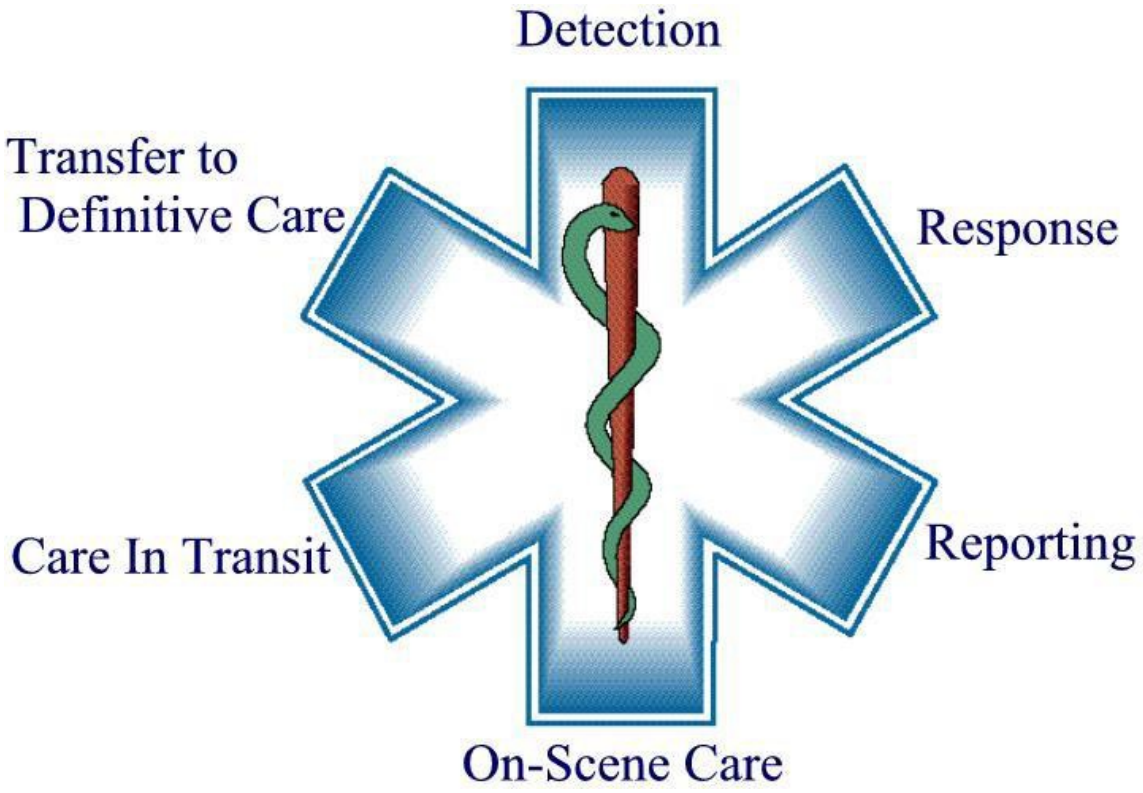
Good Samaritan Hospital
EMS Protocols
2024

12/13/23



INTRODUCTION

The following protocols have been developed to provide standardized guidelines for patient care in particular critical situations. In some circumstances it is necessary to abbreviate or shorten terms to provide the most concise set of guidelines possible. When "ALS" appears in this document, we refer to Paramedic (EMT-P) procedures, care, or transport as outlined by the Emergency Medical Services Branch, Fire and Building Safety Division of the Indiana Department of Homeland Security. When "BLS" appears in this document, we refer to Basic Emergency Medical Technician (EMT-B) procedures, care, or transport as defined by the Emergency Medical Services Branch, Fire and Building Safety Division of the Indiana Department of Homeland Security. Throughout this document the terms "guidelines", "protocols", and "directives" may be used interchangeably. Advanced Emergency Medical Technician (AEMT) is considered to be an ALS provider and may provide patient care to their full scope of practice as defined by the Emergency Medical Services Branch, Fire and Building Safety Division of the Indiana Department of Homeland Security.

The following protocols are guidelines to be used in patient care management. These medical guidelines are not intended to be all-inclusive and may not necessarily have covered every situation which may be encountered by the Paramedic/EMT. These guidelines are not meant to serve as a teaching tool, but are written with the understanding that the EMT or Paramedic knows how to perform the procedures. If there are references to procedures, medications, or conditions to which the Paramedic/EMT is not familiar, it is his/her responsibility to attain the appropriate guidance and/or education prior to performing such procedures or using such medications.

The protocols are designed to guide the Paramedic/EMT through the continuity of care for the out-of-hospital patient. ALS procedures are contained within the same protocol as the BLS procedures. This is intended to allow both the EMT and Paramedic to understand where ALS intervention is involved as part of the team of out-of-hospital care providers and where ALS intervention may be necessary in the out-of-hospital care. Some protocols are specific to ALS care as the treatment provided to the patient evolves beyond the BLS level of care.

The protocols are to provide guidelines in the treatment of patients of all ages. Where necessary, protocols unique for specific ages those ages are noted. For the purposes of these protocols, an adult is over the age of 15 years, a child is ages 1 to 15 years, an infant is 1 month to 1 year, and a newborn is from time of delivery up to 28 days (less than 1 month). When certain procedures are contrary to these ages, they are noted in the specific protocol.

Written protocols are not a substitute for direct physician orders and will always be superseded by on-scene EMS Medical Directors/Fellows or on-line medical control. As with all aspects of health care, these patient care protocols should be considered dynamic and will thus be continually evolving.

The Operational Guidelines Section contains guidelines for all affiliates.

These protocols are reviewed and affirmed or revised annually.

These protocols are to be used by all affiliates. Except where indicated, affiliating agencies may not alter, add to or delete any portion of these protocols without written permission from their Medical Director.

Good Samaritan Hospital
Out-Of-Hospital Protocols

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The following protocols and procedures are hereby approved for use by all officially certified and affiliated BLS – Non Transport, BLS Transport and ALS Transport provider under the direction of Good Samaritan Hospital as the supervising hospital and Dr. Scott Keyes, EMS Medical Director.

Dr. Scott R Keyes, M.D. EMS Medical Director.

12/11/23
DATE

GSH EMS Protocols

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SECTION ONE:
OPERATIONS

PHILOSOPHY

The Good Samaritan Hospital **Advanced and Basic Life Support Protocols** are designed to allow pre- hospital care to begin immediately upon arrival of EMS personnel. If the advanced life support provider believes it is appropriate to provide ALS treatment beyond the contents of these protocols, the provider must establish on-line medical control and receive orders for such additional care.

Realizing that each patient's presentation is unique, the EMS provider's care should be stylized for the patient's needs. EMS personnel should take the time for an appropriate and accurate assessment. Most patients will tell the provider what is wrong with them. EMS personnel should take the time to listen. All patients require initial and on-going assessments. Making the assumption that everything is abnormal until proven normal by exam will minimize errors. Communication with the physician or nursing staff as a consult is encouraged. It is all right not to know everything. It is unacceptable not to ask questions. When specifically noted, communication is mandatory for medical direction. Medical control means interaction with a physician either through direct communication or via a nurse or paramedic who has questioned a physician regarding the requested order.

The sequence of care outlined may vary according to the patient's condition and the resources available. Documentation in the patient care report of decisions made is required. EMS providers can accept reasonable and appropriate orders from physicians. They can also refuse orders which do not seem right for the situation. The EMS provider is the individual assessing the patient and further discussion can always occur.

Incident reports by receiving facilities or by the EMS provider should be viewed as quality assurance issues not punishment. Growth and improvement can occur only with a continuous examination of this system and its needs. Concerns and issues that are not directly related to patient care should be documented via an incident report. Patient care reports should be reserved for patient care documentation only.

It is the goal of the Good Samaritan Hospital Advanced and Basic Life Support System to provide the best possible care to all patients. The paramedics and EMTs within this system should view themselves as responsible professionals committed to others through service and example. Through their dedication, knowledge, and essential prehospital patient management, the patient's chances for a positive outcome can only be enhanced.

GENERAL GUIDELINES

- Affiliating services, departments, and agencies may not alter any portion of these protocols without written permission from the Medical Director.
- These protocols are not intended to be all-inclusive and may not have covered every situation potentially encountered by EMS personnel. An on-line ED physician must order any other skills or therapies and the EMS provider must have been trained in the skill or therapy.
- This is NOT meant to be a teaching tool. EMS personnel are expected to know how to perform the therapies and procedures. If an EMT or Paramedic is unfamiliar with any condition, treatment, medication, skill, or procedure contained herein, it is that individual's responsibility to seek the needed education.
- Once contact is made with a patient, the patient remains the EMS provider's responsibility until one of the following occurs:
    A. Care is transferred to receiving facility staff
    B. Care is transferred to an appropriate level healthcare provider ○ The patient is deemed non-viable
    C. A valid Signature of Release (refusal of transport) is obtained

- **Transfer of care at the receiving facility is not complete until a verbal report is given to the medical care provider. It is also required that the Electronic Patient Care Report be signed by the receiving provider acknowledging patient transfer. The ePCR should be completed prior to the shift end and must be completed within 24 hours of incident completion. All ePCRs must be printed to Health Information Management. The administration of controlled substances requires appropriate ePCR documentation to be completed. The controlled substance module must be printed and placed in the Omnicell prior to replacing the medication.**
- Throughout these protocols unless otherwise specified, adult is over 15 years old, child is 1 to 15 years old, infant is 1 month to 1 year of age, and newborn is birth to 1 month old.
- Throughout these protocols, interventions are listed by certification level. BLS (EMT) personnel may only provide therapies listed as BLS, and Paramedics may provide all therapies listed. When appropriate, the Paramedic may elect to provide a Paramedic level intervention instead of an EMT level intervention (i.e. – Endotracheal intubation instead of placing a non-visualized airway).
- Cases of suspected abuse must be reported according to law.
    A. 1-800-800-5556 is the Indiana Child Abuse and Neglect Hotline
    B. 1-800-992-6978 is the Indiana Adult Protective Services Hotline

- In the event of the death of a child less than 1 year of age the Sudden Unexpected Infant Death (SUID) form (available here https://www.cdc.gov/sids/pdf/suidi-reporting-form-508.pdf) will be filled out and faxed to the county coroner's office.
- Anywhere throughout this protocol manual where medications are to be administered at the BLS or the ALS level, it is required that the medication be verified prior to administration.

COMMUNICATIONS AND ORDERS

- Establish communications with the intended receiving hospital when:
    A. Patient's condition is unstable
    B. Patient requires specialized care
    C. Requesting orders
    D. Consulting MD regarding a refusal of transport
- Radio or phone report should be brief and generally follow this guideline:
    A. State the reason for the report
    B. State patient's age and gender
    C. State general condition / chief complaint
    D. Give pertinent history, medications, and allergies
    E. State vital signs and pertinent assessment findings
    F. ECG rhythm interpretation and presence of ST elevation (when appropriate)
    G. List treatment performed or in progress and clinical changes with treatment
    H. Give ETA
    I. Request orders (when appropriate)

    Note: Patient names are not to be given over the radio-patient initials and/or last 4 digits of social security number are permissible if requested by receiving facility

- Repeat any orders received exactly as heard for confirmation.
- If, based upon the EMS provider's training, the orders received are inappropriate and/or dangerous, question the orders three times then verbally refuse to act. Continue to treat the patient according to these protocols.
- If an order for therapy is denied and the EMS provider believes it to be life-saving, verbally request it three times. The EMS provider may then contact their supervising hospital for further instructions. Continue to treat the patient according to appropriate protocols.

An incident of refusal of orders must be brought to the attention of the appropriate leader at the service, agency, or department and the Medical Director within 48 hours.

VERIFICATION OF MEDICAL PERSONNEL ON THE SCENE

A. The EMS provider is operating under the supervision of "medical control". Medical control is defined as the Medical Director or an on-line ED physician.
B. In general, on scene physicians will be courteously dissuaded from participating in patient care.
C. This and sections C and D do not apply to the agency's EMS Medical Director(s). The paramedic on the scene with the patient will have medical control of the patient except when:
    1. A physician identifies him/herself as a physician and can produce a State of Indiana Professional Licensing Agency license and is willing to assume in advance ALL medical and legal responsibilities for the patient. The physician:
        II. Must be willing to sign the run sheet for all orders given.
        III. Must be willing to sign a required provider specific form (when applicable)
        IV. Must make radio or telephone contact with the emergency department physician at the receiving facility and be willing to accompany the patient to the hospital in the ambulance.
    2. The paramedic feels the physician may be helpful in rendering care to the patient within the scope of the ALS protocols or if the physician possesses special knowledge about the patient or can perform special skills the patient may need.
D. If the physician requests an intervention that according to prehospital standards of care is inappropriate or detrimental to the patient, the paramedic will treat the patient as outlined by the ***appropriate protocols***. The paramedic will then refer the on-scene physician to the physician at the receiving hospital.
E. At no time should lifesaving medical care be delayed in order to establish identities or medical control. It is the responsibility of the paramedic to institute appropriate medical care ASAP.

ALS AND BLS TEAM APPROACH

A. The EMS provider with the highest level of certification is responsible for the initial assessment of all patients unless the number of patients or the severity of injuries makes this impossible.
B. In the event of a non-transport (refusal or non-viability), the EMS provider with the highest level of certification is responsible for the assessment and documentation unless the number of patients and the severity of injuries make this impossible.
C. In situations where a BLS crew has requested a paramedic for assistance and the paramedic feels BLS transport is indicated, the paramedic will continue to assist the BLS crew throughout the transport.
D. Patient care may be delegated from the Paramedic to the EMT under the following conditions:
    1. The patient is stable and does not meet any of the criteria for ALS transport listed below.
    2. The Paramedic fully informs the EMT of assessment findings and anticipated patient needs.
    3. The EMT is comfortable with accepting responsibility for treatment and transport.
    4. The patient has not received any ALS treatment (i.e. – IV therapy, intubation, etc.)
    5. The Paramedic fully documents assessment findings and treatment up to the point of delegation of patient care to the EMT.

ALS treatment and transport is indicated if the patient has one or more of the following conditions. If the BLS crew is able to deliver the patient to an emergency department in less time than it would take for the ALS crew to make contact, the BLS crew should complete transport. Waiting for ALS to arrive should not cause delays in transporting the patient.

• Shortness of breath or acute dyspnea • Chest pain or anginal equivalent • New onset altered level of consciousness • Uncontrollable bleeding • Unconsciousness • Seizures • Patient meets Trauma Alert Criteria • Patient meets Medical Alert Criteria • Shock signs/symptoms (unstable patient)	OB at >20 weeks with contractions and: • Evidence of meconium staining **or** • Vaginal Bleeding • Childbirth prior to 38 weeks gestation • Syncope or near-syncope • Symptomatic with abnormal vital signs • Any uncertainty about the patient's status

*****Any time the EMS provider believes the patient's condition warrants ALS treatment and care.**

TRANSPORTATION/DESTINATION

A. A patient is anyone who has either requested an ambulance or has had an ambulance requested for them. All patients who have activated the EMS system will be transported to a hospital campus with EMS radio communication capabilities unless patient refuses transport. (See “Non-Transported Patient”)
B. Patients will be transported to the patient’s hospital of choice when their condition is stable and they do not meet a special needs situation. The EMS provider is responsible for informing the patient that transport to a specific hospital may be better for their specific medical situation.
C. If there is an immediate threat to loss of life or limb, the EMS provider may use their judgment and transport the patient to the nearest or most appropriate facility. The EMS provider will advise the patient and the family of this decision. The EMS provider will make every effort to explain the rationale behind the decision.
D. In the interest of safety and well being for EMS providers, patients, and community members, it is realized that red lights and sirens must be used appropriately when transporting to the hospital. If, in the judgment of the EMS provider, there is a "time critical" threat to life or limb, red lights and sirens are appropriate.

NON-TRANSPORTED PATIENT

A. Transportation of the patient for additional evaluation and care should always be the goal of EMS providers regardless of the acuity of the patient's complaint. Should the patient state that they are refusing transportation, the EMS provider will enlist the aid of the patient's friends and family members present to encourage the patient to agree to additional treatment and transportation. Any fears or concerns the patient might have should be discussed.
B. Medical control must be consulted when a patient is refusing transport and any of the following applies:
    1. Patient has an abnormal mental status, indicated by:
        a. Slurred or abnormal speech
        b. Disorientation to person, place, or time
        c. Inappropriate or irrational thinking
    2. Patient is less than 1 year old.
    3. There are any historical data, symptoms, or signs suggestive of a potentially life threatening illness or injury.
    4. Patient does not have access to a phone or "significant others" to aid in getting further care if needed.
C. When Medical Control is contacted, the physician will be apprised of the situation and whether the SOR is against the EMS personnel's medical advice. The physician will be asked for recommendations, and may ask to speak directly to the patient. The EMS provider should record the hospital, physician's name, and the recommendations on the patient care report of the Refusal of Transport or Signature of Release form.
D. To accept the patient's decision not to receive treatment and/or transportation, the following must be performed:
    1. The patient or the patient's guardian is informed:
        a. That transport is indicated for further evaluation and care by an emergency department physician.
        b. That the patient has not been evaluated by a physician.
        c. That significant medical problems may exist and that these potential problems cannot be fully described at this time, but may possibly lead to significant disability or even death.
        d. To seek follow-up medical care as soon as possible.
        e. That 911 may be called at any time should they change their mind and wish to be transported to a hospital emergency department.
    2. The patient is asked if they understand the risks in refusing further medical care, and additional explanation is provided as needed.
    3. The refusal form is signed by the patient or their guardian after they read (or have read to them) the statement of refusal.
    4. A complete patient care report with all assessment findings and vital signs must be completed in addition to the refusal-specific documentation.
E. In the event the patient is less than 18 years old, these persons may take responsibility for the child:
    1. Parent or legal guardian
    2. Individual in loco parentis (someone who assumes the duties and responsibilities in place of a parent, e.g., grandparent, aunt, uncle, babysitter, principal, police officer) if:

a. There is no parent or legal guardian present; or
b. The parent or legal guardian is not reasonably present or declines to act; or
c. The existence of the parent or legal guardian is unknown to the health care provider.

3. Adult sibling of the minor if:
    a. There is no parent, legal guardian, or individual in loco parentis present; or
    b. The parent, legal guardian, or individual in loco parentis is not reasonably present or declines to act; or
    c. The existence of the parent, legal guardian, or individual in loco parentis is unknown to the health care provider.
4. The minor patient if there is compelling evidence of emancipation as defined under Indiana Code 16-36-1-3(a)(2)(A)-(E):
    a. At least 14 years of age; and
    b. Not dependent on a parent for support; and
    c. Living apart from the minor's parents or from an individual in loco parentis; and
        i. Managing the minor's own affairs; or ii. Is or has been married; or
        ii. Is in the military service of the United States; or
        iii. Is authorized to consent to health care by any other statute.

F. If the patient is a minor and none of the above can be contacted, the patient should be transported to the closest, most appropriate facility.

SAFE TRANSPORT OF PEDIATRIC PATIENTS

A. These guidelines apply to every EMS response resulting in the need to transport pediatric patients and require the use of a safety seat or restraint (as defined below). Pediatric patients that do not require a child safety seat or restraint should be transported following the same procedure as adult patients.

   Unlike other situations, choice of safety restraints are directly related to the child's size. Therefore, for the purposes of this protocol, child specific safety seats or restraints are required until the child has reached adult size by provider judgment (As a general guide, greater than 5 feet tall and 100 lbs.).

B. These guidelines offer recommendations, as published by NHTSA, for the transportation of children in five (5) different possible situations:
   1. A child who is not injured or ill.
   2. An ill or injured child whose condition does not require continuous and/or intensive medical monitoring/intervention.
   3. An ill or injured child who does require continuous and/or intensive monitoring/intervention.
   4. A child whose condition requires spinal motion restriction and/or lying flat.
   5. A child or children who require transport as part of a multiple patient transport (newborn with mother, multiple children, etc.).

C. General Guidelines
   1. Each agency is responsible for providing child restraint options that are compatible with their transporting vehicles. These guidelines do not comprehensively cover all possible situations and EMS provider judgment should be used if a situation is presented that is not addressed below.
   2. The child's age and weight shall be considered when determining an appropriate restraint system. Child seat models offer a wide range of age/weight limits, so each individual device must be evaluated to determine the appropriateness of use.
   3. The child's own safety seat is the preferred device unless the device has been involved in a motor vehicle crash, cannot be safely secured in the vehicle or the child needs care and monitoring that cannot be delivered with the child in the car seat.
      a. With the exception of a minor vehicle crash (e.g. "fender-bender"), avoid using the child's own safety seat if the seat was involved in a motor vehicle crash. However, using the child's own seat can be considered if no other restraint systems are available and the seat shows no visible damage/defect.
   4. Transportation of a child in any of the following ways is NEVER appropriate:
      a. Unrestrained;
      b. On a parent/guardian/other caregiver's lap or held in their arms;
      c. Using only horizontal stretcher straps, if the child does not fit according to cot manufacturer's specifications for proper restraint of patients;
   5. On the multi-occupant bench seat or any seat perpendicular to the forward motion of the vehicle, even if the child is in a child safety seat.

D. Situation Guidelines:
   Ideal transport method is in **bold & highlighted, with acceptable alternatives listed.*
   1. The uninjured/not ill child shall be transported:

a. **In a vehicle other than a ground ambulance using a properly installed, size-appropriate child restraint system.**
b. In a size-appropriate child seat properly-installed in the front passenger seat of the ambulance with the airbags off or in another forward-facing seat.
c. In a size-appropriate child seat properly-installed on the rear-facing EMS provider's seat.
d. Consider delaying the transport of the child (ensuring appropriate adult supervision) until additional vehicles are available without compromising other patients on the scene. Consult medical direction/operations.

2. The ill/injured child not requiring continuous intensive monitoring/interventions, shall be transported:
    a. **In a size-appropriate child restraint system secured appropriately on the cot.**
    b. In the EMS provider's seat (captain's chair) in a size-appropriate restraint system. On the cot using three horizontal straps (chest, waist, knees) and one vertical restraint across each shoulder (X formation).
3. The ill/injured child whose condition requires continuous intensive monitoring or intervention, shall be transported:
    a. **In a size-appropriate child restraint system secured appropriately to cot.**
    b. On the cot using three horizontal straps (chest, waist, knees) and one vertical restraint across each shoulder (X formation). If assessment/intervention requires the removing of restraint strap(s), restraints should be re-secured as quickly as possible.
4. The ill/injured child who requires SMR or lying flat, shall be transported:
    a. **Secured to a size-appropriate LBB, then secure the LBB to the cot, head first, with a tether at the foot (if possible) to prevent forward movement, and three horizontal restraints (chest, waist, and knees) and a vertical restraint across each shoulder (X formation).**
    b. Secured to a standard LBB with padding added as needed and secure using the strap configuration listed above.
5. The child or children requiring transport as part of a multiple patient transport.
    a. **If possible, for multiple patients, transport each as a single patient according to the guidance provided for situations 1 through 4. For mother and newborn, transport the newborn in an approved size-appropriate restraint system in the rear-facing EMS provider seat with a belt-path that prevents both lateral and forward movement, leaving the cot for the mother.**
    b. Consider the use of additional units to accomplish safe transport, remembering that non-patient children should be transported in non-EMS vehicles, if possible.
    c. When available resources prevent meeting the criteria for situations 1 through 4 or all child patients, transport using space available in a non-emergency mode, exercising extreme caution and driving at a reduced speed.
    d. Note: Even with childbirth in the field, it is NEVER appropriate to transport a child held in the parent/guardian/caregiver's arms or on a parent/guardian/caregiver's lap.

Reference: Working Group Best-Practice Recommendations for the Safe Transportation of Children in Emergency Ground Ambulances. National Highway Traffic Safety Administration (NHTSA), September 2012, available at www.ems.gov

LANGUAGE CONSIDERATIONS

Communication is a key to a thorough evaluation of the patient's condition and determining necessary treatment. All services, agencies, and departments are strongly encouraged to have interpretation services available for EMS personnel to contact in the event of a language barrier.

English/Spanish Translations

I am a paramedic.	Soy paramédico.
How are you?	Cómo se siente?
What's the matter?	Qué le ocurre?
Speak slowly please.	Hable despacio, por favor.
You must go to the hospital.	Tiene que ir al hospital.
We're going to take you to the hospital, OK?	Vamos a llevarle al hospital. ¿De acuerdo?
Understand?	¿Me comprende?
What is your name?	Cómo se llama?
What is your age?	Cuántos años tiene?
Where do you live?	Dónde vive?
Are you allergic to medicine?	Sufre de alguna alergia a las medicinas?
Where does it hurt?	Dónde le duele?
Does it hurt here?	Le duele aquí?
How much does it hurt? Bad? Mild? Little?	Quanto duele? Malo? Suave? Poco?
Do you take medications?	Toma usted medicamentos?
Do you have insurance?	Tiene seguro médico?
What hospital do you want to go to?	A qué hospital quiere ir?
Sign here please.	Firme aquí, por favor.
Do you feel better?	Se encuentra mejor?
Do you take Viagra?	Toma Viagra o otra?
Please don't move.	No se mueva, por favor.
Any questions?	Tiene alguna pregunta?

Refusal of Transportation Statements

Emergency personnel have offered to transport me to the hospital for further evaluation and care. I refuse this service.	Aunque el personal de emergencia se ha ofrecido a llevarme al hospital para que me realicen más pruebas y para recibir más atención médica, yo rechazo este servicio.
I understand that I have not been evaluated by a physician and that serious medical problems may still exist which may result in disability or death.	Yo comprendo que no me ha examinado un médico y que posiblemente tenga problemas de salud graves que puedan causarme incapacidad o incluso la muerte.
I understand that I may call 911 or an ambulance at any time if I change my mind and wish to be taken to a hospital.	Entiendo que puedo llamar al 911 o a una ambulancia en cualquier momento si cambio de opinión y deseo que me lleven al hospital.

I understand that I am assuming full responsibility for my continuing medical care.	Yo asumo toda la responsabilidad de buscar atención médica

GUIDELINES FOR INITIATING RESUSCITATION EFFORTS

A. Basic and/or Advanced cardiac life support must be started on all patients who are found apneic and pulseless, UNLESS meets Dead On Arrival (DOA) Criteria:
    1. Valid DNR (see below)
    2. Obvious signs of prolonged death such as rigor mortis, dependent lividity, or decomposition
    3. Injury that is incompatible with life (i.e. decapitation, or burned beyond recognition without detectable signs of life, gross dismemberment including crushing of head or torso)
B. If any of the above applies, do not start CPR. Contact the appropriate authorities and complete a patient care report.
C. Resuscitation efforts should begin immediately in all other cases. **If in doubt, start resuscitation.** CPR shall be performed according to current AHA standards. The appropriate protocol shall be followed for further treatment.

GUIDELINES FOR TERMINATION OF RESUSCITATION EFFORTS (FOR PATIENTS OVER THE AGE OF 15)

Termination of Resuscitation for Medical Cardiac Arrest:

A. Termination of resuscitation may be appropriate for victims of medical cardiac arrest who have no return of spontaneous circulation after 30 minutes of advanced life support. This therapy should include, at a minimum, CPR with minimal interruptions, ventilation with oxygenation, intravenous or intraosseous access, and administration of fluids and/or appropriate medications per protocol.
B. Resuscitation may also be terminated by contacting intended receiving facility.

Termination of Resuscitation for Traumatic Cardiac Arrest:

A. Resuscitative efforts should be withheld for trauma patients that meet DOA criteria. See above guidelines.
B. Resuscitation may be terminated for blunt or penetrating traumatic arrest found pulseless and apneic (without agonal respirations) and ***without organized electrical activity*** (must be asystolic or other rhythm with rate less than 40/min). Patients with ventricular fibrillation, ventricular tachycardia or organized rhythms with rate greater than 40/min should have resuscitation continued with prompt transport.
C. When the mechanism of injury does not correlate with the clinical condition, suggesting a non-traumatic cause of cardiac arrest, standard resuscitative measures should be followed.

Exemptions: Standing termination protocols do not apply for patients under 15 years of age, females with known pregnancy >24 week or uterine fundus palpable above the umbilicus, victims of lightning strikes, victims of cold water immersion (unless known submersion time greater than 30 minutes), or victims with hypothermia as suspected etiology of cardiac arrest. Please refer to appropriate protocols.

GUIDELINES FOR DO NOT RESUSCITATE (DNR)/ POST ORDERS/ ADVANCED DIRECTIVE ORDERS:

A. If persons present at the scene of a patient in cardiopulmonary arrest request that resuscitative measures be withheld, request to see a DNR/POST order which has been signed by the attending physician or chart order (if an ECF patient).
B. If the DNR/POST order is presented and resuscitative efforts are not attempted, complete a patient care report with assessment findings, contact the attending physician, and contact the appropriate authorities.
C. In the event the documents cannot be produced immediately, begin resuscitative efforts in accordance with the appropriate protocol and contact the receiving facility for further orders.
D. If the paramedic questions the validity of the DNR order, resuscitative efforts should be initiated. Contact the emergency department physician at the intended receiving facility for further orders. These guidelines do not apply to a Living Will

TRAUMATIC CARDIAC ARREST RESUSCIATION PROTOCOL

A. If patient is unresponsive and has no palpable pulse with evidence of trauma being most likely cause of cardiac arrest and does not meet DOA criteria:
    1. Position patient in position where resuscitation efforts can be initiated
    2. Apply manual c-spine stabilization or c-collar if situation allows
    3. Apply cardiac monitor and treat displayed rhythm
        a. Asystole or PEA with rate < 40
            i. Terminate resuscitation
        b. PEA with rate > 40
            i. Prompt transport to nearest trauma center with continued resuscitation
        c. VFib/VTach
            i. Defibrillate per protocol
            ii. Prompt transport to nearest trauma center with continued resuscitation
    4. Control obvious external hemorrhage by application of direct pressure and/or tourniquet as needed.
    5. Start chest compressions at rate 100 per minute with minimal interruptions
    6. Provide oxygenation and ventilation by BVM or advanced airway as indicated.
    7. If mechanism of injury was blunt or penetrating trauma to chest, strongly consider bilateral needle thoracostomy.
    8. Obtain vascular access by IV or IO and initiated fluid resuscitation.
B. Transport to nearest trauma center
    1. Transport if ROSC achieved
    2. Transport if PEA (organized rhythm) with rate > 40 or persistent VF/VT
    3. Penetrating or blunt trauma with witnessed cardiac arrest by EMS provider
    4. Females with known pregnancy >24 week or uterine fundus palpable above the umbilicus

GLASGOW COMA SCALE

Eye Opening	**Spontaneous**	**4**
	To Voice	**3**
	To Pain	**2**
	None	**1**
Verbal Response	**Oriented**	**5**
	Confused	**4**
	Inappropriate Words	**3**
	Incomprehensible Sounds	**2**
	None	**1**
Motor Response	**Obeys Commands**	**6**
	Purposeful Movement to Pain	**5**
	Withdraw to Pain	**4**
	Flexion to Pain	**3**
	Extension to Pain	**2**
	None	**1**

PEDIATRIC ADAPTATION OF GLASGOW COMA SCALE
(for use with children less than school age)

Eye Opening	**Spontaneous**	**4**
	To Sounds	**3**
	To Painful Stimuli	**2**
	None	**1**
Verbal Response	**Appropriate Words or Social Smile**	**5**
	Cries but Consolable	**4**
	Persistently Irritable	**3**
	Restless, Agitated	**2**
	None	**1**
Motor Response	**Spontaneous Movement**	**6**
	Localizes to Pain	**5**
	Withdraw to Pain	**4**
	Flexion to Pain	**3**
	Extension to Pain	**2**
	None	**1**

START AND JUMP-START TRIAGE

Good Samaritan Hospital EMS protocols have adopted a simple system for triaging patients in a multiple- patient scenario or a mass casualty incident*. It is acknowledged that, under these circumstances, some patients that EMS could potentially save if encountered individually will not be given the benefit of all necessary resources.*

START Triage Tag Color

Move the Walking Wounded	Minor
No Respirations after Head Tilt/Jaw Thrust	Dead / Dying
Respirations >30	Immediate
No radial pulse (least injured arm)	Immediate
Mental Status: Unable to follow simple commands	Immediate
Otherwise…	Delayed

Developed by the Newport Beach, CA Fire & Marine Dept., and the current DOT Standard for EMS providers.

JUMP-START TRIAGE

Jump-START is a modification of the START triage guidelines for pediatric patients and takes into account the normal variation in respiratory rate on the basis of age, and the fact that primary respiratory failure can be corrected easily.

- An apneic child is more likely to have a primary respiratory problem than an adult. Perfusion may be maintained for a short time and the child may be salvageable.
- A respiratory rate of 30 may either over-triage or under-triage a child, depending on age.
- Capillary refill may not adequately reflect peripheral hemodynamic status in a cool environment.
- Obeying commands may not be an appropriate gauge of mental status for younger children.

JUMP-START TRIAGE (ages 1-8)

Move the Walking Wounded	Minor
Apneic or irregular respirations: Open Airway	
Resume Breathing?	Immediate
Still apneic and no peripheral pulse?	Dead / Dying
Still apneic and has a peripheral pulse: Mouth-to-Mask for 15 seconds (4-5 breaths)	
Resume Breathing?	Immediate
Still apneic?	Dead / Dying
Respirations <15 or >45	Immediate
Pulse: No peripheral pulse (least injured extremity)	Immediate
Mental Status: Unresponsive or responsive to pain only	Immediate
Otherwise…	Delayed
Age<1: If all Jump-Start "delayed" criteria are satisfied and there are no significant external injuries, the child may be classified "ambulatory" and tagged	Minor

DECONTAMINATION OF PATIENTS

To decrease potential exposure of emergency and health care personnel, patients exposed to hazardous materials should be decontaminated at the scene as indicated by the exposure, given resources and patient condition. This guideline is for the medical treatment and transportation aspects of these patients, and does not encompass the hazardous materials response or mitigation.

1. Ensure that each receiving hospital is notified as early as possible of
    1. suspected agent(s),
    2. route of exposure (e.g., skin vs. inhalation), and
    3. estimated number of patients.
2. Ensure that the Indiana Poison Center (IPC) is notified as early as possible of the suspected agent(s) and likely receiving hospital(s). 800mhz. or the IHERN is preferred; the E.R. is also available at 812- 885-3777.
3. Perform decontamination as indicated by the exposure.
    1. Upon completion of decontamination and/or removal of contaminated clothing, patients should be covered (including feet).
    2. If the patient's clothing is removed, it should remain at the scene; valuables may come with the patient sealed in a plastic bag.
4. Treat and transport patients per appropriate out-of-hospital care guidelines. Utilize appropriate personal protective devices to decrease likelihood of EMS personnel exposure.
5. For each patient transported, notify the receiving hospital en route of the patient's medical and/or trauma issues, condition, and the type of decontamination performed.
6. Deliver patients to the appropriate area at the Emergency Department.
    1. If additional decontamination is needed, this will typically not be directly into the ED, but rather to the adjacent decontamination area.
    2. Unless otherwise directed, do not drive the ambulance into an enclosed area (e.g., garage)
7. At the conclusion of all out-of-hospital patient assessment and transport activities, ensure that each hospital contacted in #1 and the IPC is notified of
    1. The total number of patients transported (or if no patients are coming).
    2. The conclusion ("all clear") of out-of-hospital EMS activity at the scene.

UNIVERSAL PRECAUTIONS

SINCE MEDICAL HISTORY AND EXAMINATION CANNOT RELIABLY IDENTIFY ALL PATIENTS INFECTED WITH BLOOD BORNE PATHOGENS, BLOOD AND BODY FLUID, UNIVERSAL PRECAUTIONS SHALL BE USED FOR ALL PATIENTS.

