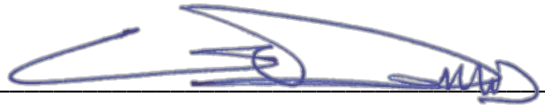
Rice University

Emergency Medical Services

Protocols

Protocols valid as of August 2025



Dr. Cameron Decker
Rice EMS Medical Director

08/14/2025

Date

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Preface

Patients, EMS providers, and EMS physicians supporting all aspects of EMS through clinical leadership all deserve the finest clinical treatment protocols available. This set of clinical guidelines has been written to guide Rice University EMS providers in offering quality prehospital care.

EMS professionals should never perform emergency medical care outside of their individual scope of practice established by professional medical training, certification/licensure, and medical oversight physician authorization. When encountering patient conditions requiring care unspecified in these clinical guidelines, seek appropriate direction from on-line medical control, always delivering care with prudence and reasonable regard for safety of the patient, peers, and the public.

General Rules for Following the Clinical Guidelines

1. Clinical guidelines may overlap with one another. In this situation, treat the most life- or limb-threatening problem first. If that is unknown, treat the most likely underlying problem first.
2. When the indicated treatment changes from one guideline to another guideline, do not administer more than the maximum total dose of a medication.
3. Some guidelines and drug dosage ranges are taught as absolutes. However, provider judgment based on individual patient conditions must also be used in determining appropriate patient care. For any case where deviation from the guideline seems like an appropriate course of action, medical command contact with a physician medical director should be made.
4. Any licensed medical personnel who orders procedures beyond the scope of these clinical guidelines must accompany the patient during transport to the hospital.

Specific medical devices are occasionally utilized to illustrate one method of care performance in several protocols. Rice University EMS does NOT exclusively endorse these devices for use. Devices may change and/or be updated due to product availability.

When possible, medication alternatives are indicated in the clinical guidelines in light of current and anticipated future medication supply shortages affecting EMS systems throughout the United States.

It is the sincere hope that these clinical guidelines will guide Rice University EMS professionals in achieving the best clinical outcome possible for each and every patient receiving their dedicated care.

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Authorization Level

The following represents the patient care activities that are authorized to be performed by personnel as stated in the clinical guidelines. All BLS activities are authorized in a standing order to be used as needed. Authorization for ALS activities is indicated in the clinical guideline or procedure document for each intervention. The Medical Director(s), the EMS Director, and current Rice EMS advanced level preceptors have the authority to delegate beyond the guidelines for advanced level students as needed to directly supervise clinical skills performed within the scope of a provider's certification and/or currently enrolled training level.

Emergency Medical Technician

Oxygen Administration
Use or oral and nasal airway adjuncts
Basic Cardiac Life Support
Vital Signs
Bandaging and Splinting
Cervical Spine Immobilization
Patient Assessment
Airway maintenance & ventilation
Blood glucose determination
Administration of a patient's Epi-pen© or Epi-pen Jr. © with patient Rx

Administration of medications with approval of an Incharge:

- Oral Glucose
- Aspirin (ASA)
- Albuterol
- Hydrocortisone Topical Cream
- QuikClot

Administration of medication with approval of medical command:

- IM Epinephrine

Advanced Emergency Medical Technician

All EMT Skills

IV access (except EJ unless supervised by a Paramedic)
Advanced Airway Device – AirQ SP3G (with approval by an Incharge)
Administration of medications with approval of an Incharge:

- IV Dextrose
- IV/IN Naloxone
- IM/IV Diphenhydramine
- IV Methylprednisolone
- IM Glucagon
- PO Loratadine

Incharge Level Providers

All Advanced EMT Skills

Administration of PR Medications
Intraosseous infusion
IV administration of Epinephrine in cardiac arrest
Administration of Epinephrine for anaphylaxis without Rx
Administration of IV Ondansetron with approval by medical command
Advanced airway management by endotracheal intubation if individually credentialed
End-Tidal capnography monitoring
Cardiac Monitoring: 3 & 12-Lead ECG acquisition

Paramedic / Incharge Level Providers

All Incharge Level Skills

Administration of IV Medications

- Adenosine
- Amiodarone
- Atropine
- Calcium Chloride
- Diltiazem
- Sodium Bicarbonate

Cardiac Monitoring including external pacing, synchronized cardioversion, and defibrillation
IV Access – External Jugular
SL Nitroglycerin

Medical Director's Signature: _____ Date: 08/14/2025

Infectious Disease Precaution Recommendations

Rice University Emergency Medical Services Clinical Guidelines

In the course of EMS care of a patient (from time of emergency services request through transport of the patient to the destination location), EMS professionals should be informed, aware, and proactive regarding practices that reduce their exposure to infectious diseases, with a goal of preventing transmission of those infectious diseases to and/or through EMS professionals.

The following recommendations are general guidelines that will assist in reducing exposure to infectious diseases in the commission of EMS treatment of patients.

- Follow immunization recommendations from Centers for Disease Control Advisory Committee on Immunization Practices (ACIP) (e.g., Hepatitis B and Flu vaccinations)
- Always be prepared for isolation from body substances (blood, respiratory secretions, sputum, saliva, emesis, fecal matter).
- Wear examination gloves and eye protection during patient care activities.
- If patient conditions tolerate, reduce exposure of suspected infectious respiratory droplets by covering the patient's nose and mouth in oxygen administration (e.g., non-rebreather mask)
- or with a face mask (e.g., surgical type face mask) if oxygen administration is not required.
- When providing airway assessment and management, maximize the functional distance between the patient's nose and mouth and the EMS professional's nose and mouth. The greater the possible distance, the lesser the risk of respiratory illness transmission.
- Wear appropriate body substance isolation (eye splash protection, mask over nose/mouth, gloves as previously noted, gown to protect personal uniform contamination) as patient suspected illness/injury may dictate.
- During treatment of the patient, avoid likely trajectories of bleeding, coughing, spitting, vomiting, defecating whenever possible.
- Exercise extremely diligent action when handling or around the handling of contaminated sharps (e.g., IV/IO needles, needle/syringe, glucometer lancets) and have appropriate sharps container readily present. Full sharps containers should be disposed of at the infectious waste collection area on campus, at the back dock of George R. Brown Hall.
- For all exposures, wash exposed area(s) as soon as possible with copious irrigation and/or antibacterial solution approved for that area(s) use.
- **In the event of exposure, follow general principles as listed in Post-Exposure Prophylaxis Recommendations. Do not delay in reporting and seeking treatment for an infectious disease/body substance exposure of concern.**

Hand washing with soap and water should be done by all patient care providers after each call.

Cleaning supplies are available in EMS responder vehicles, at RUPD, and at the Duncan EMS room. Patient care equipment should be cleaned after every call, with particular attention to frequently used items such as vital signs equipment, clipboards, and radios. Contact the Operations Lieutenant for any needed cleaning supplies.

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Post-Exposure Prophylaxis Recommendations

Rice University Emergency Medical Services Clinical Guidelines

Preventing an exposure is always better than the "cure" for an exposure. Despite careful practices, EMS professionals can experience at least one concerning infectious disease exposure in a career.

The following recommendations are general guidelines that can assist in post-exposure evaluation and PEP care:

- Wash exposed area(s) as soon as possible with copious irrigation and/or antibacterial solution approved for that area(s) use.

- Gather as much information about the exposure of concern as possible – what body substance (e.g., blood, saliva), what route of exposure, timing/amount of exposure, patient demographics, and any related infectious disease medical history of the patient (e.g., known HIV or Hepatitis C?).

- Do not delay in reporting and seeking treatment for an infectious disease/body substance exposure of concern. Regardless of time of day or day or week, seek direction from the appropriate EMS supervisor. Contact the InCharge present on the call, the EMS Captain or Senior Lieutenant, and/or the EMS Director immediately after the patient's care can be transferred to other healthcare providers. Rice EMS Medical Command will be consulted for appropriate follow up care.

- Time to treatment (in hours) is of the essence to reduce transmission of infectious disease.

- Additional information on PEP care can be obtained at the following website: ***http://nccc.ucsf.edu/clinician-consultation/pep-post-exposure-prophylaxis/***

- Complete a **First Report of Injury/Illness form**, located on the Rice University Risk Management website. This form should be returned to the EMS Director.

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Informed Patient Consent & Refusal

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Refusal = when competent patient refuses treatment and/or transport to advanced health care facility after being informed of suspected medical condition, type of treatment rendered and consequences and possible risks of treatment and refusal of treatment or transport
- Mental capacity of adult (>18 years old) patient. Capacity should be noted to include the following:
  - Ability to communicate a choice concerning medical evaluation, treatment and/or transport
  - Ability to understand relevant information about treatment/plan
  - Ability to appreciate the significance of the information in this circumstance, by communicating understanding of risks and benefits
  - Ability to use reasoning to select a choice
- (Pediatric) Mental competence of adult (>18 years old) caretaker as defined above

General

- All personnel must have consent (either implied or informed) before treating a patient.
- Any adult of mental capacity or guardian may either consent to or refuse treatment/transport for themselves (adult) or patient for whom they are responsible (pediatric)
- Any police officer may order treatment or transportation of any prisoner in their custody
- Any patient may be transported against their will if the EMT has court order for patient to receive treatment or if the patient is in the custody of a law enforcement officer.
- Mentally incompetent patient or patients without the capacity to refuse
  - Patients can be considered by either courts or by definition of policy may be treated under implied consent. If patient refuses to be treated/transported, RUPD may be notified to safely restrain patient.
- Refusal
  - Any competent adult has the right to refuse treatment, even if that lack of treatment may result in death.
  - Any patient refusing treatment or transport shall be informed of the possible consequences of that refusal and shall sign a refusal form.
  - Individuals other than REMS personnel should sign as a witness the patient's refusal, if possible.
  - Any EMT who does not feel comfortable with a patient refusing treatment or transport because the EMT feels that the refusal may result in death or serious injury shall contact the EMS Director and/or an EMS Medical Director.

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Implied consent: the assumption that, in a true emergency where a patient who is unresponsive or unable to make a rational decision is at significant risk of death, disability, or deterioration of condition, that patient would agree to emergency treatment.

Informed consent: consent for treatment that is given by a competent patient based on a full disclosure of possible risks and benefits.

Prehospital Emergency Care, 10th Edition. Mistovich, Joseph J. Pearson Education, © 2014.

All patients that REMS providers meet for an EMS call will be offered evaluation and transport to the emergency room. For patients who choose not to go to the emergency room by ambulance, a refusal form must be signed. This should be signed by the patient in most cases.

Exceptions:

- If the patient is less than 18 years old, the patient's parent or guardian may sign on their behalf if they are present on scene. If there is no parent or guardian on scene, the EMS provider should make a reasonable attempt to contact a parent or guardian on the phone to verify consent and refusal. If no parent or guardian is available on scene or on the phone, RUPD or a University official such as a College Master, Resident Assistant, or Athletics personnel such as a coach or trainer may be asked to sign on the minor's behalf. In the case that no one is willing to sign on the minor's behalf, Medical Command should be contacted for direction.

RICE UNIVERSITY
Emergency Medical Services

PAGE ___ OF ___

DATE	RUN NO:	PATIENT NAME

RELEASE OF LIABILITY – REFUSAL OF SPECIFIC INTERVENTIONS

By initialling next to the interventions listed below, I indicate that I fully relinquish **all liability** by refusal of those interventions. I understand that this does not preclude alternative interventions, further treatment / evaluation, or transport to an emergency room or other appropriate medical facility.

PT INITIAL	INTERVENTION	PT INITIAL	INTERVENTION
PT INITIAL	INTERVENTION	PT INITIAL	INTERVENTION
PT INITIAL	INTERVENTION	PT INITIAL	INTERVENTION

REFUSAL CHECKLIST

Pt oriented to: ☐ Person ☐ Place ☐ Time ☐ Event ☐ No evidence of altered mental status ☐ No evidence of head injury ☐ No evidence / suspicion of alcohol / drug ingestion

☐ Medical control / superior contacted via: ☐ Authorized refusal AMA of treatment or transport ☐ Authorized use of restraints or force

☐ Pt advised treatment / evaluation needed ☐ Pt advised transport needed ☐ Pt advised of dangers of refusing treatment / transport ☐ Pt advised of dangers of not using ambulance transport

RELEASE OF LIABILITY – INFORMATION FOR THE PATIENT

This form has been given to you because you have refused treatment and/or transport by Rice University Emergency Medical Services (REMS). Your health and safety are our primary concern. Even though you are electing to refuse treatment and/or transport, please remember the following:

PT INITIAL	
PT INITIAL	The evaluation and/or treatment provided to you by REMS is not a substitute for evaluation and treatment by a doctor. We advise you to get medical evaluation and treatment.
PT INITIAL	Your condition may not seem as bad to you as it actually is. Without treatment, your condition or problem could become worse. If you are planning to get medical treatment, a decision to refuse treatment by REMS or transport by ambulance may result in a delay which could make your problem or condition worse.
PT INITIAL	Medical evaluation and/or treatment may be obtained by calling your doctor, if you have one, or by going to any hospital emergency room in this area, all of which are staffed 24 hours a day by Emergency Physicians. You may be seen at these emergency rooms without an appointment.
PT INITIAL	If you change your mind or your condition becomes worse and you decide to accept treatment by REMS and/or transport by ambulance, please do not hesitate to call us back, by dialing 713-348-6000. We will do our best to help you.
PT INITIAL	Don't wait! When medical treatment is needed, it's usually better to get it right away.

After reading and initialing the above information, read initial, and sign the specific releases indicated by the Emergency Medical Technician. A copy of this form will be provided to you for you records.

RELEASE OF LIABILITY – REFUSAL OF EMERGENCY MEDICAL ASSISTANCE OR AMBULANCE TRANSPORT

PT INITIAL		
PT INITIAL	I fully understand my medical condition as it has been explained to me by the Emergency Medical Technician, and I fully relinquish **all liability** by refusal of ambulance transportation to a medical facility for further evaluation by a physician.	
PT INITIAL	I fully understand and assume **total responsibility** for my medical condition by not allowing the Emergency Medical Technician to examine me / treat me / transport me to a medical facility for further evaluation by a physician.	*RMA*
PT INITIAL	Additionally, I understand that my refusal of examination, treatment, and/or transport is **against the medical advice** of the Emergency Medical Technician.	*AMA*
PT INITIAL	Additionally, I will seek the advice of a medical doctor at a later time.	*MD*
PT INITIAL	Additionally, I will go to the emergency room or other appropriate medical facility in a private vehicle.	*POV*
PT INITIAL	Additionally, I consent to a non-medical escort to the emergency room or other appropriate medical facility by the Rice University Police Department.	*RUPD*
PT INITIAL	I consent to the release, as deemed necessary by the REMS In-Charge, of my name and information related to my illness or injury to the necessary parties, as listed below, for the purposes of follow-up care, advice, and completion of illness or injury reporting paperwork. Information released to:	*RELEASE*
PT INITIAL	Additionally, by signing this release in lieu of the patient, I assume custody and full responsibility for this patient. Relation of custodian to patient:	*CUSTODY*

PATIENT NAME (PRINT)	PATIENT SIGNATURE	DATE
CUSTODIAN NAME (PRINT)	CUSTODIAN SIGNATURE	DATE
WITNESS NAME (PRINT)	WITNESS SIGNATURE	DATE

The possibility of medical complications has been explained to this patient, and said patient attests he / she understands what has been explained. Said patient refuses to accept further evaluation, treatment, and/or transport to a medical facility for evaluation by a physician, and refuses to sign the Release of Liability.

EMT NAME (PRINT)	EMT SIGNATURE	EMT DOB	DATE
WITNESS NAME (PRINT)	WITNESS SIGNATURE	WITNESS DOB	DATE

PATIENT ___ OF ___

- A patient must be awake and alert, with a reasonable understanding of what the form states, to qualify to sign the refusal form. The EMS provider should review the information on the form

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with the patient, and then ask to check the patient understands what they are signing. Patients who are unable to understand the form, recall the information on the form, and/or who are physically unable to sign the form, should be reevaluated for competency.

- A patient who has a physical injury to an arm or hand that would make signing painful or difficult may choose to not sign the form. RUPD or a University Official should be requested to witness the patient's acknowledgement of the refusal of ambulance transport.
- In the case of a patient who refuses to sign the form, RUPD or a University Official should be requested to respond to the scene to witness that EMS offered treatment and/or transport, but the patient refused these options, and refused to sign the form.

Patients should also be requested to sign the refusal form for refusal of specific interventions. A patient with neck pain may elect to not have a cervical collar applied, for instance, and should sign the form indicating they accept liability for this action.

Multiple Patient Scenes / Mass Casualty Events

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Definitions

- A multiple patient scene involves multiple patients on scene, but not more patients than can be managed by the EMS resources available on campus.
- A mass casualty event involves multiple patients than cannot be managed by the EMS resources available on campus.
- A victim is a person involved in an incident that does not require or request medical attention, and no apparent injuries are identified.
- A patient is a person involved in an incident that either requires or requests medical evaluation, treatment, or transport. A person with an obvious injury or ailment that refuses EMS care or evaluation is still considered a patient.

General

Incident command at these scenes will be assigned according to the National Incident Management System (NIMS) guidelines and a unified command team consisting of representatives of police, fire and EMS should be rapidly assigned and coordinated to ensure safe, efficient and effective operations.

Below please find a general outline of NIMS guidelines for mass casualty events, focused on the medical branch tasks. As a small agency. REMS will almost always need to call for additional assistance from Houston Fire Department for any large-scale emergency event. Familiarization with campus, and an ability to bridge communications between campus resources and Houston resources will likely be the most productive role that REMS staff can fill in a large-scale emergency event. See the REMS specific notes on the side of the page for practical tips.

Scene Tasks:

1. Initial Size-up Actions:
    a. Park initial arriving apparatus in safe location a short distance away from the incident.

REMS – request additional assistance page from Dispatch.

2. Advise dispatch:
    a. Incident location (if different from initial dispatch)
    b. Incident type (transportation accident, fire, etc. if different from initial dispatch)
    c. The estimated number of patients.
    d. What additional resources are needed and how many are requested.
    e. Any hazardous conditions (weather, electrical, structural, toxic chemicals, etc.).
    f. Identify a “HOT ZONE” or ”Immediate Danger Zone,” if applicable
    g. Best route & access to scene (if appropriate)
    h. Staging area location (if staging indicated).
3. Check in with Incident Command staff to determine your ICS role. The medical treatment and transport of injured patients will normally be done through the position of Medical

Branch Director and subordinate positions headed by Group Supervisors. However, the Incident Commander will determine which positions, if any, they feel needs to be filled.

All information about the incident should be treated as Protected Health Information (number of patients, type of incident, hospital destinations)

- For all large-scale incidents at Rice, the University's Public Affairs Staff will serve as the Public Information Officer(s) and will release information about the incident to the press/public after consulting with Incident command staff.

REMS – forward important information on scene via the InCharge or EMS Director to the Command Staff.

Specific Roles and Responsibilities:

- **Medical Branch Director**
  - Reports to the Operations Section Chief.
  - Establishes the Triage, Treatment, and Transportation Areas (if indicated) and assigns individuals to the role of Group Supervisors (or Officers) for each area.
  - Maintains adequate span of control within Medical Branch
  - Establish appropriate EMS communications with appropriate response elements (i.e. Staging, logistics)
  - Establish and maintain communications with assigned Group Supervisors (Officers)
  - Oversee the triage, treatment, transportation and accountability of patients created by the incident.
  - Monitors the potential or actual effect of the incident on the existing medical infrastructure and communicates such with the Operations Section Chief
  - Determines resource requirements to meet the medical needs of the incident and communicates needs to the Operations Section Chief or designated response element.
  - Determines the need for specialized medical resources and processes requests for such elements through appropriate channels.
  - Provides situation updates and reports to the Operations Section Chief

REMS – contact a medical director to advise of campus situation. Ask for their availability for future phone calls as needed throughout the incident.

REMS – consider scope of event & weather. Will additional trash cans be needed? Drinking water? Contact campus resources via dispatch to request support in these areas

REMS – Some large-scale Rice Events have preplanned MCI plans including staging, ingress/egress routes, and maps.

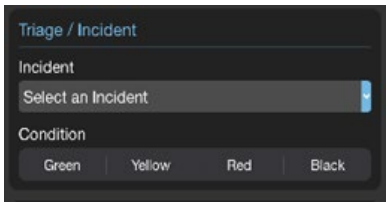
REMS – find a place to highlight and copy campus maps for EMS transport personnel, showing the most direct route to TMC hospitals from treatment area.

- **Group Supervisor (Officer):**
  - Establishes Area to perform assigned tasks
  - Determine resource and staffing needs for Area of responsibility and communicates needs to Medical Branch Director
  - Provides situational updates and reports to the Medical Branch Director
  - Establish communications with the Medical Branch Directors and other needed response elements.
  - Monitors safety and welfare of patients and assigned personnel
  - Ensures patient tracking and accountability of injured patients in assigned area.

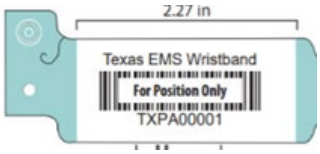
Tasks during a Mass Casualty Incident:

Triage Area:

- The Initial triage of patient should begin where the incident occurred, unless a hazard or other situation indicates the scene is no longer safe.
  - For scenes with hazards or safety concerns, a Casualty Collection Point should be established at a safe location nearby, outside of the designated "HOT ZONE."
- During the triage phase, no treatment is performed. In order to efficiently and effectively treat the casualties, you must ensure you know how many patients require treatment.
- **Every victim or patient within an incident will be tagged with a Texas EMS Wristband and logged into the Rice EMS patient tracking software, Pulsara®.** Pulsara® will be used to track all individuals associated with the incident.
  - A Texas EMS wristband will be placed on the patient's extremity (Left arm preferred)
  - The patient's name, date of birth, and primary injury will be documented.
  - The patient's wristband number will be entered manually or scanned using the barcode scanner.
  - The patient will be added to the incident in Pulsara®



  - The patient will be triaged, and their acuity ("Condition") will be logged into Pulsara®.
    - No Color / Unmarked: A victim that DOES NOT require medical assistance
    - **Green:** Patients with minor injuries who can walk and follow commands
    - **Yellow:** Patients who are unable to walk, but are able to follow commands
    - **Red:** Patients with life threatening injuries including altered mental status, RR ≥ 30, delayed Cap refill, or absent radial pulses
    - **Black:** Patients who are deceased or have injuries that will not sustain life
    - Link to START Triage Algorithm (Adult) and JUMPStart Algorithm (Pediatric)



  - After the above steps have been completed, select CREATE at the bottom of the page and continue to the next patient.
    - The CREATE button must be selected as soon as possible in order to allow others to begin documenting on the same patient channel.

