

INTRODUCTION

The Madison Fire Department EMS and Critical Care Protocols have been provided to allow immediate, pre-authorized treatment of patients, as a standardized approach in the interfacility and prehospital care of sick and injured patients.

The authorization to provide prehospital care, under these protocols, is limited to those prehospital care providers with current certification by the State of Idaho, current credentialing with the Madison Fire Department, and approval of the Madison Fire Department Medical Director.

The prehospital care provider is expected to follow these statements:

1. The General Patient Care protocol will be followed to facilitate the rapid evaluation of patients and aide in initiating the appropriate emergency treatment as outlined in the Madison Fire Department Protocols.
2. It is expected that BLS procedures will be completed prior to ALS or CC interventions.
3. The prehospital care provider is also given the latitude to flow between protocols as appropriate.
4. Make ER contact as soon as possible for telemetry (patient) reports or if further orders are needed. The Madison Fire Department Medical Director authorizes the on-duty Emergency Department physician at the receiving ER to provide on-line Medical Control. The receiving Emergency Department Physician is also available to provide advice regarding patient disposition, alternative interventions, inter-facility medication authorization, and delegation of on-line medical control to other physicians.
5. Madison Fire Department EMS Providers will follow these protocol guidelines. Deviation from these guidelines can be detrimental to optimal delivery of emergency medical services, thereby having a negative impact on patient care. Persistent or significantly serious deviation from these guidelines therefore may result in the loss of Madison Fire Department credentialing.
6. The protocols for dysrhythmias are written for Paramedics and Critical Care Paramedics only; the EMT's scope of practice does not allow them to treat rhythms.
7. Two complete sets of vital signs should always be taken unless time or the patient's condition prevents this from being done.
8. All documentation is required to be performed as outlined in [1003](#) (Patient Care Report) and [1004](#) (QA/QI).
9. Questions about these protocols should be directed to the Battalion for Chief-EMS or the Deputy Chief.

Thanks to Jeffrey Zollinger, M.D., for making these protocols possible. Thanks also to those others who have contributed their time and talents in this process.

MADISON FIRE DEPARTMENT EMS PROTOCOL

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Protocol Use

POLICY:

All patient care will be provided as directed by the Madison Fire Department EMS Protocols. Scope of practice is defined as the boundaries of these protocols.

All prehospital care providers are authorized and directed to utilize these protocols as guidelines for patient care unless specifically instructed to the contrary by Medical Control (Receiving Hospital Physician). The receiving hospital physician is responsible for the treatment of all patients attended by field care personnel. The physician may deviate from the possible treatment modalities listed in these protocols if it is deemed medically appropriate and it falls within the provider's scope of practice.

PURPOSE:

The purpose of these protocols is to:

- Provide written documentation of the expected standard of care.
- Provide patient care guidelines, which comply with Idaho EMS regulations.
- Provide an initial training and continuing education tool for prehospital care providers.
- Provide a standard of care to which each prehospital care provider will be held, through monitoring, evaluation, and when necessary, disciplinary action.
- Protect the Madison Fire Department and its personnel from undue risk and liability.

PROCEDURE:

- These protocols are guidelines. Nothing contained in these protocols shall be construed to expand the Scope of Practice of any prehospital care provider beyond that which is identified in the State of Idaho EMS Regulations and these Protocols. Reference ([1002 Scope of Practice](#)) For your information a link to the [Idaho Physicians Commission Scope of Practice document is provided here](#).
- Nothing contained within these protocols is meant to delay rapid patient treatment and transport to an appropriate receiving facility.
- Each patient's evaluation requires the execution of protocol components based on the patient's complaint, following a standard thought process.
- The General Patient Care protocol should be followed in the specific sequence noted. For all other treatment protocols, the letter and numerical outline format is strictly for rapid and uniform reference and does not imply or direct a mandatory sequence for patient care.
- It is the responsibility of the Battalion Chief-EMS, to ensure that protocols are being followed.
- It will be the responsibility of all department members who have knowledge of unlawful or grossly negligent acts, which may bring liability upon the department, to notify the Chief of Department in a timely manner.
- Although it may not be specifically noted in each protocol, the Chief of Department may choose to participate in any or all administrative committees and processes as outlined in these protocols.

- The following is the current list of EMS administrative staff:
 1. Medical Director: Jeffrey Zollinger, M.D.
 2. Fire Chief: Corey Child
 3. Deputy Chief: Troyce Miskin
 4. Battalion Chief - EMS: Joseph Haeberle

Scope of Practice

Authority:

Idaho Code § 56-1013A, § 56-1016, and § 56-1017(1)
Rules for EMS Physician Commission Idaho Administrative Procedures Act 16.02.02

The State of Idaho Scope of Practice and these protocols are intended to identify the psychomotor skills and knowledge necessary for the minimum competence of each level of EMS provider at the Madison Fire Department.

Protocols will be reviewed for updates if and/or when the Idaho EMS Physician Commission changes the Idaho Scope of Practice guidelines. Because the Idaho EMS Physician Commission has changed this document frequently, it has not been included as part of these protocols. A current version of the State's Scope of Practice for EMS providers can be found online through the Idaho EMS website.

All providers at a higher level of certification retain the scope of practice for the lower certification levels. i.e. Paramedics retain the scope of practice for emergency medical technicians and emergency medical technicians with modules.

Madison Fire department Scope of practice is approved as follows

Emergency Medical Technician

Obtain vital signs
EKG including 12-lead acquisition
Bag Mask Ventilation
Head tilt/chin lift
Finger sweep
Manual obstruction removal
Jaw thrust
Nasopharyngeal airway insertion
Oropharyngeal airway insertion
End Tidal CO₂ monitoring/capnography
Mouth to barrier
Mouth to mask
Mouth to mouth
Mouth to nose
Mouth to stoma
Oxygen Therapy
 Humidifiers
 Nasal Cannula
 Non-Rebreather Mask
 Partial Rebreather Mask
 Simple Face Mask
 Venturi Mask

Scope of Practice

Pulse Oximetry
CO oximetry
Suctioning of upper airway
CPR
Mechanical CPR device (Lucas device)
AED
Hemorrhage Control (direct pressure, dressing, wound packing, tourniquet)
Immobilization
Cervical Collar application
Longboard
Seated immobilization
Extremity splinting
Medication administration routes
 Nebulized anticholinergics and beta agonists
 Metered Dose inhalers
 Oral administration of oral glucose, aspirin for chest pain
 Sublingual administration of ondansetron or patients prescribed nitroglycerin
 Nasal Narcan
 Assist with prescribed medications
Assist with childbirth
Blood glucose monitoring
Blood Pressure
Taser barb removal
Patient restraints
Rapid extrication

Emergency Medical Technician with Modules
Ambulance based clinician will operate autonomously at this level

King airway insertion
igel (LMA) insertion
Suctioning, tracheobronchial (advanced airway)
CPAP
IV access excluding external Jugular
IO access
IV fluid infusions
 Normal Saline
 Lactated Ringers
Venous blood sampling
Medication administration routes
 Subcutaneous
 Intramuscular Epinephrine 1:1000
 Vaccinations

Scope of Practice

Paramedic & Ambulance Based Clinician (when accompanied by a paramedic)

High Flow Nasal Cannula
BIPAP
Direct and Video Laryngoscopy
Needle chest decompression
Chest Tube Monitoring and Management
Cricothyrotomy Needle/Surgical
NG/OG tube insertion
Intubation including RSI
Automated transport ventilators
EKG interpretation including 12-lead
Cardioversion (electrical and pharmacological)
Manual Defibrillation
Hemorrhage Control pressure point
Transcutaneous pacing
External Jugular IV access
Blood chemistry analysis
Medication administration routes
 Medicated IV fluid infusions
 Intranasal
 IV piggyback
 IV push
 Sublingual
 Topical
 Rectal
 Nasogastric

Paramedic with Modules

IV pump infusions
 Not to exceed 2 different infusion medications maximum at any given time. Additional bolus medications are permissible.
 Not to include blood products or sedative infusions.

Central Line access

Critical Care Paramedic

Invasive Hemodynamic monitoring (Arterial, venous)
Arterial line access
Ventilators, Automated – Enhanced Assessment & Management.
Blood Product Administration.
All IV medications both bolus and infusion as ordered by sending physician.

Patient Care Report

POLICY:

An EMS Patient Care Report (PCR) will be completed accurately to reflect the patient assessment, patient care, and interactions between EMS providers and the patient, for each patient contact, which results in some form of assessment component. PCR's should also be completed on all standby functions (i.e., rodeos and fire assists). PCR's are to be completed as quickly as possible following the call out.

The information in the EHR will be used to procure system data, provide insurance and billing information, and ensure that documentation is available for liability purposes. EHR's are legal court documents. Accuracy should be of utmost importance.

PROCEDURE:

General Procedures:

The following are general guidelines for completion of the PCR:

- The electronic patient care report (ePCR) should be initiated at the time of dispatch and then completed during, or as soon as possible after, each patient encounter.
 - If the computer is not available or is down for some reason, document on the paper form until you are able to complete the digital form.
- When possible, the ePCR should be completed by one crew member while simultaneous assessment and treatment is being provided by other crew members.
 - The responsibility for completing the ePCR rests with every member of the EMS crew.
- Except for extenuating circumstances, and only with the approval of the on-duty Battalion Chief, all ePCR's should be completed before the end of each shift.
- Personnel who are not covering full-time shift hours should complete the ePCR immediately after the run.
- All patient assessments, interactions, and interventions are to be documented on the ePCR.
- The ePCR must be completed as outlined by the Battalion Chief-EMS, Deputy Chief, the Medical Director, and the QAI Coordinator.
- Attachments that should be attached to the ePCR:
 - Billing information sheets
 - Physician Certification Statements
 - Vital signs report (if not manually entered)
 - 3-Lead EKG's (if not uploaded as part of the vitals report)
 - 12-Lead EKG's (if not uploaded as part of the vitals report)
 - Interfacility transfer orders
 - Do Not Resuscitate orders
 - Misc. sheets and forms as needed

ESO Guidelines:

The following are general guidelines for using the ESO ePCR program:

- ESO is a web based, ePCR software used by our department that utilizes objective data fields to document patient care.
- The ePCR must objectively demonstrate that the best care possible was provided.
- Within the ePCR is a narrative section that should be used by EMS providers to illustrate subjective information that would otherwise be difficult to report using only the objective pre-defined data fields.
- When writing the narrative, avoid repeating information already provided elsewhere within the ePCR.
 - Repeated information within the narrative adds to the tediousness of completion and creates opportunity for contradictory data that diminishes the durability of the report.
- Narrative outline:
 - Include all subjective or other information that is not elsewhere included in the ePCR and that will complete a useful understanding of the patient's present condition and direction of treatment.
 - Illustrate the scene upon arrival of EMS, providing background of illness/injury.
 - Throughout the narrative, highlight significant events during the flow of patient care, being cautious not to provide excessive detail that might already be documented elsewhere in the ePCR.
 - The following are the approved narrative section headers:
 - DISPATCH:
 - HISTORY OF PRESENT ILLNESS/INJURY:
 - ARRIVAL/GENERAL IMPRESSION:
 - ASSESSMENT/VITALS/TREATMENTS:
 - TRANSPORT/HOSPITAL REPORT:
 - ARRIVAL/TRANSFER OF PATIENT CARE:
 - Your signature with your certification level and licensure level
 - Example: John Doe FP-C, Paramedic

Documentation Guidelines:

Appropriate to your level of licensure, scope of practice, and interventions made for the patient the following should be documented for all patient transports. Documentation of these items should take place in the objective fields within the ePCR:

- AVPU
- GCS
- Respiratory Rate, depth, quality
- Lung sounds
- Heart tones
- Bowel Sounds
- Pulse rate and quality: presence / absence in all extremities
- Patient EKG
- 12-lead EKG where appropriate

- IV sites to include:
 - Gauge of needle used
 - Total fluid infused prior to arrival
 - Condition of infusion site (document on initial patient contact as well as condition upon transfer of patient at receiving facility)
 - Total fluid infused during transport
- Other drains or tubes
 - NG/OG tubes
 - Total output during transport
 - Foley Catheters
 - Total output prior to arrival
 - Total output during transport
 - Airway Securing Devices (ET tubes, secondary airway devices, Tracheostomy, etc...)
 - Depth of insertion
 - Securing device used
 - Condition
- Invasive monitoring lines
 - Type and Placement
 - Condition of site
 - Adjustments made for transport
 - Monitored during transport
 - Attach strip / readings
 - Discontinued for transport
 - Left in place but not monitored during transport
- Medications and Interventions
 - General patient care plan prior to arrival
 - Medications administered enroute
 - Name
 - Concentration of IV bolus and drip medications
 - Dosages intended to administer
 - How administered
 - Actual mL, mL/hour, etc. administered
 - Patient reaction to medication
 - If patient is on vasoactive medications, document blood pressure and heart rates every 3-5 minutes
 - If patient is receiving pain, sedation, and/or paralyzing medications, document patient pain, sedation, paralyzation levels every 5-10 minutes.
 - Interventions administered enroute
 - Type of intervention
 - Why it was performed
 - How it was performed
 - Patient reaction
- Diagnostics
 - Critical Care Provider (CCP) interpretation of the following (if performed and made available to CCP):
 - Pertinent Labs
 - Pertinent X-ray, CT, MRI
 - Other pertinent diagnostic procedures/reports

EMS Quality Assurance / Improvement Plan

POLICY:

- All patient contact will be reviewed using a Quality Assurance / Improvement Plan (QAI) and improvements will be implemented based on a review process.
- Employee performance data is private and protected and will only be used for administrative purposes.

PURPOSE:

The purpose of the QAI Plan is to ensure that the quality of patient care meets established medical standards. Data collected provides a systematic mechanism for problem identification and improvement by meeting the following objectives:

- Continuously improve patient care and service
- Improve documentation of patient care rendered
- Reduce risk and liability from patient care
- Assess for and improve cost effective patient care services
- Identify education needs of the staff, community, and other pre-hospital care providers
- Identify problem areas and provide a mechanism for improvement within the system
- Ensure proper documentation for billing purposes

PLAN ELEMENTS:

Authority and Responsibility:

The responsibility for administering the QAI Plan rests with the Medical Director, Deputy Chief, and Battalion Chief - EMS.

The Medical Director, Deputy Chief, and Battalion Chief - EMS will be responsible for planning, designing, and implementing the QAI activities of the EMS division. These directors may delegate the responsibility for data collection, compilation, and analysis to individual personnel. Final analysis, follow-up, and reporting will be the responsibility of the Deputy Chief, and Battalion Chief - EMS.

Monitoring Process:

Data Collection and Organization

Data will be collected on an ongoing basis and evaluated at training meetings, EMS CEU's, QAI meetings, and administrative meetings.

Data will be reviewed for identification of specific patient care problems, operational and service issues, and evaluation of the effectiveness of QAI efforts previously implemented in the department.

EMS run reports will be the data source for threshold monitoring.

Corrective Action Implementation

The Medical Director, Deputy Chief, and Battalion Chief - EMS have the responsibility for designing and implementing system improvement plans needed to resolve identified problems (i.e. training programs and CEU's).

Improvement plans and the effectiveness of actions taken will be evaluated to verify problem resolution and improvement in patient care.

Reporting

With respect to department-wide performance: the general findings, conclusions, recommendations, and actions taken will be reported to EMS personnel at training meetings and CEU's.

Annual Evaluation

The objectives, organization, and effectiveness of the QAI Plan and activities will be reviewed and evaluated annually. Program revisions will be recommended, approved, and implemented as necessary.

Documentation Thresholds

It is expected that all EMS documentation follows the format of the field ePCR.

Run Reviews

Run reviews are to be done periodically and are essential to the QAI process. Run reports can be tagged, either by the individual submitting the report or by those performing a review on the report, to be used during "run reviews." Run reports can be tagged for reasons including, but not limited to, the following:

- Special or unique circumstances surrounding the patient or the call.
- Questions about how or why certain procedures were done or left undone.
- Conflicts in protocols.
- Clarification of protocols or procedures.
- To provide recognition for exceptional performances.

Process Summary

1. Run reports are to be finished as outlined in reference #1003.
2. On duty crew will review run reports each day.
3. Tag reports for use in Run Reviews by sending an email with run report number to the Battalion Chief - EMS.
4. Completed QAI Monitoring will be reviewed by the Deputy Chief and Battalion Chief - EMS.
5. The Battalion Chief - EMS will compile individual employee statistics and track them for individual improvement plans.
6. The Medical Director, Deputy Chief, and Battalion Chief - EMS may perform individual employee improvement interviews as needed.
7. Run reviews will be done periodically throughout the year.

HIPAA Policy

POLICY:

- All personnel are required, as outlined by federal and state law, to receive HIPAA training prior to participating in patient care activities.
- All personnel should also undergo yearly refresher training in HIPAA.
- Personnel who do ambulance ride-alongs are required to either a)sign a confidentiality agreement or b) receive or show proof of participation in HIPAA training prior to their scheduled ride-along. (See reference #1024 for forms)
- All department personnel, including non-clinical staff, are expected to protect the privacy and security of all protected health information (PHI) and electronic PHI (ePHI) as required by federal and state law and in accordance with general principles of professionalism as a health care provider.
- Personnel may access PHI and ePHI only to the extent that it is necessary to complete job duties. Personnel may only share such information with those who have a need to know specific patient information they have in the possession to complete their job responsibilities related to treatment, payment, or other company operations.
- Personnel are encouraged and expected to report any concerns regarding the Madison Fire Department's policies and procedures on patient privacy or security and any observed practices in violation of those policies to the Deputy Chief or Battalion Chief – EMS.

PROCEDURE:

- All patients, or patient designees, should be made aware of our privacy policy.
- Personnel are required, when patient's or patient designees are able, to have patients, or designees, sign that they have been made aware of and understand the privacy policy.
- Anyone requesting PHI or ePHI should complete the PHI / ePHI request form (see page 3 of this protocol for a copy of this form).
- These forms should then be given to the Battalion Chief – EMS.
- The Battalion Chief – EMS will review the request and then either complete or deny the release of the information based on current federal and state laws and guidelines.
- Page #2 is a copy of the Madison Fire Department's Privacy Policy:

NOTICE OF PRIVACY POLICY

THIS NOTICE DESCRIBES HOW MEDICAL INFORMATION ABOUT YOU MAY BE USED AND DISCLOSED AND HOW YOU CAN GET ACCESS TO THIS INFORMATION. PLEASE REVIEW IT CAREFULLY. YOU WILL BE PROVIDED A COPY FOR YOUR FUTURE REFERENCE.

Federal privacy law permits health care providers and those that assist them to use certain types of patient information without a patient's consent. The permitted uses of the information are for providing treatment to the patient (which might include disclosures between physicians and /or nurses), for purposes of collecting payment for the treatment from Medicare, Medicaid, private insurers (such as submitting diagnostic information and test results to your insurance company or to a collection agency for non-payment and to a billing company employed by Madison County ambulance for the purpose of collecting payment). Health information may also be used for certain health care operations.

Patient health information may be used for other purposes only with written consent of the patient (or the patient's parent or guardian). It is Madison County Ambulance's policy that we will limit our use of your health information to the purposes described above. Therefore, this is a notice to you of our policies and not a request for permission to use your health information. By signing below you are merely confirming that you have reviewed and received this document.

Federal law permits patients to examine their medical records once each calendar year at no cost to the patient. Patients may be charged for additional requests during the same calendar year. If a patient believes the medical records contain inaccurate information, the patient is permitted to ask the records be corrected. Providers will investigate any claim of inaccuracy and make any corrections where warranted. If you wish to examine your medical records in the possession of a hospital, physician, home health agency or durable medical supplier, you must contact them directly.

If you wish to review your medical records in Madison County Ambulance's possession, the request must be in writing. You may request a form for that purpose by writing or calling:

Battalion Chief – EMS
Madison Fire Department
26 North Center
Rexburg, ID 83440
Phone: 208-359-3010
Fax: 208-359-3003



Madison Fire Department

26 North Center Street

Rexburg, Idaho 83440

208-359-3010

www.fdmadison.org

Request to Access Protected Health Information (PHI)

When complete, return this form to:

Madison Fire Department
Attn: Battalion Chief - EMS
26 North Center Street
Rexburg, Idaho 83440

For Office Use Only:

ID Verified: _____

Request received by: _____

Filled by: _____

Incident #: _____

Section A: The individual for whom access is being requested. Please complete the following:

Name: First _____ M _____ Last _____ Date of Occurrence _____

Social Security Number _____ Date of Birth _____

Address _____ City _____ State _____ Zip _____

Area Code & Telephone Number _____ E-mail address (if available) _____

Section B: By placing an "X" in the appropriate box, please indicate the manner in which you wish to receive/review your information. Select only one option:

- Paper copy of information via US Mail.
- Send me an electronic copy, if available. You must provide an e-mail address in Section A above. NOTE: E-mail may not be secure. Any information we send will be in the form of a password-protected attachment.
- Allow me to view my records in person. I understand that I will be contacted to arrange for this.

Section C: Signature

Signature of Individual or Individual's Personal Representative

Date: month/day/year

Section D: If Section C is signed by a Personal Representative, please complete the information below:

Personal Representative _____ Relationship to Individual _____

Personal Representative's Address _____ City _____ State _____ Zip _____

Personal Representative's Area Code & Telephone Number _____ Personal Representative's Email address (if available) _____

Medication / Fluid Inventory

The following is a list of drugs and fluids that are authorized to be carried in our ALS and Critical Care Ambulances (*Quantities and medication form carried must be approved by the Deputy Chief and Medical Director*):

Alkalinizing Agents:

- Sodium Bicarbonate

- Lorazepam
- Midazolam

Anesthetics:

- Etomidate
- Tetricaine

Beta-Blockers:

- Labetalol Hydrochloride
- Metoprolol Tartrate

Antiarrhythmics:

- Adenosine
- Amiodarone Hydrochloride
- Lidocaine Hydrochloride

Calcium Channel Blockers:

- Diltiazem

Antibiotics:

- Cefazolin Sodium

Corticosteroids:

- Dexamethasone
- Methylprednisolone

Anticoagulants / Antiplatelets:

- Aspirin

Crystalloid:

- Lactated Ringers
- Normal Saline

Antifibrinolytic:

- Tranexamic Acid

Diuretic/Osmotic:

- Furosemide
- Mannitol
- 3% Saline

Antiemetics:

- Ondansetron Hydrochloride
- Promethazine Hydrochloride

Electrolytes:

- Calcium Chloride
- Magnesium Sulfate

Antihistamines:

- Diphenhydramine

Hormones:

- Glucagon
- Oxytocin

Benzodiazepines:

- Diazepam

Narcotics/Analgesics:

- Morphine Sulfate
- Fentanyl Citrate
- Dilaudid
- Ketamine
- Acetaminophen

Narcotic / Benzodiazepine Antagonists:

- Flumazenil
- Naloxone Hydrochloride

Vasodilators:

- Nitroglycerin
- Nicardipine Hydrochloride

Neuromuscular Blockers:

- Succinylcholine Chloride
- Rocuronium Bromide
- Vecuronium

Vasopressors:

- Dopamine Hydrochloride
- Norepinephrine Bitartrate
- Epinephrine Hydrochloride

Non-Steroidal Anti-Inflammatory Agents:

- Ketorolac Tromethamine

Nutrients:

- Dextrose
- Glucose
- Thiamine

Parasympatholytics:

- Atropine Sulfate

Sympathomimetics:

- Albuterol
- Ipratropium Bromide
- Phenylephrine
- Terbutaline
- Racemic Epinephrine

Abuse / Neglect

POLICY:

To provide EMS personnel with information on how to appropriately identify and treat both adult and pediatric patients who are victims of abuse or neglect.

PROCEDURE:

All health care providers are obligated by law to report cases of suspected child or vulnerable adult abuse or neglect to either the local law enforcement agency or the Department of Health and Welfare (IDHW) within 24 hours of discovery. The report to law enforcement or IDHW should be made in a manner that does not aggravate the situation or compromise the safety of the patient or the responders on scene.

- Findings that suggest abuse or neglect include, but are not limited to:
 1. Injuries of different ages located on face, ears, neck, back, thighs, genitalia, or buttocks
 2. Stocking or glove scald burns
 3. Burns to buttocks and genitalia
 4. Adult human bites
 5. Injuries with clear demarcation matching the shape of the item used
 6. Poor nutrition, poor care
 7. Delay in seeking treatment
 8. Vague, inconsistent, or changing history
 9. Child who is withdrawn, passive, depressed or who does not look for comfort from parents
 10. Parents who are hostile or distant
 11. The patient may present with patterned burns or injuries suggesting intentional infliction, such as: injuries in varying stages of healing, injuries scattered over multiple areas of the body, and/or fractures or injuries inconsistent with stated cause of injury
 12. The patient, parent or caregiver may respond inappropriately to the situation.
 13. Malnutrition or extreme lack of cleanliness of the patient or environment may indicate neglect.
- Treatment:
 1. Perform patient assessment.
 2. Provide treatment appropriate to the injury or condition.
 3. Protect the patient.
 4. If necessary call law enforcement to get permission to treat and transport.
 5. DO NOT question or accuse the parent or care giver.
 6. Report your observations to the hospital staff.
 7. Document a detailed descriptive Patient Care Report describing the physical environment where the child was found, the child/parent interactions, and your physical findings in detail. Do not make a diagnosis of abuse. Simply describe your findings on the reporting form.

Infection Control

PURPOSE:

The purpose of the Infection Control plan is to reduce the possibility of exposure and to provide personnel with appropriate care after an exposure has taken place. All elements of this plan are provided under the direction of the Deputy Chief, Battalion Chief-EMS, and Medical Director.

PLAN ELEMENTS:Pre-Exposure Precautions:

- Personal Protective Equipment:
 1. *Protective Gloves:* Should be worn during all patient contacts when invasive procedures are performed or when at risk for coming in contact with body fluids or other infectious substances. Gloves should be worn under turn-out/extrication gloves when there are large amounts of blood or body fluids present at accident scenes.
 2. *Goggles, Masks, Protective Footwear and Gowns:* Should be worn whenever splashes may generate droplets of infectious materials or whenever the potential for gross contamination is anticipated. Use of mouth to mouth resuscitation should only be used as a last resort if no other equipment is available. Masks can be placed on patients that are suspected of having an airborne communicable disease.
 3. *Protective Eyewear:* Should be worn when controlling bleeding with spurting blood, during emergency childbirth, and during airway maneuvers when splashing or aerosolization of blood is likely.
- Cleaning of Ambulance and Equipment:
 1. All surfaces that have come into contact with infectious substances will be cleaned using an approved disinfectant (i.e. Acute Care, Hebi-clense, or Clorox solution). When gross amounts of blood or body fluids are present, first use soap and water and then clean with an approved disinfectant.
- Sharps, Sharps Containers, and Biohazard Bags:
 1. Do not recap sharps when it is not necessary. If you must recap, place the receiver cap on a surface and then insert the needle without holding onto the cap.
 2. Do not put needles down where they can pose a threat to you or another person.
 3. All sharps go into “Sharp’s” containers and not into waste baskets.

4. Do not push sharps into the sharp's container with your hand—if needed use a mechanical means to push it into the container.
 5. Do not remove items from the sharp's containers.
 6. Do not give exposed sharps to another person. If a sharp needs to be disposed, ask the other person for a sharps container, and then dispose of the sharps yourself.
- Immunizations:
 1. Hepatitis B and Tetanus vaccinations will be available for all personnel, at no cost, that have a risk of exposure to infectious materials (i.e. blood and body fluids).

Post-Exposure Evaluation and Follow up:

- After an exposure the following steps should be taken:
 1. Hand, skin surfaces, and mucous membranes will be washed immediately and thoroughly if contaminated with blood/body fluids.
 2. Emergency Personnel will immediately notify their department supervisor and Madison Memorial Hospital ED of the exposure to begin the process of identification of the source individual and, if possible, the individuals risk status. After source patient consent is obtained the source's blood will be tested for HIV/HBV/HCV infectivity.
 3. The exposed Emergency Personnel will report to the Emergency Department; check in as a patient and be evaluated (tetanus status and appropriate lab draws will be ordered).
 4. Exposed Emergency Personnel will then report to the lab for the ordered lab draw.
 5. All employees who incur an exposure incident will be offered post-exposure evaluation and follow-up which will include the following:
 - Documentation of the exposure route and the circumstances related to the incident are found on the "Employee Illness/Injury report form".
 - Exposed employee will be offered HIV/HBV/HCV testing. If the employee initially refuses baseline HIV testing, the blood sample will be preserved for 90 days to allow testing should he/she later desire the testing (If employee refuses test, employee takes on all occurred liability from incident).
 - Counseling and information regarding signs and symptoms to report to employee will be given by Attending Physician or Battalion Chief – EMS.
 - Records are maintained in the employee health files.
 6. The Attending Physician completing the evaluation will submit a written opinion including the following:

- Whether or not the hepatitis B vaccine is indicated and if the employee has received the vaccine.
 - That the employee has been informed of the evaluation results.
 - That the employee has been informed of any medical conditions, resulting from exposure to blood/body fluid, which requires further evaluation or treatment.
7. Follow up evaluation or treatment will be done with the current medical director.
 8. Follow-up lab work will be ordered at 6 weeks, 3 months, and 6 months and 1 year respectively by the Infection control officer using the “Lab Tests: Screening for Employee Exposure” form.
 9. As soon as possible (same day if feasible) go into Rexburg City Hall and fill out a Workers Compensation-First Report of Injury or Illness Form.
 10. Complete the “Employee Injury/Illness Report” form and accompanying “Narrative Form.”
 11. Make two copies of all the paperwork, give one to the Battalion Chief - EMS, and keep one for your files. These documents will be kept as part of your permanent file and be made available for future reference.

Madison Fire Department

Exposure Checklist

- Notify Supervisor and Madison Memorial Hospital Emergency Room.
- Check in at Madison Memorial Hospital as an outpatient.
- Report to the Emergency Department. (Lab work)
- Sign Consent for the HIV Antibody blood test form.
- Fill out Employee Injury/Illness Report form.
- Fill out Narrative form.
- Fill out Workers Compensation-First Report of Injury or Illness form at City Hall.
- Make copies of paperwork. (Three copies)
- Have counseling done.
- Follow up lab work. (6 weeks, 3 months, 6 months, and 1 year)

Madison Fire Department

Employee Injury/Illness Report

Employee Name: _____

Address: _____ Telephone: _____

Soc. Sec. #: _____ Date of Birth: _____ Marital Status: _____

Job Title: _____ Department: _____

Date of Injury/Illness: _____ Time: _____ AM/PM

Date Supervisor notified: _____ Time: _____ AM/PM

Missed Work? _____ If yes, time period missed: _____

Where did the injury/illness take place (Station, Ambulance, etc.)? _____

What was employee doing when injury/ illness occurred? _____

Describe the injury/illness in detail and indicate specifically part of the body affected. Example would be right arm, left leg, etc: _____

List witness if any: _____

Employee seen in the E.D.? _____ Physician? _____ Name of Hospital? _____

Describe the treatment given: _____

Was employee referred to the lab? _____ If so, what treatment was given? _____

This form must be immediately turned into the Supervisor or Infection Control officer to be Eligible for workers Compensation Insurance.

Idaho law mandates the State being notified of any work related injuries or illnesses within 10 days of occurrence.

Employee Signature

Date

Supervisor Signature

Date

Madison Fire Department

Lab Tests: Screening for Employee Exposure

Employee Name: _____

Date: _____

- | | |
|--|--|
| <input type="checkbox"/> CXR for TB screening (positive TB test) | <input type="checkbox"/> TB Screening (PPD) New Employee |
| <input type="checkbox"/> HBV titer (Hbsab) | <input type="checkbox"/> HCV Profile |
| <input type="checkbox"/> HIV (baseline HIV blood test) | <input type="checkbox"/> HIV Follow-up 6 weeks |
| <input type="checkbox"/> HIV follow-up 3 months | <input type="checkbox"/> HIV follow-up 6 months |
| <input type="checkbox"/> HIV follow-up 1 year | <input type="checkbox"/> Rubella titer |
| <input type="checkbox"/> Other: _____ | |

Infection Control Officer

Date

Madison Fire Department

Narrative Form

Date of Injury: _____ Time: _____ AM/PM

Where the injury took place (Station, Ambulance, etc.): _____

Narrative on how the exposure occurred:

Employee Signature: _____

Care of Minors in the Field

PURPOSE:

To provide guidelines for EMS personnel for treatment and/or transport of minors in the field.

DEFINITIONS:

- Minor: Any person under 18 years of age.
- Minor who is legally competent and not requiring parental consent: a person who:
 1. Is decreed by the court as an emancipated minor.
 2. Has a medical emergency and parent is not available.
 3. Is married or previously married.
 4. Is on active duty in the military.
 5. Is pregnant and requires care related to the pregnancy.
- Legal Representative: Generally, a person who is granted “custody” of another person, including guardianship.
- Emergency: a condition or situation in which an individual has need for immediate medical attention, or where the potential for need is perceived by EMS personnel or a public safety agency.

PRINCIPLE:

- Consent: Except for circumstances specifically prescribed by law, a minor is not legally competent to consent to, or refuse medical care.
 1. Informed consent: treatment and/or transport of a minor shall be with the verbal or written consent of the “competent” parent or legal representative. If unavailable, a competent relative representing him/herself as the appropriate responsible person for the minor may act for a minor.
 2. Implied consent: in the absence of a parent or legal representative, emergency treatment and/or transport may be initiated without consent.

PROCEDURE:Treatment and/or Transport of Minors:

- If a parent or legal representative is unavailable, minors with an emergency condition shall be treated and transported to the medical facility most appropriate to the needs of the patient.

Minors Not Requiring Immediate Treatment and/or Transport:

- A minor who is evaluated by EMS personnel and determined not to be injured, to have sustained only minor injuries, or to have an illness or injury not requiring immediate treatment and/or transportation, may be released to:
 1. Parent or legal representative.

2. Designated care giver (i.e.: immediate adult family member, day care provider, and others who may have a legal obligation to care for the minor).
 3. Law Enforcement.
- EMS personnel shall document in the patient care report to whom the minor was released.
 - In the event a minor is not able to be released, contact medical control.

Minors Refusing Indicated Care In an Emergency:

- For a minor refusing any indicated treatment and/or transport, EMS personnel:
 1. Shall attempt to contact a parent or legal representative for permission to treat and/or transport.
 2. May contact Law Enforcement and request minor to be taken into temporary protective custody (only if parents or legal representative are unavailable).

Responsibility for Patient Management

PURPOSE:

To define the responsibility for patient health care management in an emergency.

PROCEDURE:

Physician / Medical Professionals on Scene:

- The authority for medical direction of Idaho EMS personnel rests with the EMS agency offline medical direction and/or on-line medical control of the receiving hospital.
- Medical professionals who offer their assistance at the scene should be asked to identify themselves and their level of licensure. The EMS Provider should ask that the medical professional provide proof of identity if they wish to assist with care given to a patient after the arrival of EMS agency personnel.
- An identified Idaho licensed physician on the scene who is caring for a patient prior to arrival of EMS may retain responsibility for the patient or relinquish further care to the responding EMS agency.
 1. If the physician chooses to retain responsibility for the patient, the EMS Provider should advise the physician that he/she must accompany the patient to the hospital and maintain care for the patient, including responsibility for the patient's medical care, and communicate with the EMS supervising physician.
 2. The physician on the scene shall have made available to them the services and equipment of the EMS unit, if requested.
 3. Document the event in full in the EMS Patient Care Report including the name of the physician on scene.
- If a conflict arises about patient care or treatment, on-line medical control should be contacted for assistance.
- On scene EMTs not affiliated with our service or on scene Nurses, doulas, or Nurse Midwives of all levels, are not able to take or retain responsibility for patient management.

Transfer of Patient Management to Lower Level of Care:

- An EMT of higher-level licensure may transfer pre-hospital patient management responsibility to an EMT of lower-level licensure for transportation only under the following conditions:
 1. When the patient has not received advanced care that is above the scope of practice for the receiving EMT.
 2. When operating under the MCI Protocol.

Medical Direction

POLICY:

The ability to practice medicine, at all levels, within the Madison Fire Department system is performed under the license of our Medical Director. This policy defines the roles and responsibilities of Medical Direction and Control as well as criteria of how to use standing orders and on-line medical control in the field.

Roles and Responsibilities:

Physician direction of pre-hospital emergency care may be accomplished through off-line and online medical direction using prospective, concurrent, and retrospective methods.

OFF-LINE (Prospective and Retrospective) MEDICAL DIRECTION:

Off-line medical direction is the administrative promulgation and enforcement of accepted standards of pre-hospital care. Off-line medical direction can be accomplished through both prospective and retrospective methods. Prospective methods include, but are not limited to, training, testing, and certification of providers; protocol development; operational policy and procedures development; and legislative activities. Retrospective activities include, but are not limited to, medical audit and review of care, direction of remedial education, and limitation of patient care functions if needed. Committees can handle various aspects of prospective and retrospective medical direction. The committees function under the medical director with representation from appropriate medical and EMS personnel.

ON-LINE (Concurrent) MEDICAL DIRECTION:

On-line medical direction is the medical direction provided directly to pre-hospital providers by the medical director or designee either on-scene or by direct voice communication. Ultimate authority and responsibility for concurrent medical direction rests with the medical director.

Use of Standing Orders and On-Line Medical Control in the Field:

- Protocols set forth by Madison Fire Department should be followed as written. They set the standard of care. Protocols, however, do not allow for unique situations that might arise.
- If deviation from protocols is required, it should only be done under the direction of Medical Control.
 1. Medical Control:
 - Telephone or radio contact with Medical Director
 - On-scene Physician
 - Telephone or radio contact with Receiving Facility Physician

EMS Medical Director Qualifications, Authority and Responsibility.

In accordance with Section 56-1011, Idaho Code, licensed EMS personnel must provide emergency medical services under the supervision of a designated EMS medical director.

1. The EMS agency must designate a physician for the medical supervision of licensed EMS personnel affiliated with the EMS agency.
 - a. Dr. C. Jeffrey Zollinger is the Madison Fire Department Medical Director.
2. The EMS medical director can designate other physicians to supervise the licensed EMS personnel in the temporary absence of the EMS medical director.
 - a. Dr. Joseph Watson is a secondary contact if Dr. Zollinger is unavailable.

The EMS medical director will have a written agreement with the EMS agency(s) that includes the following elements:

1. Identification of the EMS agency(s) for which he provides medical supervision.
2. Acknowledgement of the authority of the EMS medical director as established in Idaho statute and IDAPA 16.02.02, "Rules of the EMS Physician Commission."
3. An effective date.
4. An expiration date or a provision for automatic renewal upon mutual agreement.
5. Assurance of EMS medical director access to relevant agency, hospital, or medical clinic records as permitted or required by statute to ensure responsible medical supervision of licensed EMS personnel.

The EMS medical director will provide the EMS Bureau with documentation of the written agreement upon request.

The EMS medical director must:

1. Accept responsibility for the medical direction and medical supervision of the activities provided by licensed EMS personnel.
2. Obtain and maintain knowledge of the contemporary design and operation of EMS systems.
3. Obtain and maintain knowledge of Idaho EMS laws, regulations, and standards manuals.

The EMS medical director is authorized to:

1. Provide explicit approval for licensed EMS personnel under his supervision to provide medical care. Licensed EMS personnel may not provide medical care without the explicit approval of an EMS medical director.
2. Credential licensed EMS personnel under his supervision with a scope of practice. This scope of practice may be limited relative to the scope of practice authorized by the Commission and may not exceed the scope of practice established by the Commission.
3. Restrict the scope of practice of licensed EMS personnel under his supervision and withdraw approval of licensed EMS personnel to provide services when such personnel fail to meet or maintain proficiencies established by the EMS medical director or the Idaho EMS Bureau.
 - a. Such restriction or withdrawal of approval must be reported in writing within fifteen (15) days of the action to the EMS Bureau in accordance with Section 39-1393, Idaho Code.

- Our Medical Director performs these functions on an ongoing basis through the credentialing program of the department (Reference #1015), the QAI Program (Reference #1004), and these protocols.

The EMS medical director is responsible for:

1. Approving the planned deployment of personnel resources (Reference #1027).
2. Approving the manner in which licensed EMS personnel administer first aid or emergency medical attention as a "Good Samaritan" in accordance with Section 5-330 or 5-331, Idaho Code, without expectation of remuneration.
3. Documenting the review of the qualification, proficiencies, and all other EMS agency, hospital, and medical clinic affiliations of EMS personnel prior to credentialing the individual (Reference #1015).
4. Documenting that the capabilities of licensed EMS personnel are maintained on an ongoing basis through education, skill proficiencies, and competency assessment (Reference #1004).
5. Developing and implementing a program for continuous assessment and improvement of services by licensed EMS personnel under their supervision (Reference #1004).
6. Reviewing and updating protocols, policies, and procedures at least every two (2) years (Reference #1022).
7. Developing, implementing, and overseeing a Medical Supervision Plan.
8. Collaborating with other EMS medical directors, hospital supervising physicians, and medical clinic supervising physicians to ensure EMS agencies and licensed EMS personnel have protocols, standards of care, and procedures that are consistent and compatible with one another.
9. Designating other physicians to supervise licensed EMS personnel in the temporary absence of the EMS medical director.
10. Designating Physician Assistants and Nurse Practitioners to serve as designated clinicians, as defined in this Standards Manual.

Do Not Resuscitate

This protocol is to be used in conjunction with the Determination of Death on Scene protocol, reference #3001.

GENERAL INDICATIONS:

- Patient is in respiratory or cardiac arrest.
- *AND*
- Patient has a valid Idaho POST/DNR order.
 1. Intact (original or photocopy) signed (by a physician and patient or surrogate), **Idaho POST/DNR** order.
 2. Patient has a signed DNR order from another state.
- *OR*
- Patient is wearing DNR Identification jewelry (Idaho POST/DNR).