1. Universal blood and body fluid precautions (the use of barriers) shall be used for all patients if contact with blood or body fluids is possible regardless of whether a diagnosis is known. EMS providers are responsible to use the personal protective equipment (PPE) made available by their employer.
2. PPE should be removed immediately after patient contact to avoid contamination of other surfaces (i.e. – steering wheel, door handles, clip boards, pens, etc.)
3. Personnel with patient contact responsibilities, who have any open lesions, cuts, or skin conditions such as eczema, should report such conditions to management personnel prior to beginning their scheduled shift. Management may consult the Medical Director or Occupational Health physician when appropriate.
4. Personnel should have been assessed for the need for immunization against the Hepatitis B Virus.
5. Personnel will, upon hire and annually thereafter receive education and training pertaining to infection control guidelines to be observed for their service.
6. Body fluids include: saliva, sputum, gastric secretions, urine, feces, CSF, breast milk, serosanguineous fluid, semen, or any drainage.
7. Immediately after use, sharps will be disposed of in provided biohazard, puncture resistant containers. Containers will be replaced when 3/4 full. Used needles shall not be sheared, bent, broken, recapped, or resheathed by hand. Used needles shall not be removed from disposable syringes. Do not lay or stick used needles in seat cushions.
8. Exposure to Blood and/or Body fluids:
    a. Personnel sustaining an exposure (needle stick, mucous membrane, or skin contact) to blood and/or body fluids shall immediately cleanse the contaminated area with soap and water. If these are not immediately available, waterless hand cleaner shall be used.
    b. In cases of splattering of blood or body fluids to the eyes and/or mouth, flush with copious amounts of water for 15 minutes.
    c. Notify the employee's appropriate leadership personnel.
    d. Complete the Indiana State Board of Health **REPORT OF BLOOD OR BODY FLUID EXPOSURE** form and leave a copy of this at the receiving facility with any other paperwork left following patient care. Remaining copies shall be turned over to Management per the Department policy. This form must be filled out completely and accurately within twenty-four (24) hours.
9. **Hand washing is the most important infection control procedure**. EMS providers should wash their hands:
    a. after removing PPE
    b. after each patient contact
    c. after handling potentially infectious material
    d. after cleaning/decontaminating equipment
    e. after using the restroom
    f. before eating or preparing food

BLOOD AND BODY FLUID EXPOSURE OF EMS PERSONNEL

The Ryan White Care Act of 1990 and amended in 1996 contains provisions for the notification of emergency response personnel exposed to infectious diseases while attending, treating, assisting, or transporting a victim. In Indiana, IC 16-41-10 provides for an emergency medical services provider (a firefighter, a law enforcement officer, a paramedic, an emergency medical technician, a physician or nurse licensed in Indiana, or other persons who provider emergency medical services in the course of their employment) who is exposed to potentially infectious blood or body fluids to get this notification in the following manner:

A. EMS Provider must notify provider's employer within 24 hours of the exposure on a form designated by the EMS Commission and the State Health Department. A copy of the form goes to:
    1. The Medical Director of the health care facility to which the patient was taken following the exposure OR in the health care facility where the patient was located at the time of exposure, AND
    2. The EMS provider's employer, AND
    3. The State Health Department.
B. A patient (including those unable to consent due to physical or mental incapacity) to whose blood or body fluids the EMS provider is exposed is considered to have consented to:
    1. Testing for the presence of dangerous communicable diseases. These diseases are only those which are life-threatening by carrying a substantial risk of death if acquired by a healthy, susceptible host, and the disease can be transmitted from person to person. The diseases are:
        I. Infectious pulmonary tuberculosis
        II. Hepatitis B, C
        III. HIV
        IV. Diphtheria
        V. Hemorrhagic fevers
        VI. Meningococcal disease
        VII. Plague
        VIII. Rabies
    2. Release of the testing results to the Medical director of the health care facility (or other designated physician).
    3. However, a medical facility may not restrain a patient in order to test the patient for dangerous communicable diseases, and nothing in the law prohibits a patient from being discharged from the medical facility before such testing is performed or the results of the tests are released.
    4. A provider or a facility that tests patient for the presence of a dangerous communicable disease under this law is immune from liability for the performance of the test over the patient's objections or without the patient's consent.
C. Within 72 hours of being notified of the exposure, the Medical director of the health care facility (or other designated physician) must notify the Medical Director of the EMS provider's employer (or other physician designated in writing by the EMS provider) of the results of the test(s).
D. Within 48 hours of being notified of the results of the test(s), the Medical Director of the EMS provider's employer (or other physician designated by the EMS provider) will

1. Explain, without disclosing information about the patient, the presence or absence of dangerous communicable disease(s) to which the provider was suspected to have been exposed, if any.
2. Provide any medically necessary treatment and/or counseling to the EMS provider. Expenses of testing, treating, or counseling the EMS provider are the responsibility of the EMS provider or the provider's employer.

INFECTION CONTROL PROCEDURES

A. All body fluids from all patients will be considered potentially to be infectious. All emergency response employees are to use the personal protective equipment (PPE) made available by their employer. It is the employee's responsibility to wear the appropriate PPE in order to have maximum protection against infectious disease.
B. Handwashing is the most important infection control procedure! Emergency response employees will wash hands:
    1. after removing PPE
    2. after each patient contact
    3. after handling potentially infectious materials
    4. after cleaning or decontaminating equipment
    5. after using the bathroom
    6. before eating
    7. before and after handling or preparing food
C. Handwashing will be performed for at least 10-15 seconds, utilizing soap and water or an alcohol-based solution.
D. Eating, drinking, smoking, handling contact lenses, or applying cosmetics or lip balm is prohibited at the scene of EMS operations.
E. Disposable resuscitation equipment and supplies will be used whenever possible. For CPR, the order of preference is:
    1. Disposable bag-valve mask
    2. Disposable pocket mask with one-way valve
    3. Mouth-to mouth resuscitation
F. After use, all PPE and contaminated disposable patient care materials will be placed in leak proof bags, color coded and marked as a biohazard for disposal as soon as possible.
G. Contaminated work clothes will be removed and exchanged for clean clothes as soon as possible. The crew member will shower if body fluids were in substantial contact with skin under work clothes.

POST EXPOSURE PROTOCOL

A. Any employee exposed to potentially infectious material will immediately wash the exposed area with soap and water or an alcohol-based solution (saline wash if the eyes are involved.)
B. Any employee having an occupational communicable disease exposure will immediately report the exposure to his/her supervisor. Needle stick injuries will be reported to the designated officer immediately.
C. The emergency response employee will fill out the appropriate exposure report forms at the soonest possible time after any exposure occurs.
D. All exposures to infectious or potentially infectious materials should be medically evaluated within the first hour after exposure as some prophylactic treatments are only effective if initiated within that time period. The following events will be considered potentially high risk exposures:
    1. Hollow needle stick injuries.
    2. Breaks in the skin caused by potentially contaminated objects.
    3. Splash of blood or other potentially infectious material onto eyes, mucous membranes, or non-intact skin.

E. All potentially high risk exposures will immediately be evaluated by a qualified medical care provider and a plan for prophylactic treatment will be initiated if deemed appropriate:
    1. Blood (and urine sample for UPT, if applicable) may be obtained to establish a baseline.
    2. The decision to initiate anti-retroviral therapy is made without waiting for lab test results.
        I. Current treatment guidelines will be followed.
        II. The patient will be referred to Occupational Health, Infectious Disease, and/or their private physician as appropriate.
F. Whenever possible, the source patient will be traced to the receiving facility by the designated officer. The designated officer will notify the receiving facility that a communicable disease exposure has taken place, and request an infectious disease determination as provided for in IC 16-41-10.

REQUEST FOR NEW OR CHANGED PROTOCOL / MEDICAL EQUIPMENT

A. Documentation of the following information should be submitted to the agency's EMS Medical Director for review:
    1. Executive Summary (one-paragraph summary of everything below)
        I. Define the problem.
        II. How commonly is the problem encountered (e.g., cases per week, month, or year)
            a. This should be data-based – either retrospectively (looking at patient care records) or prospectively (using a survey after calls)
        III. What is the proposed solution?
            a. Provide a copy of the new protocol (in the usual format) and/or Identify all protocols that will require a change.
            b. What are the benefits? (e.g., reduced morbidity/mortality, increased patient comfort, increased patient care efficiency or effectiveness)
            c. What are the risks (e.g., side effects, complications)
            d. What is the cost?
                a. Direct costs (e.g., to supply all vehicles/kits plus spare supplies at station(s), how soon will it expire/become obsolete?
            e. Will special storage be necessary (e.g., refrigeration)?
            f. Indirect costs (e.g., training)?
        IV. What alternatives were considered? Why is the proposed solution the best choice?
    2. Include a list of keywords used for medical literature search and a copy of the salient literature.

Patient Transfer of Care / EMS Timeout

The following steps should occur each patient being moved from EMS cot to ER stretcher:

1. Nurse calls "EMS Time Out"
2. Patient movement and conversations stop
3. EMS delivers patient report
    A. Demographic
    B. Mechanism
    C. Injuries
    D. Signs/Vitals
    E. Treatments
4. Receiving nurse signs ePCR
6. Patient moved to hospital bed

“ALERT” Notifications to ER

1. Suspected STEMI
2. Suspected Sepsis
3. Stroke Alert
4. Trauma

Early notification to the ER will allow preparation and therefore should occur immediately upon identification.

This process should follow these steps:

1. Utilize the appropriate guideline and posted flow charts to assess the patient for possible ALERT inclusion.
2. Advise Central Dispatch of ALERT
3. Central Dispatch will call the ER and advise them that EMS is notifying them of an ALERT.
4. Transport the patient.
5. Follow the specific guideline for continued patient assessment and care.
6. Perform patient “call-in” via phone or radio.
7. Name and date of birth are essential during ALERT notification
8. Deliver patient
9. Adhere to “EMS Timeout” for patient handoff report.

SECTION TWO:
TREATMENT GUIDELINES

INITIAL MEDICAL CARE

BLS

1. Follow the Universal Precautions protocol.
2. Follow the Airway Management protocol to open and maintain a patent airway.
3. Follow the Oxygen Administration protocol when appropriate.
4. Loosen tight clothing and reassure the patient.
5. Place the patient in the position of comfort unless contraindicated by injuries and/or symptoms.
6. Completely assess the patient, including vital signs.
7. Obtain an appropriate history
8. Refer to appropriate protocol according to patient condition.
9. Reassess patient and record vital signs every 5-10 minutes as condition warrants. Transported patients must have at minimum 2 sets of complete vitals documented. Weight will be recorded in kilograms for all pediatric, overdose/poisoning, and any adult receiving medications.
10. Patient's body temperature should be preserved, especially infants, children, and the elderly

ALS

11. Establish IV access:
    1. to administer pre-hospital medications, or
    2. for fluid replacement, or
    3. if the patient's condition is likely to deteriorate before arriving at the hospital.
12. The IV solution is to be NORMAL SALINE unless otherwise stated. *(See Vascular Access Procedures)*
13. If an IV cannot be established and an urgent need for vascular access exists, establish IO access. *(See Vascular Access Procedures)*
14. Pre-existing vascular access devices (PVAD) may be used only if:
    1. The patient is in cardiac arrest, or
    2. There is an emergent need to administer fluids or IV medications and a peripheral IV cannot be established and an IO is not appropriate due to the patient's condition. *(See Vascular Access Procedures)*

AIRWAY MANAGEMENT

BLS

A. Open the airway by use of a chin-lift or jaw thrust without head tilt. Remember to protect the cervical spine at all times when the potential for cervical spine injury exists.
B. Suction is indicated in any patient whose airway is obstructed by liquid or solid material which may result in aspiration or interfere with respiration.
C. Use a non-visualized, oropharyngeal or nasopharyngeal airway device as needed to maintain a patent airway.
D. Assist ventilations as needed using a bag-valve device (BVM) and 100% oxygen. *(Pediatric rate - 20 / min., newborns – 40 - 60 / min.)* BVM use should include the two-hand mask-seal technique whenever possible. The volume of the ventilation should be enough to provide visible chest rise.
E. If a patient age 18 or older is in respiratory arrest with no gag reflex, insert an appropriately sized non- visualized airway, if available. See cardiac arrest protocol for cardiac arrest patients.

ALS

A. If the above measures prove to be inadequate or there is risk of aspiration or vomiting in the unconscious patient, intubate adults with an endotracheal tube or non-visualized airway. The guidelines for intubation are as follows:
B. Bag-valve-mask ventilation is the preferred method of oxygenating and ventilating pediatric patients. If you cannot adequately ventilate with a BVM, attempt placement of a non-visualized airway if available. If non-visualized airway fails to provide adequate oxygenation, proceed to endotracheal intubation.
C. Endotracheal intubation is the preferred advanced airway maneuver for adults. ***(See Verification of Endotracheal Tube (ETT) Placement – Procedure*.**
D. The initial use of the non-visualized airways by an ALS provider should be reserved for those adults in whom an endotracheal tube cannot be placed. If a non-visualized airway is in place and maintaining a patent airway it should not be replaced with an ETT.
    a. If unable to place an endotracheal tube after two attempts, place a non-visualized airway, if available.
    b. If the above are unsuccessful, maintain an airway via basic skills utilizing modified jaw thrust, OP airways, BVM, etc.
E. Criteria for performance of cricothyrotomy are as follows:
    a. If basic airway management, non-visualized airways, and intubation are **unable to provide oxygenation and ventilation**
        i. Surgical cricothyrotomy is to be performed on the patient > /= 8 years old.
        ii. Needle cricothyrotomy is to be performed on the patient < 8 years old
        iii. ***(See Procedures- Cricothyrotomy)***

IF CRICOTHYROTOMY IS ATTEMPTED, A COPY OF THE PATIENT CARE REPORT MUST BE MADE AVAILABLE TO PROVIDER AGENCY SUPERVISORY PERSONNEL AND THE MEDICAL DIRECTOR WITHIN 24 HOURS OF THE RUN.

OXYGEN ADMINISTRATION

BLS

A. Any patient who has difficulty breathing or a SaO_2 < 93% should be given oxygen.
B. Patients with mild respiratory distress *(respiratory rate <25, no cyanosis, and no use of accessory muscles)* may be given oxygen by nasal cannula at 4-6 LPM to maintain an oxygen saturation of 94-99%.
C. Patients with moderate respiratory distress *(with or without cyanosis and/or using accessory muscles while breathing)* should be given oxygen by a non-rebreather mask at 10-15 LPM. Liter flow should be enough to maintain inflation of the reservoir with oxygen and to maintain an oxygen saturation of 94-99%.
    1. Infants and newborns should have oxygen administered by the blow-by method.
D. Patients with severe respiratory distress should be assisted with ventilations by use of a bag-valve-mask with reservoir and supplemental oxygen (an oropharyngeal or nasopharyngeal airway should be inserted if tolerated). Oxygen should be set to 15 LPM.
E. Spontaneously breathing patients who are suspected to have been exposed to carbon monoxide or who are suspected of having a pneumothorax should receive oxygen by a non-rebreather mask at 10-15 LPM. Liter flow should be enough to maintain inflation of the reservoir with oxygen.

OBSTRUCTED AIRWAY

Infant – Conscious

BLS

A. Determine complete airway obstruction.
B. Deliver cycles of alternating chest thrusts and back slaps until the obstruction is relieved or the patient becomes unconscious.
C. Do not perform blind finger sweeps.
D. If patient becomes unconscious, see below.

Child or Adult – Conscious

BLS

A. Determine complete airway obstruction.
B. Deliver abdominal thrusts until the obstruction is relieved or the patient becomes unconscious (Chest thrusts can be substituted in obese or pregnant patients.)
C. If patient becomes unconscious, see below.

Infant, Child or Adult – Unconscious

A. Stabilize cervical spine if potential for injury exists.
B. If the patient has no breathing or agonal gasps, begin CPR, starting with compressions.
C. Continue 2 minute cycles of CPR (30:2 for the adult, 15:2 for the infant and child with more than one rescuer).
D. Prior to giving respirations check for an obstructing object. If an object is visualized, remove it.
E. Attempt to ventilate.
F. If unable to ventilate, repeat above steps until material is dislodged. Suction the patient as needed.
G. If patient remains unconscious, transportation by ALS is preferred.
H. If the object is dislodged, assess airway, breathing, and circulation. Proceed with appropriate protocol.

ALS

A. Use of the Magill forceps may be necessary to dislodge objects.

PAIN MANAGEMENT

A pain assessment is considered standard of care on every patient, along with an initial set of vitals, and should be documented on the run report along with any pain management intervention and the patient's response.

BLS
Attempt to place patient in position of greatest comfort

ALS
Paramedics should consider offering pain medication to any patient describing pain. Medications should be selected by paramedic judgment of pain severity (mild, moderate, severe) and is not necessarily limited to single pharmacologic agent.

Mild Pain

A. Paramedics should consider offering patients describing mild pain acetaminophen for pain management.
   1. Acetaminophen may be administered to patients > 15 years old and > 50 kg as 650 mg PO once a. Unless the patient has:
      a. An allergy to acetaminophen
      b. A history of liver dysfunction
      c. Active vomiting
      d. Acetaminophen use within last 4 hours

Moderate Pain

B. Paramedics should consider offering patients describing moderate to severe pain ketorolac (Toradol®) for pain management.
   1. Ketorolac is administered in the following doses:
      For patients > 15 years old: 15 mg IV or 30 mg IM once.
      a. Unless the patient has:
         i. An allergy to ketorolac, aspirin, or other NSAIDS
         ii. History of renal dysfunction
         iii. History of GI bleed
         iv. Active bleed or suspicion of active bleed
         v. NSAID use within last 6 hours
         vi. Pregnancy

Severe Pain

C. Paramedics should consider offering patients describing severe pain fentanyl for pain management.
      a. Fentanyl is administered in the following doses:
         i. Patients >15 years old **or** >50 kg:
            1mcg/kg slow IV push or IN up to 100 mcg for the first dose. Re-assess and consider an additional 50 mcg may be administered every 5

minutes up to a maximum of 300 mcg prn pain > 3/10. Consider lower doses for patients > 65y/o or those with other comorbid conditions.

ii. Patients <15 years old **or** < 50 kg:
    a. Up to 1mcg/kg slow IVP or 1-2 mcg/kg intra-nasal every 5 minutes up to a maximum of 3 mcg/kg prn with evidence of significant discomfort.
    b. Unless the patient has:
        i. An allergy to fentanyl; **OR**
        ii. A significantly altered level of consciousness (GCS < 14 or below baseline)

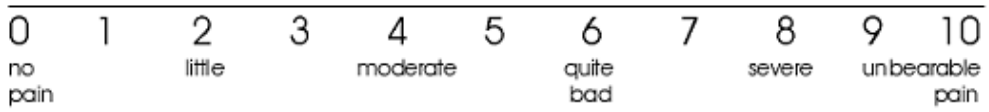
b. Ketamine is administered in the following doses:
    i. Patients greater than 3 months old
    ii. <15 years old or <50kg:
        a. 0.1-0.3mg/kg slow IVP or IO
c. Additional doses may be administered with approval of Medical Control.

D. Naloxone must be immediately available.

Patient's BP, HR, RR, GCS, and pain scale must be monitored regularly (at least once prior to and once after the dose(s) of medication) and documented on the patient care record.

EXAMPLE PATIENT PAIN ASSESSMENT SCALES

0 – 10 Numeric Rating Scale and Descriptors



Wong-Baker FACES Pain Rating Scale

From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

Infant Pain Scale Assessment Tool

Behavior	Scoring			
	0	**1**	**2**	**3**
Facial	Neutral/smiling	Frowning/grimaci	Clenched teeth	Full cry expression
Body Movement	Calm, relaxed	Restless/fidgeting	Moderate agitation or moderate mobility	Thrashing, flailing, incessant agitation or strong voluntary immobility
Sleep	Sleeping quietly with easy respirations	Restless while asleep	Sleeps intermittently (sleep/awake)	Sleeping for prolonged periods of time interrupted by jerky movements or unable to sleep
Verbal/Vocal	No cry	Whimpering, complaining	Pain crying	Screaming, high complaining pitched cry
Consolability	Neutral	Easy to console	Not easy to console	Inconsolabe
Response to Movement/Touch	Moves easily	Winces when touched/moved	Cries out when moved/touched	High-pitched cry or scream when touched or moved

NAUSEA AND/OR VOMITING

Assess for potential life-threatening causes of nausea and vomiting (such as myocardial infarction or shock) and initiate appropriate protocols.

ALS

If nausea and/or vomiting persists after initiating other indicated treatment protocols, and if no contraindication is present, you may administer ondansetron.

A. Administer ondansetron:
    a. Adults 50 Kg and over: 4-8 mg IV push or via oral-dissolving (ODT) tablet.
    b. Less than 50 kg: 0.1 mg/Kg IV push or via an appropriate portion of an oral-dissolving (ODT) tablet (e.g., one-quarter or one-half...).

RESPIRATORY EMERGENCIES

DIFFICULTY BREATHING: CROUP

CRITERIA: If the patient with difficulty breathing is at least 6 months of age and the cause is suspected to be croup (e.g., the patient has stridor at rest with retractions and/or accessory muscle use):

BLS

A. Begin Initial Medical Care.
B. Follow Airway Management protocol.
C. Follow Oxygen Administration protocol.
D. If the patient is in moderate to severe respiratory distress per the Oxygen Administration protocol, call for a paramedic unit.
E. If possible, administer humidified oxygen via the blow-by method.

ALS

A. Administer one of the following treatments:
    a. The preferred treatment is 0.5 ml of 2.25% **racemic epinephrine (Vaponephrine)** diluted with 4.5 ml of 0.9% normal saline (for a total volume of 5 ml) and administered by nebulizer with 5-6 lpm oxygen.
    b. If racemic epinephrine is unavailable administer 5 ml of 1:1,000 **epinephrine** by nebulizer with 5-6 lpm oxygen.
B. Apply the cardiac monitor.
C. If the patient becomes unresponsive or is markedly short of breath, a nebulizer may be connected to a BVM using a "flex connector" to administer racemic epinephrine or epinephrine. Two oxygen connections will be required. The nebulizer will require an oxygen connection at 5-6 lpm in addition to a high flow connector for the BVM.

Obstructive or Reactive Airway Diseases

A. Administer oxygen as indicated - (See **Oxygen Administration Protocol**)
   1. If the patient presents with shortness of breath related to a known diagnosis of COPD or asthma, determine if the patient has physician-prescribed hand-held inhaler or nebulizer. If available, assist with one of the following:
      a. Metered Dose Inhalers **Use with spacer device if possible**
         i. Albuterol (with or without Ipratropium) – one dose (2-4 puffs)
         ii. Levalbuterol – one dose (2 puffs)
      b. Nebulizers (EMTs may connect nebulizer to oxygen at 6 LPM)
         If no relief from patients meter dosed inhaler or patient does not have a prescribed MDI then nebulized treatment may be administered:
         i. Albuterol, Albuterol/Ipratropium (Combivent), or Levalbuterol
            (a) Administer albuterol, 2.5 mg and ipratropium 0.5 mg nebulized with 5-6 lpm of oxygen.
               (i) No more than three doses of ipratropium should be administered.
               (ii) Albuterol dose should be increased to 5 mg if the patient uses an albuterol nebulizer regularly.
               (iii) Nebulizer treatments should be repeated as needed.
   2. Reassess patient. Anticipate need for assisting ventilations with BVM and high flow O2.
   3. Request ALS if not already enroute. If the BLS crew is able to deliver the patient to an emergency room within the same time it would take for the ALS crew to respond to the scene, then BLS crew should transport the patient.

ALS

If difficulty breathing is suspected from reactive airway disease or obstructive airway disease and there is no improvement from prescribed inhaler or if no inhaler was administered:

1. Administer albuterol, 2.5 mg and ipratropium 0.5 mg nebulized with 5-6 lpm of oxygen
   a. No more than three doses of ipratropium should be administered.
   b. Albuterol dose should be increased to 5 mg if the patient uses an albuterol nebulizer regularly.
   c. Nebulizer treatments should be repeated as needed.
   d. If you suspect the SOB is due to CHF, refer to the CHF protocol

2. Apply the cardiac monitor, pulse oximeter, and waveform capnography to the patient.
3. Initiate a peripheral IV, if necessary.
4. Administer therapy and medications as follows:

Adults	Pediatrics
1. If the patient is still markedly short of breath, hypoxemic (oxygen saturation <92% on non-rebreather), or in the judgment of the Paramedic immediate CPAP would be beneficial CPAP may	1. If the patient is over the age of 2 years with a KNOWN history of asthma AND are receiving a 2nd nebulized treatment, give ONLY ONE of the following treatments.

be initiated immediately in conjunction with medication therapies (see specific protocol). 2. For patients 18 years or older who are receiving a 2ns nebulized treatment OR are being placed on CPAP, give ONLY ONE of the following treatments: a. Oral Prednisone 50-60mg b. Methylprednisolone 125mg IV/IM 3. If the patient has a history of asthma and presents in respiratory arrest, respiratory failure or status asthmaticus and continues to decline with treatment (e.g. if you have initiated CPAP or BVM ventilations with in-line nebulized treatment) administer 0.3mg Epinephrine 1:1,000 IM a. If the that patient is over the age of 50, has a history of COPD, a heart rate >150 or a history of heart disease contact medical control prior to administration. 4. (Optional) Consider the following if the patient does not improve after two (2) Albuterol or Ipratropium treatments is still in respiratory distress or begins to worsen, and has been given Corticosteroids AND Epinephrine, a. Normal Saline 500-1000ml Bolus b. Administer Magnesium Sulfate 2g over 20 minutes	1. Oral Prednisone 50-60 mg IF able to swallow pills and >30kg 2. Methylprednisolone 2 mg/kg IV (maximum dose 125 mg IV) 2. If the patient is over the age of 2 years with a KNOWN history of asthma and presents with respiratory arrest, respiratory failure or status asthmaticus and continues to decline despite treatments administer **0.01 mg/kg Epinephrine 1:1,000 IM. (Max 0.3 mg)** 3. If the child is markedly short of breath, hypoxemic (oxygen saturation <92% on non- rebreather), **and showing signs of respiratory failure (**e.g. altered mental status, poor respiratory effort**)**, BVM ventilations may be initiated immediately in conjunction with medication therapies

If a treatment was initiated by a fire department, you must document the exact dose given in the assessment/treatment of EMR.

Initiate transport

Medication Guidelines

For patients 18 years or older who are receiving a 2nd nebulized treatment OR are being placed on CPAP, give ONLY ONE of the following treatments.

1. Oral Prednisone 50-60mg.
    A. This treatment should be used for patients with mild-moderate symptoms who can swallow the medication without difficulty.
    B. Do not give this medication if you believe the SOB is due to a mechanism other than an Asthma or COPD exacerbation.

2. Methylprednisolone 125mg IV/IM.
    A. This treatment should be used for patients with severe symptoms and who are unable to swallow oral medications.
    B. If the patient is being placed on CPAP due to CHF symptoms DO NOT administer methylprednisolone.
    C. Do not administer this medication if you believe the SOB is due to mechanism other than an Asthma or COPD exacerbation.
3. Magnesium Sulfate (Adults Only)
    A. Administer 2g over 20 minutes

Drop Set	20	60
Gtt/min	100	300

Table is for 2g in 100mL

DIFFICULTY BREATHING-PULMONARY EDEMA

BLS

If difficulty breathing is suspected from pulmonary edema:

CPAP may be initiated, Refer to CPAP Protocol (Section Procedures, protocol #86)

ALS

If difficulty breathing is suspected from pulmonary edema:

1. If SBP is 90 mm Hg or greater, administer up to three (3) 0.4 mg doses of nitroglycerin sublingually (SL) and repeat up to three 0.4 mg SL doses every 3 minutes until the patient's respiratory distress is relieved or the SBP is < 90 mm Hg.
2. ***See note below – Nitroglycerin and Viagra, etc.**
3. If the patient is still markedly short of breath and hypoxemic (oxygen saturation <92% on 100% oxygen) after the first dose of nitroglycerin dosing, CPAP may be initiated (see specific protocol)
4. Nitroglycerin should continue to be administered as above every 3 minutes as long as the patient remains dyspneic and systolic BP > 90 mm Hg.
5. Apply the cardiac monitor, pulse oximeter, and waveform capnography to the patient.
6. Initiate an IV.

The combination of nitroglycerin and Viagra®, Revatio® (sildenafil), Levitra® (vardenafil), or Cialis® (tadalafil) have been found to cause precipitous and irreversible hypotension.

- *Ask every chest pain patient whether or not he/she has been on Viagra, etc. and, if so, when was the last dose? Document this on every run sheet involving the cardiac chest pain patient (even those who deny using Viagra or similar medications).*
- ***DO NOT** automatically administer nitroglycerin to any patient who has had Viagra, etc. within the past week. Consult with the receiving physician for appropriateness.*

DIFFICULTY BREATHING-SMOKE INHALATION

BLS

1. Assess for and manage trauma or burns per the appropriate protocol.
2. Carbon monoxide and cyanide toxicity should be considered for any patient who experiences smoke inhalation in an enclosed space. See Carbon Monoxide Poisoning Protocol.
3. Apply the cardiac monitor, pulse oximeter, and waveform capnography to the patient. (Pulse oximetry monitors may give false readings in patients exposed to carbon monoxide.)
4. Categorize the patient:

Responsive Patient	Responsive patient with soot in airway and 1) altered level of consciousness or 2) hypotension	Unresponsive Patient
1. Provide high flow O2 2. Request ALS if not already enroute	1. Ensure an airway and provide high flow O2. 2. For wheezing or stridor, treat with 2.5-2 mg nebulized albuterol as needed.	1. Establish airway with OP, NP or non-visualized airway 2. Provide high flow O2 by NRB mask or BVM 3. For wheezing or stridor, treat with 2.5-2 mg nebulized albuterol as needed. 4. Request ALS if not already enroute 5. If BLS can transport the patient before ALS can arrive at the scene, do so.

ALS

1. Assess for and manage trauma or burns per the appropriate protocol.
2. Carbon monoxide and cyanide toxicity should be considered for any patient who experiences smoke inhalation in an enclosed space. See Carbon Monoxide Poisoning Protocol.
3. Apply the cardiac monitor, pulse oximeter, and waveform capnography to the patient. (Pulse oximetry monitors may give false readings in patients exposed to carbon monoxide.)
4. Categorize the patient:

Responsive patient – no evidence of significant cyanide toxicity	Responsive patient with soot in airway and 1) altered level of consciousness or 2) hypotension	Unresponsive patient
1. Provide high flow O2 by NRB mask	1. Ensure an airway and provide high flow O2. 2. For wheezing or stridor, treat with 2.5-2 mg nebulized albuterol as needed.	1. Establish an airway and provide high flow O2 2. For wheezing or stridor, treat with 2.5-5 mg nebulized albuterol as needed.

	3. Establish an IV 4. Draw blood samples 5. Adult: If available mix both Cyanokit® 2.5g vials, each with 100mL NS and administer over 15 minutes Pediatrics: If available, mix one or both Cyanokit® 2.5g vials, each with 100mL NS and administer 70mg/kg over 15 minutes 6. If hypotensive, consider fluid challenge(s) 7. Transport emergently to closest appropriate hospital	3. Establish an IV; if patient is in cardiac arrest, establish 2 IVs 4.Draw blood samples 5. Adult: If available mix both Cyanokit® 2.5g vials, each with 100mL NS and administer over 15 minutes Pediatrics: If available, mix one or both Cyanokit® 2.5g vials, each with 100mL NS and administer 70mg/kg over 15 minutes 6. If hypotensive, consider fluid challenge(s) 7. Transport emergently to closet appropriate hospital

CARBON MONOXIDE POISONING

Patients suffering from exposure to byproducts of combustion should, when feasible, have a carbon monoxide (CO) level recorded using a co-oximeter device. These situations include fire victims or smoke inhalation exposure to CO, firefighters during rehab activities, patients or families with complaints of general illness or headache. EMS providers should make efforts to assure that firefighters are assessed for elevated levels of CO after structural firefighting activities.

BLS

1. Refer to airway management protocol
2. Obtain vital signs
3. Obtain CO determination using a co-oximeter device if available.
4. CO level 10% or greater and/or symptomatic - 100% NRB O2 and transport to nearest appropriate hospital

ALS

1. Initiate IV Access when appropriate.
2. Treat arrhythmias per appropriate protocol when present.

NOTES:

1. Remember that pulse oximetry should not be used as a determination of oxygenation in the patient with elevated carboxyhemoglobin.
2. Smokers may have a baseline CO level as high as 5-6%

CARDIOVASCULAR EMERGENCIES

CHEST PAIN – Adult

All patients complaining of chest pain should be treated as having a myocardial infarction, unless other signs indicate pain is obviously from another origin.

The combination of nitroglycerin and Viagra®, Revatio® (sildenafil), Levitra® (vardenafil), or Cialis® (tadalafil) have been found to cause precipitous and irreversible hypotension.

- *Ask every chest pain patient whether or not he/she has been on Viagra, etc. and, if so, when was the last dose? Document this on every run sheet involving the cardiac chest pain patient (even those who deny using Viagra or similar medications).*
- ***DO NOT** automatically administer nitroglycerin to any patient who has had Viagra, etc. within the past week. Consult with the receiving physician for appropriateness.*

BLS

A. Administer oxygen if necessary. *(See Administration of Oxygen Protocol)*
B. If pain is suspected to be cardiac in origin and if no significant allergy to aspirin exists, administer 324mg aspirin PO and have the patient chew them.
C. Request ALS if not already enroute. If the BLS crew is able to deliver the patient to an emergency room within the same time it would take for the ALS crew to respond to the scene, the BLS crew should transport the patient.
D. If available, obtain a 12-lead EKG as soon as possible, and with any significant change in patient condition. Transmit this to the receiving facility by electronic means or present with the patient.
E. If systolic BP is at or above 90 mm Hg and the patient has their own nitroglycerin prescription, assist the patient with taking one dose of his/her nitroglycerin. Nitroglycerin may be administered up to 3 times (every 3-5 minutes) as long as pain is not completely resolved and systolic BP remains above 90 mm Hg.
F. Contact receiving facility for further consultation if ALS is not on the scene. Initiate transport.

ALS

A. Administer ASA 324mg PO and have the patient chew them.
B. Apply the cardiac monitor. If dysrhythmias are present, refer to the *appropriate protocol.* Obtain a 12-lead EKG as soon as possible, and with any significant change in patient condition.
    1. Time permitting, repeat 12-lead EKG enroute and present both with patient.
    2. If the patient's 12-lead EKG demonstrates an acute inferior STEMI, consider obtaining another 12-lead with V4R
    3. Consider posterior 12-lead V8-V9
C. If systolic BP is at or above 90 mm Hg, administer a 0.4 mg dose of nitroglycerin sublingually. Nitroglycerin may be administered every 3 – 5 minutes as long as pain is not completely resolved and systolic BP remains at or above 90.
D. Initiate an IV

E. Scene time should be kept to a minimum, as this is a time-critical condition. Contact the intended receiving facility and alert them of a potential myocardial infarction (Medical Alert).

STEMI (ST Segment Elevation Myocardial Infarction) SPECIAL CARE

Patients with a STEMI or patients with chest pain thought to be due to myocardial ischemia and a left bundle branch block (LBBB) will be transported to a receiving facility with a cardiac catheterization laboratory (cath lab) available.

1. Call the intended receiving facility as early as possible to activate the cath lab process. Inform the receiving facility that you are bringing in a "STEMI Alert"
    A. Patients who are hemodynamically stable will be transported to an appropriate hospital of their choice.
    B. Patients who are hypotensive (systolic BP < 90 mm Hg) despite fluids or who have persistent life-threatening dysrhythmias will be transported to the closest hospital with cath lab availability.

The combination of nitroglycerin and Viagra®, Revatio® (sildenafil), Levitra® (vardenafil), or Cialis® (tadalafil) have been found to cause precipitous and irreversible hypotension.

- *Ask every chest pain patient whether or not he/she has been on Viagra, etc. and, if so, when was the last dose? Document this on every run sheet involving the cardiac chest pain patient (even those who deny using Viagra or similar medications).*
- ***DO NOT** automatically administer nitroglycerin to any patient who has had Viagra, etc. within the past week. Consult with the receiving physician for appropriateness.*

STEMI Alert

STEMI: S-T Segment Elevation Myocardial Infarction

Age

Can occur in the 20's, most common in older age groups. The elderly may present with atypical chest pain symptoms such as generalized weakness.

Gender

Chest discomfort is the most common symptom in both sexes, but providers should have increased vigilance with women who are more likely to have atypical symptoms than men.

Onset

Symptoms will have an acute onset.

Pain

Left chest or substernal chest pain most common. Note that with advancing age, chest pain is less common (sources cite ACS without chest pain in only 11% of those under 65 compared with 43% in those at age 85). The chest pain is visceral: squeezing, aching, pressure, band-like; sometimes with atypical symptoms such as unexplained diaphoresis, dyspnea of sudden onset (consider PE), jaw pain, left arm pain, indigestion, unexplained nausea and/or vomiting.

Clinical Criteria

Patient looks "sick," distressed, diaphoresis is common.

Provider Impression

- "This is very likely a patient suffering an acute MI".
- **Do not call a STEMI Alert unless you clinically believe that this patient is having an acute MI.**

If patient meets above clinical criteria, review the following checklist for STEMI Alert:

Indications: If answer is "no" or "unsure" do not call STEMI Alert	**YES**	**NO**	**UNSURE**
Does 12-Lead ECG present any of the following ST-segment abnormalities: ● **ST-Elevation in 2 contiguous leads ≥ 1 mm in any leads other than V2-V3** ● **ST-Elevation ≥ 2mm in leads V2- V3** ● **ST-Depression ≥ 1mm in V1-V2** ● **ST-Elevation ≥ 2mm in V8-V9 if posterior ECG is performed.**			
Does LP15 interpretation indicate one of the following? **>>Acute MI<<** **>>ACUTE MI SUSPECTED<<** **>>MEETS ST ELEVATION MI CRITERIA<<**			
Is QRS width < 0.12 sec or is RBBB present?			
Are symptoms consistent with myocardial infarction?			
Is ECG absent of ventricular paced rhythm?			
Is ECG absent of LVH?			

Call STEMI Alert if patient has concerning clinical symptoms AND the answer to all questions in the checklist is "YES"

DYSRHYTHMIAS: BRADYCARDIA

BRADYCARDIA CRITERIA: Heart rate <60/minute for children (1-15) and adults; <80/minute in infants. *Bradycardia with hemodynamic compromise is an ominous sign of impending cardiac arrest in infants and children.*
SYMPTOMATIC CRITERIA: Bradycardia with signs of poor perfusion and altered mentation, chest pain or dyspnea with associated hypotension.

BLS

1. Begin Initial Medical Care
2. Follow Airway Management protocol
3. Follow Oxygen Administration protocol
4. If patient is symptomatic, call for ALS unit. If the BLS crew is able to deliver the patient to an emergency room within the same time it would take the ALS crew to respond to the scene, the BLS crew should emergently transport the patient.

ALS

1. Apply cardiac monitor and obtain 12-lead EKG
2. If patient is symptomatic, establish a saline lock or IV with 0.9% NaCl. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.
3. If patient remains symptomatic, perform the following in a step-wise fashion. Reassess after each step and proceed to the next step if there is no improvement.