- Pulsara® will monitor and track the amount of patients and the number of patients in each category in real time. This information will be monitored by the Triage Group Supervisor (Officer), Medical Branch Director, and Command Staff.
    - In the event of catastrophic failure of the communications network and Pulsara® cannot be utilized, a wristband will be attached to the patient's extremity and their triage color will be written on their extremity, or a color-coded wristband or tape may be used.
- Once established, each patient will be directed to the Treatment area based on their acuity.
    - Ambulatory patients will be instructed to walk to the GREEN treatment area.
    - Use discretion in allowing GREEN patients to assist in caring for critical patients while those more serious casualties are awaiting extrication to the treatment areas.
- Repeat the triage process when possible and note changes in any patient's condition.
    - Perform a more detailed assessment, provide treatment, and update colored ribbon as appropriate while casualties are being extricated to the Treatment Area.
    - If a victim becomes a patient, select their appropriate Condition (Green, Yellow, Red) on their Patient Channel in Pulsara®

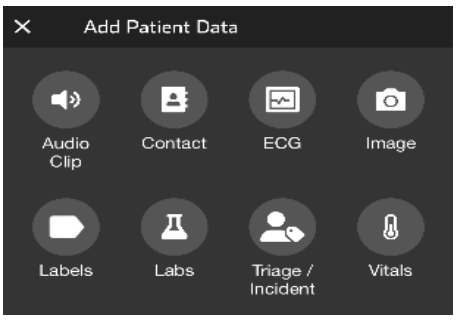
Treatment Area:

- Establish a treatment area in consultation with the Medical Branch Director regarding location.
    - Identify a large enough space to allow adequate room to triage, treat, and move casualties.
    - Ensure the location promotes relative ease of ambulance loading and egress.
- Request, assign, utilize, and oversee appropriate clinical personnel caring for patients.
    - Assemble into crews of at least 2 personnel and use backboards and stair-chairs to package and extricate triaged casualties into the Red, Yellow, and Green treatment areas. Patients who have been marked deceased (Black) should not be moved into the treatment area.
    - The Treatment Sector Officer may choose to have separate personnel perform treatment once inside the Treatment Area, if available.
    - All persons involved in the incident triaged Green are to be kept in the Green Treatment Area until thoroughly evaluated. These individuals will be released at an appropriate time by the Transport Group Supervisor (Officer).
        - Depending on the circumstances, the Green casualties may be transported early or in large groups using alternative transport means.

REMS – what additional supplies will be needed? Consider utilizing non-sworn RUPD personnel for assistance in bringing additional equipment, such as cots or special event bags, to the treatment area.

REMS – consider optimal staging & triage locations. Consider temperature-controlled locations, ideally two or three buildings away from incident.

- During the treatment phase, more patient information should be collected and logged into Pulsara®.
    - Use a *Flowchart Note* to document past medical history, current injuries / complaints, or any interventions (Medications or Skills)
    - Add a *Label* to identify the patient's affiliation (College, Visitor, Staff, or Unknown)
    - Add in *Vital signs* (A minimum of a GCS, Respiratory Rate, and Pulse should be documented)
    - Use the *Contact* Tab to document a patient's phone number and email (if able and time permits)
    - If available, Add in the patient's Rice ID, State ID, or DL into the *Images* tab.



    - It is acceptable and encouraged to include images of the patient and their injuries into Pulsara®. Pulsara® is HIPPA compliant.
- If a patient's condition worsens (e.g. Yellow to Red; Green to Yellow) inside the Treatment Area, update the patient's acuity within Pulsara® and move the patient to the appropriate location in the Treatment Area.
    - Changing the patient's acuity in Pulsara will notify the Operations and Command Staff of the change in condition.
    - Document the change in condition and time by adding a *Flowchart Note* into the patient's Pulsara channel.

Transportation Area:

- The Transportation Area will require the coordinated effort of several people to coordinate with the Staging and Treatment Groups, and to assist with the tracking and movement of patients.
- Outside agencies that utilize Pulsara® can obtain patient information by scanning the patient's Texas EMS Wristband.
- Establish a patient loading zone.
    - Consider a close proximity to the treatment area and how the ambulances will approach and exit the area.
    - Establish ambulance traffic routes that prevent ambulances from having to back-up to load patients or turn around to leave the area. This makes for safer and more efficient transport operations.

REMS – consider if non-ambulance transport would be of assistance for green category patients. Dispatch can contact Rice Transportation to request shuttle bus

- Consider establishing a secondary staging area.
    - A staging area allows additional ambulances to wait outside of the patient loading zone to prevent a backlog or traffic jam.
    - Work with the Staging Group Supervisor to ensure at least one ambulance is always in the loading zone.

- Ensure vehicle operators stay with their ambulances to ensure as soon as patients are loaded, the ambulance leaves.
- Communicate with Treatment Group Supervisor (Officer) when ambulances are available for transport. Each ambulance can only transport:
    - One RED patient with one YELLOW or GREEN patient
    - Two YELLOW patents
- Pulsara® will be used to track where the patient is being transported and by which EMS agency and unit. One to two people should be assigned to this task. Rice EMS will:
    - Select the transport destination for all patients being transported by HFD or City Ambulance.
        - Other outside agencies who are using the Pulsara® app may select their own transport destination
    - In the Chief Complaint box, the EMS Agency and Unit will be documented.
        - Ex: HFD A16 or HCEC M91
- Notify the Medical Branch Director when all patients have been cleared from the scene and transported. Maintain and secure records for the Medical Branch Director and secure the patient loading area.

Staging Area

- A Staging Group Supervisor (Officer) will oversee the establishment and operations of the staging area. The staging area may not be required for all incidents.
    - A staging area is a secondary location to temporarily store ("stage") additional resources until they are needed
    - Staging area should be large enough to contain numerous ambulances, fire apparatus, or transportation assets such as buses and vans.
    - The staging area should be far enough from the Treatment Area that units are not prevented from leaving the area or creating a traffic jam, but close enough to loading zone to allow for short drive times.
- Select and communicate a desired travel route for resources assigned to the Staging Area.
    - This route should allow for easy access but should take units away from the impacted area.
- The Staging Group Supervisor (Officer) should coordinate an orderly arrangement of arriving apparatus to allow for ease of ambulance ingress to the transport loading zone.
- The Staging Group Supervisor (Officer) or the officer's designee should maintain a log of available resources in the staging area and communicate with the Medical Branch Director the number of resource and if any more are required or have not yet arrived.
- The Staging Sector Officer or the officer's designee should assure ambulance or specialty transport crews stay with their assigned vehicles to ensure rapid availability of the asset when requested at the transport loading zone.
- Delivering equipment needed in the treatment sector that is requested from staging in an organized manor with the minimum number of personnel leaving the staging area to deliver this equipment.
    - Alternatively, all the requested equipment may be sent to the treatment area on one designated vehicle.

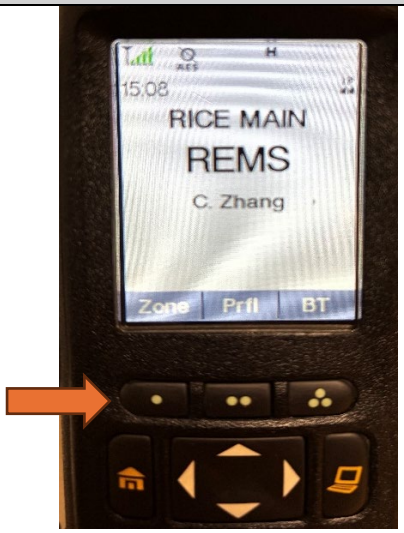
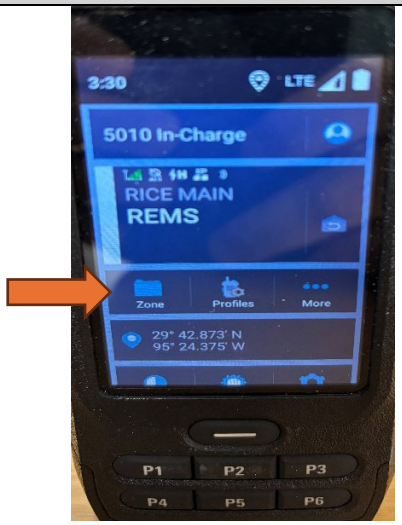
- Assign and deploy transportation assets to the loading zone(s) at the request of the Medical Branch Director or the Transportation Group Supervisor depending on the established communication pathways.

Mass Casualty Medical Communications

- Medical communications during a mass casualty incident, like all other incident communications, are of critical importance and often will determine the level of effectiveness and success of the operation. Basic communication principals should be used during an incident.
    - Use of interoperable radio channels so all agencies are able to communicate.
    - Following the overall incident communications plan established by the Incident Commander.
    - Establishing assigned, clear, and understood lines of communications, who will communicate with whom, for what reason, and by what method.
        - Use of multiple and redundant means of communications including, but limited to, radio, data, phone, runners, face-to-face, and even hand signals.
    - Preparation for communications failure and immediately switching over to one of the established redundant communication means.
    - Ensuring communications sent receive a response of some manner to ensure the loop has been closed.
- Medical communications from the scene of an MCI, depending on complexity and command structure, often involves up to three different levels of communications:
    - Communications (internal) with other Incident Command System elements
        - Operations Section Chief or designee(s)
        - Unified Command medical representatives
        - Logistics, Planning, Admin/Finance if appropriate
    - Communications (internal) within the scene medical response infrastructure (Triage, Treatment, Transportation, Staging Group Supervisors)
    - Communications (external) with local, county, or regional medical coordination entities
- After assigning support positions, one of the first activities of the Medical Branch Director should be to establish redundant communications pathways within the ICS structure, subordinate Group Supervisors (Officers), and other medical response elements by:
    - Obtaining the ICS Communication Plan (Incident Channels, etc.).
    - Determine reporting lines and redundant means of communication with Group Supervisors (Officers).
    - Establishing and communicating manner for all communications acknowledgments.
    - Establish communications via radio, e-mail, or phone with outside medical coordination entities
    - Advise the ICS infrastructure of communication pathways for incorporation into the updated ICS communication plan.

Harris County Mutual Aid Channels

- During large-scale events involving multiple agencies, the Incident Command Team may direct you to move to a designated regional mutual aid channel. These channels are referred to as "Harris County Mutual Aid" followed by a number. (Ex: HCMA #2)
    1. Change the Zone: Harris County Mutual Aid channels are on "Zone 76". On your radio, select ZONE and then navigate to "Zone 76"

APX 7000 (Old Radios)	APX N70 (New Radios)
	

    2. Change the Channel: Rotate the dial to the appropriate channel number.
    3. The ICS 205 Form (Radio Comms) will include a Zone and Channel number for any radio channels being utilized during an incident. Use this guide to find the channels.

MCI Equipment

- Rice EMS is currently carrying the Thomas Triage Packs
    - One pack can be found in the REMS Tahoe and the REMS Expedition
    - The packs include six colors of plastic ribbon. Each patient should receive a 6–8-inch ribbon with the appropriate color after being triaged.
    - Patient categories are:
        - Immediate (**RED**)
        - Delayed (**YELLOW**)
        - Minor (**GREEN**) – "Walking Wounded"
        - Deceased or Expectant (BLACK)

    - The pack also contains two additional color tape rolls for hazards:
        - **Orange** – a contaminated patient
        - **Blue** – patients have been treated with an antidote
    - **Patients will still need to be logged into Pulsara. This will not replace the online patient tracking.**

Patient Destination Determination

Rice University Emergency Medical Services Clinical Guidelines

General

Rice EMS is a First Responder Agency and does not provide transportation for patients. All patients are offered ambulance transportation, and for those who refuse ambulance transportation alternative destinations may be appropriate. As a general guideline:

- Undergraduate patients with a medical complaint such as flu, fever, cough/cold symptoms, abdominal pain, allergies/asthma, etc., may be seen at the Rice Health Services if appointments are available. Call Health Services (x4966) to ask about appointment availability.
- Urgent Care centers, such as AFC, can see patients with similar medical complaints to Rice Health Services. Any patient with a more serious medical complaint, or requiring specialist care and/or inpatient care, should be seen at an emergency department.
- University employees with minor work-related injuries can be seen at Nova Clinic with workers compensation. Risk Management should be notified if a patient seeks care at Nova Clinic.
- Off campus stand-alone emergency centers, such as Methodist Emergency Care Center, are equipped to handle any medical emergency. Any patient requiring specialist care, and/or inpatient care, would have to be transferred to another facility.
- Texas Medical Center has multiple hospital-based emergency departments.
    - Ben Taub, Memorial Hermann, and Texas Children's Hospital are Level I trauma centers, and can care for the most serious medical emergencies or traumatic injuries.
    - Methodist Hospital and St. Luke's Hospital are also neighboring emergency rooms capable of handling medical and traumatic injuries.

Specialty Care

Some patients may have a specific condition or injury that would be best treated at certain facilities. Patients with:

- Burn: Memorial Hermann is best equipped for any moderate or serious burns
- Chemical exposure: Memorial Hermann is best equipped for chemical exposure
- Dental emergency: generally, should be seen at a hospital-based emergency department
- Eye injury/condition: generally, should be seen at a hospital-based emergency department
- Psychiatric emergency: Ben Taub and Methodist Hospital are able to evaluate patients in the emergency department, and also offer inpatient psychiatric care
- Sexual assault: any emergency department in the TMC can provide specially trained nursing staff to care for patients who have experienced sexual assault.
    - Ben Taub has Sexual Assault Nurse Examiners (SANE) available at all times
    - Pediatric patients with suspected sexual assault should be evaluated at Texas Children's Hospital or Memorial Hermann.

Rice EMS does not endorse any particular health care facility.

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Rice University

Emergency Medical Services

Clinical Guidelines

Medical Assessment & Treatment

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Medical General Assessment: Adult and Pediatric

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Treatment Priorities

- Assessment
  - SCENE SAFETY
  - PROTECTIVE EQUIPMENT
  - Primary Survey
  - Secondary Survey (when appropriate)
- Primary Survey Care
  - Initiate cardiopulmonary resuscitation if indicated
  - Open airway
  - Support oxygenation/ventilation
  - Support circulation: dysrhythmia care? rate control? hypotension care?
- Ongoing Care
  - Reassess all primary care
  - Support oxygenation/ventilation
  - Vascular access
  - Secondary Survey (if able)
  - Keep patient warm/avoid hypothermia
- ***Appropriate Destination***

General

Approach the assessment of medical (non-trauma) patients in A-B-C order.

Airway

- Evaluate the patency and mechanics of the airway.
  - Is the patient able to oxygenate and ventilate?
- Rapid intervention may be required during the assessment phase if airway patency and protection is compromised.

Breathing

- Expose the chest as required to accurately assess the mechanics of respiration (considering patient privacy/modesty if in public location).
- Note the rate, depth, and pattern of respirations and any degree of respiratory distress or effort.
- Auscultate breath sounds bilaterally.
- Liberally obtain pulse oximetry readings and in patients with respiratory difficulties, waveform capnography readings (if equipped).
  - **Waveform capnography is mandatory if an advanced airway is in place.

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Circulation

- The adequacy of a patient's circulation is best assessed first by evaluating their level of consciousness and mental status.
- Next assess the location, rate, and character of the pulse.
- Then check a blood pressure, preferably manually for at least the first reading.
- Apply the cardiac monitor (if equipped) liberally.

Special Considerations

- Cardiac Arrest is an exception to the above order. Aggressively initiate chest compressions and search for shockable rhythms at the appropriate intervals per the ***Cardiac Arrest Protocol***.

- Many treatment decisions regarding airway management involve calculating the adult patient's Glasgow Coma Scale score using the following table:

Points	Best eye	Best verbal	Best motor
6	---	---	Obeys verbal orders
5	---	Oriented, conversational	Localizes to pain
4	Spontaneously	Disoriented, conversational	Withdraws to pain
3	To command	Inappropriate words	Flexion (decorticate)
2	To pain	Inappropriate sounds	Extension (decerebrate)
1	No response	No response	No response

- **After addressing the A-B-C order in most medical patients, including evaluating and addressing any life-threatening conditions, minimize scene time and initiate steps needed for transport to an appropriate emergency department in any setting of a time-sensitive medical condition.**

- Complete a head-to-toe assessment of the patient if the patient is relatively medically stable. Obtain relevant history of past and current medical problems, medications, allergies, and physicians/hospitals used in care plans to help guide further assessment.

- Reassess patients frequently, typically at least every 10 minutes, and more often if critical illness is discovered and being treated. In the situations of an unstable patient, vital signs should be assessed every 5 minutes, especially if hemodynamic changes are occurring.

- Assess and treat per symptom or illness specific protocols that follow in this protocol set.

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Pediatric Assessment Considerations

- Pediatric respiratory distress may look just like adult respiratory distress, presenting with:
  - slowing respirations, cyanosis, accessory muscle use, paleness, nasal flaring, lethargy/listlessness, retractions – intercostal or subcostal, irritability, tachypnea, stridor, mottling, grunting

- Vital signs vary with age. In general, the younger the patient, the faster the respiratory rate, the faster the heart rate, and the lower the blood pressure:

Age	Heart Rate (beats/min)	Blood Pressure (mmHg)	Respiratory Rate (breaths/min)
Premature	110-170	SBP 55-75 DBP 35-45	40-70
0-3 months	110-160	SBP 65-85 DBP 45-55	35-55
3-6 months	110-160	SBP 70-90 DBP 50-65	30-45
6-12 months	90-160	SBP 80-100 DBP 55-65	22-38
1-3 years	80-150	SBP 90-105 DBP 55-70	22-30
3-6 years	70-120	SBP 95-110 DBP 60-75	20-24
6-12 years	60-110	SBP 100-120 DBP 60-75	16-22
> 12 years	60-100	SBP 110-135 DBP 65-85	12-20

  - The average normal systolic BP can also be estimated using: 80 + (2 x age) in years.
  - Lower limits of normal systolic BP can also be estimated using: 70 + (2 x age) in years.

- The following table can be used to calculate Glasgow Coma Scale scores in pediatric patients, especially those under 4 years of age. Most pediatric patients above the age of 4 years will be able to be assessed for Glasgow Coma Scale scores using the adult table:

Points	Best eye	Best verbal		Best motor
6	---	---		obeys
5	---	smiles, oriented to sound, follows objects, interacts		localizes pain
		Crying	**Interaction**	
4	spontaneous	consolable	inappropriate	withdraws to pain
3	to speech	inconsistently consolable	moaning	flexion (decorticate)
2	to pain	inconsolable	restless	extension (decerebrate)
1	none	none	none	none

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Abdominal Pain, Nausea, Vomiting, & Diarrhea

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria:

- Complaint of abdominal pain, nausea, vomiting, or diarrhea
- Active vomiting during EMS Care

Treatments and Interventions:

EMT ➢ CABCs ➢ Oxygen via NC or NRB as appropriate ➢ Vital signs (apply cardiac monitor) ➢ Provide emesis bag for patients who are vomiting
Advanced EMT ➢ IV Normal Saline TKO if Systolic BP is > 100 mmHg without symptoms of hypotension ➢ IV Bolus Normal Saline 250 mL if Sys BP < 100 mmHg with symptoms of hypotension and no signs of pulmonary edema ➢ Consider 4 - 8mg IV Ondansetron for nausea and/or vomiting with no history of prolonged QT Syndrome. Must contact medical control prior to administration. *Pediatric* ➢ IV Normal Saline TKO if Sys BP > (70 +2x age in years) mmHg without symptoms of hypotension ➢ IV Bolus Normal Saline 250 mL if Sys BP < (70 +2x age in years) mmHg with symptoms of hypotension and no signs of pulmonary edema ➢ Consider 0.15 mg/kg (Max 4 mg) IV Ondansetron for nausea and/or vomiting with no history of prolonged QT Syndrome and Age > 6 months. Must contact medical control prior to administration.
Paramedic ➢ Consider ECG monitoring ➢ Consider 4 - 8mg Ondansetron for nausea and/or vomiting with no history of prolonged QT Syndrome.

General:

- Place the patient in a position of comfort
- Recommend the patient limit movement
- For females of childbearing age, consider ruptured ectopic pregnancy, ovarian cysts, endometriosis, and pelvic inflammatory disease
- Consider abdominal aortic aneurysm for patients with pain described as tearing or shredding

Allergic Reaction & Anaphylaxis

Rice University Emergency Medical Services Clinical Guidelines

Acute Urticarial Reactions may develop in patients who have been exposed to an environmental trigger, medication, or food. The reaction may be mild, including symptoms of:

- Hives, rash, or an itch
- Localized peripheral edema and redness

Credit: https://dermnetnz.org/topics/urticaria-an-overview

The reaction may progress to include systemic symptoms (i.e. anaphylaxis), including:

- Dyspnea, wheezing, or other respiratory complaints
- Nausea and/or vomiting
- Generalized edema

Anaphylaxis should be suspected in patients who experience symptoms of two or more body systems with any combination of symptoms, and/or hypotension.

- Be sure to distinguish between allergic/urticarial reaction and anaphylaxis/anaphylactic shock. As stated above, anaphylaxis involves more than one body system and presents with symptoms like edema, respiratory distress, nausea/vomiting in addition to urticaria/itching. If there is a problem with airway, breathing, or circulation, anaphylaxis is likely.
- Anaphylactic shock is accompanied by hypotension.
- For anaphylaxis, the priority is rapid Epinephrine administration.

A thorough comprehensive physical exam should be performed for any patient with suspected allergic reaction and/or anaphylaxis, including a thorough assessment of the skin to assess for hives and/or rash; oropharynx, lips, and face for any edema; and lung sounds.

Treatment and Interventions:

EMT

- Remove the patient from allergen / environment
- CABC's
- Oxygen, as needed, to ensure adequate oxygenation and ventilation
- Assist patients with their own albuterol inhaler (when applicable)
- General supportive care

***** For Anaphylaxis Only:**

- Assist patients with their Epi-Pen® auto-injector in the anterior/lateral thigh **OR**
- Contact medical command for permission, then administer epinephrine from vial
  - Adult dose: Epinephrine 1:1000, 0.3mg
- If the patient has dyspnea with wheezing, administer Albuterol 5 mg via nebulizer
  - Contact medical command for subsequent doses.

Pediatric

- Assist patients with their Epi-Pen Jr® auto-injector in the anterior/lateral thigh **OR**
- **Contact medical command** for permission, then administer epinephrine from vial
  - Pediatric dose: Epinephrine 1:1000, 0.15mg
- If the patient has dyspnea with wheezing, administer Albuterol 2.5 mg via nebulizer
  - Contact medical command for subsequent doses.

Advanced EMT

- Includes EMT scope as above
- Assess oxygenation & ventilation; consider SPO_2 and $EtCO_2$ waveform capnography.
- Consider placement of a supraglottic airway if indicated **AND** only if BVM ventilations are ineffective.

***** For acute urticarial reaction:**

- Loratadine (Claritin) 10 mg PO

***** For anaphylaxis:**

- Epinephrine 1:1000, 0.01mg/kg (max dose 0.5 mg) administered IM in the anterior/lateral thigh.
  - **Medical command consult required** if the diagnosis is in question.
  - Medical command should be consulted for additional doses.
- IV Normal Saline TKO if Sys. BP $\geq$ 90 mmHg without symptoms of hypotension
- IV Normal Saline 500 mL bolus if Sys. BP < 90 mmHg OR with symptoms of hypotension and no signs of volume overload (rales on lung auscultation or significant lower extremity edema).
  - Repeat up to 2 Liters of Normal Saline if Sys. BP remains < 100 mmHg and no signs of pulmonary edema.
- Diphenhydramine 50 mg IV
  - IM administration may be considered if unable to obtain IV access.
- Methylprednisolone 1 mg/kg IV (max 125)

- If the patient has dyspnea with wheezing, administer Albuterol 5 mg via nebulizer.
  - Medical command should be consulted for additional doses.

Pediatric

*** For acute allergic reaction:

- For patients 2 to 5 years old, Loratadine (Claritin) 5 mg PO
- For patients ≥ 6 years old, Loratadine (Claritin) 10 mg PO

*** For anaphylaxis:

- Epinephrine 1:1000, 0.01mg/kg (max dose 0.5 mg) IM anterior/lateral thigh
- IV Normal Saline TKO if Sys. BP > (70 + 2x age in years) mmHg
- IV Normal Saline 20mL/kg bolus if Sys. BP < (70 + 2x age in years) mmHg OR with symptoms of hypotension and no signs of volume overload.
  - Repeat up to a total of 60mL/kg if Sys. BP remains < (70 + 2x age in years) mmHg and no signs of volume overload.
- Diphenhydramine 1mg/kg IV (Max Dose 50 mg)
  - IM administration may be considered if unable to obtain IV access.
- Methylprednisolone 1mg/kg IV (Max Dose 125 mg)
- If a patient has dyspnea with wheezing, administer Albuterol 2.5 mg via nebulizer
  - Medical command should be consulted for additional doses.