CONTRAINDICATIONS:

- Severe trauma.
- Mass casualty incident.
- Patient is obviously dead with evidence of homicide or suicide.
- The DNR order has been revoked by the patient.
- DNR order (photocopy or original, bracelet or necklace) is not physically present or has been defaced or destroyed.
- Verbal or physical threats from bystanders: EMS may ignore the DNR if bystanders verbally/physically threaten EMS if they do not initiate/continue CPR.

PROCEDURE:

- Perform routine patient assessment, resuscitation, or other medical interventions while an attempt is made to determine DNR status.
- If a valid DNR order or DNR identification jewelry is found, obtain assurance that the patient is the person for whom the order was written. (*See pages 3 for DNR example*)
- If the patient is in respiratory or cardiac arrest and DNR status is confirmed:

EMS providers WILL NOT:

1. Initiate CPR.
2. Provide ventilator assistance.
3. Initiate cardiac monitoring (unless to confirm death).
4. Defibrillate.
5. Administer resuscitative medications.

EMS providers WILL:

1. Provide comfort care.
 2. Provide emotional support (to the patient and family).
- If the patient is not in respiratory or cardiac arrest, EMS providers will:
 1. Attempt to determine if the patient has a POST form.

2. Follow the patient's treatment choices listed in sections B and C of the Patient's Post form.
 - If resuscitative efforts have been started before learning of a valid DNR order, stop those resuscitative efforts. Contact medical control if questions exist.
 - If it is determined the patient does not have a valid DNR order, proceed with all resuscitative efforts within scope of practice. Contact medical control for any permission to discontinue.
 - Revoking a DNR order may only be done by the maker of the form (this is the patient or person who signed the Patient/Surrogate block in Section E of the POST form), or attending physician either verbally, or by removing the bracelet or necklace or destroying the original form and/or photocopy with patient. If revoked, perform full resuscitation.
 - The DNR order may be disregarded only if there is a good faith belief the order has been revoked, to avoid confrontation, or if ordered to do so by the attending physician. (An attending physician is a physician licensed in Idaho who is selected by, or assigned to, the patient and who has primary responsibility for the treatment and care of the patient. The attending physician can be an EMS on-line medical control physician. Questions about out of state physicians should be directed towards medical control).
 - Complete the patient care report per protocol.

		Print Form				
IDaho POST IDaho POST IDaho POST IDaho POST IDaho POST IDaho POST IDaho POST						
Idaho Physician Orders For Scope of Treatment (POST)						
<p><i>THIS FORM MUST BE SIGNED BY A PHYSICIAN IN SECTION E TO BE VALID</i></p> <p>If any section is NOT COMPLETE, provide the most treatment included in that section</p> <p>EMS: If questions arise, contact on-line Medical Control</p>						
<table border="1"><tr><td>Patient's Last Name: Lastname</td></tr><tr><td>Patient's First Name: Firstname</td></tr><tr><td>Date of Birth: 1/11/1911</td></tr><tr><td><input checked="" type="checkbox"/> Male <input type="checkbox"/> Female</td></tr></table>			Patient's Last Name: Lastname	Patient's First Name: Firstname	Date of Birth: 1/11/1911	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Patient's Last Name: Lastname						
Patient's First Name: Firstname						
Date of Birth: 1/11/1911						
<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female						
Section A <small>Select only one box</small>	<p>Cardiopulmonary Resuscitation: Patient does not have a pulse and/or is not breathing:</p> <p><input type="checkbox"/> Resuscitate (Full Code)</p> <p><input checked="" type="checkbox"/> Do Not Resuscitate (No Code): Allow Natural Death; Patient does not want any heroic or life-saving measures.</p> <p>If patient is not in cardiopulmonary arrest, please follow the orders found in B, and C.</p>					
Section B	<p>Medical Interventions: Patient has a pulse and/or is breathing:</p> <p><input checked="" type="checkbox"/> Comfort Measures: Please treat patient with dignity and respect. Reasonable measures are to be made to offer food and fluids by mouth and attention must be paid to hygiene. Medication, positioning, wound care, and other measures shall be used to relieve pain and discomfort. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. These measures are to be used where patient lives, do not transfer to hospital for life-sustaining treatment. Transfer only if comfort needs cannot be met in current location.</p> <p><input type="checkbox"/> Limited Additional Interventions: In addition to the care described above, you may include cardiac monitoring and oral/IV medications. Transfer to hospital if indicated but do not use intubation or advanced airway interventions. Do not admit to Intensive Care.</p> <p><input type="checkbox"/> Aggressive Interventions: In addition to the care described above, you may include endotracheal intubation, advanced airway interventions, mechanical ventilation and cardioversion as indicated. Receiving hospital may admit to Intensive Care if indicated.</p> <p><input type="checkbox"/> Other Instructions: _____</p>					
Section C	<p><input type="checkbox"/> Feeding tube <input checked="" type="checkbox"/> No Feeding tube</p> <p><input type="checkbox"/> IV fluid <input checked="" type="checkbox"/> No IV fluid</p> <p><input type="checkbox"/> Other Instructions: _____</p>	<p>Antibiotics and Blood Products:</p> <p><input type="checkbox"/> Antibiotics <input checked="" type="checkbox"/> No Antibiotics</p> <p><input type="checkbox"/> Blood Products <input checked="" type="checkbox"/> No Blood Products</p> <p><input type="checkbox"/> Other Instructions: _____</p>				
Section D	<p>Advance Directives: The following documents also exist:</p> <p><input checked="" type="checkbox"/> Living Will <input type="checkbox"/> DPA <input checked="" type="checkbox"/> DPAHC <input type="checkbox"/></p>					
Section E	<p>Patient/Surrogate Signature: Firstname Lastname Patient Jul 3, 2007 Print Patient/Surrogate Name Relationship Date</p> <p>Physician Signature: First Last, MD M-123456 Jul 3, 2007 Print Physician's Name Idaho License Number Date Discussed with: <input checked="" type="checkbox"/> Patient <input type="checkbox"/> Spouse <input type="checkbox"/> DPA <input type="checkbox"/> DPAHC <input type="checkbox"/> Other</p> <p>The basis for these orders is: <input checked="" type="checkbox"/> Patient's request <input type="checkbox"/> Patient's known preference <input type="checkbox"/></p> <p>FORM SHALL ACCOMPANY PATIENT WHENEVER TRANSFERRED OR DISCHARGED</p>					
IDaho POST IDaho POST IDaho POST IDaho POST IDaho POST IDaho POST						



Patient Refusal of Care

POLICY:

The following guideline is to be used by EMS Providers any time a competent adult patient refuses patient care or transport or requests to be transported to a hospital other than the nearest, medically appropriate facility.

Consent:

- Legal consent procedures should not delay immediately required treatment.
- An individual has the responsibility to consent to or refuse treatment. If he/she is unable to do so consent is then considered implied.
- In non-emergency cases, consent should be obtained from the individual.
- For treatment of minors or emancipated minors refer to the Care of Minors, Reference #1009.

Mental Competence:

- An individual is mentally competent if he or she:
 1. Is capable of understanding the nature and consequences of the proposed treatment.
 2. Has sufficient emotional control, judgment, and discretion to manage his or her own affairs.
- Ascertaining that an individual understands what may possibly happen if treated or not treated, and is oriented to person, place, time and event, should be adequate for these determinations.
- Individuals with an altered level of consciousness (e.g., impaired cerebral perfusion, shock, postictal, or under the influence of drugs or alcohol) will be unlikely to fulfill these criteria.
- If the individual is not deemed mentally competent, the person should be treated and transported to a medical facility.

PROCEDURE:

Patient Refusal of Care:

- For a patient declaring no need for emergency medical care, where no patient care has occurred and no injuries, mechanism of injury or illness is obvious, do not treat the patient. Have patient sign the "Refusal of Treatment / Transport" form.
- Document per guidelines.
- For a patient declaring no need for emergency medical care, where patient care has already begun, and the EMS provider suspects injury or illness, proceed with the following:
 1. For the alert, conscious, ill, or injured patient who requests no transport or further treatment, the EMS Provider will explain risks of refusal and benefits of transport.

2. Should the patient continue to refuse, and transport is deemed medically necessary, the EMS Provider should contact medical control and try to establish communication between the patient and physician.
 3. The EMS Provider should accept the right of the patient to refuse treatment and transport and be sensitive to the needs and concerns of the patient and the patient's family. Have patient sign the "Refusal of Treatment / Transport" form.
 4. Exceptions: Patients that are placed in protective custody because they are a danger to themselves, or others should be treated and transported.
 5. Document per guidelines.
- For a patient unable to declare his or her own decision due to diminished consciousness or other incapacitation (alcohol, drugs or other) and where care is refused by family member(s):
 1. Contact on-line medical control at the receiving hospital and attempt to establish communication among the EMS Provider, medical control, and family member(s). After discussion, the EMS Provider will follow the orders of the on-line medical control physician.
 2. Document per guidelines.
 - Exceptions: altered mental status due to alcohol or drug intoxication and under arrest by police. Confer with law enforcement.

Patient Refusal Documentation Guidelines:

Document the following:

- The individual's chief complaint, mechanism of injury, level of orientation/level of consciousness, (e.g., if the person suffered a head injury, or whether the person is under the influence of drugs and/or alcohol).
- If used, on-line medical control.
- Any medical treatment or evaluation needed and refused.
- The need for emergency transportation; also, if transport by means other than an ambulance could be hazardous due to the individual's injury or illness.
- Individual advised that potential harm could result without emergency medical treatment and/or transport.
- Individual provided with the "Refusal of Treatment / Transport" form and if he or she would sign it.

Patient Restraint

PROCEDURE:

- Medical personnel are responsible for the assessment, treatment, transport, and safety of restrained patients; however, law enforcement assistance may be requested.
- Restraint shall be used when increased agitation or resistance poses a safety risk to patient and/or EMS providers.
- For inter-facility transport, a physician order must be obtained for physical restraint.
- Optimally, 5 people should be available to control a truly combative person. One person for each limb and one to direct the process and initiate application of restraints.
- The following types of patients may require some form of restraint:
 1. Unconscious
 2. Confused
 3. Intoxicated and showing signs of illness/injury
 4. Pediatric patient and showing signs of illness/injury
 5. Developmentally or psychologically disabled and showing signs of illness/injury
 6. Verbally or physically hostile and/or threatening others and/or showing signs of illness/injury
 7. Suicidal
 8. Patients that are under police custody must be accompanied at all times by a police officer whose jurisdiction the patient is under.
- Only reasonable force may be used. Reasonable force is equal to or minimally greater than the amount of force being exerted by the resisting patient. Reasonable must also be safe force.
- Use of prone restraint is contraindicated. It prohibits complete assessment, emergency care cannot be efficiently rendered, it makes spinal immobilization impossible, and contributes to death from Restraint-Related Positional Asphyxia.
- Types of Restraint:
 1. Physical or manual restraint is achieved by hands-on contact and /or body contact without the use of devices.
 2. Mechanical restraint is achieved by using approved medical restraints. Use approved devices according to manufacturer recommendation.
 - Soft restraints should be used (i.e., spider straps, gauze rolls, coban, or ACE wraps) with the patient supine and all four extremities restrained. Care should be given to ensure that appropriate circulation, motor, and sensory functions are maintained in all extremities after restraint.
 3. Chemical restraint is achieved by using appropriate medication for sedation.

- Documentation Guidelines:
 1. Type of emergency and that the need for treatment was explained to the patient.
 2. Patient refusal of care or patient was unable to consent to treatment.
 3. Chemical restraint is achieved by using approved medications to sedate.
 4. Evidence of the patient's incompetence or inability to refuse treatment, including behavior and/or mental status of patient before restraint.
 5. Least restrictive methods of restraint were attempted.
 6. If applicable, assistance of law enforcement was requested, including officer names.
 7. Orders from medical control to restrain, if any.
 8. The treatment and restraint were for the patient's benefit and safety.
 9. The reasons for the restraint were explained to the patient.
 10. The type and mechanism used for restraint.
 11. The limbs restrained (Right wrist, bilateral wrists, four points, etc.).
 12. Any injuries that occurred during or after restraint.
 13. Initial and periodic circulation checks.
 14. Behavior and/or mental status of patient after restraint.

Requirements for Credentialing

PURPOSE:

To define the requirements for initial and continuous MFD credentialing for eligible individuals to practice as an EMT within Madison County (EMT, Advanced EMT, Paramedic, and Critical Care Paramedic).

POLICY:

Department members must successfully complete the credentialing process prior to performing patient care activities. Although department members may be trained to a higher certification level, they are only allowed to wear department designations and perform patient care activities at their current level of credentialing. The only exception is during the credentialing process. Providers who are currently undergoing credentialing evaluation are allowed to perform patient care activities at the level of certification they are seeking.

Initial Individual Credentialing for Full-time and Paid Call Members

- Receive permission to begin credentialing process:
 - Inform Lieutenant of intent to begin process
 - Receive permission from Deputy Chief/Division Chief. Use the [supervision recommendation form](#).
- Possess a current Idaho EMT certification.
- Submit copies, both front and back, of EMS certifications to the Division Chief. The following are required:
 - Current Idaho EMS license (all providers)
 - Critical Care Paramedic Certification
 - Current Healthcare Provider CPR cards (all providers)
- Complete the requirements for credentialing as currently outlined.

Credentialing is good for a two (2) year period.

Continuous Credentialing

- Completion of yearly Vector Solutions trainings
- Possess a current Idaho EMS certification
 - Ensure required certifications are up to date.

Wildland Medical Coverage

EMTs who maintain the requirements for credentialing will be eligible for wildland medical coverage. Reference department SOGs for more information.

Paramedic Full-time Shift Coverage

Paramedics who maintain the requirements for credentialing will be eligible for full-time shift coverage. Reference department SOGs for more information.

Critical Care Paramedics

By January 1, 2014, one hundred percent of all full-time, non-officer (Captains / Chiefs), credentialed paramedics will be required to successfully complete and maintain MFD credentialing at the Critical Care level. Paid call paramedics will still be allowed to be placed on the full-time shift coverage list, without critical care certification, until they reach one year of credentialing experience with MFD. After that time, it will be required for them to become critical care credentialed in order to stay on the list. It will be optional, but encouraged, for all other paid call personnel to also complete and maintain this new certification.

Dual Response / Out of County Mutual Aid

PURPOSE:

It is the intent of this policy to define responsibilities and decrease the chance of confusion at any emergency scene and to ensure a coordinated, efficient procedure of treatment and transport of patients to an appropriate medical facility.

POLICY:

Scope: Because many different agencies are sometimes involved in the delivery of EMS, it is imperative to have responsibilities and authority clearly defined. Patient care must remain the number one priority. Teamwork, cooperation, and communication are essential to achieve this goal.

Responsibilities:

- **Fire/Rescue:** Oversee scene control and provide emergency fire and rescue service.
- **Air Transport:** Provide ALS air transport for patients to appropriate medical facilities.
- **All Agencies:** Responsible for cooperation, coordination, and communications with all other contributing agencies.

Out of County Mutual Aid: The Madison Fire Department routinely responds to assist other areas with ALS care (i.e.: Fremont, Jefferson, Teton, and Clark counties as well as Yellowstone National Park and Hebgen Lake Fire Department). When responding to other areas of jurisdiction, the following guidelines should be followed:

- Initiate contact as early as possible with the first responding agency. Try to ascertain patient condition and treatment needs, discuss rendezvous point, and provide a probable estimated time of arrival.
- Upon arrival at the rendezvous point, the lead paramedic will contact the requesting agency representative and the patient while the remaining personnel prepare for patient transfer.
- Be courteous and complimentary towards appropriate assessments and treatments performed by the responding agency.
- Re-stock supplies used by responding agency whenever possible.
- Patient care remains with the responding agency until they officially transfer care to our agency.
- Move the patient(s) into MFD ambulances for transport because requesting agency may not have MFD equipment types and because of MFD familiarity with MFD equipment and crew members.
 1. Exceptions: At times the responding agency will request that the ALS crew respond with them in their ambulance. If you are unable to convince the responding agency of the advantages of patient transfer, it is appropriate to use MFD equipment and crew members while responding in their agency vehicle. Bring primary bags & equipment you may need.
 2. It is also appropriate to have the responding agency assist with patient care while transporting in MFD agency vehicles.
- Remember that patient care is our number one priority, and it is our responsibility to conduct ourselves in a professional manner when working with other agencies.

Use of Radio

POLICY:

Use of radios is outlined in the M.F.D. Standard Operating Guidelines (SOGs) Reference #C-3.

Narcotic Security

POLICY:

To provide for regulation of controlled substances used by the Madison Fire Department.

PURPOSE:

- Provide accurate documentation of controlled substances.
- Provide a means to account for all controlled substances used or stored by MFD.
- Assure quality control of controlled substances.

PROCEDURE:

Medications that are considered to be controlled substances will be stored in the Knox Medication Safe in the EMS supply room and in a Knox Medication Safe in each ambulance. Access to the Knox Medication Safe is controlled by requiring two separate pin numbers to be entered. The pin numbers are issued to each EMS provider and every access is tracked with the Knox Medication Safe software. Access to the ambulance Knox Medication Safe is restricted to paramedic or critical care paramedic providers. As with the EMS supply room every ambulance Knox Medication Safe access is tracked with the Knox Medication Safe software.

EMS Supply Room Knox Medication Safe

- The Knox Medication Safe in the EMS supply room will be checked at the beginning of each 48-hour set by the Battalion Chiefs and recorded in Check It.
- The Battalion Chief - EMS is responsible for the purchasing of controlled substances and maintaining adequate inventory in the medication safe.

Ambulance Knox Medication Safe

- Standard narcotic boxes are secured in each ambulance Knox Medication Safe.
- Each box is to be stocked and properly locked.
- Each ambulance Knox Medication Safe will contain the following medications and quantities
 - Morphine 5 each 10mg in 1ml vials
 - Fentanyl 5 each 100mcg in 2ml vials
 - Midazolam 4 each 5mg in 1ml vials
 - Ketamine 2 each 500mg in 10ml vials
 - Lorazepam 4 each 2mg in 1ml vials
- Rare exceptions such as in the case of medication shortages, when these medication concentrations and vial sizes are unavailable, changes will be made and accompanied by a department wide correspondence explaining the temporary change.
- It is the previous shifts responsibility to ensure that narcotic boxes are stocked and properly locked.
 - This includes medication boxes stored in each ambulance.
- At the beginning of each 48-hour set paramedic or critical care paramedic providers will access the narcotic box by entering their pin number and complete a Check It narcotic box inventory check.

- A key to access the locked refrigerator is also in the Knox Medication Safe. The controlled substances in the refrigerator will also be accounted for in the count.
- Any identified discrepancy or variation will be communicated to the on-duty Battalion Chief by those providers who identify the problem during the count.

Drug Administration

- Controlled substances administered to patients will be documented in the electronic Patient Care Report (ePCR).
- Portions of drugs not administered will be “wasted” and the appropriate documentation will be completed on the ePCR.

Restocking

- Two authorized personnel are required to restock narcotic boxes.
- Restock only the approved number and amounts of medications as found in Check It.
- Using the Check It software transfer the medication(s) to be replaced from Station 1 Narcotic Supply to the appropriate ambulance.
- Replace the narcotic box in the appropriate ambulance Knox Medication Safe.
- Any identified discrepancy or variation will be communicated to the on-duty Battalion Chief by those providers who identify the problem during the count.

Shortages

- Medication shortages will be investigated and reported immediately to the Battalion Chief - EMS for further investigation.
- Personnel who are discovered abusing or diverting controlled substances will be subject to immediate disciplinary action which may include termination and legal charges.

Discrepancies

- Any discrepancies found may result in drug testing of personnel involved.

Response to Incidents

POLICY:

Response to incidents is outlined in the M.F.D. Standard Operating Guidelines (SOGs) Reference #B-1.

Mass Casualty Incidents / Local Emergencies

PURPOSE:

To provide a written guideline to assist EMS personnel in determining if a multi-casualty incident exists, and to provide general guidelines in handling the incident consistent with the Incident Command System (ICS). This policy provides the basic structure for EMS response in a mass casualty incident. This structure can be enlarged or modified, as needed, by the Incident Commander for large scale incidents or multi-jurisdictional / multi-agency emergencies.

DEFINITIONS:

- **Mass-Casualty Incident:** Any incident where EMS personnel and equipment are not adequate to care for all victims.
- **S.T.A.R.T.:** Acronym for simple triage and rapid transport. The S.T.A.R.T. system allows first responders to triage patients in sixty (60) seconds or less, based on three physical assessments: ventilation, perfusion, and mental status.
- **Incident Command System (ICS):** A basic expandable organization system for handling emergencies beyond the capabilities of an initial resource response.
- **Incident Commander (IC):** Individual responsible for the overall management of the incident.
- **Triage:** The continuous screening and classification of sick and injured victims.
- **Triage Tag:** A tag used by triage personnel to identify and document the patients' medical condition.

PROCEDURE:

Performing Triage:

- The S.T.A.R.T. system will be used. It stands for Simple Triage and Rapid Treatment.
- Identify total number of victims and request appropriate resources.
 1. Example: One ambulance for every critical victim or one ambulance for every two non-critical victims.
- When assessing patients, simple triage starts with quick assessments performed in the areas of Airway, Breathing, and Circulation.
- Rapid treatment is performed in the following manner:
 1. Airway: If patient does not have a patent airway, open the airway using either the head-tilt-chin-lift or the modified jaw thrust (whichever is appropriate).
 2. Breathing: If patient is not breathing, administer two rescue breaths. If the patient does not start breathing on their own, mark as deceased and move on.
 3. Circulation: Emphasis is placed on quickly controlling major bleeding only. Minor bleeding should be left untreated at this time.
- Patients should be prioritized according to the nature of their injuries and the presence of priority symptoms. The order of triage is as follows:

1. **Immediate:** Highest priority patients who need immediate care and injuries are correctible.
 - Airway and breathing difficulties
 - Uncontrolled or severe bleeding
 - Decreased mental status
 - Severe medical problems
 - Shock
 - Severe burns.
2. **Delayed:** Patients who can have care delayed and have serious, but not life threatening, injuries.
 - Burns with no airway compromise
 - Major or multiple fractures
 - Joint injuries
 - Spinal Injuries
3. **Minor:** Lower priority of patient that requires minor care. Often referred to as "walking wounded."
 - Minor painful or swollen or deformed extremities
 - Minor fractures
 - Minor soft tissue injuries
4. **Deceased:** Patients who are dead or fatally injured.
 - No ventilations present even after attempting to position airway
 - Exposed brain matter
 - Cardiac arrest
 - Decapitation
 - Severed trunk
 - Incineration

Operational Principles:

Initial response and initial multi-casualty organization:

- The first arriving firefighter will establish an Incident Command.
- The first arriving EMS provider (Generally a Paramedic) should become Triage Officer.
- Patients are triaged according to S.T.A.R.T. system and the ICS system is expanded accordingly.
- Additional incoming units are assigned tasks, as needed by the Incident Commander in conjunction with the Triage Officer and are to be given incident updates as they arrive on scene. If information given is unclear or incomplete, on-scene units should ask for clarification and additional information—this will aid in complete patient care and assist in appropriate on-scene operations.
 1. The first, appropriate, incoming unit will take the most serious patients first.
 2. Additional units will be assigned patients by priority with the lowest priority patients being treated and transported last.
 3. The first on-scene unit will be the last unit to leave the scene.

Small Scale Operational System Procedure:

- The Incident Commander or designee will perform the following duties:
 1. Provide an initial size-up and declare a mass-casualty incident.
 2. Request additional resources as needed (i.e., additional fire resources, additional ground ambulances, air-medical transport, etc.)
 3. Act as the Medical Communication Coordinator and contact the appropriate care facilities and report the initial size-up (including location, mechanism, and approximate number of immediate, delayed, and minor patients as reported by the Triage Officer.)
- The Triage Officer and team will perform the following duties:
 1. Perform initial triage using the S.T.A.R.T. System.
 2. Work with the Incident Commander to stage incoming resources appropriately in order to maximize the pick-up and delivery of patients by ground and air ambulances.
 3. Prepare and package patients for transport based on priority (as assessed during initial triage). For example:
 - Immediate: First
 - Delayed: Second
 - Minor: Last
 4. Notify the receiving facility of patient departure and include:
 - Transport Unit No.
 - Number of Patients
 - Disposition of Patients
 - Destination and ETA
- Each transporting unit should contact the facility designated to receive their patient. This contact should be brief and concise and advise that facility of the following:
 1. Transporting unit number.
 2. Age/Sex.
 3. Trauma Level (if applicable).
 4. Method of Injury.
 5. Chief Complaint and injuries that may need specialty services such as: respiratory, neurological, or vascular and need for decontamination.
 6. Glasgow Coma Scale (GCS).

Large Scale Operational System Description:

- For large scale emergencies, multi-agency emergencies, or multi-jurisdictional emergencies, the basic initial response framework can be expanded to include the following responses:
 1. **Reinforced Response Organization:** In addition to the initial response, the Incident Commander designates a Triage Unit Leader, a Treatment Unit Leader, Treatment Teams, and a Ground Ambulance Coordinator.
 2. **Multi-Leader Response Organization:** The Incident Commander will establish an Operations Section Chief who will in turn establish a Medical Supply Coordinator, a manager for each treatment category and a Patient Transportation Group Supervisor.

3. **Multi-Group Response:** All positions within the Medical Group and Patient Transportation Group are filled. An Air Operations Branch may be designated to provide coordination between the Air Ambulance Coordinator and the Air Operations Branch. An Extrication Group may be designated to coordinate the extrication of trapped victims.
4. **Complete Incident Organization:** The Multi Casualty Branch will have medical divisions (geographically separate) but only one Patient Transportation Group.

Large Scale Operational System Leaders:

- **Triage Unit Leader** - Supervises triage personnel, who perform the actual triage of patients. Once triaged, patients are moved to the Treatment Unit, usually via backboard or litter carried by litter bearers.
- **Treatment Unit Leader** - Supervises personnel assigned to treat patients in the three treatment areas (Immediate, Delayed, and Minor). Assumes responsibility for treatment, preparation for transport, coordination of patient treatment and directs movement of patients to the loading area.
- **Ambulance Coordinator** - Manages the Air/Ground Ambulance staging Areas and dispatches ambulances as requested.
- **Patient Transportation Group Supervisor** - Responsible for the transportation and ensuring records relating to patient identification, injuries, transportation, and destination are relayed to the Medical Communications Coordinator. Requests ambulances from Ambulance Coordinator.
- **Medical Communications Coordinator** – Relays patient information to receiving hospitals and care centers. Works with receiving facilities and Patient Transportation Group Supervisor to ensure that patients are transported to appropriate facilities based on patient's symptoms and facility resources.

Protocol Update

PURPOSE:

- To provide for periodic reviews and update of protocols.
- To define the requirements for the Protocol Curriculum Class (PCC).

PROCEDURE:

Updates

- These protocols are valid beginning on the effective date noted for each protocol.
- Review dates are set for each protocol, but protocols may be updated as needed.
- Personnel may, at any time, recommend changes to existing protocols. Personnel may also, at any time, recommend new protocols. These recommendations should be made to the Battalion Chief - EMS.
- As needed, the Deputy Chief, in conjunction with the Battalion Chief - EMS, will make the determination of which, if any, protocols need to be reviewed. They then oversee and participate in the change process.
- Protocol changes will then be submitted to the Medical Director, and/or Chief of Services, for approval. Any changes to administrative policies of the department will be reviewed by the Chief of Services prior to being implemented.
- New or updated protocols will be communicated in Vitals so all personnel can become familiar with the changes.
- Implementation of protocol updates will be the responsibility of the Deputy Chief and Battalion Chief – EMS.

Protocol Curriculum Class

- The PCC class is developed by the Battalion Chief - EMS with the curriculum being approved by the Assistant Chief - EMS.
- The PCC class is given each time major changes are made to these protocols.
- Battalion Chief – EMS is responsible for teaching this class.
- This class qualifies for continuing education towards NREMT and State re-certification.
- This class is required for all EMS providers, regardless of licensure/credentialing level.

Transport Guidelines

PURPOSE:

To identify guidelines for EMS personnel during all phases of the patient transport process.

POLICY:**Standard Transports:**

All patients will be evaluated and furnished transportation (if indicated) in a timely and appropriate manner based on each individual situation.

- A minimum of two credentialed EMTs are required for every EMS transport.
- All stable patients requesting/requiring transportation will be transported to the hospital of the patient's request (as long as it falls within MFD's normal transport area—Rexburg to Idaho Falls).
- Unstable or potentially unstable patients will be transported to the closest appropriate facility.
- All trauma patients with mechanisms or history for multi-system trauma will be transported as soon as possible. Every attempt should be made to minimize on-scene time. Consider transport by Air Ambulance.
- Medical patients will be transported in the most efficient manner possible with consideration to the medical condition. Advanced Life Support care or Critical Care should be provided at the scene if it would positively impact patient care.
- As a general rule, patients will not be transported in Quick Response Units. During times of disaster, or when staffing levels are appropriate and the situation warrants it (A supervisor, whether an on-scene supervisor or shift supervisor, should give approval), Quick Response Units may be utilized to transport patients.
- Transport adults and children who are not patients by properly restraining them in the front compartment of the ambulance.
 1. Exception: A parent or guardian may ride in the back compartment of the ambulance with their child so long as they are restrained during transport.
- Patients, parents, or other passengers should be restrained during transport. Caregivers, when not involved in patient care, should also be restrained.
- Transport children, whenever possible, by restraining them in their own car seat or use the Pedi-Mate if patient size is appropriate and no car seat is available.
- Only when no other option for safe restraint is available should an infant be held in the parents, caregiver, or EMS personnel's arms or laps during transport.

Inter-Facility Transports:

- Inter-facility transports are performed on a regular basis. The following documents/information are required when performing these transports:
 1. Signed doctor's orders for transport.
 2. Signed doctor's orders for treatment to be provided en-route.

3. Signed consent of transport by patient, or designee, and doctor.
 4. Patient face sheet to include insurance information and emergency contact information.
 5. Nurse's notes to include medication list, allergies, and vital signs (may be faxed to receiving institution).
 6. Doctor's notes to include diagnosis, preliminary or otherwise, and treatment plan, if appropriate (may be faxed to receiving institution).
 7. Verbal report from the Physician or Nurse.
 8. Other items as needed. (i.e.: X-rays, CT films, labs, EKG's, and etc...)
 - Exception: Nursing home transports (either to or from the nursing home) will generally have a condensed version of this information.
- Shift supervisors will be responsible for receiving and triaging requests for transports. Crews are determined by the expected needs of the patient. Transports can be staffed by any level of provider provided that the needed patient care falls within their scope of practice.
 1. Critical care transports require a minimum of one critical care paramedic and one EMT. Staffing changes may be made at the discretion of the on-shift supervisor.
 2. At the discretion of the shift supervisor, EMTs and Advanced-EMTs can perform fixed wing transfers because the responsibility for patient care lies solely with the Air Medical Transport Crew.
 - Medications, equipment, or devices that are not within a provider's scope of practice will require additional specialty personnel to accompany the EMS crew and the patient to the destination facility.
 1. Some examples of specialty personnel are Doctor, RN, Respiratory Therapist.
 2. In these instances, with the exception of physicians, the paramedic will maintain the overall responsibility for patient care while specialty personnel will be responsible for assisting and advising the paramedic in their areas of expertise. Specialty personnel will also be responsible for administration and/or use of their medications and/or equipment.
 - If problems arise during transport the EMT should contact the transferring doctor for orders. In the event the transferring doctor cannot be contacted, treat per protocol or attempt to contact receiving hospital physician.
 - Complete appropriate documentation and billing forms as outlined by current practices/procedures for all inter-facility transports.

Transport Decision Matrix:

The Transport Decision Matrix located on the following page should be utilized for determining level of care for Interfacility transfers. The diamond indicates the minimum level of licensure to perform the transport. Decisions should be made both on the need and the potential need of the patient being transferred.

Equipment or Care Required	BLS	Advanced	ALS	CC
Patient Type:				
Air Medical transport where responsibility for patient care lies solely on the air medical crew	◆			
Stable patient. Requires no special care. May have NG tube, Foley Catheter, gastrostomy tube, or patient controlled device that requires no intervention from transporting personnel.	◆	◆		
Stable patient. Requires cardiac monitoring or may need paramedic level intervention. No reasonable expectation that the patient condition will deteriorate.			◆	
Stable patient requiring care outside the paramedic scope of practice. Patient who is stable but whose condition has a reasonable expectation of deteriorating. Unstable patient.				◆
Airway / Breathing Interventions:				
Oxygen by mask or cannula	◆			
Continuous ventilatory assistance required			◆	◆
IV Access / Medication Administration:				
Saline Lock without additives and not requiring access or flush enroute	◆	◆		
Saline Lock without additives. Peripheral IV without additives (D10W, Normal Saline, or Lactated Ringers acceptable).		◆		
Peripheral IV with any drug listed in Madison Fire Department formulary and within the paramedic scope of practice—administered without an IV pump.			◆	
IV infusion of any drug outside paramedic scope of practice and any medication that requires an IV pump.				◆
Blood and blood products administration				◆
Central venous access device (capped)			◆	
Central venous access device with fluids infusing				◆
Arterial access device				◆
Pulmonary artery line, other central catheter, or Art line				◆
Other Devices:				
Temporary pacemaker				◆
Chest tube without suction			◆	
Chest tube with suction				◆

Ambulance Ride-a-Long and Preceptors

PURPOSE:

To provide guidelines for working with ride-alongs, students, and paramedic interns.

POLICY:

Ride-Alongs

The Madison Fire Department offers ride-alongs to anyone wishing to learn more about our ambulance program or emergency medical services in general. These ride-alongs are for observation only. Regardless of medical training, ride-alongs cannot participate in patient care. Ride-alongs must be 18 years of age or older. No more than one ride-along, student, or intern (per ambulance) should be allowed. Ambulance staffing should not exceed four personnel per ambulance. Paid-call personnel should not be excluded from EMS calls in order to permit ride-alongs, students, or interns to participate.

Requirements for Ride-Alongs:

- Read and sign the “Acknowledgement and Indemnification Agreement” form.
- Ride-alongs can be scheduled through the Division Chief or designee.

Students

Students are allowed to ride/participate after they have fulfilled the following requirements:

- Be an Idaho certified EMT (or higher level) or be in training to become an EMT (or higher level).
- Have undergone HIPPA compliance training.
- Be cleared to run by their EMS training program director.

EMT students are allowed to practice and perform skills at the EMT level only under the supervision of a provider at the EMT level or higher.

Advanced-EMT students are allowed to practice and perform skills at the Advanced-EMT level only under the supervision of a provider at the Advanced-EMT level or higher.

Paramedic students are allowed to practice and perform skills at the Paramedic level only under the supervision of a provider at the Paramedic level or higher.

Critical Care Paramedic students are allowed to practice and perform skills at the Critical Care Paramedic level only under the supervision of a provider at the Critical Care Paramedic level or higher.

Students are allowed to practice their skills only while enrolled in a training program. Students who have completed their course work and are waiting to be tested are not allowed to perform skills above their current level of certification.

Paramedic Interns

Paramedic Internships are done on a case-by-case basis. Those considering an internship with MFD must contact the Deputy Chief. Internships will be completed with an approved MFD paramedic/critical care paramedic. Successful completion of an internship will be based on the guidelines set forth by Paramedic Program who is sponsoring the student.

Madison Fire Department HIPAA Privacy Rule Confidentiality Agreement

As a participant in Madison Fire Department's observation (ride-along) program, you may become aware of protected health information (PHI) that is confidential in nature. Disclosure of PHI is protected under the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Your acknowledgment of this agreement specifies that you understand and agree to the following:

- PHI is any "individually identifiable health information," which includes information about an individual's past, present or future physical or mental health or condition; the provision of health care to the individual; or the past, present or future payment for the provision of health care to the individual.
- PHI includes information that identifies the individual, or which can reasonably be used to identify the individual. Individually identifiable information includes many common identifiers such as name, address, birth date, and Social Security number.
- HIPAA prohibits the unauthorized disclosure of PHI to anyone outside the organization, whether oral, written, photographic, video, or electronic.
- As a ride-along participant with Madison Fire Department, you agree to comply with all confidentiality policies during your entire experience with the organization, including after your experience ends.
- You understand that potential civil penalties for unauthorized disclosure of PHI are \$100 for each violation, up to a maximum of \$25,000 per year for all violations. Criminal penalties can include one to 10 years of prison with financial penalties ranging from \$50,000 to \$250,000 for violations knowingly committed under false pretenses or with the intent to use PHI for malicious harm, personal gain or commercial advantage.
- If at any time you knowingly or inadvertently breach these patient confidentiality policies, you agree to notify the Training Officer of Madison Fire Department immediately. In addition, you understand that a breach of patient confidentiality may result in the termination of your privileges to ride along with Madison Fire Department. It may also include the recommendation, by this department, for disciplinary action by your sponsoring agency, if applicable.

If you understand and agree to these stipulations, please initial line #5 of the 'Acknowledgement and Indemnification' form.



26 N. Center Street, Rexburg, ID 83440 • (208) 359-3010

ACKNOWLEDGEMENT AND INDEMNIFICATION

Observer Name: _____ Date of Birth: _____

Address: _____

Affiliation (if applicable): _____

Read and initial all of the following: (exception: initial only #2 or #3, whichever applies)

1. _____ I understand and agree that my services are voluntary in nature and that no benefits or remuneration shall be received.
2. _____ I am current on my Heptavax (Hepatitis) immunizations, or I have started my prescribed series of vaccinations. I also have a current Hepatitis C and PPD (tuberculosis) test.

OR
3. _____ I understand that, during the course of my observation, I may potentially be exposed to infectious diseases, such as hepatitis and tuberculosis, and I release the City of Rexburg, Madison County, and the Madison Fire Department from any and all liability, because I have personally chosen to not receive the Heptavax immunizations, the HCV, and PPD test.
4. _____ I agree to indemnify and hold harmless the City of Rexburg, Madison County, and the Madison Fire Department and its officers and employees from all claims, actions, suits or damages of any kinds, including cost and attorney fees, for any damage(s) to third parties while participating in this observation (ride-along program), and to hold harmless the City of Rexburg, Madison County, and the Madison Fire Department, its officers and employees from any suit or action arising from an accident or injury while in the course of participating in the observation (ride-along program).
5. _____ I have read and agree to follow Madison Fire Department's HIPAA Privacy Rule Confidentiality Agreement (on the back of this form).
6. _____ I agree to abide by the dress and grooming standards as explained to me (collared shirt, khakis or EMS pants, close-toed shoes). I also agree to wear the Ride-Along vest whenever I am participating in an incident.
7. _____ I do not have any Felony Convictions and am not involved in any pending legal issues.

Volunteer Observer Signature: _____ Date: _____

Witness Name: _____ Signature: _____

Verified by BC: _____

Safe Haven Act

POLICY:

A Safe Haven is authorized by law to accept a baby less than 30 days of age, directly from a parent, without identifying the parent. The parent is not required to provide any information to the safe haven but may volunteer medical or other information. The parent remains anonymous and will not be prosecuted for child neglect or abandonment.

Who can be a Safe Haven?

The law specifically identifies the following safe havens:

- Emergency medical personnel, when responding to a 911 call requesting a safe haven
- Licensed physicians and staff working at the physician's office or clinic
- Advanced practice professional nurses, including certified nurse midwives, nurse practitioners, and registered nurse anesthetists
- Licensed physician assistants
- Hospitals licensed in Idaho.

What does a Safe Haven do?

The Safe Haven will:

- Accept the baby from the parent
- Not ask the parent's name, but may ask the parent if they wish to provide medical or other information about the baby
- Make certain the baby receives necessary medical attention
- Immediately contact law enforcement. Law enforcement will establish emergency protective custody of the baby and contact the Idaho Department of Health and Welfare, which will provide an emergency home

More Information:

- Idaho Care Line at 211 or 1-800-926-2588
- Health and Welfare child protection, 208-334-5700
- Call the Legislative Services Office, Room 108, State Capitol, Boise, Idaho 83720-0054, 208-334-2475 for copies of the Safe Haven Act

Treat and Release

PURPOSE:

To provide guidance for EMS personnel who provide on-scene treatment to patients but do not transport.

POLICY:

All patients will be evaluated and treated (if indicated) in a timely and appropriate manner based on each individual situation. Patients that receive treatment on scene but are not transported will be charged a “Treat/No Transport Fee.” On scene providers will need to get the following information from the patient or family:

- Name
- Age
- Date of birth
- Social security number
- Billing address
- Name of Insurance company
- Policy holder’s name
- Policy number

The following are some examples of treatments that will need to be charged:

- IV therapy
- Nebulizer treatments
- Medication administration
- Oxygen therapy
- Any other invasive procedure

The following are some examples of items that can be performed without charging the patient:

- 3, 4, and 12-lead EKG monitoring
- Blood glucose testing
- Vital sign assessments

Patients that receive medications that will exert their effects over a prolonged period of time must be transported to an appropriate facility.

In order for patients to be treated and then released, they must be mentally competent. Refer to policy #1013 for guidance in determining a patient’s mental competence.

Personnel Deployment

PURPOSE:

To provide operational guidance regarding geographically authorized patient care for personnel representing Madison Fire Department (MFD) department.

The intent of this policy is to provide clarification when responding to EMS calls of an emergent / non-emergent nature for pre-hospital, inter-agency, and inter-facility care while operating within the scope and authority of the MFD and its' Medical Director.

POLICY:

Pre-hospital / Interagency:

Authorized areas of response:

- **Idaho:** Personnel may provide patient care in all cities, counties, jurisdictions, hospitals, and so forth within the state of Idaho. Off duty personnel are also authorized, and expected when feasible, to offer their assistance and expertise, within their authorized scope of practice and operating under MFD protocols, to any person requiring emergency medical care, within the state of Idaho, until local EMS arrives.
- **Montana:** On duty EMS personnel may, when rendezvousing with out of state agencies requesting our assistance (i.e., Yellowstone National Park Ambulance, Hebgen Lake Fire Department, and etc...), provide patient care while crossing state lines temporarily. The purpose of these rendezvous should be to facilitate transport of patients to hospitals within the state of Idaho.
- **Wyoming:** On duty EMS personnel may, when rendezvousing with out of state agencies requesting our assistance (i.e., Yellowstone National Park Ambulance, Jackson Hole Fire Department, etc...), provide patient care while crossing state lines temporarily. The purpose of these rendezvous should be to facilitate transport of patients to hospitals within the state of Idaho.