Bradycardia - Adult	**Bradycardia – Pediatric**
1. Administer atropine 0.5 mg every 3-5 minutes until pulse rate is greater than 60 beats per minutes or a total dose of 3 mg is given. A. Atropine administration should not delay pacing in peri-arrest situations. B. Second Degree Type II and wide complex Third Degree blocks should prompt aggressive use of external pacing. 2. Implement pacing procedures: A. Set rate at 70 bpm B. Start mA at 10 and gradually increase until the point of electrical capture C. Verify mechanical capture by feeling for a femoral or radial pulse. Muscle contractures initiated by the pacemaker make	1. Perform CPR if clinically indicated 2. Intubate only if BVM ventilations/oxygenation is inadequate 3. Administer epinephrine 0.01 mg/kg (1:10,000, 0.1 mL/kg) IV or IO every 3-5 minutes. 4. For increased vagal tone or primary AV block administer atropine 0.02 mg/kg (min. dose 0.1 mg, max single dose 0.5 mg) IV or IO; may repeat one time 3-5 minutes after initial dose. 5. Continue searching for possible reversible causes of hypoxia

a carotid pulse unreliable while externally pacing. D. If sedation or analgesia is indicated during the pacing procedure, Versed 2.5mg SIVP may be administered. Repeat x1 as necessary to maintain an adequate level of sedation.	

DYSRHYTHMIAS-TACHYCARDIA

BLS

1. Begin Initial Medical Care
2. Follow Airway Management protocol
3. Follow Oxygen Administration protocol D. If patient is symptomatic, call for ALS
4. Rule out underlying causes of tachycardia

ALS

1. Apply cardiac monitor and obtain 12-lead EKG
2. If patient is symptomatic, establish a saline lock or IV with 0.9% NaCl. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.
3. If the patient has no signs or symptoms of pulmonary edema, administer 250 mL bolus of 0.9% NaCl solution. Repeat 250 mL boluses every 5 minutes as long as SBP remains below 90 mmHg and no signs of pulmonary edema exist. (For peds, 20 mL/kg boluses)
4. If patient remains **symptomatic**, perform the following in a step-wise fashion. Reassess after each step and proceed to the next step if there is no improvement.
5. **For pediatric patients, refer to Pediatric Emergency weight/length-based tape**

Narrow Complex – Adult **QRS ≤ 0.12 sec**	**Narrow Complex – Pediatric** **QRS ≤ 0.12 sec**
Urgent: Angina chest pain, hypotension and/or pulmonary edema	**Urgent**: Infants – rate usually > 220/min Children – rate usually > 180/min
1. Have patient perform Valsalva maneuver using the REVERT method.* 2. If rhythm has not converted to a sinus rhythm and in your judgement the rhythm is believed to be SVT, administer: a. Adenosine, 12mg RIVP followed with 10mL fluid flush I. Observe and anticipate AV block(s) and/or transient asystole b. If, after 1-2 minutes, the rhythm does not convert or no AV block/transient asystole has occurred has occurred, repeat adenosine at 12mg RIVP, followed with 10mL fluid flush 3. If unable to rapidly establish IV access or if no response to adenosine or a rhythm other than SVT is observed, transport.	1. Have patient perform Valsalva maneuver using the REVERT method.* 2. If rhythm has not converted to a sinus rhythm and in your judgement the rhythm is believed to be SVT, administer: a. Adenosine, 0.1mg/kg (max 6mg) RIVP, followed with 10mL fluid flush b. Second dose of Adenosine, 0.2mg/kg (max 12mg) RIVP, followed with10mL fluid flush.
Emergent: Unconscious or no obtainable BP	Emergent: Hypotension, acutely altered mentation, signs of shock
Perform synchronous cardioversion in an escalating fashion at dosages recommended by the manufacturer.	**Perform synchronous cardioversion in an escalating fashion at dosages recommended by the manufacturer.**

*Have patient blow into a 10mL syringe to slowly move the plunger (~15 seconds); then quickly position patient supine with legs ≥45°.

Wide Complex – Adult **QRS > 0.12 sec**	**Wide Complex – Pediatric** **QRS > 0.12 sec**
Asymptomatic	Asymptomatic
1. Establish IV access and monitor patient for changes	1. Establish IV access and contact Medical Control for further instructions
Chest pain or dyspnea	
1. If regular/monomorphic administer adenosine 12mg RIVP; immediately follow with 10mL fluid flush. 2. If irregular or VT does not resolve, administer Amiodarone 150mg/IV over 10 minutes 3. Do not delay emergent transport 4. If VT does not resolve, an additional 150mg Amiodarone may be administered over 10 minutes 5. If VT persists, contact Medical Control regarding additional doses of Amiodarone	1. Contact Medical Control for further instructions.
Pulmonary edema, SBP<90 or unconscious with pulse	Hypotension, acutely altered mentation, signs of shock
1. Perform synchronous cardioversion in an escalating fashion at energy levels recommended by the manufacturer 2. Administer Amiodarone 150mg/IV over 10 minutes 3. If VT persists, cardiovert with maximum electrical output 4. If VT recurs, administer additional Amiodarone 150mg/IV over 10 minutes and cardiovert at the energy level that was previously successful 5. If VT persists, contact Medical Control regarding additional doses of Amiodarone	1. Perform synchronous cardioversion beginning with 0.5-1j/kg; if not effective, increase to 2j/kg 2. Contact Medical Control for further instructions.
Unconscious without pulses	**Unconscious without pulses**
Treat as Cardiac Arrest, VF/VT	**Treat as Cardiac Arrest, VF/VT**

Cardioversion Energy Recommendations

Narrow Complex	50j – 100j – 150j – 200j
Atrial Fibrillation	120j – 150j – 200j
Wide Complex Tachycardia	100j – 150j – 200j

SHOCK-CARDIOGENIC

Criteria: Symptomatic hypotension due to a suspected cardiac event with heart rate between 60-150 per minute.

BLS

A. Begin Initial Medical Care
B. Follow Airway Management protocol
C. Follow Oxygen Administration protocol
D. Request ALS if not already enroute. If the BLS crew is able to deliver the patient to an emergency room within the same time it would take for the ALS crew to respond to the scene, the BLS crew should transport the patient.

ALS

A. Apply cardiac monitor and obtain 12-lead EKG; if dysrhythmias are present, treat according to the appropriate protocol. If STEMI is suspected, notify the intended receiving facility
B. Establish an IV with 0.9% NaCl. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.
C. If the patient has no signs or symptoms of pulmonary edema, administer 500 mL bolus of 0.9% NaCl solution (20ml/Kg in pediatrics).
D. Contact medical control at the intended receiving facility to discuss additional fluid boluses and/or a norepinephrine infusion (typically beginning at 2-4 mcg/min and titrated to a MAP above 65. Max infusion 30 mcg/min.).

SHOCK-NONCARDIOGENIC

BLS

A. Follow A-D in Shock-Cardiogenic protocol
B. If evidence of trauma or hemorrhage present see Initial Trauma Care Protocol C. Consider other causes of shock

ALS

Adult	Pediatric
1. Apply the cardiac monitor 2. Initiate two large bore IVs (or IO, if IV access in not available) of NaCl and titrate to a systolic BP of 90 mmHg if patient has no signs or symptoms of fluid overload. 3. Reassess vital signs and peripheral perfusion; reassess for signs of pulmonary edema.	1. Administer 20mL/kg IV or IO NaCl solution as rapidly as possible 2. Reassess vital signs and peripheral perfusion; reassess for signs of pulmonary edema. 3. If no improvement in vital signs, peripheral perfusion and no indication of pulmonary edema is present, repeat NaCl bolus of 20mL/kg 4. In cases of hypotension involving infants, perform glucose analysis. If blood glucose suggest hypoglycemia administer 5mL/kg D10

CARDIAC ARREST, GENERAL CARE

Do not delay oxygenation/ventilation for suspected primary respiratory arrest.

For EMS witnessed cardiac arrest, quick defibrillation is key – do not delay defibrillation!

Pediatric/Infant/Neonate: Oxygenation and ventilation is of utmost importance in cardiac arrest care! Use the Broselow® tape (or appropriate equivalent) to assess and determine correct dosing regimen. Note that pediatric patients ALWAYS requires respiratory support with BVM during cardiac arrest.

BLS

A. Initiate chest compressions according to current local guidelines for healthcare providers.
B. Call for ALS if not already enroute.
C. Attach AED and follow prompts.
    1. If "no shock advised," perform CPR for 2 minutes, then check pulse. Re-analyze rhythm if no pulse is found.
D. Initial airway management (Adult)
    1. Provide oxygen via 100% NRB @ 15 lpm
    2. OP/NP with NRB Only if gag reflex absent – No non-visualized airway
    3. Assist respirations when suspected cause is respiratory (deliver rescue breaths)
    4. Follow protocol specific airway for cardiac arrest after 3rd cycle of CPR
E. If the patient regains a pulse, follow Post Cardiac Arrest Care protocol.

ALS

A. Establish an IV/IO with 0.9% NaCl
B. Apply cardiac monitor and follow appropriate Cardiac Arrest Dysrhythmia protocol
C. VF/VT witnessed arrest primary goal is high quality UNINTERRUPTED CPR and basic airway maneuvers with NP/OP with NRB only- no non-visualized airway
    1. Provide oxygen via 100% NRB @15 lpm
    2. Op/NP with NRB Only if gag reflex absent- No Non-Visualized Airway
    3. Follow protocol specific airway for cardiac arrest after 3rd cycle of CPR
D. Follow protocol specific airway for cardiac arrest after 3rd cycle of CPR

Defibrillation is the treatment priority when advised by the AED. Bare and dry chest, remove any medication patch. Place patient on hard surface.

- Defibrillate at setting recommended by the manufacturer.
- Try to minimize interruptions in chest compressions
- Use mechanical compressions (LUCAS or similar device) when available.
- Respiratory rate of 10-12/minute is adequate for patients in cardiac arrest – do not hyperventilate.
- If female patient is suspected to be pregnant, displace the uterus to the left if uterus is palpable above the umbilicus.

PEDIATRIC CARDIAC ARREST, GENERAL CARE

Prior to transport, the patient should receive 15 minutes of high quality CPR OR have received at least 3 doses of Epinephrine administered according to the appropriate cardiac arrest protocol.

Oxygenation and ventilation are of utmost importance in pediatric cardiac arrest care! Most pediatric cardiac arrests are secondary to a primary respiratory arrest.

Use the Broselow® tape (or appropriate equivalent) to obtain approximate weight and determine correct dosing regimen.

For EMS witnessed cardiac arrest, quick defibrillation is key – do not delay defibrillation!

BLS

A. Initiate chest compressions (at a rate of 100-120 beats per minute and ratio of 15 compressions to 2 breaths for two rescuers or 30 compressions to 2 breaths for a single rescuer)
B. Call for ALS if not already en route.
C. Attach AED and follow prompts.
    1. Utilize pediatric pads or pediatric key as appropriate to the AED. The use of an adult AED is acceptable if pediatric supplies are not available
    2. Pads should be placed in the anterior-posterior position.
    3. If "no shock advised," perform CPR for 2 minutes, then check pulse. Re-analyze rhythm if no pulse is found.
D. Initial airway management
    1. OP/NP - Only if gag reflex absent
    2. Provide good bag valve mask ventilation with mask that forms an adequate seal around the mouth.
E. If the patient regains a pulse, follow Post Cardiac Arrest Care protocol.

ALS

A. Establish an IV/IO with 0.9% NaCl
B. Apply cardiac monitor and follow appropriate Cardiac Arrest Dysrhythmia protocol
C. Defibrillation is the treatment priority when advised by the AED. Bare and dry chest. Place patient on hard surface.
    1. Defibrillate as described in the appropriate protocol
D. Try to minimize interruptions in chest compressions
E. Respiratory rate of 10-12 breaths/minute is adequate for patients in cardiac arrest – do not hyperventilate.
F. Place ETCO2 in line with the bag.

ADULT PIT CREW CPR

Pit crew CPR is a high performance model of CPR that maximizes compressions and minimizes interruptions by pre-assigning provider roles based on order of arrival to the patient. Below is a description of the positions that are to be assumed by those arriving on scene to a cardiac arrest.

A. Pit Crew CPR applies to all cardiac arrest patients (VT, VF, PEA and asystole) B. Positions:
   1. Position #1: (Patient's right hand side)
      a. Check pulses and initiate first 2 minutes of compressions
      b. When not performing compressions, assist position #3 with BVM if indicated
   2. Position #2: (Patient's left hand side)
      a. Attach AED and follow prompts
      b. Alternate compressions with position #1 on 2 minute intervals, use mechanical compressions when available (LUCAS or similar device).
      c. When not performing compressions, assist position #3 with BVM if indicated
   3. Position #3: (Patient's head)
      a. Initiate airway management as per protocol
      b. Alternate with position #1/#2 for compressions
   4. Position #4: First arriving EMT-P after Positions 1-3 are filled.
      a. Obtain IV/IO access and administer medications as per ACLS protocol
      b. Temporarily slide to position #3 if advanced airway required
      c. Directs ACLS interventions based on rhythm, EtCO2 and pulse
   5. Position #5: "Quality Assurance"
      a. Utilizes checklist (see appendix) to verify positions are appropriately filled and performing required interventions
      b. Records rhythm and if shock delivered every 2 minutes
      c. Records time of administration of ACLS medications
      d. IF ROSC OBTAINED – Utilizes Checklist to verify all tasks have been completed.
   6. Position #6: "Liaison"
      a. Liaisons with family, bystanders and maintains scene safety.

PEDIATRIC PIT CREW CPR

Pit crew CPR is a high performance model of CPR that maximizes compressions and minimizes interruptions by pre-assigning provider roles based on order of arrival to the patient. Below is a description of the positions that are to be assumed by those arriving on scene to a cardiac arrest.

NOTE: The positions for Pediatric Pit Crew CPR are slightly different to emphasize the importance of Oxygenation and Ventilation

A. Pit Crew CPR applies to all cardiac arrest patients (VT, VF, PEA and asystole)
B. Positions:
    1. Position #1: (Patient's right hand side)
        a. Check pulses and initiate first 2 minutes of compressions
        b. Alternate compressions with Position #4 on 2 minute interval
        c. Compressions should be continuous until BVM is set up then switch to ratio of 15 compressions:2 breaths
    2. Position #2: (Patient's head)
        a. Initiate BVM with 100% Oxygen
        b. Focus on achieving and maintaining an excellent seal with 2 handed technique
    3. Position #3: (Patient's head right/left)
        a. Assist Position #2 with BVM and airway management
        b. Maintain quality CPR with 15:2 ratio
        c. Alternate with Position #2 holding the mask in case of fatigue
    4. Position #4: (Patient's left hand side)
        a. Attach AED and follow prompts
        b. Alternate compressions with Position #1 on 2 minute intervals
    5. Position #5: First arriving EMT-P after Positions 1-4 are filled.
        a. Obtain IV/IO access and administer medications as per current protocol
        b. Directs PALS interventions based on rhythm, EtCO2 and pulse
        c. Temporarily slide to position #3 if advanced airway required
    6. Position #6: "Quality Assurance"
        a. Utilizes checklist (see appendix) to verify positions are appropriately filled and performing required interventions
        b. Records rhythm and if shock delivered every 2 minutes
        c. Records time of administration of PALS medications
        d. IF ROSC OBTAINED – Utilizes Checklist to verify all tasks have been completed.
    7. Position #7: "Liaison" (if available)
        a. Liaisons with family, bystanders and maintains scene safety.

CARDIAC ARREST-VF/VT

BLS

A. Perform chest compressions until defibrillator is attached. (Provide 2 minutes of chest compressions prior to defibrillation for unwitnessed arrest.) Compressions should be performed at a rate of 100-120/minute.
B. Refer to Cardiac Arrest, General Care guideline

ALS

CARDIAC ARREST – ADULT **V-FIB / VT**	**CARDIAC ARREST – PEDIATRIC** **V-FIB / VT**
Persistent or Recurrent VF/VT	**Persistent or Recurrent VF/VT**
1. For witnessed arrest apply pads and defibrillate at maximum settings as recommended by the manufacturer. 2. Immediately resume CPR for 2 minutes. Place OP or NP airway and provide oxygen via 100% NRB. Establish IV/IO A. **IF PRIMARY RESPIRATORY ARREST IS SUSPECTED ETIOLOGY** immediately initiate standard resuscitative measures using BVM with 100% oxygen. 3. ASAP administer 1 mg epinephrine 1:10,000 IV or IO push and repeat every 3-5 min. 4. Check for an organized rhythm at 2-minute intervals. Shock if indicated. Immediately resume CPR. 5. If still in V/VT after 3rd cycle of CPR and shock consider advanced airway techniques or BVM at rate of 8-10/min (this can include prior treatment by fire/BLS) 6. Administer 300 mg amiodarone IV or IO. May repeat one time at half dose (150 mg) 7. Resuscitative efforts should rotate on 2 minute cycles. Pattern should be shock, CPR, drug. 8. If no response to amiodarone, consider 2 grams magnesium sulfate IV or IO. May repeat one time in 3-5 mins.	1. Defibrillate, if indicated at 2J/Kg. Subsequent shocks should be at 4 J/Kg. *The use of pediatric defibrillation pads is preferred. If adult pads are used, they should be placed in an anterior-posterior configuration.* 2. Defibrillate, immediately resume CPR for 2 minutes. Establish an IV (or an IO line, if IV access is not available). 3. Administer 0.01 mg/Kg (0.1 mL/Kg) 1:10,000 epinephrine IV or IO every 3-5 minutes (max dose is 1mg) 4. Check for an organized rhythm at 2-minute intervals. Shock if indicated. Immediately resume CPR. 5. Administer amiodarone 5 mg/Kg IV or IO (max dose is 300mg). 6. Resuscitative efforts should rotate on a 2-minute cycle. Pattern should be shock, CPR, drug.

Once VF/VT has Resolved – ADULT	Once VF/VT has Resolved - Pediatrics
1. Administer amiodarone if the 300 mg bolus was not given previously: A. Add 150 mg amiodarone to a 50 mL 5% dextrose IV bag B. Infuse over 10 minutes i. 100 gtt/min using 20 gtt/mL drip set ii. 75 gtt/min using 15 gtt/mL drip set 2. Begin a magnesium IV infusion at 33 mg/min (2 g/h) if the 2 g magnesium bolus was used A. Add 2 g magnesium sulfate to a 50 mL 0.9% saline or 5% dextrose IV bag B. Infuse at 50 gtt/min using the 60 gtt/mL drip set.	1. Contact medical control for further instructions.
If VF/VT has <u>NOT</u> Resolved	
1. Consider Double Sequential External Defibrillation if second defibrillator is available and: A. Refractory to ≥3 standard defibrillations **AND** B. Has already received 300mg amiodarone **AND** C. Ventricular fibrillation/pulseless ventricular tachycardia NEVER converted 2. Refer to Procedures section for further instruction on Double Sequential External Defibrillation.	

CARDIAC ARREST-PULSELESS ELECTRICAL ACTIVITY/ASYSTOLE

Consider possible reversible causes of **PEA** such as hypovolemia, hypoxia, tension pneumothorax, cardiac tamponade, hypothermia, acidosis, drug overdose, hyperkalemia, massive acute MI, or pulmonary embolism.

Consider possible reversible causes of **Asystole** such as hypoxia, preexisting acidosis, drug overdose, or hypothermia.

CARDIAC ARREST – ADULT	**CARDIAC ARREST – PEDIATRIC**
PEA / ASYSTOLE	PEA / ASYSTOLE
1. If the rhythm is unclear and possibly ventricular fibrillation, defibrillate as for VF. 2. Immediately resume CPR for 2 minutes. Apply 100% NRB with NP or OP if no gag reflex present, Establish IV/IO. 3. ASAP administer 1mg epinephrine 1:10,000 IV or IO push and repeat every 3-5 minutes. 4. Check for an organized rhythm at 2 minute intervals. Shock if indicated. Immediately resume CPR. 5. If after 2nd round pt still is asystole/PEA may consider advanced airway maneuvers and/or BVM at rate of 10-12 minutes 6. Continue resuscitative efforts for 30 minutes total. Contact receiving facility for further consultation as needed.	1. If the rhythm is unclear and possibly ventricular fibrillation, defibrillate as for VF. 2. Resume CPR immediately and begin BVM ventilation and oxygenation. <u>Proceed to advanced airway only if BVM ventilation/oxygenation is inadequate</u>. 3. Establish IV (or and IO line, if IV access is not available) 4. Administer 0.01mg/kg epinephrine: (1:10,000, 0.01mL/kg) IV or IO every 3-5 minutes (max dose is 1mg).

POST CARDIAC ARREST CARE FOR ADULTS

1. Applies to patients resuscitated from cardio-respiratory arrest who have a perfusing rhythm and pulse, and who remain unresponsive.
2. Secure the airway. If not previously accomplished, the airway should be secured with an ET tube or a non-visualized airway.
3. Maintain normoventilation. Initially, ventilate at 10-12 breaths per minutes. Do NOT hyperventilate. If end-tidal capnography is available, titrate ventilation to an $EtCO_2$ of 35-40 mm Hg. All advanced airways require confirmation/monitoring with waveform capnography.
4. Stabilize dysrhythmias:
    1. Unstable tachydysrhythmias – treat with cardioversion
    2. Unstable bradydysrhythmias – consider external pacing
    3. Stable tachycardia or bradycardia – treat per protocols
5. If initial arrest rhythm was v-fib or v-tach, give amiodarone 150 mg IV over 10 minutes if not already given during resuscitation. If significant ventricular ectopy persists, repeat amiodarone.
6. Support blood pressure
    1. Administer 500 mL boluses of 0.9 NS to maintain MAP above 65
    2. If the patient's SBP is less than 90 mm Hg after 500 mL of fluid, call medical control and consider norepinephrine and titrate to a MAP above 65
7. **On the Alaris Pump set up norepinephrine drip using the emergency room profile.**
8. **Norepinephrine is under the guardrail medications.**
9. **Use the 8mg / 250 concentration. Then set the desired mcg/min. Start at 2-4mcg/min. The default is 2 mcg/min.**
10. **Titrate to maintain a MAP above 65.**
11. Obtain a 12-lead EKG and transmit, if possible. Notify the receiving facility as soon as a STEMI is suspected.
12. Check glucose and treat per protocol
13. Seizure activity – monitor for seizure activity and treat per protocol.

POST CARDIAC ARREST CARE FOR PEDIATRICS

1. Applies to pediatric patients resuscitated from cardio-respiratory arrest who have a perfusing rhythm and pulse, and who remain unresponsive.
2. Continue to support respirations with BVM, attempting to time support with the patients own respirations.
3. ETCO2 should be used in line with bag during BVM. If the patient is breathing and BVM is not necessary, then nasal cannula ETCO2 should be placed on the patient.
4. Maintain normal ventilation. Initially, ventilate at 10-12 breaths per minutes. Do NOT hyperventilate or hypoventilate.
5. Stabilize dysrhythmias:
    A. Stabilize tachycardia or bradycardia – treat per protocols.
    B. If initial arrest rhythm was VF or VT, give Amiodarone 5mg/kg (max 300 mg) IV/IO over 10 minutes if not already given during resuscitation. If significant ventricular ectopy persists, repeat Amiodarone per protocol.
6. Support blood pressure
    A. Administer 10mL/kg boluses of 0.9 NS to maintain adequate systolic blood pressure for age (70 + (patient age x 2).
    B. If the patient's SBP is less than the lower limit based on the above equation after 10mL/kg of fluid, call medical control for further instructions.
7. Obtain a 12-Lead EKG
8. Check glucose and treat per protocol.
9. Seizure activity – monitor for seizure activity and treat per protocol.
10. Monitor for fever.

LEFT VENTRICULAR ASSIST DEVICE (LVAD)

1. The most valuable resource for the LVAD patient is their caregiver. They are trained and familiar with all of the LVAD equipment. The caregiver will be transported with the patient to the Emergency department.
2. Contact VAD coordinator (found on card the patient will give you) for additional guidance.
3. All ALS and BLS protocols are valid for the LVAD patient.
4. You must use clinical judgment to determine the need for CPR. (warm, pink, with good capillary refill)
    A. Peripheral pulses may not be present.
    B. BP can only be measured with a Doppler ultrasound.
    C. Pulse oximetry may not be reliable (if there is no pulse).
    D. Listen over the pump for a mechanical whirring sound.
        i. If this is present no need for CPR.
        ii. Look for another cause of the patient's decompensated state.
5. If CPR is initiated transport patient to the hospital.
6. CPR is performed in the usual manner.
7. Defibrillation and cardioversion are performed in the usual manner.
    A. Not all dysrhythmias need to be treated.
        i. If the patient is warm, pink with good capillary refill, CPR is not necessary
    B. Do not place defibrillator pads over the "pump"
8. If the pump is not working (no mechanical whirring sound):
    A. Check System control panel for alarms.
    B. Check Power Supply connection.
    C. Never disconnect both batteries at the same time.
    D. Contact VAD coordinator (found on card the patient will give you) for additional guidance.
9. Always transport patient with Travel Bag containing extra controller, batteries and cables and if stable transport to a VAD center.

Most patients are on sildenafil (Viagra®, Revatio®) and nitrates should not be administered.

MEDICAL EMERGENCIES

ALTERED LEVEL OF CONSCIOUSNESS

BLS

1. Begin "Initial Medical Care" and call for ALS.
2. Follow "Airway Management" protocol.
3. Follow "Oxygen Administration" protocol.
4. Investigate for possible causes (medical history, medications, medic alert tag, recent trauma).
5. Perform blood glucose analysis if available.
6. If blood glucose reading is <70, administer oral glucose if patient can tolerate oral medication.
7. If patient is unable to tolerate oral medication and blood glucose is <70, administer 1mg Glucagon Intranasally using Intranasal Atomizer.
8. If the patient has respiratory depression, miosis and a history suggestive of possible opiate overdose, administer Naloxone IN/IM depending on your BLS approved formulation and route of administration.

ALS

1. Establish a saline lock or an IV with 0.9% NaCl.
2. Apply cardiac monitor. Obtain a 12-lead electrocardiograph (ECG).
3. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.
4. Perform blood glucose analysis, if <70 mg/dL administer 250ml D10.

OPIATE OVERDOSE – ADULT BLS/ALS	OPIATE OVERDOSE – PEDIATRIC ALS ONLY
1. If the patient has respiratory depression, miosis and a history suggestive of possible opiate overdose, initiate ventilation using BVM and administer 0.4 mg Naloxone IVP. A. If unable to administer IV, administer 2mg of naloxone IN or IM B. IN or IM auto-injector by EMT-B is permitted. 2. If respiratory depression persists after 2 minutes, repeat IV, IM or IN via alternating nostrils until respirations are adequate or a total of 2 mg IV or 4mg IN of naloxone has been administered.	1. If the patient has respiratory depression, miosis and a history suggestive of possible opiate overdose, initiate ventilation using BVM and administer 0.1 mg/kg (up to 2mg) Naloxone IVP or intra-nasally. 2. If respiratory depression persists after 2 minutes, contact medical control for recommendations for any further dosing.

BEHAVIORAL EMERGENCIES/RESTRAINT

A. General approach
    1. Violent behavior may be Violent behavior may be a manifestation of a medical condition such as head injury, drug or alcohol intoxication, metabolic disorders, hypoxia, stroke, or post-ictal state. Field personnel should consider these medical conditions first, and then consider psychiatric disorders in the approach to violent patients. Field personnel should obtain a detailed history from family members, bystanders, and law enforcement personnel, and make particular note of patient surroundings for clues to the cause of the behavior (e.g., drug paraphernalia, medication bottles).
    2. EMS personnel shall attempt to de-escalate verbally aggressive behavior with a calm and reassuring approach and manner.

B. Physical Restraint Issues
    1. Restrained patients shall be placed in a supine position, Fowler's or semi-Fowler's position. Patients shall not be transported in a prone position or "hog-tied." Patients shall not be "sandwiched" between scoop stretchers, backboards, and/or mattresses during transport.
    2. Four-point restraint is preferred; additional tethering of the thorax may be necessary. A surgical mask may be placed on the patient to prevent spitting.
    3. The method of restraint must allow for adequate monitoring of pulse and respirations, and should not restrict the patient or rescuer's ability to protect the airway should vomiting occur. EMS personnel must provide sufficient slack in the restraint device(s) to allow the patient to straighten the abdomen and chest and to take full tidal-volume breaths. The neck may not be compromised.
    4. Once the patient has been restrained, he/she should never be left alone.
    5. Restrained extremities should be monitored for circulation, motor function, and sensory function every 10 minutes and upon arrival at the hospital. It is recognized that the evaluation of motor and sensory status requires patient cooperation, and thus may be difficult or impossible to achieve.
    6. Out-of-hospital documentation should include behavior, reason for restraint, that the restraints were "applied for the patient's safety", identification of personnel/agency applying restraint, other pertinent clinical information, vital signs, and documentation of monitoring of restrained extremities.
    7. Unless mandated for emergency care, restraints are to be left in place until the patient is turned over to hospital ED staff and preparations are made for a smooth and safe transfer.
    8. Metal handcuffs for initial restraint may only be applied by law enforcement personnel. Metal handcuffs may be replaced with another method of restraint (e.g., those listed above or hard plastic flex-cuffs) prior to transport. Metal handcuffs may only be used for restraint during transport when law enforcement personnel accompany the patient. Only law enforcement personnel may remove metal handcuffs.

Law enforcement responsibilities:

1. Law enforcement personnel are responsible for the capture and/or restraint of potentially violent patients. EMS personnel should obtain assistance from law enforcement to prepare patients for transport.

2. Law enforcement agencies retain primary responsibility for safe transport of patients under arrest or involuntary detention.
3. Patients under arrest or involuntary detention shall be searched thoroughly by law enforcement personnel prior to being placed in the ambulance.
    i. Patients under arrest must always be accompanied by law enforcement personnel in the ambulance if patient is being transported.
    ii. EMS and law enforcement personnel should mutually agree on need for law enforcement assistance during transport of involuntary detention patients.

C. Transport Issues

1. If an unrestrained patient becomes violent during transport, EMS personnel shall request law enforcement assistance and make reasonable efforts to calm and reassure the patient
2. If the crew believes that their personal safety is at risk, they should not inhibit a patient's attempt to leave the ambulance. Every effort should be made to release the patient into a safe environment. EMS personnel are to remain on scene until law enforcement arrives to take control of the situation.

CHEMICAL RESTRAINT

Chemical restraint is to be used only where the patient can be adequately and repeatedly monitored by EMT-P providers. It is to be reserved for patients who cannot otherwise be restrained or restrained only at the risk of significant harm to the patient, law enforcement, or EMS providers or if provider has concern for excited delirium. Once applied, patients should be isolated and placed in an ALS ambulance as soon as possible. All patients who are administered midazolam or ketamine are required to be monitored with waveform EtCO2 for adequate ventilation. All patients will be transported to closest appropriate facility for further evaluation.

ALS

A. Consider other causes of combative or irrational behavior, including but not limited to hypoxia and hypoglycemia.
B. Indications for chemical restraint include
    1. Evidence of excited delirium such as drug usage, severe agitation, violent behavior, aggressiveness, hyperthermia, surprising physical strength, lack of response to pain such as Tasers™
    2. Violent, agitated patient who cannot be otherwise restrained or restrained only at the risk of significant harm to the patient, law enforcement, or EMS provider
C. Administer ONE of the following:
    1. Midazolam IV, IM, or via intra-nasal spray
        a. If patient >50kg, administer 5mg IV, IM or IN (2.5 mg in each nostril)
        b. If patient <50kg, administer 2.5mg IV, IM, or IN
        c. Consider lower dose if patient is elderly (>65) or has serious comorbid medical conditions
    2. Ketamine IM for patients 12 years of age or older. Preferred medication for patients with suspected excited delirium.
        a. If patient estimated >50kg, administer 300mg IM to lateral thigh or deltoid.
        b. If patient estimated <50kg, administer 150 mg IM to lateral thigh or deltoid
        c. Use with caution in patients with history of coronary artery disease. If there is concern for an acute ischemic event such as a stroke or MI, do not administer ketamine.
        d. Larngyospasm is a rare, but serious adverse effect of ketamine administration. If patient develops stridor, apnea, or sudden loss of EtCO2 after administration, suspect laryngospasm.
            i. Apply airway maneuvers, such as jaw thrust or chin lift. Consider oral or nasal airway.
            ii. Assist with BVM at 100% O2 to apply positive pressure.
            iii. If these methods prove to be inadequate and patient is not being ventilated, follow advanced airway protocols with the modification that only a single attempt to visualize the vocal cords should be made with direct laryngoscopy. If vocal cords can be seen and are open, then attempt to intubate with ET tube. If vocal cords are closed/spasming, DO NOT attempt to pass anything through vocal cords and proceed to cricothyrotomy.
            iv. DO NOT administer any further ketamine.

D. Patient should be isolated and placed in an ALS ambulance as soon as possible and all patients will be transported to the nearest appropriate facility for further evaluation and released to law enforcement thereafter.
E. After sedation is achieved
    1. Treat any immediate life threatening injuries.
    2. Airway, mental status, and vital signs (including pulse oximetry, waveform EtCO2, and heart rhythm) must be examined and documented every 5 minutes.
        a. All patients that receive midazolam or ketamine are required to be placed on nasal waveform capnography
    3. Monitor for signs of hypoventilation such as decreased respiratory rate or increase in EtCO2
        a. Provide passive oxygenation via nasal cannula or nonrebreather
        b. Attempt verbal and/or physical stimulation
        c. If severe, apply BVM, and move onto advanced airway options per protocol if continued inadequate ventilation
        d. Establish IV, initiate IVF therapy
        e. Obtain blood glucose level
        f. Keep patient in an upright position and allow for hyperventilation.
F. If adequate sedation is not achieved with one of the above options, contact medical control for requests for additional medication or other orders.
    1. If medical control recommends additional doses of midazolam or ketamine, either in isolation or in combination, advanced airway preparation should be made, as there is an increased risk for respiratory depression.
G. If patient subsequently has a cardiac arrest, follow ALS protocol for cardiac arrest, but consider early administration of sodium bicarbonate 100mEq IV push if patient initially presented with severe agitation or concerns for excited delirium.

If chemical restraint is used, a copy of the run record must be made available to the Medical Director through the CQI Coordinator within 24 hours.

DIALYSIS PATIENTS

The use of Body Substance Isolation Procedures is especially important because of the possibility of exposure to blood and body fluids and the probability of dialysis patients being carriers of the hepatitis B virus. Treat any presenting problems according to the appropriate protocol and note the following modifications:

BLS

A. Do not take vital signs in an extremity containing a graft or fistula.
B. If the patient is on the hemodialysis machine, have the dialysis technician disconnect the patient from the machine. If the dialysis technician is not present, or is unable to disconnect the patient, turn off the machine.
    1. Clamp off the access device and disconnect the patient from the machine.
    2. Remove or have technician remove the needles. Apply pressure as the needle is removed so as to avoid cutting the access device.
C. If the patient is on continuous ambulatory peritoneal dialysis (CAPD), unclamp drainage tube and allow fluid in the peritoneal cavity to drain back into the bag.
D. Be alert for pathological fractures or fractures that might occur.
E. If a venous or arterial air embolus is suspected, immediately place the patient in Trendelenburg position on the left side.
F. If the site is persistently bleeding, apply direct pressure and elevate the limb. Do **NOT apply a tourniquet device.**

ALS

A. Initiate an IV in an extremity containing a shunt or fistula only if an immediate life-threatening situation exists and there is no other IV site. NOTE: This does not mean that inserting an IV **into** the shunt or fistula is allowed – only that another IV site in that same arm is allowed.
B. For patients who may be hyperkalemic (with or without a missed dialysis) that exhibit a wide QRS ($\geq$ 0.12 sec), AND hypotension or refractory ventricular fibrillation, give the following medications in this order:
    1. Calcium chloride 1 g SLOW IV push.
    2. Albuterol 5 mg nebs back-to-back/continuously for the spontaneously breathing patient, and,
    3. If no change in patient condition, consider Sodium Bicarbonate, 100 mEq IV push.

DRUG OVERDOSE/POISONING-SUSPECTED

A. Protect yourself from exposure to poisons.
B. Begin Initial Medical Care when safe to do so.
C. Obtain the following information:
    1. Type of poison/medication.
    2. Type of exposure - ingestion, injection, absorption, inhalation.
    3. Time of exposure.
    4. Amount of poison exposure (quantity, strength of agent(s)).
    5. Time exposure took place.
    6. If an ingestion, poison/medication taken with water/alcohol/etc.?
    7. Time of last food and alcohol intake.
    8. Weight of patient (in Kg).
D. Remove the patient from the source of contamination, if necessary, without endangering responders. In the event of topical poisons, decontaminate the patient with copious amounts of water. Brush away powdered substances prior to irrigation.
E. Categorize type of poison
    1. Injected poisons - (e.g., bites, stings, or open wounds caused by an object contaminated with a poisonous substance) – apply a venous constricting band above the site of injection on an extremity, immobilize the extremity and keep it below the level of the heart. For stings, scrape stinger away, do not squeeze stinger.
    2. Suspected allergic reactions *(See Allergic Reaction Protocol**)***
    3. Inhaled poisons - Administer high flow oxygen to all patients with poisoning by inhalation or who meet criteria for oxygen administration or airway management procedures. *(See Administration of Oxygen Protocol and/or Airway Management Protocol)*
F. If level of consciousness is decreased or vital signs abnormal, transportation by advanced life support is preferred. *(See Altered Level of Consciousness Protocol)*
G. Gather containers or remaining medications that can be taken to the hospital safely.
H. Consider contacting the Indiana Poison Center (IPC) on Med-1 or the IHERN for information on expected toxicity. The Poison Center may be used as a resource for information, NOT for orders for patient care. The IPC is also available at 962-2323, (800) 222-1222, on via the IHERN (EMS-M1).