Paramedic

- Includes scope of care of Advanced EMT and:

*** For anaphylaxis:

- Epinephrine 1:1000, 0.01mg/kg (Max Dose 0.5 mg) administered IM in the anterior/lateral thigh or upper arm. Re-dose as needed q ~3-15 min.
  - Medical consult required if the diagnosis is in question.
- If patient has dyspnea with wheezing, administer Albuterol 5 mg via nebulizer (may be redosed as needed every 5 minutes).
- If refractory anaphylaxis, administer Epinephrine 1:10,000 0.1mg slow IV/IO (over 5 minutes)
  - Medical command should be consulted for additional doses

Pediatric anaphylaxis treatment:

- Follow Advanced EMT protocol

General Considerations:

- Use precaution and situational awareness to ensure that REMS personnel do not become contaminated with the allergen.
- Epi-Pen© or Epi-Pen Jr.© is administered to the lateral surface of the patient's thigh, midway between the hip and knee.

- Properly dispose of sharps to minimize risk of exposure.
- Continuous monitoring of the patient is preferred, and treatments (O_2, fluids) should be titrated to patient's condition.

Altered Mental Status

Rice University Emergency Medical Services Clinical Guidelines

Treatment Priorities:

1. Vital signs
2. Ensure adequate oxygenation & ventilation
3. Dextrose for hypoglycemia

Evaluate differential diagnosis of AMS & treat per protocol(s):

- Hypoxemia (shock)
- Head injury
- Stroke
- Seizure
- Infection (Sepsis/Meningitis)
- Medication/alcohol
- Heat or cold illness

Treatments:

EMT:

- Obtain vital signs
- Oxygen via NC, NRB, or BVM, as appropriate
- Determine BGL: if < 50 mg/dL
  - Adult or Ped ≥ 25 kg: 15 g Oral Glucose PO
  - Pediatric < 25 kg: 7.5 g Oral Glucose PO
- Apply cardiac monitor
- BVM if ventilations are ineffective

Advanced EMT:

- Measure end-tidal CO_2 and monitor waveform capnography
- Place a supraglottic airway if indicated and only if BVM ventilations are ineffective
- IV Normal Saline:

  Adult:
  - Normal Saline TKO if systolic BP ≥100 mmHg without symptoms of hypotension.
  - Normal Saline 250 mL bolus if systolic BP < 100 mmHg with symptoms of hypotension and no signs of pulmonary edema
    - May repeat up to a total of 2 Liters Normal Saline if the systolic BP remains < 100 mmHg with symptoms of hypotension and no signs of pulmonary edema

  Pediatric:
  - Normal Saline TKO if systolic BP ≥ (70 + 2x age in years) mmHg
  - Normal Saline 20 mL/kg bolus if systolic BP < (70 + 2x age in years) mmHg and no signs of pulmonary edema

Advanced EMT continued

- Hypoglycemia (BGL < 50 mg/dL):
  - 10% Dextrose (D10) 5 mL/kg IV/IO bolus up to 250 mL **- OR -**
  - Patients > 25 kg: 1mL/kg D50 IV/IO push up to 50mL
    - Glucagon 1 mg IM if vascular access cannot be obtained
  - Pediatric < 25 kg
    - **D25** 2 mL/kg IV push up to 50 mL **– OR -**
    - D10 5mL/kg IV/IO bolus up to 250mL
    - Glucagon 0.5 mg IM if vascular access cannot be obtained

- Toxins or Drug Overdose – use with suspected narcotic or opiate overdose with apnea or ineffective / agonal breathing:
  - Adult: Naloxone 0.4 mg IVP/IOP/IN/IM, may repeat every 5 minutes up to a total of 4 mg
    - If available, consider using Single Use 4mg Nasal Narcan Spray
  - Pediatric: Naloxone 0.1 mg/kg (Max Dose 0.4 mg) IVP/IOP/IN/IM, may repeat every 5 minutes up to a total of 4 mg
  - Use Naloxone to restore effective breathing; avoid excessive dosing to prevent withdrawal

General:

- 25% Dextrose solution (D25) is made by diluting 50% Dextrose (D50) with equal parts normal saline. 50mL of D50 should be mixed with 50mL of Normal saline to make D25.
- Naloxone (Narcan) is intended to restore an adequate breathing pattern and is not designed to be used to "wake up" an overdose patient. Administer Naloxone in low doses until a normal breathing pattern is restored.

Excited Delirium Syndrome

- Excited delirium is defined as a state of extreme mental and psychological excitement, usually associated with chronic or illicit drug use, characterized by symptoms such as:
  - Exceptional agitation, hyperactivity, and exceptional strength
  - Hyperthermia
  - Hostility, aggression, and paranoia
- Patients are often found naked or stripping clothes to cool down due to extreme hyperthermia, often above 102°F.
  - If safe to do so, actively cool the patient with icepacks and evaporative cooling, making sure not to induce hypothermia
- <u>Law Enforcement should be notified immediately in cases of suspected Excited Delirium.</u>
  - REMS members should remain a safe distance away from the patient until law enforcement has arrived.
- Patients often die suddenly, immediately following cessation of resistance; therefore, don't mistake a sudden unexpected calm for compliance
- Transport as quickly and safely as possible.

Behavioral Emergency

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Unusual behavior/activity
- Possible aggression
- ***Altered Mental Status***

Treatment

EMT

- Scene safety and police involvement
- Manage CABCs
- Obtain vital signs (if this can be done safely)
- Determine ***Blood Glucose Level***
- Apply cardiac monitor (if this can be done safely)
- ***Oxygen Administration*** as appropriate
- Consider coaching breathing
- Do not leave patient unattended

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

General

Treatment Priorities

- Provider safety
- Safety of police/rescue personnel
- Safety of patient

Back

- Observe for uncontrolled movement or agitation that may interfere with medical interventions
- Employ alternative methods to avoid physically restraining patient
- Restrain patient if patient becomes a danger to themselves or environment, or as necessary to perform needed interventions

Considerations

- Utilize counseling resources for assistance. Rice Counseling 24/7 – (713)-348-3311
- Be wary of excited delirium
- Listen to the patient, be honest and ask pertinent questions:
    - Are you considering harming yourself or others?
    - Do you have a plan for hurting someone, or yourself? Do you already have the means?
    - Have you ever been, or are you currently, under the care of a psychiatrist for your mental health?
    - Do you take any medications for your mental health, or are you prescribed any medications that you're not currently taking?
    - Are you hearing voices that other people are not able to hear? Are the voices encouraging you to take any action, such as hurting yourself or others?
    - Are you able to see things or people that others around you aren't able to see? Are these people encouraging you to take any action, such as hurting yourself or others?
- Utilize QPR for suicidal patients: Question, Persuade, Refer

Back

Cardiac Arrest

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria:

- Patients who are unresponsive, Apneic or agonal gaps, and pulseless

Treatment

EMT

- Apply the AED
  - If estimated downtime is > 4 min, do 2 min of CPR before applying AED
- Perform high-quality CPR:
  - Uninterrupted compressions at a rate of 100 – 120 per minute
  - All full chest recoil between chest compressions
  - Switch compressor every 2 minutes
  - Pause compressions only for AED analysis and shocking
  - Immediately resume compressions after an AED shocks, or after AED advises no shock
- Give 1 breath every 5 to 6 seconds, **DO NOT** pause compressions during breaths

Advanced EMT

- Consider cardiac monitor for defibrillation if available
  - Adult: 1st: 200J, 2nd: 300J, 3rd and subsequent shocks: 360J
  - Pediatric: 2 J/kg, 4 J/kg, then subsequent ≥ 4 J/kg (Max: 10 J/kg or 360 J)
- Place Air-Q without pause in chest compressions
  - Adult: 1 breath every 5 to 6 seconds (10-12/min) if advanced airway
  - Pediatric: 1 breath every 2 to 3 seconds (20-30/min) if advanced airway
- Monitor $EtCO_2$ and Waveform Capnography
  - If $EtCO_2$ is less than 10 mmHg, attempt to improve chest compressions
- Obtain IV / IO access
- Administer Epinephrine 1:10,000 every 3 to 5 minutes while patient is still pulseless
  - Adult: 1 mg IV/IO
  - Pediatric: 0.01 mg/kg IV/IO (Max Dose: 1 mg)
- Assess for and treat underlying etiology
  - Hypovolemia suspected:
    - Adult: 1 L Normal Saline IV/IO bolus if no signs of pulmonary edema
    - Pediatric: 20 mL/kg Normal Saline IV/IO bolus if no signs of pulmonary edema
  - Hypoglycemia suspected (BGL < 60 mg/dL):
    - 10% Dextrose (D10) 5 mL/kg IV/IO bolus up to 250 mL **- OR –**
    - Patients > 25 kg: D50 1mL/kg IV/IO push up to 50mL
    - Pediatric < 25 kg
      - **D25** 2 mL/kg IV push up to 50 mL **– OR –**
      - D10 5mL/kg IV/IO bolus up to 250mL

Advanced EMT continued

- Narcotic or opiate overdose suspected:
  - Adult: Naloxone 0.4 mg IVP/IOP/IN/IM, may repeat every 5 minutes up to a total of 4mg
    - If available, consider using Single Use 4mg Nasal Narcan Spray
  - Pediatric: Naloxone 0.1 mg/kg (Max Dose: 0.4mg) IVP/IOP/IN/IM, may repeat every 5 minutes up to a total of 4 mg

Paramedic

- Administer Epinephrine 1:10,000 every 3 to 5 minutes while patient is still pulseless
  - Adult: 1 mg IV/IO
  - Pediatric: 0.01 mg/kg IV/IO (Max Dose: 1 mg)

- Specific rhythm management
  - Asystole / Pulseless Electrical Activity
    - Administer Epinephrine 1:10,000 every 3 to 5 minutes
      - Adult: 1 mg IV/IO
      - Pediatric: 0.01 mg/kg IV/IO (Max Dose: 1 mg)
  - Ventricular Fibrillation and Pulseless Ventricular Tachycardia
    - Administer Epinephrine 1:10,000 every 3 to 5 minutes
      - Adult: 1 mg IV/IO
      - Pediatric: 0.01 mg/kg IV/IO (Max Dose: 1 mg)
    - Administer Amiodarone IV/IO
      - Adult: 1st Dose of 300 mg then 2nd Dose of 150 mg after 5 min
      - Pediatric: Single dose of 5 mg/kg
      - If ROSC is obtained after Amiodarone, consider:
        - Adult: Amiodarone 150 mg IV/IO over 10 minutes
        - Pediatric: Medical Control consult required

- Assess for, and treat, underlying reversible causes of cardiac arrest
  - Hyperkalemia:
    - Calcium Chloride 10mg/kg IV/IO (Max Dose 1 Gram)
    - Sodium Bicarbonate 1 mEq/kg IV/IO (Max Dose 50 mEq)
  - Pre-existing acidosis:
    - Sodium Bicarbonate 1 mEq/kg IV/IO (Max Dose 50 mEq)
  - Tricyclic antidepressant overdose:
    - Sodium Bicarbonate 1 mEq/kg IV/IO (Max Dose 50 mEq)
  - Beta blocker overdose:
    - Adult: Glucagon 1 mg IV/IO
    - Pediatric: Glucagon 0.03 mg/kg IV/IO (Max Dose 1 mg)
  - Calcium channel blocker overdose:
    - Calcium Chloride 10mg/kg IV/IO (Max Dose 1 Gram)

General:

- High quality CPR guidelines
  - The chest compression rate should be 100-120 per minute
  - If available, utilize a metronome. For the LP 15, push the CPR button on the right side of the screen
  - Switch compressors every 100 compressions or 2 minutes
- Prioritize minimal pauses in compressions
  - Only pause compressions during AED analysis and shocking
  - Limit compression pauses to under 10 seconds
  - Do not pause for placement of an advanced airway
  - Do not pause for breaths, even without an advanced airway
- Consider reversible causes of cardiac arrest (Hs & Ts)

Withholding Resuscitation

- If a patient has a valid "Out of Hospital Do Not Resuscitate" or other Advanced Directive orders:
  - All EMTs, Advanced EMTs, and Paramedics shall follow physician's written "Do Not Resuscitate (DNR)" order, Texas DNR Consent form, or Advanced Health Care Directive accompanied by written statement from physicians
  - Requests can only be honored by bystanders if accompanied by appropriate documentation
  - **If there is any doubt, begin CPR and immediately contact medical control**
- CPR should not be initiated, or be continued if initiated, by EMTs, Advanced EMTs, or Paramedics in the event of obvious death. Obvious death is defined as:
  - Regardless of the cause of cardiac arrest
    - No pulse AND no spontaneous respirations AND pupils fixed (unreactive to light) AND one or more of the following:
      - Rigor mortis
      - Decapitation
      - Decomposition
  - Blunt traumatic cardiac arrest
    - No pulse AND no spontaneous respirations AND no shockable rhythm AND no organized ECG activity (Asystole)
  - Penetrating traumatic cardiac arrest
    - No pulse AND no spontaneous respirations AND pupils fixed (unreactive to light) AND no spontaneous movement AND no organized ECG activity (Asystole)
- In any of the above-mentioned and confirmed situations, cease or withhold BVM ventilations, placement of an advanced airway, defibrillation, CPR, and any medication administration as applicable to cardiopulmonary resuscitation.
- **Unless obvious death criteria met as outlined above, CPR and other resuscitative efforts should be initiated and delivered to promote the best chance of patient survival.**

Cardiac Rhythm Abnormalities (Non-Arrest)

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- In general, heart rate outside of normal parameters
  - Tachycardia: HR > 150 bpm in adults OR HR > 180 bpm in non-febrile pediatrics
  - Bradycardia: HR < 60 bpm
- May or may not have associated symptoms

Treatment

EMT

- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate

AEMT

- ECG monitoring (see ***Cardiac Monitor Operation***)
- Obtain 12-lead ECG
- Obtain IV access
- If myocardial infarction suspected, consider:
  - ADULT: ASA 324 mg PO, chewed by patient
    1. Do not give if ASA was taken within 1 hour or otherwise contraindicated

Paramedic

- Sinus Bradycardia / 1° AV Block / 2° AV Block, Type I (Wenckebach)
  - Asymptomatic
    1. Monitor rhythm
  - ADULT: symptomatic, SBP < 100 mmHG, *ACS suspected*
    1. Treat per ACS guideline, avoid Atropine unless HR < 40 bpm
  - ADULT: symptomatic, SBP < 100 mmHG, *NO ACS suspected*
    1. Atropine 0.5 mg IV/IO, repeat every 5 minutes (max 3 mg)
  - PEDIATRIC: symptomatic, SBP < (70 + 2x age) mmHG
    1. Epinephrine [1:10,000] 0.01 mg/kg IV/IO, may repeat once

    If unresponsive to Epinephrine:
    2. Atropine 0.02 mg/kg IV/IO (min 0.1 mg, max 0.5 mg), may repeat once
- Bradycardia 2° AV Block, Type II (Classic) / 3° AV Block (Complete)
  - Asymptomatic
    1. Monitor rhythm
    2. Place pacing pads per ***Cardiac Pacing***
  - ADULT: symptomatic, *ACS suspected*
    1. Treat per ACS guideline
    2. Use ***Cardiac Pacing*** at 60 bpm instead of Atropine

Back

- ADULT: symptomatic, *NO ACS suspected*
  1. Use ***Cardiac Pacing*** at 60 bpm instead of Atropine
- PEDIATRIC: symptomatic
  1. Place pacing pads per ***Cardiac Pacing***
  2. Consult medical command for orders

➢ Stable Atrial Fibrillation / Flutter
- If patient < 70 years old: Diltiazem 0.25 mg/kg (max 25 mg) SLOW IV over 2 mins
- If patient ≥ 70 years old: Diltiazem 0.25 mg/kg (max 10 mg) SLOW IV over 2 mins

➢ Stable Supraventricular Tachycardia
- Valsalva maneuver

If not resolved:
- Adenosine 12 mg *rapid* IVP, may repeat once

➢ Stable Monomorphic V-Tach / Wide-Complex Unknown Origin
- Amiodarone 150 mg *very slow* IV over 10 mins

➢ Unstable Tachycardia (All Types)
- Begin ***Synchronized Cardioversion***, 100 J – 200 J – 300 J – 360 J

After resolution of unstable V-Tach, consider:
- Amiodarone 150 mg *very slow* IV over 10 mins to prevent arrhythmia reoccurrence

General

➢ In this reference, unstable is defined as:
- ADULT: SBP < 100
- PEDIATRIC: SBP < (70 + 2x age)
- AND at least one of the following symptoms:
  1. Dyspnea
  2. Chest pain
  3. Weakness
  4. AMS
  5. Hypoxemia
  6. Pulmonary edema

➢ **Always check for a pulse with any rhythm change**

➢ 2° AV Block Type I refers to Wenckebach phenomenon
- Progressive prolongation of the PR length until a dropped QRS complex occurs

➢ 2° AV Block Type II refers to the Classic or Mobitz phenomenon
- PR length remains constant
- Regular pattern of dropped QRS complexes (e.g., every third QRS is not observed)

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Chest Pain of Unknown Etiology

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Patients complaining of non-traumatic chest pain.
- Any pain of the chest/back/shoulder/neck/jaw/arm/epigastrium, SOB, nausea, diaphoresis, syncope, and/or generalized weakness/fatigue may be indicative of myocardial ischemia.
- Atypical presentations are often seen in certain patient populations, including females, diabetics, the elderly, and those with comorbidities.

Treatment

EMT

- Manage CABCs
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** if patient complains of dyspnea or SpO2 < 94 % on room air
- If myocardial infarction suspected, consider:
  - ADULT: ASA 324 mg PO, chewed by patient
    1. Do not give if ASA was taken within 1 hour or otherwise contraindicated
- ***BVM*** ventilations as needed

AEMT

- ECG monitoring (see ***Cardiac Monitor Operation***)
- Obtain 12-lead ECG
- Obtain IV access
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Paramedic

- If patient has nausea and/or vomiting, consider:
  - ADULT: Ondansetron 4-8 mg IV
    1. If no history of prolonged QT Syndrome
  - PEDIATRIC: Ondansetron 0.1 mg/kg IV (max 4 mg)
    1. If no history of prolonged QT syndrome
- For pain relief:
  - Nitroglycerine 0.4 mg SL, every 3-5 min if SBP maintains > 100 mmHg
    1. IV must be established prior to the second dose
    2. Medical command consult required if patient ≤ 40 years old
    3. May be administered as tablets or powders
    4. Nitroglycerine is contraindicated in patients with:
       - History of aortic stenosis
       - Use of Viagra (Sildenafil) or Levitra (Vardenafil) within last 24 hrs
       - Use of Cialis (Tadalafil) within last 48 hrs
       - Suspected right sided MI, as it may precipitate hypotension

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COVID-19

Rice University Emergency Medical Services Clinical Guidelines

Criteria

Refer to ***Infectious Disease Precaution Recommendations*** for general guidelines.

COVID-19 symptoms may include a wide range of symptoms, ranging from one or two mild symptoms to severe illness. This may include:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Appropriate PPE must be worn for every COVID positive patient or suspected COVID patient. For any patient complaining of the symptoms listed above, providers are required to don an N-95 respirator, eye protection, gown, and gloves. The patient should be given a surgical mask.

The donning order for PPE is as follows:

- Gown
- N-95 respirator
- Eye protection
- Gloves

The doffing order for PPE is as follows:

- Gown
- Gloves
- Eye protection
- N-95 respirator

To remove gloves safely, pinch the glove on one hand at the wrist with the forefinger and thumb of the other hand. Pull the glove off while turning it inside out. Hold the removed glove in the gloved hand, slide the forefinger of the non-gloved hand inside the wrist of the other glove, and pull it off.

Hand washing with soap and water should be done by all providers after each call.

Contact with the patient should be minimized when possible. See Isolation Housing SOP for response procedures. Equipment should also be placed in the hallway at a safe distance away from the patient.

Treatment should be limited to interview and destination planning as much as possible. If additional care is needed, the steps below can be considered for patients in moderate to severe distress.

Treatment

EMT

- General supportive care
- Manage ABCs
- Assess lung sounds and temperature
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Obtain a detailed history of the patient's travel, contact with others, and possible exposure

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider obtaining 12-Lead ECG
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Consider IV access and NS administration
  - ADULT:
    1. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

General

Properly clean all equipment, including radios, pagers, and clipboards, using bleach wipes. Equipment should be cleaned away from the patient's room.

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Dyspnea of Unknown Etiology

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Dyspnea

Treatment

EMT

- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Assist patient with their own albuterol inhaler or nebulizer (when applicable) OR:
  - ADULT or PEDIATRIC ≥ 15 kg: Albuterol 5 mg via nebulizer (see ***Nebulization Therapy***)
    1. May repeat twice, every 10 minutes, if no patient relief AND
    2. HR does not increase by ≥ 20 bpm
  - PEDIATRIC < 15 kg: Albuterol 2.5 mg via nebulizer (see ***Nebulization Therapy***)
    1. Medical command consult required for additional doses

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain 12-lead ECG
- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

General

- Albuterol is indicated for suspected bronchospasm and/or reactive airway disease. Signs may include wheezing, poor air movement with labored effort, and/or diminished lung sounds.
- Patients with congestive heart failure (CHF) may present with wheezing but the problem is from cardiac etiology. Albuterol will not help and should not be administered in this case.

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Environmental: Cold Illness

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Although Houston has a generally temperate climate, cold illness/injury should remain a concern for patients found out of doors in the winter months.
- Hypothermia can occur with brief exposure to cold weather, and with prolonged exposure in ambient temperatures as high as 50 – 60°F, particularly if the patient is wet from rain or other environmental conditions.

Treatment

EMT

- Manage CABCs
- Remove patient from cold environment and remove wet/restrictive clothing
- Apply heat packs to groin, neck, axilla
- Cover patient with blankets to extent clinically possible
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate
- If frostbite, apply loose sterile dressings and splint involved extremities

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access and consider NS administration (use warmed NS if available)
  - ADULT:
    1. IV NS 500 mL if no signs of pulmonary edema
    2. Repeat up to 2 L NS if:
       - Temperature remains < 30°C (86°F) and/or
       - ***Altered Mental Status*** remains and/or
       - SBP remains < 100 mmHg if no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if no signs of pulmonary edema
    2. Repeat up to 60 mL/kg if:
       - Temperature < 30°C (86°F) and/or
       - ***Altered Mental Status*** and/or
       - SBP < (70 + 2x age in years) mmHg if no signs of pulmonary edema

Paramedic

- ECG monitoring (see ***Cardiac Monitor Operation***)

Back

Environmental: Heat Illness

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Heat illness should be considered for patients engaged in activity outdoors in high humidity, high temperatures, and subsequently high heat index. Heat illness may be the primary cause of the emergency or may contribute to or develop with other medical or traumatic conditions.
- Heat illness may progress quickly to a life-threatening condition. Stages of heat illness include:
  - Heat Cramps: Minor muscle cramps usually in the legs and abdominal wall. Temperature is normal.
  - Heat Exhaustion: May include weakness, vertigo, nausea/vomiting, tachycardia, profuse sweating, and/or syncope. Temperature may be normal or 1 – 2° elevated.
  - Heat Stroke: May include ***Altered Mental Status***, ***Seizure*** or other neurological dysfunction, may be without sweating. Temperature ≥ 104℉.