Inter-facility:

Authorized areas of response:

- **Idaho:** On duty personnel may perform patient care during transfers between all cities, counties, jurisdictions, hospitals, and so forth within the state of Idaho.
- **Montana:** On duty personnel may perform patient care during transfers between hospitals in Idaho and Montana providing one of the hospitals (whether the sending or receiving) is located within the state of Idaho.
- **Wyoming:** On duty personnel may perform patient care during transfers between hospitals in Idaho and Wyoming providing one of the hospitals (whether the sending or receiving) is located within the state of Idaho.

- **Utah:** On duty personnel may perform patient care during transfers between hospitals in Idaho and Utah providing one of the hospitals (whether the sending or receiving) is located within the state of Idaho.

Mobile Medical Clinic:

Authorized areas of response:

- Personnel may provide patient care in all cities, counties, jurisdictions, and so forth within the United States on a limited basis during wildland fires, natural disasters, or other emergencies where the Mobile Medical Clinic has been requested. Ability to do so is made available through the National Wildland Coordinating Group (NWCG). Paperwork granting limited recognition for care providers must be filled out for each provider and for each incident. Paperwork and instructions can be found in the Mobile Medical Clinic.

Protocol Dispute

PURPOSE:

To provide guidance for those who wish to dispute a current Madison Fire Department-EMS protocol.

POLICY:

In the event a protocol, or portion(s) of a protocol, comes into dispute, the following procedure is expected to be followed:

- If the dispute arises as the result of patient care, the incident should be discussed, immediately, with the MFD personnel involved.
 - a. The discussion should be to ascertain if proper protocol/procedure was followed.
 - b. If protocol was not followed, the Battalion Chief - EMS should be contacted by the party bringing the dispute, and the department will determine further course of action (including notification of the Medical Director).
 - c. If proper protocol/procedure was followed, then the party bringing the dispute should contact the Battalion Chief – EMS to register their dispute with the protocol or portions of the protocol.
 - The Battalion Chief – EMS will ascertain the reasoning behind the dispute and gather any/all information that is available.
 - The Battalion Chief – EMS will then contact the Medical Director to inform him/her of the dispute. A determination will be made, between the Battalion Chief – EMS and the Medical Director, as to whether the disputed protocol/portion of protocol will be temporarily suspended or if it will continue until the dispute is resolved.
 - The disputing party will be contacted by the Battalion Chief – EMS to inform them of their decision.
- The Dispute Process should be completed as soon as possible (every effort will be made to complete the process in less than 2 weeks).
- The disputing party should provide the Battalion Chief – EMS with documentation (including research, clinical studies, etc...) showing why the protocol should be changed.
- The Battalion Chief - EMS, will also provide documentation (including research, clinical studies, etc...) showing why the protocol should remain in force.
- This documentation will be given to the Medical Director. The Medical Director will review the materials and then meet with the Battalion Chief – EMS to discuss how to proceed. The disputing party may also request to attend this meeting.
- Throughout the dispute process, all parties should remember that it is the goal of the MFD-EMS division to provide the highest level of current, scientific based, and proven care as is possible. The service should remain patient care advocates at all times. Protocol decisions will be based on this philosophy.

Londyn Porter Protocol

Standards of Care in EMS

HISTORY:

Londyn Porter was born, unexpectedly, at home and was subsequently treated and transported by the Madison Fire Department. During her care, Londyn was provided with warming measures that included wrapping her in a foil blanket, wrapping her in a cloth blanket, and the use of warming packs. These particular warming packs, when activated, rapidly increase in temperature before cooling to their maintenance and use temperature. Unfortunately, for Londyn, two events occurred that resulted in her receiving significant burns. First, the warming packs were activated and then were immediately placed without verifying their temperature. Second, the packs were placed in an area where the barrier to Londyn's skin was not adequate to prevent burns to the skin.

Everything we do has the potential for significantly affecting our patients, their families, and our community. Be diligent in our training, our response, our care, our attitudes, and our approach to our duties as care providers.

As a Madison Fire Department care provider, approach patient care with a professional care provider mindset, philosophy, and provide a minimum standard of care. Be accountable, take appropriate actions, be trusting and trustworthy, be willing to help, and commit yourself to building your skills and excelling at your job.

A professional care provider mindset and philosophy means you will:

- Treat every patient as you would if they were your own parent, grandparent, sibling, or child:
 - Every patient receives our full attention and care.
 - Every patient is treated with dignity, kindness, and respect.
 - Every patient receives, at least, our minimum standard of care.
 - Verify all interventions per procedure and protocol.
 - Take responsibility for yourself and your teams actions as you engage in the activities of patient care.

MINIMUM STANDARD OF CARE:

Every patient will be offered a full and thorough assessment. If they agree, the following should take place simultaneously:

Primary provider:

- Contact the patient and begin a thorough assessment. This should include:
 - History of Present Illness/Injury (HPI)
 - SAMPLE history
 - A general and/or focused physical exam

Secondary and Tertiary providers:

- Stage the cot at the closest appropriate location.
- Bags are then taken from the cot and to the patient's side.
- Assess and document vital signs.
- Within 5 minutes of patient contact all primary monitoring devices are attached to the patient and the following is retrieved:
 - AVPU and GCS
 - Respiratory Rate
 - Lung Sounds
 - Heart Tones
 - SPO2
 - Heart Rate
 - Blood Pressure with appropriately sized cuff
- These interventions are not to delay rapid extrication for significant trauma patients however, they should all occur within 5 minutes of extrication.

Additionally, the following vital signs should be taken, at least once, if their key indicators are present:

Vital Sign	Key Indicator
Blood Glucose	Any alteration of mental status (syncope, near syncope, seizure, stroke, etc.), significant trauma, significant illness, >30 minute transport involving children <8 or the elderly.
Capnography / Capnometry	Confirm and monitor advanced airways, respiratory illnesses and injuries (hyper/hypoventilation, asthma, COPD), critical illnesses and injuries, chest pain or discomfort, and stroke.
Temperature	Current/recent illness, alteration of mental status, any time the patient feels abnormally cold or hot; environmental exposure
EKG (with interpretation)	Any cardiorespiratory complaint, alteration of mental status, including syncope, weakness, critical illness, and injuries.

12-Lead EKG (with interpretation)	Chest pain, epigastric pain, back/neck/jaw/arm pain without chest pain in at risk populations, palpitations, alteration of mental status, dyspnea, weakness in at risk populations.
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- For each patient assessment the following should guide the total number and frequency of vital signs
- A minimum of two vital signs should be assessed, at least 5 minutes apart, for every patient.
- Critical patients should have vital signs re-assessed continuously and documented at least every 5 minutes.
- Non-critical patients should have vital signs re-assessed continuously and documented at least every 15 minutes.
- A final set of vital signs should be taken within 5 minutes of transfer of patient Care to receiving facility staff or release of patient when transport refusal is made.

After these interventions are in place, each provider should provide treatment to their level of care, without prompting by a higher level of care, in response to vital signs findings.

- For Example: If the SPO2 is below 93%, an EMT level provider should initiate oxygen therapy at an appropriate rate without being prompted by a Paramedic.

Every effort will be made to channel communication with the patient through the lead provider. This is to reduce the confusion experienced by a patient being asked multiple questions by different providers.

EMS Use of Lights and Sirens

PURPOSE

To provide policy on the appropriate use of lights and sirens while in response to and completion of calls for service and in return to service.

PROCEDURE

Idaho 49-623 governs use and driving of emergency vehicles.

RESPONDING TO CALLS

EMS units may respond to requests for service with lights and sirens where there is reason to believe there is:

- A threat to life
- A threat to limb
- A threat of personal injury

TRANSPORTING A PATIENT

EMS units may transport patients using lights and sirens when there is an ongoing:

- Threat to life
- Threat to limb

Lights and sirens use is also appropriate for stable patients who develop a threat to life/limb, or for patients who become violent.

RETURN TO SERVICE

While returning to assigned station/area from out of County transports, EMS units may only utilize lights and sirens to return to assigned station/area for response to an unfulfilled call for service for the reasons noted above under "Responding to Calls." Lights and sirens may not be used to return to station/area if there is not an exigent need.

GENERAL PATIENT CARE

A. RESPONSE

Review the dispatch information and select the appropriate response.

B. SCENE ARRIVAL AND SIZE-UP

1. Consider Body Substance Isolation (BSI).
2. Evaluate the scene for safety.
3. Determine the number of patients.
4. Consider the need for additional resources.

C. PATIENT APPROACH

1. Determine the Mechanism of Injury (MOI) / Nature of Illness (NOI).
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures
[\(1021 Mass casualty incidents / Local Emergencies\)](#)

D. INITIAL ASSESSMENT

Correct life-threatening problems as identified and stabilize cervical spine when appropriate.

1. Airway
 - Ensure Airway patency. Reference ([3001.1 Basic Airway Management](#)) or ([3001.2 Advanced Airway Management](#))

If a patent airway cannot be established, the patient must be transported to the nearest emergency department. The patient's need to continue on to the nearest trauma or pediatric center should be made after the patient's airway has been secured.

2. Breathing
 - a. Determine adequacy of breathing. Reference ([3001.1 Basic Airway Management](#)) or ([3001.2 Advanced Airway Management](#))

Never withhold oxygen from a patient in respiratory distress!

5. Circulation
 - a. Assess brachial, radial, or carotid pulse. If absent reference ([3003.7 Cardiopulmonary Arrest Procedure](#))
 - b. Assess for and manage profuse bleeding. Reference ([3003.6 Bleeding Control](#))
 - c. Assess skin color, temperature, and capillary refill.
6. Disability
 - a. Assess mental status using AVPU Scale
 - Alert
 - Responds to Verbal stimuli
 - Responds to Painful stimuli
 - Unresponsive
 1. Perform Mini-Neurological Assessment (Pulse / Motor / Sensory).
 2. Cervical Spine Immobilization. Reference ([3004.2 Clearing C-spine in the field](#))

ALERT

If a trauma patient is unable to communicate or appropriately respond to the above questions, perform complete spinal immobilization.

7. Exposure
 - a. To assess patient's injuries, remove clothing as necessary, considering condition and environment.

E. HISTORY AND PHYSICAL EXAMINATION

1. For **UNSTABLE / UNRESPONSIVE** trauma patients:
 - a. Conduct Rapid Trauma Assessment, assessing for *DCAP-BTLS*:
 - Head
 - 1. Crepitation
 - Neck
 - 1. JVD
 - 2. Tracheal Deviation
 - Chest
 - 1. Crepitation
 - 2. Respiration
 - 3. Paradoxical Motion
 - 4. Breath Sounds
 - Abdomen
 - 1. Rigidity
 - 2. Distention
 - Pelvis / GU
 - 1. Pain on Motion
 - 2. Blood, Urine, Feces
 - Extremities
 - 1. Pulse / Motor / Sensory
 - Posterior
 - b. Obtain Baseline Vital Signs to include:
 - a. HR, SPO2, RR, BP reference ([1029 London porter protocol](#))
 - c. Obtain *SAMPLE* History
2. For **STABLE / RESPONSIVE** trauma patients:
 - a. Determine chief complaint
 - b. Perform focused examination of the injured site and areas compatible with given MOI
 - c. Obtain Baseline Vital Signs to include:
 - a. HR, SPO2, RR, BP reference ([1029 London porter protocol](#))
 - d. Obtain *SAMPLE* History
3. For **UNSTABLE / UNRESPONSIVE** medical patients:
 - a. Perform Rapid Physical Examination
 - Head and Neck
 - 1. JVD
 - 2. Medical Alert Device
 - Chest
 - 1. Breath Sounds
 - Abdomen
 - 1. Rigidity
 - 2. Distention
 - Pelvis / GU
 - 1. Blood, Urine, Feces
 - Extremities
 - 1. Motor / Sensory / Pulse
 - 2. Medical Alert Device
 - Posterior
 - b. Obtain Baseline Vital Signs to include:
 - HR, SPO2, RR, BP reference ([1029 London porter protocol](#))
 - c. If possible, obtain history (*OPQRST*) of episode from family or bystanders.
 - d. If possible, obtain *SAMPLE* History from family or bystanders.

4. For **STABLE / RESPONSIVE** medical patients:
 - a. Obtain history of episode (**OPQRST**).
 - b. Obtain Baseline Vital Signs to include:
 - HR, SPO₂, RR, BP reference ([1029 London porter protocol](#))
 - c. Obtain **SAMPLE** History
 - d. Perform a Focused Physical Exam, checking areas suggested by NOI.
5. Perform Detailed and Ongoing Assessments as dictated by patient condition.
 - a. Reassess unstable patients frequently (recommended every 5 minutes).
 - b. Reassess stable patients at a minimum of every 15 minutes.

F. TREATMENT PROTOCOLS

1. Refer to **ALL** appropriate protocols.
2. For pediatric patients:
 - a. Equipment and medications must be appropriate for the size and weight of the patient. Use of the Broselow Tape or equivalent is encouraged.
 - b. The developmental age of the infant/child must be considered in the communication and evaluation for treatment.
 - c. Treatment priorities are similar to the adult patient.
 - d. When appropriate, family members should remain with pediatric patients.
 - e. Infants and children should be properly restrained prior to and during transport.

G. COMMUNICATIONS

1. Telemetry contact should be established as early as possible.
2. Telemetry reports should include:
 - a. Attendant / vehicle identification.
 - b. Nature of call: Patient information or Request for physician orders.
 - c. Patient information: i.e. number, age, sex.
 - d. Patient condition: i.e. stable, full arrest.
 - e. History
 1. Basic problem or chief complaint.
 2. Pertinent associated symptoms.
 3. Time since onset.
 4. Past history, if pertinent.
 - f. Objective findings
 1. General status of patient.
 2. Level of responsiveness.
 3. Vital signs.
 4. Working impression of patients' problem.
 - g. Treatment
 1. In progress.
 2. Requests for online medical control.
 - h. Estimated Time of Arrival, including any special circumstances that may cause a delay in transport.

H. DISPOSITION

1. Transport of patients should be provided as outlined in reference ([1023 Transport Guidelines](#)).
2. If the patient declines pre-hospital care and/or transport, follow the procedure as outlined in reference ([1013 Patient refusal of care](#)).

I. TRANSFER OF CARE / RENDEZVOUS

Providers will relay assessment findings and treatment provided to the individual(s) assuming responsibility for the patient(s). Rendezvous will be completed as outlined in reference ([1017 Dual response / Out of county mutual aid](#)).

J. DOCUMENTATION

A Patient Care Record (PCR) will be completed for each incident/patient encounter, in accordance with protocol. Reference ([1003 Patient Care report](#))

K. CONFIDENTIALITY

Patient confidentiality must be maintained at all times. Reference ([1005 HIPAA](#))

L. PROFESSIONAL CONDUCT

All patients should be treated with dignity and respect in a calm and reassuring manner.

CRITICAL CARE ASSESSMENT, MONITORING, AND TREATMENT PLAN

Critical care paramedics should still follow all applicable guidelines from the General Patient Care protocol. In addition, the following guidelines should also be followed when appropriate:

A. Pre-Plan / Pre-Arrival

- Use dispatch / hospital request information to ensure proper crew configuration and equipment availability.
 - i. What is the reason for the transport
 - ii. What is the history of the present illness
 - iii. What interventions and/or medications are currently in place
 - iv. How is the patient responding to the current interventions and/or medications
 - v. What interventions are anticipated during transport

B. Arrival, Size-up, and Patient Report

- Determine the current physiologic status of the patient through an in-depth patient transfer report:
 - i. Determine diagnosis
 - ii. Determine stability (how is the patient handling their current medical or traumatic problem)
 1. Mental Status
 - a. AVPU and GCS trending
 2. Respiratory rate and breathing adequacy
 - a. Pulse oximetry
 - b. Waveform capnography Reference ([3002.4 Capnography](#))
 - c. Mechanical ventilator compliance
 3. Cardiovascular and peripheral assessment
 - a. Pulse
 - b. Capillary refill
 - c. Skin characteristics
 - d. EKG rate and rhythm
 - e. Hemodynamic pressure findings
 4. Laboratory values and blood chemistries
 5. Results of diagnostic imaging

C. Patient Assessment

- After completing the patient transfer report, complete a physical assessment and confirm the information you have been provided and reassess for any changes in status.
 - i. Head and Airway
 - ii. Neck
 - iii. Chest
 - iv. Abdomen
 - v. Pelvis / Genitourinary
 - vi. Extremities
 - vii. Posterior
- Confirm status of all interventions
- Perform needed interventions per procedure
 - i. Critical Care Paramedics are allowed to do the following additional interventions:
 1. Airway / Ventilation / Oxygen Interventions
 - a. BiPap
 - b. Assist nurse/PA/physicians at the hospital or clinic with placement of chest tube

- c. Provide therapeutic PEEP up to 10 cm H₂O, levels greater than 10 cm H₂O require online medical control.
reverence ([3002.2 Mechanical Ventilators](#))
- d. Operate ventilators other than automatic transport ventilators
- 2. Cardiovascular / Circulation Interventions
 - a. Assist specialized personnel with transport of IABP
 - b. Perform invasive hemodynamic monitoring
 - c. Assist nurse/PA/physicians at the hospital or clinic with pericardiocentesis
 - d. Assist specialized personnel with transport of transvenous and epicardial pacers
- 3. Vascular Access / Fluids Interventions
 - a. Access and monitor arterial lines and central lines
 - b. Assist nurse/PA/physicians at the hospital or clinic with central line placement
 - c. Assist nurse/PA/physicians at the hospital or clinic with umbilical catheterization
- 4. Medication Administration
 - a. Use IV pumps
 - b. Administer medications not included in paramedic formulary or scope of practice
 - c. Administer blood and blood products
 - d. Administer plasma volume expanders
- 5. Diagnostics
 - a. Perform blood chemistry / laboratory analysis
 - b. Use of doppler
 - c. Use of ultrasound
 - d. Diagnostic imaging interpretation
- Prepare the patient for transport
 - i. Retrieve proper paperwork
 - ii. Package the patient
 - 1. Identify, separate, and mark IV lines
 - a. Move to MFD IV pumps
 - 2. Attach patient to monitoring devices
 - a. Bundle cables
 - 3. Transfer patient to airway tubing, ventilating, and monitoring devices
 - a. Place cervical if needed to maintain airway interventions
 - 4. Move patient to transport cot
 - a. Ensure adequate blankets and pillows
 - 5. Review and ensure nothing has been missed
 - 6. Discuss patient condition with family members
 - a. Brief family members who will be riding with the patient
 - b. Ensure family members know how to locate the receiving facility
 - c. Answer medical questions
 - 7. Move patient to transport vehicle
- D. Documentation
 - A Patient Care Record (PCR) will be completed for each incident/patient encounter. Reference ([1003 Patient Care Report](#))

CARDIAC EMERGENCIES

Chest Pain / Heart Problems

Coronary artery disease may cause as many as half of all deaths to patients aged 36 to 64 years. Have a high index of suspicion for the presence of acute myocardial ischemia when evaluating patients in the appropriate age group, especially when risk factors are present. Risk factors include being male or postmenopausal female, hypertension, cigarette smoking, hypercholesterolemia, diabetes, sedentary lifestyle, obesity, and family history. Chest pain or discomfort should be characterized completely, including quality, location, radiation, duration, frequency, pattern, and onset of pain and what exacerbates and relieves the pain. Onset of symptoms is defined as the beginning of continuous, persistent discomfort. Frequently patients present with "off & on" pain. In general, for onset time, use the time of the experience that prompted the patient to seek care. Female, elderly, and diabetic patients do not necessarily have classic MI symptoms. Symptoms may be as subtle as diaphoresis or "not feeling right".

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> • Rapid or irregular pulse • Frightened appearance • * Hypotension • Restlessness, anxiety • Radiation of pain 	<ul style="list-style-type: none"> • *Diaphoresis • *Pale, grey, or cyanotic skin color • * Difficulty breathing • * Nausea, vomiting • * Altered LOC
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care), (1029 Standards of Care) 2. Administer O₂ to maintain saturations @ 94-99% and assist respiratory status as needed. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. EKG, 12-lead EKG (e) and Telemetry report. Reference (3004.8 12-Lead ECG) 4. If 12-Lead EKG shows STEMI place multi-function pads in preparation for electrical therapy. 5. Aspirin. Reference (3005.1 EMT Medications) 6. IV/IO access. Reference (3003.1 Vascular access) 7. If patient is prescribed Nitroglycerin (a, b, c, d, e). Reference (3005.1 EMT Medications) 8. Treat other associated S/S per appropriate protocol 9. Fluid administration per procedure. Reference (3003.3 Fluid Administration) 10. Consider antiemetic. Reference (3005.5 Nausea / Vomiting) 11. Nitroglycerin tablets (a, b, c, d, e). Reference (4000.1 Nitroglycerin) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • Unconscious / Not breathing • Male, age >40 years • Female >45 years • Age, >25 years w/symptoms of SOB, nausea, or diaphoresis • Rapid HR w/CP or signs of shock • CP w/drug use • Implanted defibrillator shock

12. Analgesics (c). Reference (3005.2 Pain management, sedation) 13. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	
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Note:

- a. Contraindicated in patients who have taken erectile dysfunction drugs within the last 24 hours.
- b. In known right ventricular infarct do not give nitroglycerin via the SL route. Rule out right ventricular infarct by performing right sided EKG. Treat hypotension with fluid bolus.
- c. Titrate to patient's pain (goal is 3 or less/10) and stop if systolic BP becomes 100 or less.
- d. Target therapy within 10 minutes of patient contact.
- e. Obtain 12-lead prior to pharmacological interventions and then after interventions to assess for effectiveness of treatments.

CARDIAC EMERGENCIES

Cardiac Arrest

Each year more than 436,000 Americans die from cardiac arrest – more than 350,000 cardiac arrests occur outside the hospital. Resuscitative efforts can restore these hearts to spontaneous activity before the brain has been permanently injured. The core purpose of emergency cardiac care is to provide effective care as soon as possible. The chain of survival relies on five principles: immediate recognition of cardiac arrest and activation of the emergency response system, early CPR with emphasis on chest compressions, rapid defibrillation, effective advanced life support, and integrated post cardiac arrest care. Each component of the chain of survival is crucial. Numerous clinical studies have confirmed two simple observations; (1) almost every adult who survives sudden non-traumatic arrest was resuscitated from ventricular fibrillation. (2) The success of defibrillation is time dependent. The probability of cardioverting someone back to a perfusing rhythm declines about 2 – 10% per minute, starting with an estimated probability of 70 – 80% survivability at time zero. Attempt to identify possible cause(s) of arrest and initiate corrective measures:

Hypovolemia	Tablets (drug OD, accidents)
Hypoxia	Tamponade, cardiac
Hydrogen ion (acidosis)	Tension Pneumothorax
Hyper/Hypokalemia	Thrombosis, coronary (ACS)
Hypothermia	Thrombosis, pulmonary (embolism)
Hypoglycemia	Trauma

SIGNIFICANT FINDINGS (*Automatic ALS)	
• *Unresponsive	• * Apneic
• * Pulseless	
TREATMENTS	
(Standing Orders: choose any or all that apply)	
1. General Patient Care. Reference (2000.1 General Patient Care) 2. Initiate CPR/AED (a) Reference (3003.7 Cardiopulmonary arrest), (3003.8 AED Procedure) 3. Administer O2 and assist respiratory status. (b) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 4. Treat other associated S/S per appropriate protocol (c) 5. IV/IO access (3003.1 Vascular Access) 6. Fluid administration per procedure. Reference (3003.3 Fluid Administration) 7. Use LifePak in manual mode and refer to appropriate cardiac arrest protocol 8. With ROSC (2002.6) : Treat/Prevent hypoxia (SpO2 <94%) and Hypotension (SBP <90 mmHg), EKG, 12-lead EKG and Telemetry report. Reference (3004.8 12-lead ECG) 9. Consider termination of efforts if appropriate (d) Reference (3004.1 Determination of Death)	***Request Paramedic Evaluation If*** • This is an automatic ALS response

10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment monitoring and treatment plan)	
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Note:

- a. Do not initiate CPR if patient has a completed DNR form, documentation of DNR, or DNR jewelry is present. If valid DNR identification is presented after CPR is initiated, CPR may be discontinued. Reference ([1012 Do Not Resuscitate](#))
- b. CPR should not be stopped for intubation attempts. Ventilations should be at one breath every 6-8 seconds. Reference ([3001.2 Advanced Airway Management](#))
- c. AHA periodically makes changes to their guidelines. Current AHA guidelines should be followed. Protocols will be updated to reflect the new changes.
- d. Termination of efforts may be considered as outlined, Physician contact must be made before resuscitation efforts are stopped. Reference ([3004.1 Determination of Death](#))

IMMEDIATE ACTIONS

1. **Prior to arrival identify a team leader. (Typically, the highest-level provider)**
2. **Team leader makes assignments based on level of importance and crew scope of practice. Remember C-A-B**
 1. **Chest Compressions**
 2. **Airway Management**
 3. **Team leader applies monitor and prepares for defibrillation**

If additional crew members are available, the team leader should remain disengaged.

Additional assignments as necessary i.e. venous access, pharmacology, recorder etc.

CARDIAC EMERGENCIES

Cardiogenic Shock

10–15% of all patients with acute myocardial infarction develop cardiogenic shock. It is generally agreed that 40% of the left ventricular myocardium must be damaged before shock develops. It has also been determined that all patients dying of the symptoms have apical involvement of the myocardium and 84% have severe disease of the left anterior descending coronary artery. The majority of patients who develop cardiogenic shock have had previous infarctions. When the mean arterial blood pressure falls below 65 mmHg, coronary perfusion becomes inadequate, further extending the area of the infarction. Although the incidence of cardiogenic shock has decreased, mortality still remains high, averaging 50% to 70%. There are differences between patients with ST-segment elevation and ST- segment depression. Of those who develop shock, patients without ST-segment elevation develop shock significantly later than those with ST- segment elevation.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> ● *Rapid pulse ● * Diaphoresis ● * Pale, grey skin color ● * Irregular pulse ● * Low blood pressure 		<ul style="list-style-type: none"> ● *Difficulty breathing or SOB ● Restlessness, anxiety ● * Nausea, vomiting ● Radiation of pain ● * Cyanosis
TREATMENTS		
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. Patient Care assessment, monitoring, and treatment plan. Reference (2000.1 General Patient Care) 2. Administer O2 and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Aspirin up to 325 mg chewable PO Reference (3005.1 EMT Medications) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access Reference (3003.1 Vascular access) 6. Fluid administration per procedure (a) Reference (3003.3 Fluid administration) 7. 12-lead ECG. Reference (3004.8 12-lead ECG) 8. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment monitoring and treatment plan) 9. After correcting for hypovolemia administer a vasopressor to increase cardiac output or in profound hypotension. Titrate to patient's hemodynamic status. Reference (4000.1 Norepinephrine) or (4000.1 epinephrine) 		***Request Paramedic Evaluation If***
		<ul style="list-style-type: none"> ● Unconscious / Not breathing ● Male, age >40 years ● Female >45 years ● Symptoms of SOB, nausea, or diaphoresis ● Rapid HR w/CP or signs of shock ● CP w/drug use ● Implanted defibrillator shock

Note:

- a. Be cautious of potential to cause pulmonary edema with excessive fluid administration. Assess for dyspnea and listen to lung sounds regularly.

Cardiac Emergencies

Acute Pulmonary Edema / CHF

Left ventricular failure is the inability of the left ventricle to adequately move blood into the systemic circulation. In left ventricular failure, an imbalance in the output of the two sides of the heart occurs. The left ventricle is unable to move all the blood delivered to it from the right side of the heart. Left ventricular followed by left atrial pressure rises and is transmitted back to the pulmonary veins and capillaries. When the pressure in the pulmonary vessels becomes too high blood serum is forced into the alveoli resulting in pulmonary edema. Left ventricular failure may be caused by various types of heart disease, including AMI, chronic hypertension, mitral valve disease, certain arrhythmias, and non-compliance of medication to control CHF.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> • *Shortness of breath, Dyspnea • *Hypo/Hypertension • *Altered LOC • *Chest Pain • *Rapid Pulse/Respirations 	<ul style="list-style-type: none"> • *Cyanosis • Cough • *Rales and/or wheezing • *Pink, frothy sputum • *Diaphoresis
EMT TREATMENT	
<i>(Standing Orders: choose any or all that apply)</i>	***Request Paramedic Evaluation If*** <ul style="list-style-type: none"> • As noted above
ADVANCED EMT TREATMENT	
<i>(Standing Orders: choose any or all that apply)</i>	***Request Paramedic Evaluation If*** <ul style="list-style-type: none"> • As noted above
PARAMEDIC TREATMENT	
<i>(Standing Orders: choose any or all that apply)</i>	<i>(Physician Orders)</i>
<ul style="list-style-type: none"> 8. EKG, 12-lead EKG and Telemetry report (d) 9. Nitroglycerin tablets (e) 10. Albuterol (a) 11. Pain and Sedation per procedure 	
CRITICAL CARE PARAMEDIC TREATMENT	
<i>(Standing Orders: choose any or all that apply)</i>	<i>(Physician Orders)</i>
<ul style="list-style-type: none"> 12. Critical Care assessment, monitoring, and treatment plan 13. Nitroglycerin Drip. Titrate to effect (f) 	

14. Administer a vasopressor as needed. Titrate to patient's hemodynamic status (g)	
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Note:

- a. Use only when wheezing is present. Repeat until clinical condition improves
- b. Consider CPAP as an early intervention and prior to intubation.
- c. Use a saline lock or, if hanging fluid, run @ TKO to prevent fluid overload.
- d. Rule out acute MI as a cause of patient symptoms. Consider transmitting 12-lead to receiving hospital. Consider right-side EKG.
- e. Systolic blood pressure must be >100 mmHg.
- f. Increase by 10 mcg/min q 3-5 min until clinical improvement in patient condition.
- g. For hypotension; to maintain blood pressure >100 mmHg.

CARDIAC EMERGENCIES

Asystole / PEA

Usually asystole, the complete absence of electrical activity in the myocardium, represents extensive myocardial ischemia from prolonged periods of inadequate perfusion. Such a status has a grim prognosis. Asystole most often represents a confirmation of death rather than a "rhythm" to be treated. A useful mnemonic for Asystole causes is the 5 H's & 5 T's.

Hypovolemia	Tablets (drug OD, accidents)
Hypoxia	Tamponade, cardiac
Hydrogen ion (acidosis)	Tension Pneumothorax
Hyper/Hypokalemia	Thrombosis, coronary (ACS)
Hypothermia	Thrombosis, pulmonary (embolism)
Hypoglycemia	Trauma

TREATMENTS

(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care. (a) Reference (2000.1 General Patient Care)2. Initiate CPR Reference (3003.7 CPR)3. Check for Pseudo-PEA if in PEA (b)4. Administer O2 to maintain saturations @ 94-99% and assist respiratory status as needed (c) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)5. IV/IO access Reference (3003.1 Vascular access)6. Fluid administration. Reference (3003.3 Fluid admin.)7. Epinephrine IV/IO q 3-5 min. Reference (4000.1 Epinephrine)8. Use specific intervention if cause is known9. Consider termination of efforts if appropriate (d) Reference (3004.1 Determination of death on scene)10. Critical Care assessment, monitoring, and treatment plan. (2000.2 Critical care assessment monitoring and treatment plan)	<ul style="list-style-type: none">• Termination of resuscitation efforts

Note:

- a. Confirm asystole in two (2) or more anatomically contiguous leads.
- b. Pulse Ox, BP, Waveform Capnography.
- c. CPR should not be stopped for intubation attempts. Ventilations should be performed one breath every 6-8 seconds.
- d. Termination of efforts may be considered as outlined in ([3004.1 Determination of death on scene](#)). Physician contact must be made before resuscitation efforts are stopped.

Immediate Actions

1. **Treat the Patient for Cardiac Arrest, Reference ([2002.2 Cardiac Arrest](#))**

2. Treat other reversible causes H's and T's

- a. Tension Pneumothorax ([3002.1 Chest Decompression](#))
- b. Hyperkalemia i.e. Hx of renal failure ([3003.11 Hyperkalemia](#))
- c. Overdose ([2409 Toxicological Emergencies](#))
- d. Check Blood Glucose ([2405 Diabetic Emergencies](#))
- e. Hypothermia (warm to 90° f) ([2053 Hypothermia](#))
- f. Trauma, acidosis, cardiac tamponade, myocardial infarction, (correct cause if possible and rapid transport)

CARDIAC EMERGENCIES

Post-Resuscitation Management

A healthy brain is the primary goal of all cardiopulmonary-cerebral resuscitation. In the immediate post-resuscitation period the most important action that the pre-hospital care provider can take to restore cerebral function is to optimize oxygenation, and perfusion. The initial objectives of post-cardiac arrest care are to: 1) Optimize cardio pulmonary function and vital organ perfusion. 2) After out-of-hospital cardiac arrest, transport patient to an appropriate hospital with a comprehensive post cardiac arrest treatment system of care that includes acute coronary interventions, neurologic care, goal directed critical care, and hypothermia. 3) Try to identify and treat the precipitating causes of the arrest and prevent recurrent arrest. 4) Identify and treat ACS. 5) Optimize mechanical ventilation to minimize lung injury. 6) Reduce the risk of multi-organ injury and support organ function if required.

TREATMENTS

(Standing Orders: choose any or all that apply)		***Request Paramedic Evaluation If***
1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O2 to maintain saturations @ 94-99% and assist respiratory status as needed. Reference (3001.1 Basic Airway Management), (3001.2 Advanced airway Management), (3002.4 Capnography) 3. Place patient in recovery position (a) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access Reference (3003.1 Venous access) 6. Fluid administration. Reference (3003.3 Fluid admin.) 7. 12-lead ECG. Reference (3004.8 12-Leak ECG) <ul style="list-style-type: none">• Treat STEMI per ACS protocol. Reference (2002.1 Acute coronary syndrome) 8. Pain / Sedation per procedure. Reference (3005.2 Pain and sedation) <ul style="list-style-type: none">• Consider paralysis (c) 9. Treat arrhythmias. Reference (4000.1 Amiodarone) 10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical Care assessment monitoring and treatment plan) 11. Prevent Hypoxia (consider PEEP, ETT) Reference (3001.2 Advanced airway management), (3002.2 Mechanical Ventilators) 12. Prevent hypovolemia (keep systolic BP >90 with fluids and/or pressor) (d) Reference (4000.1 Norepinephrine), (4000.1 Epinephrine) 13. Transport to appropriate facility (e)	<ul style="list-style-type: none">• This is an automatic ALS response	

Note:

- a. If c-spine issues not present, otherwise ensure protection of spine.
- b. Target ETCO₂ 35 mm Hg to 45 mm Hg, Hyperventilation should be avoided.
- c. Consider post arrest sedation and/or paralysis to avoid the removal of the ET tube, facilitate patient management, avoid shivering, and monitor the patient.
- d. For hypotension; to maintain systolic blood pressure >90 mmHg/MAP >65
- e. Realize EIRMC has on site clinicians and equipment for treatment as recommended by AHA guidelines.

IMMEDIATE ACTIONS

- 1. OPTIMIZE VENTILATION AND OXYGENATION**
 - a. TARGET BETWEEN 94% AND 99% SATURATION
 - b. WAVEFORM CAPNOGRAPHY
 - c. DO NOT HYPERVENTILATE
- 2. TREAT HYPOTENSION**
 - a. FLUID ADMINISTRATION
 - b. VASOPRESSORS
- 3. IDENTIFY AND REVERSIBLE POSSIBLE CAUSES**
 - a. HYPOVOLEMIA
 - b. HYPOXIA
 - c. HYDROGEN ION (ACIDOSIS)
 - d. HYPER/HYPOKALEMIA
 - e. HYPOTHERMIA
 - f. TENSION PNEUMOTHORAX
 - g. TAMponade, CARDIAC
 - h. TOXINS
 - i. THROMBOSIS, CORONARY
 - j. THROMBOSIS, PULMONARY

CARDIAC EMERGENCIES

Symptomatic Bradycardia

Bradycardia has many causes. Consider H's and T's. Ensure bradycardia is being caused by a cardiac condition and the patient has significant signs and symptoms, related to the bradycardia, prior to proceeding with this protocol. Brady-arrhythmias can be caused by two mechanisms: depression of sinus nodal activity or conduction system blocks. In both situations, subsidiary pacemakers take over and pace the heart, provided the pacemaker is located above the bifurcation of the Bundle of His. The need for emergent treatment is guided by two considerations: evidence of hypoperfusion and the potential to degenerate into a more profound bradycardia or ventricular asystole.

TREATMENTS	
(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care.(a) Reference (2000.1 General Patient Care)2. Assist airway and respiratory. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)3. IV/IO access (b) Reference (3003.1 Vascular Access), (3003.2 EZ-IO)4. Fluid administration. Reference (3003.3 Fluid Admin.)5. 12-lead ECG and Telemetry report (c) (3004.8 12-Lead ECG)6. Atropine (d) while preparing for transcutaneous pacing. Reference (4000.1 Atropine)7. Pain / Sedation. Reference (3005.2 Pain and sedation) (b)8. Transcutaneous pacing (e)9. Treat other associated S/S per appropriate protocol10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical Care assessment monitoring and treatment plan)11. Administer a vasopressor as needed. Reference (4000.1 Norepinephrine), (4000.1 Epinephrine)	

Note:

- a. Serious signs and symptoms include chest pain, dyspnea, ALOC, hypotension, shock, pulmonary congestion.
- b. Transcutaneous pacing should be done first if there is a delay in IV access. Sedate prior to pacing time allowing, do not delay pacing for sedation.
- c. Inferior wall infarction can present with hypotension, and brady-arrhythmias. Obtain 12 lead ECG. Consider obtaining right-sided ECG to identify possibility of RSMI.
- d. In symptomatic 2nd and 3rd degree heart block, use pacing instead of atropine.
- e. Start at a rate of 80 BPM and an output of 20mA. Adjust upward in 5-10mA increments to achieve electrical capture. Ensure Mechanical capture is present by palpating radial or carotid pulse. Consider increase of 10 mA once mechanical capture is achieved as a safety margin to maintain capture.

CARDIAC EMERGENCIES

Tachycardia with a Pulse

Unstable tachycardia exists when the heart beats too fast for the patient's cardiovascular condition. The unstable tachycardia leads to serious signs and symptoms. (Signs: pulmonary edema, rales, rhonchi, hypotension, JVD, pedal edema. Symptoms: SOB, chest pain, dyspnea, altered LOC). To be classified as an unstable tachycardia, the signs and symptoms must be the result of the rapid heart rate. Serious signs and symptoms rarely occur at rates of less than 150 bpm.

TREATMENTS	
(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care. Reference (2000.1 General patient care)2. Assist Respiratory status. Reference (3001.1 Basic airway management), (3001.2 Advanced airway management)3. IV/IO access. (3003.1 Vascular access), (3003.2 EZ-IO)4. 12-lead ECG and Telemetry report. Reference (3004.8 12-Lead ECG)5. Fluid administration (a). Reference (3003.3 Fluid admin.)6. Determine rhythm and treat: <p>**Consider Rapid transport to an appropriate facility.**</p> <p>In patients with suspected non-cardiac etiology treat per appropriate protocol. This is based on history and physical assessment findings.</p> <p>Persistent tachyarrhythmia causing:</p> <p>Hypotension? Acute altered mental status? S/S of shock? Ischemic chest discomfort? Acute heart failure?</p> <p>If yes to any of above, condition is unstable refer to appropriate section.</p> <p>If no to all of the above, condition is stable refer to appropriate section.</p> <p><u>Unstable (Wide or Narrow)</u></p> <ol style="list-style-type: none">7. Consider Pain / Sedation (b) Reference (3005.2 Pain and sedation)8. Synchronized cardioversion (c)9. If tachycardia is wide complex, consider Anti-Arrhythmic post-	

<p>cardioversion. Reference (4000.1 Amiodarone)</p> <p><u>Stable Wide Complex ≥ 0.12 seconds</u></p> <p>Regular</p> <p>10. Consider Adenosine Reference (4000.1 Adenosine) (e) (h)</p> <p>11. Consider Amiodarone Reference (4000.1 Amiodarone)</p> <p>Irregular</p> <p>12. Consider Amiodarone (f) Reference (4000.1 Amiodarone)</p> <p><u>Stable Narrow Complex ≤ 0.12 seconds</u></p> <p>Regular:</p> <p>13. Vagal maneuvers</p> <p>14. Consider Adenosine (h) Reference (4000.1 Adenosine)</p> <p>Irregular:</p> <p>15. Give supportive measures, & treat associated S/S per appropriate protocol</p> <p>16. Critical Care assessment, monitoring, and treatment plan Reference (2000.2 Critical care assessment monitoring and treatment plan)</p>	
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Note:

- a. Caution in patients with pulmonary edema
- b. If patient presents with serious signs and symptoms and no IV access is already established, consider immediate synchronized cardioversion.
- c. Narrow Regular – 50-100 J
Narrow Irregular -- 120-200 J
Wide Regular – 100 J
Wide irregular: defibrillation dose (not synchronized)
- d. Regular rhythms are most probably V-tach or SVT with aberrancy. Irregular rhythms are most probably Torsade's de Pointes, a-fib with aberrancy, or a-fib with pre-excitation syndrome (a-fib + WPW). Only Torsade's should be treated in the field. All other irregular rhythms should have expert evaluation before treatment.
- e. Consider only if regular and monomorphic. If rhythm slows, underlying rhythm is likely SVT. See narrow complex tachycardia protocol.
- f. Irregular rhythms are most probably a-fib, a-flutter, or MAT. Supportive treatment is recommended if patient is considered stable. Transport to nearest appropriate facility for expert consultation.
- g. Perform ECG tracing before, during, and after administration of adenosine.

