks, bradycardia, cardiogenic shock

Precautions:

Postural hypotension should be expected. Monitor for signs and symptoms of CHF, bradycardia, shock, heart block, or bronchospasm.

Side Effects:

Bradycardia, hypotension, lethargy, CHF, dyspnea, wheezing, weakness, headache, nausea, and vomiting.

Interactions:

Beta agonists, Cimetidine, diuretics, NSAIDS, TCAs, oral antidiabetics, Halothane.

Lactated Ringers Solution

(LR)

Class:

Isotonic crystalloid intravenous solution

Description:

Lactated Ringer's solution is very often used for fluid resuscitation after a blood loss due to trauma, surgery, or a burn injury. Lactated Ringer's solution is used because the by-products of lactate metabolism in the liver counteract acidosis, which is a chemical imbalance that occurs with acute fluid loss or renal failure. Lactated Ringer's solution in a large-volume resuscitation over several hours, maintains a more stable blood pH as compared to normal saline.

Mechanism of Action:

The lactate is metabolized into bicarbonate by the liver, which can help correct metabolic acidosis. Ringer's lactate solution alkalinizes via its consumption in the citric acid cycle, the generation of a molecule of carbon dioxide, which is then excreted by the lungs. They increase the strong ion difference in solution, leading to proton consumption and an overall alkalinizing effect. The solution is formulated to have concentrations of potassium and calcium that are similar to the ionized concentrations found in normal blood plasma. To maintain electrical neutrality, the solution has a lower level of sodium than that found in blood plasma or normal saline. Generally, the sodium, chloride, potassium, and lactate come from sodium chloride, sodium lactate, calcium chloride, and potassium chloride.

Indications:

Major trauma, hemorrhagic shock, fractures, traumatic cardiac arrest, heat exhaustion, burns, dehydration, hypovolemia, diarrhea, vomiting.

Contraindications:

There are no significant contraindications for intravenous administration of Lactated Ringer's solution.

Precautions:

Fluid overload. Electrolyte imbalance.

Side Effects:

There are no significant side effects for Lactated Ringer's solution in emergency care.

Interactions:

There are no significant interactions for Lactated Ringer's solution in emergency care.

Lidocaine Hydrochloride

(Xylocaine)

Class:

Pharmacological class – Amide derivatives
Therapeutic class – Antiarrhythmics

Description:

Lidocaine is an amide-type local anesthetic. It is also used to treat life-threatening dysrhythmias.

Mechanism of Action:

A class IB antiarrhythmic that decreases the depolarization, automaticity, and excitability in the ventricles during diastolic phase by direct action on the tissues, especially the Perkinje network.

Onset IO/IV: immediate Peak: immediate Duration: 10-20 minutes

Indications:

Ventricular tachycardia, ventricular fibrillation, malignant premature ventricular contractions. Anesthetic for IO procedure.

Contraindications:

Known hypersensitivity to amide-type local anesthetics, second and third degree heart blocks, Wolf-Parkinson-White syndrome, Adams-Stoke syndrome, ventricular escape beats,

Precautions:

Elderly patients, heart failure, renal or liver disease, consider reducing dose and infusion by 50%.

Side Effects:

Drowsiness, seizures, confusion, hypotension, bradycardia, heart blocks, nausea, vomiting, new or worsened arrhythmias, and cardiac arrest.

Interactions:

Beta-blockers, Procainamide, Phenytoin, Quinidine, Cimetidine, Ergot-type oxytocic drugs, Mexiletine, succinylcholine.

Magnesium Sulfate

Class:

Pharmacological class – Minerals
Therapeutic class – Electrolyte replacements

Description:

Magnesium Sulfate is a salt that dissociates into the Magnesium cation and the sulfate anion when administered. Magnesium is an essential element in numerous biochemical reactions that occur within the body.

Mechanism of Action:

Replaces Magnesium and maintains Magnesium level; as an anticonvulsant, reduces muscle contractions by interfering with release of acetylcholine at myoneural junction.

Onset IO/IV: Immediate	Peak: Unknown	Duration: 30 min
Onset IM: 1 hour	Peak: Unknown	Duration: 3-4 hours

Indications:

Torsades de Pointes, eclampisa/preeclampsia, status asthmaticus.

Contraindications:

Myocardial damage, heart block, coma, active labor, renal failure.

Precautions:

Magnesium Sulfate should be administered slowly to minimize side effects. Calcium Chloride should be available as an antidote.

Side Effects:

Hypocalcaemia, flushing, sweating, bradycardia, decreased deep tendon reflexes, drowsiness, respiratory depression, arrhythmias, hypotension, hypothermia.

Interactions:

Cardiac glycosides, CNS depressants, neuromuscular blockers.

Methylprednisolone

(Medrol, Depo-Medrol, Solu-Medrol)

Class:

Pharmacological class – Glucocorticoids
Therapeutic class – Corticosteroids

Description:

Methylprednisolone is a synthetic steroid with potent anti-inflammatory properties. It is related to the natural hormones secreted in the adrenal cortex.