Treatment

EMT

- Manage CABCs
- Remove patient from hot environment
- Remove clothing as needed
- Active cooling with continuous temperature monitoring:
  - Move to air conditioned room
  - Cool body and head with water or saline
  - Fan to promote evaporative cooling
  - Apply ice packs to groin, neck, and axilla
  - Use ice bath if available
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access and consider NS administration (use chilled NS if heat stroke suspected)
  - ADULT:
    1. IV NS 500 mL bolus, if no signs of pulmonary edema
    2. Repeat up to 2 L NS if:
       - Fatigue remains and/or
       - ***Altered Mental Status*** remains and/or
       - SBP < 100 mmHg, if no signs of pulmonary edema

Back

- PEDIATRIC:
  1. IV NS 20 mL/kg bolus, if no signs of pulmonary edema
  2. Repeat up to 60 mL/kg if:
     - Fatigue remains and/or
     - ***Altered Mental Status*** remains and/or
     - SBP < (70 + 2x age in years) mmHg, if no signs of pulmonary edema

Paramedic

➢ ECG monitoring (see ***Cardiac Monitor Operation***)

Fever

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Temperature > 101.3°F
- Cold-like symptoms

Treatment

EMT

- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

Paramedic

- If patient has nausea and/or vomiting, consider:
  - ADULT: Ondansetron 4-8 mg IV
    1. If no history of prolonged QT Syndrome
  - PEDIATRIC: Ondansetron 0.1 mg/kg IV (max 4 mg)
    1. If no history of prolonged QT syndrome

General

- Fever with hypotension that is refractory to fluid therapy indicates severe septic shock
- Do not delay transport, and ensure ALS transport is enroute

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Hypertensive Emergency

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Symptomatic hypertension
- Chest pain, dyspnea, or other related symptoms of ischemia
- Severe headache

Treatment

EMT

- Obtain vital signs (apply cardiac monitor) including manual blood pressure
- ***Oxygen Administration*** as appropriate
- ***Los Angeles Prehospital Stroke Screen***
- Elevate head to 15°

AEMT

- Obtain 12-lead ECG
- Obtain IV Access

Paramedic

- If SBP > 180 mmHg and/or DBP > 120 mmHg AND chest pain or dyspnea:
  - ADULT: Nitroglycerin 0.4 mg SL
    1. May repeat every 5 min until BP reduced 10% or symptoms resolved
       - DO NOT reduce BP beyond 10%
    2. Medical command consult required if patient ≤ 40 years old
    3. May be administered as tablets or powders
    4. Nitroglycerine is contraindicated in patients with:
       - History of aortic stenosis
       - Use of Viagra (Sildenafil) or Levitra (Vardenafil) within last 24 hrs
       - Use of Cialis (Tadalafil) within last 48 hrs
       - Suspected right sided MI, as it may precipitate hypotension
  - PEDIATRIC: Consult medical command

General

- Do NOT treat asymptomatic hypertension.
- Do NOT reduce BP in symptomatic hypertension by more than 10%.
- A hypertensive emergency means end-organ damage and therefore assessment should include ACS, stroke, and renal failure.

Back

Neonatal Resuscitation

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Newborn patients who do not respond to initial stimulation and resuscitation
  - Example: weak cry, signs of respiratory distress, poor tone
- Prompt initial resuscitation steps are critical to the successful outcome of a neonatal resuscitation.

Treatment

EMT

- Position the newborn on their back, with the airway in sniffing position.
- Suction the mouth and then nose using bulb suction if thick meconium or secretions are present
- Dry the newborn, then place on a dry blanket, cover the head, and keep warm.
- Provide tactile stimulation if the newborn is not responding to drying
- Record APGAR score at 1 min. and at 5 min.
- If the HR < 100 bpm, gasping, or apnea:
  - Positive pressure ventilations with *room air* at 40 to 60 breaths/min.
    - The primary indicator of effective ventilation is heart rate improvement.
    - Use minimum necessary volume to achieve chest rise and heart rate change.
  - If there is no improvement after 90 seconds, ventilate *with oxygen* until heart rate normalizes, then reassess.
- If HR < 60 bpm:
  - Positive pressure ventilations *with oxygen* at 40 to 60 breaths/min.
  - If no improvements after 30 seconds, begin chest compressions at 3:1 ratio
    - 90 compressions and 30 breaths/min
- Blood glucose analysis using a heal prick. Hypoglycemia in a newborn is defined as:
  - BGL ≤ 30mg/dL in the first 24 hours of life
  - BGL ≤ 45mg/dL thereafter
  - Treat using the hypoglycemia protocol.

Advanced EMT

- If ventilation and heart rate are not improved after 3 minutes of adequate resuscitation:
  - IV Normal Saline 10 mL/kg IV over 5 to 10 minutes
- If persistent obtundation AND suspicion or evidence of maternal narcotic use:
  - Naloxone 0.1mg/kg IV/IO/IN (Max Dose 0.4 mg) every 5 minutes up to a total of 4 mg

Paramedic

- Continuous ECG monitoring and treat life threatening dysrhythmias as indicated
- If heart rate < 60 and no chest rise during ventilation, intubate.
- If the heart rate remains < 60 despite adequate ventilation and chest compressions, consider:
  - Epinephrine [1:10,000] 0.01 mg/kg IV, may be repeated every 3 to 5 minutes if heart rate remains < 60 bpm.

APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

Obtain APGAR scores at 1 and 5 minutes of life

Obstetric Emergencies

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Obstetric emergencies can include a broad array of conditions found in women of childbearing age.
- For any female patient with a specific complaint of abdominal pain, vaginal bleeding or discharge, and/or nonspecific shock/hypotension, an obstetric emergency should be considered.
- Obtaining pertinent information during a patient interview will help to identify conditions/complaints that should be seen without delay in the emergency room, and conditions/complaints that would be more appropriately seen by the patient's physician.

Maternal changes over the pregnancy can affect a woman's body:

- A growing abdomen becomes more prone to injury. Balance and gait may be affected.
- A pregnant woman's blood volume increases by almost 50% by the time she reaches term.
- During pregnancy, the heart rate increases by 10 – 15 bpm.
- Blood pressure may be lower than normal in the first two trimesters but returns to normal in the third trimester.
- Hypertension in a pregnant woman should raise suspicion for pre-eclampsia.
- Increased maternal blood volume delays findings associated with shock.
- Slight shortness of breath is a common complaint in late pregnancy.
- Severe nausea and vomiting (hyperemesis gravidarum) may occur in early pregnancy.
- Pregnancy causes musculoskeletal joints to loosen – sprains and strains may occur more readily.

Concerning findings that should increase the suspicion of an emergent condition include:

- **Unusually heavy vaginal bleeding (menorrhagia):**
  - Saturating a tampon or sanitary napkin as frequently as every hour for more than four hours is significant and the patient should be evaluated for hypovolemia/ hemorrhaging shock.
- **Unusual abdominal pain:**
  - Severe or unusual abdominal pain may be caused by premature labor, ectopic pregnancy, spontaneous abortion, placenta previa or placental abruption, as well as other abdominal complaints such as appendicitis, kidney stones, etc.
- **Trauma in pregnancy:**
  - The increased vascularity of the uterus, as well as other physiologic changes in the pregnant patient, increases the risk of serious maternal injury, and/or fetal distress.

Medical command should be consulted as needed for assistance with appropriate destination for patients with obstetric complaints.
Note: Remember, two patients = two charts.

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General Treatment Priorities

EMT

- Supportive care
- Obtain vital signs (apply cardiac monitor)
- Rapid transport if needed, position the patient carefully:
  - To prevent supine hypotensive syndrome and further impairment in maternal and fetal perfusion, never position a patient in the third trimester of pregnancy in a supine position for transport.
  - Consider laying the patient on their left side to avoid pressure on the vena cava.

Pre-eclampsia/Eclampsia

Criteria

- Pre-eclampsia is the new onset of hypertension and either protein in the urine or end-organ dysfunction after 20 weeks of gestation in a previously normotensive woman.
- Eclampsia is the development of grand mal seizures in a woman with preeclampsia, in the absence of other neurological conditions that could account for the seizure. Note that eclampsia may occur up to 30 days post-delivery.

Indications for preeclampsia/eclampsia:

- Severe hypertension (SBP ≥ 160 mmHg or DBP ≥ 110 mmHg)
- Peripheral edema
- Persistent and/or severe headache
- Visual abnormalities
- Upper abdominal pain or epigastric pain
- Nausea and/or vomiting
- Dyspnea and/or retrosternal chest pain
- Altered mental status

Treatment

EMT

- Manage CABCs
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate
- Place patient in left lateral recumbent position if possible
- If seizing or postictal, treat per ***Seizures*** guideline

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Vaginal Bleeding

Criteria

- Vaginal bleeding can be caused by:
  - abruptio placenta
  - placenta previa
  - uterine rupture
  - miscarriage
  - postpartum hemorrhage

Treatment

EMT

- Manage CABCs
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate
- Positioning:
  - If in the third trimester of pregnancy, place the patient in the left lateral recumbent position.
  - If not in the third trimester and is exhibiting signs/symptoms of hypoperfusion, place the patient in Trendelenburg position.
- If active postpartum hemorrhage from the vagina, apply a firm uterine massage starting from the pubis toward the umbilicus clockwise.
- If miscarriage and the fetus is < 20 weeks in gestation:
  - If pulseless and apneic, do not attempt resuscitation measures for the fetus.
  - If there is any question as to the approximate gestation of the fetus, provide neonatal resuscitative measures.
  - If spontaneous respirations and/or pulses, provide immediate ***Neonatal Resuscitation*** and transport to the closest appropriate facility.
- If miscarriage and the fetus is ≥ 20 weeks in gestation:
  - Immediate ***Neonatal Resuscitation***

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Labor and Delivery

Uncomplicated Delivery

An important decision to make with patients in labor is whether to attempt delivery in the field or transport the patient to the hospital.

Factors that affect that decision include:

- Frequent contractions that are less than 2 minutes apart and lasting 30 – 45 seconds.
- Crowning or bulging
- Mother has the urge to push or move her bowels. Do not allow the patient to utilize the toilet.
- Number of previous deliveries.

If determined that delivery in the field is best for the patient:

Treatment

EMT

- Manage CABCs
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate
- Place patient supine with knees bent and widely separated. Elevate buttocks if needed.
- Carefully assist expulsion of the newborn from the birth canal in its natural progression. Provide gentle pressure with palm to control delivery of the head. Do not pull the newborn.
- As the head emerges, encourage the mother not to push so that the delivery process can continue slowly and with minimal trauma to the perineal area.
- Gently guide the head downward (posterior) until the upper (anterior) shoulder delivers.
- If the cord is wrapped around the newborn's neck, attempt to unwrap it from the neck. If unable, attach 2 umbilical clamps and cut the cord between the clamps.
- Gently lift the head upwards (anterior) until the lower (posterior) shoulder delivers.
- Do not routinely suction the newborn's mouth and nose to clear secretions, unless there is an obvious airway obstruction or requires positive pressure ventilations.
- Once delivery is accomplished, position the infant at or slightly below the level of the vagina, clamp the cord at 6" and 8" from the navel, and cut between the clamps.
- Dry and wrap the newborn in a blanket to preserve body temperature.
- Note the delivery time and the sex of newborn.
- Record ***APGAR*** score at 1 min and at 5 min post-delivery.
- Provide immediate ***Neonatal Resuscitation*** if necessary.
- If the placenta is delivered (separation usually occurs within 5 min after delivery), ensure it is transported to the hospital.
- After delivery, massaging the uterus and allowing the infant to nurse will promote uterine contraction and help control bleeding.

Back

AEMT

- ➢ Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

APGAR Score

Test	0 Points	1 Point	2 Points
Activity (muscle tone)	Absent	Arms and legs extended	Active movement with flexed arms and legs
Pulse (heart rate)	Absent	<100 bpm	>100 bpm
Grimace (response to stimulation)	No response	Facial grimace	Sneeze, cough, pulls away
Appearance (skin color)	Blue-gray, pale	Pink body, blue extremities	Normal over entire body, completely pink
Respiration (breathing)	Absent	Slow, irregular	Good, crying

Consider using the ***APGAR Score*** on mdcalc.com.

Back

Prolapsed Cord

Prolapsed cord occurs when the umbilical cord presents itself outside of the uterus while the fetus is still inside. It can occur when the water breaks: with the release of amniotic fluid, the cord can follow. Usually, the fetus will engage and compress the cord, resulting in fetal hypoxia.

Treatment

EMT

- Place the patient in the knee-chest position. Consider a prone knee-chest position.
- Palpate the cord for a pulse (excessive palpation may cause vasospasm, potentially leading to a worse outcome):
  - If no pulse, elevate the presenting fetal part. This is generally performed by placing 2 fingers or an entire hand in the vagina to elevate the fetus off the cord.
- Wrap the cord in saline soaked dressing.
- **Do not attempt** to push the cord back into the vagina.
- Provide immediate transport to the closest appropriate facility while maintaining elevation of the presenting fetal part.

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Presenting Limb

When faced with a newborn's limb as the presenting part **do not attempt delivery** in the prehospital setting.

Back

Breech Presentation

Breech presentation occurs when a newborn's buttocks is the presenting part. Let the delivery occur naturally and ensure that an open airway is provided until delivery is completed.

Treatment

EMT

- Place the patient supine with knees widely separated. Elevate the patient's buttocks, if needed.
- Allow the delivery to proceed normally while supporting the newborn with the palm of your
- hand and arm to prevent explosive delivery.
- If the head delivers slowly or becomes trapped in the birth canal:
  - place a gloved hand in the vagina, with the palm towards the newborn's face utilizing a "V" technique with your fingers
  - push the vaginal wall away from the newborn's face to create a space until delivery of the head.
- Check the cord to ensure that it is not wrapped around the newborn's neck.

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Shoulder Dystocia

Shoulder dystocia occurs when, after normal delivery of the head, the newborn's shoulders cannot pass through the pelvic outlet, interrupting delivery. Typically, after the head is delivered it will retract tightly against the perineum.

Treatment

EMT

- Place the patient supine with knees widely separated. Elevate the patient's buttocks.
- Hyperflex mother's legs into a knee-chest position (McRoberts maneuver), allowing her pubic symphysis to slide over the infant's anterior shoulder, flattering the maternal sacrum.
- If McRoberts maneuver fails, also apply suprapubic pressure to displace the infant posteriorly. Apply pressure just above the pubic symphysis, not the uterine fundus.

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Uterine Inversion

Uterine inversion occurs when the uterine fundus collapses into the endometrial cavity, turning the uterus partially or completely inside out. It is a rare complication of vaginal delivery, but when it occurs it is life-threatening.

Treatment

EMT

- Place the patient supine.
- If the placenta is still attached, do not remove it.
- Make one attempt to manually replace the inverted uterus by placing a hand inside the vagina and pushing the fundus along the long axis of the vagina toward the umbilicus.
- If a constriction ring is palpable, pressure should be applied to the part of the fundus nearest the ring to ease it through from bottom to top.
- If unsuccessful, cover any protruding tissue lightly with moist sterile dressings.

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 1 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema

Back

Oleoresin Capsicum (OC) Spray Exposure

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Exposure to Oleoresin Capsicum (OC, pepper) spray
- Services requested by RUPD

Prior to scene entry, all providers must:

- **Use a face shield and eye protection**
- **N95 mask should be worn**
- **Gloves should also be worn**
- **Minimize exposure to equipment and clothing**

Treatment

EMT

- Manage CABCs
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** as appropriate
- Remove contaminated clothing if possible and practical.
- Remove contact lenses if present.
- Place patient in a position of comfort as allowed by law enforcement.
- Irrigate face and eyes:
- Copious irrigation and time will relieve symptoms
- Use of running water, such as showers or hoses, is preferable to saline
- Irrigate for at least 10 minutes or until symptoms reside
- If any open wounds have been contaminated, irrigate as described above
- Assess breath sounds
- If patient complains of respiratory distress, treat per ***Dyspnea Guidelines***. Proceed with extreme caution if patient has a history of asthma or respiratory disease.

General

- Individuals exposed to pepper spray may experience increased difficulty with respirations and are at risk for positional asphyxiation. Ensure that any patient with shortness of breath or other respiratory difficulty is placed in a position that allows minimal respiration effort.
- Individuals exposed to pepper spray may concurrently exhibit signs of excited delirium, including but not limited to combativeness, hyperthermia, and restlessness. These individuals require immediate transport and ALS intervention. Treat these patients with symptomatic care and reference the appropriate protocols as necessary.
- **Additional attention is necessary to prevent the unnecessary exposure of personnel and equipment.**

Back

Respiratory Arrest

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Not breathing but has a pulse.

Treatment

EMT

- Establish airway patency with positioning
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Obtain vital signs (apply cardiac monitor)
- Determine a ***Blood Glucose Level***

AEMT

- Obtain 12-lead ECG
- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access
- Toxins/drug/narcotic/opiate overdose suspected with apnea or ineffective/agonal breathing:
  - ADULT or PEDIATRIC ≥ 25 kg: Naloxone 0.4 mg IVP/IOP/IM/IN, may repeat every 2 to 5 minutes to a maximum of 4 mg
    1. Use Naloxone to restore effective breathing
    2. Avoid excessive dosing to prevent withdrawal
    3. If available, Consider Single-Use 4 mg Nasal Narcan Spray
  - PEDIATRIC < 25: Naloxone 0.1 mg/kg (Max Dose 0.4 mg) IVP/IOP/IM/IN, may repeat every 5 minutes to a maximum of 4 mg

Paramedic

- ECG monitoring (see ***Cardiac Monitor Operation***)
- Consider advanced airway management if indicated and only if individually credentialed

General

- As with any airway management scenario, the least invasive method is usually preferred.

Back

Seizures

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Suspected seizures

Treatment

EMT

- Obtain vital signs (apply cardiac monitor)
- Determine a ***Blood Glucose Level***
- ***Oxygen Administration*** as appropriate and consider ***BVM*** ventilations
- Assess patient for possible trauma and treat as appropriate
- Place patient in recovery position post-seizure

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
- Hypoglycemia suspected (BGL < 60 mg/dL):
  - ADULT or PEDIATRIC ≥ 25 kg:
    1. D10 5 mL/kg IV/IO (up to 250 mL) OR
    2. D25 2 mL/kg IVP/IOP (up to 100 mL) OR
    3. D50 1 mL/kg IVP/IOP (up to 50 mL) OR
    4. Glucagon 1 mg IM if no vascular access obtained
  - PEDIATRIC < 25 kg:
    1. D10 5 mL/kg IV/IO (up to 250 mL) OR
    2. D25 2 mL/kg IVP/IOP (up to 100 mL) OR
    3. D50 1 mL/kg IVP/IOP (up to 50 mL) OR
    4. Glucagon 0.03 mg/kg IM (maximum 1 mg) if no vascular access obtained

Back

General

- D10 should be administered as a piggyback drip, or into an extension set, using a macro drip set with a dose of 5 mL/kg IV/IO up to 250 mL. D10 may be given with the drip wide open. Once the patient regains consciousness, the drip should be shut down, and the BGL reassessed. No further Dextrose should be administered if the BGL is > 60 mg/dL.

Stroke/CVA

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Suspected stroke

Treatment

EMT

- Rapid assessment:
  - To identify stroke: ***Los Angeles Prehospital Stroke Screen***
  - If positive, to identify likely LVO: ***Rapid Arterial oCclusion Evaluation***
  - Identify time last known well
- Obtain vital signs (apply cardiac monitor)
- Determine a ***Blood Glucose Level***
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Rapid transport to stroke center (see ***Destination Determination***)

AEMT

- Rapid assessment and transport
- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
- Consider 12-lead ECG

General

- The patient may still be experiencing a stroke even if the screening criteria are not met.

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Revised 07.10.2023

Rice University

Emergency Medical Services

Clinical Guidelines

Trauma Assessment & Treatment

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Trauma General Assessment: Adult and Pediatric

Rice University Emergency Medical Services Clinical Guidelines

Treatment Priorities

- Assessment
  - SCENE SAFETY
  - PROTECTIVE EQUIPMENT
  - Primary Survey
  - Secondary Survey (when appropriate)
- Primary Survey Care
  - Control arterial bleeding
  - Open airway
  - Seal any penetrating wounds from neck to navel
- Ongoing Care
  - Reassess all primary care
  - Support oxygenation/ventilation
  - Vascular access
  - Secondary Survey (if able)
  - Keep patient warm/avoid hypothermia
- ***Appropriate Destination***

General

Before entering any trauma scene, ensure your personal safety. **Do not attempt patient contact until hazards can be appropriately mitigated.** In addition to scene safety, consider mechanisms of injury, number of patients, and special equipment or extrication needs.

All trauma patients should be assessed utilizing primary, secondary and reassessment surveys.

Primary Survey

- The primary survey is to be conducted on all trauma patients. It is designed to rapidly identify life-threatening or potentially life-threatening injuries. The primary survey should be completed within 2 minutes of patient contact. **The primary survey is only interrupted for life-threatening arterial bleeding, airway obstruction, or respiratory/cardiac arrest.**
- Primary survey interventions include airway management, sealing open chest wounds, identifying suspected tension pneumothorax, oxygen administration, and controlling any obvious external hemorrhage. Remember to expose the patient as needed to conduct an appropriate exam.
- **The following are steps of the primary survey:**
  1. Manually stabilize the cervical spine while assessing the airway and level of consciousness.
  2. Evaluate breathing – present? rapid? normal? slow? shallow?
  3. Evaluate circulation – carotid and radial pulses present? Control external hemorrhage.

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4. Examine for deformity, contusions, abrasions, penetrations, burns, lacerations, tenderness, or swelling ("DCAP-BTLS"):
    - Head
    - Neck – subcutaneous emphysema?
    - Chest – paradoxical movement?
5. Auscultate the chest for breath sounds in the mid-axilla bilaterally – present? equal?
6. Examine the abdomen and pelvis for deformity, contusions, abrasions, penetrations, burns, lacerations, tenderness, or swelling ("DCAP-BTLS").
7. Examine the extremities for deformity, contusions, abrasions, penetrations, burns, lacerations, tenderness, or swelling ("DCAP-BTLS"), and pulse, movement, sensation.

Any trauma patient with altered level of consciousness, abnormal respiration, abnormal circulation, or signs/conditions likely to lead to shock (distended abdomen, pelvic instability, bilateral femur fractures) should be rapidly immobilized and ambulance transport should be contacted after completing the primary survey. These are "LOAD & GO" patients.

Secondary Survey

- ➢ The secondary survey is always done enroute on critical patients.
- ➢ If no critical conditions are found in the primary survey, the secondary survey may be conducted on the scene and should be completed within 5 minutes after the primary survey is completed.
- ➢ **The following are steps of the secondary survey:**
    1. Obtain vital signs (pulse, respiratory rate, blood pressure, pulse oximetry)
    2. Obtain history of traumatic event and pertinent patient medical history (allergies, medications, past illness/injury, last oral intake)
    3. Head to toe exam – look for "DCAP-BLS" in every body area. Calculate GCS score
    4. Perform indicated bandaging and splinting

Reassessment Survey

- ➢ The reassessment survey is an abbreviated exam after interventions and done at least every 5 minutes for critical patients.
- ➢ **The following are steps of the reassessment survey:**
    1. Repeat the primary survey
    2. Repeat vital signs
    3. Repeat GCS score calculation
    4. Check every intervention – proper placement of advanced airway? Proper placement of IV/IO?
    5. Check results of every intervention – improved oxygenation/ventilation? Improved vitals?

Note: Patients who appear to have traumatic injuries may also have a medical complaint. Focused assessment, and reassessment, of every patient, medical or traumatic, should be conducted to identify all life-threatening conditions and treat as appropriate.