CARDIAC EMERGENCIES

V-Fib / V-Tach (pulseless)

Ventricular fibrillation is totally disorganized depolarization and contraction of small areas in the ventricular myocardium. During this time, there is no effective pumping activity, pulse, or blood pressure. The ECG of ventricular fibrillation shows a fine-to-course zigzag pattern without discernible P waves or QRS complexes. Ventricular fibrillation is most commonly seen in patients with severe ischemic heart disease and is the most frequently encountered rhythm in sudden cardiac death in adults. Defibrillation is required to stop ventricular fibrillation. It constitutes the most important aspect of therapy for ventricular fibrillation. The sooner the shocks are given, the more likely they are to be successful. Ventricular tachycardia is more organized but can rapidly deteriorate to ventricular fibrillation if left untreated. Good, effective CPR is essential in “priming” the heart to accept the defibrillator shocks.

TREATMENTS	
(Standing Orders: choose any or all that apply)	(Physician Orders)
<p>1. General Patient Care. Reference (2000.1 General patient care)</p> <p>2. Initiate CPR (a) Reference (3003.7 CPR)</p> <p>3. Electrical therapy (b)</p> <p>**UNDERSTAND GOOD QUALITY CPR AND DEFIBRILLATION ARE THE ONLY 2 INTERVENTIONS SHOWN TO IMPROVE SURVIVAL TO HOSPITAL DISCHARGE. ALL ADDITIONAL INTERVENTIONS SHOULD BE SEEN AS AN APPENDAGE TO THESE AND SHOULD NEVER TAKE AWAY FROM THEM.**</p> <p>4. Assist airway and respiratory status per Advanced Airway Procedure. (c) Reference (3001.1 Basic Airway Management), (3001.2 Advanced airway management)</p> <p>5. IV/IO access. (d) Reference (3003.1 Vascular access), (3003.2 EZ-IO)</p> <p>6. Fluid administration. (3003.3 Fluid admin.)</p> <p>7. Epinephrine (e) Reference (4000.1 Epinephrine)</p> <p>8. Amiodarone (e) Reference (4000.1 Amiodarone)</p> <p>9. Treat other associated S/S per appropriate protocol</p> <p>10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment monitoring and treatment plan)</p>	

Note:

- a. Compression to ventilation ratio is 30:2 – perform 5 cycles (2 minutes) prior to defibrillation (if effective bystander CPR is being performed or arrest was witnessed by responders, go directly to defibrillation). Emphasis should be placed on effective CPR.
- b. Assess for and shock VF/pulseless VT x 1 (200 J). Additional shocks can be maintained at 200 J or can escalate (200 J, 200 J – 300 J, 360 J). Currently our Lifepak monitor/defibrillators are programmed to automatically escalate to the appropriate levels of energy after each shock.
- c. CPR should not be stopped for intubation attempts. Ventilations should be performed one breath every 6-8 seconds after ETT is placed and confirmed with waveform capnography. If anticipated difficult intubation consider OPA/NPA or KING airway placement and transport.
- d. Use 18 G, or larger, IV catheter and place proximally to the heart (AC or EJ is preferred).
- e. Flush IV line after each medication, lift extremity, and perform CPR to facilitate circulation.

TRAUMA

Abdominal / Pelvic Injuries

Abdominal injuries are the result of blunt trauma, penetrating trauma, or both. It most commonly results from MVC's, blast injuries, falls from heights, blows to the abdomen, abdominal compression, gunshot, and stab wounds. Abdominal injuries include skeletal, renal, splenic, hepatic, bladder, gastrointestinal, vascular, pancreatic, and diaphragmatic. A number of potentially lethal injuries can occur with significant abdominal trauma. In general these patients are managed under the multi-systems trauma protocol reference ([2003.7 Multisystem Trauma](#)), and rapid transport to the appropriate trauma center should be considered early.

SIGNIFICANT FINDINGS (*Automatic ALS)	
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O2 and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. (c) Reference (3003.6 Bleeding Control) 4. Maintain normal body temperature 5. Stabilize if suspected fracture. 6. Treat other associated S/S per appropriate protocol (b) 7. Report trauma level © 8. IV/IO access. Reference (3003.1 Vascular access) 9. Fluid administration. Reference (3003.3 Fluid Administration) (d) 10. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 11. 12-lead ECG. Reference (3004.8 12-Lead ECG) 12. Pain / Sedation. Reference (3005.2 Pain and sedation) 13. Consider antiemetic. Reference (3005.5 Nausea and vomiting), (4000.1 ondansetron), (4000.1 Promethazine) 14. Antibiotic therapy for open or penetrating trauma. Reference (4000.1 cefazolin) 15. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • *Pulsating mass • *Bowel evisceration • *Bruising • *Pale, cool, diaphoretic <ul style="list-style-type: none"> • Unconscious / Not breathing • ALOC • Crushing, penetrating, or significant blunt trauma to abdomen. • Abdomen warm to touch • Uncontrolled bleeding • Eviscerating trauma

Note:

- a. Assess for bruising, guarding, and/or tenderness to the flank, periumbilical region, abdominal quadrants, and pelvis. Assess abdominal skin temperature.
- b. Impaled object: Stabilize the object. Do not remove unless object interferes with CPR.
Eviscerating Trauma: Cover eviscerated organs with sterile, soaked gauze. Do not replace organs into abdominal cavity.
- c. For transports to trauma centers
- d. Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration.

TRAUMA **Bites and Stings**

Insect stings and animal, snake, or spider bites from a variety of species can result in serious illness and injury. Animal bites from wild animals such as skunks, bats, raccoons, and foxes pose a special risk of rabies. Snake bites or stings can be a route for poisonous venom to be injected into patients. These poisons generally affect the cardiovascular or neurological system. Individual reactions to venom vary greatly depending on the person's sensitivity. Five percent of the general population is allergic to the stings of wasps, bees, hornets, yellow jackets, and ants. Insect stings cause twice as many deaths as snake bites each year. Anaphylactic shock can occur from any source, observe for signs and symptoms of anaphylactic reaction, and refer to anaphylaxis protocol as needed. Judicious use of cold packs, if care is taken to prevent further tissue damage from frostbite, is acceptable in both snake bites and insect bites.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● Chest tightness ● *Weakness or collapse ● *Restricted airway ● *Difficulty breathing ● Localized pain / itching ● *Hypotension 	<ul style="list-style-type: none"> ● Abnormal pulse rate/rhythm ● *Anaphylactic shock ● Nausea/Vomiting ● Excessive salivation ● Altered LOC ● Hives
TREATMENTS	
<p><i>(Standing Orders: choose any or all that apply)</i></p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O2 and assist respiratory status per Basic Airway Procedure Reference (3001.1 Basic Airway Management), 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Remove jewelry or other constricting items. 5. Scrape away stingers or venom sacs, taking care not to pinch venom sac. 6. Wash area & immobilize extremity. 7. Identify and transport organism if safely possible. 8. Treat other associated S/S per appropriate protocol. 9. IV/IO access. Reference (3003.1 Vascular access) 10. Fluid administration per procedure Reference (3003.3 Fluid Administration) 11. 12-lead ECG. Reference (3004.8 12-Lead ECG) 12. Treat Reactive Airway per protocol(3001.2 Advanced Airway Management) 13. Pain / Sedation per procedure. Reference (3005.2 Pain and sedation) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/not breathing ● Uncontrolled bleeding ● Respiratory distress ● Serious face and neck bites ● Bite from poisonous animal ● Signs of shock

<p>14. Consider antiemetic. Reference (3005.5 Nausea and Vomiting), (4000.1 ondansetron), (4000.1 Promethazine)</p> <p>15. Antibiotic Therapy for deep wounds. Reference (4000.1 Cefazolin)</p> <p>16. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p>	
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Note:

Bites from humans have higher infection rates than bites from animals due to normal bacteria in the human mouth; They will require antibiotics for infection prophylaxis.

- In Idaho, bats are the most common carrier of rabies. If the patient awakes to find a bat in their bedroom, rabies prophylaxis is indicated, even in the absence of a bite. Likewise, incidental contact with a bat (e.g. children playing with a bat carcass) will also require rabies prophylaxis
- In Idaho, the rattlesnake, a pit viper, is the most common poisonous snake. However, exotic snakes are sometimes kept as pets.
 - do not apply suction as first aid for rattlesnake bites
 - do not incise the wound
 - the amount of envenomation is variable; it is generally worse with larger snakes and bites in early spring
 - if the patient experiences no pain or swelling, envenomation is unlikely

TRAUMA Burns

Burns are a devastating form of trauma associated with high mortality rates, lengthy rehabilitation, cosmetic disfigurement, and permanent physical disabilities. Thermal, chemical, electrical, nuclear radiation or solar sources may cause burns. Burns can affect the body's fluid and chemical balance, temperature regulation, and musculoskeletal, circulatory, and respiratory functions. Burns are classified by degree:

- **Superficial** some reddening,
- **Partial thickness** has blistering and deep reddening,
- **Full thickness** causes damage to all skin layers and is either charred/black or white/leathery with little or no pain at the site.

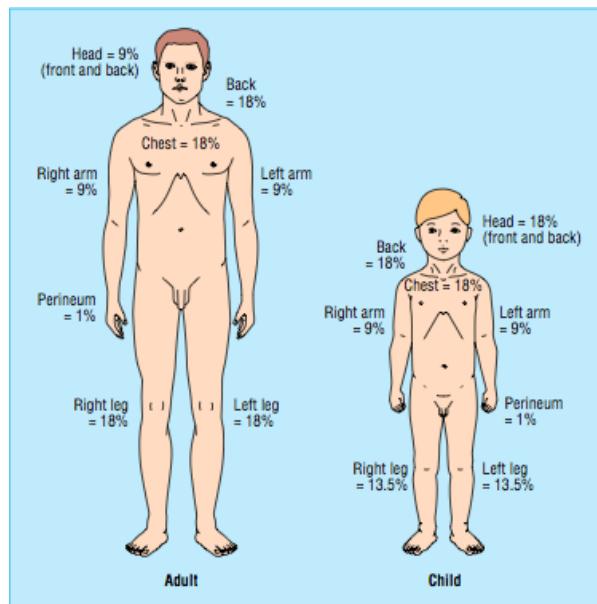
The patient's palm equals 1% of body surface area when determining the area affected. This is sometimes more helpful than using the "rule of nines" especially with pediatric patients. Some burn patients will have other associated trauma. Treat other trauma per appropriate protocol(s). Transport the burn patient to the closest appropriate facility.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> ● *% of Body surface area burned (a, i) <ul style="list-style-type: none"> a. >10% Body surface area with full thickness burns. b. >15% Body surface area with partial thickness burns. c. >30% body surface area with superficial burns. 		<ul style="list-style-type: none"> ● *Unconscious/not breathing ● *Singed nasal hairs or mouth ● *Low blood pressure ● *Hoarseness / *Difficulty breathing ● *Rapid, weak pulse ● *ALOC ● *Secondary trauma
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. Removal from burning source (b) 2. General Patient Care. Reference (2000.1 General Patient Care) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) (e) 3. Treat burn(s) (c) 4. Assume hypothermia exists; prevent heat loss. 5. Treat other associated S/S per appropriate protocol 6. Consider transporting patient in fowlers/semi-fowlers position 7. Report trauma level to receiving facility. (d) 8. IV/IO access. Reference (3003.1 Vascular access) 9. Fluid administration. Reference (3003.3 Fluid Administration) (f, h) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) (g) 11. Pain / Sedation. Reference (3005.2 Pain and sedation) 12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 	<ul style="list-style-type: none"> ● Unconscious/not breathing ● ALOC ● RSI needed ● Burns to airway, nose or mouth, hands or feet, joints and/or genitalia. ● Respiratory distress ● Hoarseness, difficulty talking/swallowing ● Electrical burns from high voltage sources i.e., agricultural equipment, power substation etc. 	

- | | |
|--|--|
| <p>13. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) (h)</p> <p>14. Administer blood products. Reference (3003.4 Blood administration)</p> | |
|--|--|

Note:

- a. Criteria for rapid transport to burn center
- b. Proceed to patient care only if electrical source is determined to be non-hazardous, if in doubt **do not proceed with patient care.** Utilize dispatch to connect to the most appropriate utility company. Remove patient's clothing as appropriate. Brush off solid/dry chemicals. Remove rings, bracelets, and other constricting items.
- c. **Thermal Burns:** Cover burned area with dry, sterile dressing. Cool or room temperature saline soaks for pain relief in superficial and partial thickness burns if < 10% of BSA.
Chemical Burns: Continue to flush with water for 20 minutes (should be performed enroute). If eyes are involved, flush for 20 -25 minutes then cover with moistened pads. (Remove contact lenses if present).
Electrical Burns: Apply dry, sterile dressing, Monitor for arrhythmia, and treat per ACLS protocol. Consider fluid therapy.
- d. For transports to trauma centers
- e. **Airway burns:** Prepare for RSI, should be done by most experienced provider.
- f. Use of Lactated Ringers is preferred but Normal Saline can also be administered. Do not use LR if blood products are to be administered in the same IV line. Fluid calculation (Modified Brooke): $2 \text{ ml} \times \text{kg} \times \% \text{ of partial and full thickness burns}$ ($1/2$ of this total is given over the 1st 8 hours and the remaining given over the next 16 hours).
- g. Look for 12-lead EKG changes that suggest Hyperkalemia and treat per procedure.
- h. Goal of fluid resuscitation is best determined by urinary output (Adult: 0.5-1.0 mL/kg/hr; Child: 1.0 mL/kg/hr).
- i.



TRAUMA Choking

The inhalation or aspiration of foreign objects can cause symptoms ranging from none to serious life threats. In children, choking is a major cause of death, most of the victims being under the age of four. If the patient possibly aspirated a foreign object but is in no distress, he or she still needs to be transported to the hospital. The only way to prove non-aspiration is by x-ray; this needs to be done as soon as possible. Children who have possibly aspirated anything should not be transported POV but can be transported BLS if stable.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> *No breath sounds *Flared nostrils *Cyanosis *Progressive restlessness, anxiety, and confusion 		<ul style="list-style-type: none"> *Inability to speak *Labored use of accessory muscles *Strained neck and facial muscles *Unresponsiveness *Stridor
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. (a) Reference (3001.3 Choking), (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) (d) 3. Consider transport. (b), (c) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Pain / Sedation. Reference (3005.2 Pain management and sedation) 9. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 		<ul style="list-style-type: none"> Unconscious/not breathing. Signs of partial or full obstruction. (b) Unable to speak normally. Cyanosis Patient refuses transport. (c) Altered mental status.

Note:

- a. (5) Back blows, (5) chest compressions for 0-1 year. 1 year and older perform abdominal thrusts.
- b. If obstruction is successfully cleared, BLS transport may be considered.
- c. All choking victims should be transported to the hospital.
- d. If unable to remove obstruction with Magill forceps utilize an ETT to push the obstruction into the right mainstem bronchus if possible. This allows for the left lung to be ventilated, potentially preserving life. The obstruction can then be surgically removed later.

TRAUMA

Drowning / Near Drowning

Drowning, like other causes of accidental death, often strikes the young or otherwise healthy individual. Prevention is the most important step to reduce these unnecessary deaths. The patient prognosis after near drowning depends on the speed of rescue and resuscitation, emphasizing the role of emergency care. Treatment of near drowning begins at the scene with rapid, cautious removal of the victim from the water. Spinal precautions should be observed if the mechanism of injury is significant (i.e., a high velocity impact, diving, surfing, etc.). Concern of saltwater vs. freshwater aspiration is not of immediate importance in the pre-hospital environment. Factors that increase survivability include (1) The younger the person the better, (2) The colder the water the better, (3) The cleaner the water the better, and (4) The less time submerged the better.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● *Seizures ● *Pink, frothy sputum ● *Absent respirations or pulse 	<ul style="list-style-type: none"> ● Cough ● *ALOC ● *Signs of respiratory distress
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. (a) Reference (2000.1 General Patient Care) 2. If Cardiac Arrest is present begin CPR. Reference (3003.7 CPR) 3. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 4. Remove wet clothing and keep warm. Treat for Hypothermia if present. Reference (2005.3 Hypothermia) 5. If persistent hypoxia/dyspnea consider CPAP. Reference (3002.3 CPAP) 6. Treat other associated S/S per appropriate protocol 7. Transport and report trauma level to receiving facility. (b) 8. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 9. Fluid administration. Reference (3003.3 Fluid Administration) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/not breathing ● ALOC ● Respiratory distress ● Submersion confirmed > 1 min ● SCUBA diving accident

Note:

- a. All patients suspected of submersion need to be evaluated at an emergency department & transported by ALS due to high risk of flash pulmonary edema (secondary drowning).
- b. For transport to trauma center.

TRAUMA

Head Trauma / Injury

The primary concern in the pre-hospital setting is awareness of the potential for brain injury and recognition of the signs and symptoms of head, neck, and spinal injury early in the patient assessment. Head trauma can range anywhere from traumatic brain injury (TBI) to superficial injuries involving the scalp, fascia, and skull. TBI can be classified in two different ways: Primary injury and secondary injury.

- Primary injury is caused by penetration and laceration of brain tissue, or by the effects of force or energy transmitted to the brain.
- Secondary injury is caused by the late effects of the brain cells response to trauma (usually caused by hypotension and hypoxia.)

Early treatment of TBI should be directed at preventing and reducing the effects of secondary brain injury. This is accomplished by maximizing cerebral blood flow and oxygenation. Spinal cord injuries often coincide with head injuries. Be strongly suspicious of c-spine injuries when treating head injuries.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● MOI ● *Loss of consciousness ● *Headache ● *Changes in vision or hearing ● *History of seizure following trauma ● *Incontinence of bladder/bowel ● *Altered or changing level of consciousness ● *Change in mental status before and after the injury ● Underlying medical condition ● Medications ● *Nausea/vomiting ● *Amnesia (antegrade/retrograde) ● *Paralysis/Paresthesia 	
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. (a)(b) Reference (2000.1 General Patient Care) <ul style="list-style-type: none"> ● If ALOC Obtain blood glucose level. Reference (2004.3 ALOC) 2. Administer O₂ and assist respiratory status. (c) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Treat other associated S/S per appropriate protocol 5. If not immobilized, place patient in semi or high fowler's. 6. Consider transport to trauma center and report trauma level. (d) 7. Continuous capnometry. (e) Reference (3002.4 Capnography) 8. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 9. Fluid administration. Reference (3003.3 Fluid Administration) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● ALOC ● Significant MOI ● Unresponsive/not breathing

<p>11. Pain / Sedation. Reference (3005.2 Pain management and sedation)</p> <p>12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting)</p> <p>1. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p> <p>13. Administer a vasopressor as needed. Titrate to patient's hemodynamic status. Reference (4000.1 norepinephrine), (4000.1 epinephrine)</p>	
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Note:

- a. Consider Air Medical transport. Consider transport to facility with neurological consult.
- b. All patients with altered mental status should have spinal immobilization performed.
- c. Provide O₂ but do not hyperventilate. Maintain O₂ saturations at 94% - 99% to prevent hyperoxic injury. Keep ventilation rates between 8-12/min (enough to maintain O₂ saturations.) Patients who are hyperventilated have poorer outcomes.
- d. Attempt to maintain MAP @ 90 mmHg. This enhances cerebral perfusion.
- e. Although normal CO₂ levels are 35-45 mmHg, treatment of head injury patients center around maintaining CO₂ levels @ 35-40 mmHg. Levels below 35 indicate hyperventilation.

TRAUMA

Multi-System Trauma

Trauma victims require definitive surgical intervention to repair and/or stabilize their injuries in order to enhance survival and reduce complications. Successful management of trauma victims will require rapid assessment, stabilization and transportation to an appropriate trauma center. Activate air transport as appropriate and refer to fly criteria as needed.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> *Signs of internal bleeding *Deformity to head, torso, extremities Decreased capillary refill (a) 		<ul style="list-style-type: none"> Paleness / Diaphoresis Contusions *Fractures
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding 4. Treat other associated S/S per appropriate protocol 5. Report trauma level. Reference (3004.4 Trauma leveling criteria) 6. IV/IO access x 2 (large bore 18ga or greater) (c) Reference (3003.1 Vascular access), (3003.2 EZ-IO) 7. Fluid administration. (a) Reference (3003.3 Fluid Administration) 8. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 9. 12-lead ECG. Reference (3004.8 12-Lead ECG) 10. Pain / Sedation. Reference (3005.2 Pain management and sedation) 11. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 12. Antibiotic Therapy for open or penetrating trauma. Reference (4000.1 Cefazolin) 13. Treat tension pneumothorax / hemothorax. (b) (3002.1 Chest decompression) 14. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 15. Administer blood products. (a) Reference (3003.4 Blood admin.) 	<ul style="list-style-type: none"> Unconscious/not breathing ALOC Crushing, penetrating, or significant blunt trauma to head, chest, abdomen, or thigh. Uncontrolled bleeding Seizures secondary to head injury 	

Note:

- a.** Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration. Attempt to keep MAP above 60 mmHg.
- b.** Watch for hypotension, tracheal shift, distended neck veins, progressively worsening dyspnea / cyanosis, decreased / diminished or absent lung sounds, and / or shock.
- c.** Hang blood Y tubing.

TRAUMA

Musculoskeletal Trauma

Musculoskeletal injuries can occur from both blunt and penetrating trauma. Injuries may include contusions, dislocations, fractures, sprains, and subluxations. Early proper treatment of these injuries may prevent long term morbidity and disability. Major injuries to the musculoskeletal system like hip, pelvic, and long bone fractures; can cause injury to adjacent nerves, blood vessels, and lead to shock from hemorrhage. Fractures of the humerus, femur, pelvis, and those causing circulatory or neurological deficits take priority over other musculoskeletal injuries.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> Pain Swelling/bruising Numbness/tingling Deformity 		<ul style="list-style-type: none"> *Neurological deficit Medial / Lateral rotation of extremity Shortening of extremity Diminished/Absent pulses in extremity
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Manually stabilize fracture (a) 5. Check neurovascular status distal to injury before and after splinting <ul style="list-style-type: none"> If no pulse and / or sensation, pull gentle traction and place extremity in anatomical position Reduction / Relocation of dislocations is not permitted 6. Pull traction if indicated (a) 7. Splint the injury (if hand or foot, in position of function) (b) 8. Treat amputation if indicated (c) 9. Remove all jewelry distal to injury 10. Treat other associated S/S per appropriate protocol 11. Consider transport to trauma center and report trauma level. Reference (3004.4 Trauma leveling criteria) 12. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 13. Fluid administration. Reference (3003.3 Fluid Administration) 14. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 15. 12-lead ECG. Reference (3004.8 12-Lead ECG) 	<ul style="list-style-type: none"> Long bone fracture Pain control needed Multi-system trauma Hemodynamically unstable 	

<p>16. Pain / Sedation. Reference (3005.2 Pain management and sedation)</p> <p>17. Consider antiemetic. Reference (3005.5 Nausea and Vomiting)</p> <p>18. Antibiotic Therapy for open or penetrating trauma. Reference (4000.1 Cefazolin)</p> <p>19. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p> <p>20. Administer blood products. Reference (3003.4 Blood admin.)</p>	
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Note:

- a. Pelvic / hip fractures can be splinted with a sheet wrapped snugly around pelvis. Mid shaft femur fractures should be splinted using a traction splint. Other fractures can be splinted using rigid splints, sling and swathes, or vacuum splints. Do not push protruding bones back inside the skin.
- b. Angulated fractures and dislocations should only be straightened or reduced if distal circulation is compromised. Unless unavailable, perform paramedic evaluation along with pre-medication, for pain, prior to realignment. Realignment is performed by applying longitudinal traction before splinting.
- c. Rinse amputated part and wrap in sterile, soaked gauze and place in plastic bag. Place bag in container and keep cool. Elevate and immobilize amputated extremity and cover in sterile, soaked dressing. Transport to trauma center.

TRAUMA

Soft Tissue / Crush Injuries

Trauma to the skin may include abrasions, lacerations, hematomas, punctures, avulsions, contusions, incisions, amputations, crush injuries, and compartment syndrome. These injuries are typically not life threatening, but may damage blood vessels, nerves, connective tissue, and other internal structures. Crush injuries and compartment syndrome require early recognition and treatment in order to produce a favorable outcome and prevent metabolic abnormalities which could result in death. Compartment syndrome; which commonly results from crush injuries, electrocution, or other injuries that cause bleeding into the affected compartment; is most commonly seen in the forearm, leg, gluteal region, thigh, and lumbar paraspinal muscles.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> ● * ALOC ● *Severe bleeding ● *Resp. distress, *Traumatic asphyxia 		<ul style="list-style-type: none"> ● *Rapid, weak pulse ● *Penetrating wounds ● *Amputation
TREATMENTS		
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Treat other associated S/S per appropriate protocol 5. Report trauma level. Reference (3004.4 Trauma leveling criteria) 6. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 7. Fluid administration. (a) Reference (3003.3 Fluid Administration) 8. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 9. 12-lead ECG. (c) Reference (3004.8 12-Lead ECG) 10. Consider capnography. Reference (3002.4 Capnography) 11. Pain / Sedation. Reference (3005.2 Pain management and sedation) 12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 13. Antibiotic Therapy for open or penetrating trauma. Reference (4000.1 Cefazolin) 14. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 		***Request Paramedic Evaluation If***

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| <p>15. Assess for and treat hyperkalemia.
Reference (3003.11 Hyperkalemia)</p> <p>16. Administer blood products. Reference
(3003.4 Blood admin.)</p> | |
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Note:

- a. Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration. Attempt to keep MAP above 60 mmHg.

TRAUMA Spinal Cord Injuries

Most spinal cord injuries result from motor vehicle collisions, firearms, falls, and recreational activities. They can be the result of direct blunt and/or penetrating trauma, compression forces, and abnormal motion. Spinal cord injuries may be classified as sprains, strains, fractures, dislocations, and actual cord injuries. One should assume the presence of spinal cord injury in the following circumstances: grand mal seizure activity, significant trauma, complaint of pain and/or paresthesia, unconsciousness subsequent to head injury, injury above the clavicle, a significant fall, neck tenderness and/or deformity, MVC with significant MOI, electrocution, and all non-extremity penetrating injury.

SIGNIFICANT FINDINGS (*Automatic ALS)	
TREATMENTS	
<i>(Standing Orders: choose any or all that apply)</i>	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • *Pain or trauma to the head, back, neck, or extremities • Obvious bleeding, Paleness • *Rapid, weak pulse, Hypotension • *ALOC • *Unconsciousness/not breathing • *Difficulty breathing • *Numbness/Paralysis
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Maintain normal body temperature 5. Stabilize deformities 6. Treat other associated S/S per appropriate protocol 7. Consider transport to trauma center and report trauma level. Reference (3004.4 Trauma leveling criteria) 8. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 9. Fluid administration. Reference (3003.3 Fluid Administration) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 11. Pain / Sedation. Reference (3005.2 Pain management and sedation) 12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 13. Perform spinal immobilization. 14. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 15. Neurogenic Shock Treatment: (b) <ol style="list-style-type: none"> a. Administer a vasopressor as needed. Titrate to patient's hemodynamic status Epinephrine 	<ul style="list-style-type: none"> • Unconscious/not breathing • Severe neck/back pain • Significant MOI • Difficulty breathing • Seizures • Accident with penetrating/crushing injury to head, neck, torso, or thigh

2-10 mcg/min via infusion pump – 1 st line treatment (a) Reference (4000.1 epinephrine) b. Levophed 2-20 mcg/min via IV infusion pump – 2 nd line treatment. Reference (4000.1 norepinephrine)	
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Note:

- a. Consider a one-liter bolus if neurogenic shock is suspected & reassess BP, if no signs/symptoms of fluid overload may give up to 30 mL/kg with frequent reevaluation for signs/symptoms of fluid overload. For Critical Care Paramedic: if bradycardia develops initiate epinephrine.
- b. Consider footnote "(a)" before initiation of vasopressor for suspected neurogenic shock.

TRAUMA

Thoracic Trauma

Chest injuries are the result of blunt and/or penetrating trauma and most commonly result from motor vehicle collisions, blast injuries, falls from heights, blows to the chest, gunshot, and stab wounds. Thoracic injuries include those to skeletal, pulmonary, heart, great vessels and diaphragm. Potential lethal injuries that can occur include: flail chest, hemothorax, pneumothorax, tension pneumothorax, myocardial contusion, sucking chest wound, cardiac tamponade, aortic rupture, and diaphragmatic rupture.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> ● Guarding ● * Flail segment(s) ● *Open/sucking chest wound ● *Subcutaneous emphysema 		<ul style="list-style-type: none"> ● *Absent or diminished lung sounds ● * Distended neck veins ● * Tracheal deviation
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Stabilize flail chest / impaled object if needed. 5. Treat other associated S/S per appropriate protocol 6. Consider transport to trauma center and report trauma level. Reference (3004.4 Trauma leveling criteria) 7. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 8. Fluid administration. (a) Reference (3003.3 Fluid Administration) 9. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 11. Pain / Sedation. Reference (3005.2 Pain management and sedation) 12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 13. Antibiotic Therapy for open or penetrating trauma. Reference (4000.1 Cefazolin) 14. Treat tension pneumothorax / hemothorax. (b) Reference (3002.1 Chest decompression) 15. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2) 	<ul style="list-style-type: none"> ● Unconscious/not breathing ● ALOC ● Respiratory distress ● Chest pain ● Significant MOI/NOI ● Uncontrolled bleeding 	

<p><u>Critical care assessment, monitoring and treatment</u></p> <p>16. Administer a vasopressor as needed. Titrate to patient's hemodynamic status. (a) Reference (4000.1 norepinephrine), (4000.1 epinephrine)</p> <p>17. Administer blood products. Reference (3003.4 Blood admin.)</p>	
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Note:

- a. Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration. Attempt to keep MAP above 60 mmHg.
- b. Watch for tracheal shift, distended neck veins, hypotension, progressively worsening dyspnea / cyanosis, decreased / diminished or absent lung sounds, and / or shock. When in doubt, decompress.

TRAUMA

Traumatic Arrest

Cardiopulmonary arrest due to trauma may be reversible with prompt aggressive therapy. In the traumatic patient, rapid transport to the nearest trauma center has been shown to be the most critical element in patient survivability. This is more likely to be possible with penetrating trauma as opposed to blunt trauma. Patients found in arrest, without any signs of life, by first-arriving EMS personnel have little probability of survival. Therefore, resuscitation of these patients should be considered only in situations where witnessed signs of life shortly before EMS arrival were noted or in exceptional circumstances (penetrating trauma, hypothermia, etc.). Attempt to identify possible cause of arrest and initiate corrective measures:

Hypovolemia	Tablets (drug OD, accidents)
Hypoxia	Tamponade, cardiac
Hydrogen ion (acidosis)	Tension Pneumothorax
Hyper/Hypokalemia	Thrombosis, coronary (ACS)
Hypothermia	Thrombosis, pulmonary (embolism)

SIGNIFICANT FINDINGS (*Automatic ALS)	
• * Agonal respirations	• *Pulseless
• *Obvious signs of death	• *Apneic
TREATMENTS	
(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O ₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Control bleeding. Reference (3003.6 Bleeding Control) 4. Tranexamic Acid if inclusion criteria met. Reference (4000.1 Tranexamic Acid). 5. Maintain normal body temperature 6. Treat other associated S/S per appropriate protocol 7. Rapid, Early transport to the closest appropriate facility 8. Consider transport to trauma center and report trauma level. Reference (3004.4 Trauma leveling criteria) 9. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 10. Fluid administration. (a) Reference (3003.3 Fluid Administration) 11. Consider 12-lead ECG. Reference (3004.8 12-Lead ECG) 12. Treat cardiac arrest. Reference (2002.2 Cardiac arrest) 13. Treat pneumothorax / hemothorax if present. Reference (3002.1 Chest decompression)	• This is an automatic ALS response

<p>14. Consider termination of efforts. Reference (3004.1 Determination of death on scene)</p> <p>15. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p> <p>16. Administer blood products. (a) Reference (3003.4 Blood admin.)</p>	
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Note:

- a) Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration. Attempt to keep MAP above 65 mmHg.

MEDICAL EMERGENCIES

Abdominal Pain

Abdominal pain is one of the most common presenting complaints in emergency medicine. In up to 42% of patients, the etiology remains obscure. Recalling the differences between generalized types of pain can be helpful diagnostically. Visceral abdominal pain results from stretching of the autonomic nerve fibers. The pain may be described as cramp like, colicky or gaseous and is often intermittent. Obstruction is often the cause. Somatic pain occurs when pain fibers located in the parietal peritoneum are irritated by chemical or bacterial inflammation. The pain is described as sharp, more constant, and more precisely located. Referred pain is any pain felt at a distance from a diseased organ. Referred pain generally follows certain classic patterns, for example, diaphragmatic irritation often radiates to the supraclavicular area.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● *Distended or rigid abdomen ● *Unequal/ absent femoral pulses ● *Diaphoresis ● *Orthostatic hypotension 	<ul style="list-style-type: none"> ● *Pulsating abdominal mass ● Tender mass ● *ALOC
TREATMENTS	
<p><i>(Standing Orders: choose any or all that apply)</i></p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. The patient should have nothing to eat or drink after initiation of care. 4. Treat other associated S/S per appropriate protocol 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Pain / Sedation. Reference (3005.2 Pain management and sedation) 9. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 10. If suspected abdominal aortic aneurysm: consider NTG tablets or Labetalol to lower blood pressure (c) 11. Treat other associated signs and symptoms per appropriate protocol 12. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/ not breathing ● Respiratory distress ● Vomiting red blood ● Black tarry stools ● Frank, red blood from rectum (bloody diarrhea) ● Upper abdominal pain ● Lower abdominal pain, woman age 11-50 with dizziness, syncope or heavy vaginal bleeding ● Orthostatic changes > 30 SBP and/ or > 30 bpm

Note:

- a. Abdominal pain may be the first sign of an impending rupture of the appendix or problems with the liver, spleen, ectopic pregnancy or aneurysm. Monitor for signs of hypovolemic shock.
- b. If pulsating mass is felt, suspect an abdominal aneurysm and discontinue palpation.
- c. Maintain blood pressure between 100-120 mmHg systolic.
- d. Consider Tranexamic Acid administration for suspected acute (<3 hours) bleeding emergency/emergent surgical need

MEDICAL EMERGENCIES

Allergic Reaction / Anaphylaxis

Allergic reactions can range from mild local eruptions to severe and life-threatening systemic illnesses. The most common presenting complaints involve the dermatologic and respiratory systems, but gastrointestinal and cardiovascular involvement also occur frequently. Allergic reactions are generally divided into three degrees of severity:

- **Mild:** Patient presents with mild localized swelling and urticaria (hives). Symptoms are resolved with the administration of diphenhydramine.
- **Moderate:** Patient presents with airway swelling, urticaria, and wheezes. Symptoms resolved with nebulizer treatments and administration of diphenhydramine. Use of steroid should be considered.
- **Severe:** Patient presents in extremis (Wheezes, urticaria, dyspnea, shock). Symptoms are resolved with aggressive treatment including nebulizer treatments, diphenhydramine, epinephrine, steroid therapy, fluid administration, and vasopressors as needed.

Patient severity should be classified during assessment and treated per severity.

SIGNIFICANT FINDINGS	(*Automatic ALS)
<ul style="list-style-type: none"> ● *Blueness around lips ● *Low blood pressure ● Flushing around face and chest ● Itching, hives 	<ul style="list-style-type: none"> ● *Difficulty Breathing, *ALOC ● *Chest pain ● Nausea, vomiting ● *Weak, rapid pulse
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) (a) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Epinephrine (b)(c)(d) Reference (4000.1 Epinephrine) 4. Nebulizer treatments. Reference (4000.1 Albuterol), (4000.1 Ipratropium Bromide) 5. Treat other associated S/S per appropriate protocol 6. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 7. Fluid administration. Reference (3003.3 Fluid Administration) 8. 12-lead ECG. Reference (3004.8 12-Lead ECG) 9. Diphenhydramine Reference (4000.1 Diphenhydramine) 10. Dexamethasone (e) Reference (4000.1 Dexamethasone) 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2) 	<p style="text-align: center;">***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/ not breathing ● Cannot speak full sentences ● Swelling tongue, throat ● Diaphoresis ● Syncope ● Hx of anaphylaxis

<p><u>Critical care assessment, monitoring and treatment)</u></p> <p>12. Administer a vasopressor as needed. (f) Titrate to patient's hemodynamic status. Reference (4000.1 norepinephrine), (4000.1 epinephrine)</p>	
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Note:

- a. Anaphylaxis is an extreme emergency since cardiac arrest can occur. Do not delay treatment or transport.
- b. A single dose of epinephrine may not reverse the effects of anaphylaxis. Administer additional epinephrine or epinephrine auto-injector as needed.
- c. May repeat without Physician Orders.
- d. Studies have shown IM injections to be a "faster" route of administration than SQ, consider IM prior to SQ.
- e. Corticosteroids should be administered as early as possible, as their onset of action is typically >1 hour.
- f. Use only to maintain BP if fluid challenge is ineffective

Other Considerations: Remove/Stop inciting cause (i.e. infusing medication).

MEDICAL EMERGENCIES

Altered Level of Consciousness / Syncope

In the usual clinical approach to a patient, the examiner first obtains a history, performs a physical examination, and then administers treatment. This sequence may not be used for patients with an altered level of consciousness. ALOC can be such a major variance, from normal neurological function, that immediate supportive efforts may be required. Patients without a gag reflex urgently need mechanical airway control in order to prevent aspiration. A common cause of ALOC is low blood glucose levels in diabetic patients. If C-spine fracture is suspected or if the mechanism of ALOC is unknown, the neck **must** be stabilized while the airway is secured. The possibility of trauma should always be suspected in patients with seizures and alcohol or drug intoxication. Finally, obvious bleeding should be stopped before a detailed neurological examination can be initiated.

SIGNIFICANT FINDINGS		(*AUTOMATIC ALS)
<ul style="list-style-type: none"> ● *Medic alert tag ● *Evidence of trauma ● *Hyper/ hypotension ● *Abnormal/ unusual breathing 		<ul style="list-style-type: none"> ● Breath odor ● *ALOC ● *Evidence of drug use ● *Diaphoresis, chest pain
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Find cause of altered LOC and treat appropriately (a) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 		<ul style="list-style-type: none"> ● Unconscious/ not breathing ● Multiple syncope episodes in same day ● Combined drugs and alcohol OD ● Respiratory distress ● Syncope associated with headache, chest pain/ discomfort/ palpitations age >40, diabetes, GI/ vaginal bleeding, abdominal pain ● Single syncope >50

Note:

- a. Causes: AEIOU-TIPS (alcohol, epilepsy, insulin, overdose, uremia, trauma, infection, psychiatric, and stroke). Treat specific cause per protocol.

MEDICAL EMERGENCIES

Behavioral Emergencies / Combative Patients

Behavioral emergencies and combative patients are some of the most pitfall laden situations EMS personnel will encounter. Many of these patients will have multiple underlying pathologies which will pose many challenges to overcome. Patient care should be focused on preventing/mitigating hyperthermia, agitated delirium, positional asphyxia, hypoxia, and physical self-harm. Above all else, personal safety takes precedence over patient care- scene safety is of the utmost concern.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> Withdrawn Rapid speech Not responding to people or environment *Tries to hurt self or others 	<ul style="list-style-type: none"> Hyperventilation *Hallucinating *Hostile or aggressive behavior Anxious and fearful Crying or hysterical
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. DO NOT enter the scene until dispatch has verified that law enforcement is on scene and the environment is secure 2. General Patient Care. Reference (2000.1 General Patient Care) 3. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 4. Calm, relax and reassure patient 5. Restrain patient PRN for safety per procedure (a)(b)(c) 6. If physical restraints are necessary, it is also appropriate for provider/patient safety to perform chemical restraint per procedure. Reference (3005.2 Pain management and sedation), (1014 Patient restraint) (b) 7. Treat other associated S/S per appropriate protocol 8. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 9. Fluid administration. Reference (3003.3 Fluid Administration) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/ not breathing Unusual behavior associated with diabetes GSW/ stabs to head, neck, torso, and thigh

Note:

- a. If restraining the patient is not possible or the pre-hospital care provider feels they are in danger, they should withdraw from patient contact until scene safety can be established.

MEDICAL EMERGENCIES: Behavioral Emergencies / Combative Patients

- b.** A minimum of four to five people is necessary to ensure adequate protection for the rescuers and patient during the restraint process. Strongly consider chemical restraint if physical restraint is used.
- c.** Do not restrain prone if possible. 4-point restraints are recommended. Observe for and prevent positional asphyxia. Monitor airway and respirations closely. Once restrained, do not release restraints until at hospital unless required for essential patient care. DO NOT LEAVE RESTRAINED PATIENT UNATTENDED.