ALS

A. Follow appropriate protocol for specific presentation/toxin.
    1. **BETA BLOCKER OVERDOSE**
    Consider **glucagon** for Beta blocker OD with:
        a. Hypotension (SBP < 90 mm Hg adult or SBP < 70 + 2 x age in years for pediatric patients)
            i. *Adult dose* – Glucagon 3 mg slow IVP (over 3 minutes)
            ii. *Pediatric Dose* – Glucagon 50mcg/kg slow IVP (3 mg max)
    2. **CALCIUM CHANNEL BLOCKER OVERDOSE**
    Consider **calcium chloride** for calcium channel blocker OD with:
        a. Bradycardia (HR < 60) ***AND***

b. Hypotension (SBP < 90 mm Hg adult or SBP < 70 + 2 x age in years for pediatric patients)
    i. *Adult dose* – Calcium Chloride 1 g slow IVP
    ii. *Pediatric Dose* – 0.2ml/kg of 10% calcium chloride slow IVP (1 gram max)

3. **CYCLIC ANTIDEPRESSANT OVERDOSE**
    a. Consider **sodium bicarbonate** for cyclic antidepressant OD with:
        i. Wide QRS complex (≥ 0.12 sec) ***OR***
        ii. Hypotension (SBP < 90 mm Hg adult or SBP < 70 + 2 x age in years for pediatric patients) **OR**
        iii. Seizures
            1. *Adult dose and Pediatric*– Sodium bicarbonate 1 mEq/Kg IVP

SEIZURES

- Administer high flow oxygen. (See Oxygen Administration)
- Protect patients from injury while the patient is seizing. DO NOT RESTRAIN PATIENT. DO NOT FORCE A BITE STICK INTO THE PATIENT'S MOUTH. Determine the duration of the seizure. Observe the type of seizure activity and what part(s) of the body it affects.

Not in Status Seizures

A. Initiate transport.

1. Adult patients who are no longer post-ictal may request not to be transported. You should consult with the hospital for authorization not to transport. (See Non - Transported Patient Protocol)

Status Seizures

Criteria: Continuous seizure activity for longer than 3 minutes or two or more consecutive seizures without regaining consciousness

BLS

- Assist ventilations. (See Airway Management Protocol)
- Contact the receiving facility for further orders if ALS is not on scene. Request advanced life support.

STATUS SEIZURE - ADULT	STATUS SEIZURE - PEDIATRIC
1. Perform blood glucose analysis. If blood glucose <70 mg/dL, administer glucagon 1 mg IN. 2. Place on pulse oximeter and monitor vitals signs. Note: Patient must be placed on nasal waveform capnography.	1. Perform blood glucose analysis. If blood glucose <70 mg/dL, administer glucagon: o 0.5 mg IN for children < 20 Kg o 1 mg IN for children ≥ 20Kg. 2. Place on pulse oximeter and monitor vitals signs. Note: Patient must be placed on nasal waveform capnography.

ALS

STATUS SEIZURE - ADULT	STATUS SEIZURE - PEDIATRIC
1. Perform blood glucose analysis. If blood glucose < 70 mg/dL, administer 250ml of 10% Dextrose (D10) 20gtts/ml over 10mins. 2. If unable to establish IV after 2 attempts, administer glucagon 1 mg IM or intranasal 3. Apply the cardiac monitor and pulse oximeter. 4. Administer midazolam IV, IM, or intranasal: a. If patient ≥ 50 kg, administer 5 mg b. If patient < 50 kg, administer 2.5 mg c. Dose may be repeated in 5 minutes, if needed; use other nare if administered intranasally. Note: Patient must be placed on nasal waveform capnography. If the patient is pregnant in the 3rd trimester, administer 2 grams magnesium IVP over 2 minutes	1. Perform blood glucose analysis. If blood glucose suggests hypoglycemia, administer 5 mL/Kg of Dextrose 10% (D10) IV 2. If patient is hypoglycemic and unable to establish IV after 2 attempts, administer glucagon 0.5 mg IM or intra-nasal for children < 20 Kg, 1 mg IM or intra-nasal for children ≥ 20Kg. 3. Apply the cardiac monitor and pulse oximeter 4. Administer midazolam IV, IM, or intra-nasal o 0.1mg/kg of midazolam (up to a maximum of 5.0 mg) o If intra-nasal, divide the dose so that each nares receives half o The dose may be repeated ONE TIME in 5 minutes if needed. 5. Contact the receiving facility for further instructions or additional dosing if needed. Note: Patient must be placed on nasal waveform capnography.

SEPSIS PROTOCOL - ADULT

Any patient with altered mental status, weakness, or respiratory distress should be screened for inclusion in the sepsis protocol by reviewing a complete set of vital signs, including ETC02.

Patients with:

A. Suspected or possible infection **AND**
B. 2 or more of the following:
    1. Heart rate >90
    2. Respiratory rate > 22
    3. Temp > 38C (100.4F) or < 36C (96.8F) (if available)
    4. ETC02 < 25

BLS

A. Minimize scene time
B. Call in Medical Alert – "suspected sepsis" to receiving facility

ALS

A. Alert receiving facility of Medical Alert – "suspected sepsis" prior to arrival including how much fluid has been administered.
B. Establish IV or IO access
C. Give 500ml bolus of NS
D. Repeat IVF bolus until SBP > 90, not to exceed 2L IVF.
E. If SBP < 90 after 2L IVF, call medical control and consider norepinephrine at 2-4 mcg/min and titrate to a MAP above 65, not to exceed 30 mcg/min.

On the Alaris Pump set up norepinephrine drip using the emergency room profile.

Norepinephrine is under the guardrail medications.

Use the 8mg / 250 concentration. Then set the desired mcg/min. Start at 2-4mcg/min. The pump default is 2 mcg/min.

Titrate to maintain the MAP above 65.

STROKE (CVA)

This protocol is intended to reduce the time to thrombolysis in the acute stroke patient. Patient with symptoms of less than 6 hours duration are considered "time-critical." Patients may present as having fallen, unable to walk, or with altered level of consciousness.

Evaluate any patient with suspected stroke using the Cincinnati Stroke Scale. If positive/abnormal, perform RACE Stroke Scale and determine, to the best of your ability, *THE LAST KNOW NORMAL/WELL TIME (NEUROLOGICALLY)*.

Contact the receiving emergency department and include the following information: time of onset of signs/symptoms, RACE Stroke Scale findings, and blood glucose results. Document all results.

Encourage a close family member to accompany the patient to the hospital to provide information on baseline function, onset of symptoms, and possible consent for tPA. If a family member is unable to accompany the patient, obtain a phone number for a family member to provide the hospital with this same information.

BLS

Administer oxygen as indicated. (*See Oxygen Administration protocol*) and perform blood glucose analysis.

1. Perform blood glucose analysis. If blood glucose < 70 mg/dL, administer Glucagon 1mg IN.
2. Obtain a 12-lead EKG and transmit (if available) or carry in at the receiving facility.
3. Transport patient with head of stretcher elevated at 30 degrees.

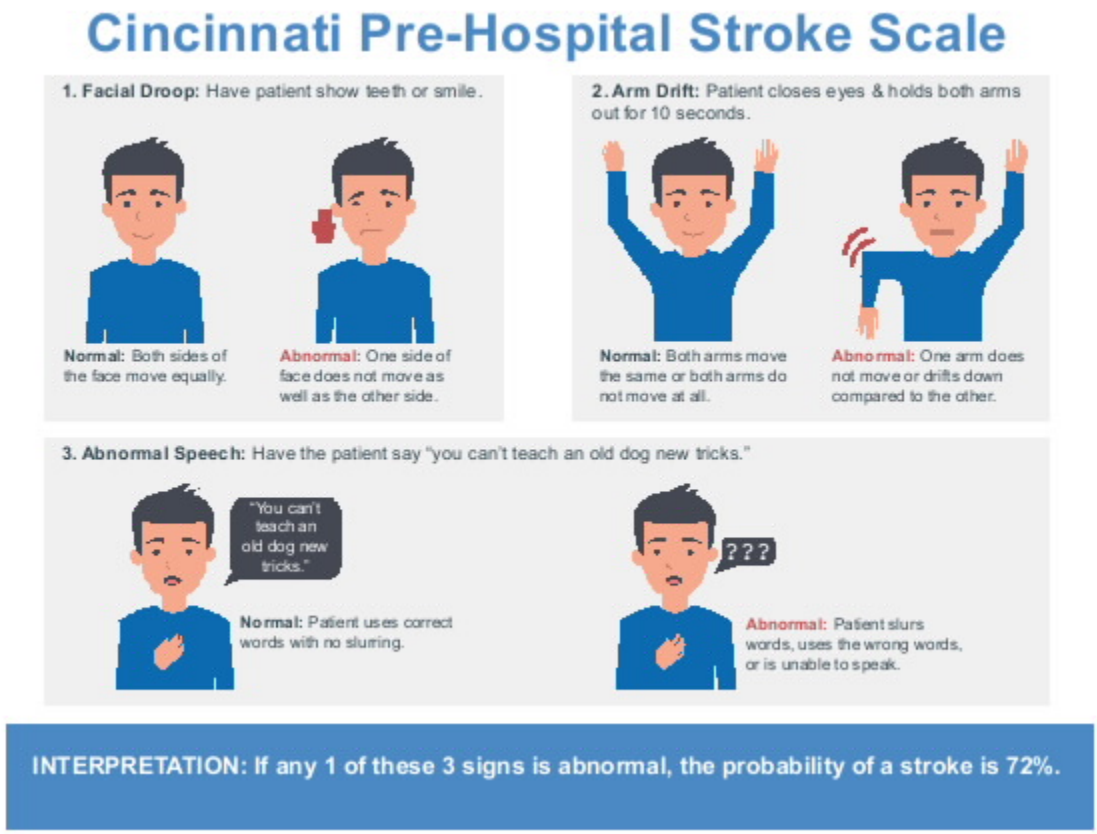
If level of consciousness is decreased or vital signs abnormal, transportation by advanced life support is preferred.

ALS

1. CONTACT MEDICAL CONTROL AS SOON AS STROKE SCALE RETURNS A POSITIVE RESULT WITHOUT DELAY.
2. Administer oxygen as indicated and maintain pulse oximetry >92%.
3. Obtain IV access in the RAC/18g preferred and start NS.
4. Perform blood glucose analysis. If blood glucose < 70 mg/dL, administer 25g in 250ml Dextrose 10% IV Bolus.
5. If unable to establish an I.V. administer Glucagon 1 mg. I.M. or intra-nasal.
6. Obtain a 12-lead EKG and transmit or carry in at the receiving facility.
7. Transport patient with head of stretcher elevated at 30 degrees.
8. Do not treat hypertension
9. If time allows during transport, establish 2nd IV LAC/18g preferred and obtain lab draw.

10. ePCR must include “Stroke Form” with RACE and CSS filled to its entirety.

NOTE: *Patients possible thrombectomy candidate transfer time goal is <90 mins (Starting time at arrival at destination facility to leaving for higher level of care)*. If patient is being transferred then refer to “Nicardipine-rTPA Transfer protocol”.



RACE Stroke Scale

Facial Palsy	Absent 0 Mild +1 Moderate/Severe +2
Arm Motor Impairment	Normal/Minimal 0 Moderate +1 Severe +2
Leg Motor Impairment	Normal/Minimal 0 Moderate +1 Severe +2
Head and Gaze Deviation	Absent 0 Present +1
Hemiparesis (Left or Right)	If LEFT hemiparesis *Ask the patient: (1) While showing patient the paretic arm, "Whose arm is this?" (2) "Can you lift both arms and clap?"* Patient recognizes his/her arm and the impairment 0 Does not recognize his/her arm or the impairment +1 Does not recognize his/her arm AND the impairment +2
	If RIGHT hemiparesis *Instruct the patient: (1) Close your eyes" (2) "Make a fist."*

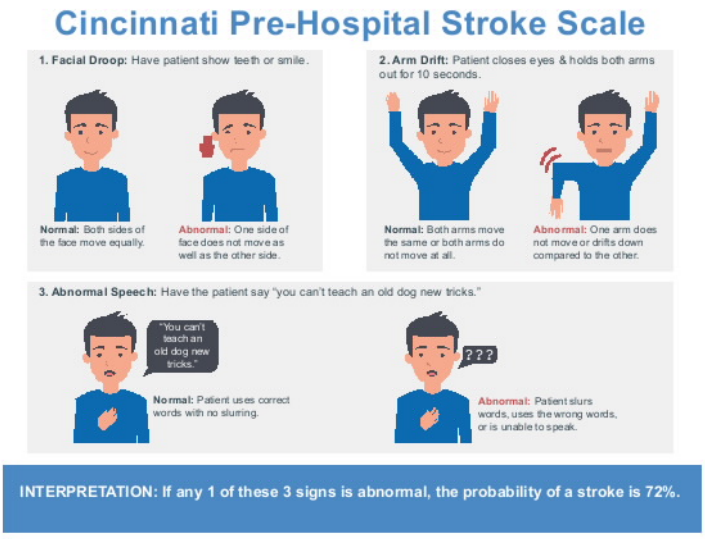
	Performs both tasks correctly 0 Performs one task correctly +1 Performs neither task correctly +2

SYNCOPE

Commented [1]: 05MARCH2023

BLS

1. If patient's mental status remains altered, refer to Altered Level of Consciousness Protocol.
2. Place patient in position of comfort.
3. Perform Blood Glucose analysis if available.
4. If blood glucose suggest hypoglycemia of <70 mg/dL, administer oral glucose if patient can tolerate oral medication.
5. If patient is unable to tolerate oral medication, administer 1mg/IN of Glucagon.
6. Perform Cincinnati Prehospital Stroke Scale, if abnormal, refer to Suspected Stroke (CVA) Protocol.



ALS

1. Apply the cardiac monitor
2. Obtain 12-lead EKG
3. If the patient's mental status is not completely normal or there is a slow response to baseline, measure blood glucose.
    - If less than 70 mg/dL, refer to Altered Mental Status Protocol.
    - Treat abnormal vital signs appropriately.

ENVIRONMENTAL EMERGENCIES

ALLERGIC REACTION

BLS

1. Begin “Initial Medical Care”.
2. Follow “Airway Management” protocol.
3. Follow “Oxygen Administration” protocol.
4. Call for an ALS unit if patient has wheezing, stridor, or shows other signs of respiratory distress or nausea/vomiting.
5. If patient has a prescribed Epi auto-injector and is experiencing stridor and/or hypotension, assist patient with or administer one dose of the patient’s own Epi auto-injector.
6. If patient does not have a prescribed Epi-auto injector and displays signs of anaphylaxis, administer epinephrine 1mg/mL (1:1000) at the following dose and route:
    1. Adult (25kg or more) 0.3 mg IM
    2. Pediatric (less than 25kg) 0.15 mg in the anterolateral thigh
    3. If available us Epi auto-injector or Epi – Junior auto-injector depending upon patients age
7. If signs of anaphylaxis and hypoperfusion persist following the first dose of epinephrine, additional IM epinephrine can be repeated every 5-15 minutes at above noted doses.

RASH/HIVES & WHEEZING - ADULTS	RASH/HIVES & WHEEZING – PEDIATRIC
1. Administer 0.3 mg Epinephrine 1:1,000 IM. 2. Administer 2.5 mg nebulized Albuterol at a flow sufficient to produce of mist.	1. Administer 0.01 mg/kg Epinephrine 1:1,000 IM. (Max 0.3 mg) 2. Administer 2.5 mg nebulized Albuterol at a flow sufficient to produce a mist.

STRIDOR &/OR HYPOTENSION – ADULT	STRIDOR &/OR HYPOTENSION – PEDIATRIC
1. Administer 2.5 mg nebulized Albuterol. 2. Administer 0.3 mg Epinephrine 1:1,000 IM. 3. If condition remains unchanged or worsens after 3 minutes, administer additional dose of 0.3mg Epinephrine 1:1,000 IM.	1. Administer 2.5 mg nebulized Albuterol. 2. Administer 0.01 mg/kg Epinephrine 1:1,000 IM. (Max 0.3 mg) 3. Be prepared for emergent airway management. 4. If condition is unchanged after 3 min. or worsens, administer additional dose of 0.01mg/kg Epinephrine 1:1,000 IM.

ALS – IF suspected anaphylaxis, proceed directly to epinephrine administration

1. Establish a saline lock or an IV with 0.9% NaCl. Titrate fluids to a SBP of 90 mmHg.
2. Apply cardiac monitor.
3. Medicate according to signs/symptoms as below.

ISOLATED ITCHY RASH/HIVES - ADULT	ISOLATED ITCHY RASH/HIVES – PEDIATRIC

Administer Diphenhydramine 25-50mg IV or IM.	Administer Diphenhydramine 0.5 mg/kg IV or IM. (Max 50 mg)

RASH/HIVES & WHEEZING - ADULTS	RASH/HIVES & WHEEZING – PEDIATRIC
1. Administer 0.3 mg Epinephrine 1:1,000 IM. 2. Administer 2.5 mg nebulized Albuterol at a flow sufficient to produce of mist. 3. Administer Diphenhydramine 25-50 mg IV or IM.	1. Administer 0.01 mg/kg Epinephrine 1:1,000 IM. (Max 0.3 mg) 2. Administer 2.5 mg nebulized Albuterol at a flow sufficient to produce a mist. 3. Administer Diphenhydramine 0.5 mg/kg IV or IM. (Max 50 mg)

STRIDOR &/OR HYPOTENSION – ADULT	STRIDOR &/OR HYPOTENSION – PEDIATRIC
1. Administer 2.5 mg nebulized Albuterol. 2. Administer 0.3 mg Epinephrine 1:1,000 IM. 3. Administer Diphenhydramine 25-50 mg IV or IM. 4. If condition remains unchanged or worsens after 3 minutes, administer additional dose of 0.3mg Epinephrine 1:1,000 IM. 5. If after 3 minutes and second dose of epinephrine condition remains unchanged, mix and infuse epinephrine drip (see below).	1. Administer 2.5 mg nebulized Albuterol. 2. Administer 0.01 mg/kg Epinephrine 1:1,000 IM. (Max 0.3 mg) 3. Be prepared for emergent airway management. 4. Administer Diphenhydramine 0.5 mg/kg IV or IM. (Max 50 mg) 5. If condition is unchanged after 3 min. or worsens, administer additional dose of 0.01mg/kg Epinephrine 1:1,000 IM. 6. If after 3 minutes and second dose of epinephrine condition remains unchanged, mix and infuse epinephrine drip (see below).

Epinephrine drip: Inject 1ml of epinephrine 1:1000 (also known as epinephrine 1mg/ml) into a 1-liter saline bag and mix. This yields 1 mcg/cc of epi. Attach a micro (60 gtt) drip set and run wide open.

For a 500 cc bag of saline inject 0.5 ml of 1:1000 and mix. This mix yields 1 mcg/cc of epi. Attach a micro (60 gtt) drip set and run wide open.

DROWNING

1. PROTECT YOURSELF! Do not enter a body of water unless you are certified in water rescue and have the appropriate equipment.
2. Administer high flow oxygen *(See Oxygen Administration)*
3. Immobilize cervical spine if potential exists for cervical injury.
4. Treat patients for problems as indicated by *appropriate protocol.*
5. If a cold water drowning exists consider hypothermia *(See Hypothermia protocol).*
6. Transportation by ALS is preferred.
7. All drowning patients should be transported to a hospital. Complications such as pulmonary edema may not be immediately recognized.
8. If the patient is persistently hypoxemic (oxygen saturation <92% on non-rebreather), or in the judgment of the Paramedic, CPAP would be beneficial, refer to CPAP protocol.

HYPERTHERMIA

A. Administer high flow oxygen. *(See Oxygen Administration)*
B. Move patient to cool environment.
C. Remove clothing. Cool patient with cold packs around the abdominal, axillary, neck, and groin areas.
D. Do not allow patient to shiver during cooling. If shivering occurs, remove cold packs.
E. If patient presents with altered level of consciousness, *(See Altered Level of Consciousness)*.

Note: Many athletic programs have instituted ice bath cooling for exertional heat stroke. If ice bath cooling has been initiated consider the following:

1. Indications for ice bath cooling include altered mental status and elevated temperature.
2. Once initiated, patient may stay in the ice bath for up to 30 minutes.
3. When patient is in the ice bath, monitor vital signs, ECG, and start IV per protocol.
4. When possible, monitor temperature as best as possible.
5. If at any point in time the patient becomes unstable, remove from ice bath and initiate rapid transport.
6. Patient may be removed from the ice tub once core temperature falls below 102 or they regain a normal mental status.

If patient appears unstable:
BLS

1. Request ALS if not already en route and initiate transport. Contact receiving facility for further orders if ALS is not on scene.

ALS

1. Apply the cardiac monitor
2. Initiate an IV and titrate flow to a systolic BP of 90 mmHg.

HYPOTHERMIA

Any patient with a **suspected** core body temperature of 96° F or less. Hypothermic patients are considered viable until rewarmed and pronounced dead by a physician.

A. Administer oxygen at 10-15 LPM per non-rebreather *(See Administration of Oxygen Protocol)*
    1. If you need to assist ventilations with BVM, do not induce a gag reflex, do not hyperventilate, and do not insert a non-visualized airway or OP airway.
B. On all patient procedures, handle gently. Do not let the patient walk.
C. Remove wet clothing. Cover patient with dry blankets. Do not rub patient's extremities.
D. Assess vital signs (Check pulse for one full minute).

Pulse Present
BLS/ALS

A. If patient presents with altered level of consciousness, see Altered Level of Consciousness protocol.

Pulse Absent
BLS

A. Begin CPR and request ALS.

ALS

A. If monitor shows an organized rhythm, do not initiate CPR.
B. Initiate CPR if the patient is found to be in asystole or ventricular fibrillation.
C. Intubate or place a supra-glottic airway (refer to Airway Management Protocol) if there are no spontaneous respirations. Do not hyperventilate (rapid correction of acidosis may induce ventricular fibrillation).

TRAUMA

INITIAL TRAUMA CARE

- To be performed on all patients following a traumatic or suspected traumatic event.
- As scene evaluation, initial assessment, rapid trauma assessment, focused assessment, on-going assessment, and detailed physical exam are part of the training of EMTs and paramedic, the details of those steps will not be provided in this protocol. It is expected that EMS personnel will perform in accordance to their training.

BLS

A. Begin Initial Medical Care.
B. Follow Airway Management protocol.
C. Follow Oxygen Administration protocol.
D. Record LOC using AVPU method. Obtain an initial GCS as early as possible.
E. Control all significant external bleeding. If direct pressure, elevation, and pressure points do not rapidly stop the bleeding in an extremity, apply a tourniquet.
    1. Direct pressure is the method of choice to control bleeding.
F. If bleeding continues despite tourniquet use or wound is not amenable to tourniquet placement (e.g. groin or armpit), pack the wound cavity with a sterile gauze roll and apply direct pressure with a pressure bandage.
G. Providers may also utilize a TCCC-approved gauze based hemostatic dressing (e.g., Combat Gauze, Chito Gauze, Celox Gauze) if available.
H. The number of dressings packed into the wound must be documented in the patient care record.
I. Expose patient to perform a detailed physical exam.
J. Cover and keep patient warm between assessments in order to conserve body heat.
K. If patient's presentation, or the mechanism of injury, meets "Trauma Alert" criteria:
    1. Call for a paramedic unit. See "ALS and BLS Team Approach".
    2. Rapidly extricate with cervical spine immobilization.
    3. Try to keep scene time to 10 minutes or less. If scene time exceeds 10 minutes, document the reason for the delay.
L. Patients with major multiple system trauma or penetrating trauma to the head, neck, chest or abdomen should be transported to a Trauma Center. Patients with serious burns should be transported to a Burn Center. If the patient can be transported by BLS to a Trauma or Burn Center in less time than it would take for ALS to arrive, then transport by BLS.

ALS

1. During transport – Establish 2 large bore IV's of 0.9% NaCl. Titrate fluids to a SBP of 90 mmHg.
2. Apply cardiac monitor.
3. Intubation with C-spine control may be necessary to maintain a patent airway and/or to prevent aspiration of vomitus. Do not nasally intubate patients with facial trauma.
4. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.

Trauma Alert Criteria

Physiologic

- Systolic BP < 90 mm Hg or vital signs outside of physiologic ranges for pediatrics
- Glasgow Coma Scale (GCS) ≤ 13
- Respiratory rate < 10 or > 29
- Airway or respiratory compromise as defined by:
    - BVM, Intubation, adjunct airway, or cricothyroidotomy in the field
    - Needle chest decompression
- Seizures with a fall

Anatomic

- Penetrating trauma to the head, neck, chest, abdomen, groin or extremities proximal to the knees and elbows
- Traumatic amputation proximal to the wrist or ankle
- Burns > 15% with associated trauma
- Any crushed, degloved, pulseless, or mangled extremity
- Pelvic fracture
- Two or more long bone fractures
- Flail chest
- Extremity paralysis suggestive of spinal cord injury
- Open or depressed skull fracture
- Syncope with unprotected head or neck

Mechanism of Injury

- Ejection from vehicle, including from ATV or motorcycle
- Vehicle roll-over
- Prolonged extrication from vehicle
- Pedestrian struck by vehicle at speed > 20 MPH
- Falls > 20 feet (adults) or > 3x the child's height
- > 18" intrusion into operator's compartment of motor vehicle

Special Circumstances

- Head injury with LOC
- Head injury on daily anticoagulant therapy
- Hanging
- Drowning
- Pregnancy >20 weeks with trauma

****Healthcare provider discretion****

OUT-OF-HOSPITAL SPINAL CLEARING/IMMOBILIZATION

A. Spinal immobilization is to be provided to blunt trauma patients only if significant evidence of spinal injury exists, see below.
B. Penetrating trauma patients do NOT require full spinal immobilization on backboard for transport.
C. Patients that are ambulatory upon arrival do NOT require full spinal immobilization on backboard for transport.

BLS/ALS

Cervical collar immobilization should be used for **trauma patients** meeting any of the following:

A. Presence of midline bony tenderness of c-spine to palpation or with movement
B. Focal neurologic deficit present or reported
C. Age <8 or >65
D. Intoxication
E. Distracting injury present
F. High risk injury/mechanism of injury or provider discretion

Cervical collar immobilization should be used for any **pediatric trauma** patient meeting any of the following:

A. Age<8
B. Presence of midline tenderness to palpation or with movement
C. Distracting injury present
D. Complaint of any neck pain
E. Torticollis
F. Focal neurologic deficit present or reported
G. AMS including GCS < 15, intoxication, and other signs (agitation, apnea, hypopnea, somnolence, etc.)
H. Involvement in a high-risk motor vehicle, high impact diving injury, or has substantial torso injury.

Cervical collar and long spine board immobilization should be provided to patients meeting **Trauma Alert** criteria and any of the following:

A. Unconscious or altered mental status on exam
B. Neurologic deficit present or reported
C. Midline spinal tenderness or deformity Intoxication

-If a long spine board is used for extrication purposes only, and the patient does not meet the above criteria, the patient does NOT need full spinal immobilization for transport unless necessary for patient safety. The patient can be moved onto the stretcher.
-Patients who are ambulatory upon arrival do NOT require full spinal immobilization on a backboard for transport.

SPINAL IMMOBILIZATION FOR THE PREGNANT TRAUMA PATIENT

A. During the third trimester, transport the patient in the left lateral recumbent position (tilted 20-30 degrees to the left by securing the patient to the backboard and tilting the backboard with pillow or blankets).

Amputations

Guidelines

A. Amputated part shall be wrapped in sterile dressing, slightly moistened with NS (dressing should be damp, not wet).
B. Place the part in a plastic bag and seal.
C. Place bag in a cool solution.
D. Never immerse the part or put it directly on ice.
E. Transport amputated part with patient to hospital.
F. Stump care:
    1. Apply bulky dressing.
    2. Control extremity hemorrhage: If tourniquet was applied in the field prior to EMS arrival, it is usually best to leave it in place. Note in writing as accurately as possible.

SPECIAL TRAUMA SITUATIONS

EYE INJURIES

A. Assess for the following:
    1. Intact globe (do not touch the globe).
    2. Hemorrhage, lacerations, contusions.
    3. Ability of both eyes to move together.
    4. Fluid from the globe.
    5. Decreased visual acuity (unable to see light, hand motion, or count fingers)
    6. Visible foreign bodies.
B. Cover both eyes when bandaging, but avoid pressure on the eyes.
C. Do not remove impaled objects – stabilize.
D. Cover avulsed eye with paper cup if available.
E. For chemical burns, irrigate the eye with normal saline or water for 20 minutes and then bandage both eyes. If initiating transport will not interrupt eye irrigation, continue irrigation en route to the hospital.

CHEST INJURIES

BLS

A. Assess for flail segments or rib fractures. Do not use sandbags.
B. Cover open chest wounds with an occlusive dressing. If a commercial seal is used, a vented seal is preferred. Apply on exhalation. Watch for signs of increased respiratory distress and decreasing blood pressure. If this occurs lift one edge of the dressing long enough to allow air to escape.
C. Stabilize impaled objects. Secure occlusive (e.g., Vaseline®) gauze at base of impaled objects.
D. Assess breath sounds every 5 minutes.
E. If level of consciousness is decreased or vital signs abnormal; transportation by advanced life support is preferred.

ALS

A. If tension pneumothorax is suspected perform needle decompression (see Needle Chest Decompression).

ABDOMINAL INJURIES

A. If an evisceration is present, keep it covered with moist sterile, non-adherent dressings. Use normal saline. Do not attempt to replace organs. Do not use Vaseline dressing.
B. Transportation by ALS is preferred.

MUSCULOSKELETAL INJURIES

A. Assess distal circulation, movement, and sensation before moving the injured extremity.
B. Cover open wounds with a sterile dressing. If bone is exposed, use a moist, sterile saline dressing.
C. Splint the injured extremity.
D. Do not attempt to straighten the extremity unless pulses are absent. Never attempt to straighten an injury involving a joint. If resistance is met while straightening a limb, splint the injury as it is.
E. Reassess distal circulation, movement and sensation.
F. Elevate the extremity in a supported position and apply cold packs.
G. When in doubt, splint.
H. If the patient is in more pain after splinting of the injured part, reassess and re-splint.
I. Care of amputated parts:
    1. Rinse away gross contamination with sterile saline.
    2. Cover the injured site on the amputated part with a moist, sterile saline dressing and bulky bandage.
    3. Place the amputated part in a plastic bag. If ice is immediately available, place the plastic bag on ice. Do not delay transport to obtain ice.
    4. Do not clamp bleeders. Apply a compression dressing.

BURNS

A. Protect yourself!
B. Remove the patient from the source, put out fire on the patient and remove burned clothing.
C. Address the more life threatening injuries first, and then treat burns.
D. Maintain sterility when treating burns.
E. Estimate the percentage and degree of burns using the rule of nines, or as an alternative for burns less than 10 percent, the palm of the patient's hand is equivalent to ~1% BSA.
F. Categorize type of burn and provide appropriate treatment:

Thermal burns

A. Suspect inhalation injury in any patient with facial burns or involvement in any fire in an enclosed space.
B. For first and second degree thermal burns involving < 10% body surface, soak area with sterile water for 10-15 minutes until temperature is the same as the normal skin, then cover. Do not apply cold packs to burned areas.
C. For all other thermal burns, cover with dry, sterile dressings or burn sheets (If in doubt whether to soak burns, leave dry.)
D. Leave unbroken blisters intact.

Chemical burns

B. Brush off excess dry agent
C. Copious irrigation with saline or water for at least 20-30 minutes. 3. Transport in dry sterile sheets.
D. Keep warm – protect from hypothermia associated with wet skin.

Electrical burns

A. Turn off the source.
B. Be aware of musculoskeletal injuries and an irregular pulse.
C. Look for entrance and exit wounds.

G. Place the patient on high flow oxygen with a non-rebreather at 10 – 15 LPM.
H. ALS is preferred for:
    1. Any burns complicated by fractures
    2. All electrical burns
    3. Any burns complicated by smoke inhalation, damage to the airway or confinement in an enclosed space.
    4. Pediatric patients
    5. Partial or full-thickness burns of > 10% BSA.
    6. Burns involving hands, feet, face, genitalia or joints
    7. Patients meeting medical alert criteria
    8. Patients meeting trauma criteria

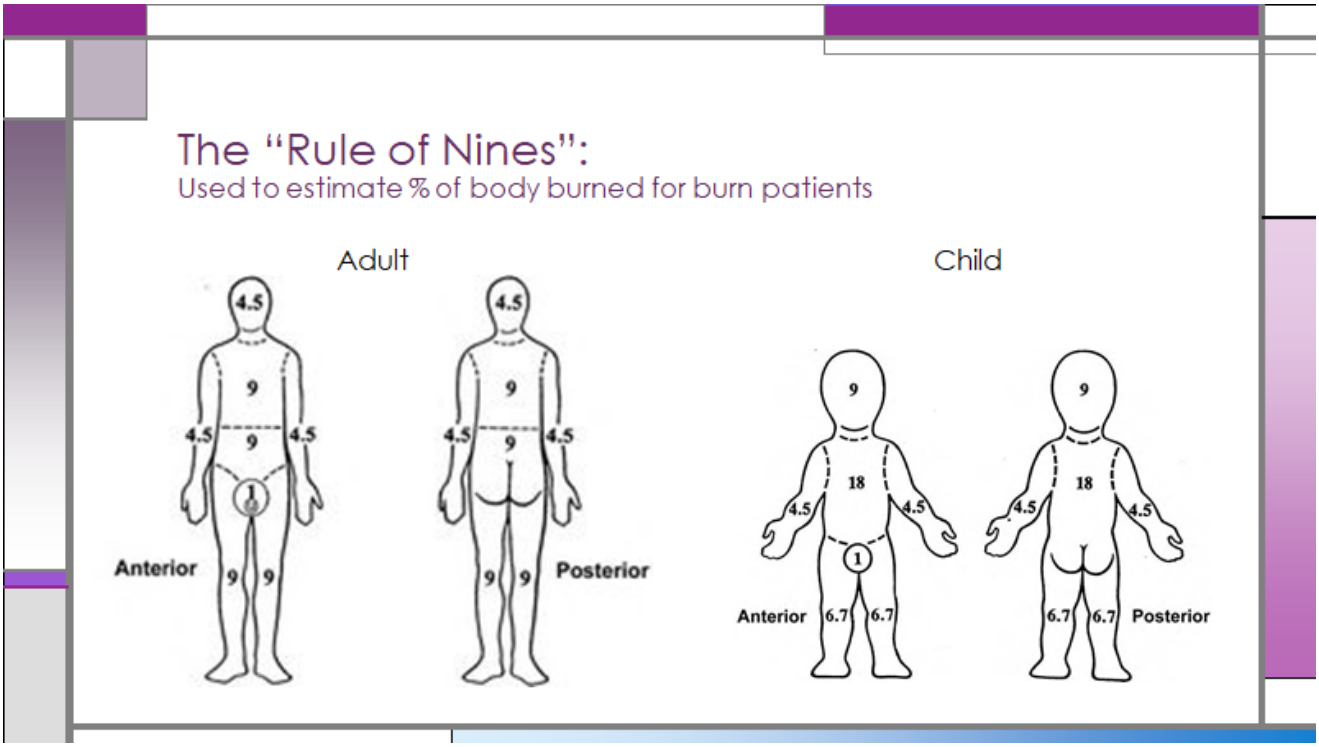
ALS

A. Intubate the patient if indicated. Strongly consider oral intubation if LOC is decreasing and one or more of the following signs are present:
    1. Obvious oral inhalation injury (e.g., increasing hoarseness, stridor)
    2. Soot in the airway or nasal hair burned
B. Apply the cardiac monitor to non-burned skin.
C. Initiate an IV with normal saline for partial or full thickness burns > 20% BSA, other associated trauma, significant dysrhythmias, or need for intubation.
    1. Insert IV catheter preferentially through non-burned skin.
    2. Run wide open until arrival at hospital or 1000 mL infused.
    3. Document total IV fluids given in the field and advise receiving facility upon arrival.
D. Administer fentanyl as appropriate *(See Pain Management protocol)*

*** Burn injuries that should be referred to a burn center include:**

- Partial thickness burns greater than 10% total body surface area (TBSA).
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
- Third degree burns in any age group.
- Electrical burns, including lightning injury.
- Chemical burns.
- Inhalation injury.
- Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.
- Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
- Burned children in hospitals without qualified personnel or equipment for the care of children.
- Burn injury in patients who will require special social, emotional, or rehabilitative intervention.

Rule of Nines



Burn Severity

BSA %	Superficial	Partial Thickness	Full Thickness
100	Moderate >50%	Critical >30%	Critical >10%
90			
80			
70			
60			
50	Minor <50%		
40			
30		Moderate <30%	
20			
15		Minor <15%	
10			Moderate <10%
2			Minor <2%
0			

EMD WEAPON (e.g., Taser®) INJURIES

This protocol is intended to provide guidelines for care of patients following the use of electromuscular disruption (EMD) weapons (e.g., the X26 TASER®). For situations involving altered level of consciousness, significant secondary trauma or other medical problems, follow the applicable protocol(s).