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Animal Bites and Stings

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Treatment Priorities

- If an allergic reaction occurs, treat per ***Allergic Reaction and Anaphylaxis***.
- Make sure the scene is safe before beginning treatment.
- Request assistance from RUPD and animal control if needed.
- If safe, take a photo of the animal for the hospital.
- If the bite/sting is on an extremity, remove any jewelry or constricting clothing.
- Mark the edge of any swelling/irritation every 20 minutes.
- Keep the patient calm.

Animal bites carry a risk for infection and may require evaluation in the ER.

- Dog and cat bites may require prophylactic treatment, especially bites to the hands, puncture wounds, and crush injuries. Cat bites are at a particularly high risk for infection.
- Rabies should be suspected in animals who display symptoms such as inappetence, dysphagia, abnormal behavior, ataxia, paralysis, altered vocalization, or seizures:
  - Skunks, racoons, and bats are commonly infected, and injuries from these animals should be seen in the ER.
  - Small rodents such as squirrels, chipmunks, rats, and mice are rarely infected with rabies and have not been known to transmit rabies to humans.

Treatment

EMT

For snake bites:

- Elevate the injury above the level of the heart, if possible.
- Loosely bandage and transport to a hospital-based ER. Consider trauma center.
- Do not apply cold packs or tourniquets.

For dog/cat bites:

- Manage major bleeding and any immediate life threats.
- Thoroughly clean wounds. Warm water and soap are preferred if available.
- Consider transport to ER for possible disease transmission, especially if the animal was not domesticated or is showing signs of rabies. ER treatment should also be considered to assess for possible fractures, retained foreign bodies (like teeth), and ligament/tendon injury.

For ant bites:

- Move the patient to a safe area and brush off any remaining ants.
- Wash affected area with soap and water.
- Apply hydrocortisone cream to the affected area for itching/burning.
- Assess for allergic reaction. Refer to ***Allergic Reaction and Anaphylaxis*** guidelines.

Back

For asp caterpillar stings:

- Use tape to carefully remove any remaining hairs embedded in the skin.
- Wash affected area with soap and water.
- Assess for allergic reaction. Refer to ***Allergic Reaction and Anaphylaxis*** guidelines.

For squirrel and other rodent bites:

- Thoroughly clean wounds. Warm water and soap are preferred if available.
- Use pressure to stop bleeding and bandage appropriately.

AEMT

- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

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Amputation

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria:

A traumatic amputation is the loss of a body part, such as a finger, toe, arm, or leg, that occurs suddenly due to an accident or injury. Amputations can either be partial, in which some soft tissue is still connected, or complete, in which the body part is completely separated from the body.

Treatment

EMT

- CABCs
- Oxygen via NC or NRB as appropriate
- Apply tourniquet if bleeding continues despite direct pressure per "Life Threatening Hemorrhaging" protocol
- Obtain Vital signs
- Splint suspected fractures including joint above and below area of injury
- Cover amputated anatomy with saline-moistened gauze and place in a clean plastic bag. Then, place the bag containing the wrapped amputated anatomy over ice, avoiding direct contact of amputated anatomy with ice
- Stabilize impaled objects

Advanced EMT

- IV Normal Saline TKO if systolic BP ≥100 mmHg without symptoms of hypotension
- IV Normal Saline 250 mL bolus if systolic BP < 100 mmHg with symptoms of hypotension and no signs of pulmonary edema
  - May repeat up to a total of 2 Liters Normal Saline if systolic BP remains < 100 mmHg with symptoms of hypotension and no signs of pulmonary edema
- Consider assisting with ventilation as needed. BLS airway or advanced airway such as the Air-Q or endotracheal intubation, if credentialed to do so and procedure is indicated

Pediatric

- IV Normal Saline 20 mL/kg bolus if systolic BP < (70 ÷ 2x age in years) mmHg and no signs of pulmonary edema
  - May repeat up to a total of 60 mL/kg if systolic BP < (70 ÷ 2x age in years) mmHg and no signs of pulmonary edema

General:

- Amputations have the potential for massive hemorrhage, but most often, the bleeding will control itself with pressure applied to the stump. If bleeding cannot be controlled with pressure, a tourniquet may be used.

Burns

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

General

- Thermal burn
  - Irrigate with water only if flames not extinguished, smoldering present, or significant heat is still being dissipated
  - Determine possibility of smoke/toxic inhalation
- Chemical burn
  - Consult Safety Data Sheet (SDS)
  - Consult Environmental Health Safety and Lab Operations
  - Brush off dry chemicals
  - Irrigate with water for at least 15 min
- Electrical burn
  - Evaluate airway and cardiac status

Treatment

EMT

- Scene safety
- Stop burning process. Remove all burned/burning clothing and any jewelry
- ***Trauma and Hypovolemic Shock*** supportive care
- Assess for respiratory symptoms and examine face/neck/airway for burns
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Stabilize impaled objects if explosive mechanism of injury
- If burn is $<$ 10% BSA: cool with water (preferred) or sterile saline
- If burn is $\geq$ 10% BSA: cover with sterile dry dressing (consider non-adhesive dressing)

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography*** if respiratory symptoms
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain 12-lead ECG if electrical burn
- If major thermal burn, administer IV NS:
  - ADULT:
    1. NS 500 mL/hr IV/IO, monitor for signs of pulmonary edema
  - PEDIATRIC:
    1. If age < 5 years: NS 125 mL/hr IV/IO
    2. If age 6 – 13 years: NS 250 mL/hr IV/IO

Paramedic

- ECG monitoring if electrical burn, treat per ***Cardiac Rhythm Abnormalities*** guideline

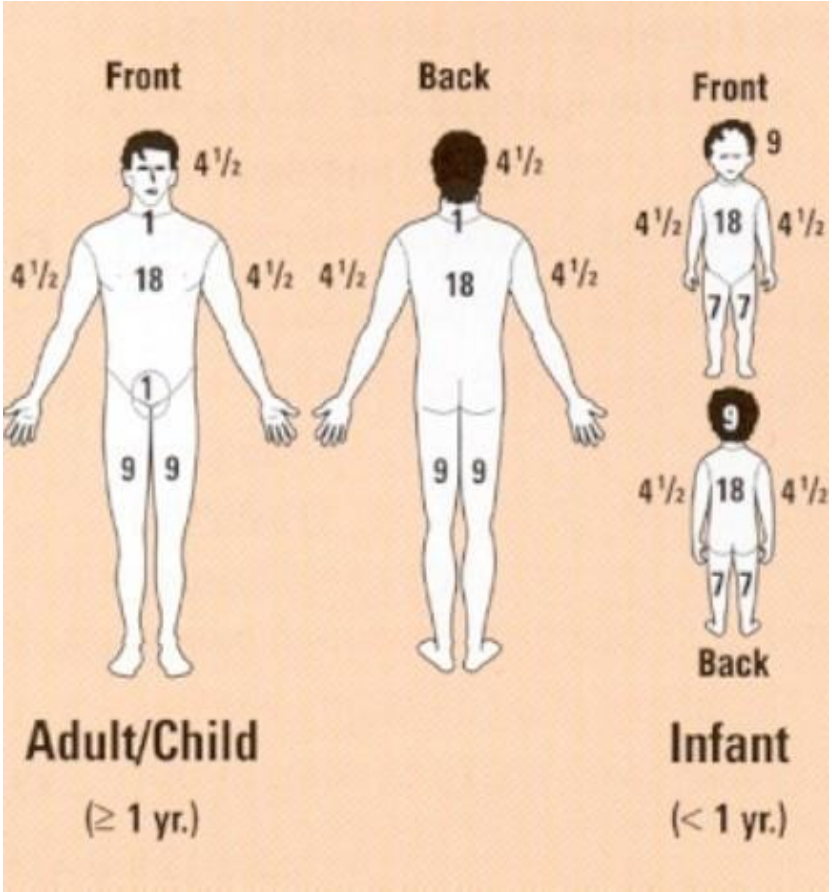
Back

General

- ➢ If patient's clothes are burning or smoldering, douse them with water immediately. If water is not available, roll the patient on the ground or smother the fire. Do not touch or pick up debris.
- ➢ Consider advanced airway management for patients with:
  - Full thickness burns of face or perioral region
  - Circumferential neck burns
  - Acute respiratory distress
  - Progressive hoarseness or air hunger
  - Respiratory depression
  - Altered mental status
  - Airway edema

<u>Percent Body Surface Area (BSA) Estimation Chart</u>

Note: count only partial-thickness and full-thickness burns when calculating estimated % BSA.



An alternate method of calculating %BSA involvement is to use the size of the patient's entire hand as equal to 1% of their BSA. This is a useful method when calculating smaller burn areas.

Back

Chest, Abdomen, and Pelvis Trauma

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Blunt or penetrating injury to the chest, abdomen, or pelvis

Treatment

EMT

- Consider ***Spinal Motion Restriction*** as indicated by mechanism and exam
- Seal open wounds from neck to navel
- Stabilize impaled objects
- ***Apply pelvic binder*** for suspected pelvic fractures
- Cover eviscerated organs with sterile, saline-dampened dressing layered with dry dressings
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS bolus to maintain MAP > 65 mmHg, EXCEPT IF:
       - Suspected head injury
       - Female patient with suspected pregnancy
       - Age ≥ 40 years old
       - Known history of hypertension and/or coronary artery disease
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    2. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

Paramedic

- ECG monitoring (see ***Cardiac Monitor Operation***)
- Consider advanced airway management if indicated and only if individually credentialled

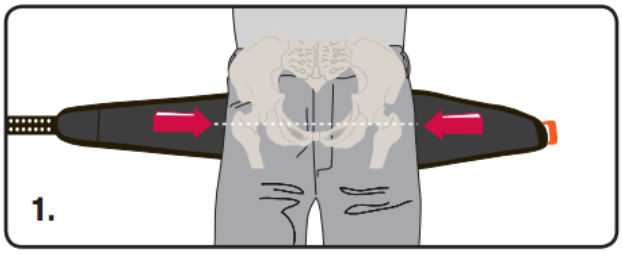
General

- Prioritize calling for transport as soon as injuries are realized
- Ensure correct pelvic binder usage (see diagram below)
- Purpose of the pelvic binder is to secure the pelvis closer to its natural position to control bleeding

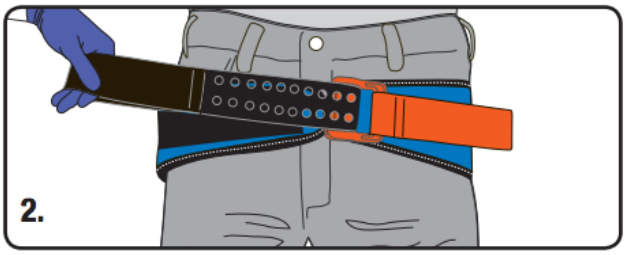
Back

Pelvic Binder Application

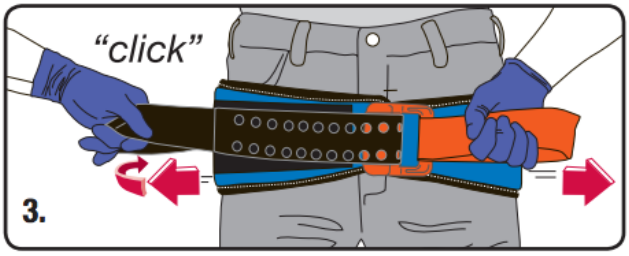
- Indications:
  - Blunt force trauma or blast injury consistent with mechanism causing an “open-book” pelvic fracture and any of the following:
    1. Pelvic instability
    2. Hemodynamic instability/shock
    3. Pelvic pain
- Contraindications:
  - None



Remove objects from patient’s pocket or pelvic area. Place SAM Pelvic Sling II black side up beneath patient at level of trochanters (hips).



Place **BLACK STRAP** through buckle and pull completely through.



Hold **ORANGE STRAP** and pull **BLACK STRAP** in opposite direction until you hear and feel the buckle click. Maintain tension and immediately press **BLACK STRAP** onto surface of SAM Pelvic Sling II to secure. You may hear a second click as the sling secures.

Back

Compartment Syndrome

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- History of trauma in extremity in past days or acutely that could cause pressure to build in deep spaces of extremity, hindering perfusion of surrounding tissues.

Treatment Priorities

- Vital signs
- 5 P's exam (see description below)
- Notification of concern regarding limb circulation compromise during transfer of care

Treatment

EMT

- ***Trauma and Hypovolemic Shock*** supportive care
- Control bleeding with direct pressure
- Position extremity to promote circulation to distal extremity
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Obtain vital signs (apply cardiac monitor)
- Evaluate extremity for 5 P's of compartment syndrome:
    1. Pain out of proportion to assessed injury
    2. Paresthesia (numbness, tingling, or burning sensation due to nerve compression)
    3. Pressure with palpation (skin/muscle feels tense due to increasing force within compartment)
    4. Paralysis (late sign due to nerve compression)
    5. Pulselessness in distal extremity (late sign)

General

- Do not move entrapped patient unless in danger.
- Do not attempt to splint injuries.

Back

Eye Injury

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Blunt or penetrating trauma to the eye or surrounding areas
- Foreign objects in the eye or surrounding areas (i.e. chemicals, debris, etc.)

Treatment

EMT

- Manage CABCs
- Check visual acuity (if possible)
- Obtain vital signs (apply cardiac monitor)

- **For chemical exposure:**
  - Brush off solid chemical prior to flushing
  - Continually flush affected eye with saline or water (if available)
  - Check any relevant SDS sheets for instructions and recommendations for appropriate eye washing time and technique
  - Consult Environmental Health Safety and Lab Operations

- **For open injury to globe (or any non-superficial injury to the eye):**
  - Patch both eyes
  - Do not put pressure on or manipulate the eyes
  - Do not administer any medication into eyes
  - Elevate head if possible
  - Do not allow eating or drinking

Back

Head, Neck, and Spinal Trauma

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Mechanism of injury with likely trauma to the head, neck, or spine.
- Visible or palpated deformity to the head, neck, or spine.

Treatment Priorities

- Consider spinal motion restriction (see below).
- Treat life-threatening injuries.
- Do not attempt to splint individual injuries if multi-system trauma is present.
- Remember, patients with neurological or focal deficits can decompensate rapidly.
- For suspected traumatic brain injuries, avoid hypoxia and hypotension.

Treatment

EMT

- Manage CABCs
- Consider spinal motion restriction (***per guidelines below***)
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Control bleeding per ***Life Threatening Hemorrhage***
- Elevate patient's head to 30° for severe head injury with mental status changes, if no contraindications

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS TKO if SBP ≥ (70+2x age in years) mmHg without hypotensive symptoms
    2. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) and no signs of pulmonary edema

Back

Spinal Motion Restriction (SMR)

Apply SMR if any of the following are present:

- Altered mental status
- Evidence of drug or alcohol intoxication
- Midline neck and/or back pain and/or tenderness
- Focal neurological deficits or symptoms
- Anatomic deformity to the spine
- Distracting injury or circumstance, including extreme agitation or emotional distress
- Torticollis in children (may require immobilization in position found)
- A communication barrier which prevents accurate assessment
- Increased suspicion of spinal injury (major MVC, axial loading injuries to the spine, substantial torso injuries, falls > 10 feet, significant facial trauma, hanging)

If SMR is indicated and patient agrees to transport:

- **For patients who are ambulatory on scene or can safely self-extricate:**
  - Place cervical collar on patient. Direct patient to limit spine movement.
  - Keep the patient in the position found (have the patient sit if found standing).
  - When a transport service arrives, allow the patient to carefully move themselves to the unloaded stretcher.
  - Secure the patient to the stretcher in a supine position or position of comfort.
- **For patients who are NOT ambulatory, require extrication, display altered mental status, and/or are unable to communicate reliably:**
  - Place cervical collar on patient. Direct patient to limit spine movement.
  - Load patient onto a scoop or backboard. When a transport service arrives, use the scoop or backboard to move the patient to the stretcher.
  - Remove the backboard or scoop once the patient is on the stretcher, maintaining in-line spinal alignment. Secure the patient to the stretcher. Transport in supine position.
  - The patient may remain on the backboard or scoop if removing the device would otherwise delay critical interventions/rapid transport.

Special considerations:

- Extremes of age and the cognitive ability of the patient to understand assessment questions.
- Patients ≥ 65 years old are more prone to skeletal injury with even minimal traumatic insult.
- Patients must clearly understand the language spoken AND must have the cognitive ability to comprehend the answers asked in the SMR assessment.
- Immobilized patients are at high risk for aspiration secondary to nausea/vomiting or blood in the mouth. Assess adequacy of respirations in all immobilized patients. Avoid placing securing devices over the abdomen of pediatric patients.
- Ensure proper padding under the shoulders to maintain neutral alignment in pediatric patients.
- All patient movements should be done to limit motion of the spine.
- If in doubt, apply SMR and contact a Medical Director.

Back

Life Threatening Hemorrhage

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Life threatening hemorrhaging that cannot be controlled by direct pressure should be treated with a tourniquet (extremity injuries) and/or a hemostatic agent (trunk injuries).

Treatment

EMT

- General supportive care
- ***Trauma and Hypovolemic Shock*** supportive care
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Determine if patient is taking antiplatelet agent (e.g. Aspirin) or anticoagulant (e.g. Warfarin)
- Apply direct pressure as indicated using manual and/or via pressure dressing
- If direct pressure is insufficient and bleeding is arterial and/or brisk:
  - ***Apply topical hemostatic agent*** as indicated
    1. Maintain direct pressure while using topical hemostatic agent
    2. Notify receiving EMS personnel if hemostatic agent was used and type
  - ***Apply tourniquet*** as indicated
    1. Multiple tourniquets may be used if bleeding continues
    2. Tourniquet should be placed as high as possible on extremity in a multi-trauma patient

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective
- Obtain large-bore IV access and consider NS administration
  - ADULT:
    1. IV NS bolus to maintain MAP > 65 mmHg, EXCEPT IF:
       - Suspected head injury
       - Female patient with suspected pregnancy
       - Age ≥ 40 years old
       - Known history of hypertension and/or coronary artery disease
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg and no signs of pulmonary edema
    2. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg and no signs of pulmonary edema

Back

Tourniquet Application

- Indications:
  - Life-threatening extremity hemorrhage
- Contraindications:
  - None

Technique for the application of a Combat Application Tourniquet (CAT):
(Note: this protocol uses the CAT to illustrate achieving extremity bleeding control using a tourniquet. Commercial tourniquets are proven more effective than 'homemade' devices. In the absence of a commercial tourniquet, 'homemade' devices may also help control bleeding.)

- The CAT windlass uses a free-moving internal band to provide circumferential pressure to an injured and uncontrollably bleeding extremity. Once placed, keep the tourniquet secure but uncovered so that the bleeding site can be clearly monitored as well as the tourniquet itself. The time of tourniquet application should be written and secured to the patient on a piece of tape. Conscious patients may experience pain related to tourniquet use.

- The CAT is applied over the extremity proximal to the bleeding site routing the self-adhering band around the extremity. Lower extremity wounds require feeding the strap through both sections of the buckle. Upper extremity wounds typically require less pressure to control and do not require feeding the strap through both sections of the buckle, though doing so is usually the optimal strategy. If a single slit of the buckle is used for arm wounds, the inner slit (closest to the windlass) is to be used.

- <u>In a multi-trauma patient, the tourniquet should be placed as high as possible on the extremity.</u>

Back

- For all lower extremity wounds, pass the band through the outside slit of the buckle, utilizing the friction adaptor buckle which will lock the band in place.

- Pull the self-adhering band tight and secure the band back on itself with the Velcro-adhesive strap.

- Twist the windlass until the bleeding stops. This will typically be at or less than three complete rotations of the windlass. More could be required, but be careful not to exert too much torque on the windlass to avoid breakage.

- Lock the rod in place with the windlass clip.

- Secure the rod with the strap by pulling it tight and adhering it to the opposite hook on the windlass hook. Indicate the time of tourniquet application on tape.

- If one tourniquet correctly applied does not completely control hemorrhaging, in addition to direct pressure, an additional tourniquet may be applied just proximal to the first tourniquet. **For lower extremity bleeding, two tourniquets are typically required.**

- Once bleeding has been controlled by a tourniquet, the usual and customary practice is to leave the tourniquet in place throughout the remainder of scene care and transport to an emergency department.

Back

Hemostatic Agent Application

- Indications:
  - Life-threatening hemorrhage unable to be controlled by direct pressure
  - If extremity wound, consider tourniquet use (see above)
- Contraindications:
  - None

Technique for the application of a hemostatic agent (QuikClot):

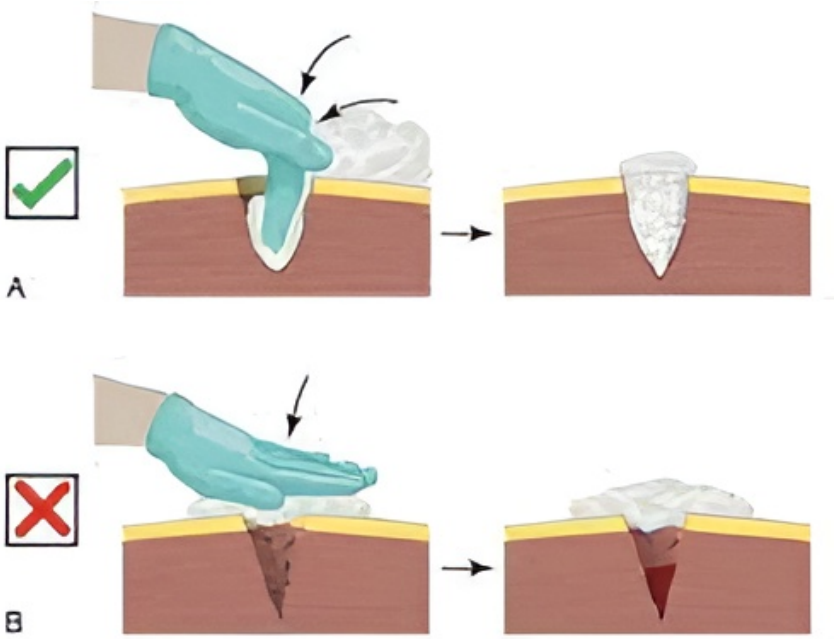
- Open clothing around wound. Remove any excess pooled blood, while preserving any clots already in the wound if possible.

- Locate source of bleeding and pack gauze into wound directly onto bleeding source. More than one may be required.

- Apply direct pressure until bleeding stops (typically within 3 – 5 minutes).

- Leave QuikClot in place. Wrap to secure the product in the wound.

- Notify receiving EMS/hospital personnel if hemostatic agent was used and what time it was packed in wound.



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Extremity Injury

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria

- Significant trauma to an extremity

Treatment

EMT

- Manage CABCs
- ***Trauma and Hypovolemic Shock*** supportive care
- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- ***Splint suspected fractures*** including joint above and below area of injury
- Apply cold pack to the injury site, avoid direct contact with skin
- Control bleeding per ***Life Threatening Hemorrhage***:
  - ***Apply topical hemostatic agent*** as indicated
  - ***Apply tourniquet*** as indicated

Back

Sexual Assault: Adult and Pediatric

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Treatment Priorities

- Physical and emotional supportive care
- Transport to sexual assault exam capable destination

Treatment

EMT

- General supportive care. Refrain from touching the patient without permission. Clear communication is essential.
- Obtain vital signs (apply cardiac monitor if given permission).
- Check for secondary wounds and consider treating as appropriate.
- Allow the patient to change clothes. Keep clothing in a bag and transfer it to the hospital or forensic nurse examiner. Discourage the patient from showering, but weigh the risks/benefits with the patient if they desire to shower for comfort.
- Try to have a provider of the same gender on scene

AEMT

- Consider IV access and NS administration
  - ADULT:
    1. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

General

- If you suspect a patient may have been a victim of sexual assault, request RUPD to respond.
- Refer the patient to the SAFE Office (713-348-3311). The navigators will assist the patient in accessing multiple resources on campus. Rice University partners with Texas Forensic Nurse Examiners to provide a forensic exam on campus in Student Health Services at no cost 24/7.
- For students who would like to have a forensic exam performed, there are two off-campus options available: Memorial Hermann and Ben Taub. If the patient is under the age of 18, the patient should be evaluated at Texas Children's Hospital. If the student wants to go to the hospital, RUPD can provide a courtesy escort. A SAFE Office navigator is available to accompany the student to the hospital if desired. Be sure to offer this service to the patient. *Please note that forensic exams are also available to students who experienced domestic/dating violence.*
- To access these services after hours, call 713-348-3311 and ask to speak with the Director of the SAFE Office. Share that it is an emergency. The answering service will connect with the Office.