Mechanism of Action:

Not clearly defined. Decreases inflammation, mainly by stabilizing leukocyte lysosomal membranes; suppresses immune response; stimulates bone marrow; and influences protein, fat, and carbohydrate metabolism.

Onset IV: Rapid Peak: immediate Duration: 1 week
Onset IM: 6-48 hours Peak: 4-8 days Duration: 4-8 days

Indications:

Severe anaphylaxis, Asthma, or COPD.

Contraindications:

Known hypersensitivity to the drug or its ingredients. Systemic fungal infections.

Precautions:

Use cautiously: GI ulcers, renal disease, hypertension, osteoporosis, diabetes, and seizures.

Side Effects:

Fluid retention, congestive heart failure, hypertension, abdominal distention, vertigo, headache, nausea, malaise, and hiccups.

Interactions:

Aspirin, NSAIDs, Cyclosporine, Oral anticoagulants.

Midazolam Hydrochloride

(Versed)

Class:

Pharmacological class – Benzodiazepines (controlled substance schedule IV)
Therapeutic class – Anxiolytics

Description:

Midazolam is a potent but short acting benzodiazepine used as a sedative and hypnotic. It is three to four times more potent than Diazepam. Its onset of action is approximately 1.5 minutes when administered IV. Midazolam has impressive amnestic properties, and like other benzodiazepines, it has no effect on pain.

Mechanism of Action:

May potentiate the effects of GABA, depress the CNS, and suppress the spread of seizure activity.

Onset IV: 90 seconds – 5 minutes Peak: Rapid Duration: 2-6 hours
Onset IN: 3-5 minutes Peak: 10-15 minutes Duration: 30-45 minutes
Onset IM: 15 minutes Peak: 15-60 minutes Duration: 2-6 hours

Indications:

Seizure. Behavioral/Psychiatric.

Contraindications:

Known hypersensitivity to the drug, narrow angle glaucoma, shock, depressed vital signs, and acute alcohol intoxication.

Precautions:

Midazolam has more potential than the other benzodiazepines to cause respiratory depression and respiratory arrest.

Side Effects:

Laryngospasm, bronchospasm, dyspnea, respiratory depression and arrest, drowsiness, altered mental status, amnesia, bradycardia, tachycardia, premature ventricular contractions, and retching.

Interactions:

CNS depressants, Diltiazem, Erythromycin, alcohol, and narcotics.

Morphine Sulfate

Class:

Pharmacological class – Opioids (controlled substance schedule II)
Therapeutic class – Opioid analgesic

Description:

Morphine is a potent CNS depressant and analgesic.

Mechanism of Action:

Unknown. Binds with opioid receptors in the CNS, altering perception of and emotional response to pain.

Onset IV: 5 minutes	Peak: 20 minutes	Duration: 4-5 hours
Onset IM: 10 - 30 minutes	Peak: 30-60 minutes	Duration: 4-5 hours

Indications:

Myocardial Chest Pain. Pain management.

Contraindications:

Known hypersensitivity to the drug, volume depletion, hypotension, abdominal pain.

Precautions:

Morphine can cause respiratory depression and arrest, use with caution in elderly or debilitated patients and those with head injury.

Side Effects:

Nausea, vomiting, abdominal cramps, blurred vision, constricted pupils, altered mental status, headache, respiratory depression and arrest.

Interactions:

CNS depressants, antihistamines, antiemetics, sedatives, hypnotics, barbiturates, and alcohol.

Naloxone Hydrochloride

(Narcan)

Class:

Pharmacological class – Opioid antagonists
Therapeutic class – Antidotes

Description:

Naloxone is an effective narcotic antagonist.

Mechanism of Action:

Naloxone is chemically similar to narcotics, however it has only antagonistic properties. Naloxone competes for opiate receptors in the brain, and displaces narcotic molecules from opiate receptors.

Onset IV: 1-2 minutes	Peak: Unknown	Duration: 45 minutes
Onset IN/IM: 2-5 minutes	Peak: Unknown	Duration: >45 minutes

Indications:

Complete or partial reversal of respiratory depression caused by narcotics.

Contraindications:

Known hypersensitivity to the drug.

Precautions:

Naloxone should be administered cautiously to patients who are known or suspected to be physically dependent on narcotics. Abrupt and complete reversal by Naloxone can cause withdrawal type effects.

Side Effects:

Hypotension, hypertension, ventricular arrhythmias, nausea, and vomiting.

Interactions:

Cardiotoxic drugs.

Nitroglycerine

Class:

Pharmacological class – Nitrates
Therapeutic class – Vasodilators

Description:

Nitroglycerine is a potent smooth muscle relaxant used in the treatment of angina pectoris.

Mechanism of Action:

Reduces cardiac oxygen demand by decreasing left ventricular end-diastolic pressure (preload) and, to a lesser extent, systemic vascular resistance (afterload). Also increases blood flow through the collateral coronary vessels.