A. Assure the scene is secure. Use of this type of weapon to subdue a violent person implies he/she was a risk to him/herself or others.
B. Evaluate and treat for secondary injuries/altered level of consciousness as indicated.
C. Stabilize dart(s) in place and transport patient to ED if the dart(s) is/are embedded in the eyelid/globe of eye, genitalia, or face/neck.
D. Darts in other locations may be carefully removed by gently pulling backwards in the same plane as they entered the body. Assure the dart is intact and no portion of the dart remains inside the patient's skin.
E. Provide the darts to law enforcement officers.
F. Control minor bleeding and clean the wound area(s) with alcohol and/or povidone-iodine solution. Cover with an adhesive bandage.
G. If all darts are out, any minor bleeding is controlled, and no other injuries or symptoms exist, EMS transport is not indicated and an SOR may be obtained.

TRAUMATIC BRAIN INJURIES

A. Identify patients with physical trauma and a mechanism consistent with the potential to have induced brain injury and:
    1. GCS of 12 or less
    2. GCS <15 with decreasing mental status
    3. Multisystem trauma requiring intubation (whether the primary need for intubation was from TBI or from other potential injuries)
    4. Post-traumatic seizures (whether status or not).
B. Elevate head of bed (cot) 30° if possible.
C. Start 6 L/min O_2 via nasal cannula and obtain IV access when applicable.
D. Monitor O_2, BP, HR, and neurologic status every 3-5 minutes.
E. Maintain oxygen saturation > 90%.
    1. If oxygen saturation falls below 90% despite nasal cannula, reposition airway and increase to NRB mask (see Airway Management protocol).
    2. If continued saturation <90%, start BVM ventilation with airway adjuncts (eg, OP or NP airway when appropriate).
    3. If airway compromise or hypoxia persists after these interventions, a non-visualized airway or ETI should be considered (see Airway Management protocol).
F. Maintain Normo-Ventilation.
    1. If there is evidence of hypoventilation (ineffective respiratory rate, shallow or irregular respirations or periods of apnea) despite high-flow O_2, assist ventilation with BVM and if ineffective, consider non-visualized airway or ETI (see Airway protocol).
    2. When assisting ventilation with BVM, maintain respiratory rate according to the following:
        a. 25 breaths per minute in infants (0-24 mo)
        b. 20 bpm in children (2 yo-14 yo)
        c. 10 bpm in children aged 15 or older
        d. 10 breaths per minute in adults
    3. In intubated patients, use BVM to maintain $ETCO_2$ between 35 and 45 mmHg.
G. Maintain blood pressure according to the following:
    1. >70 mmHg for infants 0-24 mo
    2. >80 mmHg for children 2 yo-7 yo
    3. >90 mmHg for children 8 yo and older and all adults
    4. Prevent even a single isolated episode of hypotension by IV fluid resuscitation with initial bolus of 1 L NS, followed by repeat boluses of 500 ml NS to keep SBP>90 mmHg in adults. 20 ml/kg for pediatric patients, followed by repeat boluses of 10 ml/kg NS or at sufficient rate to keep SBP as above. Do not treat hypertension, but restrict IVF TKO in adults with SBP >140 mmHg, infants with SBP >100mm Hg and older children/adolescents with SBP >130 mmHg.
H. Check for hypoglycemia.
    1. For blood sugar < 70 mg/dL, follow Hypoglycemia protocol.
    2. Recheck blood sugar 10 minutes after administration of dextrose, and repeat treatment X 1 if BS <70 mg/dL.

OBSTETRICAL EMERGENCIES

MATERNAL BLEEDING DURING PREGNANCY

BLS

A. Begin initial Medical Care
B. Follow “Airway Management” protocol
C. Administer oxygen at 10-15 LPM by NRB mask
D. If patient has signs/symptoms of shock, call for a paramedic unit. See “ALS and BLS Team Approach”.
E. Have patient estimate the number of pads soaked per hour. Determine when bleeding began.
F. Prepare to treat for shock.
G. Transport emergent in left lateral recumbent position if ≥20 weeks gestation or if uncontrollable bleeding is present

ALS

A. Establish two (2) large bore IV’s of 0.9% NaCI. Titrate fluid to SBP of 90 mmHg.

Refer to *Non-Cardiogenic Shock* and other protocols as patient condition requires.

PREECLAMPSIA/ECLAMPSIA

Any pregnant or recently delivered (within 4 weeks) woman with the presence of hypertension (BP > 140/90) and marked edema of the face, hands and/or feet.

A. Begin Initial Medical Care
B. Administer high flow oxygen to mother. (*See Administration of Oxygen Protocol*)
C. Transport non-emergently (without lights or siren) in a darkened ambulance.
D. If patient begins to have seizures, *see Seizures Protocol – Note that Midazolam is still given before the magnesium.*

PROLAPSED UMBILICAL CORD

A. Administer high flow oxygen to the mother. *(See Administration of Oxygen Protocol)*
B. Place patient in left lateral recumbent position.
C. Elevate presenting part of the umbilical cord by using a gloved hand in vagina. Keep elevated until relieved at hospital.
D. Call for ALS and initiate transport.
E. Contact receiving facility as early as possible.

BREECH PRESENTATION

A. Administer high flow oxygen to the mother. *(See Administration of Oxygen Protocol)*
B. Place patient in left lateral recumbent position.
C. Check for prolapsed cord.
D. Contact receiving facility as early as possible.

POSTPARTUM HEMORRHAGE

Any patient who has an estimated blood loss exceeding 500 ml following childbirth.

BLS

A. Contact receiving facility for further orders if ALS is not on scene.
B. Call for ALS and initiate transport.
C. Administer high flow oxygen to mother. *(See Administration of Oxygen Protocol)*
D. Massage the fundus of the uterus after delivery of the placenta until firm. Check fundus every 5 minutes for firmness and repeat massage as necessary.

ALS

A. Insert 2 large bore IV's with normal saline and run wide open to maintain a SBP of 90 mmHg.
B. Contact receiving facility as early as possible

NEWBORN CARE

DELIVERY OF THE NEWBORN

If delivery is determined to be imminent, follow the guidelines below. Delivery may be imminent even though the bag of waters has not broken. If the mother is not at full term, or if signs of meconium stain are present, call for ALS.

A. Obtain the following information:
    1. Due date.
    2. Frequency of contractions.
    3. Number of pregnancies (gravida), number of children born (para)
    4. History of pre-term or post-term deliveries.
    5. Sensation of the need to move bowels (delivery is imminent).
    6. Presence of crowning (delivery is imminent).
B. If no crowning is present, begin transportation in the left lateral recumbent position. If crowning is present, prepare to deliver the infant.
C. Administer high flow oxygen to the mother. *(See Administration of Oxygen Protocol)*
D. Assist with the delivery. (*See Newborn Care Protocol)*
    1. Guide and control but do not try to stop the delivery.
    2. Don't pull on infant or put traction on cord.
    3. If cord is around the neck of the infant, slip it over the head. If unable to slip the cord over the head, immediately clamp the cord in two places and cut between the clamps. Continue with delivery.
    4. Look for presence of meconium staining. *(See Meconium Staining)*
    5. After completion of delivery, vigorously stimulate the infant.
    6. Wait at least one minute before clamping the newborn's cord.
E. Provide post-partum care to the mother. After the placenta is delivered (or 5 minutes after the baby is born, whichever comes first), initiate patient transportation. Massage the fundus of the uterus after delivery of the placenta. Wrap up the delivered placenta and take it to the hospital.
F. Contact the receiving facility for early notification.

NEWBORN CARE

A. Stimulate, position and warm. Dry with towels, stimulate with gentle rubbing or heal flicks. Suction only if an obvious obstruction is seen or the neonate requires positive pressure ventilation.
    1. Note – In premature infants with estimated gestational age <30 weeks DO NOT towel dry. Instead, wrap in plastic or put infant in a plastic bag (not the head) and put on a hat if available.
B. If any of the following are present, immediately start newborn resuscitation protocol.
    1. Non-vigorous newborn
    2. Apneic or gasping
    3. Heart rate < 100

- If none of the above are present, continue below.

C. Keep baby at the same level of the perineum for at least 1 minute. Clamp and cut the cord. Place one clamp six inches from the infant, the second clamp three inches distal from the first clamp. Cut the cord between the clamps. If cord continues to bleed, apply additional clamps.
D. Record the time of birth. Determine APGAR scores at one and five minutes after birth. Normal respiratory rate is 40-60/minute and pulse is 120-160/minute. See below for normal preductal oxygen saturations in the neonatal period (in the right arm.)
E. Contact the receiving facility for early notification.

Targeted Preductal SpO2 After Birth	
1 min	60% - 65%
2 min	65% - 70%
3 min	70% - 75%
4 min	75% - 80%
5 min	80% - 85%
10 min	85% - 95%

APGAR Scoring Chart			
SIGN	**0**	**1**	**2**
ACTIVITY	Limp	Some extremity flexion	Good extremity flexion
PULSE	Absent	<100	≥100
GRIMACE	Absent	Some facial grimace	Strong grimace
APPEARANCE	Blue	Blue extremities, pink torso	All pink
RESPIRATORY EFFORT	Absent	Weak cry	Strong cry

MECONIUM STAINING

Presence of green amniotic fluid or green/black particulate material on face or in upper airway.

A. After completion of delivery, using a catheter or bulb syringe, suction mouth and then nose of newborn ONLY if there are signs of obvious obstruction or if the baby requires positive pressure ventilation (PPV).
B. Wipe away any collection of meconium in the upper airway with gauze-wrapped finger.

BLS

A. Request ALS if not already enroute and initiate transport. Contact receiving facility for further orders if ALS is not on scene.

ALS

A. See Newborn Resuscitation protocol.

NEWBORN RESUSCITATION (TIME OF DELIVERY)

Perform the following procedures in a stepwise fashion as indicated. Reassess after each step before proceeding to the next.

BLS

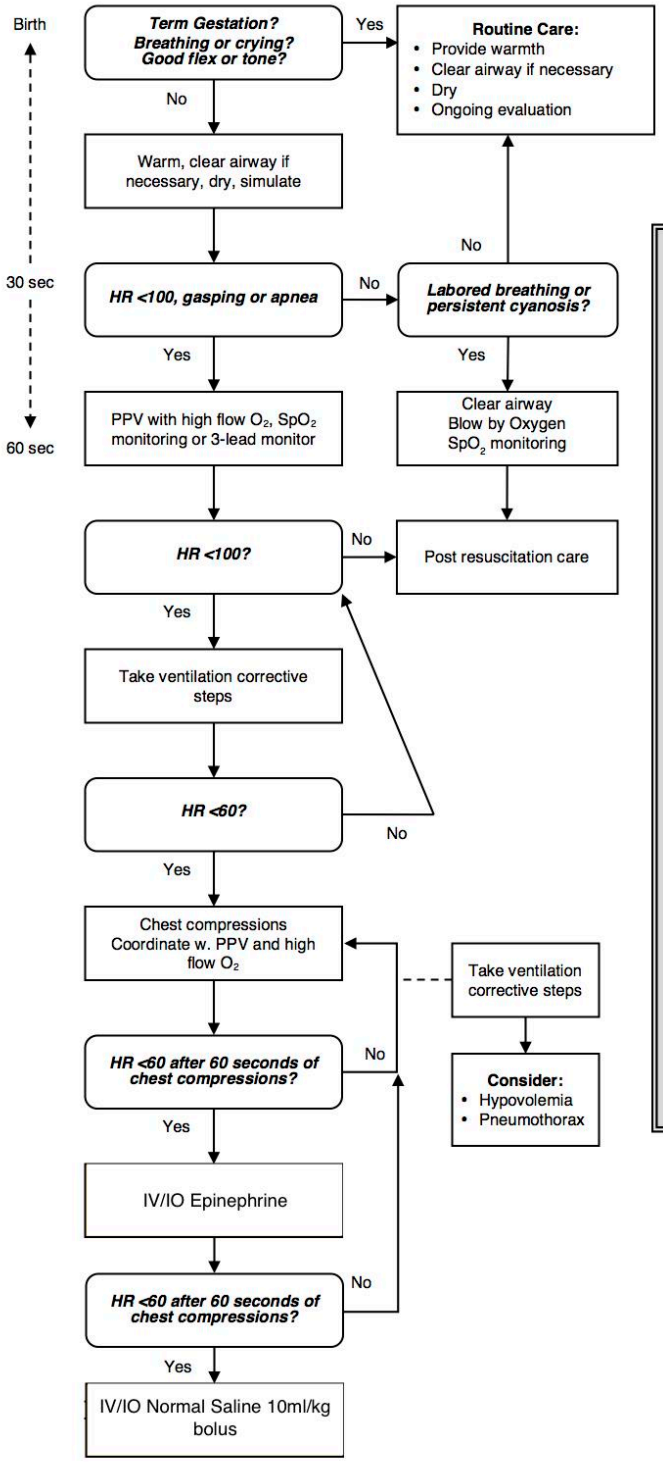
A. If infant is apneic, gasping, or has a HR < 100/min begin Positive Pressure Ventilation (PPV) with a bag-valve-mask (infant preferred) at rate of 40-60 breaths per minute for 30 seconds. (Caution: risk of barotrauma – bag only enough for chest rise and fall.)
    1. Start oxygen saturation monitoring with pulse oximeter, if available
    2. Consider 4-lead monitoring (for purposes of obtaining heart rate)
    3. If available, begin resuscitation with 21% oxygen.
B. Reassess after 30 seconds of PPV:
    1. If HR is <100/min but >60/min PPV, ensure good seal and airway position. Continue to perform PPV.
    2. If HR < 60/min, begin chest compressions with a ratio of 3:1 compressions to breaths (90 compressions and 30 respirations per minute)
C. If HR >100/min, transport to closest pediatric facility with continued close monitoring.

ALS

A. If infant is apneic, gasping, or has a HR < 100 begin Positive Pressure Ventilation (PPV) with a bag-valve-mask (infant preferred) at rate of 40-60 breaths per minute for 30 seconds (Caution: risk of barotrauma – bag only enough for chest rise and fall.)
    1. Start oxygen saturation and heart rate monitoring with pulse oximeter, if available
    2. Consider 3-lead monitoring
    3. If available, begin resuscitation with 21% oxygen.
B. Reassess after 30 seconds of PPV:
    1. If HR is <100/min but >60/min, ensure good seal and airway position. Continue to perform PPV.
    2. If HR < 60/min begin chest compressions with a ratio of 3:1 compressions to breaths (90 compressions and 30 respirations per minute)
        a. Reassess after additional 30 seconds of PPV and compressions. If HR < 60 BPM, administer epinephrine 0.01mg/kg of 1:10,000 IV/IO and continue compressions and ventilation.
        b. Reassess after additional 30 seconds. If HR still < 60 bpm, administer 0.9% NS bolus 10ml/kg, slow IV push over 5-10 minutes.
C. If HR does not improve despite performance of good PPV intubate and use meconium aspirator to suction thick secretions that may be obstructing the airway (this is not necessarily meconium.)
D. If continued HR <100/min then intubate or place a Supraglottic Airway
E. If HR >100/min, transport to closest pediatric facility with continued close monitoring.

Targeted Preductal SpO2 After Birth	
1 min	60% - 65%
2 min	65% - 70%
3 min	70% - 75%
4 min	75% - 80%
5 min	80% - 85%
10 min	85% - 95%

Newborn Resuscitation Flow Chart



General Considerations
(From 2015 AHA Guidelines)

- Initial resuscitation steps should be completed within 60 seconds as illustrated
- The decision to progress beyond initial steps is based on an assessment of respirations (apnea, gasping, labored, or unlabored breathing) and heart rate (>/< 100 bpm)

Assisting Ventilations

- Assist ventilations at a rate of 40-60 breaths per minute to maintain HR > 100
- Use 2 person BVM when possible

Chest Compressions

- Indicated for HR < 60 despite adequate ventilation w. supplemental O_2 for 30 seconds
- 2 thumbs-encircling hands technique preferred
- Allow full chest recoil
- Coordinate with ventilations so not delivered simultaneously
- 3:1 ratio for compressions to ventilations

Medications

- Epinephrine is indicated if the newborn's heart rate remains less than 60 beats/min after 30 seconds of PPV with 100% O_2 AND another 60 seconds of chest compressions coordinated with PPV using 100% O_2

Intubation

- Intubation is only to be performed if the all other measures listed have been attempted and the patient continues to have HR <60 beats/min

SECTION THREE:
PROCEDURES

VERIFICATION OF ENDOTRACHEAL TUBE AND SUPRAGLOTTIC AIRWAY DEVICE PLACEMENT-ALS

End-Tidal-Carbon-Dioxide detection (EtCO2) should be used to confirm the initial placement of the ETT on ALL intubated patients (in addition to physical exam) per EtCO2 standard operating procedure, on any ambulance that has the capability of performing capnography. Continuous EtCO2 monitoring should be used throughout patient encounter on ALL intubated patients.

Endotracheal Tubes are to be confirmed and secured prior to moving the patient. Any time the patient has been moved (i.e. from the scene to the vehicle, in the vehicle, from the vehicle to the ED) the ETT placement is to be re-confirmed.

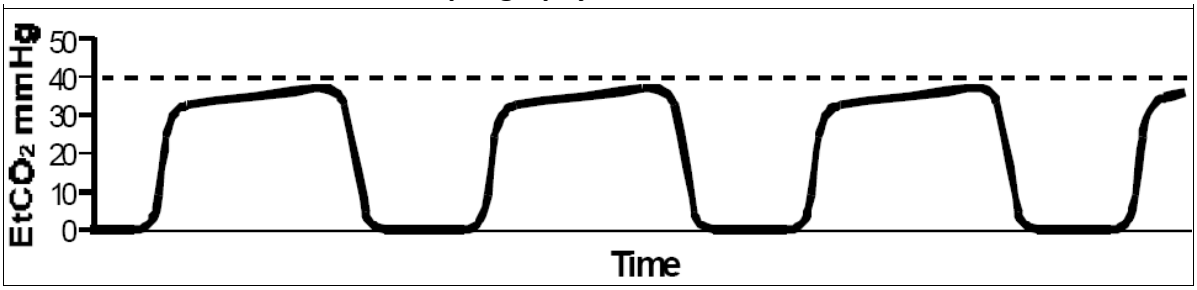
This will also apply to supraglottic airway devices (King airway, LMA, etc)

Documentation on the run sheet is to include:

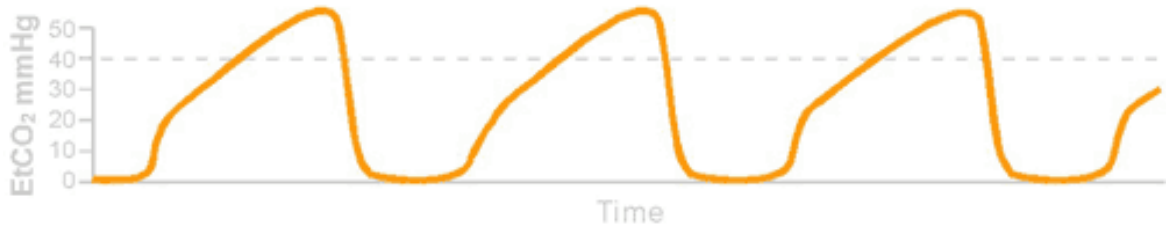
1. Bilateral breath sounds, absence of epigastric sounds
2. Size of ETT and depth of insertion (in centimeters)
3. Method of securing the ETT
4. EtCO2 measurement (initial reading and any changes during patient encounter)

Confirmation signature of *successful placement of an advanced airway (ETT, King, LMA, Cric)* at the receiving facility is required upon *arrival* in the Emergency Department. *If the EMS provider fails to get the airway confirmed at the receiving facility or if the confirming entity assesses that the device is misplaced a copy of the patient care report must be made available to provider agency supervisory personnel and the Medical Director within 24 hours.*

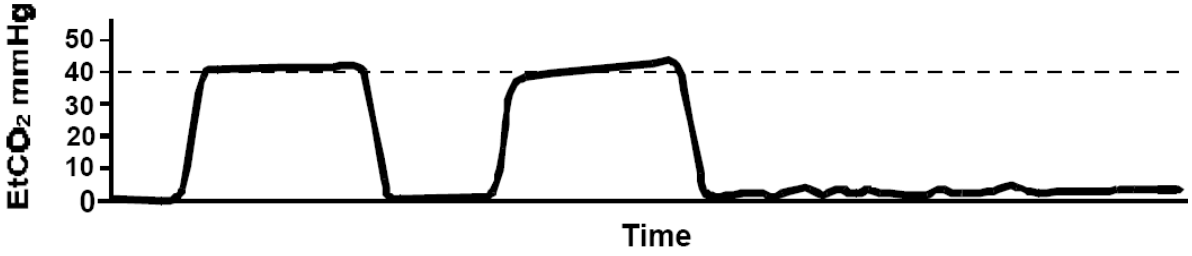
Capnography Waveform Review



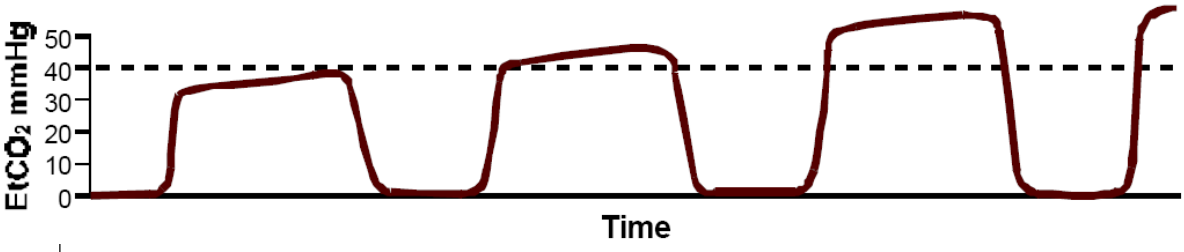
Normal Waveform

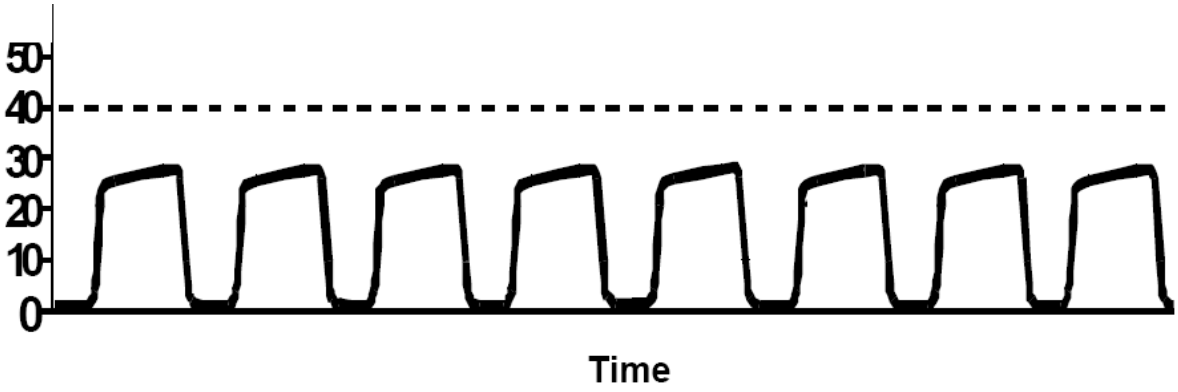


"Shark Fins" – indicates bronchospasm

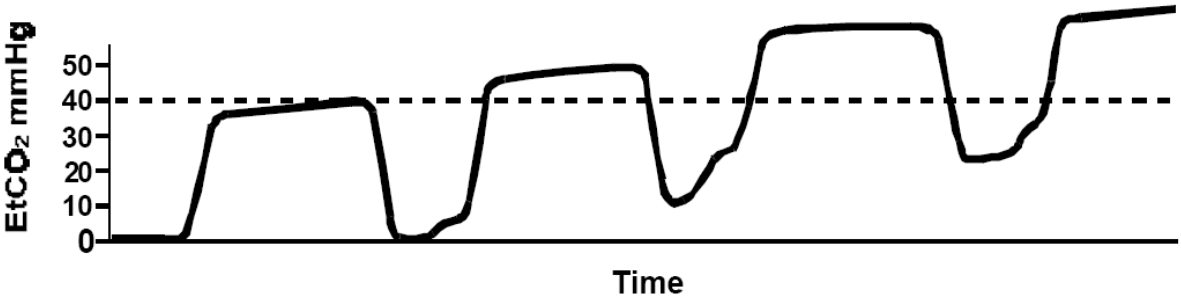


Displaced ET Tube / Apnea





Hyperventilation



Air trapping or inadequate exhalation as in COPD or asthma

CRICOTHYROTOMY-ALS

SURGICAL CRICOTHYROTOMY

A. Position adult patient (age greater than 8 years) by hyperextending the neck unless c-spine concerns mandate neutral positioning.
B. Locate the cricothyroid membrane.
C. Clean the incision site, if possible.
D. Incise the skin vertically over the membrane.
E. Bluntly dissect down to the cricothyroid membrane.
F. Incise the lower portion of the membrane horizontally with scalpel and rotate the blade 90^{o}.
G. Enlarge and maintain the opening with hemostats or the end of the scalpel.
H. Insert cuffed endotracheal tube and inflate cuff.
I. Confirm correct placement by use of the EtC02, if available, or Esophageal Detector Device/ colorimetric $ETCO_2$ detector and auscultating for breath sounds over both lungs and stomach.
J. Cover wound with occlusive dressings and secure the tube.
K. Reassess breath sounds.

Complications of Cricothyrotomy

A. Hypoxemia
B. Hypercarbia (CO2 toxicity)
C. Perforation of the esophagus
D. Hemmorrage
E. Injury to the thyroid/parathyroid glands
F. Subcutaneous and mediastinal emphysema
G. Infection
H. Damage to tracheal cartilage involving disruption of vocal cords

If cricothyrotomy is attempted, a copy of the run record must be made available to the Medical Director through the CQI Coordinator within 24 hours of the run.

CRICOTHYROTOMY-ALS

NEEDLE CRICOTHYROTOMY

A. Position pediatric patient (age 8 years or less) by hyperextending the neck unless c-spine concerns mandate neutral positioning.
B. Locate the cricothyroid membrane.
C. Clean the puncture site, if possible.
D. Connect a syringe to the end of the catheter/needle.
E. Insert the catheter/needle into the cricothyroid space at less than 90 degrees to the longitudinal axis of the neck and caudally. Maintain suction with the syringe until air freely flows into the syringe or until bubbles are noted (if the syringe is partially filled with saline)
F. Advance the catheter over the needle, and then remove the needle.
G. Reconfirm placement with free-flow aspiration or the syringe bubble technique.
H. Attach a mechanism to provide high flow oxygen through the catheter (e.g., a 3.0 ET tube adapter plus BVM or an oxygen supply tubing, 3-way stopcock, and extension set) and begin oxygenation.
I. Watch for prompt chest inflation and auscultate for breath sounds over both lungs and stomach
J. Secure the catheter carefully; avoiding kinking the cannula.
K. Reassess breath sounds.

Complications of Cricothyrotomy

A. Hypoxemia
B. Hypercarbia (CO_2 toxicity)
C. Perforation of the esophagus
D. Hemmorrage
E. Injury to the thyroid/parathyroid glands
F. Subcutaneous and mediastinal emphysema
G. Infection
H. Damage to tracheal cartilage involving disruption of vocal cords

If cricothyrotomy is attempted, a copy of the run record must be made available to the Medical Director through the CQI Coordinator within 24 hours of the run.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

BLS

Indication: Along with medical (pharmacologic) management, treatment for respiratory distress as evidenced by:

A. Persistent dyspnea/hypoxemia
B. History consistent with heart failure, volume overload, COPD or asthma exacerbation
C. Drowning

Patients must meet the following criteria for CPAP administration:

A. Age greater than or equal to 18 y/o
B. Has the ability to maintain and protect an open airway
C. Systolic BP at or above 90 mm Hg
D. Pulse oximetry < 92% on 100% oxygen plus at least two (2) of the following:
    1. Severe or sudden onset of shortness of breath
    2. RR rate > 25/minute
    3. Use of accessory muscles
    4. Dyspnea at rest
    5. Rales or wheezes

Contraindications

A. Respiratory or cardiac arrest
B. Agonal respirations
C. Suspected or confirmed pneumothorax or penetrating chest trauma
D. Inability to maintain a patent airway
E. Any impediment to proper mask placement or seal (facial trauma, stroke, facial anomalies, epistaxis)
F. Tracheostomy
G. Persistent nausea and vomiting/Upper GI bleeding
H. Inability to comply with the device due to severe anxiety or altered mental status

Procedure

A. Assure patent airway, place patient on pulse oximetry; capnography if available.
B. Explain procedure to the patient and reassure.
C. CPAP does not replace pharmacology – initiate medications first if applicable:
    1. If asthma or COPD is suspected, administer 5 mg albuterol and 0.5 mg ipratropium per nebulizer and repeat as needed if the patient remains dyspneic (not to exceed 3 doses of ipratropium).
    2. If the 2nd round of pharmacologic therapy (above) fails to resolve the patient's dyspnea, and they remain hypoxemic (oxygen saturation < 92% on 100% oxygen), then CPAP may be initiated.

D. Ensure adequate oxygen supply to device, if needed, set manufacturers recommended liter flow.
E. Place mask and hold in place as patient adjusts to ventilatory support. Encourage patient to breathe deeply.
F. Secure mask, check for air leaks and if recommended by manufacturer, increase liter flow as needed.
G. Contact receiving hospital as early as possible to allow Respiratory Therapy to prepare their equipment.
H. Monitor and document patient VS and pulse oximetry (watch for decreased respiratory rate and/or mental status).
I. If patient deteriorates, remove device and consider BVM ventilations.

ALS

Procedure

A. Assure patent airway, place patient on EKG monitor and pulse oximetry; capnography if available.
B. Explain procedure to the patient and reassure.
C. CPAP does not replace pharmacology – initiate medications first if applicable:
    1. If suspected cardiogenic pulmonary edema and SBP > 90 mm Hg, administer three 0.4 mg doses of NTG SL and repeat three 0.4 mg doses every 3 minutes if SBP remains at or above 90 mm Hg and patient remains dyspneic.
        a. Remember to avoid the use of NTG in the setting of Viagra, Levitra, Cialis, or other ED drug use.
    2. If asthma or COPD is suspected, administer 5 mg albuterol and 0.5 mg ipratropium per nebulizer and repeat as needed if the patient remains dyspneic (not to exceed 3 doses of ipratropium).
    3. If the 2nd round of pharmacologic therapy (above) fails to resolve the patient's dyspnea, and they remain hypoxemic (oxygen saturation < 92% on 100% oxygen), then CPAP may be initiated.
D. Ensure adequate oxygen supply to device, if needed, set manufacturers recommended liter flow.
E. Place mask and hold in place as patient adjusts to ventilatory support. Encourage patient to breathe deeply.
F. Secure mask, check for air leaks and if recommended by manufacturer, increase liter flow as needed.
G. Contact receiving hospital as early as possible to allow Respiratory Therapy to prepare their equipment.
H. Monitor and document patient VS and pulse oximetry (watch for decreased respiratory rate and/or mental status).

If patient deteriorates, remove device and consider BVM ventilations or ET intubation.

Documentation
Documentation should include all of the following:

A. CPAP level (cm H_2O)
B. SpO_2 every 5 minutes
C. Vital signs (HR, RR, BP)
D. Response to treatment including, SpO_2, RR and work of breathing
E. Adverse reactions
F. Clinical Impression on patient care form (respiratory distress and/or CHF/Asthma/COPD/Drowning)

NEEDLE DECOMPRESSION - ALS

A. Auscultate the chest to confirm which side has a suspected tension pneumothorax (indicated by absence/decrease in breath sounds, hypotension, and significant respiratory distress)
B. Locate the second intercostal space at the midclavicular line.
C. Clean the skin.
D. Insert a 3.25" needle over the superior border of the 3rd rib perpendicular to the floor/cot and with the bevel pointing toward the midline.
    1. When the needle reaches the visceral pleura, you may feel a "pop" and/or air may rush out
E. Reassess and re-auscultate for improvement of breath sounds, pulse, respirations, and blood pressure.
F. Remove the needle and tape the catheter in place.
G. Reassess and re-auscultate for improvement of breath sounds, pulse, respirations, and blood pressure.

COMPLICATIONS OF NEEDLE DECOMPRESSION
Hemorrhage from laceration of intercostal vessels
Hemorrhage from laceration of a pulmonary vessel
Puncture of the lung

If needle decompression is attempted, a copy of the run record must be made available to the Medical Director through the CQI Coordinator within 24 hours of the run.

APPLICATION OF EXTERNAL PACEMAKER-ALS

Criteria: Any patient 18 years or older with a non-traumatic presentation of atropine-refractory symptomatic bradycardia

A. Assess for signs of instability.
   1. Heart rate < 60/min and
   2. SBP < 90 mmHg and
   3. Signs and symptoms of shock

B. Apply pacing electrodes.
   1. The anterior-posterior (AP) placement of the pacing electrodes is preferred. If absolutely necessary, anterior-anterior (AA) placement may be used.
      a. ***AP placement***
         i. Place negative electrode on left anterior chest halfway between the xyphoid process and the left nipple with the upper edge of the electrode below the nipple line.
         ii. Place the positive electrode on the left posterior chest beneath the scapula and lateral to the spine.
      b. ***AA placement***
         i. Place negative electrode on left chest, midaxillary over the fourth intercostal space.
         ii. Place positive electrode on anterior right chest, inferior to clavicle.
         iii. This position should only be used if AP placement is not possible.

C. Pacing procedure:
   1. Maintain EKG monitoring during pacing procedure.
   2. Attach pacing electrodes and connect pacing cable to pacemaker.
   3. Power up pacemaker.

D. Observe monitor for a "sense" marker. One mark should appear on each QRS complex. If it does not appear or only appears intermittently, the pacemaker is not sensing the intrinsic rhythm of the patient. Adjust EKG size (larger) or change from Lead II to Lead I or III in order to achieve sensing. If more than one sensing mark appears for each QRS, the EKG size is probably too high. If intrinsic beats are not present, omit this step.

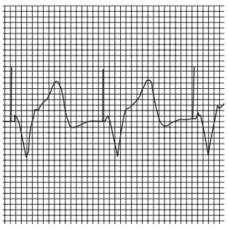
E. Adjust pacing rate to 70 bpm.

F. Adjust milliamp (mA) output to start at 10 mA. Gradually increase mA until electrical capture is noticed on the monitor.

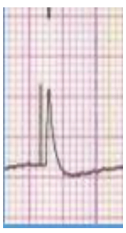
G. Assess for mechanical capture by checking for a pulse and blood pressure.
   ***If electrical capture is present but no pulse is present, increasing the mA is of** no benefit.

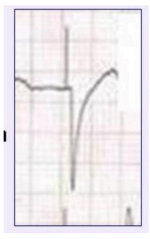
H. Record time of application and obtain rhythm strips before and after application.
   1. If the patient's intrinsic rate exceeds the pacing rate, the pacemaker will sense the activity and not discharge.
   2. Musculoskeletal discomfort may accompany external pacing. If this is a problem and the patient's vital signs will allow it, sedation and/or analgesia may be appropriate.

True Capture Example



False Capture Examples





GUIDELINES FOR IV/IO-ALS

A. IVs should be initiated for patients needing out-of-hospital IV medication administration, rapid fluid replacement, or for those patients who could potentially decompensate before arriving at the hospital.
    1. Aseptic technique must be observed.
    2. Peripheral sites, including the external jugular, are the routes of choice. Upper extremity placement is preferred to lower.
    3. IV/IO placement attempts should not delay appropriate and timely patient care.
B. An IO may be considered if an IV cannot be placed in the following patient situations:
    1. Cardiac arrest (medical or traumatic)
    2. Profound hypovolemia (shock) with significantly altered mental status
    3. Emergent need for an IV but veins are not immediately available

    Whenever an IO has been established or attempted unsuccessfully, identify the site(s) and/or the attempt(s) to the receiving hospital personnel. Document the time of insertion.

C. An IO may not be attempted more than one time in the same extremity.
D. In order to minimize dislodgement, humeral head placement requires securing the upper extremity to limit external rotation.
E. Advanced EMTs may initiate IV's in order to assist the paramedic. Patient care and transport are to be continued by the paramedic.