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Splinting

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- For any trauma incident involving an extremity joint or long bone, the wrist, elbow, shoulder, ankle, knee, etc. whether it was a sporting incident, MVC, or fall, splinting should be considered to stabilize the injury and provide pain relief to the patient.

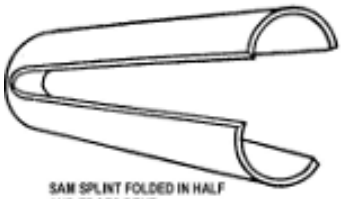
Treatment

EMT

- General supportive care
- Obtain vitals (apply cardiac monitor)
- Assist patient to the position of most comfort
- Joint or Long Bone Injury:
  - Assess for distal pulse, motor, and sensation in all extremities
  - Manually stabilize the bone and surrounding joints
  - Splint above and below the site of injury without compromising any joints to immobilize the injury
  - Reassess for distal pulse, motor, and sensation after splinting
- Consider application of a cold pack
- Consider applying a traction splint for a suspected femur fracture

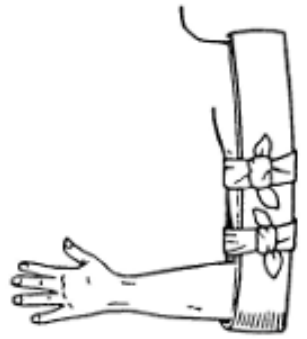
General

- REMS currently carries SAM splints, padded board splints, cardboard splints, and ACE bandages.
- Here is a brief SAM splint guide:

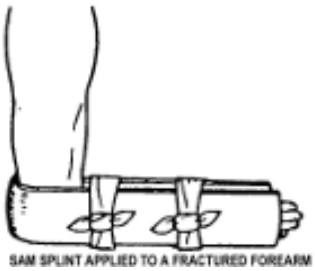


SAM SPLINT FOLDED IN HALF AND EDGES BENT

SAM SPLINT APPLIED TO A FRACTURED LEG OR ANKLE



SAM SPLINT APPLIED TO A FRACTURED HUMERUS



SAM SPLINT APPLIED TO A FRACTURED FOREARM

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Trauma and Hypovolemic Shock Supportive Care

Rice University Emergency Medical Services Clinical Guidelines

Treatment Priorities

- Scene safety and protective equipment
- Primary survey and care
  - Control arterial bleeding
  - Open airway
  - Seal open wounds from chest to navel
- Secondary survey

Treatment

EMT

- Control bleeding per ***Life Threatening Hemorrhage***:
  - Bandage, dressing, and direct pressure
  - ***Apply topical hemostatic agent*** as indicated
  - ***Apply tourniquet*** as indicated
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Obtain vital signs (apply cardiac monitor)
- Assess for and treat shock, prevent hypothermia
- Treat per applicable guidelines:
  - ***Head, Neck, and Spinal Trauma***
  - ***Chest, Abdomen, and Pelvis Trauma***

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography.***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective.
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS bolus to maintain MAP > 65 mmHg, EXCEPT IF:
       - Suspected head injury
       - Female patient with suspected pregnancy
       - Age ≥ 40 years old
       - Known history of hypertension and/or coronary artery disease
  - PEDIATRIC:
    1. IV NS 20 mL/kg bolus if SBP < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema
    2. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg and no signs of pulmonary edema

Back

Water Submersion Events

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Treatment Priorities

- Rescue safety
- Oxygenation/Ventilation
- Assessment/care for life-threatening injuries and/or cardiac arrest

Treatment

EMT

- Obtain vital signs (apply cardiac monitor)
- ***Oxygen Administration*** and ***BVM*** ventilations as appropriate
- Evaluate etiology of water submersion and treat per applicable guidelines
- Cold water submersion cardiac arrest:
  - Rewarming measures per ***Hypothermia***
  - Resuscitation per ***Cardiac Arrest***
- Warm water submersion cardiac arrest:
  - Resuscitation per ***Cardiac Arrest***
- Consider ***Spinal Motion Restriction*** as indicated by mechanism and exam

AEMT

- Monitor ***$EtCO_2$ and Waveform Capnography.***
- Consider ***Supraglottic Airway*** if indicated and only if ***BVM ventilations*** are ineffective.
- Obtain IV access and consider NS administration
  - ADULT:
    1. IV NS TKO if SBP ≥ 100 mmHg without hypotensive symptoms
    2. IV NS 250 mL bolus if SBP < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
    3. Repeat up to 2 L NS if SBP remains < 100 mmHg with hypotensive symptoms and no signs of pulmonary edema
  - PEDIATRIC:
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    3. Repeat up to 60 mL/kg if SBP remains < (70 + 2x age in years) mmHg with hypotensive symptoms and no signs of pulmonary edema

Paramedic

- Continuous ECG monitoring, treat dysrhythmias per ***Cardiac Rhythm Abnormalities***

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Rice University

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Automated External Defibrillation (AED): Adult and Pediatric

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

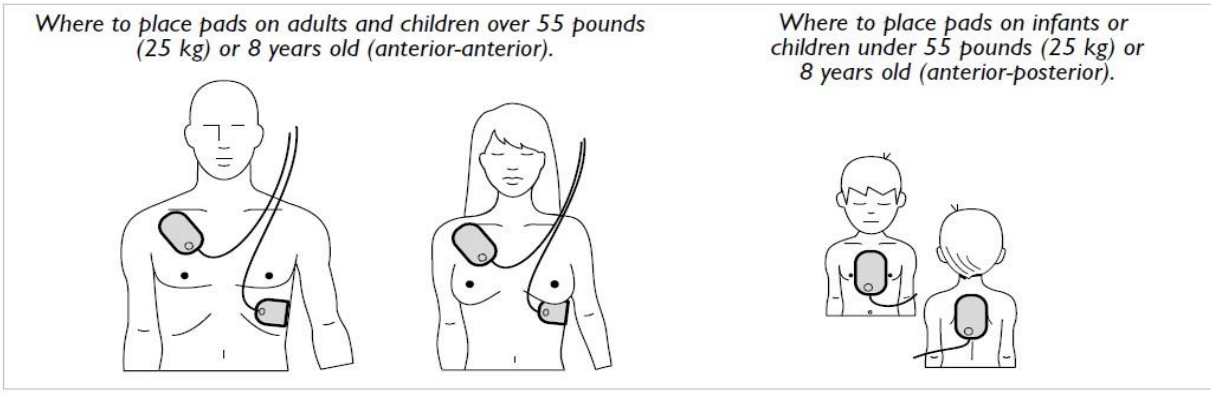
Criteria

- Adult and pediatric patients that are unconscious, unresponsive, apneic or agonally breathing and pulseless. No contraindications for use.

Treatment

EMT

- Check for consciousness, airway patency, breathing, pulse (CABC)
- If determined that patient meets all qualifications for use of AED, turn on AED.
- Apply AED defibrillation pads. Follow illustrations on defibrillation pads for correct pad placement.
  - Avoid overlapping pads over one another.
  - Avoid placing pads over implanted pacemakers and/or defibrillators.
- Pediatric
  - AEDs are NOT indicated in patients under 1 years old, utilize manual defibrillation with the LifePak 15
  - If the patient is between 1 and 8 years old or under 25 kg, use the Infant/Child defibrillation pads
  - If Infant/Child defibrillation pads ae not available, place the Adult defibrillation pads on the posterior and anterior chest.
- Follow AED visual and voice prompts in conjunction with chest compressions.
- Utilize the appropriate protocol for the resuscitation of cardiac arrest patients
- Minimize pauses in chest compressions
- Consider possible reversible causes of cardiac arrest and treat where appropriate
  - Hypoxia: adequate oxygenation and ventilation with 100% oxygen
  - Acidosis: adequate oxygenation and ventilation with 100% oxygen
  - Trauma: Rapid transport to a trauma center
- If a Lifepak 15 becomes available and will be used for defibrillation:
  - Adult Lifepak CR2 and CR+ AED pads are compatible with the LP15 monitor. Leave the LP CR2 / CR+ pads on the patient and start defibrillation using LP15.
  - Adult and pediatric pads from Philips and Cardiac Science AEDs are **NOT** compatible with LP15 and must be replaced with LP15 pads.



Daily Check Procedures

- When checking off the AED at the start of a shift or an event, the following should be checked:
  - One set of adult pads (not expired)
  - Device powers on when opened and voice prompts can be heard. Battery indicator flashes green

General

- In this setting, the most important thing is to confirm that the patient is unresponsive, unconscious, not breathing normally, and pulseless. If uncertain of any of these qualities, perform a sternal rub to determine responsiveness and consciousness.
- In an emergency resuscitation setting that required the use of an AED, do not interrupt or pause chest compressions unless absolutely necessary. For example, continue to provide chest compressions while another operator is applying defibrillation pads, powering on the monitor, selecting appropriate energy and charging the device.
  - HOWEVER: **Do NOT continue to provide chest compressions when the AED is discharging or defibrillating.**

LIFEPAK CR2 Defibrillator

Other AED Brands / Types found on Campus		
Phillips AED	LIFEPAK CR+/1000	Cardiac Science AED

Cardiac Monitor Operation: Lifepak 15 (LP15)

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Vitals monitoring including EtCO2, SpCO, SpMet, 3-Lead EKG, 12-Lead EKG and defibrillation

Orientation

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Procedure

a) AED usage
    1. Turn on LP15
    2. Retrieve Defibrillation Pads from the right side zippered pocket
    3. Connect pads to the therapy cable
    4. Attach pads to patient
    5. Press **Analyze**, LP15 will enter automatic mode
    6. Follow prompts
    7. To cancel at any time, press the speed dial
    8. During compression times, pressing the **CPR** button will silence the metronome
    9. Pressing the **Energy Select** buttons will convert the monitor into manual operation mode (for ALS providers only)
    10. Note: **Options** is not available in AED mode

b) Manual Defibrillation
    1. Turn on the LP15
    2. Attach pads as done with AED
    3. Press **Energy Select** and choose desired energy level
    4. Press **Charge**
    5. Ensure all personnel are clear of the patient
    6. Confirm EKG rhythm requires defibrillation
    7. Confirm available energy
        i. To disarm, press the speed dial
    8. Press the **Shock** button (shaped like a lightning bolt)
    9. Resume compressions
    10. To change metronome settings press **CPR**
        i. Select desired setting (Adult/Youth, Airway/No Airway, Stop Metronome)

c) Routine Vitals Monitoring
    1. Turn on LP15
    2. Attach SpO2 monitor to finger, SpO2 will appear on **Channel 2**
    3. Attach BP cuff to arm, press **NIBP**
    4. Continue to monitor vitals, press **NIBP** as desired to get blood pressure readings
        i. See “General” to print vitals

d) EtCO2 Monitoring
    1. Turn on LP15
    2. Lift EtCO2 protective cap on monitor
    3. Plug in orange “butterfly” to receiver
        i. Push in gently
        ii. Twist clockwise until resistance is felt

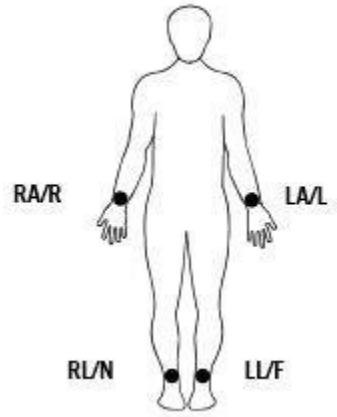
4. Allow LP15 to zero itself
5. Attach probe/cannula/rebreather to patient or tube
6. Results should display on **Channel 3**, can press **Print** to view

e) SpCO and SpMET Monitoring

1. Turn on LP15
2. Unplug “red” SpO2 cable
3. Retrieve “rainbow” SpCO cable from rear lower compartment
4. Plug in “rainbow” cable
5. To get results:
   i. Press **Print** and get value on top banner. If dashed lines appear, try again, or
   ii. Use the speed-dial to select **SpO2** on the left side
   iii. Select **Parameter**
   iv. Select **SpCO**
   v. Press **Home**
   vi. Value will appear for ten seconds

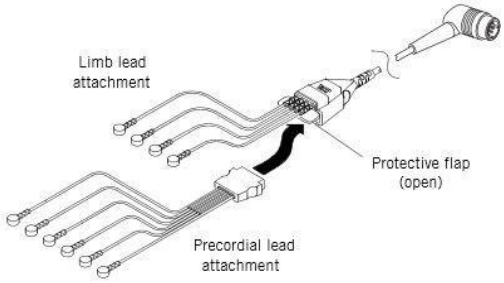
f) 3-Lead EKG

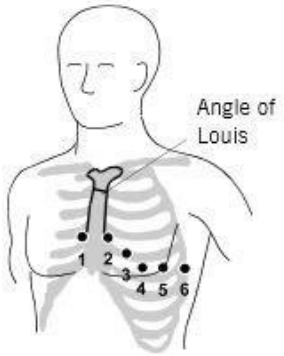
1. Turn on LP15
2. Retrieve electrodes from right-most pocket
3. Attach electrodes to sensors, then to patient
   i. LA – Left Arm
   ii. RA – Right Arm
   iii. LL – Left Leg
   iv. RL – Right Leg
   v. Place medially, proximal to the most distal major joint (ankle, wrist)
4. Advise patient to remain still and uncross legs if crossed
5. EKG will appear on **Channel 1**
6. To generate a rhythm strip, press **Print** to begin printing, press again to end



g) 12-Lead EKG

1. Turn on LP15
2. Attach 3-Lead EKG (shown above)
3. Retrieve 12-Lead extension from left-most pocket
4. Plug in extension to 3-Lead splitter
5. Attach electrodes to sensors, then to patient
6. Advise pt. to remain still





LEAD		LOCATION
V1	C1	Fourth intercostal space to the right of the sternum
V2	C2	Fourth intercostal space to the left of the sternum
V3	C3	Directly between leads V2/C2 and V4/C4
V4	C4	Fifth intercostal space at midclavicular line
V5	C5	Level with V4/C4 at left anterior axillary line
V6	C6	Level with V5/C5 at left midaxillary line

7. Press **12-Lead**
8. Use speed-dial to select age and gender
9. EKG will print, consider second attempt if patient movement created substantial noise
10. Repeat as necessary
11. Note: EKG's can only be interpreted by EMT-P or higher. Computer readings are not a substitute for an accurate diagnosis.

General

a) To print vitals, options:
   1. If LP15 is still on from the same patient
      i. Press **Code Summary**, note that this will print rhythm strips as well if they had been previously generated, or
      ii. Press **Options**
      iii. Select **Print**
      iv. Select **Report**
      v. Select one of the following
         1. **Code Summary** (all events including waveforms)
         2. **Trend Summary** (trend graphs for various vital signs)
         3. **Vital Signs** (just a history of the vitals with times)
         4. **12 Lead** (all 12-Lead EKG's that were taken)
   2. If LP15 has been turned off since the last patient
      i. Turn on LP15
      ii. Press **Options**
      iii. Select **Archives**
      iv. Select **Yes** when prompted to enter patient archives
      v. Select **Print**
      vi. Select **Patient**
         1. Navigate to correct patient, they are in chronological order
      vii. Select **Report**

1. Select options as done above

viii. Turn off LP15

b) To change view options

1. For **Channel 1**

i. Press **Lead**

1. Use speed-dial to select desired lead

ii. Press **Size**

1. Use speed-dial to select desired size

2. For other channels

i. Use speed-dial to select desired channel

ii. Use speed-dial to select desired lead/trend/waveform and size

iii. Press the **Home** icon to return

c) To record events

1. Press **Events**

2. Use the speed-dial to select desired event
3. Events will record in the code summary

d) To change the battery

1. Go to the bottom compartment in the rear of the device
2. Open the Flap
3. Remove the yellow Velcro strip
4. Lift up the compartment
5. Press the gray button to see current battery level
6. Replace batteries as needed

e) To change EKG paper roll

1. Go to the printer compartment below the screen
2. Lift the printer door latch to release the door
3. Pull out the door
4. Remove the paper, including the empty spool if present
5. Insert a new paper roll, making sure the end of the paper extends out of the printer door
6. Close the printer door and ensure it clicks

More information on the LifePak 15, including a full instruction manual, is available at: https://www.stryker.com/us/en/emergency-care/products/lifepak-15.htmlphysiocontrol.com

Cardiac Pacing

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Symptomatic 2nd Degree AV Block Type II
- Symptomatic 3rd Degree AV Block
- Symptomatic Bradycardia in Acute Coronary Syndrome in preference to atropine use
- Symptomatic Bradycardia unresponsive to non-electrical interventions
- Symptomatic Bradycardia in pediatric patients when approved by medical control

Contraindications

- Asymptomatic Bradycardia

Procedure (Lifepak 15)

1. Maintain standard ECG monitoring
2. Apply Quik-Combo pads at chest wall locations illustrated on pads. Dry severe diaphoresis and remove excessive chest hair prior to placement.
3. Connect Quick-Combo pads to Lifepak 15.
4. Advise patient of impending therapy.
5. Power on the pacing function by pressing the PACER button.

6. Ensure triangular “sense” markers are above each QRS complex. Ensure proper connection if they do not appear. If “sense” markers are present for only some QRS complexes, adjust ECG size or select an alternate monitoring lead to achieve proper tracking.

Back

7. Set pacing **rate** at 60 paces per minute using either the RATE switch or the SPEED DIAL.

8. Set pacing **current** at minimum level achieving both *electrical AND mechanical capture*. Deliver electrical pacing current using either the CURRENT switch or the SPEED DIAL.

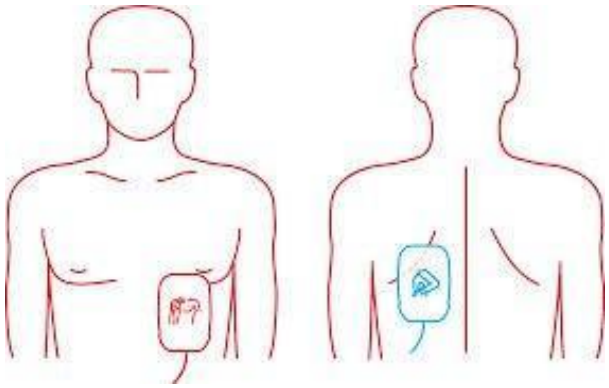
9. Do not use the pause button unless directed by medical control. Holding the pause button will decrease pacing rate by 25% while it is depressed.
10. If pacing therapy termination is required, power off the pacing function by pressing the PACER button.

Considerations

1. If ventricular fibrillation or pulseless ventricular tachycardia occurs, pressing the yellow CHARGE button will automatically stop pacing. Proceed with defibrillation.
2. If monitoring leads become detached, pacing continues but in non- demand mode. During this mode, the patient will receive pacemaker activity at the set rate regardless of any intrinsic beats the patient may have. Reattach the monitoring leads to reestablish demand pacing.

Back

3. If the Quik-Combo pads get detached at any time, an alarm will sound. During this disconnection, the pacing function will resume but current will be set automatically at 0 mA. Current will remain at 0 mA until pads are reconnected and the current is manually increased back to its original level.
4. Electrical capture is demonstrated by a QRS complex after each pacer spike followed by a distinct, broad T-wave. Mechanical capture is demonstrated by a palpable pulse after each pacer spike. Ensure that both electrical capture and mechanical capture are achieved.
5. Pacing Pads should ideally be placed on the anterior and posterior chest.



Synchronized Cardioversion

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Unstable, symptomatic tachycardia:
  - ADULT: HR > 150 bpm
  - PEDIATRIC: HR > 180 bpm AND afebrile
- AND hemodynamic compromise:
  - ADULT: SBP < 100 mmHg
  - PEDIATRIC: SBP < (70 + 2x age in years) mmHg

Contraindications

- Stable tachycardia
- Normal sinus rhythm
- Bradycardia
- Ventricular fibrillation/pulseless ventricular tachycardia

Procedure (Lifepak 15)

1. Power ON (figure 1)

Figure 1

2. Attach patient ECG cable and ECG electrodes.

3. Select lead with the greatest QRS complex amplitude positive or negative deflection (figure 2).

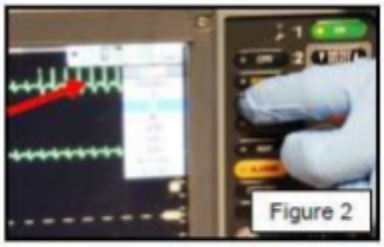


Figure 2

4. Press SYNC. The SYNC mode message appears in the message area when SYNC is active (figure 3).

5. Observe the ECG rhythm. Confirm that a triangle marker appears near the middle of each QRS complex (figure 4). If the markers do not appear or are displayed in the wrong location (for example, on the T wave) adjust the ECG size or select another lead.

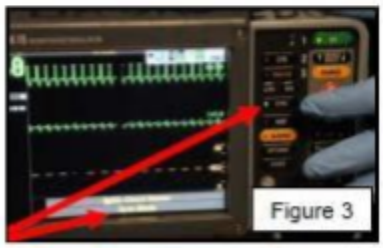


Figure 3

6. Connect the therapy electrodes to the therapy cable and confirm cable connection to the monitor.

7. Prepare the patient's skin and apply therapy electrodes to the patient in the anterior-lateral position (figure 6).

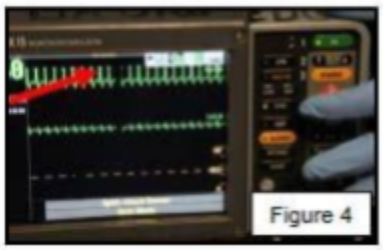


Figure 4

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8. Press ENERGY SELECT or rotate the SPEED DIAL to select the desired energy (figure 7). Begin at 100J energy. If unstable tachydysrthymia persists, repeat synchronized cardioversion at escalating energy settings of 200J, 300J, 360J. For pediatric synchronized cardioversion, consult medical command for treatment plan and energy settings.

9. Press CHARGE. While the monitor is charging a charging bar appears and a ramping tone sounds, indicating the charging energy level. When the monitor is fully charged, the screen displays the available energy (figure 8).

10. Make certain that all personnel stand clear of the patient, bed, and any equipment connected to the patient.

11. Confirm ECG rhythm. Confirm available energy. Prior to delivering synchronized cardioversion, it is essential to ensure that the SYNC mode message continues to appear. Failure to deliver a “synchronized” cardioversion in this setting could cause ventricular fibrillation arrest in the patient (figure 9).

12. Press and hold the SHOCK button on the monitor until the energy delivered message appears on the screen (figure 10). NOTE: to disarm (cancel the charge), press the SPEED DIAL. The energy disarms automatically if shock buttons are not pressed within 60 seconds, or if the energy selection changes after charging begins.

13. Observe patient and ECG rhythm. Repeat procedures starting from step 4 if necessary.

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

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Medication Administration

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Ensure the five "rights"

1. Right patient
2. Right route
3. Right dose
4. Right time
5. Right medication

If any of these is not correct, do not continue with medication administration.