Onset SL: 1-3 minutes Peak: Unknown Duration: 30-60 minutes
Onset IV: Immediate Peak: Immediate Duration: 3-5 minutes

Indications:

Chest pain associated with angina pectoris, acute myocardial infarction, acute pulmonary edema, and hypertensive crisis.

Contraindications:

Known hypersensitivity to the drug. Hypotension, increased intracranial pressure, the use of Sildenafil, tadalafil, or vardenafil.

Precautions:

Generalized vasodilation may cause profound hypotension and reflex tachycardia.

Side Effects:

Headache, dizziness, weakness, tachycardia, hypotension, orthostasis, skin rash, dry mouth, nausea, and vomiting.

Interactions:

Alteplase, Antihypertensives, Heparin, Alcohol.

Ondansetron Hydrochloride

(Zofran)

Class:

Pharmacological class – Selective serotonin (5-HT_3) receptor antagonist
Therapeutic class – Antiemetics

Description:

Ondansetron blocks the actions of chemicals in the body that can trigger nausea and vomiting.

Mechanism of Action:

May block 5-HT_3 in the CNS in the chemoreceptor trigger zone and peripheral nervous system on nerve terminals of the vagus nerve.

Onset IM: Unknown	Peak: 41 minutes	Duration: Unknown
Onset IV: Immediate	Peak: 10 minutes	Duration: Unknown

Indications:

Nausea and vomiting.

Contraindications:

Known hypersensitivity to the drug.

Precautions:

ECG changes, including prolonged QT interval and Torsades de Pointes.

Side Effects:

Dizziness, fatigue, headache, malaise, sedation, fever, arrhythmias, hypoxia.

Interactions:

Apomorphine.

Oxygen

(O_2)

Class:

Natural colorless and order-less gas

Description:

Is used to primarily to treat hypoxia. Alternative uses include treatment of carbon monoxide poisoning, diabetic foot ulcers, infections such as clostridial myonecrosis, air gas embolism, decompression sickness and radiotherapy injury.

Mechanism of Action:

Oxygen diffuses passively throughout the body down a concentration gradient. It reverses hypoxia by increasing the partial pressure and improving Oxygen delivery to mitochondria. Oxygen is inhaled by passive diffusion in the lungs and is bound to hemoglobin and dissolved in plasma. Extracorporeal oxygenation is an alternative delivery method. Oxygen is metabolized with glucose to form energy, carbon dioxide and water. The precise mechanism is a three-step process of glycolysis, the Krebs cycle, which are anaerobic (and produce 4 ATP) and finally oxidative phosphorylation in the mitochondria, which results in 34 ATP units.

Indications:

Hypoxemia, respiratory distress, acute chest or abdominal pain, hypotension, trauma, the acutely ill, carbon monoxide poisoning.

Contraindications:

There are no significant contraindications for Oxygen administration.

Precautions:

If the patient is not breathing adequately on their own, the treatment of choice is ventilation, not just oxygenation.

Side Effects:

There are no significant side effects for Oxygen administration in emergency care.

Interactions:

There are no significant interactions for Oxygen in emergency care.

Sodium Bicarbonate

Class:

Pharmacological class – Alkalinizers
Therapeutic class – Antacids

Description:

Sodium Bicarbonate is a salt that provides bicarbonate to buffer metabolic acidosis.

Mechanism of Action:

Restores buffering capacity of the body and neutralizes excess acid.

Onset IV: Immediate Peak: Immediate Duration: Unknown

Indications:

Metabolic acidosis. Hyperkalemia. Sodium channel blocker toxicity.

Contraindications:

Metabolic or respiratory alkalosis, hypocalcemia.

Precautions:

Sodium Bicarbonate can cause metabolic alkalosis.

Side Effects:

Tetany, edema, gastric distention, belching, flatulence, metabolic hypokalemia, metabolic alkalosis.

Interactions:

Catecholamines, vasopressors, Calcium Chloride.

Sodium Chloride 0.9%

(Normal Saline, NS)

Class:

Isotonic crystalloid salt intravenous solution

Description:

Sodium Chloride 0.9% is used in the administration of parenteral drugs. It is also Utilized as an extracellular fluid replacement and in the management of metabolic Alkalosis in the presence of fluid loss, and for restoring or maintaining the concentration of sodium and chloride ions.

Mechanism of Action:

Sodium is the major cation of extracellular fluid and functions principally in the control of water distribution, fluid, and electrolyte balance and osmotic pressure of body fluids. Chloride, the major extracellular anion, closely follows the physiological disposition of sodium cation in maintenance of acid-base balance, isotonicity and electrodynamic characteristic of the cells.

Indications:

Diabetic ketoacidosis, dilution of medications, flushing agent for rapid IV medication administration, irrigation solution for eyes and wounds.

Contraindications:

There are no significant contraindications for intravenous administration of Sodium Chloride 0.9%.

Precautions:

Fluid overload. Electrolyte imbalance.

Side Effects:

There are no significant side effects for Sodium Chloride 0.9% in emergency care.

Interactions:

There are no significant interactions for Sodium Chloride 0.9% in emergency care.