MEDICAL EMERGENCIES

Diabetic Emergencies

Classic diabetes mellitus is a disease caused by insufficient insulin production (Type I). Most diabetics control the disease through diet and exercise or via pharmacologic means. Those required to take insulin are at an increased risk of developing insulin shock or diabetic coma. Insulin shock occurs when there is not enough sugar available in the blood, due to high levels of blood insulin. This is characterized by relatively rapid changes in the patient. Diabetic coma results from a very high blood sugar level and inadequate insulin. This condition is characterized by a slow progression, sometimes taking weeks to develop. Regardless of the etiology, both insulin shock and diabetic coma can be life threatening.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> Dry mouth and intensive thirst Restlessness Dry, red, warm skin *Abnormal, hostile or aggressive behavior 	<ul style="list-style-type: none"> *Abnormal pain and vomiting *Weak, rapid pulse Dizziness and headache *Fainting, convulsions Skin pale, cold and clammy
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> General Patient Care. Reference (2000.1 General Patient Care) <ul style="list-style-type: none"> Obtain blood glucose level (a) Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) If ALOC, position left lateral recumbent Oral Glucose (b) Reference (4000.1 Glutose) Reassess BGL, treat as indicated (c) Treat other associated S/S per appropriate protocol IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) IV Dextrose (f) Reference (4000.1 Dextrose) Fluid administration. Reference (3003.3 Fluid Administration) (e) 12-lead ECG. Reference (3004.8 12-Lead ECG) Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/ not breathing ALOC Signs of shock Chest pain Unusual behavior Seizure

Note:

- Normal glucose levels are 60- 120 mg/dL.
- Patient must be awake, have a patent airway, and an intact gag reflex.
- Give complex carbohydrate (i.e. peanut butter, if no allergy) as soon as patient is able to eat.
- If blood glucose level is higher than 300 mg/dL, refrain from slower ventilatory rates when assisting ventilations with BVM/intubated patients.
- Give 500mL fluid boluses and reassess patient and blood glucose levels. Repeat fluid boluses as needed and tolerated.
- Flush IV after administration of Dextrose.

MEDICAL EMERGENCIES General Illness

The prehospital provider should be very careful to ensure that patients who present with no specific complaints are given due regard. The patient's symptoms and recent history must determine the most appropriate care.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● *Increased/ decreased BP ● *ALOC ● *Diaphoresis ● Nausea, vomiting ● Weakness ● *Difficulty breathing 	
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Search for and treat possible reversible causes. (a) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) (b) 8. Pain / Sedation. Reference (3005.2 Pain management and sedation) 9. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) (c) 10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/ not breathing ● ALOC ● Chest pain or discomfort ● Diaphoresis ● Syncope or near syncope when sitting ● Pale, clammy skin ● Respiratory distress ● Orthostatic changes > 30 SBP/ BPM

Note:

- a. It should be noted that diabetic patients, women, and the elderly who present with general illness might be an atypical presentation of Myocardial Infarction.
- b. Strongly consider use of 12-lead ECG for patients over 35 years old.
- c. Give to patients who complain of nausea or to control vomiting.

CARDIAC EMERGENCIES

Hypertensive Emergency

Hypertensive emergency is an elevated blood pressure associated with acute central nervous system, cardiac, and/or renal dysfunction. Immediate recognition and treatment is required. The pathophysiology of hypertensive heart disease is a complex interplay of various hemodynamic, structural, neuroendocrine, cellular, and molecular factors. Factors within each anatomical system play integral roles in development of hypertension and its complications, while concurrently hypertension itself can modulate these factors. Elevated blood pressure leads to adverse changes in cardiac structure and function in two ways: directly by increased afterload and indirectly by associated neurohormonal and vascular changes.

A hypertensive emergency is an elevated blood pressure with associated signs of end organ damage/dysfunction resulting from hypertension. In the EMS setting end organ damage/dysfunction is recognized by central nervous system, cardiac, or renal dysfunction in the setting of extreme hypertension (>220/120 mmHg).

Care should be taken to obtain a reliable history in these patients.

Consideration should be given for the following differential diagnoses and the appropriate protocol used: ischemic stroke/TIA, subarachnoid hemorrhage, hemorrhagic stroke, thoracic aortic dissection, abdominal aortic aneurysm, pulmonary edema/congestive heart failure. Otherwise the following is the treatment for hypertensive emergencies – seeking for symptom alleviation or a 20% reduction in MAP.

Certain hypertensive emergency etiologies require specific intervention. For hypertensive emergencies associated with Cocaine or Methamphetamine use DO NOT use beta-blockers, instead use benzodiazepines. For hypertensive emergencies associated with CHF and acute pulmonary edema consider nitroglycerine.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none">Prior diagnosis of hypertensionCessation of antihypertensive medicationsHx of cardiovascular diseaseDyspneaChest pain	<ul style="list-style-type: none">Hx of renal diseaseHx of cerebrovascular disease*Pregnancy*Illegal drug use*Seizures
TREATMENTS	
(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
<ol style="list-style-type: none">General Patient Care. Reference (2000.1 General Patient Care)Administer O2 and assist respiratory status per Basic Airway Procedure (a) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)Transport in position of comfortTreat other associated S/S per appropriate protocolIV/IO access. Reference (3003.1 Vascular access)	<ul style="list-style-type: none">HeadacheVisual changesWeaknessPalpitationsHematuria

<p>6. Fluid administration per procedure (b) Reference (3003.3 Fluid Administration)</p> <p>7. 12-lead ECG. Reference (3004.8 12-Lead ECG)</p> <p>8. Hypertension in pregnancy. Reference (3006.3 Eclampsia)</p> <p>9. Hypertension with pulmonary edema (b) Reference (2002.4 Acute pulmonary edema CHF)</p> <p>10. For Cocaine or Methamphetamine induced hypertensive emergency:</p> <ul style="list-style-type: none">• DO NOT use a beta-blocker, rather use<ul style="list-style-type: none">• Midazolam: 2.5 – 5 mg, prn every 5 minutes Reference (4000.1 Midazolam)• Lorazepam: 1 – 4 mg, prn every 15 minutes Reference (4000.1 Lorazepam) <p>11. Otherwise for BP > 220/120 mm Hg with signs of end-organ damage, consider one of the following antihypertensives until:</p> <ul style="list-style-type: none">• Consider Labetalol Reference (4000.1 Labetalol) until one of the following is achieved• Symptoms are alleviated. -OR-• 20% reduction of MAP is achieved. <p>12. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p>	
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Note:

- a. Maintain O₂ saturations between 94% and 99%.
- b. Special attention should be given to fluid administration in the hypertensive patient. These patients are more frequently fluid overloaded. Physical assessment to include lung sounds are advised prior to fluid administration.

MEDICAL EMERGENCIES

Pulmonary Embolism

Pulmonary Embolism (PE) is a common, highly lethal condition. Patients with a history of deep vein thrombosis (DVT) are especially at risk. Any type of chest or upper abdominal pain should trigger a strong suspicion of PE until other causes can be found. Common signs and symptoms include unexplained, often sudden onset of shortness of breath, chest pain that gets worse with deep breathing, or chest movement, and coughing up blood. Higher risk patients include bedridden, recent fracture, history of long-distance travel, use of hormonal birth control pills, smokers, < six weeks post-partum.

SIGNIFICANT FINDINGS	(*Automatic ALS)
<ul style="list-style-type: none"> *Difficulty breathing *Chest pain *Cough with blood 	<ul style="list-style-type: none"> Wheezing lung sounds "Low SpO₂ saturation
EMT TREATMENT	
<i>(Standing Orders: choose any or all that apply)</i> <ol style="list-style-type: none"> 1. General Patient Care. Reference (a) (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) (3002.3 CPAP) 3. Minimize patient movement and exertion. 4. Treat other associated S/S per appropriate protocol 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Pain / Sedation. Reference (3005.2 Pain management and sedation) 9. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	***Request Paramedic Evaluation If*** <ul style="list-style-type: none"> ALOC Pale, clammy skin Respiratory distress Orthostatic changes > 30 SBP Signs of DVT

Note:

- a. Consider orthostatic vital signs
- b. Use ventilator and add PEEP of 5 mmHg to assist in preventing alveolar collapse.

MEDICAL EMERGENCIES

Toxicological Emergencies

Poisoning is more common in small children. However, adult poisonings are responsible for most hospital admissions. Analgesics are the most common causes of overdoses with tricyclics, acetaminophen, benzodiazepines and alcohol as other common causes. Most overdose history and information (whether from patient, family, bystanders or even care providers) is not completely accurate. The most important factors to discover include **what** poison is involved, **how much** was ingested/ injected, **how** it was taken, **when** it was taken, **why** it was taken and **what else** was taken. Treatment is focused on resolution of symptoms.

TREATMENTS	
<p><i>(Standing Orders: choose any or all that apply)</i></p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Attempt identification of toxin 4. Consider Rapid transport 5. Consider Consulting Poison Control [1-800-222-1222] (a) 6. Contact receiving hospital with nature of toxic exposure 7. Treat other associated S/S per appropriate protocol 8. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 9. Fluid administration. Reference (3003.3 Fluid Administration) 10. 12-lead ECG. Reference (3004.8 12-Lead ECG) 11. Pain / Sedation. Reference (3005.2 Pain management and sedation) 12. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 13. NG/OG placement. Reference (3001.4 NG/OG tube insertion) 14. Narcotics <ul style="list-style-type: none"> • Naloxone Reference (4000.1 Naloxone) 15. Benzodiazepines <ul style="list-style-type: none"> • Fluid Administration. Reference (3003.3 Fluid Administration) • Transcutaneous Pacing 16. Tricyclic Antidepressants <ul style="list-style-type: none"> • Fluid Administration. Reference (3003.3 Fluid Administration) 17. Calcium Channel Blockers <ul style="list-style-type: none"> • Transcutaneous Pacing 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • Unconscious/ not breathing • Respiratory distress • ALOC • Intentional/ accidental with prescription medications • Ingestion of household cleaners • Difficulty swallowing • Acute ETOH intoxication, age <17 yrs • Combined ETOH and drug overdose • Cocaine/ crack with chest pain • Seizure secondary to drug overdose

<ul style="list-style-type: none">● Epinephrine Reference (4000.1 Epinephrine) <p>18. Beta Blockers</p> <ul style="list-style-type: none">● Fluid Administration Reference (3003.3 Fluid Administration)● Transcutaneous Pacing● Norepinephrine infusion. Reference (4000.1 Norepinephrine) <p>19. Organophosphates / Carbamates</p> <ul style="list-style-type: none">● Atropine (b) Reference (4000.1 Atropine) <p>20. CNS Stimulants</p> <ul style="list-style-type: none">● Lorazepam Reference (4000.1 Lorazepam)● Midazolam Reference (4000.1 Midazolam) <p>21. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p> <p>22. Administer a vasopressor as needed. Titrate to patient's hemodynamic status. Reference (4000.1 norepinephrine), (4000.1 epinephrine)</p>	
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Note:

- a. Poison control is part of the healthcare system, and it is ok to share patient information with them.
They may follow up with receiving hospital.
- b. Look for "SLUDGE" (Salivation, lacrimation, urination, defecation, GI upset, and emesis)

MEDICAL EMERGENCIES

Reactive Airway Disease (Asthma / COPD)

Asthma is a reversible airway obstruction, associated with hyper-responsiveness of the tracheobronchial tree. An early component of an asthma attack is bronchial smooth-muscle contraction, inflammation, edema, and increased mucus secretions. These become more prominent as the attack progresses. Direct physical examination reveals hyperresonance to percussion, decreased intensity of breath sounds and prolongation of the expiratory phase, usually with wheezing. Although wheezing results from the movement of air through narrowed airways, the intensity of the wheezing may not correlate with the severity of the airflow obstruction. The quiet chest reflects very severe airflow obstruction with air movement insufficient to promote a wheeze.

SIGNIFICANT FINDINGS

- | | |
|---|---|
| <ul style="list-style-type: none">● *Extreme difficulty breathing● *Chest pain● *Pink, frothy sputum● *Accessory muscle use● *Hypotension, Hypertension | <ul style="list-style-type: none">● *Wheezing● *Diaphoresis● *Tripod position● *Cyanosis● *ALOC |
|---|---|

TREATMENTS

(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
<ol style="list-style-type: none">1. General Patient Care. Reference (2000.1 General Patient Care)2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) (3002.3 CPAP).3. Administer Breathing Treatment. Reference (4000.1 Albuterol), (4000.1 Ipratropium Bromide)4. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO)5. Fluid administration. Reference (3003.3 Fluid Administration)6. 12-lead ECG. Reference (3004.8 12-Lead ECG)7. Dexamethasone or Methylprednisolone Reference (Dexamethasone 4000.1) (4000.1 Methylprednisolone)8. Epinephrine Reference (4000.1 Epinephrine)9. Treat other associated S/S per appropriate protocol10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	<ul style="list-style-type: none">● Unconscious/ not breathing● Respiratory distress● Dyspnea with chest pain● Inhaled toxic substances● Unable to speak full sentences● Drooling / difficulty swallowing● Recent trauma, childbirth, or immobilization

Note:

MEDICAL EMERGENCIES

Seizures

A seizure is a period of altered neurologic function caused by abnormal neuronal electrical discharges. Approximately 1% - 2% of the general population has recurrent seizures. Generalized seizures begin with abrupt loss of consciousness. If motor activity is present, it symmetrically involves all four extremities. Episodes that develop over minutes to hours are less likely to be seizures. Most seizures only last 1– 2 minutes. Patients with seizure disorders tend to have stereotype, or similar, seizures with each episode and are less likely to have inconsistent or highly variable attacks. True seizures are usually not provoked by emotional stress. Most seizures are followed by a postictal state of lethargy and confusion.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none">● *ALOC● *Head or mouth trauma● Incontinence● *Pregnancy	<ul style="list-style-type: none">● *Ongoing seizure activity, lasting longer than 5 minutes● Medic alert tag
TREATMENTS	
(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
<ol style="list-style-type: none">1. Protect patient from injury2. General Patient Care. Reference (2000.1 General Patient Care)<ul style="list-style-type: none">● Obtain blood glucose level (a)3. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)4. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO)5. Fluid administration. Reference (3003.3 Fluid Administration)6. Administer Benzodiazepine. Reference (4000.1 Lorazepam), (4000.1 Midazolam)7. Treat other associated S/S per appropriate protocol (b)8. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	<ul style="list-style-type: none">● Unconscious/ not breathing● Seizures > 5 min or status seizures● First time seizure● Diabetic● Pregnant > 20 weeks● Secondary to illicit drugs● Secondary to recent head trauma● Seizure, unknown Hx, age > 50 years

Note:

- a. Normal blood glucose levels are 60 – 120 mg/ dL.
- b. If suspected eclampsia then refer to OB: Eclampsia. Reference ([2006.3 Eclampsia](#))

MEDICAL EMERGENCIES

Shock (Hypotensive / Hypovolemic)

Shock, caused by decreased or inadequate tissue perfusion (low blood pressure or low blood volume), is the most common form of shock. It is important to identify whether it is due to a “tank” or “fluid” issue. One of the widely accepted treatments of shock is fluid bolus therapy along with vasopressor use. The caveat on this is to be aware of circumstances which can cause shock and identify any factors which may complicate treatment. Traumatic origins may benefit from fluid bolus therapy *after* active bleeding has been controlled (when possible). Cardiogenic shock treatment should be referenced in the **cardiogenic shock protocol (2002.3)**.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> • *Pale skin • *Diaphoresis • *Cool skin • *HR < 60 or >150 	<ul style="list-style-type: none"> • *ALOC/ Unconscious • *Uncontrollable bleeding • *SBP < 90 mmHg • *Narrowing pulse pressure
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) <ul style="list-style-type: none"> • Obtain blood glucose level (a) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Keep patient warm and position appropriately. 4. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 5. Fluid administration (b) Reference (3003.3 Fluid Administration) 6. 12-lead ECG. Reference (3004.8 12-Lead ECG) 7. If hypotension is due to bradycardia or tachycardia, refer to appropriate cardiac protocols (c) reference (2002.7 symptomatic bradycardia), (2002.8 Tachycardia with a pulse) 8. Hypovolemic / Hemorrhagic Shock <ul style="list-style-type: none"> • Causes: external or internal bleeding, dehydration. (d) <ul style="list-style-type: none"> • Control bleeding. Reference (3003.6 Bleeding Control) • Administer TXA (4000.1) (e) • Administer fluid bolus. (3003.3 Fluid Administration) 9. Obstructive Shock <ul style="list-style-type: none"> • Causes: cardiac tamponade, tension pneumothorax 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • Multi-system trauma • Unconscious/ not breathing

<p>reference (3002.1 Chest Decompression), supine hypotension syndrome, pulmonary embolism reference (2004.8 Pulmonary embolism), aortic dissection reference (2004.1 Abdominal pain)</p> <ul style="list-style-type: none">● Treat case per appropriate protocol <p>10. <u>Distributive Shock</u></p> <ul style="list-style-type: none">● <u>Septic</u><ul style="list-style-type: none">● Causes: Infection● Administer fluids Reference (3003.3 Fluid Administration)● Administer antibiotics Reference (4000.1 Cefazolin)● <u>Anaphylactic</u><ul style="list-style-type: none">● Causes: Allergic reaction● Treat per protocol Reference (2004.2 Allergic reaction anaphylaxis)● <u>Neurogenic</u><ul style="list-style-type: none">● Causes: trauma or infection Reference (2003.10 spinal trauma), Reference (4000.1 Cefazolin)● Administer fluids Reference (3003.3 Fluid Administration) <p>11. <u>Cardiogenic Shock</u></p> <ul style="list-style-type: none">● Reference (2002.3 Cardiogenic Shock) <p>12. Treat other associated S/S per appropriate protocol</p> <p>13. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p>	
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Note:

- a. Normal blood glucose range 60-120 mg/dL.
- b. Hang blood "Y" tubing if hypovolemia is due to significant external or suspected internal bleeding.
- c. Symptomatic Bradycardia or Tachycardia with a pulse
- d. Hypotension is permissible. Use mental status, heart rate, and MAP as indicators for fluid administration. Attempt to keep MAP above 60 mmHg.
- e. Tranexamic acid for use in acute hemorrhagic shock patients (<3 hours since onset).

MEDICAL EMERGENCIES
Stroke

Stroke is the third leading cause of death and a major cause of disability. There are two main mechanisms of stroke: Ischemic (85% of all strokes) and hemorrhagic. Ischemic strokes are most commonly caused by vessel thrombosis, although embolism or hypoperfusion are also causes. Thrombosis formation etiology includes atherosclerosis, vessel dissection and some infectious diseases. Hemorrhagic strokes are divided into intracerebral hemorrhage (ICH) and subarachnoid (SAH) hemorrhage. Risk factors for hemorrhage include hypertension, older age, prior stroke, and cocaine use. In the pre-hospital setting it is not currently possible to determine ischemic from hemorrhagic stroke. EMS provider care should focus on recognition of stroke symptoms, pre-hospital stroke screening with the Cincinnati Prehospital Stroke Scale (CPSS) and if the CPSS is positive a follow up VAN assessment while providing emergent transport to a Stroke Center. Early hospital notification of CPSS and VAN results improve patient outcome.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> ● *ALOC ● *Difficulty breathing ● *Collapse ● *Coma ● *Confusion/dizziness ● Mouth drawn to one side of face, drooping 	<ul style="list-style-type: none"> ● Impaired vision ● Loss of function to extremities on one or both sides ● Paralysis of facial muscles ● Loss of expression on face ● Headache ● Personality change
TREATMENTS	
(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. (2000.1 General Patient Care) (a) <ul style="list-style-type: none"> ● Obtain blood glucose level (b) 2. Administer O₂ and assist respiratory status. (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Perform Cincinnati Prehospital Stroke Test. (3004.5 Cincinnati stroke scale) 4. If positive for arm drift perform VAN assessment while enroute to a Stroke Center and report VAN assessment result to the Stroke Center.(c) 5. This is a Time Sensitive Emergency (TSE) – attempt to limit scene time to 10 minutes. Transport decision Reference (1023 Transport guidelines) 6. Provide for patient comfort: <ul style="list-style-type: none"> ● Maintain normothermia ● Place patient in sitting position; with HOB >70° ● Ensure patients head stays in an inline neutral position to aid in venous blood return ● If possible, dim lights in ambulance and minimize patient movement and noxious stimuli 	<ul style="list-style-type: none"> ● Unconscious/ not breathing ● Stroke symptoms < 50 ● ALOC ● Respiratory distress ● Chest pain, age > 40 ● Diabetic ● Seizure ● Severe headache ● Onset of symptoms < 4.5 hrs ● Positive Stroke Test

MEDICAL EMERGENCIES
Stroke

<ul style="list-style-type: none">● Avoid placing c-collar or other devices that may inhibit venous blood return from the head7. Treat other associated S/S per appropriate protocol8. IV/IO access. (3003.1 Vascular access), (3003.2 EZ-IO)9. Fluid administration. (3003.3 Fluid Administration)10. 12-lead ECG. (3004.8 12-Lead ECG)11. Pain / Sedation. (3005.2 Pain management and sedation)12. Continuous capnometry (d) (3002.4 Capnography)13. If suspected elevated ICP and suspected herniation, consider targeted ETCO₂ of 30-35 mmHg (e)14. Critical Care assessment, monitoring, and treatment plan. (2000.2 Critical care assessment, monitoring and treatment)15. For all stroke types maintain SBP > 90 mmHg and administer a vasopressor as needed. (4000.1 norepinephrine), (4000.1 epinephrine)16. For <i>interfacility transports</i>, unless written orders contradict, maintain blood pressures below these thresholds (yet, maintain > 90 SBP). (4000.1 Nicardipine):<ul style="list-style-type: none">a. Ischemic stroke 220 systolic if no TPA given yet 180 systolic if TPA already givenb. Hemorrhagic stroke 160 systolicc. Subdural stroke 140 systolic	
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Note:

- a. Determine time of onset of symptoms if possible. Time is critical for pharmacological intervention. (Onset of symptoms to pharmacological intervention < 4.5 hrs). Ensure assessment and documentation of Last Known Well Time.
- b. Normal glucose levels are 60- 120 mg/dL.
- c. **SEE NEXT PAGE FOR THE VAN ASSESSMENT.**
- d. Although normal CO₂ levels are 35-45 mmHg, treatment of head injury patients center around maintaining CO₂ levels @ 30-35.
- e. Signs of herniation: abnormal posturing, decreased level of consciousness, decreasing GCS, pupillary dilation, and vomiting.

MEDICAL EMERGENCIES
Stroke

Table 1 Vision, aphasia, neglect emergent large vessel occlusion screening tool

Stroke VAN

How weak is the patient?	<input type="checkbox"/> Mild (minor drift) <input type="checkbox"/> Moderate (severe drift—touches or nearly touches ground)
Raise both arms up	<input type="checkbox"/> Severe (flaccid or no antigavity) <input type="checkbox"/> Patient shows no weakness. Patient is VAN negative (exceptions are confused or comatose patients with dizziness, focal findings, or no reason for their altered mental status then basilar artery thrombus must be considered; CTA is warranted)
Visual disturbance	<input type="checkbox"/> Field cut (which side) (4 quadrants) <input type="checkbox"/> Double vision (ask patient to look to right then left; evaluate for uneven eyes) <input type="checkbox"/> Blind new onset <input type="checkbox"/> None
Aphasia	<input type="checkbox"/> Expressive (inability to speak or paraphasic errors); do not count slurring of words (repeat and name 2 objects) <input type="checkbox"/> Receptive (not understanding or following commands) (close eyes, make fist) <input type="checkbox"/> Mixed <input type="checkbox"/> None
Neglect	<input type="checkbox"/> Forced gaze or inability to track to one side <input type="checkbox"/> Unable to feel both sides at the same time, or unable to identify own arm <input type="checkbox"/> Ignoring one side <input type="checkbox"/> None

Patient must have weakness plus one or all of the V, A, or N to be VAN positive.
VAN positive patients had 100% sensitivity, 90% specificity, positive predictive value 74%, and negative predictive value 100% for detecting large vessel occlusion.
CTA, CT angiography; VAN, vision, aphasia, and neglect.

ENVIRONMENTAL EMERGENCIES

Electrocution / Lightning Emergencies

Electrical emergencies are relatively common, complex, and potentially devastating. The manifestations and severity of electrical emergencies encompass a wide spectrum, ranging from a transient unpleasant sensation due to brief contact with low-intensity household current to instantaneous death or massive injury from high-voltage electrocution/lightning injury. Injuries from electricity may include burns to the skin and deeper tissues, cardiac rhythm disturbances, and associated injuries from falls and other trauma. The amperage, voltage, type of current (AC vs DC), duration of contact, tissue resistance, and pathway through the body will determine the type and extent of the injury. Higher voltage, greater current, longer contact, and flow through the heart are associated with more significant injury and worse outcomes. AC voltage may cause V-Fib while DC voltage may cause Asystole. Lightning exposure/contact may result in the most severe form of electrical injury.

SIGNIFICANT FINDINGS		(*AUTOMATIC ALS)
<ul style="list-style-type: none"> Burned areas *Altered LOC *Rapid, weak pulse 		<ul style="list-style-type: none"> Secondary trauma *Hypotension
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. Safely remove patient from electrical source (a) 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Treat cardiac arrest per protocol (2002.2 Cardiac Arrest) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Treat burns (b) (2003.3 Burns) 4. Report trauma level (c) (3004.4 Trauma Leveling) 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. (d) Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 1. Pain / Sedation. Reference (3005.2 Pain management and sedation) 8. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 1. Antibiotic Therapy for open or penetrating trauma. Reference (4000.1 Cefazolin) 9. Treat other associated signs & symptoms per appropriate protocol 10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<ul style="list-style-type: none"> Electrical burns/electrocution >220 volts ALOC Unconscious/not breathing Injuries or burns to the airway, nose, or mouth 	

Note:

- a. Only if trained to do so or wait until source has been removed by trained professional.
- b. Apply dressings. Be sure to locate both the entrance and exit areas.
- c. For transports to trauma centers
- d. A fluid bolus is recommended for significant exposure as it will help keep the kidneys clear of myoglobin and prevent secondary complications.

ENVIRONMENTAL EMERGENCIES

Hyperthermia

Body temperature is contingent on the balance between heat production and heat loss. Regulation of body temperature is dependent upon the principles of conduction, convection, and evaporation. Populations at risk for hyperthermic emergencies include the elderly, the poor (who lack adequate air conditioning), those who suffer from malnutrition and those who have chronic illnesses or substance addiction. Predisposing factors commonly intervene over days rather than minutes or hours. Hyperthermia may occur in the presence of numerous host factors. These factors include many that affect thermoregulation through heat loss mechanisms (lack of acclimatization, fatigue, lack of sleep, dehydration and skin disorders), while others contribute to heat production (obesity, lack of physical fitness, febrile illness, or sustained exercise). Changes in cognitive function appear to occur before the development of the physical symptoms associated with heat stress. Time distortion, memory impairment, or deterioration in attention are frequent cognitive characteristics associated with heat stress.

Heat related illness include:

Heat Cramps:	Heat Exhaustion:	Heat Stroke:
<ul style="list-style-type: none"> • Consist of benign muscle cramping secondary to dehydration • Not associated with an elevated temperature 	<ul style="list-style-type: none"> • Consists of dehydration, salt depletion, dizziness, fever headache, cramping, nausea and vomiting • Indicative vital signs may include tachycardia, hypotension and an elevated temperature 	<ul style="list-style-type: none"> • Consists of an altered mental status • Indicative vital signs may include tachycardia, hypotension, and a temperature of > 104°F (39.5°C)

SIGNIFICANT FINDINGS		(*AUTOMATIC ALS)
<ul style="list-style-type: none"> • Weakness Dizziness/faintness • Severe muscular cramps/pain • *Rapid, shallow breathing • *Seizures 		<ul style="list-style-type: none"> • Rapid, weak pulse • *Pale, clammy skin • *ALOC • *Hot, dry skin
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Remove patient from heat source 4. Cooling measures (b)(c) 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Pain / Sedation. Reference (3005.2 Pain management and sedation) 9. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 		<ul style="list-style-type: none"> • Unconscious/not breathing • ALOC • Signs of shock • Respiratory distress • Syncope or near syncope • Pale, clammy skin • Altered mental status

10. Treat other associated S/S per appropriate protocol 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	
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Note:

- a. Consider humidified O2 to assist with cooling.
- b. Do not delay transport for procedures – perform enroute.
- c. Cooling measures: Remove from heat source/direct sunlight. remove clothing, ice packs to neck, armpits and groin, aggressive evaporative cooling.

ENVIRONMENTAL EMERGENCIES

Hypothermia

Hypothermia is defined as a core temperature less than 95 Fahrenheit. While most commonly seen in cold climates, it may develop without exposure to extreme environmental conditions. Hypothermia is not uncommon in temperate regions and may develop indoors even during summer. Individuals at the extremes of age and those of altered senses are susceptible to developing hypothermia.

Signs & Symptoms

Mild (>93.2 F)	Moderate (86°F/30°C- 93.2°F/34°C)	Severe (<86°F/30°C)
<ul style="list-style-type: none"> Shivering 	<ul style="list-style-type: none"> Confusion/Stupor/Apathy Paradoxical undressing Ataxia 	<ul style="list-style-type: none"> Comatose Bradycardia Prominent J wave (Osborn)

SIGNIFICANT FINDINGS (*AUTOMATIC ALS)			
<ul style="list-style-type: none"> *Temperature of 93.2°F or less *Depressed VS *ALOC *No shivering despite being very cold AMS 	<ul style="list-style-type: none"> *Cold, pale skin Rapid pulse and breathing Poor muscle coordination Shivering 		
TREATMENTS			
<p>(Standing Orders: choose any or all that apply)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <ol style="list-style-type: none"> General Patient Care. (a)(b) Reference (2000.1 General Patient Care) Treat cardiac arrest per protocol (c) Reference (2002.2 Cardiac arrest) Administer O₂ and assist respiratory status. (d) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) Remove wet clothing & keep patient warm (e) Treat frostbite areas by wrapping them with dry dressings (f) Treat other associated S/S per appropriate protocol IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) Fluid administration. (g) Reference (3003.3 Fluid Administration) 12-lead ECG. Reference (3004.8 12-Lead ECG) Pain / Sedation. Reference (3005.2 Pain management and sedation) Consider antiemetic. Reference (3005.5 Nausea and Vomiting) Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) </td><td style="width: 50%; vertical-align: top;"> <p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/not breathing ALOC Signs of shock Respiratory distress Syncope or near syncope Diaphoresis Pale, clammy skin </td></tr> </table>		<ol style="list-style-type: none"> General Patient Care. (a)(b) Reference (2000.1 General Patient Care) Treat cardiac arrest per protocol (c) Reference (2002.2 Cardiac arrest) Administer O₂ and assist respiratory status. (d) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) Remove wet clothing & keep patient warm (e) Treat frostbite areas by wrapping them with dry dressings (f) Treat other associated S/S per appropriate protocol IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) Fluid administration. (g) Reference (3003.3 Fluid Administration) 12-lead ECG. Reference (3004.8 12-Lead ECG) Pain / Sedation. Reference (3005.2 Pain management and sedation) Consider antiemetic. Reference (3005.5 Nausea and Vomiting) Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/not breathing ALOC Signs of shock Respiratory distress Syncope or near syncope Diaphoresis Pale, clammy skin
<ol style="list-style-type: none"> General Patient Care. (a)(b) Reference (2000.1 General Patient Care) Treat cardiac arrest per protocol (c) Reference (2002.2 Cardiac arrest) Administer O₂ and assist respiratory status. (d) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) Remove wet clothing & keep patient warm (e) Treat frostbite areas by wrapping them with dry dressings (f) Treat other associated S/S per appropriate protocol IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) Fluid administration. (g) Reference (3003.3 Fluid Administration) 12-lead ECG. Reference (3004.8 12-Lead ECG) Pain / Sedation. Reference (3005.2 Pain management and sedation) Consider antiemetic. Reference (3005.5 Nausea and Vomiting) Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/not breathing ALOC Signs of shock Respiratory distress Syncope or near syncope Diaphoresis Pale, clammy skin 		

Note:

- a. Assess pulses for a minimum of 30 seconds.
- b. Treat very gently. Do not rub or manipulate the extremities. Keep the patient supine.
- c. Use caution when administering defibrillation and medications as most hypothermic patients will not respond to these attempts until after they have been adequately re-warmed.
- d. Oxygen should be heated if possible – consider use of H900.
- e. Prevent further heat loss. Insulate patient from cold, protect from the wind, eliminate evaporative heat loss by removing wet clothes & by packing the patient with a vapor barrier, cover the head and neck. Place heat packs wrapped in towels around the neck, axilla, and groin areas.
- f. Do not warm frostbitten parts unless able to keep warm. Avoid refreezing.
- g. Use warm fluids if possible.

OBSTETRICAL EMERGENCIES

Pregnancy / Childbirth

Childbirth is a normal, natural process. Occasionally complications do arise. Care of patients in emergencies involving reproductive organs is not a common event. EMS providers must deal with all emergencies in a professional, effective, and compassionate manner. Ensure enough ambulances and personnel are available to treat both mom and newborn(s).

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● Abdominal pain ● Vaginal bleeding Weakness/dizziness ● *Labor before 38 weeks ● *Urge to have a bowel movement ● *ALOC 	
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. (a) Reference (2000.1 General Patient Care) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 2. Place in left lateral recumbent position unless birth is imminent 3. Childbirth imminent: prepare for delivery (b) 4. Initiate postpartum care (c) 5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 6. Fluid administration. Reference (3003.3 Fluid Administration) 7. 12-lead ECG. Reference (3004.8 12-Lead ECG) 8. Treat postpartum hemorrhage with administration of Oxytocin and titrate to effect (d) Reference (4000.1 Oxytocin) 9. For postpartum hemorrhage provide Tranexamic Acid (d) Reference (4000.1 Tranexamic Acid) 10. Treat other associated S/S per appropriate protocol 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 12. Administer blood products. Reference (3003.4 Blood admin.) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/not breathing or ALOC ● Vaginal bleeding with syncope ● Signs of shock ● Labor pains/contractions < 2 min apart, ● 2nd pregnancy contractions < 5 min apart ● Prior delivery with labor lasting < 1 hour ● Bleeding > 20 weeks pregnant ● Delivery ● Abdominal injury w/contractions > 20 weeks ● Seizure > 20 weeks pregnant ● Suspected illicit drug use

Note:

- a. Ask para (live births) and gravida (pregnancies), due date, possibility of multiple births, membrane rupture, vaginal bleeding, prenatal care, use of alcohol and/or recreational drugs.
- b. Be aware of the possibility of multiple deliveries. 1. Delivery (head, shoulders, body) 2. Cut and clamp cord @ least 10" from infant 3. Infant resuscitation as necessary and per protocol or 4. APGAR @ 1 & 5 minutes post-delivery ([3004.6 APGAR](#)) 5. Deliver placenta and deliver to hospital.

- c. **Baby:** Dry, warm, position, suction mouth then nose PRN, and stimulate.
Mother: Massage fundus, encourage breastfeeding.
- d. Only after delivery of the placenta, titrate to control postpartum hemorrhage.

OBSTETRICAL EMERGENCIES

Birth Complications

Although most babies are born without difficulty, complications may occur. Reference the Pregnancy / Childbirth Protocol ([#2006.1](#)) for initial treatment and then consult the following list of possible complications and additional treatments:

Breech Presentation:

The largest part of the fetus (head) is delivered last. In general, breech presentations include buttocks and/or extremity presentations. An infant in breech presentation is best delivered in the hospital setting since an emergency c-section is often necessary. However, if it is necessary to perform a breech delivery in the pre-hospital setting, the following additional procedures should be performed:

- Allow the fetus to deliver spontaneously up to the level of the umbilicus. If the fetus is in a frank presentation, gently extract the legs downward after the buttocks are delivered.
- After the infant's legs are clear, support the baby's body with the palm of the hand and the surface of the arm.
- After the umbilicus is visualized, gently extract a 4"-6" loop of the umbilical cord to allow for delivery without excessive traction on the cord. Gently rotate the fetus to align the shoulder in an anterior-posterior position. Continue with gentle traction until the axilla is visible.
- Gently guide the infant upward to deliver the posterior shoulder.
- Gently guide the infant downward to deliver the anterior shoulder.
- During a breech delivery, avoid having the fetal face or abdomen toward the maternal symphysis.
- The head is often delivered without difficulty. However, be careful to avoid excessive head and spine manipulation or traction.
- If the head does not deliver immediately, action must be taken to prevent suffocation of the infant:
 - Place a gloved hand in the vagina with the palm toward the baby's face.
 - With the index and middle fingers, form a "V" on either side of the infant's nose.
 - Gently push the vaginal wall away from the infant's face until the head is delivered.
 - If unable to deliver infant's head within three (3) minutes, maintain the infant's airway with the "V" formation and rapidly transport to the hospital.

Prolapsed Umbilical Cord:

This occurs when the cord slips down into the vagina or presents externally after the amniotic membranes have ruptured. Fetal asphyxia may rapidly ensue if circulation through the cord is not re-established and maintained until delivery. If the umbilical cord is seen in the vagina, insert two fingers of a gloved hand to raise the presenting part of the fetus off of the cord.

- Position mother in "knee to chest" position to relieve pressure on the cord.
- Instruct mother to "pant" with each contraction to prevent from bearing down.
- Relieve pressure to the cord but do not attempt to reposition or push the cord back into the uterus.
- If assistance is available, apply moist, sterile dressings to the exposed cord.
- Transport to hospital as definitive treatment is an emergency cesarean section.

Shoulder Dystocia:

This occurs when the fetal shoulders impact against the maternal symphysis, blocking shoulder delivery. Delivery entails dislodging one shoulder and rotating the fetal shoulder girdle into the wider oblique pelvic diameter. The anterior shoulder should be delivered immediately after the head.

- Position mother on her left side in a dorsal-knee-chest position to increase the diameter of the pelvis.
- Attempt to guide the infant's head downward to allow the anterior shoulder to slip under the symphysis pubis.
- Gently rotate the fetal shoulder girdle into the wider oblique pelvic diameter. The posterior shoulder usually delivers without resistance.
- Complete the delivery.

Uterine Inversion:

This is a turning "inside out" of the uterus. Signs and symptoms include postpartum hemorrhage with sudden and severe abdominal pain. Hypovolemic shock may develop rapidly.

- Treat for hemorrhagic shock.
- Do not attempt to detach the placenta or pull on the cord.
- Make one (1) attempt to reposition the uterus:
 - Apply pressure with the fingertips and palm of a gloved hand and push the uterine fundus upward and through the vaginal canal.
 - If procedure is ineffective, cover all protruding tissues with moist sterile dressings and rapidly transport to the hospital.

OBSTETRICAL EMERGENCIES

Eclampsia

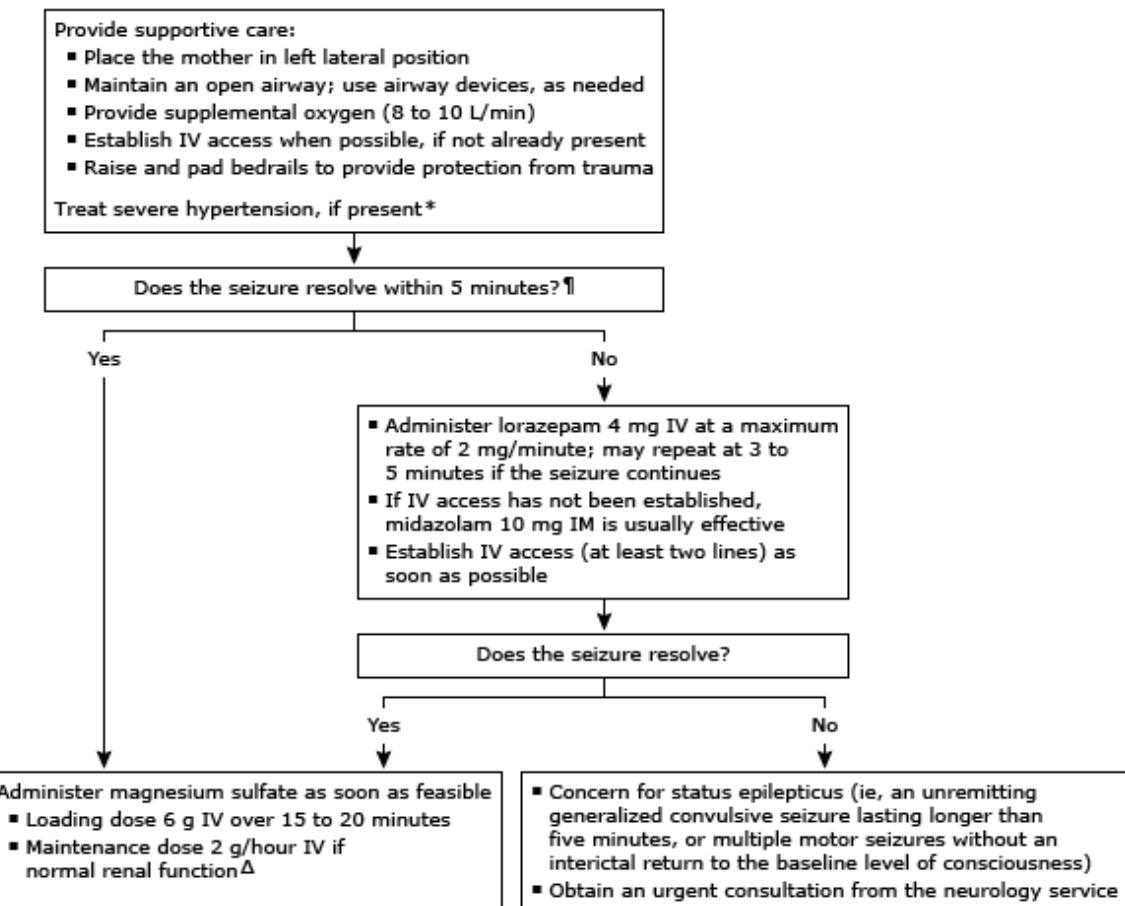
Eclampsia or pre-eclampsia is a toxic state that develops in the last trimester. Pre-eclampsia is characterized by increased blood pressure, fluid retention, headaches, and visual disturbances. Eclampsia, in addition to the signs and symptoms just listed, is characterized by seizure disorders with resultant high morbidity/mortality for both mother and child. Most seizures (95%) stop within 1-2 minutes. Eclampsia may occur up to 2 weeks postpartum.