Procedure and Clearances

Intravenous (IV) and Intraosseous (IO)

AEMT / Paramedic

1. Assure IV/IO is patent
2. Cleanse access port
3. Eject any air from syringe
4. Pinch IV/IO line above the medication port
5. Inject medication per specification by protocol
6. Open flow to allow 10-20 mL flush

Intramuscular (IM) and Subcutaneous (SQ)

AEMT / Paramedic

1. Use 1.0 – 1.5 inch, 21 – 25 gauge needle
2. Select injection site
3. Cleanse injection site
4. Eject air from syringe
5. If IM, stretch skin over injection site and insert needle at 90° angle. Aspirate. If no blood, inject medication and immediately sharps needle.
6. If SQ, pinch skin to form a fold and insert needle at 45° angle into the subcutaneous fatty tissue. Aspirate. If no blood, inject medication and immediately sharps needle.
7. Put bandage over injection site.

Intranasal (IN)

AEMT / Paramedic

1. Place nasal atomizer onto syringe
2. Eject air from syringe
3. Place atomizer tip approximately 1.5 cm into nostril
4. Briskly compress the syringe plunger to force liquid into a spray directed into the nasal cavity

Back

Sublingual (SL) and Oral (PO)

EMT / AEMT / Paramedic

1. Instruct, assist, or place tablet or spray under the tongue (SL) or into the mouth (PO)

Medicated Fluid Infusion

Paramedic

1. Assure patent IV/IO line
2. Cleanse access port
3. Flush any air from medicated fluid bag infusion set
4. Unless simultaneously giving an IV fluid bolus, close IV line above the medication port
5. Infuse medication per protocol

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Venous Access: Intravenous

Rice University Emergency Medical Services Clinical Guidelines

AEMT / Paramedic

Criteria

- Vascular access for intravenous administration of crystalloid fluids in hypotension and/or volume insufficiency
- Vascular access for intravenous administration of medications for a multitude of medicinally indicated effects
- Vascular access in a patient with an increased potential for needing either of the above indications

Contraindications

- None absolutely, though despite aseptic technique and using sterile angiocatheters, there is always a risk of introducing infection when the skin integrity is violated. Do not establish IV access unless directed by applicable treatment protocol(s) or the patient meets one of the indications above.
- Venous sites distal to a fracture
- Venous sites underlying cellulitis/abscess
- Venous sites on same extremity with an AV fistula in an ESRD patient
- Venous sites on upper extremities of patients with axillary node removal (post breast cancer)

Procedure

Extremity

1. Apply IV tourniquet proximal to proposed vascular access site.
2. Clean insertion site with ChloraPrep®, Betadine®, or alcohol prep.
3. Stabilize vein in place by applying gentle traction on vein distal to point of entry.
4. Puncture the skin with the bevel of the needle upward about 0.5 - 1 cm from the vein and enter the vein from the side or from above.
5. Note blood return and advance the catheter over the needle.
6. Remove needle and connect IV line. Note: venous blood for laboratory work may be drawn with syringe before connecting IV line.
7. Release IV tourniquet.
8. Open IV tubing clamp full to check flow and placement, then slow rate to TKO or as indicated by applicable treatment protocol.
9. Secure catheter and tubing with tape or commercial device in a manner that reduces traction upon the catheter.
10. Recheck IV patency periodically to minimize occurrence of unrecognized fluid/medication extravasation.

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External Jugular Vein – for peripheral venous access in a patient in extremis only.

Anatomical landmarks, including the vein, must be visible – no “blind” sticks. Avoid multiple attempts and avoid attempts on both sides – use IO access prn.

1. Position the patient supine, head down (this may not be necessary or desirable if congestive heart failure or respiratory distress present). Turn patient's head to opposite side from procedure. (Maintain cervical spine alignment if cervical spinal injury suspected; do not attempt external jugular vein cannulation in suspected cervical spine injury patients.)
2. Expose vein by having patient bear down if possible, and "tourniquet" vein with finger pressure just above clavicle.
3. Clean insertion site with ChloraPrep®, Betadine®, or alcohol prep.
4. Stabilize vein in place by applying gentle traction on vein distal to point of entry.
5. Align the cannula in the direction of the vein, with the point aimed toward the shoulder on the same side.
6. Puncture skin over vein first, then puncture vein itself. Use other hand to traction vein near clavicle to prevent rolling.
7. Proceed as with extremity vein. Do not wrap any tape/retaining device around the circumference of neck to stabilize IV catheter/line.

Complications

- ➢ Local: hematoma formation, infection, thrombosis, phlebitis.
- ➢ Systemic: bacteremia/sepsis, catheter fragment embolism.

Considerations

- ➢ Antecubital veins are useful access sites for patients in shock, but, if possible, avoid areas near joints.
- ➢ The point between the junction of two veins is more stable and often easier to use.
- ➢ Start distally and, if successive attempts are necessary, make more proximal attempts.
- ➢ The most difficult problem with IV insertion is to know when to try and when to stop trying.
- ➢ If the procedure is not accomplished after two attempts or two minutes, the AEMT or higher licensed EMS professional must consider expediting other care, including transport to the emergency department.
- ➢ Renal dialysis fistulas and surgically implanted ports should not be used for vascular access. Use IO access in critical patient situations otherwise.
- ➢ Saline locks may be utilized in place of crystalloid infusions/IV lines in conditions less likely to require rapid administration of IV fluid.

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Venous Access: Intraosseous

Rice University Emergency Medical Services Clinical Guidelines

AEMT / Paramedic

Criteria

- First choice access in cardio/pulmonary arrest (unless IV access can be achieved as timely).
- Second choice access in dynamic, life-threatening shock or respiratory failure (if IV access cannot be achieved in clinically needed time).

Contraindications

- Inability to locate anatomical landmarks (blind insertion contraindicated).
- Suspected cellulitis at insertion site.
- Suspected acute or non-healed fracture proximal to foot in same leg (proximal tibial insertion) or proximal to forearm in same arm (humeral head insertion).
- Suspected total knee arthroplasty/replacement (proximal tibial insertion).
- Suspected markedly poor circulation extremity (history of amputation, gangrene, bypass).

Procedure

SAM IO® System

1. Assemble the following materials.
    a. Driver with needle set based on patient size and weight:
        i. PINK: 15 mm for 3-39 kg (non-existent to limited overlying adipose tissue)
        ii. BLUE: 25 mm for ≥ 40 kg (minimal to moderate overlying adipose tissue)
        iii. YELLOW: 45 mm for ≥ 40 kg (moderate to excessive overlying adipose tissue)
    b. ChloraPrep®, Betadine®, or alcohol wipe
    c. Extension set (90)
    d. Saline flush syringe
    e. SAM IO® Stabilizer
    f. NeedleVISE® sharps

Back

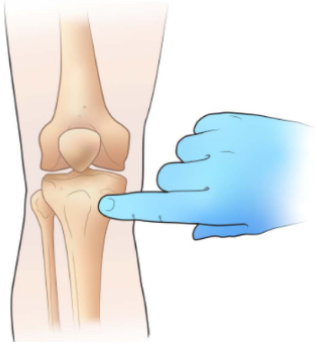
2. Locate the insertion site.

   a. Proximal tibia site

      i. Palpate patella.

      ii. Palpate tibial tuberosity approximately two finger widths below patella in adults and adolescents, or one finger width below patella in smaller pediatrics.

      iii. The insertion site is one finger width medial to tibial tuberosity in the tibial plateau.



3. Clean the insertion site with alcohol wipe, or preferably with ChloraPrep® or equivalent swab.

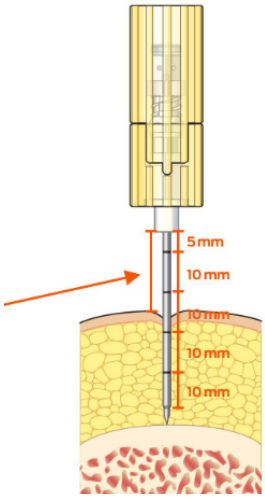
4. Prime infusion set, attach the needle assembly to the driver, and remove the safety cap from the needle assembly. Do not touch uncapped, sterile components of the needle assembly.

5. Access the intraosseous space.

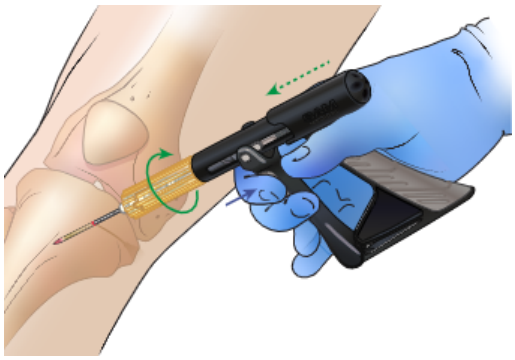
   a. Stabilize anatomy near the insertion site with non-dominant hand.

   b. Position driver at insertion site with needle at a 90 angle to the surface of the bone.

   c. Use the driver to insert the needle through the skin and adipose tissue at the insertion site until you feel the needle tip encounter bone. Ensure that ≥ 5 mm of catheter (at least the first black line on proximal catheter) is visible above the skin before attempting intraosseous insertion.



   d. Continuously actuate (repeatedly compress) the driver's trigger assembly, while applying gentle, steady downward insertion pressure to achieve controlled entry. Use minimal (gentle) steady downward insertion pressure. Allow needle assembly tip rotation to penetrate compact bone. Discontinue trigger actuation when a subtle "give" or "pop" is appreciated, indicating needle assembly entry into the medullary space.



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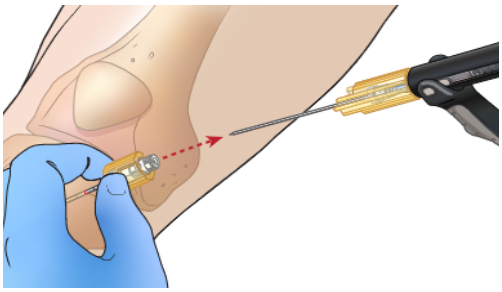
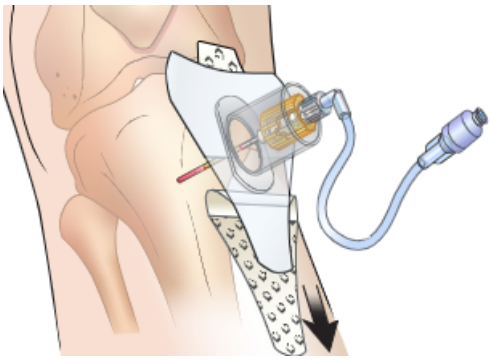
e. Once the bone cortex feels encountered, ensure that ≥ 5 mm of catheter (at least the first black line on proximal catheter). If at least one 5 mm mark line is not visible, a longer needle will be required to achieve usable intraosseous access.

f. Remove the stylet by stabilizing the needle assembly hub while retracting (lifting off) and disconnecting the driver. The stylet will remain attached to the driver. While holding the driver, guide the stylet into the provided NeedleVISE® or appropriate sharps containment device and disconnect the stylet from the driver.



g. Apply sterile SAM IO® Stabilizer carefully over catheter and against skin. Attach primed extension set to catheter hub, firmly secure by twisting clockwise. Do NOT attempt aspiration of blood or marrow via the catheter. Pulling marrow into the catheter may clog the catheter and prevent its use for fluid and/or medication administration.



h. Confirm proper catheter placement using a combination of the following signs:
   i. IO catheter rests at a 90 angle and feels firmly in bone when grasping hub.
   ii. Blood-tinged marrow oozes spontaneously from hub (may often be absent, yet the catheter is still correctly placed).
   iii. Fluid and medication administration is possible without significant resistance and without extravasation.

i. Flush SAM IO® catheter with 10 mL normal saline. Medication administration is given in the same dosing as with IV administrations. Fluid administration will require the use of a pressure infuser on the IV fluid bag. Due to the increased pressure of the marrow space, IV fluid will not infuse without assistance of the pressure infuser. Inflate pressure infuser until IV fluid is seen infusing with constant flow. Monitor for extravasation and monitor for need to reinflate pressure infuser. Fluid delivery rate may be as high as 1 liter per hour.

j. In determining the site for IO access, consider knowledge of the anatomy, prior training, and comfort in accessing that particular site, and how IO access at that site may or may not interfere with other care events (e.g., use of the humeral head site for medication administration in cardiac arrest could disrupt the continuity of chest compressions).

Additional information about SAM IO® system: ***https://www.sammedical.com/blogs/training/sam-io***

Back

Complications

- Through and through bone penetration
  - avoid by using correct needle and insertion technique
- Extravasation
  - avoid by using correct needle and insertion technique
  - monitor ongoing use and stop at early signs of extravasation
- Fracture of bone
  - avoid by using correct insertion technique (avoid excessive pressure)
- Infection
  - avoid by using aseptic technique and do not insert through suspected cellulitis
- Growth plate injury in pediatrics
  - avoid by choosing correct insertion site

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Airway Assessment

Rice University Emergency Medical Services Clinical Guidelines

Criteria:

In order to assess a patient's airway, there are several principles that must be followed in order to adequately determine if any interventions are needed:

- Use the least invasive method of airway management appropriate to the patient
- Position the airway that provides the most appropriate access
  - Use a head tilt-chin lift for medical patients
  - Use jaw thrust maneuver for trauma patients with suspected C-spine injures / precautions
- Only use an airway management method that you are credentialed to perform
- Patients may require frequent suctioning in order to keep the airway clear of debris
- Monitor the patient continuously in order to ensure that oxygenation and/or ventilations are effective
  - Use supplemental oxygen via nasal cannula (NC), non-rebreather mask (NRB), or bag-valve mask (BVM) as necessary
- Remember the following important concepts:
  - Patency: Open and clear the airway by looking for foreign substances, blood, vomitus, or tongue obstruction. Suction, if necessary, to clear the airway and/or consider repositioning the patient's airway.
  - Ventilation: Determine the volume / amount of air the patient is able to inhale and exhale in a given time.
    - Waveform capnography provides effective real time measurement of ventilation.
  - Oxygenation: Determine the amount of oxygen the patient is able to convey to the circulation for tissue/organ perfusion.
    - Pulse oximetry may be used in this case to help assessment. Rember that pulse oximetry readings are delayed.

Important Considerations:

- The above guidelines are the approach to typical medical and trauma-related airway problems. They assume the treating EMS professional is skilled in the various procedures appropriate for their scope of practice.
- Advanced airway procedures should only be attempted if clinically indicated after less invasive measures fail or are futile to attempt. Individual cases may require modification of these protocols.
- Airway management decisions and actions should always be thoroughly documented in the patient care report.
- Intoxicated (either by alcohol or drugs), trauma (especially head trauma) or altered mental status patients require careful monitoring of the airway. For these patients, be prepared to perform interventions as symptoms of respiratory distress may have a sudden onset.

Airway Suctioning

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Indications:

- Trauma to the face or upper airway with the potential for, or actual, airway obstruction
- Vomitus, food, or other foreign liquid material in the airway
- Excess secretions or pulmonary edema fluid in the upper airway
- Amniotic fluid in the pharynx of a newborn with obvious obstruction to spontaneous breathing or who require positive-pressure ventilation
- Meconium in pharynx of a non-vigorous newborn

Technique:

1. Open the airway and inspect for visible foreign material
    a. For trauma patients, use the jaw thrust method
2. Turn the patient on their side to facilitate clearance of foreign liquid materials
3. Remove large or obvious foreign bodies with gloved hands.
    a. Sweep finger ACROSS the posterior pharynx and clear the visible material out of the mouth
    b. Do not perform blind finger sweeps of the airway. This may lodge the obstruction further into the airway
4. Turn on suction machine
5. Suction the oropharynx
    a. Attach appropriate tip to the suction unit (French catheter vs DuCanto tip)
    b. Oxygenate and/or ventilate the patient prior to this procedure, as needed
    c. Insert the tip into the oropharynx under direct vision, with a sweeping motion. **Do not suction for longer than 10 seconds.**
    d. Continue intermittent suction interspersed with active oxygenation by mask. Use positive pressure ventilation if needed.
    e. If suction becomes clogged, dilute by suctioning water or normal saline to clean the obstructed tubing. If suction clogs repeatedly, use connecting tube alone, or manually remove large debris.

Important Considerations:

- In most situations, limit the suction time to no longer than 10 seconds. However, this precaution should NOT be followed when vomitus or other material continues to well up and completely obstruct the airway. In this case, suctioning must be continued until an airway is reestablished, with intermittent oxygenation and ventilation performed to avoid prolonged lack of oxygen.
- When possible, have a container of water or normal saline at hand before beginning suctioning as it may require frequent rinsing of the catheter and tubing. Use gauze to remove large material from the end of the catheter.

Equipment Notes:

- Rice EMS uses the Laerdal Suction Units. These units operate off battery power and should be recharged regularly. To check the battery power, turn on the device. If the battery indicator light (next to the power button) shows yellow, the unit needs to be recharged.

Oxygen Administration

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Presentation of hypoxia/hypoxemia with symptoms of respiratory distress
- Conditions directed by specific protocol
- Chronic conditions (COPD, lung disease)
- Acute conditions (respiratory arrest, cardiac arrest, acute coronary syndrome, acute onset dyspnea, allergic reaction, multi-systems trauma, AND SpO2 < 95%)

Contraindications

- SpO2 ≥ 95% if no concern for acute ischemia and infarction
- As noted in specific protocols

Procedure

1. Gather and prepare all equipment:
    a. Don appropriate body substance isolation (gloves and eye protection)
    b. Prepare oxygen tank with regulator
    c. Select appropriate oxygen administration device (nasal cannula, nebulizer, NRB, BVM)
2. Decide how much oxygen is necessary for patient's condition.
3. Instruct/inform patient of how the device functions.
4. Release any residual oxygen in regulator.
5. Connect tubing to regulator.
6. Open the oxygen tank by rotating the valve.
7. Adjust regulator to desired flow rate.
8. If using an NRB, be sure to fill the reservoir bag before administering to patient.
9. Appropriately secure administration device to patient.
10. Continue to monitor patient and titrate oxygen as necessary.

Non-Rebreather

1. REMS carries infant, pediatric, and adult non-rebreather masks. Be sure to accurately size the mask for optimal oxygen administration.
2. Fill the reservoir bag by covering the one-way valve.
3. Fit the mask comfortably over the patient's nose and mouth.
4. The top of the mask should cover the patient's nose and the bottom should extend over the anterior portion of the chin.
5. Pinch the nosepiece to fit the contour of the patient's nose and make sure the one-way valve sits below the patient's mouth.
6. Secure the mask around the patient's head using the green elastic straps.

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Flow Rates of Different Administration Devices

- Nasal Cannula: 2 – 6 L/min
- Nebulizer: 6 – 8 L/min
- Non-Rebreather Mask: 10 – 15 L/min
- Bag-Valve Mask: 15 – 20 L/min

Considerations

- Consider all possible causes of respiratory distress.
- Administration should be directed to achieve oxygen saturation level of 94-98% in patients without chronic pulmonary disorders.
- Over administration of oxygen has been shown to produce serious adverse outcomes. Do not administer oxygen if SpO2 is greater than 95% on room air with no signs of respiratory distress.
- Administration of blow-by oxygen via NRB at 10-15 L/min can be achieved by holding the mask near the patient's nose/mouth. This is a common administration route for pediatric patients who may be averse to having a nasal cannula/mask secured on the face.
- Consider use of humidified oxygen when using nasal cannula at high flow rates.
- A BVM connected to 15 L/min of oxygen should be used if the patient is unconscious and unable to breathe, respiratory rate ≤ 8 breaths/minute, or agonal respirations are noted. If the patient is conscious and experiencing profound respiratory distress, consider use of a BVM to give controlled, regular breaths. Be sure to explain procedure to patient and coach him/her to cooperate with the breaths you give, in order to avoid extreme discomfort and exacerbating damage to the lungs. Have the patient breathe with the squeezes of the bag and give oxygen only until chest rise is observed.
- Oxygen tanks should be replaced when pressure ≤ 500 psi, or some malfunction is detected (air leakage, obstruction to administration). Notify the Operations Lieutenant when switching out an oxygen tank.

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Bag Valve Mask (BVM) Management

Rice University Emergency Medical Services Clinical Guidelines

Criteria:

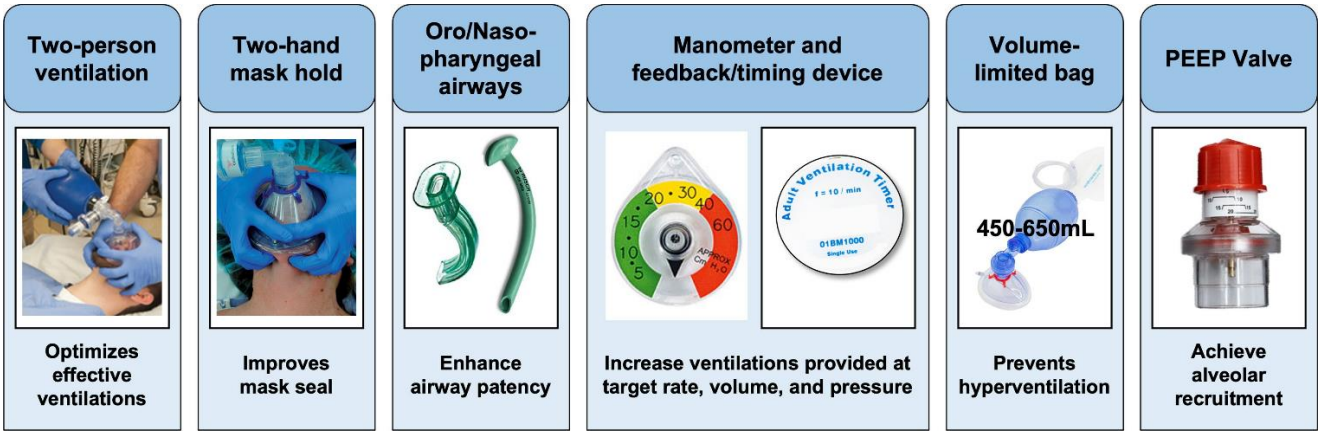
- Respiratory arrest
- Inadequate oxygenation or ventilation that is not improved by non-positive pressure methods or immediately obvious that patient will not improve by non-positive pressure methods

Technique:

- Hold the mask using a c/e-clamp formed by one, but preferably, both hands
- Insert an oropharyngeal and/or nasopharyngeal airway(s)
- Head-tilt chin lift to place the patient in a sniffing position to open the airway
    - Use the jaw thrust maneuver in suspected spinal cord injuries
- Place the mask over the mouth and elevate the jaw into the mask, ensuring an adequate seal
- Consider the Sellick maneuver, if indicated, by putting pressure on the cricoid cartilage to partially occlude the esophagus in the unconscious patient.
    - Do not utilize if ventilations are effective and without onset of gastric distention. Emesis is a distinct possibility after releasing Sellick maneuver.
- Use high flow, 100% oxygen with BVM ventilations
- Squeeze the bag slowly and smoothly (over 1 second ventilation periods) delivering adequate ventilation volume to ensure the chest rises (approximately 6 mL/kg of air) and provide adequate exhalation time.

Important Considerations:

- Optimal Bag valve mask ventilations often requires two EMTs



Nebulization Therapy

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Dyspnea of uncertain etiology
- Bronchospasm
  - Acute allergic reaction
  - Reactive Airway Disease (i.e., asthma or COPD)
  - Infectious exacerbation
  - Toxic inhalations

Procedure

1. Assemble nebulization device
2. Explain procedure to the patient
3. Fill nebulization chamber with medication to be nebulized
4. Initiate 6 – 8 L/min of oxygen flow with the hand-held nebulization device or via a face mask
5. Place mouthpiece in patient's mouth
   a. If this is not possible, direct the medication at the patient's nose/mouth via nebulizer face mask
6. When delivering the treatment, ask the patient to hold their breath for 1 – 2 seconds after inhaling before exhaling

Considerations

- This process is commonly used with albuterol. Patients should be continually assessed during albuterol treatment. Treatment should be discontinued if HR increases $\geq$ 20 bpm.