COMPLICATIONS

- Abscess from prolonged insertion
- Leakage around the needle with compartment syndrome
- Tibia fractures
- Osteomyelitis from prolonged insertion
- Potential injury to the bone marrow cavity
- Skin necrosis

ADULT INTRAOSSEOUS INFUSION-ALS

A. Prepare the IO insertion device and needle
B. Locate insertion site
    1. Proximal humerus (preferred)
    2. Tibia plateau
C. Cleanse insertion site.
D. Stabilize extremity and insert the needle following the manufacturer's recommendations.
E. Remove driver from needle set while stabilizing catheter hub
F. Remove stylette from needle set and secure until it can be placed in a sharps container.
G. Confirm placement. It may be possible to aspirate bone marrow at this point with a 20 or 30 mL syringe.
H. If the patient is awake and alert administer *prime all tubing with lidocaine instead of saline and* 2 mL 2% lidocaine slowly over 60 seconds, then allow 30-60 seconds for the lidocaine to affect the visceral nerves. Follow with a brisk 10 mL saline flush. Another 1 mL 2% lidocaine may be administered in the same manner.
I. Connect primed IV line and begin infusion
J. Place a pressure bag (or IV infusion pump) on solution being infused where applicable
K. Secure tubing and dress site using commercial stabilizer if available, secure tubing
L. Frequently monitor IO catheter site and patient condition

COMPLICATIONS

- Abscess from prolonged insertion
- Leakage around the needle with compartment syndrome
- Tibia fractures
- Osteomyelitis from prolonged insertion
- Potential injury to the bone marrow cavity
- Skin necrosis

PEDIATRIC INTRAOSSEOUS INFUSION-ALS

A. Place the child in the supine position.
B. Identify the tibia tuberosity, 1-3 cm below the tuberosity on the medial surface of the tibia, approximately one finger's breath below and just medial to the tuberosity.
    1. 1. Alternatively, 1 - 2 cm proximal to the medial malleolus on the anteromedial surface of the distal tibia.
C. Clean the skin.
D. The leg should be supported on a firm surface. Grasp the thigh and knee above and lateral to the insertion site. Do not allow any portion of your hand to rest behind the insertion point.
E. With the stylette in place, insert the needle at a 90°angle to the skin.
    1. Using gentle pressure that is steady, begin to advance the needle through the skin until you touch the bone, then check needle depth. If at least 5mm of needle remains exposed (the last black line) drill through the bone.
F. Stop advancing the needle when a sudden decrease in resistance to forward motion of the needle is felt. Do not pull back or recoil when entering the medullary space. Unscrew the cap and remove the stylet. It may be possible to aspirate bone marrow at this point with a 20 or 30 mL syringe.
G. Stabilize the IO.
H. If the patient is awake and alert, *prime all tubing with lidocaine instead of saline and* administer 1 mL 2% lidocaine over 60 seconds, and then allow 30-60 seconds to affect the visceral nerves. Follow with a brisk 10 mL irrigation of saline. A second dose of 0.5 mL 2% lidocaine may be repeated in the same manner.
I. Check for any signs of increased resistance to injection, increased circumference of the soft tissues of the calf, or increased firmness of the tissue.
    1. The needle is in the bone marrow when:
        a. there is a lack of resistance
        b. the needle passes through the cortex
        c. the needle stands upright without resistance
        d. there is no infiltration
        e. blood and marrow are aspirated (less common)
        f. fluid flows freely through the needle without evidence of subcutaneous infiltration
J. Attach the IV tubing and begin the infusion. A pressure infusion bag or in-line 60 mL syringe may be required to infuse the solution.
K. If unsuccessful, remove the needle and move to the other leg.
L. Secure tubing and use commercial stabilizer if available or secure with tape.

COMPLICATIONS

- Abscess from prolonged insertion
- Leakage around the needle with compartment syndrome
- Tibia fractures
- Osteomyelitis from prolonged insertion
- Potential injury to the bone marrow cavity
- Skin necrosis

PRE-EXISTING VASCULAR ACCESS DEVICE (PVAD) USE-ALS

PVADs (pre-existing vascular access devices) include any indwelling catheter/device placed into one of the central veins to provide vascular access for those patients requiring long term intravenous therapy and hemodialysis shunts or grafts.

A. Types of Catheters
    1. External indwelling catheters/devices
        a. Heparin/Saline Lock - A temporary venous catheter placed in a peripheral vein and occluded with a cap. Heparin or saline is instilled periodically to maintain its patency. It may be accessed directly through the injection cap.
        b. Peripherally inserted central catheter (PICC) - a long catheter inserted in the upper arm or antecubitally into the subclavian vein or superior vena cava. It may be accessed through the injection cap.
        c. "Broviac®", "Hickman®", "Groshong®", and others - a long catheter that is inserted into the right atrium through a central vein. The catheter enters the skin through an incision in the chest. The line may be heparinized and may be accessed directly through the injection cap. These catheters are usually multi-lumened and any lumen can be used, but a red-colored port is preferred.
    2. Internal indwelling devices – **NOT TO BE USED**
        a. Internal subcutaneous infusion ports - an access device embedded subcutaneously and must be accessed through the skin using special equipment.
        b. Hemodialysis fistula or graft - A permanent access device that diverts blood flow from an artery to a vein and is usually located in the forearm or upper arm. It is used for dialysis.
B. Indication for use of external indwelling catheters/devices (other than a heparin/saline lock, which may be used as needed):
    1. Cardiac arrest
    2. Other emergent need to administer fluids and/or medications:
        a. which can only be given by the IV route, and
        b. a peripheral IV site is not readily/immediately available (after 2 tries), and
        c. intraosseous access is not appropriate due to the patient's condition, and
        d. **with approval by on-line medical control.**
    3. All ALS medications and fluids (approved for IV administration) may be given through a PVAD.
C. Procedure for external indwelling catheters/devices:
    1. Assemble necessary equipment
        a. 10 mL syringe
        b. 0.9 normal saline for injection
        c. IV tubing and fluid
        d. alcohol wipes
        e. 18 gauge needles

    2. Disconnect any existing IV lines.
    3. Prepare syringe with 10 mL NS and set up IV line.
    4. Clean injection cap or needleless-port with alcohol wipe.
        • If there is a red port, use this preferentially

5. If clamped, unclamp catheter.
6. Slowly inject 5 ml of saline – if resistance is met, discontinue procedure.
7. Attach IV tubing to port (using an 18 ga. Needle if an injection cap is in place) and initiate fluid and/or medication therapy
8. Flush line with IV fluid after medication administration.

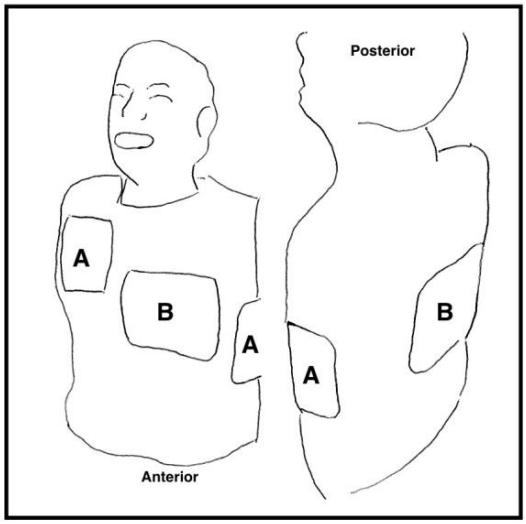
D. Complications

1. Infection. Due to the location of the catheter end, strict adherence to aseptic technique is crucial when handling these devices. The injection cap or needleless port must be cleansed thoroughly. Sterile gloves are preferred. Care must be used not to contaminate the needle used to access the line or the IV tubing used.
2. Air embolism. These devices provide a direct line into the circulation; therefore the introduction of any air into the device will go straight to the heart. Do not ever remove the injection cap or needleless port from the catheter. Do not allow IV fluids to run dry. Clear all air from the IV tubing and syringes prior to administration of fluids or medications.
3. Thrombosis. Improper handling and maintenance of the device may dislodge a clot causing pulmonary embolus or vascular damage. Check patency of the line by slowly injecting 5 mL of NS. Do not inject medications or infuse fluids if resistance is met when establishing patency of the catheter. Flush line with 5 mL of normal saline after medication administration.
4. Catheter damage. These catheters are meant for long-term use. They usually require an invasive or surgical procedure and are costly to insert. Care must be taken to avoid any damage to the catheter. If damage to the catheter outside the skin occurs, immediately clamp the catheter between the skin exit site and the damaged area to prevent air embolism or blood loss. Always use a 10 mL or larger syringe to prevent catheter damage from excess pressure when injecting directly. Use caution when inserting the needle into the injection port.

DOUBLE SEQUENTIAL EXTERNAL DEFIBRILLATION-ALS

Criteria: Any patient with refractory ventricular fibrillation or pulseless ventricular tachycardia that has not responded to ≥3 standard defibrillation attempts (i.e. - NO break in Vfib/tach)

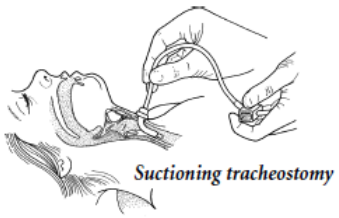
A. Ensure all necessary cardiac arrest interventions have been applied up to this point.
    1. Uninterrupted and effective CPR
    2. Defibrillation at maximum output for **at least 3 shocks** (including first responder AED shocks.)
    3. Administration of Amiodarone 300mg
    4. Consideration of possible causes of cardiac arrest
B. Prepare sites for attachment of an additional set of external defibrillation pads.
    1. Appropriately dry the desired sites on A/P chest.
    2. Minimize interference of hair and other obstacles to good pad adhesion.
C. Apply a new set of external defibrillation pads in the anterior/posterior position while assuring they do not contact the initial set of pads.
    1. Designate a primary monitor to obtain all event recording and data capture
    2. Primary monitor shall be the ONLY monitor uploaded or included in the ePCR.
D. Select maximum energy setting for both devices. Charge devices 15 seconds in advance of the anticipated break in CPR.
    1. Ensure that chest compressions continue while the device is charging.
E. At the designated time in the compression cycle discontinue compressions and assess rhythm.
F. If a shock is indicated, assertively state, “CLEAR” and visualize from the patients head to toe to make certain no one is touching the patient and deliver the Double Sequential Defibrillation by depressing both shocks simultaneously.
G. Once criteria for Double Sequential Defibrillation have been met, all subsequent shocks delivered shall be administered using this method.



TRACHEOSTOMY / VENTILATOR MANAGEMENT

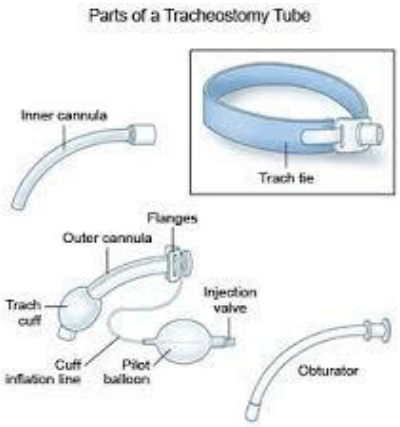
A. Existing Tracheostomy Care

Suctioning



A. Utilize appropriate PPE
B. Suction tracheostomy as needed using appropriate sized soft suction catheter
    1. Utilize sterile technique when suctioning
    2. Pre-oxygenate if at all possible
    3. Suction no more than 4-6" or until resistance is felt
    4. Apply suction only after insertion and upon withdrawing the catheter
    5. Suction for no more than 10 seconds at a time

Ventilation



A. Most tracheostomy tubes require an inner cannula to adapt to a standard BVM
B. Utilize capnography when ventilating a patient using an existing tracheostomy

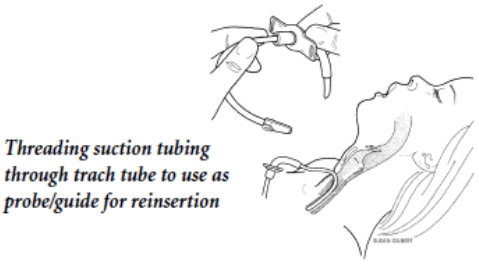
Displaced Tracheostomy Tube

A. In the event of tracheostomy tube dislodgement ALS intervention is preferred
B. BLS providers may place a gloved finger or palm over the stoma area and provide BVM ventilations via nose and mouth until ALS arrives or if the patient is breathing adequately provide supportive care.
    1. If ventilation via the nose and mouth does not work use a small BVM mask and ventilate over the stoma.
    2. In some cases it may be necessary to occlude the nose and mouth to obtain chest rise.

ALS

A. Assess the patient, if they are breathing adequately on their own, monitor the airway and initiate transport
B. If the patient is breathing inadequately determine if a spare tracheostomy tube is available on the scene

C. Insert the new tracheostomy tube using the existing stoma carefully and secure into place
    1. A soft suction catheter may be inserted thru the new tracheostomy tube and used as a guide (see photo)
    2. Confirm the placement utilizing waveform capnography
    3. Secure the new tracheostomy tube in place



Threading suction tubing through trach tube to use as probe/guide for reinsertion

D. If a tracheostomy tube is not available for an adult patient utilize a 6.0 ET tube and place it through the stoma
    1. Advance the ET tube so that the balloon advances into the stoma and inflate the balloon, DO NOT force the ET tube
    2. Utilize waveform capnography to confirm placement
    3. Secure the ET tube in place and monitor for leaks
E. If these procedures fail consider intubation or ventilation via BVM covering the stoma

Ventilator Patients

A. Many tracheostomy patients will be on portable ventilator systems
B. If the patient is NOT in cardiorespiratory arrest and the ventilator is determined to be functioning appropriately it may be in the best interest of the patient to be transported on their own ventilator
    1. Family members typically are well trained in the operation of portable ventilators and should be transported with the patient to operate the ventilator
    2. If a family member is not available to operate the ventilator and the EMS provider is not familiar with the ventilator the patient should be transported using BVM ventilation via their existing tracheostomy
    3. If there is a question regarding the appropriate functioning of the ventilator then patient should be removed from the ventilator and ventilated using BVM attached to the existing tracheostomy
C. If a patient is removed from a portable ventilator the portable ventilator should be transported with the patient if at all possible
D. Settings for the portable ventilator should be noted and relayed to the receiving hospital.
E. In-line capnography should be utilized if available and documented.

VENTILATOR ASSIST PROCEDURE

Purpose: From time to time EMS will be called upon to transport patients whose ventilations are being assisted by a mechanical ventilator. Ventilators are used to provide respiratory support for patients who are unable to effectively breathe on their own. This protocol will guide the caregiver in maintaining proper settings involved in providing adequate ventilation assistance to the patient.

Indication:

A. Continuation of ventilator controlled respirations on chronic ventilator dependent patients 2.
B. Assist/Control ventilations on any intubated patient in respiratory failure/arrest that is being transported to a care facility.

Adverse Effects/Complications:

A. Increased intra-thoracic pressure
B. Decrease venous return to the heart and decrease cardiac output (hypotension, tachycardia)
C. Increased V/Q ratio (ventilation/perfusion ratio)
D. Decrease blood flow to the kidney with resultant fluid retention (edema)
E. Air trapping and intrinsic PEEP (auto PEEP)
F. Barotrauma
G. Nosocomial infections of the lungs and sinuses
H. Respiratory alkalosis
I. Agitation and increased respiratory distress
J. Increased work of breathing

General Comment: *There are many commercial ventilators on the market. Most of the ventilators used in the pre-hospital settings are fairly simple to use. Most if not all have built-in safety features, which prevent over inflating the lungs and causing barotrauma. Everyone must be familiar and in-serviced on the particular ventilator being used.*

General Ventilator settings for transport ventilators:
For the most part, there are a few settings that are common/standard to all ventilators:

A. FIO_2 (Percent of inspired oxygen (room air is 21%): 21% - 100%. Titrate to maintain pulse ox between 92% - 94%
B. Tidal Volume: 6-8 ml/kg (ideal body weight)
C. Select Mode: CPAP, Assist Control (AC), Synchronized Intermittent mandatory ventilation (SIMV)
    1. To manage work of breathing, use assist/control mode. If patient is paralyzed and sedated, there is no difference between assist control (AC) and SIMV
D. Respiratory rate: Set between 10 – 12 breaths/minute. Selection varies on ventilators to accommodate a range of patient ages and conditions.
    1. NOTE: On some ventilators, inspiratory flow rate (usually 40 – 60 L/second) is determined by tidal volume, respiratory rate, and in the inspiratory: expiratory (I: E) ratio. (The I: E ratio is generally 1:2 to allow for complete exhalation and prevent air trapping). On other ventilators, flow rate is independently set, which allows adjustment

of air-flow to the flow wave pattern that is most comfortable for the patient. If the patient is having difficulty with spontaneous breathing, increasing the flow rate may be indicated. However, a higher flow rate means a shorter inspiratory time and usually a higher respiratory pressure secondary to increased resistance, with a lower flow rate requiring a longer inspiratory time with a decreased inspiratory pressure. The paramedic should always consult with medical control before changing the flow rate on any ventilator device.

E. Adjust the peak flow rate or inspiratory time to accommodate the patients inspiratory flow demand and to allow for sufficient expiratory time and avoidance of auto-PEP
F. Adjust the sensitivity to -1cm H2O
G. Pressure support: Usually set at 10 cm H_2O
H. PEEP (Positive End Expiratory Pressure): Usual setting is 5 cm H_2O
I. ETCO2: 35-45mmHg for medical patients (unless underlying medical condition dictates other) 35-40 for Head injury patients

Procedure:
Patients already on Ventilator

A. As part of your initial patient assessment inquire if patient has any spontaneous respiratory effort or is 100% dependent on the ventilator
B. Make note of patient's vital signs before any change over occurs. This includes the pulse ox.
C. Assess the ET tube or Trachea tube placement to assure they are properly secured
D. Acquire the patient's current ventilator settings from the nurse or RT caring for the patient.
    1. Try to match these settings on the transport ventilator to be used (do this before patient is switched to transport ventilator).
        a. IF unable to match the settings and there is a significant discrepancy, contact medical control for assistance.
E. Patient should already be on cardiac monitor and pulse ox prior to switching ventilators.
F. Depending on reason for transport and patient's condition, IV access should be obtained.
G. Have an Ambu-Bag, face mask and suction available for unexpected emergencies
H. Switch patient over to the transport ventilator and observe for any distress. It may take a
I. minute or so for the patient to become accustomed to the new ventilator.
J. Closely monitor pulse ox, signs of labored respirations, chest rise for any signs of hypoxia/distress. Remove patient from ventilator and assist respirations with an Ambu-bag if there are ANY concerns or problems with ventilation after patient was switched to transport ventilator.
K. Once patient has been switched to the transport ventilator and is tolerating this well, then move patient over to the EMS stretcher for transport.
L. If alarm on ventilator sounds, immediately check patient. Reasons for alarm:
    1. Low Battery/power source: sounds when electrical supply to the ventilator is inadequate or the gas inlet pressure is low. It is corrected by restoring the proper power supply.
    2. Low-pressure alarm:
        a. Leak or disconnection (reconnect or tighten connections)
        b. Cuffed tube may be leaking
        c. Check O_2 supply

3. High-pressure alarm:
    a. Ventilator uses too much pressure to deliver the tidal volume
        i. Bronchospasms (nebulizer)
        ii. Secretions in airway that increased the resistance/pressure in airway (suction airway)
        iii. Kinks in ET tube (unkink tube)
        iv. Biting on ET tube
        v. Coughing
        vi. Gagging
        vii. Breathing asynchronously or bucking the vent
        viii. Alveolar over distention
        ix. Improper ventilator settings (High or low tidal volumes, excessive rate causing stacking and auto PEEP) (Consult medical control for change)
        x. Water in the ventilator tubing (disconnect the tubing, empty water, reconnect tubing)
        xi. Pneumothorax (notify hospital to set up for this if you are en route. If tension pneumothorax, go to that protocol)
        xii. Patient anxiety (contact medical control for sedation order)
4. IF unable to identify the cause of the ventilator alarm and/or patient's condition deteriorates, disconnect from ventilator and assist respirations via the Ambu-bag.

M. Upon arrival at the care facility, follow above steps when transferring from EMS stretcher to care facility stretcher. Report any problems to the accepting staff.
N. Document vent settings used, vital signs, pulse ox, any changes in the patient's condition during transport
O. Contact medical control during any of the above steps for assistance as needed.

Intubated Patients Not on Ventilator

A. Ventilate patient with ambu-bag till ventilator can be set up
B. Patient should: be on Monitor, pulse ox, IV access, have suction available
C. Initial vent settings: (Call medical control as soon as possible to verify or assist with settings)
    1. FIO_2: 100% then titrate to pulse ox of 92 – 94%
    2. Tidal Volume: 6 – 8 ml/kg
    3. Be aware: If patient is a tight asthmatic, has severe COPD or has had prior lung surgery (partial lung removed), use smaller tidal volume (6 ml/ kg) and faster rate to maintain pulse ox.
    4. Rate: Adult 10 – 12 bpm, Children 12 – 24, pre-school 20 – 30
    5. Pressure support: 10 cm H_2O (if available on ventilator)
    6. Peep: 5 cm H_20 (if available on ventilator)
D. Monitor patient/vital signs/pulse ox for signs of adequate ventilations
E. If any distress or concerns, remove from ventilator and assist respirations with ambu-bag.
F. If ventilator alarm sounds, see step 11 above
G. En-route to hospital; notify the staff so they can have a ventilator set up on your arrival.

Sedation: *See pain management protocol*
Documention: *vents settings, vitals, pulse ox, patient response*.

SECTION FOUR: APPENDICES

ABBREVIATION LIST

The following is a list of acceptable abbreviations to be used when completing patient care records. This list is not all inclusive but to be used as a quick reference of more commonly used abbreviations. If other abbreviations are used, be sure they are proper and widely understood.

A	Asian		
A&O	Alert & Oriented		
ab	Abortion		
abd	Abdomen		
ACLS	Advanced Cardiac Life Support		
AED	Automatic External Defibrillator		
adm	Administered		
AF or AFIB	Atrial Fibrillation		
AF	Atrial Flutter		
AIDS	Acquired Immune Deficiency Syndrome		
AKA	Above the Knee (amputation)		
AMI	Acute Myocardial Infarction		
amt.	Amount		
ant.	Anterior		
AP	Anteroposterior		
AT	Atrial Tachycardia		
AVPU	Alert, Response to Verbal Stimuli, Painful Stimuli or Unresponsive		
B	Black (Race)		
BBB	Bundle Branch Block		
BBS	Bilateral Breath Sounds		
BKA	Below the Knee (amputation)		
Bld.	Blood		
BOW	Bag of Waters		
BS	Blood sugar, breath sounds or bowel sounds		
Brady	Bradycardia		
BSA	Body Surface Area		
BVM	Bag valve mask		
BW	Body weight		
C-c	Cervical collar		
C-spine	Cervical spine		
C1, C2, etc	1st cervical vertebrae, etc		
CA or ca	Carcinoma, cancer		
CAD	Coronary artery disease		
CC	Chief complaint		

LP15 & 12-lead Transmission

Purpose
EMS-generated 12-lead EKG's and/or complete monitor files shall be transmitted by the LifePak 15's modem via LifeNet when indicated to the appropriate ED for notification.

Method
EKG transmission shall be accomplished using the LifeNet modems placed on all LP-15 cardiac monitors.

LifeNet EKG transmission may be accomplished by 1 of 3 ways:

1. '**Live'** transmission from a patient that is currently being monitored (pushing the 'Transmit' button on the LP-15 while monitoring). This is typically used to transmit a 12 lead EKG to the ED when calling a STEMI Alert. Rarely, it may be used to obtain "expert consultation" by BLS and ALS providers.
   Prior to transmission the Name, Patient ID, Incident, Age and Gender must be entered into the LP 15
2. '**Post Incident'** transmission after the completion of a call exporting to Imagetrend by using the EKG import feature. *Prior to transmission the Name, Patient ID, Incident, Age and Gender must be entered into the LP 15*
3. '**Retrospective'** transmission after the completion of a call and arrival at the hospital or back at the station (by powering on the LP-15 and accessing the Patient Archives).

Indications
Mandatory:

- STEMI patients: live transmission of the 12-lead EKG immediately following the verbal alert to the receiving hospital. Important: When calling the STEMI Alert, transmit just the 12 lead EKG
- Cardiac arrest patients: retroactive transmission of the Code Summary for the entire incident shall be transmitted to the ImageTrend destination for post-event review and archival.
- Other patients: Any patient that receives a respiratory intervention as listed below shall be retrospectively transmitted. The file for the entire incident shall be transmitted to the ImageTrend destination for post-event review and archive. Respiratory interventions that require transmission are:
    a. Any patient that has EKG monitoring (3-lead or 12-Lead)
    b. Any patient that has ETCO2 monitoring

Notes

- Ensure transmission is 100% complete before shutting down LP15.
- Patient care is the highest priority, including the verbal STEMI Alert, and is prioritized over the EKG transmission. Management of treatment priorities and patient movements will allow the provider to integrate EKG transmissions into the incident workflow.
- The LP-15 should always be stored and ready for use with the modem attached to the port.
- Inability to transmit for mandatory indications must be documented both in the ePCR. In this circumstance, a retrospective transmission later on will likely be possible.

Antibiotics For Open Fractures

Ancef (Cefazolin)

Purpose: to define antibiotics administration, treatment and management for patients with extremity trauma involving open fractures and amputations of extremities. This does not include penetrating trauma such as a GSW with suspicion of fractures.

Indications: Administration of pre-hospital antibiotics shall be considered for any patient exhibiting signs and symptoms of OLBF. Careful clinical evaluation shall be used to determine if an open extremity (excluding fingers) fracture exists. If identified or strongly suspected the procedure for administration of Cefazolin shall be implemented.

Cefazolin:

Indications: Prophylaxis management of infection with open long bone fractures.

Contraindications: allergy to cephalosporins or penicillin

Dose: 2 grams in 100ml NS over 20mins (Mix/dilute with 4 cc's of sterile water then put into the 100 cc bag of saline. This dilutes the powder quicker)

Procedure:

1: Refer to Initial Trauma Care protocol.

2: If the patient has any of the following:

a. A suspected open fracture and meets the below identified criteria:
b. Age >= 15 y/o and estimated weight >= 50kg
c. No Allergies to cephalosporins or known anaphylaxis to Penicillin.

3. Administer mixed solution 2g in 100ml NS over 20 mins.

Please note meds should not be administered to unconscious patients where validation of allergies to penicillin and or Cephalosporin's cannot be determined.

TXA Administration

Purpose: Identify and treat patients with uncontrolled traumatic hemorrhagic shock and/or traumatic intracranial hemorrhage who may benefit from TXA.

Protocol:

1. TXA should be administered within 3 hours of injury, however administration in any patient with uncontrolled traumatic hemorrhage (blunt or penetrating), may be beneficial.
2. TXA is an option for the treatment of traumatic hemorrhage patients that meet ANY of the following criteria.

A. Known or suspected significant, uncontrolled hemorrhage after blunt or penetrating trauma.

B. In adults, sustained hypotension (systolic blood pressure < 90mmHg) and/or sustained tachycardia (>120 beats per minute.

C. In pediatrics ANY hypotension (below age adjusted normal) and/or sustained tachycardia (above age adjusted normal)

3. Adult (age 15 and older)

A. Administer 1 gram TXA IV/IO diluted in 100ml NS infused over 10 mins.

4. Pediatric

A. Administer 15mg/kg TXA IV/IO diluted in 100ml NS over 10 mins (max dose 1gm) **In pediatric patients, closely monitor fluid volume infused and calculate to use the least volume possible**.

5. TXA may be administered concurrently with blood products utilizing a separate access site. If adequate access to give both, give available blood products first.

6. Initiate transport to a definitive trauma center with capabilities to transfuse blood and administer/continue TXA.

Exclusion Criteria for the Administration of TXA

1. Known Pregnancy.
2. Known allergy to TXA

Considerations

1. If a patient is on a beta-blocker medication, reflex tachycardia may not be present. These patients, while in traumatic hemorrhagic shock, may present with hypotension and a normal heart rate.
2. Pediatric patients in traumatic hemorrhagic shock will present with tachycardia. Pediatric patients can maintain a normal BP until >20% of blood volume is lost. Hypotension is a late sign and is indicative of impending cardiovascular collapse. Do NOT wait to see hypotension in patients under 15 years of age with suspected hemorrhagic shock to administer TXA.

Nicardipine

Interfacility Hemorrhagic Stroke

Purpose: to define assessment, management treatment considerations for patients with a hemorrhagic stroke requiring interfacility care.

Procedure:

1. Obtain orders for blood pressure parameters and management from sending or receiving physicians.
2. If orders are unavailable and treatment has not been initiated by sending facility, then treatment to lower blood pressure should begin during transport. Treat based on the following guidelines to a target SBP of just below 140mmHg.

If SBP is 150/mmhg

3. Administer Nicardipine infusion 5mg/hr titrate up 2.5mg/hr every 5-15mins to target BP (max dose of 15mg/hr)

Interfacility Ischemic Stroke

Purpose: to define assessment, management treatment considerations for patient with ischemic stroke requiring interfacility care.

Procedure:

1. Obtain orders for blood pressure parameters and management from sending or receiving physician. (If there are no parameters noted use the standing parameters below.
2. Treat Pain, Anxiety and/or Nausea/Vomiting.

A. For a patient that is eligible for Nicardipine but has not yet received treatment with intravenous rTPA (alteplase)/TNK and a Systolic BP of >185mmHg or Diastolic of >110mmHg, treat to a target BP of just below or at 185/105.

1. Nicardipine infusion 5mg/hr increases by 2.5mg/hr every 5-15 mins to target BP (max dose 15mg/hr) When target BP attained, reduce to 3mg/hr.

B. For a patient that has been on or is currently being administered rTPA and/or TNK. Treat and maintain a target BP of below 180/105.

1. Nicardipine infusion 5mg/hr increases by 2.5mg/hr every 5-15mins to target BP (max dose 15mg/hr). When target BP obtained. Reduce to 3mg/hr.

Refer to rTPA documentation from transferring facility to record all vital signs according to timeline.

C. For a patient that is not eligible for or is not going to receive Fibrinolysis, treat only if Systolic BP is > 220mmHg or Diastolic BP is >120mmHg. Do not reduce BP by more than 15%.

1. Nicardipine infusion 5mg/hr increases by 2.5mg/hr every 5-15mins to target BP (max dose 15mg/hr). When target BP obtained. Reduce to 3mg/hr.

Post Intubation Management

The goal of post intubation management is to safely provide and monitor adequate sedation of the intubated patient by treating pain and anxiety. Before pain or sedation:

1. Confirm successful placement of an advanced airway.
2. Initiate and continue to monitor ETCO2, SPO2, NIBP values.
3. Establish and maintain patent IV/IO access.
4. Assess and document RASS before and after each medication administration or with vital signs every 15 mins.

Richmond Agitation Sedation Scale (RASS)

Target RASS	RASS Description
+ 4	Combative, violent, danger to staff
+ 3	Pulls or removes tube(s) or catheters; aggressive
+ 2	Frequent nonpurposeful movement, fights ventilator
+ 1	Anxious, apprehensive , but not aggressive
0	Alert and calm
- 1	awakens to voice (eye opening/contact) >10 sec
- 2	light sedation, briefly awakens to voice (eye opening/contact) <10 sec
- 3	moderate sedation, movement or eye opening. No eye contact
- 4	deep sedation, no response to voice, but movement or eye opening to physical stimulation
- 5	Unarousable, no response to voice or physical stimulation

Indications

Early Indications

1. Hypertension
2. Tachypnea
3. Tachycardia

Late Indications

1. Extremity Movement
2. Gag reflex/cough
3. Eye movement/Tears

Post Intubation Management Medication

Ketamine:

Adult/Pediatrics- 1mg/kg IV/IO. May repeat every 10/min as needed.

Fentanyl:

Adult/Pediatric- 1mcg/kg IV/IO. May repeat every 5/min as needed (max single dose 200/mcg)

If patient is hemodynamically stable, may use:

Fentanyl:

Adult/Pediatric- 1mcg/kg IV/IO. May repeat every 5/min as needed (max single dose 200/mcg).

Versed:

Adult/Pediatric- 0.05mg/kg IV/IO. May repeat every 5/min as needed (max single dose 5mg).

Considerations for PIM:

1. Correcting pain and anxiety can cause reflex hypotension in intubated patients. (Remember you are relaxing these patients)
2. Ketamine is known to cause hypertension. Give caution when administration to increase ICP. You need to assess whether the hypertension is caused by pain/agitation or underlying etiology.

Propofol (Initiated by sending facility)

Continue at the current dose initiated by the sending facility.

Adult- May titrate at 10mcg/kg/min PRN (max dose 75/mcg/kg/min) Vital signs must be monitored every 2-5 mins during infusion.

Considerations:

- Be sure to note if the facility is using a weight based infusion or standard mcg/min.
- Be sure to note the weight they are using in the pump for the calculation. Document in ImageTrend appropriately.
- Propofol is known to cause Bradycardia and hypotension. Give caution in administration with hypotensive patients. You can discontinue Propofol administration if there is concern for hypotension or bradycardia.

EMS Inter-facility Transfer Protocol

Inter-facility Transfer Guideline for Stroke Patient Receiving IV tPA

All patients need to be sent by ALS Ambulance Service ONLY

Sending facility must be able to maintain systolic blood pressure below 180 mmHg and diastolic blood pressure below 105 mmHg prior to transport.

A. Prior to transport sending facility should:
   1. Ensure peripheral IV access is patent (Two large-bore /V's - one in right antecubital space in case endovascular procedure is required)
   2. Prepare document for EMS and receiving facility
   3. Imaging- hard copy must be sent with EMS
   4. Copy of visit record- faxed to receiving facility and/or hard copy with EMS
   5. Onset information, assessment including exam and NIH Stroke Scale Results, orders, test results, vital signs, etc.
   6. tPA information including exact dose, bolus start time and infusion end time if applicable.
   7. If tPA will be infusing during transportation assure IV pump can go with the patient. Pump education and return demonstration is required.
   8. Document patient status, including vital signs and NIH Stroke Scale just prior to transport

B. tPA considerations
   1. When mixing IV tPA waste excess where only the calculated dose remains in the bottle
   2. Standard dosing is as follows: 0.9 mg/kg, with 10% given as a one minute IV push bolus, and the remainder is infused over one hour. The maximum dose is 90 mg.
   3. Label the bottle with the exact dose that the patient is to receive/what is in the bottle
   4. 50 ml of normal saline must be infused at the same rate as the tPA infusion, after the tPA ends, clear the IV tubing of remaining tPA. (If IV tubing must be changed, ensure that volume of medication in tubing is included in calculations...)
   5. Watch for angioedema. If observed, follow local guidelines. Treatment may include epinephrine, antihistamine, and steroids.

C. Handoff Communication
   Sending facility to provide the following to EMS and receiving facility:
   1. Family/caregiver contact information, including phone number
   2. Contact number of sending and receiving physicians
   3. Time patient last known normal
   4. Time patient arrived at sending facility for treatment
   5. Time the EMS was called for transport
   6. All information about tPA dose and administration times
   7. Last assessment results, including vital signs and NIH Stroke Scale

D. During Transport:
   1. Keep patient strictly NPO, including medications
   2. Provide continuous pulse oximetry monitoring, keeping SPO2 > 94%, and ETCO2 between 35-40mmHg
   3. Provide continuous cardiac monitoring
   4. If patient condition deteriorates notify receiving facility MD of condition change immediately
   5. If blood pressure> 180/105 or hypotension develops notify receiving facility MD immediately
   6. Perform and document vital signs and neurological assessment every 15 minutes on EMS-Inter-facility transfer flow sheet
   7. Contact receiving facility at least 10 minutes prior to arrival

E. Upon Arrival at Receiving Facility:
   1. Handoff all documentation provided by sending facility
   2. Handoff all transportation documentation including inter-facility transfer flow sheet
   3. Report any changes in condition status
   4. Report status of tPA infusion: amount of remaining infusion or completion time, amount of normal saline infusion after tPA if applicable
   5. Report all care provided during transport

EMS - INTER-FACILITY TRANSFER PROTOCOL:
Stroke Patient During or After IV t-PA

ALS Transport Required

Sending facility must be able to maintain systolic blood pressure below 180 mmHg and diastolic blood pressure below 105 mm Hg prior to transport and if t-PA still infusing IV pump must go with the patient

Transferring Hospital: _____

Family/Caregiver or Emergency contact number: _____

Contact number for receiving physician: _____

10% of IV t-PA dose is administered via a one minute IV push, then the rest drips in over one hour. This must be followed by 50 ml normal saline - infused at the same rate to clear the t-PA from the IV tubing and ensure maximum dose infused.
No other medications through t-PA infusion line.
*****It is important to note the start and end time of IV t-PA*****

1. Perform and document **Vital Signs and Neurological Exam:**
   (EMS Neurological Exam = Cincinnati Pre-Hospital Stroke Scale and Glasgow Coma Scale with pupil exam)
   - ☐ **From start of IV t-PA:** every 15 minutes x 2 hours, then every 30 minutes x 6 hours, or until arrival at destination hospital

PRN for SBP >180 or DBP >105 mmHg:
- ☐ **Consider IV Labetalol 10 mg IV over minutes**
- ☐ **Recheck in 5 minutes, may repeat one time**

PRN for SBP <120 mmHg:
- ☐ **HOB flat**
- ☐ **Discontinue antihypertensive medications**

PRN for SBP <90 mmHg: **NO DEXTROSE**
- ☐ **1 liter Normal Saline - wide open rate**
- ☐ **Notify receiving hospital**

2. Continuous cardiac monitoring

3. Continuous pulse oximetry monitoring
   - ☐ Apply oxygen by nasal cannula or mask to maintain Sp02 >94%

4. Monitor for acute worsening conditions and decline in neurologic status *(new headache or nausea, decline in mental status, vomiting, signs of bleeding, or angioedema)*:
   - ☐ **FIRST stop IV tPA** - then call receiving facility.

5. Strict NPO including medication and ice chips

Contact receiving facility with cardiac or blood pressure issues or acute worsening conditions or decline in neurological status.
Tell the operator you need the stroke physician on-call emergently.