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> *3rd trimester BP > 140/90 or increase of 15 mmHg above normal BP *Seizures *ALOC 	<ul style="list-style-type: none"> *Unresponsiveness Significant, sudden weight gain Edema of extremities
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care. (a) Reference (2000.1 General Patient Care) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 2. Place in left lateral recumbent position 3. Transport gently (b) 4. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 5. Fluid administration. (c) Reference (3003.3 Fluid Administration) 6. 12-lead ECG. Reference (3004.8 12-Lead ECG) 7. Benzodiazepine (d) Reference (4000.1 Lorazepam), (4000.1 Midazolam) 8. Labetalol (e) Reference (4000.1 Labetalol) 9. Prevention of recurrent seizure with Magnesium (f)(g) Reference (4000.1 Magnesium) 10. Treat other associated S/S per appropriate protocol 11. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> Unconscious/not breathing ALOC Increase of SBP > 15 above normal Seizures

Note:

- a. Check blood glucose levels.
- b. Sirens and flashing lights may precipitate seizures.
- c. Saline lock is preferred
- d. Use for treatment of seizures lasting longer than 2 minutes (Lorazepam 2 mg IV q 5 min is preferred).
- e. If BP is > 160 systolic or 110 diastolic administer labetalol 20 mg over 2 minutes, wait 10 minutes, then if needed 40 mg, and 80 mg at 10 minute intervals (may repeat 80 mg dose 2 times) up to a total of 300 mg. Do not lower diastolic BP to < 100 mmhg

- f. Magnesium sulfate is the antiseizure medication of choice. Treatment is primarily directed at prevention of recurrent seizures rather than control of the initial seizure since the initial seizure is usually of short duration and may occur in a setting where intravenous (IV) access and drugs are not readily available. Magnesium 6 mg/15-20 minutes loading dose, then 2 mg/hour



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- g. Calcium should be immediately available for signs of Magnesium Toxicity.

OBSTETRICAL EMERGENCIES

Complications of Pregnancy

Spontaneous Abortion

Spontaneous abortion is the natural death of an embryo or fetus before the age of viability (24 weeks 0 days). Most common signs are vaginal bleeding with or without pain. Spontaneous abortions are common, although it often goes unrecognized when it is mistaken for a menstrual period. Most spontaneous abortions are indicative of some fetal abnormality incompatible with life. Threatened abortions are vaginal bleeding in the first 20 weeks of pregnancy. This can indicate that a miscarriage is possible. About 15 – 20% of all pregnancies end in spontaneous abortion.

Abruptio Placenta:

This presentation is usually during the third trimester or after twenty (20) weeks of gestation and is a partial or complete separation of the placenta from the wall of the uterus. This condition may present with blood loss ranging from none at all to severe. The patient will most likely complain of severe pain characterized as a “tearing” sensation. The more extensive the abruption (tear), the more likely there will be a more severe pain and greater blood loss.

Ectopic Pregnancy:

An ectopic pregnancy occurs when a fertilized egg is implanted outside the uterus. The egg can settle in the fallopian tubes (tubal pregnancy), in the ovary, abdomen (abdominal pregnancy), or the cervix (cervical pregnancy). These areas do not have enough space for the fetus to develop. As the fetus grows, it will eventually burst the organ that contains it. This can cause severe bleeding and endanger the mother's life. A classical ectopic pregnancy never develops into a live birth.

Symptoms of an ectopic pregnancy can often mirror those of a normal early pregnancy. These can include missed periods, breast tenderness, nausea, vomiting, or frequent urination. Pain is usually the first red flag. The patient might feel pain in the pelvis, abdomen, or, in extreme cases, even the shoulder or neck (if blood from a ruptured ectopic pregnancy builds up and irritates certain nerves). This pain is mostly characterized as “sharp” and “stabbing.” It may concentrate on one side of the pelvis, and it may come and go or vary in intensity. In addition, any of the following symptoms can suggest an ectopic pregnancy: vaginal spotting or bleeding, dizziness or fainting (caused by blood loss), low blood pressure (also caused by blood loss), or lower back pain.

Placenta Previa:

This is a condition where the placenta attaches to the lower portion of the uterus in such a way that it partially, or completely, covers the cervical opening. The implantation of the placenta occurs early in the pregnancy. However, it is usually not discovered nor do complications manifest until the third trimester. Common signs and symptoms include painless bright red vaginal bleeding. As a general rule, all incidents of painless vaginal bleeding during pregnancy are considered to be placenta previa until proven otherwise. Another complication of placenta previa is that the placenta may be the presenting part during delivery, thus it will require an emergency cesarean delivery in the hospital.

Vaginal Bleeding:

Vaginal bleeding during pregnancy is never normal and is always of concern. Though the exact etiology of the bleeding cannot be determined in the pre-hospital setting, the onset of bleeding may provide clues to indicate the etiology. For example, bleeding early in the pregnancy may

suggest an ectopic pregnancy or spontaneous abortion. Third trimester bleeding is often the result of an abruptio placenta or placenta previa, but it may also be the result of trauma. Due to the variable mechanisms for bleeding, the amount of blood loss will vary anywhere from spotting to extensive hemorrhage that will require aggressive resuscitation measures.

NOTE: The visualized amount of vaginal blood loss is NOT a reliable indicator as to the actual amount of blood loss occurring. Visualized blood loss will most likely be out of proportion to the degree of shock. Several of the bleeding etiologies may conceal actual blood loss. Internal vaginal exam by EMS providers should NOT be performed.

SIGNIFICANT FINDINGS (*Automatic ALS)			
<ul style="list-style-type: none"> • *Heavy vaginal bleeding • Passage of tissues • Paleness • Cramp-like pains in lower abdomen • Patients knowledge of pregnancy • *ALOC • *Rapid, weak pulse • *Cool, clammy skin • *Low blood pressure • Previous miscarriages • Previous pregnancy complications 			
TREATMENTS			
(Standing Orders: choose any or all that apply)	<p>***Request Paramedic Evaluation If***</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="vertical-align: top; width: 50%;"> <ol style="list-style-type: none"> 1. General Patient Care. (a) Reference (2000.1 General Patient Care) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 2. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 3. Fluid administration. Reference (3003.3 Fluid Administration) 4. 12-lead ECG. Reference (3004.8 12-Lead ECG) 5. Pain / Sedation. Reference (3005.2 Pain management and sedation) 6. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 7. Treat other associated S/S per appropriate protocol 8. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 9. Administer blood products. Reference (3003.4 Blood admin.) </td><td style="vertical-align: top; width: 50%;"> <ul style="list-style-type: none"> • Unconscious/not breathing • ALOC • Vaginal bleeding with syncope • Signs of shock • Bleeding > 20 weeks pregnant • Abdominal injury, with contractions • Contractions > 20 weeks pregnant • Lower abdominal pain, women age 11-50 with dizziness, syncope or heavy vaginal bleeding • Positive orthostatic changes </td></tr> </table>	<ol style="list-style-type: none"> 1. General Patient Care. (a) Reference (2000.1 General Patient Care) 1. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 2. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 3. Fluid administration. Reference (3003.3 Fluid Administration) 4. 12-lead ECG. Reference (3004.8 12-Lead ECG) 5. Pain / Sedation. Reference (3005.2 Pain management and sedation) 6. Consider antiemetic. Reference (3005.5 Nausea and Vomiting) 7. Treat other associated S/S per appropriate protocol 8. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 9. Administer blood products. Reference (3003.4 Blood admin.) 	<ul style="list-style-type: none"> • Unconscious/not breathing • ALOC • Vaginal bleeding with syncope • Signs of shock • Bleeding > 20 weeks pregnant • Abdominal injury, with contractions • Contractions > 20 weeks pregnant • Lower abdominal pain, women age 11-50 with dizziness, syncope or heavy vaginal bleeding • Positive orthostatic changes
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Note:

- a. History to include last menstrual period and expected due date, para, gravida, blood type, prenatal care, # of fetus in uterus, medication / recreational drug use, and any bleeding.

OBSTETRICAL EMERGENCIES

Newborn Resuscitation

Resuscitation of the newborn can be challenging. Aside from caring for neonates, the pre-hospital care provider must be attentive to and treat the postpartum mother. Most term newborns require no resuscitation beyond mild stimulation, suctioning of the airway, and maintenance of temperature. Only a small number of these newborns require further intervention, such as BVM ventilation and, in severe cases, chest compression and medications. Pediatric resuscitation is challenging because of the technical demands of vascular access and airway control. In addition, the causes of pediatric cardiac arrest are different than those of adults. Cardiac arrest in a child is usually the result of either respiratory failure or shock. A child's body can compensate well during the initial stages of shock. This can rapidly change and lead the pediatric patient into a state of compromise. It is very important for the EMS provider to have a high index of suspicion for possible cardiorespiratory collapse and treat these patients as early as possible. Use of length-based resuscitation guides will aid in the rapid treatment of the newborn. Search for reversible causes based on the history of the pregnancy (i.e.: drug/alcohol use, pre-term – H's and T's).

SIGNIFICANT FINDINGS (*Automatic ALS)	
<ul style="list-style-type: none"> ● *Unresponsive ● *Apneic 	<ul style="list-style-type: none"> ● *Pulseless
TREATMENTS	
<p><i>(Standing Orders: choose any or all that apply)</i></p> <ol style="list-style-type: none"> 1. General Patient Care. Reference (2000.1 General Patient Care) 1. Initiate CPR per procedure (a)(b)(c) 2. Administer O₂ and assist respiratory status. (a) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management) 3. Check for meconium (d) 4. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO) 5. Fluid administration. (e) Reference (3003.3 Fluid Administration) 6. 12-lead ECG. Reference (3004.8 12-Lead ECG) 7. Consider reversible causes and treat appropriately i.e. H's and T's 8. Insert NG tube per procedure (f) 9. Epinephrine Reference (4000.1 epinephrine) 1. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● This is an automatic ALS response

Note:

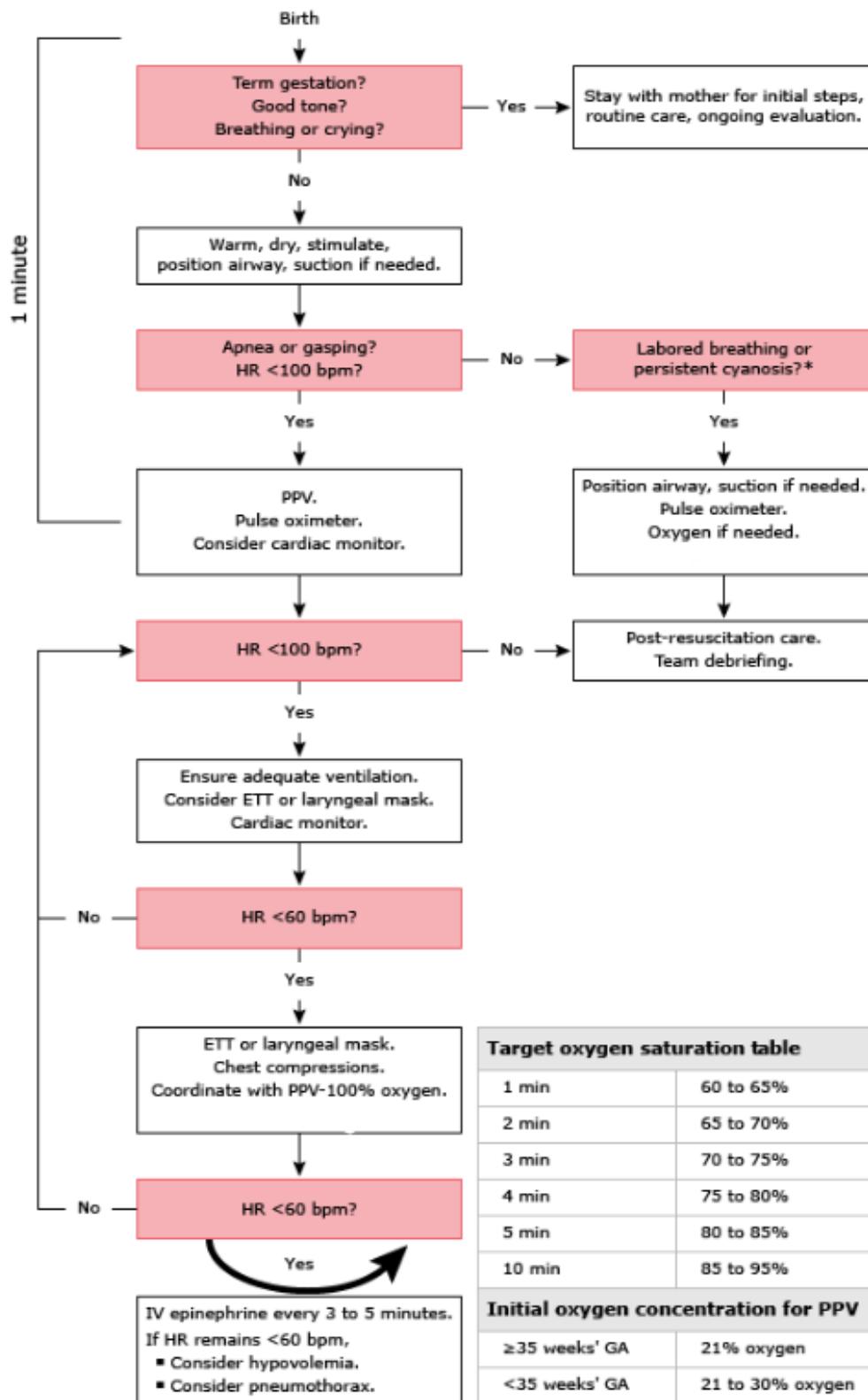
- a. Apneic or HR <100: PPV with 100% O₂; HR <60: PPV with 100% O₂ and chest compressions @ 3:1. Be sure to follow current PALS guidelines.
 - **Targeted Preaductal (taken in the right hand) SpO₂ after birth:**
1. 1 min = 60%-65%

Treatment Protocols**OBSTETRICAL EMERGENCIES: Newborn Resuscitation**

- 2. 2 min = 65%-70%
- 3. 3 min = 70%-75%
- 4. 4 min = 75%-80%
- 5. 5 min = 80%-85%
- 6. 10 min = 85%-95%

- Consider FiO₂ concentrations other than 100% post-resuscitation
- b. If ALS ETA delayed, consider rendezvous/transport after contact with incoming ALS unit.
- c. Check blood glucose levels
- d. Is meconium present?
 - **No:** Deep suction is NOT needed.
 - **Yes:** Is the newborn vigorous? (To answer, check the following: 1. HR>100/min, 2. Good crying effort, 3. Good muscle tone).
 1. **Yes:** if you can answer "yes" to two or more, then newborn is "vigorous" and no deep suction is needed.
 2. **No:** if you can answer "no" to two or more, the newborn is depressed. Consider using a BVM with PEEP valve attached to provide CPAP to the neonate. If CPAP does not improve the patient's condition consider intubation and use suction to clear the trachea of meconium (use meconium aspirator). Then use BVM and provided positive pressure ventilation.
- e. Fluid bolus **only** if suspected hypovolemia (10 cc/kg) or Dextrose if hypoglycemia (<50 mg/dL) administer 0.5-1.0 mg/kg; D10W = 5-10mL/kg; do not use D50).
- f. Gastric inflation greatly reduces the ability to ventilate the newborn. Insert NG tube after intubation.

Neonatal resuscitation algorithm



Retrieved 8/23/2023 from:
www.uptodate.com/contents/image?imageKey=PEDS%2F140126&topicKey=PEDS%2F5015&search=newborn%20resuscitation&rank=1~150&source=see_link

OBSTETRICAL EMERGENCIES

Preterm Labor

Preterm labor is regular/rhythmic uterine contractions that cause cervical changes after 20 weeks, but prior to, 37 weeks gestation. Not all women with preterm labor will feel these contractions. Infection is a major cause of preterm labor. Premature rupture of membranes (rupture of the amniotic sac prior to 37 weeks gestation) without previous contractions is another common cause. Suspect preterm labor when contractions are 10 minutes or less apart for 1 hour or longer. Pregnant women with nonspecific abdominal complaints should be assessed for preterm labor. Palpation of the fundus of the uterus should be done. Contractions are best felt at the fundus. When palpating the uterus also note fetal movement. Do not attempt intravaginal cervical examination. Prehospital administration of tocolytics may not stop labor but may delay delivery sufficient to provide betamethasone (a glucocorticoid steroid) for development of fetal lung prior to delivery.

SIGNIFICANT FINDINGS (*Automatic ALS)	
• *Unresponsive	• Hemorrhaging
(Standing Orders: choose any or all that apply)	***Request Paramedic Evaluation If***
<ol style="list-style-type: none">1. General Patient Care. Reference (2000.1 General Patient Care)2. Administer O₂ and assist respiratory status. Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)3. Place patient in Left or Right lateral position for transport.(a)4. Assess fetal movements/pattern5. Determine contraction pattern6. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO)7. Fluid administration.(b) Reference (3003.3 Fluid Administration)8. Tocolytic medication administration as appropriate.(c)9. 12-lead ECG. Reference (3004.8 12-Lead ECG)10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	<ul style="list-style-type: none">• This is an automatic ALS response

Note:

- a. This is done to prevent supine hypotensive syndrome by removing the fetus from putting pressure in the inferior vena cava.
- b. Assess patient's lung sounds and for hypertension. If neither are present consider 1 Liter NS bolus. This acts as a tocolytic and may delay labor enough to allow transport.
- c. Tocolytic medication as available see formulary: Magnesium, Terbutaline.

PEDIATRIC CARDIAC EMERGENCIES

Asystole / PEA

Cardiopulmonary arrest in infants and children is usually the end result of deterioration in respiratory and circulatory function. Injury is the leading cause of death in children between 1 - 16 years. Other etiologies include, but are not limited to severe dehydration, Sudden Infant Death Syndrome, congenital anomalies, airway obstruction, bacterial and/or viral infections, sepsis, asthma, hypothermia, and drug overdose. A common mistake in pediatric cardiac arrest care is to forego treatment at the scene and instead just "load and go." Use of a length-based resuscitation guide is recommended. Remember to search for and treat reversible causes:

- | | |
|-------------------------|--------------------------------|
| Hypovolemia | Tablets (drug OD, accidents) |
| Hypoxia | Tamponade, cardiac |
| Hydrogen ion (acidosis) | Tension Pneumothorax |
| Hyper/Hypokalemia | Thrombosis, coronary (ACS) |
| Hypothermia | Thrombosis, pulmonary embolism |
| Hypoglycemia | Trauma |

TREATMENTS

(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care. (a) Reference (2000.1 General Patient Care)2. Initiate CPR per procedure (b) Reference (3003.7 Cardiopulmonary arrest)3. Check for Pseudo-PEA (c)4. Administer O₂ and assist respiratory status. (d)(e) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)5. IV/IO access. Reference (3003.1 Vascular access), (3003.2 EZ-IO)6. Fluid administration. (f) Reference (3003.3 Fluid Administration)7. Epinephrine Reference (4000.1 epinephrine)8. Use specific intervention if cause is known.9. Consider transport (g)(h)10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	

Note:

- a. Confirm asystole in two (2) or more anatomically contiguous leads.
- b. Compression to ventilation ratio is 30:2 for 1 rescuer and 15:2 for 2 rescuers.
- c. Pulse ox, BP, CO₂.
- d. CPR should not be stopped for intubation attempts. After placement of advanced airway ventilations should be performed one breath every 2-3 seconds with no pause in compressions.
- e. Gastric inflation greatly reduces the ability to ventilate the pediatric patient. Insert gastric tube after intubation.
- f. <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- g. The hospital has resources readily accessible to help the family start the grieving and healing process. These resources are not available at the scene on an emergency and should be utilized.
- h. Cessation of efforts should only be considered after contacting Medical Control. Reference ([1011 Medical Control](#))

PEDIATRIC CARDIAC EMERGENCIES

Symptomatic Bradycardia

Bradycardia is an *ominous* sign of impending cardiac arrest in infants and children, especially if it is associated with hypotension or evidence of poor tissue perfusion. Out of hospital treatment is directed to the **symptomatic patient only**. Primary heart block is rare in children. Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia and/or late shock. Bradycardia may be a late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, hyperglycemia and/or previous neurosurgery. Rarely, a toxic ingestion can cause bradycardia. Heart rates that are normal in older patients may be bradycardia in children. Use of a length-based resuscitation guide is recommended. Remember to search for and treat reversible causes:

Hypovolemia	Tablets (drug OD, accidents)
Hypoxia	Tamponade, cardiac
Hydrogen ion (acidosis)	Tension Pneumothorax
Hyper/Hypokalemia	Thrombosis, coronary (ACS)
Hypothermia	Thrombosis, pulmonary (embolism)
Hypoglycemia	Trauma

TREATMENTS

(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care. Reference (2000.1 General Patient Care)1. Administer O₂ and assist respiratory status. (a) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)2. EKG, 12-lead ECG. Reference (3004.8 12-Lead ECG)3. IV/IO access. (b) Reference (3003.1 Vascular access), (3003.2 EZ-IO)4. If signs of diminished perfusion and heart rate < 60 despite adequate oxygenation & ventilation begin CPR (c) Reference (3003.7 Cardiopulmonary arrest)5. Epinephrine Reference (4000.1 epinephrine)6. Atropine (if bradycardia is due to vagal stimulation or primary block) Reference (4000.1 Atropine)7. Use transcutaneous pacing if bradycardia is due to 2nd degree type II or third-degree heart blocks or sinus node dysfunction that does not respond to the above treatments8. Use specific intervention if cause is known1. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	

Note:

- a. Search for and treat hypoxia immediately—1st with simple devices and then with invasive procedures if needed.

- b.** <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- C.** Compression to ventilation ratio is 30:2 for 1 rescuer and 15:2 for 2 rescuers. Follow current PALS guidelines.

PEDIATRIC CARDIAC EMERGENCIES

Tachycardia (with a pulse)

In general, tachycardia is well-tolerated in the infant and young child. Tachyarrhythmias may cause nonspecific signs and symptoms that differ according to the age of the child. Clinical findings may include palpitations, lightheadedness, and syncope. In infants who are at home, the tachyarrhythmia may be undetected for long periods (e.g., for hours or days) until cardiac output is significantly compromised and the infant develops signs of congestive heart failure such as irritability, poor feeding, and rapid breathing. Episodes of extremely rapid heart rate may be life threatening if cardiac output is compromised. The decision of whether to treat tachycardia in the field depends on whether signs of shock are present.

- **Sinus tachycardia** - rate greater than normal for age. Rates 200-220 are common in infants. Causes: Pain/stress, anger, fever, or hypovolemia. Rhythm is regular with normal P to R intervals and normal QRS duration. Rate can vary with the child's activity. Termination is gradual.
- **Supraventricular tachycardia** - rate greater than normal for age. Rates > 240 are common in infants. Rhythm is regular. P waves are difficult to identify. There is a normal QRS duration in > 90% of patients. Rate is fixed; it does not vary with child's activity. Termination is abrupt.
- **Ventricular (wide QRS) tachycardia** - rate > 120 beats/minute, wide QRS, P waves not usually identifiable. This is very uncommon in children.

PARAMEDIC TREATMENT

(Standing Orders: choose any or all that apply)	(Physician Orders)
<p>Narrow QRS</p> <p>Sinus Tachycardia</p> <p><i>Adequate (Stable) & Inadequate Perfusion (unstable):</i></p> <ol style="list-style-type: none">1. Fluid bolus if hypovolemia suspected (b) Reference (3003.3 Fluid Administration)2. Identify and treat underlying cause <p>Supraventricular Tachycardia</p> <p><i>Adequate Perfusion (Stable):</i></p> <ol style="list-style-type: none">1. Consider vagal maneuvers2. Adenosine Reference (4000.1 Adenosine) <p><i>Inadequate Perfusion (Unstable):</i></p> <ol style="list-style-type: none">3. Adenosine (f) Reference (4000.1 Adenosine)	

PEDIATRIC CARDIAC EMERGENCIES: Tachycardia (with a pulse)

<p>4. Synchronized cardioversion (d) 5. Pain / Sedation. Reference (3005.2 Pain management and sedation) Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)</p> <p>Wide QRS (with a pulse)</p> <p><i>Adequate Perfusion (Stable):</i></p> <ul style="list-style-type: none">Identify and treat cause1. Amiodarone or other antidysrhythmic Reference (4000.1 Amiodarone)2. May attempt Adenosine (c) Reference (4000.1 Adenosine) <p><i>Inadequate Perfusion (Unstable):</i></p> <ul style="list-style-type: none">3. Synchronized cardioversion (d)4. Pain / Sedation. Reference (3005.2 Pain management and sedation)5. Amiodarone prior to 3rd shock (e) Reference (4000.1 Amiodarone)6. May attempt Adenosine if not already administered (c) Reference (4000.1 Adenosine)	
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Note:

- a. H's and T's
- b. <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- c. Adenosine may convert the dysrhythmia if the underlying rhythm is SVT with aberrant conduction.
- d. 0.5 to 1 J/kg; if not effective, increase to 2 J/kg. Sedate if possible, but do not delay cardioversion.
- e. Use only if 2nd shock (2 J/kg) is unsuccessful or if tachycardia reoccurs quickly.
- f. Administration of Adenosine should not delay cardioversion. Do not administer in *true* ventricular tachycardia.

PEDIATRIC CARDIAC EMERGENCIES

V-Fib / V-Tach (Pulseless)

Cardiopulmonary arrest, as manifested by ventricular fibrillation or pulseless ventricular tachycardia, is quite rare in infants and children and is usually the end result of deterioration in respiratory and circulatory function. Common causes can be sepsis, foreign body aspiration, SIDS, traumatic hemorrhages, and meningitis. Primary cardiac insults are rare but may be due to congenital heart disease, myocarditis or primary dysrhythmias.

TREATMENTS	
(Standing Orders: choose any or all that apply)	(Physician Orders)
<ol style="list-style-type: none">1. General Patient Care. Reference (2000.1 General Patient Care)2. Initiate CPR per procedure (a) Reference (3003.7 CPR)3. Electrical therapy (b)4. Administer O₂ and assist respiratory status. (c) Reference (3001.1 Basic Airway Management), (3001.2 Advanced Airway Management)5. IV/IO access. (e) Reference (3003.1 Vascular access), (3003.2 EZ-IO)6. Fluid administration. (d) Reference (3003.3 Fluid Administration)7. Epinephrine Reference (4000.1 epinephrine)8. Amiodarone Reference (4000.1 Amiodarone)9. Treat other associated S/S per appropriate protocol10. Critical Care assessment, monitoring, and treatment plan. Reference (2000.2 Critical care assessment, monitoring and treatment)	

Note:

- a. Compression to ventilation ratio is 30:2 for 1 rescuer and 15:2 for 2 rescuers.
- b. Emphasis should be placed on effective CPR. Assess for and shock VF/pulseless VT once at 2 J/kg. Second shock at @ 4 J/kg, subsequent doses may increase up to 10 J/kg.
- c. CPR should not be stopped for intubation attempts. After placement of advanced airway ventilations should be performed one breath every 2-3 seconds with no pause in compressions.
- d. <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- e. If any delay in IV access is anticipated, IO should be selected as venous access method of choice.

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Allergic Reaction / Anaphylaxis

Allergic reactions can range from mild local eruptions to severe and life-threatening systemic illnesses. The most common presenting complaints involve the dermatologic and respiratory systems, but gastrointestinal and cardiovascular involvement also occur frequently. Allergic reactions are generally divided into three degrees of severity:

- **Mild:** Patient presents with mild swelling and urticaria (hives). Symptoms are resolved with the administration of diphenhydramine.
- **Moderate:** Patient presents with swelling, urticaria, and wheezes. Symptoms resolved with nebulizer treatments and administration of diphenhydramine.
- **Severe:** Patient presents in extremis (Wheezes, urticaria, dyspnea, shock, etc...). Symptoms are resolved with aggressive treatment including nebulizer treatments, diphenhydramine, epinephrine, steroid therapy, fluid administration, and dopamine as needed.

Patients should be classified, during assessment, according to severity and then treated appropriately.

SIGNIFICANT FINDINGS		(*Automatic ALS)
<ul style="list-style-type: none"> ● *Blueness around lips ● *Low blood pressure ● Flushing around face and chest ● Itching, hives ● *ALOC 		<ul style="list-style-type: none"> ● *Difficulty Breathing ● *Chest pain ● Nausea, vomiting ● *Weak, rapid pulse
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i> <ol style="list-style-type: none"> 1. General Patient Care monitoring and treatment plan (a) 1. Administer O₂ and assist respiratory status per basic and advanced procedures 2. Diphenhydramine for mild allergic reaction 3. Add inhaled beta agonist for moderate allergic reaction albuterol and or ipratropium bromide 4. Add epinephrine for severe anaphylaxis (b) 5. IV/IO access 6. Fluid administration (c) 7. Consider 12-lead ECG 8. Administer corticosteroid reference 4000.1 Formulary 9. Treat other associated S/S per appropriate protocol 10. Critical Care assessment, monitoring, and treatment plan 11. Administer a vasopressor as needed. Titrate to patient's hemodynamic status. Reference (4000.1 norepinephrine), (4000.1 epinephrine) (d) 		
		Request Paramedic Evaluation If
		<ul style="list-style-type: none"> ● Unconscious/ not breathing ● Cannot speak full sentences ● Swelling tongue, throat ● Diaphoresis ● Syncope ● Hx of anaphylaxis

Note:

- a. Anaphylaxis is an extreme emergency since cardiac arrest can occur. Do not delay treatment or transport.
- b. A single dose of epinephrine may not reverse the effects of anaphylaxis. Administer additional epinephrine or epinephrine auto-injector as needed.
- c. Titrate to patient's blood pressure (age appropriate). <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- d. Use only to maintain BP if fluid challenge is ineffective

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Altered Level of Consciousness

ALOC can be such a major variance, especially in pediatrics with no known medical history, that immediate supportive efforts may be required. Hypoxia is a common cause in pediatric ALOC – start with basic oxygenation combined with basic adjunctive airway procedures. Patients without a gag reflex, that do not respond after oxygenation and basic airway maneuvers, may need advanced airway control. If C-spine fracture is suspected or if the mechanism of ALOC is unknown, the neck **must** be stabilized while the airway is secured. Search for specific causes of the ALOC, as they can be varied, but maintain a high index of suspicion for trauma, whether intentional or accidental, in patients with seizures. Finally, obvious major bleeding should be stopped before a detailed neurological examination is initiated.

SIGNIFICANT FINDINGS		(*AUTOMATIC ALS)
<ul style="list-style-type: none"> ● Medic alert tag ● *Evidence of trauma ● *Hyper/ hypotension ● *Abnormal/ unusual breathing 		<ul style="list-style-type: none"> ● Breath odor ● *ALOC ● *Evidence of drug, alcohol, chemical use / ingestion ● *Diaphoresis
TREATMENTS		
<i>(Standing Orders: choose any or all that apply)</i>		***Request Paramedic Evaluation If***
<ol style="list-style-type: none"> 1. General Patient Care, monitoring and treatment plan 2. Administer O₂ and assist respiratory status per basic and advanced procedures 3. Find cause of altered LOC and treat appropriately (AEIOUTIPS pneumonic) (a) 4. Treat other associated S/S per appropriate protocol 5. IV/IO access 6. Fluid administration 7. Consider 12-lead ECG 		<ul style="list-style-type: none"> ● Unconscious/ not breathing ● Multiple syncopal episodes in same day ● Respiratory distress

Note:

A – Alcohol (overconsumption or withdrawal)

E – Epilepsy (seizure)

I – Insulin (overdose in diabetic patients)

O – Overdose (drugs)

U – Uraemia (renal failure)

T – Trauma

I – Infection (sepsis)

P – Psychiatric condition

S – Stroke/Shock

- a.
- b. Common Causes in Pediatrics: Hypoxia, fever / infection, hypoglycemia, trauma, poisoning, or seizure / neurological disorder. Treat specific cause per protocol.
- c. Titrate to patient's blood pressure (age appropriate). <1 month old: 10 cc/kg, >1 month old: 20 cc/kg
- d. Bradycardia is a strong indicator for hypoxia.

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Respiratory Distress

Respiratory distress is a clinical state characterized by tachypnea and increased respiratory effort. Respiratory distress can be associated with changes in airway sounds, skin color, and mental status. Respiratory distress ranges from mild to severe. Understand that severe respiratory distress may be an indication of respiratory failure. Respiratory distress or failure may be classified as one or more of the following types: Upper Airway Obstruction, Lower Airway Obstruction, Lung Tissue Disease, and Disordered Control of Breathing. The goal of treatment is to support/restore adequate oxygenation and ventilation. (*PALS Provider Manual, 2006*)

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none">• Nasal flaring• *Retractions• *Stridor	<ul style="list-style-type: none">• Wheezing• Grunting• Pale/Cool Skin
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none">1. General Patient Care, monitoring and treatment plan2. Administer O₂ and assist respiratory status per basic and advanced airway management procedures3. Consider inhaled beta agonist; albuterol and/or ipratropium bromide4. Consider epinephrine IM, IV/IO, inhaled as appropriate5. Treat other associated signs and symptoms per appropriate protocol6. IV/IO access7. Fluid administration8. Consider 12-lead ECG9. Critical Care assessment, monitoring, and treatment plan	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none">• Changes in mental status• Tachypnea• Tachycardia

Note:

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Burns

Burns are the second leading cause of death in children. They are the leading cause of accidental death in the home for children under 14. Burns may be chemical, thermal, or electrical. The most common burn emergency encountered by EMS is scalding. Burns are classified by degree:

- **First Degree** (superficial) some reddening,
- **Second Degree** (partial thickness) has blistering and deep reddening,
- **Third Degree** (full thickness) causes damage to all skin layers and is either charred/black or white/leathery with little or no pain at the site.

The patient's palm equals 1% of body surface area when determining the area affected. This is sometimes more helpful than using the "rule of nines" especially with pediatric patients. Consider transport to Burn Center for burn management.

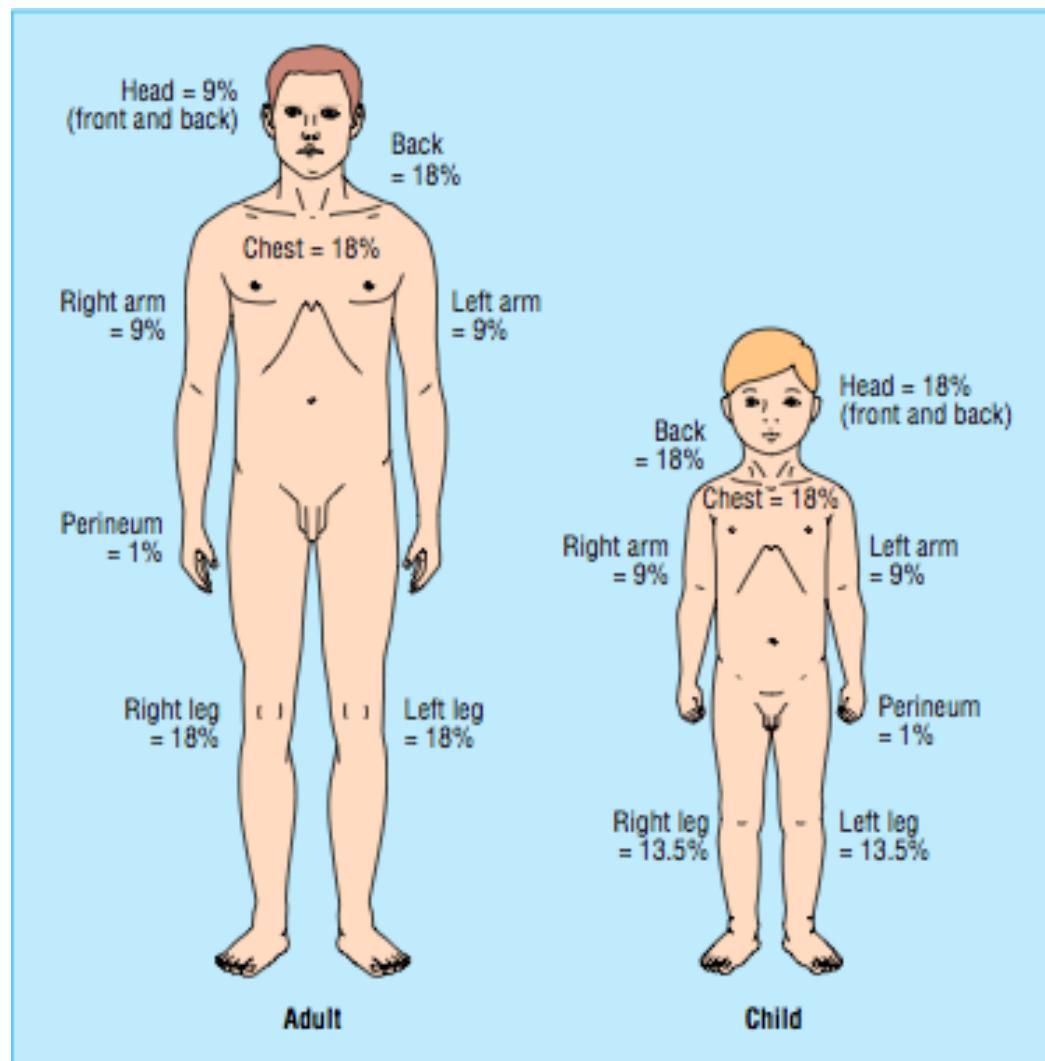
Consider the following when managing pediatric burn patients: provide prompt management of the airway, as swelling can develop rapidly; if intubation is indicated the use of an ET tube 2 sizes smaller than normal may be required; thermal burns predispose children to hypothermia – maintain patient's body heat; serious electrical burns may cause musculoskeletal injury – perform spinal immobilization.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> ● *% of Body surface area burned (a)(g) a. >10% Body surface area with 3rd degree burns b. >15% Body surface area with 2nd degree burns c. >30% body surface area with 1st degree burns 	<ul style="list-style-type: none"> ● *Unconscious/not breathing ● *Singed nasal hairs or mouth ● *Signs of poor perfusion ● *Hoarseness ● *Rapid, weak pulse ● *ALOC ● *Difficulty breathing ● *Secondary trauma
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care, monitoring and treatment plan 2. Administer O₂ and assist respiratory status per basic and advanced airway management procedures (e) 3. Treat burn (c) 4. Assume hypothermia exists in significant burns; prevent and treat as appropriate. 5. Consider transporting patient in fowlers/semi-fowlers position 6. IV/IO access 7. Fluid administration (f) 8. Consider 12-lead ECG 9. Pain / Sedation 10. Consider antiemetic 11. Critical Care assessment, monitoring, and treatment plan 12. Administer blood products 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> ● Unconscious/not breathing ● ALOC ● Burns to airway, nose, or mouth ● Respiratory distress ● Hoarseness, difficulty talking/swallowing ● Electrical burns/electrocution @ 220 volts or greater

Note:

- a. Criteria for rapid transport to burn center
- b. Remove electrical source if trained to do so safely. Remove patient's clothing as appropriate. Brush off solid/dry chemicals. Remove rings, bracelets, and other constricting items.

- c. **Thermal Burns:** Cover burned area with dry, sterile dressing. Cool or room temperature saline soaks for pain relief in 1st & 2nd degree burns if < 10% of BSA.
Chemical Burns: Continue to flush with water for 20 minutes (should be performed enroute). If eyes are involved, flush for 20 -25 minutes then cover with moistened pads. (Remove contact lenses if present).
Electrical Burns: Apply dry, sterile dressing, Monitor for arrhythmia, and treat per appropriate protocol. Consider fluid therapy.
- d. Airway burns have airway and intubation equipment ready for emergent intervention if condition worsens- aggressive airway management is always a priority in the pediatric trauma patient. Most experienced provider should establish airway. There may not be more than one attempt possible due to swelling.
- e. Fluid calculation: 2 ml of NS x kg x % of second- and third-degree burns (1/2 of this total is given over the 1st 8 hours and the remaining given over the next 16 hours).
- f. Look for 12-lead EKG changes that suggest Hyperkalemia and treat per procedure.
- g.



PEDIATRIC EMERGENCIES

Pediatric Emergencies: Hypoglycemia

Blood glucose monitoring is important in shock management. Hypoglycemia is a common finding in seriously ill children and it can result in brain injury if it is not recognized and effectively treated (*PALS Course Guide, 2006*). Hypoglycemia may be difficult to recognize. Infants and children may be asymptomatic even though they are hypoglycemic. Other children may have clinical signs of hypoglycemia that are nonspecific and are also present with hypoxemia, ischemia, or shock. In addition to the measured glucose concentration thresholds listed below, symptomatic hypoglycemia is defined by the presence of clinical symptoms such as ALOC, sweating, tachycardia, or decreased perfusion. The following lowest acceptable glucose concentrations can be used to define hypoglycemia:

AGE	Consensus Definition of Hypoglycemia
Preterm neonates	≤ 45 mg/dL
Term neonates	
Infants, Children, and Adolescents	≤ 60 mg/dL <i>(PALS Provider Manual, 2015)</i>

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> • Poor perfusion • Diaphoresis • Tachycardia • *Patient less than 1 year old 	<ul style="list-style-type: none"> • Hypothermia • Irritability/Lethargy/*ALOC • *Hypotension

TREATMENTS	***Request Paramedic Evaluation If***
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care, monitoring and treatment plan <ul style="list-style-type: none"> • Obtain blood glucose level 1. Administer O₂ and assist respiratory status per basic and advanced airway management procedures 2. If ALOC, position left lateral recumbent 3. Consider oral Glucose (a) 4. Reassess BGL, treat as indicated (b) 5. Treat other associated signs and symptoms per protocol 6. IV/IO access 7. Fluid administration 8. Consider Dextrose (c), (d) 9. Consider 12-lead ECG 1. Critical Care assessment, monitoring, and treatment plan 	<ul style="list-style-type: none"> • Patient fails to improve with treatment

Note:

- a. Patient must be awake, have a patent airway, and an intact gag reflex.
- b. Give complex carbohydrate (i.e. peanut butter, if no allergy) as soon as patient is able to eat.
- c. Children less than 8 years old should not receive dextrose in solutions more hypertonic than D₁₀W.
- d. Flush IV with NS after administration of Dextrose.