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Supraglottic Airway – Air-Q SP3G

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Criteria:

- Hypoxia and/or hypoventilation refractory to noninvasive airway/respiratory management
- Airway protection to reduce aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score < 8

Contraindications for use:

- Ability to maintain oxygenation and ventilation by less invasive methods, such as BVM
- Intact gag reflex
- Known esophageal disease
- Ingestion of caustic substance (i.e. lye, acids) or extensive airway burns
- Tracheotomy or laryngectomy
- Suspected foreign body airway obstruction

Procedure:

1. Prepare the suction device and have it readily available.
2. Place the patient on SPO_2 monitoring and watch SPO_2 levels throughout procedure.
3. Select the correctly sized Air-Q device using ideal body weight (Sizing guide below)
4. Lubricate the external surface of the device
5. Pre-oxygenate the patient using 100% oxygen via NRB or BVM
6. Position the head in the "sniffing" position (head tilt chin lift or jaw thrust)
7. Hold the Air-Q with your dominant hand
8. Open the mouth and lift the tongue with the non-dominant hand
9. Insert the Air-Q into the mouth
10. Apply inward and downward pressure, using the curvature of the Air-Q as a guide. Advance until fixed resistance is felt. **Do not force insertion.**
11. The properly positioned Air-Q should have the patient's teeth between the two black lines.
12. If needed, inflate the Air-Q using the provided syringe to the volume listed on the packaging.
13. Attach the BVM with $EtCO_2$ and ventilate.
14. Assess for chest rise and fall, auscultate breath sounds bilaterally, and maintain continuous $EtCO_2$ monitoring. *Remember to document these findings in the patient's chart.*
15. If ventilation is not accomplished, pull back slightly and re-attempt placement. If needed, repeat steps 9 – 11 and reconfirm Air-Q placement.
16. Secure the Air-Q with a commercial airway securing device
17. Ventilate with oxygen at the appropriate rate.
18. If the Air-Q is removed, suction must be available. Do not discard the Air-Q until the airway is secured.
19. Consider Gastric Tube placement (OG Tube) through the gastric side ports.

Sizing Guide:

Size	Device Color	IBW by Height	IBW in kg	IBW in lbs	Max OG Tube
1	**Blue**	-	4 – 7 kg	9 – 15 lbs	8 fr
1.5	**Green**	-	8 – 16 kg	16 – 36 lbs	8 fr
2	**Orange**	-	17 – 30 kg	37 – 66 lbs	10 fr
3	**Yellow**	4’6 – 5’6	30 – 60 kg	67 – 132 lbs	14 fr
4	**Red**	5’7 – 6’2	60 – 80 kg	133 – 175 lbs	16 fr
5	**Purple**	> 6’3	> 80 kg	> 176 lbs	18 fr

IBW = Ideal Body Weight

Precautions:

- Utilize BVM ventilation if Air-Q SP3G is unsuccessful after two attempts
- Never force the tube during insertion as it may cause trauma to airway or esophagus
- Ensure you assess and document placement verification of Air-Q SP3G and note any complications. Placement if verified by:
  - Chest rise and fall
  - Present lung sounds bilaterally with absent epigastric sounds
  - Waveform $EtCO_2$ monitoring

Visual Aide:

Placement Indicators

Gastric Side Port

Waveform Capnography (Adult & Pediatric)

Rice University Emergency Medical Services Clinical Guidelines

Indications

- Medical and Trauma General Assessment
- Acute Dyspnea (Uncertain etiology, Asthma, COPD, or CHF)
- Neurological Disorders or AMS (Stroke, Seize, Syncope)
- Toxicologic Emergencies and Poisonings
- Confirmation of Advanced Airway Placement
- Monitoring following placement of advanced airway
- Any patient complaining of dyspnea and self-administers an inhaler on scene, or who receives medication from a Rice EMS provider, **MUST** have an assessment of End-Tidal CO_2 measurement and waveform capnography (unless the equipment is not available) before refusing transport.

Contraindications

- None

Technique:

- Connect the End-Tidal CO_2 Filter line tubing by turning clockwise until it fits securely. This is evidenced by the wings in a horizontal position and the message "CO_2 Initializing" appearing on the LifePak screen.

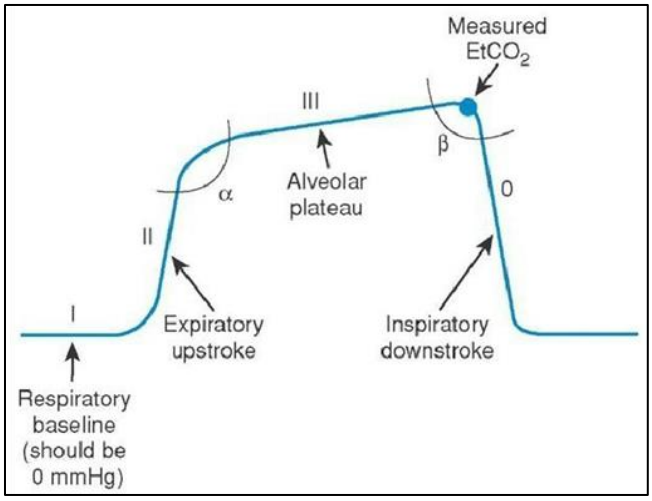
Normal $EtCO_2$ range is 35 – 45 mmHg

Critical Information:

- When an End-Tidal CO_2 measurement or waveform is not detected, or is suddenly lost during monitoring, providers should assess for the following three situations:
    1. Equipment Failure
        - Possible causes: Disconnected or malfunctioning bag valve or ventilator or severed $EtCO_2$ filter line
        - $EtCO_2$ failure of the LifePak 15 is incredibly rare, but it would be indicated by 3 Xs listed where the CO_2 measurement should be. The secondary LifePak 15 should be requested and used.
    2. Loss of the Airway
        - Possible Causes: Apnea, Placement or migration of the Endotracheal tube into the Esophagus.
    3. Circulatory Collapse
        - Possible causes: Cardiac Arrest, massive pulmonary embolism, severe blood loss (exsanguination)

Reviewed 07.10.2025

General Overview of Capnography Interpretation



Phase I: Respiratory Baseline

- Value should be 0 mmHg, reflects inspired gas which normally does not contain carbon dioxide

Phase II: Expiratory Upstroke

- Increase in CO2 is caused by oxygen and carbon dioxide diffusing within the alveoli, exhalation begins

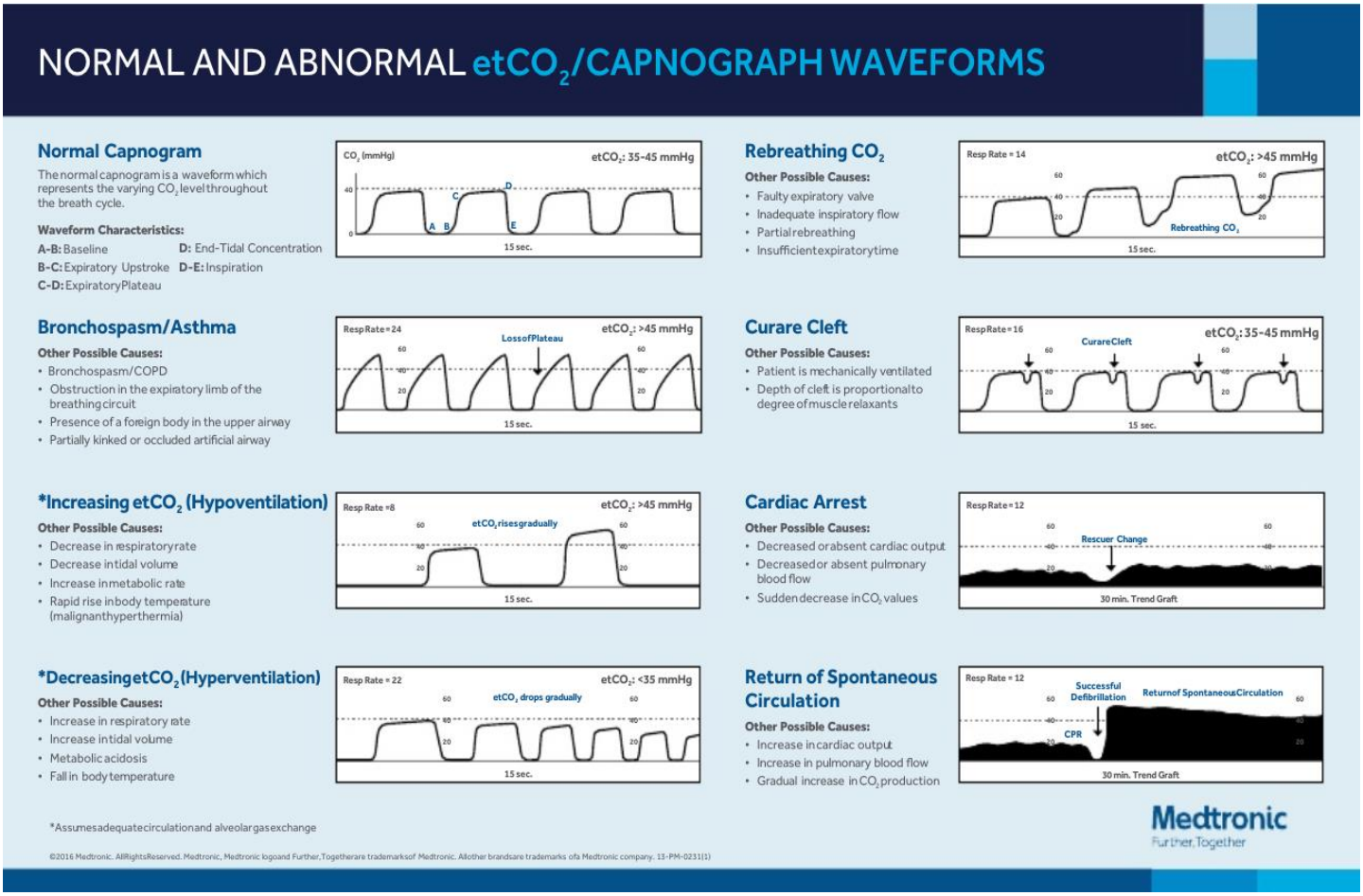
Phase III: Alveolar Plateau

- Exhalation of alveolar gases which are made up of mostly carbon dioxide
- EtCO2 is measured at the highest point (the β angle)

Phase O: Inspiratory Downstroke

- Start of inhalation, carbon dioxide levels decrease as oxygen enters into the lungs

Normal $EtCO_2$ range is 35 – 45 mmHg



Blood Glucose Analysis

Rice University Emergency Medical Services Clinical Guidelines

Criteria

- Blood glucose analysis should be considered for any patient with:
  - Altered mental status
  - Suspected stroke
  - Syncope or near syncope
  - Suspected drug or alcohol overdose
- Any ill infant should have a blood glucose analysis

Procedure

1. Assemble equipment. Insert single use test strip into meter with clear blood slot facing away from meter. Meter will turn on.
2. When blood drop symbol flashes, obtain drop of blood from fingertip. Choose whichever finger is least calloused. Apply pressure to finger to help increase blood flow. Clean fingertip with alcohol pad without contaminating area. Allow area to dry.
3. Hold finger and firmly place new, sterile lancet off center on fingertip. Firmly press lancet to puncture fingertip. Wipe first drop of blood with sterile gauze and touch next drop of blood to clear window of test strip.
4. When flash is observed on test strip, enough blood has been added to test strip. Record value on glucometer and properly dispose of all contaminated supplies.
5. If BGL analysis is < 60 mg/dL with indicated symptoms, proceed with hypoglycemic protocol outlined in ***Altered Mental Status***.

Equipment Notes

1. REMS currently uses the Assure® Prism glucometers. The chip-like end (top) of the test strip should be inserted into the glucometer, in the same orientation shown below. The narrowed end (bottom) of the test strip should be used for blood drop collection. The clear chamber near the blood drop collection end must be filled with blood to have a usable glucometer reading. If the display reads error, a new strip must be used, and the analysis should be reattempted.

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Reference Scores

RICE UNIVERSITY EMERGENCY MEDICAL SERVICES CLINICAL GUIDELINES

Los Angeles Prehospital Stroke Screen (LAPSS)

Criteria	Result
Age > 45	Y or N
No history of seizures or epilepsy	Y or N
Symptoms duration < 24 hr	Y or N
BGL between 60 and 400 mg/dL	Y or N
Obvious asymmetry or unilateral weakness in any of the following:	
1. Facial smile/grimace	Y or N
2. Grip strength	Y or N
3. Arm strength	Y or N
If all the above criteria are met (or not ascertainable) the LAPSS is positive for stroke.	

Rapid Arterial oCclusion Evaluation Score (RACE)

Criteria	Instructions	Result	
Facial Palsy	*Ask to smile or show teeth*	**Absent** (symmetrical movement) **Mild** (slightly asymmetric) **Moderate** to **Severe** (completely asymmetric)	**0** **1** **2**
Arm Motor Function	*Ask to extend arms to:* *90° if sitting* *45° if supine*	**Normal** to **Mild** (arms upheld > 10 sec) **Moderate** (arms upheld < 5 sec) **Severe** (unable to raise arms against gravity)	**0** **1** **2**
Leg Motor Function	*Ask to extend legs to:* *30° if supine*	**Normal** to **Mild** (legs upheld > 5 sec) **Moderate** (legs upheld < 5 sec) **Severe** (unable to raise legs against gravity)	**0** **1** **2**
Gaze Deviation	*Observe eyes and head deviation*	**Absent** (eyes tracked to both sides) **Present** (deviation or difficulty tracking noted)	**0** **1**
Aphasia	*Assess understanding of speech* *Give two commands:* *"Close your eyes"* *"Make a fist"*	**Normal** (performs **both** tasks correctly) **Moderate** (performs **one** task correctly) **Severe** (performs **neither** task correctly)	**0** **1** **2**
Agnosia	*Inability to recognize familiar objects* *Ask while showing weak arm:* *"Whose arm is this?"* *"Can you move your arm?"*	**Normal** (recognizes arm, aware of any impairment) **Moderate** (does not recognize **or** denies impairment) **Severe** (does not recognize arm **and** denied impairment)	**0** **1** **2**
If score ≥ 5, there is a high likelihood of large vessel occlusion (LVO).			

Consider using the ***RACE Score*** on mdcalc.com.

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APGAR Score

Test	0 Points	1 Point	2 Points
Activity (muscle tone)	Absent	Arms and legs extended	Active movement with flexed arms and legs
Pulse (heart rate)	Absent	<100 bpm	>100 bpm
Grimace (response to stimulation)	No response	Facial grimace	Sneeze, cough, pulls away
Appearance (skin color)	Blue-gray, pale	Pink body, blue extremities	Normal over entire body, completely pink
Respiration (breathing)	Absent	Slow, irregular	Good, crying

Consider using the ***APGAR Score*** on mdcalc.com.

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Rice University

Emergency Medical Services

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Fire Safety

Contact Environmental Health & Safety and Lab Operations at 713-348-4444 (Ext. 4444)

- In the event of a fire or need for a fire extinguisher inspection, contact EHSLO
- If the incident is in a dormitory or kitchen, contact Housing and Dinning at 713-348-5400

Should You Try to Fight the Fire?

Before you consider or attempt to fight a fire:

- Make sure everyone has left or is leaving the building
- Make sure the RUPD (x6000) has been called
- Make sure the fire is confined to a small area and is not spreading
- Make sure you have an unobstructed escape route to which the fire will not spread
- Make sure you know how to use the extinguisher

It is reckless to fight a fire in any other circumstances. Instead, leave immediately and close off the area.

How To Use a Fire Extinguisher

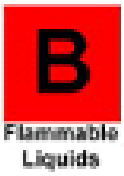
Even though extinguishers come in a number of shapes and sizes, they all operate in a similar manner. If you can remember this easy acronym, then you can use a fire extinguisher:

Fire Extinguisher Inspections

A fire extinguisher requires inspection if:

- The fire extinguisher has been used.
- The fire extinguisher missing or moved from usual place.
- The safety seals/pins are missing.
- The pressure gauge not in operable range.

Fire Extinguisher Ratings

	Class A Extinguishers will put out fires in ordinary combustibles, such as wood and paper.	
	Class B Extinguishers should be used on fires involving flammable liquids, such as grease, gasoline, oil, etc.	
	Class C Extinguishers are suitable for use on electrically energized fires.	

Types of Fire Extinguishers

	Dry Chemical extinguishers are usually rated for multiple purpose use. They contain an extinguishing agent and use a compressed, non-flammable gas as a propellant. These are the most common fire extinguishers found on campus.
	Halon extinguishers contain a gas that interrupts the chemical reaction that takes place when fuels burn. These types of extinguishers are often used to protect valuable electrical equipment since they leave no residue to clean up. Halon extinguishers have a limited range, usually 4 to 6 feet. The initial application of Halon should be made at the base of the fire, even after the flames have been extinguished.
	Carbon Dioxide (CO2) extinguishers are most effective on Class B and C (liquids and electrical) fires. Since the gas disperses quickly, these extinguishers are only effective from 3 to 8 feet. The carbon dioxide is stored as a compressed liquid in the extinguisher; as it expands, it cools the surrounding air. The cooling will often cause ice to form around the “horn” where the gas is expelled from the extinguisher. Since the fire could re-ignite, continue to apply the agent even after the fire appears to be out.
	Water extinguishers contain water and compressed air and should only be used on Class A (ordinary combustibles) fires.

Hazardous Materials Response

This protocol contains generally accepted principles related to EMS response and activity related to suspected or actual hazardous materials incidents where an exposure has occurred. The overriding principle is safety, with an emphasis on minimizing, preferably preventing, further hazardous materials exposure and related illness.

Specific practices for individual hazardous material substances are beyond the capability of a general protocol and the EMS provider should consult hazardous materials specialists (Rice University Environmental Health Safety and Lab Operations, and/or Houston Fire Department) for assistance.

Rice Environmental Health Safety and Lab Operations (EHSLO)

(713)-348-4444, (http://safety.rice.edu)

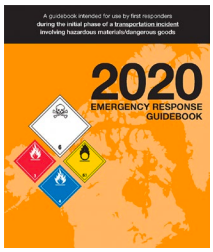
Members of the Environmental Health Safety and Lab Operations team are experts in Fire, Life, and Laboratory Safety (including biological, chemical, laser, and radiation safety). The team is on campus M-F, 7a-5p, and is also available for phone consultation overnight and on weekends. Contact Dispatch to request Safety to respond to any incident on campus involving hazardous materials. If the call is overnight or on weekends, Safety can also be contacted via dispatch for assistance. The Safety team member will assist on scene with containing any hazardous materials as appropriate, and/or with evacuation if needed. If biological or chemical substances are involved, the Safety team member will likely be able to assist with information about the substance, and/or locating the appropriate Safety Data Sheet (SDS). Information about any exposure, condition, or injury to a patient should be shared with Safety team members if it will be helpful to ascertain appropriate treatment for the patient, and/or for provider safety from possible exposure.

Houston Fire Department:

Houston Fire Department (HFD) should be contacted for any large-scale incident involving suspected exposure to any hazardous material. This could include a large quantity of a hazardous material, on the person or clothing and/or multiple people exposed who are experiencing symptoms from the exposure. HFD has the capabilities and resources to decontaminate patients and safely transport them to the appropriate facility as well as the resources to contain a large-scale spill or potential exposure.

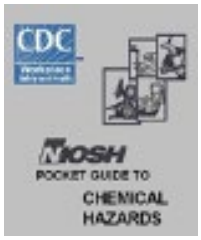
Rice's Safety Team (EHSLO) should be consulted in person and/or via phone for any hazardous materials incident on campus. This team knows campus labs and safety procedures and is the most fluent on hazardous materials on campus. However, do not delay in contacting dispatch to request HFD for any large-scale incident, or suspected hazardous materials exposure to single or multiple patients. Provider safety, and patient safety, should always be the priority.

Additional Resources about Hazardous Materials for EMS Providers



The Emergency Response Guidebook can be found in the MCI bag inside the Rice EMS responder vehicles, online, or as an app. This book contains most industrial chemicals transported on a large scale. It will not contain all of the chemical information on materials used on campus. (https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg)

WISER (Wireless Information System for Emergency Responders) is a system to assist emergency responders in hazardous materials incidents and is sponsored by the US National Library of Medicine. (http://wiser.nlm.nih.gov)



The National Institute for Occupational Safety and Health (NIOSH) Chemical Hazards Pocket Guide provides a concise source of general industrial hygiene information for workers, employers, and occupational health professionals. (http://www.cdc.gov/niosh/npg/pgintrod.html)

Texas Poison Control Center is also a useful resource.
Call 1-800-222-1222.

When responding to individuals in hazardous materials environments, a real danger exists that EMS providers, public safety apparatus, and hospitals may be unable to effectively function if not protected from this contamination. Appropriate efforts must be made to protect the already apparent patient(s), responding public safety professionals, at-risk citizens, and the emergency health care system from further contamination. EMS treatment for any suspected patient(s) should not be attempted until appropriate protective measures can be accomplished. Suspected patient(s) should be limited in their movement until it is clear that the patient is determined not to pose a contamination threat by the appropriate authority (Safety and/or HFD specialists).

Initial Response to Suspected Hazardous Materials Incident

1. Park in an anticipated safe area (typically uphill/upwind) unless otherwise directed by hazardous materials specialists responding or already on scene. Anticipate additional responders (Safety, RUPD, HFD, etc.) to the scene and leave space as appropriate.

2. Determine and advise dispatch of the following (if not previously known):
    a. Exact location of the incident
    b. Type of incident (exposure, fire, etc.)
    c. Identification/nature of the hazardous materials, if known
    d. Approximate number of patients (actual number preferred if known)
    e. Additional resources needed (Safety, HFD hazardous materials resources, number of ambulances, etc.).

3. **DO NOT** rush into a suspected hazardous/contaminated situation until appropriate safety measures are accomplished. Generally accepted safe practices include:
    a. Do not park directly in front of a building with a suspected hazardous materials release.
    b. Tell people approaching a lab or scene to stay outside until the appropriate specialists (Safety, and/or HFD specialists) determine the scene is not hazardous to others.
    c. Designate a refuge area for victims already inside the scene who may be exposed but are not symptomatic.

4. If the material is spilled **inside** of a laboratory keep the door closed. The laboratory is designed to exhaust the air 4-8 times an hour. Leaving the door open interferes with the design exhaust. It is usually not necessary to clean up a spill immediately. Patient safety should be the first priority. The laboratory will contain the spill and prevent the vapors from getting through the buildings as long as the power is on to the building and the door remains closed.

Additional safety considerations:

1. Whenever possible, disposable medical equipment should be used to avoid contamination of equipment. Responders should be limited to essential personnel, and consideration should be taken to limit the amount of equipment (medical equipment, radios/pagers, golf carts, etc) used for the scene.
2. After decontaminated patients have been treated and/or transported to the emergency department, the EMS providers (and any other first responders) should be formally evaluated by emergency health care providers at an emergency department if exhibiting unusual signs or symptoms consistent with hazardous materials exposure after participating in the incident.
3. Laboratory Safety Training classes are available through the Rice Environmental Safety Department Staff. It is recommended that you take these classes once a year to familiarize yourself with the university safety procedures and better understand laboratory design. Sign-up is available through the safety.rice.edu website.