6. Contact receiving facility with an update and ETA at least 10 minutes prior to arrival

Hand-Off Communication Upon Arrival Must Include:
- Documentation and imaging from sending facility
- Completed Transfer Protocol Documentation Form or other form that includes required documentation components listed above
- Verbal report, including changes in condition and/or concerns, and care provided
- Status of IV t-PA infusion and normal saline infusion, including completion time if finished in route

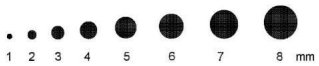
EMS - INTER-FACILITY TRANSFER PROTOCOL:

Stroke Patient During or After IV t-PA

Vital Signs: (Goal: SBP < 180 mmHg and DBP < 105 mmHg)

Date/Time from start of tPA	Blood Pressure	Heart Rate	Respiratory Rate
15 MIN			
30 MIN			
45 MIN			
60 MIN			
1 HR 15 MIN			
1 HR 30 MIN			
1 HR 45 MIN			
2 HR			
2 HR 15 MIN			
2 HR 30 MIN			
2 HR 45 MIN			
3 HR			
3 HR 15 MIN			
3 HR 30 MIN			

Neurological Exam:



GLASGOW COMA SCALE	
EYE OPENING:	
Spontaneous	4
To Speech	3
Only with noxious stimuli	2
No eye opening	1
VERBAL RESPONSE:	
Oriented	5
Disoriented, confused	4
Inappropriate speech	3
Incomprehensible sounds	2
No verbal response	1
MOTOR RESPONSE:	
Obeys verbal commands	6
Response to noxious stimuli	
Localizes	5
Withdraws	4
Flexor posturing	3
Extensor posturing	2
No motor	1

Date/time from start of tPA	Glasgow Coma Scale			Pupils		CPSS
	Eye Opening	Verbal Response	Motor Response	Left	Right	-Facial Droop -Abnormal Speech -Arm Drift (Specify Side)
15 MIN						
30 MIN						
45 MIN						
60 MIN						
1 HR 15 MIN						
1 HR 30 MIN						
1 HR 45 MIN						
2 HR						
2 HR 15 MIN						
2 HR 30 MIN						
2 HR 45 MIN						
3 HR						
3 HR 15 MIN						
3 HR 30 MIN						

Cincinnati Pre-Hospital Stroke Scale (CPSS): ≥ 1 positive finding is abnormal

*****Notify receiving physician if changes in assessment identified*****

EMS Signature: _____ Date: _____

EMS Signature: _____ Date: _____

*Communicate to receiving facility, provide this completed form, and provide electronic ePCR.

Good Samaritan

The following is a PAR Level of medications and dosages approved for use by GSEMS providers and to be stocked on ambulances.

Acetaminophen 325mg Tab	10
Adenosine 6mg/2ml vial	4
Albuterol 2.5mg/3ml	10
Amiodarone 150mg	3
Aspirin 81mg Chewable Tab	12
Atropine 1mg/10ml syringe	3
Benadryl 50mg\1mL vial	2
Calcium Chloride syringe	2
Cefazolin 2 grams	1
Dextrose-10% 250ml	2
Dextrose-25 % 10ml syringe	2
Dextrose-50% 50ml syringe	2
EPI 1:10,000 syringe	8
EPI 1:1000 1mg/1mL amp	3
Fentanyl 100mcg/2ml amp	3
Glucagon 1mg vial	1
Ipratropium/Albuterol (DuoNeb)	10
Ketamine 50mg/ml 10ml vial	2
Lactated Ringers 1000 ml	4
Lidocane 100mg/5ml syringe	2
Magnesium Sulfate - 1g/2mL	2
Methylprednisone 125mg	2
Narcan 2mg/2ml syringe	4
Nitroglycerin spray	1
Nitroglycerin Tab 400mcg tabs	1
Norepinephrine 8mg/250ml premix	1
Oral Glucose each	2
Prednisone 50mg tab	2
Racemic Epi each	4
Sodium Bicarb 8.4% 50ml syringe	2
Sodium Chloride 100ml	2
Sodium Chloride 500ml	4
Toradol (Ketorolac) 60mg/2ml vial	1
Tranexamic Acid	1
Versed (midazolam) 10mg/2ml vial	2
Zofran 4mg/2ml vial	4

Scott Keyes, M.D.
Medical Director

4/1/2024

PCA Drugs - 4 GM						
Drug Name ***Therapy***	**Concentrations:** 50 mg / 50 mL (1 mg / mL)					
Morphine						
Concentration Limits	**Conc. Units**		**Hard Min**		**Soft Min**	**Soft Max**
	n/a					
Limits	**Hard Min**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**PCA Pause Protocol:** Yes
PCA Dose	n/a	0.5	2			**Dosing Units** mg
Continuous Dose / h	n/a	0.5	10			
Bolus Dose	n/a	2	5		n/a	**Max Accum. Includes Bolus?** No
Loading Dose	n/a	2	5		n/a	
Lockout Interval (minutes)		6	30	n/a		**Clinical Advisory Name** PCA
Max Acc. Dose Range / 4 h	n/a	2	56			

2.3 ER

2.3.1 Continuous/Bolus - Non-Anesthesia Drugs

Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name ***Therapy*** **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Alteplase (TPA) ***Catheter Directed*** 5 mg / 500 mL (0.01 mg / mL) 50 mg / 200 mL (0.25 mg / mL) --- mg / --- mL	 X X X		YES	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.01	2			1	2			1	2			
Alteplase (TPA) ***Pulmonary Embolism*** 100 mg / 100 mL (1 mg / mL)	 X		N/A	**Continuous** mg/h	49	50	51										
Alteplase (TPA) ***Stroke <100kg*** 100 mg / 100 mL (1 mg / mL)	 X		N/A	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	0.5	0.899	0.9		0.05	0.099	0.1		0.05	0.099	0.1		

Reviewed and Approved by _____Date_____(Approval Only)

Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name ***Therapy*** **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Alteplase (TPA) ***Stroke 100kg or more*** 100 mg / 100 mL (1 mg / mL)	X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	50	81	82		5	9	9.1		5	9	9.1		
AMinocaproic Acid 5 gram / 250 mL (0.02 gram / mL) 20 gram / 1,000 mL (0.02 gram / mL)	X X		N/A	**Continuous** gram/h **Bolus Dose** gram **Bolus Admin Rate** gram/min	0.5	5	5.1	1	1	5	6	5	0.016	0.083	0.9	0.083	
Aminophylline Drip 500 mg / 500 mL (1 mg / mL) 500 mg / 1,000 mL (0.5 mg / mL)	X X		N/A	**Continuous** mcg/kg/h	0.3	0.8	1	0.3									
AMIODArone ***Loading Dose*** 150 mg / 100 mL (1.5 mg / mL) 300 mg / 100 mL (3 mg / mL)	X X		N/A	**Continuous** mg/min	10	15.5	16	15									Filter 0.22micron
AMIODArone ***Maintenance Dose*** 450 mg / 250 mL (1.8 mg / mL)	X		N/A	**Continuous** mg/min	0.2	1	1.6	0.5									amiodarone
Angiotensin II 2.5 mg / 250 mL (0.01 mg / mL)	X		N/A	**Continuous** nanogram/kg/min	1	40	80	20									
Argatroban 50 mg / 50 mL (1 mg / mL) 250 mg / 250 mL (1 mg / mL)	X X		N/A	**Continuous** mcg/kg/min	0.4	10.2	15										2 nurses to verify
Bumetanide 7.5 mg / 30 mL (0.25 mg / mL)	X	X	N/A	**Continuous** mg/h	0.25	4	4.1	0.5									
cangrelor 50 mg / 250 mL (0.2 mg / mL)	X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	3.5	4.5	4.6	4	25	35	36	30	30	60	90	60	Dedicated line
ClSatracurium 80 mg / 200 mL (0.4 mg / mL)	X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.5	10.2	11	1	99	200	210	100	24	25	30		IBW for rate/vent

Reviewed and Approved by _____Date_____(Approval Only)

Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
DeFEROXamine 1,000 mg / 100 mL (10 mg / mL)	 X		N/A	**Continuous** mg/kg/h	1	15	40										
Dexmedetomidine 200 mcg / 50 mL (4 mcg / mL) 400 mcg / 100 mL (4 mcg / mL)	 X X	 X X	N/A	**Continuous** mcg/kg/h **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.1	1.5	1.7	0.4	0.9	1.1	1.2	1	0.09	0.12	0.13	0.1	
Diltiazem 100 mg / 100 mL (1 mg / mL) 125 mg / 125 mL (1 mg / mL)	 X X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	2	20	30		5	30	35		4	10	12	5	
DOBUTamine 500 mg / 250 mL (2 mg / mL) 1,000 mg / 250 mL (4 mg / mL)	 X X		N/A	**Continuous** mcg/kg/min	0.5	25	40	2.5									Extravasation
DOPamine 800 mg / 500 mL (1.6 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.5	30	50	2									Extravasation
EPInephrine 1 mg / 1,000 mL (0.001 mg / mL) 5 mg / 250 mL (0.02 mg / mL)	 X X		N/A	**Continuous** mcg/min	0.4	10.5	11										Extravasation
EPInephrine 5 mg / 250 mL (0.02 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.001	0.5	2										Extravasation
Esmolol 2,500 mg / 250 mL (10 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	25	305	310		5	510	525	500	25	510	525	500	
Fenoldopam 10 mg / 250 mL (0.04 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.01	0.9	1.7										
Fentanyl-Adult 1,000 mcg / 100 mL (10 mcg / mL)	 X		N/A	**Continuous** mcg/h **Bolus Dose** mcg **Bolus Admin Rate** mcg/min	1	250	300	25	12	100	200		1	100	200		

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Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Fentanyl-Pediatric 1,000 mcg / 100 mL (10 mcg / mL)	X		N/A	**Continuous** mcg/kg/h **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.5	5	10	0.5	0.5	3	5		0.16	1	3		
Furosemide 300 mg / 30 mL (10 mg / mL)	X		N/A	**Continuous** mg/h	1	31	40										
glucagon 10 mg / 100 mL (0.1 mg / mL)	X		N/A	**Continuous** mg/h	1	15	20										
Heparin ***Stroke Protocol*** 25,000 unit / 250 mL (100 unit / mL)	X		N/A	**Continuous** unit/h	100	3,000	10,000	800									
Heparin ***Wt-based Protocol*** 25,000 unit / 250 mL (100 unit / mL)	X		N/A	**Continuous** unit/kg/h **Bolus Dose** unit **Bolus Admin Rate** unit/min	5	25	35	18	100		5,001		0.001		5,001		heparin max rate
Hydrocortisone 200 mg / 250 mL (0.8 mg / mL)	X		N/A	**Continuous** mg/day	180	210	215	200									
HYDROmorphone 50 mg / 50 mL (1 mg / mL)	X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.1	2	4	0.4	0.1	1	4		2		4	3	
Immune Globulin IVIG 10 gram / 100 mL (0.1 gram / mL) 20 gram / 200 mL (0.1 gram / mL) 30 gram / 300 mL (0.1 gram / mL) 40 gram / 400 mL (0.1 gram / mL) --- gram / --- mL	X X X X X		YES	**Continuous** mg/kg/min	0.1	9.2	9.5										
Insulin ***.insulin- diabetic*** 250 unit / 250 mL (1 unit / mL)	X		N/A	**Continuous** unit/h **Bolus Dose** unit **Bolus Admin Rate** unit/min	0.5	20	60		1	20	30		0.5	40	50		2 nurses to verify
Insulin ***insulin- bblocker OD*** 250 unit / 250 mL (1 unit / mL)	X		N/A	**Continuous** unit/kg/h	0.5	10.5	11										2 nurses to verify

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Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Ketamine-Adult 1,000 mg / 250 mL (4 mg / mL)	 X		N/A	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/min	0.05	3	4.5	0.1	0.1	0.5	0.7		50		150		
Ketamine-Pediatric 200 mg / 100 mL (2 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	5	20	60	5	0.2	4.5	5		0.2	4.5	5		
Labetalol 200 mg / 100 mL (2 mg / mL)	 X		N/A	**Continuous** mg/min **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.5	8	10	2	5	40	50	20	1	10	11	10	
Lidocaine 1,000 mg / 250 mL (4 mg / mL) 2,000 mg / 500 mL (4 mg / mL)	 X X		N/A	**Continuous** mg/min	0.1	4	8	1									
Lorazepam 20 mg / 250 mL (0.08 mg / mL) 40 mg / 250 mL (0.16 mg / mL)	 X X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.4	15	16	0.5	0.5	4	6		0.5	1	2		
Magnesium DRIP 20 gram / 500 mL (0.04 gram / mL)	 X		N/A	**Continuous** gram/h **Bolus Dose** gram **Bolus Admin Rate** gram/min	0.5	4	5	2	1	6	7		0.1	0.3	1	0.2	
Midazolam-Adult 50 mg / 50 mL (1 mg / mL)	 X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.5	10	13	2	1	6	8		0.5	5	8		Protocol
Midazolam-Pediatric 50 mg / 50 mL (1 mg / mL)	 X		N/A	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	0.02	0.12	1		0.025	0.2	0.6		0.008	0.15	0.2		Protocol

Reviewed and Approved by _____Date_____(Approval Only)

Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Milrinone 20 mg / 100 mL (0.2 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.1	0.76	0.8	0.5	49	50	51	50	4.9	5	6	5	
Morphine 50 mg / 50 mL (1 mg / mL)	 X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.5	10	15	2	0.5	10	15		1	4	8	1	
Naloxone 1.6 mg / 500 mL (0.0032 mg / mL) --- mg / --- mL	 X X		YES	**Continuous** mg/h	0.1	2	2.1										
NICARdipine 20 mg / 200 mL (0.1 mg / mL) 25 mg / 250 mL (0.1 mg / mL)	 X X		N/A	**Continuous** mg/h	1	15	16										Nicardipine
NitroGLYcerin 25 mg / 250 mL (0.1 mg / mL) 50 mg / 250 mL (0.2 mg / mL)	 X X		N/A	**Continuous** mcg/min **Bolus Dose** mcg **Bolus Admin Rate** mcg/min	0.1	200	600	5	100	800	1,000	200	100	800	1,000	200	
NitroPRUSSide 50 mg / 250 mL (0.2 mg / mL) 100 mg / 250 mL (0.4 mg / mL)	 X X		N/A	**Continuous** mcg/kg/min	0.1	10	11	0.3									Protect from light
NORepinephrine 8 mg / 250 mL (0.032 mg / mL) 16 mg / 500 mL (0.032 mg / mL)	 X X		N/A	**Continuous** mcg/min	0.5	100	300	2									Extravasation
Octreotide 500 mcg / 250 mL (2 mcg / mL) 1,000 mcg / 100 mL (10 mcg / mL)	 X X		N/A	**Continuous** mcg/h	5	51	55										
Pantoprazole 80 mg / 100 mL (0.8 mg / mL)	 X		N/A	**Continuous** mg/h	1	10	11	8									

Reviewed and Approved by _____Date_____(Approval Only)

Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name ***Therapy*** **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
PHENYLephrine 100 mg / 250 mL (0.4 mg / mL)	 X		N/A	**Continuous** mcg/min **Bolus Dose** mcg **Bolus Admin Rate** mcg/min	5	180	200	100	100	500			100	500			Extravasation
Pralidoxime Infusion --- mg / --- mL	 X		YES	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/min	4	8	9		25	35			100	200	300		
Procainamide 1,000 mg / 250 mL (4 mg / mL) 2,000 mg / 500 mL (4 mg / mL)	 X X		N/A	**Continuous** mg/min	1	6	8										
Propofol 1,000 mg / 100 mL (10 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mg **Bolus Admin Rate** mg/min	2	50	65	5	5	20			5	20			Tubing Change
rocuronium 500 mg / 100 mL (5 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	4	16	20	10	0.4	0.9		0.6	0.5	0.8		0.6	IBW for rate/vent
tirofiban ***153 kg or greater*** 5 mg / 100 mL (0.05 mg / mL) 12.5 mg / 250 mL (0.05 mg / mL)	 X X		N/A	**Continuous** mg/h **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.5	1.5	1.6	1.35	3	4		3.75	0.6	1.5	2	0.75	Aggrastat
tirofiban ***Less than 153 kg*** 5 mg / 100 mL (0.05 mg / mL) 12.5 mg / 250 mL (0.05 mg / mL)	 X X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.065	0.18	0.19	0.15	23	28		25	4	8	10	5	Aggrastat
Vasopressin ***.vasopressin*** 40 unit / 100 mL (0.4 unit / mL)	 X		N/A	**Continuous** unit/min	0.01	0.07	0.1										
Vasopressin ***vasopressin-GI Bleed*** 40 unit / 100 mL (0.4 unit / mL)	 X		N/A	**Continuous** unit/min	0.2	0.8	0.9										

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Continuous/Bolus - Non-Anesthesia Drugs - ER																	
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**				**Clinical Ads. Name**
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	
Vecuronium-Adult 30 mg / 30 mL (1 mg / mL)	X	X	N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	0.5	1.8	2	1	89	91		90	89	91		90	IBW for rate/vent
Vecuronium-Pediatric 30 mg / 30 mL (1 mg / mL)	X	X	N/A	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	0.5	1.8	2	0.5	0.1	0.3			0.2	0.6			IBW for rate/vent
Zidovudine DRIP 200 mg / 150 mL (1.3333 mg / mL)	X		N/A	**Continuous** mg/kg/h **Bolus Dose** mg/kg **Bolus Admin Rate** mg/kg/min	0.5	1.5	2		0.5	2.2			0.008	0.03			

2.3.2 Continuous/Bolus - Non-Anesthesia Drugs - Concentration Limits

Continuous/Bolus - Non-Anesthesia Drugs - Concentration Limits - ER						
Drug Name *Therapy* **Dosing Method**	**Module**		**Concentration Limits**			
	P	**S**	**Conc. Units**	**Hard Min**	**Soft Min**	**Soft Max**
Alteplase (TPA) ***Catheter Directed*** NonWeightBased	X		mg/mL	0.01		0.3
Immune Globulin IVIG WeightBased	X		mg/mL*	98		102
Naloxone NonWeightBased	X		mg/mL	0.001		0.032
Pralidoxime Infusion WeightBased	X		mg/mL	9		50

* Units Only concentration and Dosing Units have different units of measure.

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2.3.3 Continuous/Bolus - Anesthesia Only Drugs

Continuous/Bolus - Anesthesia Only Drugs - ER																
Drug Name ***Therapy*** **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**			
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**
.AMIODArone ***Loading Dose*** 150 mg / 100 mL (1.5 mg / mL) 300 mg / 100 mL (3 mg / mL)	 X X		N/A	**Continuous** mg/min	10	15.5	16	15								
.AMIODArone ***Maintenance Dose*** 450 mg / 250 mL (1.8 mg / mL)	 X		N/A	**Continuous** mg/min **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.2	1	1.6	0.5	50	150			10	15	16	15
.Cefazolin 1,000 mg / 50 mL (20 mg / mL)	 X		N/A	**Continuous** mg/min	10	50		33								
.DOBUTamine 500 mg / 250 mL (2 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.1	30	40									
.DOPamine 800 mg / 500 mL (1.6 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.1	30	50									
.EPInephrine 5 mg / 250 mL (0.02 mg / mL)	 X		N/A	**Continuous** mcg/min	1	60										
.EPInephrine 5 mg / 250 mL (0.02 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	0.25	0.5										
.Esmolol 2,500 mg / 250 mL (10 mg / mL)	 X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mcg/kg **Bolus Admin Rate** mcg/kg/min	25	210	310		5	500	1,000		25	500	2,000	
.Insulin 250 unit / 250 mL (1 unit / mL)	 X		N/A	**Continuous** unit/h **Bolus Dose** unit **Bolus Admin Rate** unit/min	0.5	20	60		1	20	30		0.5	40	50	
.Ketamine 1,000 mg / 250 mL (4 mg / mL)	 X		N/A	**Continuous** mg/kg/h	0.1	0.6	0.7	0.5								
.Lidocaine ***Analgesic*** 2,000 mg / 500 mL (4 mg / mL)	 X		N/A	**Continuous** mcg/kg/min	10	50	60	40								

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Continuous/Bolus - Anesthesia Only Drugs - ER																
Drug Name *Therapy* **Concentrations**	**Module**		**Conc. Limits**	**Dosing Units**	**Continuous**				**Bolus**				**Bolus Dose Administration Rate**			
	P	**S**			**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**
.Lidocaine ***Induction*** 2,000 mg / 500 mL (4 mg / mL)	X		N/A	**Continuous** mg/kg/h	0.4	1.7	1.8	0.5								
.Lidocaine ***Standard Dosing*** 2,000 mg / 500 mL (4 mg / mL)	X		N/A	**Continuous** mg/min **Bolus Dose** mg **Bolus Admin Rate** mg/min	0.1	4	8	1	25	50	200		25	100	200	
.Magnesium DRIP 20 gram / 500 mL (0.04 gram / mL)	X		N/A	**Continuous** mg/kg/h	20	35	40	30								
.Magnesium Sulfate 1 gram / 50 mL (0.02 gram / mL) 1 gram / 100 mL (0.01 gram / mL)	X X		N/A	**Continuous** gram/h	0.5	2										
.Mannitol 50 gram / 250 mL (0.2 gram / mL)	X		N/A	**Continuous** gram/kg/h **Bolus Dose** gram/kg **Bolus Admin Rate** gram/kg/min	0.001	0.002			0.25	1			0.012	0.05		
.niCARdipine 20 mg / 200 mL (0.1 mg / mL) 25 mg / 250 mL (0.1 mg / mL)	X X		N/A	**Continuous** mg/h	1	15	16									
.nitroGLYcerin 25 mg / 250 mL (0.1 mg / mL) 50 mg / 250 mL (0.2 mg / mL)	X X		N/A	**Continuous** mcg/min	1	200	600									
.nitroPRUSSide 50 mg / 250 mL (0.2 mg / mL)	X		N/A	**Continuous** mcg/kg/min	0.1	10	11									
.NORepinephrine 8 mg / 250 mL (0.032 mg / mL) 16 mg / 500 mL (0.032 mg / mL)	X X		N/A	**Continuous** mcg/min	0.5	100	300									
.PHENYLephrine 100 mg / 250 mL (0.4 mg / mL)	X		N/A	**Continuous** mcg/min **Bolus Dose** mcg **Bolus Admin Rate** mcg/min	0.1	180	200		100	500			100	500		
.Procainamide 1,000 mg / 250 mL (4 mg / mL)	X		N/A	**Continuous** mg/min	0.1	6.2	8									

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Continuous/Bolus - Anesthesia Only Drugs - ER																
Drug Name *Therapy* Concentrations	Module		Conc. Limits	Dosing Units	Continuous				Bolus				Bolus Dose Administration Rate			
	P	S			Soft Min	Soft Max	Hard Max	Initial Value	Soft Min	Soft Max	Hard Max	Initial Value	Soft Min	Soft Max	Hard Max	Initial Value
.Propofol 1,000 mg / 100 mL (10 mg / mL)	X		N/A	**Continuous** mcg/kg/min **Bolus Dose** mg **Bolus Admin Rate** mg/min	2	55			5	20			5	20		
.Vasopressin 40 unit / 100 mL (0.4 unit / mL)	X		N/A	**Continuous** unit/min	0.1	0.5										

2.3.4 Continuous/Bolus - Anesthesia Only Drugs - Concentration Limits

No drugs exist in this section.

2.3.5 Intermittent Drugs

Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
Acetadote LOAD	X	X	mg/kg	140	160		--- mg / --- mL	X	X		00:50	01:15	01:00	mg/mL	25		75	
Acetadote MD1	X	X	mg/kg	40	60		--- mg / --- mL	X	X		03:45	05:00	04:00	mg/mL	4		75	
Acetadote MD2	X	X	mg/kg	90	110		--- mg / --- mL	X	X		15:00	24:00	16:00	mg/mL	4		75	
ACETaminophen	X	X	mg	650	1,020		1,000 mg / 100 mL (10 mg / mL)	X			00:12	00:20	00:15	n/a				
ACETaminophen	X	X	mg/kg	14	16		--- mg / --- mL	X			00:12	00:20	00:15	mg/mL	9		11	
Acyclovir	X	X	mg	250	1,000		--- mg / --- mL	X			00:55	02:00	01:00	mg/mL	2		7	
alteplase ***MI <67kg Bag #1***	X	X	mg/kg	0.6	0.75	0.76	--- mg / --- mL	X			00:25	01:00	00:30	No				
alteplase ***MI <67kg Bag#2***	X	X	mg/kg	0.4	0.5	0.6	--- mg / --- mL	X			00:50	01:30	01:00	No				
alteplase ***MI > 67 kg Bag #1***	X	X	mg	49	51	52	50 mg / 100 mL (0.5 mg / mL)	X			00:25	00:35	00:30	n/a				
alteplase ***MI >67 kg Bag #2***	X	X	mg	34	36	37	35 mg / 100 mL (0.35 mg / mL)	X			00:45	01:15	01:00	n/a				
amikacin	X	X	mg	250	1,500		--- mg / --- mL	X			00:30	01:00	01:00	mg/mL	2		10	

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Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
Aminophylline Load	X	X	mg/kg	2	6		--- mg / --- mL	X			00:30	01:00		mg/mL		0.25	10	
Ampho B (liposomal)	X		mg/kg	2.5	10		--- mg / --- mL	X			00:50	02:20	02:00	No				
Amphotericin B	X	X	mg/kg	0.1	1.5		--- mg / --- mL	X			02:00	06:00		mg/mL		0.01	0.1	Test Dose
Ampicillin	X	X	mg	100	2,000		500 mg / 50 mL (10 mg / mL)	X			00:25	01:30	00:30	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:30	01:00	n/a				
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:30	01:00	n/a				
ampicillin/sulbact	X	X	mg	1,000	3,000		1,500 mg / 50 mL (30 mg / mL)	X			00:25	01:05	00:30	n/a				
							3,000 mg / 100 mL (30 mg / mL)	X			00:25	01:05	00:30	n/a				
Anidulafungin	X	X	mg	45	205		50 mg / 65 mL (0.7692 mg / mL)	X			00:40	01:15	00:45	n/a				
							100 mg / 130 mL (0.7692 mg / mL)	X			01:25	02:00	01:30	n/a				
							200 mg / 260 mL (0.7692 mg / mL)	X			02:55	03:30	03:00	n/a				
Ascorbic Acid	X	X	mg	1,480	1,520		1,500 mg / 100 mL (15 mg / mL)	X			00:55	01:05	01:00	n/a				
							3,000 mg / 150 mL (20 mg / mL)	X			00:55	01:05	01:00	n/a				
azithromycin	X	X	mg	250	500		250 mg / 250 mL (1 mg / mL)	X			00:59	01:30	01:00	n/a				
							500 mg / 250 mL (2 mg / mL)	X			00:59	01:30	01:00	n/a				
aztreonam	X	X	mg	1	2,000		1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:05	00:30	n/a				
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:05	00:30	n/a				
							--- mg / --- mL	X			00:25	01:05	00:30	mg/mL	9		30	
bamlanivimab	X	X	mg	300	702		700 mg / 270 mL (2.5926 mg / mL)	X			00:50	01:30	01:00	n/a				0.2 or 0.22 micron
bamlanivimab-etesevi	X	X	mg	2,000	2,200		2,100 mg / 210 mL (10 mg / mL)	X			00:38	01:00	00:45	n/a				Bama-Etes
Calcium chloride	X	X	gram	1	2		1 gram / 100 mL (0.01 gram / mL)	X			00:20	02:00		n/a				
							--- gram / --- mL	X			00:50	02:00		gram/mL	0.009		0.02	
Calcium Gluconate	X	X	gram	1	4		1 gram / 50 mL (0.02 gram / mL)	X			00:15	02:00		n/a				
							1 gram / 100 mL (0.01 gram / mL)	X			00:15	02:00		n/a				
							2 gram / 100 mL (0.02 gram / mL)	X			00:30	02:00		n/a				
							--- gram / --- mL	X			00:30	04:00		gram/mL	0.009		0.021	
casirivimab-imdevima	X	X	mg	100	1,250		600 mg / 110 mL (5.4545 mg / mL)	X			00:15	00:30	00:21	n/a				Regeneron2
Caspofungin	X	X	mg	48	72		50 mg / 250 mL (0.2 mg / mL)	X			00:45	01:15	01:00	n/a				
							70 mg / 250 mL (0.28 mg / mL)	X			00:45	01:15	01:00	n/a				
CEFAZolin	X	X	mg	1	3,001		500 mg / 50 mL (10 mg / mL)	X			00:25	01:05	00:30	n/a				
							1,000 mg / 50 mL (20 mg / mL)	X			00:25	01:05	00:30	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:05	00:30	n/a				
							2,000 mg / 50 mL (40 mg / mL)	X			00:25	01:05	00:30	n/a				
							3,000 mg / 50 mL (60 mg / mL)	X			00:25	01:05	00:30	n/a				
							--- mg / --- mL	X			00:25	01:05	00:30	mg/mL	9		70	

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Intermittent Drugs - ER																			
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits					Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max		
CefePIME *(4 Hour Infusion)*	X	X	mg	250	2,000		1,000 mg / 50 mL (20 mg / mL)	X			01:00	04:30	04:00	n/a					
							1,000 mg / 100 mL (10 mg / mL)	X			01:00	04:30	04:00	n/a					
							2,000 mg / 50 mL (40 mg / mL)	X			01:00	04:30	04:00	n/a					
							2,000 mg / 100 mL (20 mg / mL)	X			01:00	04:30	04:00	n/a					
							--- mg / --- mL	X			01:00	04:30	04:00	mg/mL	9		50		
CefePIME *30 minute*	X	X	mg	250	2,000		1,000 mg / 50 mL (20 mg / mL)	X			00:25	01:00	00:30	n/a					
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:00	00:30	n/a					
							2,000 mg / 50 mL (40 mg / mL)	X			00:25	01:00	00:30	n/a					
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:00	00:30	n/a					
							--- mg / --- mL	X			00:25	01:00	00:30	mg/mL	9		50		
cefoTAXime	X	X	mg	250	2,000		1,000 mg / 100 mL (10 mg / mL)	X			00:30	01:30	01:00	n/a					
							2,000 mg / 100 mL (20 mg / mL)	X			00:30	01:30	01:00	n/a					
							--- mg / --- mL	X			00:30	01:30	01:00	mg/mL	9		30		
CEFOXitin	X	X	mg	1,000	2,000		1,000 mg / 50 mL (20 mg / mL)	X			00:25	01:05	00:30	n/a					
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:15	01:00	n/a					
							2,000 mg / 50 mL (40 mg / mL)	X			00:25	01:05	00:30	n/a					
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:15	01:00	n/a					
Ceftaroline	X	X	mg	190	610		200 mg / 100 mL (2 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							300 mg / 100 mL (3 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							400 mg / 100 mL (4 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							600 mg / 100 mL (6 mg / mL)	X	X		00:55	01:05	01:00	n/a					
CEFTAZidime	X	X	mg	250	2,000		1,000 mg / 100 mL (10 mg / mL)	X			00:30	01:30	01:00	n/a					
							--- mg / --- mL	X			00:30	01:30	01:00	mg/mL	9		30		
CEFTOLozane/Tazo	X	X	mg	150	3,000		150 mg / 25 mL (6 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							375 mg / 25 mL (15 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							750 mg / 100 mL (7.5 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							1,500 mg / 100 mL (15 mg / mL)	X	X		00:55	01:05	01:00	n/a					
							3,000 mg / 200 mL (15 mg / mL)	X	X		00:55	01:05	01:00	n/a					
cefTRIAXone	X	X	mg	100	2,000		1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:00	00:30	n/a					
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:00	00:30	n/a					rocephin
							--- mg / --- mL	X			00:25	01:00	00:30	mg/mL	9		30		
ceFUROXime	X	X	mg	750	3,000		750 mg / 50 mL (15 mg / mL)	X			00:25	01:05	00:30	n/a					
							1,500 mg / 50 mL (30 mg / mL)	X			00:25	01:05	00:30	n/a					
chloropromazine	X	X	mg	25	50		25 mg / 50 mL (0.5 mg / mL)	X			00:25	01:05	00:30	n/a					
							50 mg / 50 mL (1 mg / mL)	X			00:55	01:35	01:00	n/a					
CIPROfloxacin	X	X	mg	200	400		200 mg / 100 mL (2 mg / mL)	X		00:55	01:00	01:30	01:00	n/a					
							400 mg / 200 mL (2 mg / mL)	X		00:55	01:00	01:30	01:00	n/a					
CLINDAmycin	X	X	mg	300	900		300 mg / 50 mL (6 mg / mL)	X			00:25	01:15	00:30	n/a					
							600 mg / 50 mL (12 mg / mL)	X			00:25	01:15	00:30	n/a					
							600 mg / 100 mL (6 mg / mL)	X			00:25	01:15	00:30	n/a					
							900 mg / 50 mL (18 mg / mL)	X			00:50	01:30	01:00	n/a					
							900 mg / 100 mL (9 mg / mL)	X			00:50	01:30	01:00	n/a					

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Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
							--- mg / --- mL	X			00:25	01:15		mg/mL	3		18	
dalbavancin	X	X	mg	350	1,525		375 mg / 100 mL (3.75 mg / mL)	X			00:25	01:00	00:30	n/a				D5W
							500 mg / 100 mL (5 mg / mL)	X			00:25	01:00	00:30	n/a				
							750 mg / 150 mL (5 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,000 mg / 250 mL (4 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,500 mg / 325 mL (4.6154 mg / mL)	X			00:25	01:00	00:30	n/a				
Daptomycin	X	X	mg/kg	3.5	10.5		--- mg / --- mL	X			00:25	01:00	00:30	No				
Desmopressin	X	X	mcg/kg	0.1	0.4		--- mcg / --- mL	X			00:30	01:00	00:30	No				
digoxin immune fab	X	X	mg	20	805		--- mg / --- mL	X			00:25	00:40	00:30	mg/mL	0.4		10	
DoxyCYCLINE	X	X	mg	50	200		100 mg / 250 mL (0.4 mg / mL)	X			00:30	01:30	01:00	n/a				
							--- mg / --- mL	X			00:30	01:30	01:00	mg/mL	0.2		2	
ertapenem	X	X	mg	500	1,000		500 mg / 50 mL (10 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:00	00:30	n/a				
Erythromycin	X	X	mg	250	1,000		250 mg / 150 mL (1.6667 mg / mL)	X			00:30	01:30	01:00	n/a				
							500 mg / 150 mL (3.3333 mg / mL)	X			00:30	01:30	01:00	n/a				
							1,000 mg / 150 mL (6.6667 mg / mL)	X			00:30	01:30	01:00	n/a				
							--- mg / --- mL	X			00:55	01:30	01:00	mg/mL	1		10	
Ferric carboxymaltos	X	X	mg	400	750		750 mg / 250 mL (3 mg / mL)	X	X		00:15	00:45	00:30	n/a				
							--- mg / --- mL	X	X		00:15	00:45	00:30	mg/mL	2		4	
Ferric gluconate Na	X	X	mg	120	130		125 mg / 100 mL (1.25 mg / mL)	X			00:50	01:30	01:00	n/a				
Ferric Hydroxide Suc	X	X	mg/m2	100	200		200 mg / 50 mL (4 mg / mL)	X			00:10	01:00	00:15	n/a				
FluCONazole	X	X	mg	100	800		100 mg / 50 mL (2 mg / mL)	X		00:55		02:00	01:00	n/a				
							200 mg / 100 mL (2 mg / mL)	X		00:55		02:00	01:00	n/a				
							400 mg / 200 mL (2 mg / mL)	X		01:55		04:00	02:00	n/a				
							800 mg / 400 mL (2 mg / mL)	X		03:55		05:00	04:00	n/a				
Folic Acid	X	X	mg	1	5		--- mg / --- mL	X	X		00:15	01:00	00:30	No				
fomepizole	X	X	mg/kg	9	16		--- mg / --- mL	X			00:25	01:00	00:30	No				
Fosphenytoin	X	X	mg	300	2,000		500 mg / 50 mL (10 mg / mL)	X			00:15	00:30	00:15	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:15	00:30	00:15	n/a				
							--- mg / --- mL	X			00:15	00:30	00:15	mg/mL	1.5		25	
Furosemide IV Bolus	X	X	mg	50	250		100 mg / 10 mL (10 mg / mL)	X		00:25		01:00	00:30	n/a				
							200 mg / 20 mL (10 mg / mL)	X		00:50		02:00	01:00	n/a				
Gentamicin ***Once Daily Dosing***	X	X	mg	25	600		--- mg / --- mL	X			00:30	01:00	00:30	mg/mL	0.5		7	Random Level
Gentamicin ***Standard Dosing***	X	X	mg	25	200		80 mg / 100 mL (0.8 mg / mL)	X			00:30	01:00	00:30	n/a				Peak and Trough
							100 mg / 100 mL (1 mg / mL)	X			00:30	01:00	00:30	n/a				

Reviewed and Approved by _____Date_____(Approval Only)