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Seizure

A seizure is a period of altered neurologic function caused by abnormal neuronal electrical discharges. Approximately 1% - 2% of the general population has recurrent seizures. Generalized seizures begin with abrupt loss of consciousness. If motor activity is present, it may symmetrically involve all four extremities. Episodes that develop over minutes to hours are less likely to be seizures. Most seizures only last 1– 2 minutes. Patients with seizure disorders tend to have stereotype, or similar, seizures with each episode and are less likely to have inconsistent or highly variable attacks. True seizures are usually not provoked by emotional stress. Most seizures are followed by a postictal state of lethargy and confusion. Pediatric patients are acutely sensitive to hypoxia, and seizures often are a manifestation of cerebral hypoxia. When appropriate, aggressively assess and establish adequate airway and oxygenation.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none">● *ALOC● *Head or mouth trauma● Age inappropriate incontinence	<ul style="list-style-type: none">● *Ongoing seizure activity, lasting longer than 5 minutes● Medical alert tag
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none">1. Protect patient from injury2. General Patient Care, monitoring and treatment plan<ul style="list-style-type: none">● Obtain blood glucose level (a)1. Administer O₂ and assist respiratory status per basic and advanced airway management procedures3. IV/IO access4. Fluid administration5. Consider 12-lead ECG6. Administer anticonvulsants (b) lorazepam, midazolam7. Treat other associated signs and symptoms per appropriate protocol1. Critical Care assessment, monitoring, and treatment plan	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none">● Unconscious/ not breathing● Seizures > 5 min or status seizures● First time seizure● Diabetic● Secondary to illicit drugs● Secondary to recent head trauma

Note:

- a. Normal blood glucose levels are:
 - neonate ≥ 45 mg/dL
 - infant/children/adolescents ≥ 60 mg/dL
- b. Consider intranasal or intramuscular for rapid administration. Refer to formulary for dosages.

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Shock

Shock is a critical condition that results from inadequate delivery of oxygen and nutrients to the tissues relative to tissue metabolic demand. It is often, but not always, characterized by inadequate perfusion. The definition of shock does not depend on blood pressure; shock may occur with a normal, increased, or decreased blood pressure. In children most shock is characterized by low cardiac output, but some forms of shock may have a high cardiac output, such as in sepsis or in the child with severe anemia. All forms of shock can result in impaired function of vital organs, such as the brain (depressed mental status) and kidneys (low urine output, ineffective filtering). Shock can result from:

- **HYPVOLEMIC / HEMORRHAGIC SHOCK:** Inadequate blood volume or inadequate oxygen-carrying capacity.
- **DISTRIBUTIVE SHOCK:** Inappropriately distributed blood volume (Sepsis, anaphylaxis, or neurogenic).
- **CARDIOGENIC SHOCK:** Impairment of heart contractility.
- **OBSTRUCTIVE SHOCK:** Obstructed blood flow.

The treatment goal for shock is to prevent end-organ injury and halt the progression to cardiopulmonary failure and arrest. (*PALS Provider Manual, 2015*)

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> • Weak, rapid pulse with hypotension • *Respiratory distress • Fever / infection • Hives / rash 	<ul style="list-style-type: none"> • *ALOC • *Pulmonary Edema • Delayed capillary refill • Pale, cool, diaphoretic skin
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. <u>General Patient Care</u>, monitoring and treatment plan (a) <ul style="list-style-type: none"> • Obtain blood glucose level 2. Administer O₂ and assist respiratory status per <u>basic</u> and <u>advanced</u> airway management procedures 3. Warm patient and position appropriately 4. Treat other associated S/S per appropriate protocol 5. <u>IV/IO</u> access 6. <u>Fluid administration</u> (b) 7. Consider <u>12-lead ECG</u> 8. If hypotension is due to bradycardia or tachycardia, refer to appropriate cardiac protocols 9. <u>Hypovolemic / Hemorrhagic Shock</u> <ul style="list-style-type: none"> • Causes: external or internal bleeding, dehydration, illness. • <u>Administer fluids</u> 10. <u>Obstructive Shock</u> <ul style="list-style-type: none"> • Causes: cardiac tamponade, <u>tension pneumothorax</u>, supine hypotension syndrome, pulmonary embolism, aortic dissection • Treat specific cause if determined • Rapid transport 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • ALOC • Respiratory distress • Signs of CHF • Cyanosis • Weak central pulses

<p>11. Distributive Shock</p> <ul style="list-style-type: none">• <u>Septic</u><ul style="list-style-type: none">• Causes: Infection• Administer fluids• Administer antibiotics• Consider vasopressor: epinephrine, norepinephrine• <u>Anaphylactic</u><ul style="list-style-type: none">• Causes: Allergic reaction• Treat per pediatric anaphylaxis protocol• <u>Neurogenic</u><ul style="list-style-type: none">• Causes: trauma or infection• Administer fluids• Consider vasopressor: epinephrine, norepinephrine <p>12. Cardiogenic Shock</p> <ul style="list-style-type: none">• Causes: Heart failure, MI, dysrhythmias, valvular disorders• Treat underlying cause first• Consider vasopressor: epinephrine, norepinephrine <p>2. Critical Care assessment, monitoring, and treatment plan</p> <p>3. Administer blood products</p>	
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Note:

- a. Shock can be an extreme emergency since cardiac arrest can occur. Do not delay treatment or transport.
- b. Titrate to patient's blood pressure (age appropriate). <1 month old: 10 cc/kg, >1 month old: 20 cc/kg. Use of warmed IV fluids is optimal. Verify and re-verify clear lung sounds before each fluid bolus administration.

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Toxicological Emergencies

There were more than 2.7 million toxic exposures reported to U.S. poison control centers in 2003. This included accidental and intentional drug use, drug abuse, and environmental exposures (envenomations, plant ingestions, and so on). 125,000 cases resulted in moderate or major medical effect and 1,106 fatalities were reported. Over 75% of cases involved ingestion, 7.5% dermal exposure, 5.8% inhalational exposure, and 3.5% envenomation. The majority of pediatric exposures involve household chemicals, plants, and herbal, prescription or OTC medications. When possible identification of specific toxins and administration of prescribed antidotes is desired; in any case support of the ABC's is paramount with swift transport to an appropriate hospital as many toxins lead to sudden and dramatic deterioration in patient condition.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none"> • ALOC • *Respiratory Depression/Apnea • SLUDGE 	<ul style="list-style-type: none"> • Multiple victims possible • CNS Depression • *Seizures
TREATMENTS	
<p>(Standing Orders: choose any or all that apply)</p> <ol style="list-style-type: none"> 1. General Patient Care, monitoring and treatment plan <ul style="list-style-type: none"> • Assess blood glucose (a) 1. Administer O₂ and assist respiratory status per basic and advanced airway management procedures 2. Attempt identification of toxin 3. Consult Idaho Poison Control [1-800-222-1222] (b) 4. Contact receiving hospital with nature of toxic exposure 5. Treat other associated S/S per appropriate protocol 6. IV/IO access 7. Fluid administration 8. Consider 12-lead ECG 9. Pain / Sedation 10. Consider antiemetic 11. Consider NG/OG placement 12. Narcotics / Opioids <ul style="list-style-type: none"> • Naloxone 13. Benzodiazepines <ul style="list-style-type: none"> • Fluid administration • Transcutaneous Pacing 14. Tricyclic Anti-Depressants <ul style="list-style-type: none"> • Fluid administration 15. Calcium Channel Blockers <ul style="list-style-type: none"> • Transcutaneous Pacing 16. Beta Blockers <ul style="list-style-type: none"> • Fluid administration • Transcutaneous Pacing 17. Organophosphates / Carbamates <ul style="list-style-type: none"> • Consider atropine (c) 	<p>***Request Paramedic Evaluation If***</p> <ul style="list-style-type: none"> • Dyspnea • Hypertension • Hypotension • Restlessness • Nausea/Vomiting

<p>18. CNS Stimulants</p> <ul style="list-style-type: none">● Consider lorazepam● Consider midazolam <p>19. <u>Critical Care assessment, monitoring, and treatment plan</u></p> <p>1. Administer a vasopressor as needed. Titrate to patient's hemodynamic status. Reference (4000.1 norepinephrine), (4000.1 epinephrine)</p>	
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Note:

- a. Pediatric Hypoglycemia is:
 - Neonate ≤ 45 mg/dL
 - Infants, Children, & Adolescents ≤ 60 mg/dL
- b. Do not act on Poison Control Center advice without contacting receiving facility. Contacting poison control should be considered in almost every situation. The Idaho Poison control center generates statistical information based on the information you give; as well as assigns a case number to that patient, that will follow them through the healthcare system.
- c. Look for "SLUDGE" (Salivation, lacrimation, urination, defecation, GI upset, and emesis)

PEDIATRIC EMERGENCIES

Pediatric Emergencies: Trauma

Trauma is the number one cause of death in infants and children. Most pediatric injuries result from blunt trauma. Although pediatric patients can be injured in the same way as adults, children tend to be more susceptible to certain types of injuries than adults because children have thinner body walls that allow forces to be more readily transmitted to body contents, increasing the possibility of injury to internal tissues and organs.

SIGNIFICANT FINDINGS	(*AUTOMATIC ALS)
<ul style="list-style-type: none">● *Neck or spinal cord injury/pain● *Penetrating wounds● *Signs of poor perfusion	<ul style="list-style-type: none">● *Respiratory distress● *ALOC
TREATMENTS	
<i>(Standing Orders: choose any or all that apply)</i>	***Request Paramedic Evaluation If***
<ol style="list-style-type: none">1. General Patient Care, monitoring and treatment plan2. Administer O₂ and assist respiratory status per basic and advanced airway management procedures3. Control bleeding4. Treat other associated S/S per appropriate protocol5. Consider transport to trauma center6. IV/IO access7. Fluid administration (a)8. Consider 12-lead ECG9. Pain / Sedation10. Consider antiemetic11. Treat tension pneumothorax (b)12. Critical Care assessment, monitoring, and treatment plan13. Administer blood products14. Antibiotic Therapy for open or penetrating trauma	<ul style="list-style-type: none">● ALOC● Trauma arrest● Ejection from vehicle● Extrication time > 20 min● Respiratory distress

Note:

- a. Titrate to patient's blood pressure (age appropriate). <1 month old: 10 cc/kg, >1 year old: 20 cc/kg
- b. Watch for tracheal shift, distended neck veins, progressively worsening dyspnea / cyanosis, decreased / diminished or absent lung sounds, and / or shock.

BASIC AIRWAY MANAGEMENT

O2 Administration, Basic Adjuncts, Maneuvers, Procedures

PURPOSE:

To establish guidelines or standing orders for securing and controlling a compromised, or potential compromised, airway with basic airway adjuncts and procedures. This procedure also provides guidelines for the administration of oxygen.

POLICY:

1. Basic airway management is the initial step in securing a patient's airway.
2. The following is the general procedure for securing an airway and then administering oxygen / ventilations:
 - a. Open airway with manual maneuvers (head-tilt-chin-lift if no suspected trauma or modified jaw thrust if trauma is suspected). These maneuvers should bring the patient into a neutral inline "sniffing position" without hyperextending the neck.
 - b. If SpO₂ is found to be ≤93% the minimum amount of O₂ should be delivered to improve and maintain SpO₂ >93%. Often an aggressive approach followed by downward titration is the best course.
 - c. Determine need for assisted ventilations (BVM)
1. **BASIC AIRWAY ADJUNCTS:** attempt to place all three if clinically correct
 - a. Oropharyngeal airway (OPA) for patients without a gag reflex.
 - b. Nasopharyngeal airway (NPA) for patients with a gag reflex and or a clenched jaw.
 - i. Do not use NPA in patients with severe maxillofacial trauma or suspected basilar skull fractures.
2. **OXYGENATION:**
 - a. Oxygen administration should be based on clinical exam including respiratory effort, oxygen saturation, and any acute or chronic medical conditions that may be present
 - b. In general, any patient with an oxygen saturation of ≤93% should be given supplemental oxygen.
 - c. The following information outlines the appropriate oxygen device, and recommended flow:
 - i. Nasal cannula: 2-6 LPM
 - ii. Non-rebreather mask: 10-15 LPM
 - iii. Nebulizer: 6-8 LPM
 - iv. Bag-Mask Ventilation: 15 LPM for patients requiring ventilatory support as evidenced by poor or no respiratory effort, severely labored breathing, and impending respiratory failure.
 - d. The following are actions to take to maximize oxygenation for the patient:
 - i. Head of bed 30°
 - ii. FiO₂ to 100%
 - iii. 2-thumbs up BVM ventilation
 - iv. Passive Oxygenation (NC placed in NPA at <10 Lpm)
 - v. PEEP to 5 mmHg
 - vi. Longer inspiratory time

3. **VENTILATIONS:**

- a. Positive pressure ventilations, utilizing BVM, should be performed on all patients requiring ventilatory support
- b. The following information outlines the appropriate rates of ventilation:
 - i. Cardiac arrest
 - 1. Adult/Pediatric 8-10 breaths per minute (1 breath every 6-8 seconds) with appropriately sized BVM device and mask
 - ii. Ventilatory support with a perfusing rhythm
 - 1. Adult 10-12 breaths per minute (1 breath every 5-6 seconds)
 - 2. Pediatric 12-20 breaths per minute (1 breath every 3-6 seconds) with appropriately sized BVM device and mask

ADVANCED AIRWAY MANAGEMENT

POLICY:

1. Perform **Basic Airway Management** (reference protocol [#3001.1](#)) **BEFORE** proceeding to Advanced Airway Management.
2. RSI and endotracheal intubation are indicated in the following scenarios:
 - Patient unable to protect his/her own airway.
 - Patient will need prolonged ventilatory support.
 - Patient will need airway management to facilitate safe transport.
 - Patient is incapable of sustaining adequate intrinsic ventilatory effort.
 - Persistent hypoxemia despite all efforts to improve oxygenation.
3. Alternative airways are indicated for the scenarios listed above, with the following additional requirements (reference protocol 3001.6 and 3001.8 for i-gel and King LT-D and 3001.7 for Surgical/Needle cricothyrotomy):
 - a. i-gel Airway or KING LT-D:
 1. Absent gag reflex – either naturally or by sedation and paralysis
 2. Failed Intubation *or* as a primary airway for anticipated difficult intubation based on established guidelines (LEMON).
 - a. Look externally, are there any apparent anatomic abnormalities?
 - b. Evaluate the 3,3,2 rule
 - c. Mallampati
 - d. Obstruction to airway placement, large tongue, epiglottis etc.
 - e. Neck mobility
 - b. Surgical cricothyrotomy:
 1. All other basic and advanced airway maneuvers and skills have failed.
 2. There is a life-threatening upper airway obstruction.
 3. Inability to ventilate.
 4. Inability to intubate.
 5. Patient age is ≥ 8 years of age (able to palpate pertinent anatomy).
 - c. Needle cricothyrotomy:
 1. All other basic and advanced airway maneuvers and skills have failed.
 2. There is a life-threatening upper airway obstruction.
 3. Inability to ventilate.
 4. Inability to intubate
 5. Surgical cricothyrotomy is contraindicated.

ADVANCED AIRWAY MANAGEMENT & RSI

1. If patient is received with an extraglottic airway device in place that is working (oxygenation/ventilation successful) **DO NOT** selectively remove it for intubation or RSI attempts, instead transport to definitive care with extraglottic airway remaining in place.
2. Ensure patient meets the requirements for RSI/Intubation.
3. Take C-spine precautions as needed. Removal of the front of the C-collar during the intubation is ok as long as manual stabilization is maintained.
4. Preoxygenate patient with a target SpO₂ of $>93\%$ prior to any attempt. Consider the following for maximizing oxygenation:
 - a. Head of bed up to 30°
 - b. FiO₂ to 100%
 - c. 2 Thumbs up BVM ventilation
 - d. PEEP to 5 mmHg
 - e. Passive oxygenation via high flow nasal cannula
 - f. Longer inspiratory times with the BVM
5. Attempt resuscitation of patient to SBP of ≥ 90 mmHg prior to attempt – fluid bolus/push dose pressors/vasopressor drip, and if indicated and available, blood products.

6. Assess the patient for potentially difficult intubation/resuscitation (LEMON/HEAVEN). If a difficult intubation is anticipated, have a backup modality available. Assess neck for possible surgical airway.
7. Prepare equipment:
 - a. Use appropriate PPE as indicated
 - b. MFD Intubation checklist
 - c. Oxygen
 - d. Cardiac Monitor with SpO₂, HR, BP, EKG, and if possible EtCO₂ applied.
 - e. BVM
 - f. PEEP valve
 - g. Suction equipment
 - h. Magill forceps
 - i. Appropriately sized tracheal tubes
 - j. Stylet
 - k. Bougie
 - l. 10 mL syringe
 - m. Variety of types and sizes of laryngoscope blades and handles
 - n. Nasal cannula for passive oxygenation
 - o. Push dose pressor prepared and ready for use
 - p. Premedication agents: atropine
 - q. Sedatives: ketamine, etomidate, or in times of shortage of preceding, midazolam
 - r. Depolarizing neuromuscular blocking agent: succinylcholine
 - s. Nondepolarizing neuromuscular blocking agent: rocuronium, or if shortage of rocuronium, vecuronium
 - t. Rescue Airway: i-gel Airway or King LT-D
 - u. Surgical airway equipment
 - v. Stethoscope
 - w. Tube securing device
 - x. Inline waveform capnography device
 - y. NG/OG tube
 - z. Ventilator
8. Use the MFD Intubation Checklist – preferably have a non-crewmember read it out loud and confirm with the crew
9. Premedicate as indicated:

Atropine 0.01 – 0.02 mg/kg for peds and 0.5 mg for adults IVP maximum 1 mg all patient ages	- Consider using for children < 8 years old and for vagotonic adults. - Treat bradycardia during intubation by temporarily halting intubation and oxygenating with 100% O ₂ . If the patient remains bradycardic, administer Atropine.
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10. Induction:

Ketamine 1-4.5 mg/kg IV (2.0 mg/kg is ideal)	<ul style="list-style-type: none">Onset is 30 seconds, duration is 45 minutesMay transiently increase BP and/or ICPIncreases secretionsCauses bronchodilation
Etomidate 0.15-0.3 mg/kg IV	<ul style="list-style-type: none">Onset is 30 seconds, duration is 5 minutes.Generally will decrease ICP without a change in the BP but consider a lower dose in the hypotensive patient.May see tonic/clonic movement but this is not a seizure.

Versed 0.1-0.3 mg/kg IVP with 0.2 mg/kg being most common	<ul style="list-style-type: none"> Only for use if no Ketamine or Etomidate available Potent dose related amnesic effect Dose related hypotension possible When used is frequently underdosed
11. Paralytic: ***YOU MUST BE ABLE TO VENTILATE THE PATIENT***	
Succinylcholine 2.0 mg/kg Use rocuronium for any known or suspected contraindication.	<ul style="list-style-type: none"> Succinylcholine provides the most reliable and fastest intubating conditions (UptoDate, 2023). Onset is 30-45 seconds. Maximum relaxation is 90 seconds after fasciculations stop. Duration is 3-5 minutes. Do not use more than 2 doses or for continued paralysis.
Rocuronium 1.0 mg/kg For known/suspected contraindication to Succinylcholine	<ul style="list-style-type: none"> Onset is 2-3 minutes. Duration is 30 minutes. 0.1 mg/kg may be administered as a defasciculating dose prior to succinylcholine administration. 0.2-1.0 mg/kg to maintain paralysis if indicated.
Vecuronium 0.1 mg/kg	<ul style="list-style-type: none"> Only for use if no succinylcholine or rocuronium is available. Onset is 3-4 minutes. Duration of action is 25-50 minutes.
12. Insert laryngoscope slowly, suction to prevent video laryngoscope camera contamination	
13. Consider utilizing external laryngeal manipulation in an effort to increase success	
14. Visualize airway anatomy	
15. Insert the tracheal tube with stylet, or if required the Bougie	
16. Remove the stylet/bougie	
17. Inflate the cuff, attach BVM, ventilate, and confirm placement:	
a. Confirm placement with waveform capnography	
b. Auscultate first over the epigastrium and then over the lung fields	
18. Secure the tube.	
19. Place NG/OG tube	
20. Reconfirm ETT placement each time the patient is moved.	
21. Continued paralysis and sedation:	
a. Adequate sedation is better than re-paralyzing the patient. <i>Only re-paralyze if needed for patient oxygenation/ventilation needs or for crew/patient safety purposes.</i>	
b. Adequately sedate patients who are paralyzed.	
Rocuronium <i>(Continued Paralysis)</i>	<ul style="list-style-type: none"> Administer 0.1-1.0 mg/kg IVP and repeat as often as every 15 minutes if needed.
Ketamine <i>(Pain and Sedation)</i>	<ul style="list-style-type: none"> Administer 0.1-0.5 mg/min continuous infusion or 0.5-1 mg/kg IVP repeated every 10 minutes as necessary.
Versed <i>(Sedation)</i>	<ul style="list-style-type: none"> Administer 1-4 mg IVP for adults and 0.05 mg/kg IVP for peds. Repeat prn based on sedation need and hemodynamic response.
Valium <i>(Sedation)</i>	<ul style="list-style-type: none"> 5-10 mg in 2 mg increments IVP for adults and 0.05 mg/kg for peds. Repeat prn based on sedation and hemodynamic response.
Lorazepam <i>(Sedation)</i>	<ul style="list-style-type: none"> 0.05 mg/kg up to 4 mg. May repeat as needed based on sedation and hemodynamics. May be used for long term sedation but not induction.
Morphine <i>(Pain)</i>	<ul style="list-style-type: none"> 2-4 mg IVP for adults and 0.1 mg/kg IVP for peds, not to exceed adult dose. May repeat as needed based on sedation and hemodynamic response.

Fentanyl <i>(Pain and Sedation)</i>	<ul style="list-style-type: none">• 0.5-1.0 mcg/kg prn IVP for adults and pediatrics. May repeat as needed based on sedation and hemodynamic response.
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22. Unable to Confirm Intubation & the Failed Intubation Attempt
 - a. Failure to confirm intubation or with a failure to pass the ETT, or with any desaturation to <93% during the intubation attempt - stop the attempt, remove the ETT (use laryngoscope and look first to verify not in place if failure to confirm) and reoxygenate with the BVM to ≥93%.
 - b. Prepare for another attempt – change something (change intubating provider, use different equipment, use assistive device such as a bougie).
 - c. Consider changing tactics and place a supraglottic airway (i-Gel, King LT-D).
 - d. Consider maintaining a Basic Airway with NPA/OPA and BVM and transport if oxygenation is successful with BVM.
23. Failure to Ventilate/Intubate
 - a. If ETT cannot be placed and extraglottic airways and BVM use is unsuccessful place a percutaneous surgical or needle airway (reference protocol 3001.7).
24. Following successful airway management, the patient is to be placed on the Hamilton T-1 transport ventilator (reference protocol 3002.2).
25. Acute Changes in the Intubated Patient
 - a. Acute changes in the intubated patient – hypoxia or bradycardia require immediate evaluation and treatment of identified cause. Consider the DOPES mnemonic:
 1. Dislodgement/Displacement – ETT too deep or too shallow
 2. Obstruction – kink in the ETT/vent circuit, or ETT plugged with secretions
 3. Pneumothorax – consider both simple and tension pneumothorax
 4. Equipment – ensure tight and proper connections, consider ventilator failure
 5. Sedation/Breath Stacking – ensure adequate sedation to prevent patient/ventilator asynchrony. For breath stacking reduce respiratory rate.
 - b. While troubleshooting the acute change in the intubated patient do not hesitate to remove the patient from ventilator and use the BVM if indicated.
26. Documentation includes:
 - a. The indication for RSI/intubation
 - b. Use of MFD RSI/intubation checklist
 - c. Tube size and depth
 - d. Vital signs before, during, and after RSI
 - e. Confirmation of initial placement and how placement was confirmed
 - f. Number of attempts
 - g. Grade of exposure (Mallampati/Cormack Lehane)
 - h. Who performed the intubation
 - i. If cricoid pressure was used and if assistive devices what they were
 - j. Medications used for the RSI and ongoing paralysis/sedation
 - k. If a rescue/surgical airway was used – reason, type, size, and result
 - l. Any difficulties encountered, solutions employed, and results obtained
 - m. Verification of continued proper placement of tracheal tube with each move of the patient, and upon turnover of care at receiving facility including the name of the provider at the receiving facility that concurs with proper placement and how correct placement was confirmed at the receiving facility.

CHOKING

PROCEDURE:

1. Refer to, and use, the most current American Heart Association guidelines.
2. Conscious:
 - a. Determine if victim is able to speak or cough.
 - b. Perform the Heimlich maneuver (abdominal thrust) until the foreign body is expelled or the victim becomes unconscious.
 - Stand behind the victim and wrap your arms around the victim's waist.
 - Press fist into abdomen with quick inward and upward thrusts.
 - c. Do chest thrusts for victims who are in advanced pregnancy or who are obese.
 - Stand behind the victim and place your arms under the victim's armpits to encircle the chest. Press with quick backward thrusts.
3. Patient becomes Unconscious:
 - a. Check for a foreign body.
 1. No blind finger sweeps.
 2. Look in the mouth/posterior pharynx. If item seen attempt to remove.
 3. If credentialed to do so use a laryngoscope and attempt to remove the foreign body if seen with Magill forceps.
 - b. Attempt rescue breathing.
 1. Open the airway.
 2. Try to give 2 breaths. If needed, reposition the head and try again.
 - c. If the airway is obstructed, perform the Heimlich maneuver.
 1. Kneel astride the victim's thighs.
 2. Place the heel of one hand on the victim's abdomen, midline slightly above the navel and well below the tip of the xiphoid process.
 3. Place the second hand on top of the first.
 4. Press into the abdomen with quick upward thrusts.
 - d. Repeat the sequence until successful.
 1. Alternate between the checking the airway, rescue breathing attempts, and abdominal thrusts.
 - e. If patient becomes pulseless begin CPR.

NASOGASTRIC / OROGASTRIC TUBE INSERTION

POLICY:

Paramedics should attempt to insert a nasogastric or orogastric tube on adult and pediatric patients that require intubation and are at risk for gastric distension or vomiting. Its purpose is to relieve pressure and distention of the stomach by removing fluid or air. Clearing stomach contents can also aid in airway control as a way to prevent aspiration.

Equipment

1. Personal protective equipment
2. NG/OG tube, appropriate size
3. Water soluble lubricant
4. 60 mL catheter tip syringe
5. Tape or other securing device
6. Stethoscope

Indications

1. Gastric emptying or gastric decompression
 - a. Comatose patients
 - b. Gastrointestinal bleeding
 - c. Overdose
 - d. Gastric distention or obstruction
 - e. Cardiac arrest
 - f. Intubated patient within 4 hours of tracheal tube placement

Contraindications:

1. Absolute contraindications
 - a. Esophageal rupture
 - b. Caustic ingestion (e.g., alkaline)
 - c. Severe midface trauma (orogastric tube may be placed)
 - d. Recent nasal surgery (orogastric tube may be placed)
2. Relative contraindications/considerations
 - a. Recent banding for esophageal varices
 - b. Esophageal varices
 - c. Known coagulation abnormality

Complications:

1. Nasal Bleeding
2. Gagging
3. Airway obstruction
4. Placement in the trachea

Procedures:

1. Recommended tube sizes:
 - a. Premature Infant: 5 French
 - b. Infant to Child: 8 – 10 French

Nasogastric:

1. Explain the procedure to the patient.
2. Measure the NG tube alongside the patient. The end of the tube should be placed at the tip of the nose, extended to the corner of the ear, and then to the xiphoid process. This is the depth the tube should be inserted.
 - a. Lubricate the end of the tube and begin to insert it into one of the patient's nares. Pass the tube gently along the floor of the nasal passage and advance it as the patient swallows. Remove the tube if patient coughs or experiences dyspnea.
 - b. After the NG tube has been inserted, assess the tube for correct placement. A 60 mL syringe should be attached to the tube and 20 mL of air should be instilled into the abdomen while listening or feeling over the abdomen for an "air rush" and an attempt at gastric content aspiration should be attempted.
 - c. Once gastric placement is confirmed, secure the NG tube in place with tape.

Orogastric:

NOTE: Preferred route in intubated patients.

1. Measure the OG tube alongside the patient. The end of the tube should be placed at the corner of the mouth, to the tip of the ear, and extended to the xiphoid process. This is the depth the tube should be inserted.
2. Insert tube into the oral cavity and advance into the stomach.
 - a. After the tube has been inserted, assess the tube for correct placement. A 60 mL syringe should be attached to the tube and 20 mL of air should be instilled into the abdomen while listening or feeling over the abdomen for an "air rush" and an attempt at gastric content aspiration should be attempted.
3. Once gastric placement is confirmed, secure the tube in place with tape.

TUBE THORACOSTOMY MANAGEMENT

POLICY

A chest tube is inserted into the pleural cavity, to evacuate air, fluid or both, or to help restore normal pulmonary function.

PROCEDURE

General Care

1. Clean hands prior to and after care of the chest tube. Appropriate BSI precautions should be taken.
2. Assess the chest tube site and surrounding area for subcutaneous emphysema and air leaks.
3. Auscultate breath sounds and observe patient's respiratory status with transferring nurse present to determine patient's baseline.
4. Ensure chest tube is secured to the patient
5. Check chest tube connections; make sure all connections are taped.
6. Maintain collection chamber in an upright position.
7. Collection chamber should be below level of insertion site at all times.
8. Ensure tubing is free of kinks.
9. Stabilize additional lengths of tubing by securing it to the cot while avoiding dependent loops in the tubing thus allowing free flow of fluid into the device.
10. Note color and consistency of fluid in the collection chamber. Mark level.
11. Note whether the unit is connected to suction. NOTE: When disconnecting suction for any reason, disconnect the suction tubing from the drainage unit connection.
12. Assess the water-seal chamber for bubbling or reduced fluid levels.
13. Once patient is moved to transport cot. Secure drainage unit to cot.
14. Reestablish low continuous suction if ordered once in ambulance.
15. Maintain patient's pain and sedation levels per orders or per procedure.
16. Monitor patient respiratory status, and chest tube throughout transport.
17. Document maintenance in the medical record. Include the amount, color and character of the drainage, the amount of the negative pressure, the chest tube fluctuation status, the insertion site and surrounding skin and respiratory assessment.

Tube Disconnected from Patient

1. Ask patient to maximally exhale or cough.
2. Apply occlusive dressing, tape on three sides to create a flutter valve.
3. Notify medical control and divert to the closest hospital immediately.
4. Monitor for S & S of tension pneumothorax; if develops lift side of dressing to allow air to release, recover wound. Perform chest needle decompression per procedure if signs of tension pneumothorax do not resolve.

Tube Disconnected from Drainage System

1. Immediately reconnect.
2. Assess patient for signs of respiratory distress.
3. Notify medical control immediately with assessment and for further orders.
 - a. Consider Needle Decompression per procedure.

King LTS-D Airway Insertion Procedure

PURPOSE:

To establish guidelines, or standing orders, for securing and controlling a compromised, or potential compromised, airway. When endotracheal intubation is unsuccessful or considered futile based on established difficult airway guidelines.

POLICY:

1. General airway maintenance should be performed, as outlined under Basic Airway Management, before proceeding to Advanced Airway Management.
2. **King LTS-D:**
 - a. The King LTS-D may not be adequate if there is subglottic swelling or increased secretions.
 - b. There is not any evidence that the King LTS-D will prevent aspiration and should only be used as a temporary device.
 - c. The King LTS-D can only be used on the unconscious, non-breathing patient without a gag reflex.
 - d. The King LTS-D should not be used on patients with known esophageal disease or on patients known to have ingested caustic substances.

Insertion procedure for the King LTS-D:

- f. Select the appropriate size for insertion.
- g. Test cuff and inflation system for leaks by injecting the maximum recommended volume of air into the cuffs (size 3: 60 mL; size 4: 80 mL; size 5: 90 mL). Remove all air from both cuffs prior to insertion.
- h. Apply lubricant, if available, to the beveled distal tip and posterior aspect of the tube.
- i. Hyperoxygenate patient.
- j. Position the head in either a “sniffing position” or a neutral position.
- k. Hold King LTS-D in dominant hand and lift tongue and jaw with the other hand, facilitating insertion with the use of a laryngoscope is recommended for advanced level providers.
- l. Advance tube behind the base of the tongue.
- m. Advance, without using excessive force, until the base of the connector is aligned with the teeth or gums.
- n. Inflate the cuffs with the appropriate volume.
- o. Attach BVM and, while gently bagging, slowly withdraw the King LTS-D until ventilation is easy and free flowing.
- p. Confirm proper position by auscultation, chest movement, and verification of CO₂.
- q. Secure device in place with tube securing device.

ADVANCED AIRWAY MANAGEMENT

Surgical Airways

PURPOSE:

To establish guidelines, or standing orders, for securing and controlling a compromised airway. Guidelines include steps for securing a surgical airway after all other attempts to intubate and ventilate the patient have failed.

POLICY:

1. General airway maintenance should be performed, as outlined under Basic Airway Management, Advanced airway management and i-Gel/King LTS-D before proceeding to surgical airway management.

CRICOHYROTOMY is used to gain rapid access to the trachea with the following scenarios: RSI fails, i-Gel/King LTS-D is/are contraindicated, there is an upper airway obstruction secondary to trauma, foreign body, lesion or edema, or in the case of a known cervical spine injury where it is felt that *any* risk of head or neck movement would result in paralysis.

1. Needle Cricothyrotomy:
 - a. Attach the syringe to the transtracheal airway catheter or a large gauge angiocath (14G is preferred).
 - b. Prep the area and stabilize the trachea with the non-dominant hand.
 - c. Insert the needle caudally into the cricothyroid membrane while applying negative pressure to the syringe at a 45°angle.
 - d. Once air is withdrawn into the plunger, advance the cannula and secure.
 - e. Attach the BVM directly to the needle by using the connector from a small diameter ET tube.
2. Surgical Cricothyrotomy:
 - a. Use an appropriate size ET tube.
 - b. Check the cuff.
 - c. Prep the cricothyroid area and stabilize the trachea with the non-dominant hand. Identify the cricothyroid membrane.
 - d. Hold the scalpel in the dominant hand with a low grip. Make a horizontal stab incision into the inferior aspect of the cricothyroid membrane.
 - e. Push the scalpel through the membrane at a 60°angle. Do not remove the scalpel at this point.
 - f. Holding the trach hook perpendicular to the patient, slide it along the caudal surface of the scalpel blade into the trachea then rotate 90° the inferior direction and apply caudal traction. Remove the scalpel.
 - g. With the trach hook in place use a troussseau dilator to create an opening in the cricothyroid membrane large enough to insert an appropriately sized ET tube. Remove the tracheal hook.
 - h. Insert the endotracheal tube (insert just past the cuffed portion of the tube) from the side and rotate it downward as you approach the back wall of the trachea.
 - i. Remove the trach hook.
 - j. Inflate the balloon and confirm breath sounds, look for chest expansion, confirm with CO₂ detector.
 - k. Secure around the neck, do not cut the ET tube..
 - l. Monitor.

i-gel Airway Insertion Procedure

PURPOSE:

To establish guidelines, or standing orders, for securing and controlling a compromised, or potential compromised, airway. When endotracheal intubation is unsuccessful or considered futile based on established difficult airway guidelines.

POLICY:

1. General airway maintenance should be performed, as outlined under Basic Airway Management, before proceeding to Advanced Airway Management.
2. I-Gel Airway

- a. Select appropriate size for patient based on

i-gel size	Patient Size	Patient weight guidance (kg)
1	Neonate	2-5kg
1.5	Infant	5-12kg
2	Small paediatric	10-25kg
2.5	Large paediatric	25-35kg
3	Small adult	30-60kg
4	Medium adult	50-90kg
5	Large adult	90+kg

- b. Lubricate i-gel
- c. Open airway with appropriate method
- d. Ensure no visible obstructions in airway
- e. Insert i-gel with opening towards lower airway
- f. Continue insertion until resistance is felt
- g. Secure i-gel



CHEST DECOMPRESSION

POLICY:

To be performed in a patient at risk of rapid deterioration secondary to Tension Pneumothorax. Patients may have history of chest trauma, spontaneous pneumothorax, intubation with high airway pressures, etc. There are no contraindications in patients with suspected tension pneumothorax.

Signs of tension pneumothorax include:

- Increased heart rate
- Increased respiratory rate and work of breathing
- Decreased SpO₂
- Increased PIP and MAP in intubated patients undergoing positive pressure ventilation
- Decreased lung sounds to the affected side(s)
- Decreased chest rise on affected side(s)
- JVD in euvolemic patient
- Subcutaneous emphysema
- Hypotension
- Tracheal deviation (late sign)
- Hyperresonance on percussion

PROCEDURE:

1. While another provider places high flow O₂, identify the second intercostal space, at the midclavicular line, on the affected side.
2. Prepare the skin area using appropriate antiseptic solution and aseptic technique.
3. Use ARS thoracentesis needle.
4. **TENSION PNEUMOTHORAX:**
 - a. Insert needle into chest at the midclavicular line second intercostal space. Be cautious of nerves, arteries and veins located just beneath each rib. The needle should pass just over the third rib.
 - b. Additional thoracentesis needles should be placed laterally from the midclavicular line as needed.
 - c. Alternate site would be the anterior axillary line at the 5th intercostal space. This location is evidenced by the cessation of hair in the axilla, or the v developed by the latissimus dorsi muscle and pectoral muscles. Insert the needle in the bottom of the v shaped space.
5. **HEMOTHORAX:**
 - a. Insert needle into chest at midaxillary line within the 5th intercostal space. The needle should pass just over the 6th rib.

6. Appropriate placement of the catheter into the pleural space should be confirmed with a rush of air out of the catheter. Note: Rush of air may not always be observed. Leave the catheter in place.
7. Remove needle leaving catheter in place.
8. Ensure adequate respiration.
9. BVM / Intubation / RSI as needed.
10. Continually monitor and reassess the patient.
11. Place additional thoracentesis needles as needed.
12. Therapeutic endpoint is establishing a MAP of 60 ensuring end organ perfusion.
13. Thoracentesis needles tend to clot leading to the patient redeveloping symptoms. If patient exhibits these symptoms additional decompression should be performed.

VENTILATOR MANAGEMENT

Except in cases of metabolic derangement traditional ventilator management goals seek normal values for EtCO₂ (35-45 mmHg) and SpO₂ (94-99%). The foundation of ventilator management is determining a person's ideal body weight. This ideal body weight is used to determine the correct minute ventilation (MV). The ideal body weight again is used to determine the correct range for tidal volume (VT). And the correct MV and VT are used to determine the correct respiratory rate (RR). The fraction of inspired oxygen (FiO₂), positive end expiratory pressure (PEEP), pressure support (PS) and pressure control (PC) are other values that may be programmed into the ventilator. (With the Hamilton T1 both PS and PC are also called Pinsp).

Following the establishment of MV, VT, and RR the ventilator is programmed, and ventilation is started. Regardless of the ventilation mode selected, the clinician then evaluates the results of ventilation based on the patient's vital signs – with particular attention being given to EtCO₂ and SpO₂. Next, depending on EtCO₂ and SpO₂ trending values, inputs to the ventilator are made to bring the EtCO₂ and SpO₂ towards the normal goals. This evaluation process of trending vitals, titrating, and further monitoring for trends and continuing titration is repeated for the duration of the ventilated patients care.

Most modes of invasive ventilation listed below will be accompanied by one or both of the following abbreviations during ventilation: VTE and/or VE. These are important measurements to monitor, and when present they must be actively monitored for patient safety. VTE is a measurement of the volume exhaled with each breath – or the expired VT. In volume modes this should be within 10% of your set VT. VE stands for expired minute ventilation and is a measurement of air exhaled by the patient over 1 minute. VE should be near what your calculated MV was.

MFD Paramedics, for intubated patients, may use the following two automated ventilation modes:

1. ASV
2. S(CMV)+

MFD Paramedics may also use the NIV mode in the CPAP configuration.

MFD Critical Care Paramedics may use any of the modes listed below.

MODES

Intelligent

ASV

The Hamilton T1's Adaptive Support Ventilation (ASV) mode, is an automated ventilation mode, and is the preferred ventilation mode at Madison Fire Department to help clinicians meet the EtCO₂ and SpO₂ goal values for their patient. ASV is the mode to be used by paramedics who intubate patients in the field. Critical Care Paramedics are encouraged to use ASV but may use whatever mode they deem best. ASV should be the first selected mode in most patient populations – considering the contraindications below.

Contraindications to ASV are:

1. Noninvasive ventilation
2. Bronchopleural fistula
3. Relative contraindication – Irregular Respiratory Drive. Another mode will work better.

If contraindications exist to ASV paramedics are to use S(CMV)+ as the mode for ventilating their patient.

In the ASV mode of ventilation the inspiratory pressure limit default is 30 mmHg. In ASV mode the ventilator determines appropriate volumes and rates – while excluding dangerous extremes in volumes and rates.

The following are the steps to initiate the **Intelligent ASV** mode of ventilation:

1. Select adult/child (Adult/Child 1, 2, or 3)
2. Select male or female (actual sex at birth)
3. Measure patient height and input height into the Hamilton T1 – accuracy is important
4. Select Modes
5. Select ASV and Confirm
6. Set the % MV for the patient (generally start at 100%-110%)
7. Set the PEEP – consider physiologic norms (3-5 mmHg)
8. Set the FiO₂ – usually start at 100% and titrate down as indicated
9. Press Confirm
10. Press Alarms & review/adjust alarm settings
11. Start ventilation

Next, evaluate patient response to ventilation. If EtCO₂ and SpO₂ are at goal values make no changes, continue to monitor trend.