Intermittent Drugs - ER																			
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
							120 mg / 100 mL (1.2 mg / mL)	X			00:30	01:00	00:30	n/a					
							--- mg / --- mL	X			00:30	01:00	00:30	mg/mL	0.5		3	
Ibutilide	X	X	mg	0.5	1.5		1 mg / 50 mL (0.02 mg / mL)	X			00:09	00:15	00:10	n/a				
IdaruciZUMAB	X	X	gram	2.4	2.6		2.5 gram / 50 mL (0.05 gram / mL)	X	X		00:04	00:15	00:05	n/a				
Imipenem/cilastatin	X	X	mg	200	1,000		250 mg / 100 mL (2.5 mg / mL)	X			00:25	01:00	00:30	n/a				
							500 mg / 100 mL (5 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,000 mg / 250 mL (4 mg / mL)	X			00:40	01:05	01:00	n/a				
Infliximab	X		mg/kg	3	10		--- mg / --- mL	X			01:59	03:00	02:00	mg/mL		0.4	4	Filter 1.2 micron
Iron DEXTRAN	X	X	mg	25	1,000		--- mg / --- mL	X			00:05	06:00		mg/mL		0.5	50	Hypersensitivity
Iron SUCROSE	X	X	mg	25	505		100 mg / 100 mL (1 mg / mL)	X			00:15	01:00	00:30	n/a				
							200 mg / 100 mL (2 mg / mL)	X			00:45	01:00	01:00	n/a				
							300 mg / 250 mL (1.2 mg / mL)	X			01:25	02:00	01:30	n/a				
							400 mg / 250 mL (1.6 mg / mL)	X			02:25	03:00	02:30	n/a				
							500 mg / 250 mL (2 mg / mL)	X			03:25	04:30	04:00	n/a				
							--- mg / --- mL	X			00:15	05:00		mg/mL	0.9		3	
Lacosamide	X	X	mg	45	205		50 mg / 50 mL (1 mg / mL)	X	X		00:25	01:05	00:30	n/a				
							100 mg / 50 mL (2 mg / mL)	X	X		00:25	01:05	00:30	n/a				
							200 mg / 50 mL (4 mg / mL)	X	X		00:25	01:05	00:30	n/a				
LEVETiracetam	X	X	mg	250	1,500		500 mg / 100 mL (5 mg / mL)	X			00:14	00:35	00:15	n/a				
							750 mg / 100 mL (7.5 mg / mL)	X			00:14	00:35	00:15	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:14	00:35	00:15	n/a				
							1,500 mg / 100 mL (15 mg / mL)	X			00:14	00:35	00:15	n/a				
							--- mg / --- mL	X			00:14	00:35	00:15	mg/mL	1.5		15	
LevoFLOXacin	X	X	mg	250	750		250 mg / 50 mL (5 mg / mL)	X		00:55		02:00	01:00	n/a				
							500 mg / 100 mL (5 mg / mL)	X		00:55		02:00	01:00	n/a				
							750 mg / 150 mL (5 mg / mL)	X		01:30		02:00	01:30	n/a				
Linezolid	X	X	mg	200	610		600 mg / 300 mL (2 mg / mL)	X			00:25	01:30		n/a				
Magnesium Sulf. IVPB	X	X	gram	1	8		1 gram / 50 mL (0.02 gram / mL)	X			00:25	03:00		n/a				
							2 gram / 50 mL (0.04 gram / mL)	X			00:55	06:00	02:00	n/a				
							3 gram / 50 mL (0.06 gram / mL)	X			00:55	08:00	03:00	n/a				
							4 gram / 100 mL (0.04 gram / mL)	X			00:55	08:00	04:00	n/a				
							6 gram / 100 mL (0.06 gram / mL)	X			01:00	10:00	06:00	n/a				
Mannitol 20%	X	X	gram	1	100		50 gram / 250 mL (0.2 gram / mL)	X			00:30	01:00	00:30	n/a				
							--- gram / --- mL	X			00:30	01:00	00:30	gram/mL	0.15		0.3	
meropenem ***(3 Hour Infusion)***	X	X	mg	250	2,000		500 mg / 100 mL (5 mg / mL)	X			02:45	03:15	03:00	n/a				
							1,000 mg / 50 mL (20 mg / mL)	X			02:45	03:15	03:00	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			02:45	03:15	03:00	n/a				

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Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
							2,000 mg / 100 mL (20 mg / mL)	X			02:45	03:15	03:00	n/a				
meropenem ***30 minute***	X	X	mg	250	2,000		500 mg / 100 mL (5 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,000 mg / 50 mL (20 mg / mL)	X			00:25	01:00	00:30	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:00	00:30	n/a				
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:00	00:30	n/a				
methocarbamol	X	X	mg	995	3,000		--- mg / --- mL	X			00:15	01:00	00:30	No				
MethylPREDNISolone	X	X	mg	125	1,500		500 mg / 100 mL (5 mg / mL)	X			00:15	01:30	01:00	n/a				
							750 mg / 100 mL (7.5 mg / mL)	X			00:15	01:30	01:00	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:15	01:30	01:00	n/a				
							1,000 mg / 250 mL (4 mg / mL)	X			00:15	01:30	01:00	n/a				
							--- mg / --- mL	X			00:15	01:30	01:00	mg/mL	0.25		35	
methypred-spinal ***Loading Dose***	X	X	mg/kg	29	30		--- mg / --- mL	X		00:10	00:15	00:20	00:15	mg/mL	0.25		35	
methypred-spinal ***Maintenance Dose***	X	X	mg/kg	124	130		--- mg / --- mL	X		22:00	23:00	24:00	23:00	mg/mL	0.25		35	
Metronidazole	X	X	mg	250	500		250 mg / 50 mL (5 mg / mL)	X			00:55	02:00	01:00	n/a				
							500 mg / 100 mL (5 mg / mL)	X			00:55	02:00	01:00	n/a				
nafcillin	X	X	mg	500	3,000		1,000 mg / 50 mL (20 mg / mL)	X			00:25	01:05	00:30	n/a				
							1,000 mg / 100 mL (10 mg / mL)	X			00:25	01:05	00:30	n/a				
							2,000 mg / 50 mL (40 mg / mL)	X			00:25	01:05	00:30	n/a				
							2,000 mg / 100 mL (20 mg / mL)	X			00:25	01:05	00:30	n/a				
Ondansetron IVPB	X	X	mg	5	32		16 mg / 50 mL (0.32 mg / mL)	X			00:25	01:05	00:30	n/a				
Oritavancin	X	X	mg	1,190	1,210		1,200 mg / 1,000 mL (1.2 mg / mL)	X			02:40	05:00	03:00	n/a				
Penicillin G K	X	X	unit	1	6	7	2.5 unit / 100 mL (0.025 unit / mL)	X			00:30	01:15	01:00	n/a				
							3 unit / 100 mL (0.03 unit / mL)	X			00:30	01:15	01:00	n/a				
							4 unit / 100 mL (0.04 unit / mL)	X			00:30	01:15	01:00	n/a				Penicillin GK
							5 unit / 100 mL (0.05 unit / mL)	X			00:30	01:15	01:00	n/a				
							--- unit / --- mL	X			00:30	01:15	01:00	unit/mL	0.001	0.015	0.07	
phenytoin sodium	X	X	mg	100	1,500		1,000 mg / 150 mL (6.6667 mg / mL)	X			00:20	01:00	00:30	n/a				saline flush
							--- mg / --- mL	X			00:20	01:00	00:30	mg/mL	5		10	
Phytonadione	X	X	mg	2	12		2.5 mg / 50 mL (0.05 mg / mL)	X			00:10	00:30	00:15	n/a				
							5 mg / 50 mL (0.1 mg / mL)	X			00:10	00:30	00:15	n/a				
							10 mg / 50 mL (0.2 mg / mL)	X			00:10	00:30	00:15	n/a				
							--- mg / --- mL	X			00:10	00:40	00:15	mg/mL	0.01	0.019	0.3	
piperacillin/tazo ***(4 Hour Infusion)***	X	X	gram	2	5		3.375 gram / 100 mL (0.0338 gram / mL)	X			03:45	04:36	04:00	n/a				
							4.5 gram / 100 mL (0.045 gram / mL)	X			03:45	04:36	04:00	n/a				
piperacillin/tazo ***30 Minute Infusion***	X	X	gram	2	5		2.25 gram / 50 mL (0.045 gram / mL)	X			00:25	01:00	00:30	n/a				
							3.375 gram / 100 mL (0.0338 gram / mL)	X			00:25	01:00	00:30	n/a				

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Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
							4.5 gram / 100 mL (0.045 gram / mL)	X			00:25	01:00	00:30	n/a					
Potassium Chloride *CENTRAL LINE*	X	X	mEq	10	41		10 mEq / 100 mL (0.1 mEq / mL)	X		00:55		05:00	01:00	n/a				potassium
							20 mEq / 100 mL (0.2 mEq / mL)	X		00:55		05:00	02:00	n/a				
							30 mEq / 100 mL (0.3 mEq / mL)	X		01:25		05:00	03:00	n/a				
							40 mEq / 250 mL (0.16 mEq / mL)	X		01:55		06:00	04:00	n/a				
							--- mEq / --- mL	X		00:55		06:00		mEq/mL	0.09		0.4	
Potassium Chloride *PERIPHERAL LINE*	X	X	mEq	5	41		10 mEq / 100 mL (0.1 mEq / mL)	X		00:45		05:00	01:00	n/a				potassium
							20 mEq / 100 mL (0.2 mEq / mL)	X		01:45		05:00	02:00	n/a				
							30 mEq / 100 mL (0.3 mEq / mL)	X		02:45		05:00	03:00	n/a				
							40 mEq / 250 mL (0.16 mEq / mL)	X		03:45		06:00	04:00	n/a				
							--- mEq / --- mL	X			01:00	06:00	04:00	mEq/mL	0.09		0.4	
Potassium PHOS mMol *CENTRAL LINE*	X	X	mmol	5	46		10 mmol / 250 mL (0.04 mmol / mL)	X		01:00	01:45	06:00	02:00	n/a				
							15 mmol / 250 mL (0.06 mmol / mL)	X		01:00	02:45	06:00	03:00	n/a				
							20 mmol / 250 mL (0.08 mmol / mL)	X		01:00	03:45	06:00	04:00	n/a				
							30 mmol / 250 mL (0.12 mmol / mL)	X		02:00	04:15	09:00	06:00	n/a				
							40 mmol / 500 mL (0.08 mmol / mL)	X		02:00	05:15	10:00	08:00	n/a				
							45 mmol / 500 mL (0.09 mmol / mL)	X		03:00	06:15	12:00	09:00	n/a				
Potassium PHOS mMol *PERIPHERAL LINE*	X	X	mmol	5	46		10 mmol / 250 mL (0.04 mmol / mL)	X		01:30	01:45	06:00	02:00	n/a				
							15 mmol / 250 mL (0.06 mmol / mL)	X		02:00	02:45	06:00	03:00	n/a				
							20 mmol / 250 mL (0.08 mmol / mL)	X		03:00	03:45	06:00	04:00	n/a				
							30 mmol / 250 mL (0.12 mmol / mL)	X		04:00	04:15	09:00	06:00	n/a				
							40 mmol / 500 mL (0.08 mmol / mL)	X		05:00	05:15	10:00	08:00	n/a				
							45 mmol / 500 mL (0.09 mmol / mL)	X		06:00	06:15	12:00	09:00	n/a				
Pralidoxime	X	X	mg	1,000	2,000		1,000 mg / 100 mL (10 mg / mL)	X		00:15		00:30	00:15	n/a				
							2,000 mg / 100 mL (20 mg / mL)	X		00:15		00:30	00:15	n/a				
							--- mg / --- mL	X		00:15		00:30	00:15	mg/mL	9		30	
Pralidoxime	X	X	mg/kg	25	35		--- mg / --- mL	X		00:15		00:30	00:15	mg/mL	10		30	
Prolastin	X	X	mg/kg	40	65		--- mg / --- mL	X			00:30	02:00		mg/mL	9		30	
promethazine	X	X	mg	5	26		6.25 mg / 50 mL (0.125 mg / mL)	X			00:12	00:30	00:15	n/a				
							12.5 mg / 50 mL (0.25 mg / mL)	X			00:12	00:30	00:15	n/a				
							25 mg / 50 mL (0.5 mg / mL)	X			00:12	00:30	00:15	n/a				
protamine sulfate	X	X	mg	1	50		--- mg / --- mL	X	X		00:13	00:30	00:15	mg/mL	0.02	0.2	1.2	
Prothrombin CC	X	X	unit	700	5,000		1,500 unit / 60 mL (25 unit / mL)	X	X		00:07	00:30	00:10	n/a				
							2,000 unit / 80 mL (25 unit / mL)	X	X		00:09	00:30	00:10	n/a				Dedicated line
							--- unit / --- mL	X	X		00:09	00:30	00:10	unit/mL	20		35	
Remdesivir	X	X	mg	100	200		100 mg / 100 mL (1 mg / mL)	X			00:30	02:00	01:00	n/a				
							200 mg / 100 mL (2 mg / mL)	X			00:30	02:00	01:00	n/a				

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Intermittent Drugs - ER																		
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
Rituximab	X	X	mg/m2	374	375		--- mg / --- mL	X	X		03:00	06:00		mg/mL		1	4	Per MD order
Sodium BICARBonate	X	X	mEq	1	50		50 mEq / 100 mL (0.5 mEq / mL)	X			00:30	01:00	01:00	n/a				
							50 mEq / 250 mL (0.2 mEq / mL)	X			00:30	01:00	01:00	n/a				
							--- mEq / --- mL	X			00:30	01:00	01:00	mEq/mL	0.15		1.1	
sodium chloride 3%	X	X	mEq	25	55		25.65 mEq / 50 mL (0.513 mEq / mL)	X		00:08	00:09	00:20	00:10	n/a				2 nurses to verify
							51.3 mEq / 100 mL (0.513 mEq / mL)	X		00:08	00:09	00:20	00:10	n/a				
Sodium PHOS mMol	X	X	mmol	5	45		10 mmol / 250 mL (0.04 mmol / mL)	X		01:30	01:45	06:00	02:00	n/a				
							15 mmol / 250 mL (0.06 mmol / mL)	X		02:00	02:45	06:00	03:00	n/a				
							20 mmol / 250 mL (0.08 mmol / mL)	X		03:00	03:45	06:00	04:00	n/a				
							30 mmol / 250 mL (0.12 mmol / mL)	X		04:00	04:15	09:00	06:00	n/a				
							40 mmol / 500 mL (0.08 mmol / mL)	X		05:00	05:15	10:00	08:00	n/a				
							45 mmol / 500 mL (0.09 mmol / mL)	X		06:00	06:15	12:00	09:00	n/a				
Sodium Thiosulfate	X	X	gram	12.5	25		25 gram / 100 mL (0.25 gram / mL)	X			00:30	01:00	01:00	n/a				
							--- gram / --- mL	X			00:30	01:00	01:00	No				
sotrovimab	X	X	mg	450	550		500 mg / 108 mL (4.6296 mg / mL)	X			00:25	00:35	00:30	n/a				0.2 or 0.22 micron
Sulfameth-Trimeth	X	X	mg	100	800		--- mg / --- mL	X		00:55	01:00	02:00	01:30	mg/mL		0.04	1	D5W
Thiamine	X	X	mg	98	501		100 mg / 50 mL (2 mg / mL)	X			00:10	00:45	00:30	n/a				
							200 mg / 50 mL (4 mg / mL)	X			00:10	00:45	00:30	n/a				
							250 mg / 50 mL (5 mg / mL)	X			00:15	00:45	00:30	n/a				
							500 mg / 50 mL (10 mg / mL)	X			00:15	00:45	00:30	n/a				
							--- mg / --- mL	X			00:15	00:45	00:30	mg/mL	1		11	
Tigecycline	X	X	mg	50	100		50 mg / 50 mL (1 mg / mL)	X			00:25	01:00	00:30	n/a				
							100 mg / 100 mL (1 mg / mL)	X			00:25	01:00	00:30	n/a				
TOBRAmycin ***Once Daily Dosing***	X	X	mg	25	500		--- mg / --- mL	X		00:55	01:00	01:30	01:00	mg/mL	0.5		7	Random Level
TOBRAmycin ***Standard Dosing***	X	X	mg	25	200		80 mg / 100 mL (0.8 mg / mL)	X			00:30	01:00	00:30	n/a				Peak and Trough
							100 mg / 100 mL (1 mg / mL)	X			00:30	01:00	00:30	n/a				
							--- mg / --- mL	X			00:30	01:00	00:30	mg/mL	0.5		3	
Tranexamic Acid	X	X	mg	975	1,025		1,000 mg / 100 mL (10 mg / mL)	X			00:08	00:12	00:10	n/a				
							1,000 mg / 500 mL (2 mg / mL)	X			07:55	08:05	08:00	n/a				
valproate sodium	X	X	mg	100		3,000	250 mg / 50 mL (5 mg / mL)	X			00:15	01:30	01:00	n/a				
							500 mg / 50 mL (10 mg / mL)	X			00:30	01:30	01:00	n/a				
							1,000 mg / 50 mL (20 mg / mL)	X			00:55	01:30	01:00	n/a				
							--- mg / --- mL	X			00:10	01:30	01:00	mg/mL	1		60	
Vancomycin	X	X	mg	500	3,500		500 mg / 100 mL (5 mg / mL)	X		00:50	00:55	02:05	01:00	n/a				
							750 mg / 150 mL (5 mg / mL)	X		01:15	01:20	02:05	01:30	n/a				
							1,000 mg / 250 mL (4 mg / mL)	X		01:15	01:20	02:05	01:30	n/a				
							1,250 mg / 250 mL (5 mg / mL)	X		01:15	01:20	03:05	01:30	n/a				
							1,500 mg / 250 mL (6 mg / mL)	X		01:15	01:20	03:05	01:30	n/a				

Reviewed and Approved by _____Date_____(Approval Only)

Intermittent Drugs - ER																			
Drug Name *Therapy*	Available As		Total Dose Limits				Concentrations	Module		Duration Limits (hh:mm)				Concentration Limits				Clinical Ads. Name
	Pri.	Sec.	Dosing Units	Soft Min	Soft Max	Hard Max		P	S	Hard Min	Soft Min	Soft Max	Initial Value	Conc. Units	Hard Min	Soft Min	Soft Max	
							1,750 mg / 500 mL (3.5 mg / mL)	X		01:45	01:50	03:05	02:00	n/a				
							2,000 mg / 500 mL (4 mg / mL)	X		01:45	01:50	03:05	02:00	n/a				
							2,250 mg / 500 mL (4.5 mg / mL)	X		01:45	02:00	04:05	03:00	n/a				
							2,500 mg / 500 mL (5 mg / mL)	X		01:45	02:00	04:05	03:00	n/a				
							2,750 mg / 500 mL (5.5 mg / mL)	X		01:45	02:00	04:05	03:00	n/a				
							3,000 mg / 500 mL (6 mg / mL)	X		01:45	02:00	04:05	03:00	n/a				
VORIconazole	X	X	mg/kg	3	6		--- mg / --- mL	X		02:00		04:00		mg/mL	0.5		5	
Zoledronic Acid	X	X	mg	4	5		4 mg / 100 mL (0.04 mg / mL)	X			00:15	01:00	00:15	n/a				

2.3.6 Fluids

Fluids - ER							
Fluid Name *Therapy*	Supports Secondary	Module		Rate Limits (mL/h)			Clinical Ads. Name
		P	S	Soft Min	Soft Max	Hard Max	
1/2NS	Yes	X		1	999		
Albumin	No	X	X	1	999		
Banana Bag	Yes	X		1	999		
Blood (RBCs)	No	X		5	999		
Cryoprecipitate	No	X		1	999		
D10W	Yes	X		1	999		
D5NS	Yes	X		1	999		
D5W	Yes	X		1	999		
Fat 20% 100ml	Yes	X	X	8	9	10	
Fat 20% 250ml	Yes	X	X	19	21	22	
Fat 20% 500ml	Yes	X	X	40	42	43	
Fresh Frozen Plasma	No	X		1	999		
LR	Yes	X		1	999		
Maintenance Fluid	Yes	X		1	999		
MaintFluid+KCL 10mEq	Yes	X	X	1	998	999	
MaintFluid+KCL 20mEq	Yes	X	X	1	998	999	
MaintFluid+KCL 30mEq	Yes	X	X	1	667	668	

Reviewed and Approved by _____Date_____(Approval Only)

Fluids - ER							
Fluid Name *Therapy*	Supports Secondary	Module		Rate Limits (mL/h)			Clinical Ads. Name
		P	S	Soft Min	Soft Max	Hard Max	
MaintFluid+KCL 40mEq	Yes	X	X	1	500	501	
Mannitol 20%	Yes	X		1	999		mannitol
NS Flush bag	Yes	X		1	999		
NSS	Yes	X		1	999		
Platelets	No	X		1	999		
PPN	Yes	X		1	200		
Sodium Bicarb Drip	Yes	X		1	999		
Sodium Chloride 3%	Yes	X		10	97	99	
TPN	Yes	X		1	200		Central Line

2.3.7 PCA Drugs

PCA Drugs - ER							
Drug Name *Therapy*	**Concentrations:** 500 mcg / 50 mL (10 mcg / mL)						
Fentanyl							
Concentration Limits	**Conc. Units**		**Hard Min**		**Soft Min**		**Soft Max**
	n/a						
Limits	**Hard Min**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**PCA Pause Protocol:** Yes	
PCA Dose	n/a	10	40	100		**Dosing Units** mcg	
Continuous Dose / h	n/a	5	30	50			
Bolus Dose	n/a	10	50	75	n/a	**Max Accum. Includes Bolus?** No	
Loading Dose	n/a	10	50	100	n/a		
Lockout Interval (minutes)	4	5	60	n/a		**Clinical Advisory Name** PCA	
Max Acc. Dose Range / 4 h	n/a	5	960	1,200			

Reviewed and Approved by _____Date_____(Approval Only)

PCA Drugs - ER						
Drug Name ***Therapy***	**Concentrations:** 50 mg / 50 mL (1 mg / mL)					
HYDROmorphone						
Concentration Limits	**Conc. Units**		**Hard Min**		**Soft Min**	**Soft Max**
	n/a					
Limits	**Hard Min**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**PCA Pause Protocol:** Yes
PCA Dose	n/a	0.1	1	2		**Dosing Units** mg
Continuous Dose / h	n/a	0.1	0.4	2		
Bolus Dose	n/a	0.1	1	2	n/a	**Max Accum. Includes Bolus?** No
Loading Dose	n/a	0.1	1	2	n/a	
Lockout Interval (minutes)	5	6	30	n/a		**Clinical Advisory Name** PCA
Max Acc. Dose Range / 4 h	n/a	0.2	16	20		

PCA Drugs - ER						
Drug Name ***Therapy***	**Concentrations:** 50 mg / 50 mL (1 mg / mL)					
Morphine						
Concentration Limits	**Conc. Units**		**Hard Min**		**Soft Min**	**Soft Max**
	n/a					
Limits	**Hard Min**	**Soft Min**	**Soft Max**	**Hard Max**	**Initial Value**	**PCA Pause Protocol:** Yes
PCA Dose	n/a	0.5	2			**Dosing Units** mg
Continuous Dose / h	n/a	0.5	10			
Bolus Dose	n/a	2	5		n/a	**Max Accum. Includes Bolus?** No
Loading Dose	n/a	2	5		n/a	
Lockout Interval (minutes)		6	30	n/a		**Clinical Advisory Name** PCA
Max Acc. Dose Range / 4 h	n/a	2	56			

2.4 Hospice

Reviewed and Approved by _____Date_____(Approval Only)

Medications

Acetaminophen

Dose-650mg PO

Drug-Class Analgesic/antipyretic Non-Opioid

Indications-Pain

Contraindications- Allergy, HIstory of Liver dysfunction, Active Vomiting, Acetaminophen use in the last 4 hours.

Patient must be over the age 15 and >50kg

Pregnancy Class C

Onset 10-45 min

Peak effect 2-4 hours

Duration of Action 4 hours

Adenosine

Dose-12mg, if no conversion another 12mg. Pediatric Dose 0.1mg/kg (max 6mg)

Drug Class- Class V antidysrhythmic

Indications- Stable SVT, Stable VT

Contraindications- Allergy, AV block, SSS, Atrial flutter, Atrial fib. Unstable SVT, Unstable VT.

Side Effects- Chest discomfort, Feeling Flush.

Pregnancy Class

Onset of Action 5-20 seconds

Peak effect 5-10 seconds

Duration of Action 10 seconds

Use most proximal IV access Followed by rapid flushing.

https://www.accessdata.fda.gov/drugsatfda_docs/label/2009/02

Aspirin

Dose-324mg ASA

Drug Class-NSAID

Indications-Angina, Cardiac Symptoms

Contraindications- Allergy, GIve caution with GI Bleeds and GI ulcers.

Side effects- Nausea/Vomtiing. Exacerbation of GI Bleed.

Pregnancy class- Avoid third trimester administration.

Onset of action 5-30mins

Duration of action 4 to 6 Hours

Amiodarone

Dose-Cardiac Arrest 300mg IVP, 150mg IVP.

VT with a pulse 150mg/100ml over 15mins.

Pedatric 5mg/kg

Drug Class- Class III antidysrhythmic

Indications- Stable and Unstable VT.

Contraindications- Sinus Bradycardia, 2nd or 3rd Degree Block.

Side effects-Bradycardia hypotension

Pregnancy Class

Onset of action 5-10 mins

Peak effect 20mins

Duration of action 1-3 hours

Amiodarone Injection: Package Insert / Prescribing Information - Drugs.com

ncbi.nlm.nih.gov/pubmed/6370540

Albuterol

Dose-2.5mg Nebulized

Drug Class-Beta 2 adrenergic agonist

Indications- Bronchoconstriction, Hyperkalemia.

Contraindications-Sensitivity

Side effects-tremors anxiety tachycardia.

Pregnancy Class- None noted.

Onset of action 1-5 mins

Peak effect 30mins

Duration of action. 3-6 hours

Atropine

Dose- 0.5mg every PRN 3-5min Total 3mg.

Pediatric 0.02mg/kg (min 0.1mg Max 0.5mg)

Drug Class Anticholingeric

Indications- Bradycardias Organophosphate Poisonings.

Contraindications Tachycardias, 3rd degree, Pregnancy, CHF, hyperthyroidism, COPD, hepatic disease.

Side Effects- Dries secretions, Tachycardia, Headache, PVC

Pregnancy Class- C

Onset of action- 1-5 mins

Peak Action 2-4 mins

Duration of action- 20-30mins

Calcium Chloride

Dose- 1gm SLOW give over 2 mins

Pediatric 0.2mg/kg of 10% (max of 1g)

Drug Class-Electrolye

Indications-Hypocalcaemia, Calcium Channel blocker overdose, Hyperkalemia, Hypermagnesemia

Contraindications- Hypercalcemia
DO NOT MIX WITH SODIUM BICARB.

Side effects- Pain, Necrosis with infiltration,

Pregnancy Class- C

Onset of Action- Less than 5mins

Peak action 5mins

Duration Of Action-30-60 mins

Dextrose 10%

Dose-25g/250ml over 10mins

Pediatric 5ml/kg Slow (max 250ml)

Drug Class-Hyperglycemic Agent

Indications-hypoglycemia

Contraindications-hyperglycemia

Side effects- Possible necrosis if infiltration

Pregnancy Class- None noted

Onset of Action-1-3 minutes

Peak action 5 mins

Duration Of Action-20-30 minutes

Dextrose 25%

Dose-4mg/kg

Drug Class-Hyperglycemic Agent

Indications-Hypoglycemia

Contraindications-Hyperglycemia

Side effects- Hyperglycemia, Possible Necrosis with infiltration

Pregnancy Class-None

Onset of Action 1-3 minutes

Peak action 5mins

Duration Of Action- 20-30 minutes

Dextrose 50%

Dose-25g in 50ml

Pediatric- 2ml/kg

Drug Class-Hyperglycemic agent

Indications-Hypoglycemia

Contraindications-Hyperglycemia

Side effects- Hyperglycemia, Possible necrosis

Pregnancy Class-None

Onset of Action 1-3 Minutes

Peak action 5mins

Duration Of Action- 20-30 minutes

Diphendhydramine

Dose- 25mg-50mg

Pediatric- 0.5mg/kg (max 50mg)

Drug Class- Antihistamine

Indications-Allergic reaction.

Contraindications-

Side effects- DIzzy, Drowsy, Hypotension, dry mouth, Tachycardia, blurred vision.

Pregnancy Class-

Onset of Action- 2-3 mins

Peak Effect 60-90 Mins

Duration Of Action- 240mins

Epinephrine 1:1,000

Dose-0.3mg

Pedatric 0.01mg/kg (Max 0.3mg)

Drug Class-Sympathomimetic

Indications-Anaphylaxis

Contraindications- None

Side effects- Tachycardia. Tremors Anxiety, Palpitations

Pregnancy Class-C

Onset of Action-1-2 mins

Peak action 5mins

Duration Of Action- 10mins

Epinephrine 1:10,000

Dose- 1mg

Pediatric 0.01mg/kg

Drug Class- Sympathomimetic

Indications- Cardiac arrest

Contraindications- none

Side effects-Tremors, Tachycardia, Dysrhythmia, Hypertension.

Pregnancy Class- C

Onset of Action-1-2 mins

Peak action 3mins

Duration Of Action- 5mins

Racemic Epinephrine

Dose- 0.5ml of 2.25% with 4.5ml of 0.9% Normal saline

Drug Class-Sympathomimetic agents

Indications- Croup, Broncholitis

Contraindications- Cardiac issues.

Side effects- Pain with inhalation.

Pregnancy Class- No data

Onset of Action 1-5min

Peak 10mins

Duration Of Action- 1-3hours

Fentanyl

Dose- Up to 1 mcg/kg PRN every 5 min max 300 mcg

Pediatric 1 mcg/kg

Drug Class-Opiate

Indications-Pain

Contraindications-Sensitivity. Caution with potentiation of other narcotics. Altered mental status

Side effects-Respiratory depression, Nausea/vomiting.

Pregnancy Class-C

Onset of Action 3-5mins

Peak action 10 mins

Duration Of Action- 30-60mins

Glucagon

Dose-1mg im Beta blocker 3mg IVP

Pedatric 0.5mg IM Beta Blocker 0.05mg/kg IV (Max 3mg)

Drug Class-Glycogenolytic Agents

Indications- Hypoglycemia Beta Blocker Overdose

Contraindications-Liver deficiency

Side effects- hyperglycemia

Pregnancy Class-C

Onset of Action- 8-10 minutes IM

IV 1minute

Peak effect 10mins

Duration Of Action- 22-25 minutes

Oral Glucose

Dose-15g

Drug Class- Glucose

Indications-Hypoglycemia

Contraindications- Unconcoiusness. Hyperlgycemia

Side effects-Nausea vomiting.

Pregnancy Class-C+

Onset of Action 10mins

Duration Of Action- 1 hour

Ipratopium Bromide

Dose-0.5mg

Drug Class-Anticholinergic, Parasympatholytic

Indications-Respiratory distress Wheezing,COPD Bronchoconstriction

Contraindications-Hypersensitivity

Side effects- Cough Headache, Dizziness, Palpitations

Pregnancy Class-C

Onset of Action 15-30 minutes

Duration Of Action-1 hour

Ketorolac (Toradol

Dose- 15mg IV or 30mg IM

Drug Class-NSAID

Indications-Mild to Moderate Pain

Contraindications- 1st trimester pregnancy GI Bleed. PUD, Renal Insufficiency. Head bleed.

Side effects- Headache Dizziness Nausea

Pregnancy Class-D

Onset of Action 15-30mins

Time to Peak after onset 5mins

Duration Of Action- 4 to 6 hours

Ketamine

Dose- 300mg >50kg and <50kg 150mg

Drug Class- NMDA receptor Antagonist

Indications- Sedation for Combative patients.

Contraindications- hypertension

Side effects-Laryngospasm, Excessive Secretions ,

Pregnancy Class-

Onset of Action 2 minutes

Peak After Onest 3 minutes

Duration Of Action- 12 to 25 minutes

Lidocaine

Dose- 2ml. (Prime all tubing)

Drug Class- anesthetic

Indications- Pain from IO infusion.

Contraindications-Bradycardia.

Side effects- Drowsiness, Confusion, Seizures, Hypotension

Pregnancy Class- B

Onset of Action 30-60 seconds

Peak effect 1 minute

Duration Of Action- 10mins

Magnesium Sulfate

Dose- Asthma 2g over 20 minutes

Eclampsia 2g over 2 minutes

Seizures 2g over 2 Minutes

VF 2g over 2 minutes

Drug Class- electrolyte

Indications- Status Asthmaticus, Pre-Eclampsia, Eclampsia Alcoholic Seizures, Refractory VF/VT.

Contraindications- Profuse Heart Disease.

Side effects-CNS depression, Respiratory depression . Hypotension, Vasodilation. Painful administration

Pregnancy Class-C

Onset of Action- Immediate

Duration Of Action- 30 minutes

Methylprednisolone

Dose-125mg IV/IM

Drug Class- Glucocorticoids

Indications- COPD, Asthma, Allergic Reaction

Contraindications- Hypersensitivity

Side effects- Nausea, Sweating Dizziness

Pregnancy Class-C

Onset of Action 1 Hour

Duration Of Action- 6 hours

Midazolam (Versed)

Dose-(5mg >50kg) (2.5mg <50kg)

Drug Class-Benzodiazepine

Indications-Sedation, Seizures

Contraindications- Alcohol use, drug use, hypotension, shock.

Side effects- Hypotension,

Pregnancy Class-D

Onset of Action- 1 minute

Peak effect- 3-5 minutes

Duration Of Action- 1 hour to 2 hour.

Narcan

Dose-0.4mg repeat until you have maintained respirations.

2mg IN/IM

Drug Class-opiate antagonist

Indications- Opiate overdose.

Contraindications- DO NOT SLAM

Side effects- Seizures, Acute Withdraw, Vomiting, Nausea

Pregnancy Class-C

Onset of Action 2 minutes

Peak effect immediate

Duration Of Action- 60mins

Nitroglycerin

Dose- 0.4mg Sublingual

Drug Class-Vasodilator

Indications-Angina. Left Sided CHF.

Contraindications- Hypotension.
Caution with right sided MI.

Side effects- Hypotension, Headache.

Pregnancy Class-C

Onset of Action- 2mins

Peak effect 3 mins

Duration Of Action- 5 mins

Norepinephrine

Dose- 8mg/250ml 2mcg/min-4mcg/min. If on pump go up by 2.5mcg/min until a MAP >65 MAX MAx of 30mcg//min

Drug Class- Sympathomimetic

Indications-Hypotension, Septic Shock, Cardiogenic shock,

Contraindications-Hypovolemia, Traumatic Shock.**ANY ACUTE HYPOTENSION CAUSE BY BLOOD LOSS.**

Side effects-Pallor, Palpitations. Headache, anxiety.

Pregnancy Class-C

Onset of Action-Immediate

Duration Of Action- 3mins

Ondansetron (Zofran

Dose- 4mg-8mg

Pediatric <50kg 0.1mg/kg

Drug Class- Antiemetic

Indications-Nausea Vomiting

Contraindications- Hypersensitivity. Long QT Intervals

Side effects-Headache, Sedation, Constipation.

Pregnancy Class-D

Onset of Action- Immediate

Peak effect-10 minutes

Duration Of Action- 4 hours

Prednisone

Dose-50-60mg

Drug Class-Corticosteroids

Indications-Dyspnea, Asthma
COPD, Allergic Reaction.

Contraindications- Hypersensitivity,
Caution with GI bleeds

Side effects- Nausea, Sweating,
Dizziness, Insomnia

Pregnancy Class-D

Onset of Action-2 hours

Duration Of Action-3 Hours

Sodium Bicarb 8.4%

Dose-1meq/kg

Drug Class-Electrolyte

Indications- Metabolic Acidosis Cardiac Arrest. Tricyclic Antidepressants overdose with dysrhythmias

Contraindications- DO NO MIX WITH EPI and Calcium

Side effects-Headache,

Pregnancy Class-C

Onset of Action- Rapid

Peak- Immediate

Duration Of Action- 8-10mins

References

Common Drips for Transfers

Some of these medications are weight based. Make note of the weight that is in the pump prior to leaving the facility.

Epinephrine 4mg/250ml 5mcg/min titrate 5mcg/min every 2 mins until goals met. Max 30mcg/min

Norepinephrine 5mcg/min every 2 min until goal met. Max 50mcg/min

Versed 2mg/hr increase by 1mg/hr Q1hr to achieve goal. Max of 10mg/hr

Propofol-1000mg/100ml. 10mcg/kg/min. (Max of 50mcg/kg/min.)

Nicardipine- 25mg/250ml increase 2.5mg/hr PRN 10-15mins (Max of 15mg/hr

Nitrolgycerin Initiate 10mcg/min Increase by 10mcg/min PRN 3-5min (Max dose of 200mcg/min).

TXA

Dose-1g/100ml over 10 mins

Pediatric-15mg/kg/100ml over 10 mins

Drug Class- Antifibrinolytics

Indications -Epistaxis, Suspected significant uncontrolled internal hemorrhage.Hemophilia with trauma

Contraindications-Injury occurred greater than 3 hours.Allergy

Side Effects- Nausea,Vomiting, Thrombosis

Pregnancy Class-C

Onset of Action-Immediate

Peak after Onset- 20mins

Duration- 2 to 15 hours

Nicardipine

Dose- 25mg/250ml 5mg/hr titrate by 2.5mg/hr every 5-15min (max 15mg/hr)

Drug Class-Calcium Channel Blocker

Indications -Acute Hypertension

Contraindications-

Side effects-Dizziness, Flushing, Peripheral Edema

Pregnancy Class-C

Onset of Action-Immediate

Peak after onset-Immediate

Duration- 30mins

Propofol

Dose-1000mg/100ml. 10mcg/kg/min. (Max of 75mcg/kg/min.) (IV PUSH 0.5mg/kg)

Drug Class-General Anesthetic

Indications-Sedation

Contraindications-Hypersensitivity to soybean oil, egg, or egg products..Pregnancy.

Side Effects-Hypotension bradycardia, respiratory depression cardiac depression

Pregnancy Class-B

Onset of Action-immediate

Peak after Onset-immediate

Duration b -5-10mins

Cefazolin (Ancef)

Dose - 2g/100ml 30/min. Piggy back to 500ml NS

Drug Class - Cephalosporin Antibiotic

Indications - Open Fracture

Contraindications - Allergic reaction to Cephalosporins

Side Effects - Nausea, Headache

Pregnancy Class - B

Onset of Action - Immediate to 24 hours

Peak after Onset - 1 Hour

Duration - 30 minutes with every 6, 8 or 12 hours after initial.