If the EtCO₂ is out of goal, make the following changes:

- a. Low EtCO₂ (and not due to hypoperfusion)
 - i. Decrease %MV by 10%
- b. High EtCO₂
 - i. Increase %MV by 20%

If the SpO₂ is out of goal, after ensuring best patient positioning, make the following changes in the order listed:

- c. Low SpO₂
 - i. Increase FiO₂
 - ii. Increase PEEP
- d. High SpO₂
 - i. Decrease FiO₂ by 10%
 - ii. Consider decrease of PEEP – not below normal physiologic norms (3-5 mmHg)

Volume Control

S(CMV)+

1. S(CMV)+ is the backup mode for paramedics if a contraindication to ASV exists (and falls under the automated transport ventilator), or if problems with ASV cannot be resolved. S(CMV)+ is a synchronized, volume targeted, and pressure regulated ventilation mode that operates adaptively to deliver the desired MV. This means the ventilator automatically adjusts the inspiratory pressure to ensure delivery of the set volume. However, this adjustment will not exceed set high pressure limits to achieve the tidal volume. In the case of a patient triggered breath the ventilator will deliver a full volume breath – but also synchronize this breath to avoid breath stacking. Paramedics are limited in their programming in this mode. Paramedics may set the following: male or female (actual sex at birth), patient height, S(CMV)+, VT, PEEP, FiO₂, and RR. Critical care paramedics may select and use all controls.

SIMV+

SIMV+ is a synchronized, volume targeted, and pressure regulated ventilation mode that operates adaptively to deliver the desired MV. This means the ventilator automatically adjusts the inspiratory pressure to ensure delivery of the set volume. However, this adjustment will not exceed set high pressure limits to achieve the tidal volume. In the case of a patient triggered breath the ventilator will allow the breath up to the point that the patient terminates their own breath – but also synchronize this breath to avoid breath stacking. In SIMV+ the operator may also set a Pressure Support value to assist the patient with their own breaths.

The following are the steps to initiate the **Volume Control S(CMV+)/SIMV+** mode of ventilation:

2. Select adult/child (Adult/Child 1, 2, or 3)
3. Select male or female (actual sex at birth)
4. **Measure** patient height and input height into the Hamilton T1 – accuracy is important
5. Select Modes
6. Select S(CMV)+ or SIMV+ and Confirm
7. Set the VT
8. Set the PEEP – consider physiologic norms (3-5 mmHg)
9. Set the FiO₂ – usually start at 100% and titrate down as indicated
10. Set the RR
11. For SIMV+ set the PS
12. Press Alarms & review/adjust alarm settings
13. Start ventilation

Next, evaluate patient response to ventilation. If EtCO₂ and SpO₂ are at goal values make no changes, continue to monitor trend.

If the EtCO₂ is out of goal, make the following changes:

- a. Low EtCO₂ (and not due to hypoperfusion)
 - i. Decrease rate or volume (usually rate first)

- ii. Usually only make change to one value at a time
- b. High EtCO₂
 - i. Increase rate or volume
 - ii. Usually only make change to one value at a time

If the SpO₂ is out of goal, and after ensuring best patient positioning, make the following changes in the order listed:

- c. Low SpO₂
 - i. Increase FiO₂
 - ii. Increase PEEP
- d. High SpO₂
 - i. Decrease FiO₂ by 10%
 - ii. Consider decrease of PEEP – not below normal physiologic norms (3-5 mmHg)

Pressure Control

PCV+

PCV+ is a pressure-controlled ventilation mode where pressure is applied to the ventilation circuit (and respiratory system) up to the set high pressure limit to enable delivery of a variable volume of air. Every breath, whether ventilator triggered, or patient triggered, is pressure-controlled and mandatory.

PSIMV+

PSIMV+ is a pressure-controlled ventilation mode where pressure is applied to the ventilation circuit (and respiratory system) up to the set high pressure limit to enable delivery of a variable volume of air. Ventilator triggered breaths are mandatory, while patient triggered breaths are allowed, they are not full pressure breaths, rather the patient may breathe the volume of air they desire with or without PS depending on what PS is set to.

The following are the steps to initiate the **Pressure Control PCV+/PSIMV+** mode of ventilation:

1. Select adult/child (Adult/Child 1, 2, or 3)
2. Select male or female (actual sex at birth)
3. **Measure** patient height and input height into the Hamilton T1 – accuracy is important
4. Select Modes
5. Select PCV+ or PSIMV+ and Confirm
6. Set the PC (Pinsp)
7. Set the PEEP – consider physiologic norms (3-5 mmHg)
8. Set the FiO₂ – usually start at 100% and titrate down as indicated
9. Set the RR
10. For PSIMV+ set the PS (if Psync is checked PS will equal PC)
11. Press Alarms & review/adjust alarm settings
12. Start ventilation

Next, evaluate patient response to ventilation. If EtCO₂ and SpO₂ are at goal values make no changes, continue to monitor trend.

If the EtCO₂ is out of goal, make the following changes:

- a. Low EtCO₂ (and not due to hypoperfusion)
 - i. Decrease rate or PC (usually rate first) & ensure VTE/VE are adequate
 - ii. Usually only make change to one value at a time
- b. High EtCO₂
 - i. Increase rate or PC (usually rate first) & ensure VTE/VE are adequate
 - ii. Usually only make change to one value at a time

If the SpO₂ is out of goal, and after ensuring best patient positioning, make the following changes in the order listed:

- c. Low SpO₂
 - i. Increase FiO₂
 - ii. Increase PEEP
- d. High SpO₂
 - i. Decrease FiO₂ by 10%
 - ii. Consider decrease of PEEP – not below normal physiologic norms (3-5 mmHg)

SPONT

Every breath is a spontaneous breath, however mandatory manual breaths may be triggered by the ventilator operator. PS may or may not be set depending on the value set by the ventilator operator. If PS is not set, SPONT functions like CPAP. A backup apnea setting is present as well. Should the patient become apneic the backup settings will be applied. These are either automatic or may be set by the ventilator operator.

The following are the steps to initiate the **Pressure Control-SPONT** mode of ventilation:

1. Select adult/child (Adult/Child 1, 2, or 3)
2. Select male or female (actual sex at birth)
3. **Measure** patient height and input height into the Hamilton T1 – accuracy is important
4. Select Modes
5. Select SPONT
6. Set PS
7. Set PEEP
8. Set FiO₂.
9. Apnea backup is automatically set, ventilator operator may make changes as appropriate to the apnea back up.
10. Press Alarms & review/adjust alarm settings
11. Start ventilation

Next, evaluate patient response to ventilation. If EtCO₂ and SpO₂ are at goal values make no changes, continue to monitor trend.

If the EtCO₂ is out of goal, make the following changes:

- a. Low EtCO₂ (and not due to hypoperfusion)
 - i. Decrease PS

- b. High EtCO₂
 - i. Increase PS

If the SpO₂ is out of goal, and after ensuring best patient positioning, make the following changes in the order listed:

- c. Low SpO₂
 - i. Increase FiO₂
 - ii. Increase PEEP
- d. High SpO₂
 - i. Decrease FiO₂ by 10%
 - ii. Consider decrease of PEEP – not below normal physiologic norms (3-5 mmHg)

Noninvasive

NIV

In NIV every breath is spontaneous and there is no set RR. If the patient becomes apneic there is an apnea backup setting to ensure the patient continues to ventilate. The apnea backup may be insufficient, ventilator operator should ensure apnea backup setting is appropriate for patient.

The following are the steps to initiate the **Noninvasive NIV** mode of ventilation:

1. Select adult/child (Adult/Child 1, 2, or 3)
2. Select male or female (actual sex at birth)
3. **Measure** patient height and input height into the Hamilton T1 – accuracy is important
4. Select Modes
5. Select NIV
6. Set the PS (Pinsp)
7. Set the PEEP – consider physiologic norms (3-5 mmHg)
8. Set the FiO₂ – usually start at 100% and titrate down as indicated
9. Select Alarms & review/adjust alarm settings
10. Start ventilation

NIV-ST

In NIV-ST the ventilator operator sets a minimum RR, but every breath is spontaneous, if the patient is breathing above the set minimum RR. If RR falls below the minimum breath rate the ventilator will deliver mandatory breaths to ensure adequate MV. Strive to set backup RR at 2 breaths less than patient's resting rate.

The following are the steps to initiate the **Noninvasive NIV-ST** mode of ventilation:

1. Select adult/child (Adult/Child 1, 2, or 3)
2. Select male or female (actual sex at birth)
3. **Measure** patient height and input height into the Hamilton T1 – accuracy is important
4. Select Modes
5. Select NIV-ST
6. Set the PS (Pinsp)

7. Set the PEEP – consider physiologic norms (3-5 mmHg)
8. Set the FiO₂ – usually start at 100% and titrate down as indicated
9. Set the RR (strive to set at 2 breaths less than patient's resting rate)
10. Select Alarms & review/adjust alarm settings
11. Start ventilation

Next, evaluate patient response to ventilation. If EtCO₂ and SpO₂ are at goal values make no changes, continue to monitor trend.

If the EtCO₂ is out of goal, make the following changes:

- a. Low EtCO₂ (and not due to hypoperfusion)
 - i. Decrease PS/Pinsp
- b. High EtCO₂
 - i. Increase PS/Pinsp

If the SpO₂ is out of goal, and after ensuring best patient positioning, make the following changes in the order listed:

- c. Low SpO₂
 - i. Increase FiO₂
 - ii. Increase PEEP
- d. High SpO₂
 - i. Decrease FiO₂ by 10%
 - ii. Consider decrease of PEEP – not below normal physiologic norms (3-5 mmHg)

HiFlowO2

The HiFlowO2 setting delivers a continuous air/gas flow mixture and monitors delivered oxygen concentration. It is for spontaneously breathing patients. HiFlowO2 is *not* intended to be life supporting. Flow rates are from 2-60 Lpm, however follow guidelines outlined in 3002.5/below. HiFlowO2 is only used with the H900 and the NuFlow nasal cannula. HiFlowO2 is to be initiated in hospital but may be a continuation of applied HiFlowO2 prior to EMS arrival for transport.

The following are the steps to initiate the **Noninvasive HiFlowO2** mode of ventilation, follow the setup in the Procedure Section of 3002.5 – an abbreviated version is below.

1. Turn on the Hamilton T1 ventilator and select HiFlowO2.
2. Select desired flow rate.
 - i. Cannula max flow rates
 1. Small 10 L/min
 2. Medium 14 L/min
 3. Large 23 L/min
 4. X-Large 27 L/min
3. Set FiO₂
4. Turn on the H900
5. Install the reservoir, spike a bag of sterile water, or use a syringe to add sterile water to the reservoir. Allow the unit to warm up.

7. Select the desired temperature, 37 degrees Celsius is the desired temperature although patient comfort should guide your decision making.
 8. Apply the correct cannula to patient
 9. Initiate flow, monitor and adjust as indicated
-

The first column in the following table lists the proprietary nomenclature Hamilton ventilators use as names for modes. The second column shows the legacy mode name that most closely matches the Hamilton ventilator nomenclature. This is included for those instances where a patient of an interfacility transport may be ventilated, but with a ventilator that is other than the Hamilton T1 ventilator.

Hamilton T-1 Ventilator Modes	Legacy Mode Names
ASV	-----
S(CMV)+	AC/VC
SIMV+	VC/SIMV
PSV+	PC/VC
PSIMV+	PC/SIMV
SPONT	PS Ventilation
NIV	CPAP/BiPAP - no apnea back up setting
NIV-ST	CPAP/BiPAP - with apnea back up setting
HiFlow	-----

CPAP

POLICY:

CPAP has been shown to rapidly improve vital signs, gas exchange, and work of breathing. It also decreases the sense of dyspnea and the need for endotracheal intubation in patients who suffer shortness of breath from asthma, COPD, pulmonary edema, CHF, and pneumonia. In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

PROCEDURE:

Indications:

- Has shortness of breath (for reasons other than trauma)
- Is awake and able to follow commands
- Is of an age able to fit the CPAP mask
- Has a respiratory rate greater than 26 breaths per minute
- Has a systolic blood pressure above 90 mmHg (CPAP may raise intrathoracic pressures, reducing preload, therefore reducing blood pressure even further)
- Has been using accessory muscles during respirations
- Presented signs and symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia

Contraindications:

- Inability to obtain a good mask fit
- Patient is unable to cooperate with the therapy
- Severe facial trauma
- Altered mentation not due to CO₂ retention
- Vomiting
- Need to continually clear airway secretions
- Comatose/uncooperative/combatative patient
- Apnea or near apnea

Precautions:

Use care if patient:

- Has failed at past attempts at non-invasive ventilation
- Has active upper gastrointestinal bleeding or history of recent gastric surgery
- Complains of nausea
- Has inadequate respiratory effort

Procedure:

- Assure patent airway
- Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO₂) reading, continuous EtCO₂ monitoring, and cardiac rhythm
- Explain the procedure to the patient
- Ensure adequate oxygen supply to ventilation device
- Apply CPAP device per manufacturer's instructions
- Monitor and document the patient's respiratory response to treatment
- Monitor vital signs at least every five minutes. CPAP can cause BP to drop

- Continue to coach patient to keep mask in place and adjust as needed
- Contact the medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel
- Remove device and consider intermittent positive pressure ventilation with or without endotracheal intubation if respiratory status deteriorates

Removal Procedure:

- CPAP therapy needs to be continuous and shouldn't be removed unless the patient can't tolerate the mask or experiences continued or worsening respiratory failure.
- Intermittent positive pressure ventilation and/or intubation should be considered if the patient is removed from CPAP therapy.

Pediatric Considerations:

- CPAP should be used with caution in children under 12 years of age and should start with lower pressures

Special Notes:

- An in-line bronchodilator nebulizer may be placed in CPAP circuit if needed.
- Don't remove the CPAP device until hospital therapy is ready to be placed on patient.
- Most patients will improve in five to 10 minutes. If there's no improvement within this time, consider increasing pressure and preparing for RSI.
- Watch patient for gastric distention (often presents as vomiting in conscious patient).
- Remember that CPAP application doesn't violate "do not resuscitate" or "do not intubate" orders.
- Consider sedation, per procedure, for anxiety associated with CPAP use, bearing in mind that doing so may result in respiratory suppression.
- FOR CIRCUMSTANCES IN WHICH THE PATIENT DOES NOT IMPROVE OR CONTINUES TO DETERIORATE DESPITE CPAP AND/OR MEDICATIVE THERAPY, TERMINATE CPAP ADMINISTRATION AND PERFORM BVM VENTILATION AND ENDOTRACHEAL INTUBATION IF NECESSARY

Capnography

POLICY:

To establish guidelines for monitoring capnography and when to produce a capnogram.

PROCEDURE:

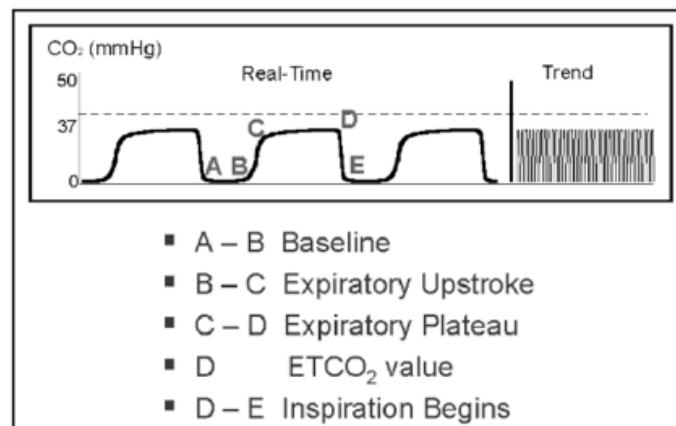
Capnography is the recording or display of exhaled CO₂. A capnogram is the visual representation of the expired CO₂ waveform.

Capnography **may be used** to assess asthma and COPD, look for other types of airway obstructions, monitor sedated patients, or monitor respiratory rates and patterns in all patient types.

Capnography **must be used** for all patients who have undergone intubation or another airway securing procedure. A capnogram should also be monitored in all intubated, sedated, or respiratory compromised patients. Strong consideration should be given to monitor a capnogram for any patient undergoing capnography evaluation.

Normal EtCO₂ is 35-45 torr. Levels below 35 torr indicate respiratory alkalosis while levels above 45 torr indicate respiratory acidosis. Patient ventilations should be performed at a rate and/or depth that allows them to maintain a normal value, unless specific patient condition/history indicate otherwise.

Whenever capnography is performed, paramedics should document their differential diagnosis of the waveform and numerical findings in the ePCR. The following will assist paramedics in this process:



Procedure Protocols
BREATHING PROCEDURES: Capnography

Page: 2 of 2

Applications on intubated patients:

- Verification of ET tube placement
- Monitoring and detection ET tube dislodgment
- Loss of circulatory function
- Determination of adequate CPR compressions
- Confirmation of return of spontaneous circulation

Examples:

Sudden loss of waveform, EtCO₂ near zero

- ET tube disconnected, dislodged, kinked or obstructed
- Loss of circulatory function



Decreasing EtCO₂ with loss of plateau

- ET tube cuff leak or deflated cuff
- ET tube in hypopharynx
- Partial obstruction



CPR Assessment

- Attempt to maintain minimum of 10mmHg



Sudden increase in EtCO₂

- Return of spontaneous circulation



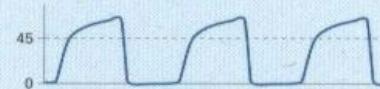
Applications on non-intubated patients include:

- Assessment of asthma and COPD
- Documented monitoring during procedural sedation
- Detection of apnea or inadequate breathing
- Measurement of hypoventilation
- Evaluation of hyperventilation

Examples:

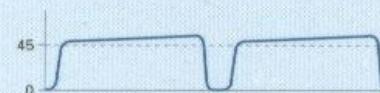
Plateau has curved, "shark-fin" appearance

- Asthma
- COPD



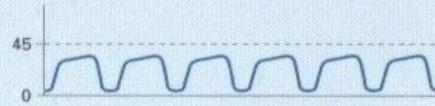
Slow rate with increased EtCO₂

- Hypoventilation
- Partial airway obstruction



Rapid rate with decreased EtCO₂

- Hyperventilation



Decreased EtCO₂, variable waveform

- Apnea, inadequate breath
- Sedation



High-Flow Nasal Oxygenation

POLICY:

High-Flow Nasal Oxygenation (HFNO) is an alternative way to administer higher amounts of oxygen than other conventional means which only allow 15 lpm of cold, dry oxygen. A clear benefit of HFNO is to deliver warmed, humidified oxygen to the airway tissues. This allows more effective removal of secretions from the airway (due to the higher water content of mucus) and prevents epithelial injury. Another clear benefit to HFNO is it provides more comfort to the patients which increases tolerance to the treatment. HFNO reduces the dead space in the lungs while facilitating CO₂ elimination. This reduces both respiratory rate and the work of breathing.

HFNO has been used to treat patients who are suffering from Hypoxemic acute respiratory failure (ARF) in the ICU environment. Recently, mostly due to SARS-CoV 2 pandemic, this treatment has seen success outside of the ICU in reducing the need for intubation of Covid patients with additional comorbidities. Although more studies are needed, the studies that have been done to date show a clear benefit in reducing the need to intubate patients who present with hypoxemic ARF and the reintubation of scheduled extubated ARF patients.

PROCEDURE:

Indications:

- Must be Initiated in hospital (Vapotherm).
- Continuing in hospital therapy.

Contraindications:

- Hypoxemic ARF with criteria for intubation
- Hypoxemic ARF with extrapulmonary organ failure.

Precautions:

- Do not allow the H900 to tilt more than 10 degrees.
- Always keep the H900 mounted while in use.
- Do not run the H900 without it being connected to the ventilator and with air flowing.
- Personnel driving the ambulance need to take extra precaution to avoid causing the water in the H900 reservoir to slosh.
- Drain water from the patient side of the H900 Circuit to prevent lavaging the patient. Periodically draining any standing water from condensation during treatment is required.
- Maintain a loop in the line that is always below the head of the patient.

Procedure:

- Turn on the Hamilton T1 ventilator and activate the High-Flow mode.
- Select desired flow rate. 60 l/m is maximum. Use chart in the Special Notes to help guide your decision in selecting the flow rate.
 - Pediatric Cannula max flow rates
 - Small 10 L/min
 - Medium 14 L/min
 - Large 23 L/min
 - X-Large 27 L/min
- Turn on the H900
- Install the reservoir, spike a bag of sterile water or use a syringe to add sterile water to the reservoir. Allow the unit to warm up.

- Select the desired temperature, 37 degrees Celsius is the desired temperature although patient comfort should guide your decision making.

Removal Procedure:

- Remove cannula from patient's nose.
- Turn off the H900 or place in stand-by.
- Turn off the Ventilator or place in stand-by mode.

TABLE 1

MFD O2 Tank Conversion Factor

D (Cot)	Tank psi x 0.16
K (Amb)	Tank psi x 3.14

TABLE 2

O2 LPM consumption table based on total liter flow and FIO2

LPM	FiO2 ->	30%	40%	50%	60%	70%	80%	90%	100%
60		7.5	12.5	22.5	30	37.5	45	52.5	60
50		6.25	12.5	18.75	25	31.25	37.5	43.75	50
40		5	10	15	20	25	30	35	40
30		3.75	7.5	11.25	15	18.75	22.5	26.25	30

Step 1. Determine available O2 utilizing Table 1 above.

Step 2. Find O2 flow based on Table 2 above.

Step 3. Utilize the following equation to determine O2 on hand in minutes.

$$\frac{\text{Available O2 from step 1}}{\text{O2 flow from step 2}} = \text{Available O2 in minutes}$$

Step 4. Repeat for second tank and add the two together to determine total Minutes of available O2.

VASCULAR ACCESS

PROCEDURE:

Establishing IV Access:

Consider establishing IV access in any patient who requires fluid administration, who will be receiving medications, or when there is a reasonable chance that the patient's condition may deteriorate.

Establish two IVs, whenever possible, in significant trauma and medical patients. Significant trauma patients should also have blood tubing hung and be primed with normal saline.

Saline Lock IV Access:

Initiate saline lock IV access in all patients who require vascular access based upon the specific treatment protocol, but who need no immediate medication administration or fluid administration (e.g., IV TKO and transport).

- Pre-existing saline lock IVs on the extremities may be used for fluid or medication administration.
- If medication administration is needed due to a change in patient status, inject medication into the lock, and flush with saline.
- If multiple doses of medication are anticipated, consider attaching an IV bag with tubing to the saline lock using sterile technique.

External Jugular Venipuncture:

Paramedics may use the external jugular route for IV insertion if:

- No peripheral IV routes are available

AND

- The IV is essential for patient care.

EZ-IO ACCESS **Humerus, Proximal, and Distal Tibia**

Medication and fluid resuscitation can be accomplished safely and in as little as 30 seconds by the IO route if IV access is unavailable. IO access is appropriate for all age groups. IO administration of medications is preferred over the ET route and any fluid/medication that may be administered IV may be given IO. It is appropriate to forego IV access attempts and proceed directly to IO access in cases where the patient is near or is actually in extremis, particularly in the pediatric patient.

POLICY:

This skill may be performed by appropriately Credentialled Madison County EMS providers only.

INDICATIONS:

- Emergent administration of fluids/medications.
- Difficult, delayed, or impossible venous access.

CONTRAINDICATIONS

- Fracture of the bone you intend to utilize for IO placement
- Insertion area compromised by a pre-existing condition/orthopedic procedure
- Skin infection at the insertion site
- Inability to locate landmarks
- Excessive tissue over the insertion site (5 mm mark not visible)

PROCEDURE:

Insertion Instructions:

1. Ensure BSI Precautions
2. Identify indication and appropriate site
3. Check for contraindication
4. Locate landmarks
5. Clean site
6. Prepare driver/needle set
7. Insert needle set, confirm 5 mm mark visible
8. Complete insertion
9. Stabilize needle set and remove driver
10. Remove stylet
11. Confirm placement
12. Attach primed EZ-Connect extension set
 - Consider syringe infusion of 2% Lidocaine IO for alert patients:
 - Adults 20-40 mg SLOW IO
 - Peds 0.5 mg/kg SLOW IO (not to exceed adult dose)
13. **Syringe FLUSH IO** with 10 mL of NS
14. Start infusion (use a pressure bag as required)
15. Stabilize catheter as needed

Removal Instructions:

1. Ensure BSI Precautions
2. Ensure alternate access as needed

3. Disconnect EZ-Connect
4. Attach sterile luer lock syringe
5. **Continuously rotate clockwise while gently pulling**
6. Dress site and monitor for complications

INSERTION SITES

Humeral

- Recommended for patients >5 years old / >25 kg due to difficulty in palpating humeral head in smaller patients.
- Preferred Procedure: The patient should be in a supine position. Expose shoulder and adduct humerus resting the elbow on the stretcher or ground. Forearm resting on the abdomen and the hand at about the umbilicus. Palpate and identify the mid-shaft humerus and continue palpating toward the proximal aspect or humeral head. As you near the shoulder you will note a small protrusion. This is the base of the greater tubercle insertion site. With the opposite hand you may consider “pinching” the anterior and inferior aspects of the humeral head while confirming the identification of the greater tubercle. This will ensure that you have identified the midline of the humerus itself. This is the insertion site.
- Alternatively: Position patient as noted. Identify two landmarks on the lateral shoulder consisting of the acromion and the coracoid process. This can be accomplished by placing one hand on the lateral superior aspect of the patient’s shoulder and palpating for the protrusions. Identifying the coracoid process and the acromion can also be accomplished by “walking” your index and middle finger along the clavicle to the shoulder’s lateral end. Identify the greater tubercle insertion site approximately two finger widths inferior to the coracoid process and the acromion. One can envision the location of this site by creating a “T” - the upper portion of the letter connecting the coracoid process and the acromion while the “leg” reaches inferiorly and slightly anteriorly - approximately two finger widths along the midline between the two structures. This is the insertion site.
- Do not attempt insertion medial to the greater tubercle.

Proximal Tibia

- Extend the leg, locate the patella and feel the anterior surface of the leg just below the patella for the tibial tuberosity. From the tibial tuberosity move 1-2 fingers width medially, depending on patient size/age, to the middle of the flat part of the tibia. This is the insertion site.

Distal Tibia

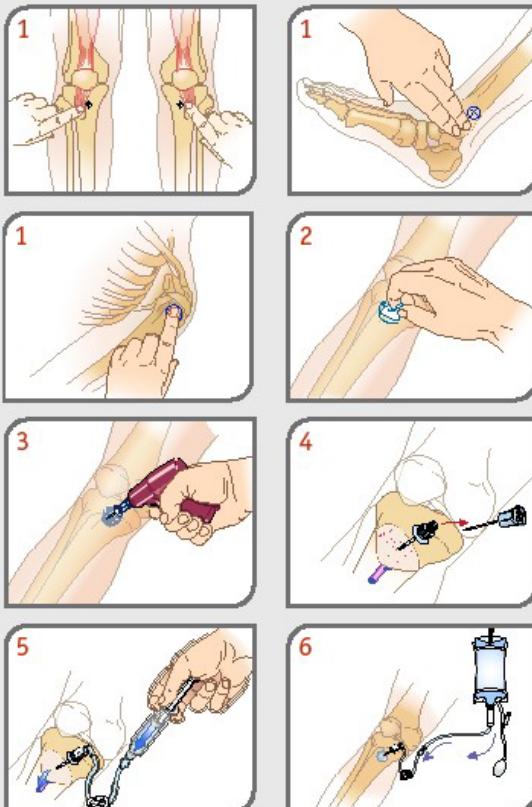
- Locate the medial malleolus. 1-2 fingers width proximally, depending on patient age/size, along the medial aspect, in the middle of the bone is the insertion site.

The following are instructions from the manufacturer:



Immediate Vascular Access... When You Need It.SM

Intraosseous Infusion System



To Insert Needle Set:

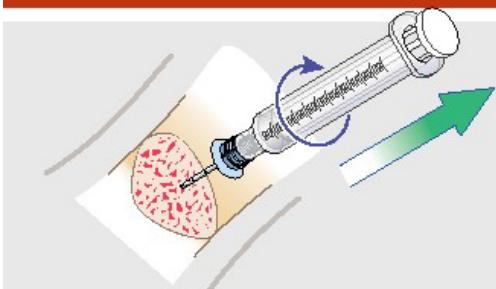
- Locate landmarks 1
- Clean site 2
- Insert EZ-IO[®] Needle Set 3
- Remove stylet from catheter 4
- Attach primed EZ-Connect[®]
- Consider IO 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) for patients responsive to pain – prior to flush

Follow institutional protocols/policy

- Medications intended to remain in the medullary space, such as a local anesthetic, must be administered very slowly until the desired anesthetic effect is achieved
- Syringe bolus (flush) IO with 10 ml normal saline..... 5
- Start infusion under pressure 6

A Medical Director or qualified prescriber must authorize appropriate dosage range.

Do Not Leave the EZ-IO catheter in for more than 24 hours.



To Remove Catheter:

- Stabilize patient's extremity
- Connect sterile Luer lock syringe to hub of catheter
- Rotate catheter clockwise – while pulling straight back
- When catheter has been removed, immediately place in appropriate biohazard container.

DO NOT ROCK the catheter while removing. Rocking or bending the catheter may cause the catheter to separate from the hub.

Emergency contact in US or Canada call: 1-800-680-4911

For international assistance contact your local Vidacare Distributor

FLUID ADMINISTRATION

Administration of fluid to a sick or injured patient has the potential to be both beneficial and detrimental to the patient's overall outcome. Patients who are hypotensive, for whatever reason, need an appropriate blood volume and pressure in order to perfuse vital organs. Isotonic solutions, when administered appropriately, can provide a needed boost to these patients. Fluids that are not administered appropriately can lead to fluid overload and/or a loss of clotting ability. For this reason, fluid administration should focus on determining the cause of the hypotension prior to determining the amount of fluid to administer.

PROCEDURE:

1. Identify if the patient requires fluid administration. For patients not requiring fluid administration, place a saline lock only. If fluid is hung, maintain the IV at TKO.
 - a. Patients that require fluid administration may have any of the following signs and symptoms:
 - i. Hypotension (relative or clinical)
 1. Also check for orthostatic hypotension
 - ii. Tachycardia (relative or clinical)
 - iii. Altered mental status
 - iv. Skin that is pale, cool, and/or diaphoretic
 - b. These patients should have an IV initiated and fluid hung
2. Use of Mean Arterial Pressure (MAP) is more reliable than systolic pressure in determining fluid resuscitation
 - a. A MAP of 65 mmHg is the goal during fluid resuscitation
 - b. Vasopressors can also be administered, per protocol, to assist in achieving the desired MAP
 - i. Do not administer vasopressors to patients who are hypotensive due to fluid loss
 - c. $MAP = [(2 \times \text{Diastolic}) + \text{Systolic}] / 3$
3. Administer fluid
 - a. Fluid boluses of 20 ml/kg, up to 500 mL, should be administered PRN
 - i. Re-check vital signs, mental status, and skin CTC after each bolus
 - ii. Lung sounds should be checked after each bolus
4. Be cautious administering fluid to the following patients:
 - a. Congestive heart failure
 - b. Pulmonary edema
 - c. Head injury
 - d. Stroke
 - e. Patients undergoing dialysis
5. Special Circumstances:
 - a. Right Ventricular Myocardial Infarctions.
 - i. May require fluid boluses in order to maintain pre-load.
 - ii. Administer fluid boluses of 500 mL each. Re-evaluate patient after each fluid bolus.
 - b. Head Injury.
 - i. May require fluid boluses in order to maintain proper cerebral perfusion pressures (CPP). A MAP of 90 mmHg is optimal in ensuring proper CPP.
 - ii. Administer fluid boluses of 250-500 mL each. Re-evaluate patient after each fluid bolus.

BLOOD ADMINISTRATION

PURPOSE

- To restore the volume, hemoglobin (Hgb), and hematocrit (HCT) to a normal range by the administration of blood or blood products.
- To be done during Interfacility transfer by physician orders.

PROCEDURE

- Blood is used generically throughout this procedure to signify both whole blood and blood products.
- 1. Prepare the patient:
 - a. Check for history of previous transfusion reactions
 - i. Patients with reactions have a greater chance of reacting again
 - b. Explain the procedure and answer patient's questions
 - c. Take a full set of vital signs including temperature and record as pre-infusion vitals
 - d. If possible have the patient void prior to procedure
 - i. If there is an agglutination problem, a fresh UA is necessary
- 2. Establish IV pathway:
 - a. Close all clamps on the Blood Y Tubing set
 - b. Insert the non-vented piercing pin (white) into the Normal Saline bag
 - c. Squeeze the drip chamber to fill with saline
 - i. Fill to cover filter
 - d. Open main clamp and allow fluid to expel air, close main clamp
 - e. Attach set to IV and secure
- 3. PRECAUTIONS:
 - a. Never precede or follow blood by a solution containing dextrose or calcium
 - i. If patient has IV running containing dextrose or calcium (Lactated Ringers contains calcium) the IV must be stopped and the tubing flushed with normal saline before blood may be administered
 1. Dextrose or calcium may cause agglutination or clotting of red blood cells
 - b. Never administer additives of any kind to blood bag
 - i. If medications must be given through the blood IV pathway, turn off blood and flush the tubing with normal saline
 - ii. Flush the IV line after medications are given
- 4. Starting the transfusion:
 - a. Two qualified individuals must verify that the lab information slip matched the information label on the blood bag
 - i. Patient name and armband
 - ii. Type of blood product
 - iii. Blood donor number
 - iv. Patient and donor ABO and Rh groups
 - v. Patient medical record number
 - vi. Blood bank armband
 - vii. If the patient is awake, ask them to state their name

- b. Gently rotate bag to disperse cells
 - c. Do not warm blood prior to use
 - i. Take from blood bank and use immediately
 - ii. Blood may not be returned to blood bank after 30 minutes
 - iii. Blood may not be stored in utility refrigerator
 1. Use only blood bank provided cooling chest
 - d. Prepare unit for administration with all flow clamps closed
 - e. Insert piercing pin into proper opening on blood bag
 - f. Open flow clamp to blood
 - i. If clamp to normal saline is open, blood will flow into the saline bag
 - g. Fill drip chamber until filter completely covered to prevent damage to cells
 - h. Open main flow clamp and observe for reaction
 - i. Take vital signs frequently until administration is completed
 - i. Observe the patient closely during the first 15 minutes as patient symptoms are likely to occur before vital signs change
 - j. In non-urgent situations, average transfusion time is 60-120 minutes
 - i. Slow down the rate for elderly
 - ii. Maximum transfusion rates for blood are four hours while fresh frozen plasma must be transfused within two hours
5. Watch for:
 - a. Adverse reactions
 - i. Sudden pain in chest or back
 - ii. Dyspnea and shock
 - iii. Chills
 - iv. Elevation in temperature and pulse
 - v. Restlessness
 - vi. Headache
 - vii. Nausea and vomiting
 - viii. Urticaria
 - ix. Flushed appearance
 - x. JVD
 - b. If patient develops any of these symptoms:
 - i. Stop transfusion immediately
 - ii. Disconnect blood set from main IV line
 - iii. Flush line with normal saline
 - iv. Maintain patency of IV
 - v. Treat reaction
 6. Chart:
 - a. Time transfusion started and ended
 - b. Any reactions and treatments administered
 - c. Record blood products and IV solutions
 - d. Vital signs

CENTRAL LINE CATHETER ACCESS & ADJUNCTS

POLICY:

1. ALS and Critical Care paramedics may not access an A-V shunt.
2. A critical care paramedic may access central lines in the course of their treatment and transport of critical care patients if such access is required.
3. An ALS responder may not access a central line catheter or any other permanent indwelling line except:
 - a. In situation of cardiac arrest
 - b. Symptomatic hypovolemic shock
 - c. Under request of base station physician
 - a. All may only be performed with Physician Order Only
4. The ALS provider and Critical Care paramedic must follow the following procedure for central line catheter access

PROCEDURE:

1. Use aseptic technique
2. Clean hands and don gloves
3. Clean port with alcohol swab
4. Attach no smaller than 10 mL syringe.
5. Unclamp catheter
6. Aspirate back for flow
7. If blood returns, clamp catheter and remove syringe
8. Attach 10 mL flush
9. Unclamp catheter and inject 10cc saline and then clamp catheter
10. Remove syringe and connect IV solution, unclamp
11. Administer solution/medication as indicated
12. Do not draw blood from catheter
13. NEVER USE ANYTHING SMALLER THAN A 10 ML SYRINGE

Bleeding Control

INDICATIONS

Immediate tourniquet use is appropriate for any identified arterial bleeding.

A tourniquet should be used to control hemorrhagic wounds that do not stop bleeding despite direct pressure/pressure dressing/wound packing or in situations of significant extremity bleeding with the need for additional lifesaving interventions – such as significant extremity bleeding with airway compromise.

PRECAUTIONS

- An incorrectly applied tourniquet can increase blood loss and lead to death
- Tourniquets should never be covered up by patient clothing or packaging
- Tourniquet use can cause nerve and tissue damage whether applied correctly or not
- Permanent damage is unlikely
- The benefits of tourniquets far outweigh the risks

PROCEDURE

- Use BSI
- Attempt to control hemorrhage with direct pressure/pressure dressing/wound packing
- If unable to control hemorrhage using the above means apply a tourniquet
 - Apply tourniquet proximal to wound
 - Do not place over joints
 - Tighten tourniquet until bleeding stops
 - Secure windlass strap
 - Note time of tourniquet application on windlass strap
 - Rarely a second tourniquet is required to stop bleeding. If required place as close as possible proximally to first tourniquet
- The tourniquet and wound site should be left uncovered so that the site can be monitored for recurrent hemorrhage
- Reassess tourniquet and wound site after each patient move
- Keep tourniquet on throughout transport – a correctly applied tourniquet should only be removed by the receiving hospital
- Ensure receiving personnel are aware of tourniquet placement

CARDIOPULMONARY ARREST RESUSCITATION

PURPOSE

To provide for consistent application of proven resuscitation techniques in the cardio-pulmonary arrest setting.

POLICY

2-Minute CPR Protocol—*the initial 2 minutes of our interventions will be considered the most crucial to patient survival and therefore the following should be strictly adhered to by all responding personnel:*

1. **Unresponsive with no/ineffective CPR:**
 - a. **Person 1:** Perform initial assessment and then immediately initiate CPR @ 5 cycles of 30 effective compressions and 2 effective ventilations (2-minute cycle).
 - b. **Person 2:** First prepare and help place the LUCAS (reference 3003.12). Second maintain an open airway and an effective face-mask seal with BVM. Attaches monitor during last cycle if no other help has arrived.
 - c. **Additional personnel (as they arrive):**
 - i. 1st priority is to attach defibrillator and administer defibrillatory shock (if indicated) immediately following 2 minutes of effective CPR
 - ii. 2nd priority is to gain IV/IO access and prepare for medication administration
 - iii. 3rd priority is to prepare for advanced airway management, unless BLS airway management is ineffective, then this becomes priority 2 – before IV/IO access
1. **Unresponsive with effective CPR:**
 - a. **Person 1:** Perform initial assessment
 - b. **Person 2:** Immediately attach defibrillator, assess for shockable rhythm, and perform immediate defibrillation
 - i. Post defibrillation treatment should then follow current AHA guidelines and department protocols / procedures
 - ii. If not a shockable rhythm, continue to appropriate cardiac algorithm
 - iii. Prepare/place LUCAS.
2. **Witnessed arrest:**
 - a. Stop all other treatments, assess for shockable rhythm, and if indicated perform immediate defibrillation
 - i. Post defibrillation treatment should then follow current AHA guidelines and department protocols / procedures.
 - ii. If not a shockable rhythm, continue to appropriate cardiac algorithm
 - iii. Prepare/place LUCAS.

After use of the 2-minute CPR protocol and for continuing treatment, refer to and use the most current American Heart Association Guidelines whenever possible.

AUTOMATED EXTERNAL DEFIBRILLATION A.E.D.

POLICY

The AED policy and procedure applies to EMTs and Advanced EMTs certified in the use of automatic external defibrillators. Refer to current American Heart Association current guidelines.

PROCEDURE

- 1. Rationale for early defibrillation**
 - a. The most frequent initial rhythm in sudden cardiac arrest is ventricular fibrillation
 - b. The most effective treatment for ventricular fibrillation is electrical defibrillation
 - c. The probability of successful defibrillation diminishes rapidly over time
 - d. Ventricular fibrillation tends to convert to asystole within a few minutes
- 2. General guidelines**
 - a. One AED series equals zero (0) to one (1) shocks regardless of what the AED indicates
 - b. Never shock a conscious patient
 - c. The AED should be rapidly placed, and the rhythm analyzed immediately if arrest is witnessed by EMS personnel or if good bystander CPR is being performed
 - d. If the arrest is not witness, or if adequate CPR is not being performed, provide 2 minutes (5 cycles) of CPR prior to initial rhythm analysis and defibrillation (reference 3003.7)
 - e. If the ALS ETA is delayed, consider rendezvous/transport after radio contact with the incoming ALS unit
- 3. Indications**
 - a. Unresponsive, apneic, pulseless patients
- 4. Contraindications**
 - a. The following patients should not be attached to an AED:
 - Any patient who is responsive, breathing, or has a pulse
 - Obvious “dead on scene” (See procedure)
 - Any patient who is actively seizing
- 5. Precautions**
 - a. All persons should be clear of the patient while the machine is analyzing the rhythm and/or delivering a shock
- 6. Considerations**
 - a. Pediatric cardiac arrests are usually due to respiratory failure
 - b. Evidence suggests that ventricular fibrillation does occur in association with congenital heart problems, drug overdoses and glue sniffing
 - c. Use child pads on children, unless no child pads available, then ensure adult pads do not touch, consider anterior/posterior placement
 - d. Hypothermia:
 - Defibrillation should not be withheld from the cold patient in ventricular fibrillation
 - Perform one series of AED protocol only
 - If the patient does not respond to one AED series, resume CPR and re-warming efforts
 - Do not continue defibrillation series until patient is rewarmed
 - e. Trauma

- Consider the causes of the cardiac arrest before applying AED pads
- Cardiac arrest secondary to major trauma seldom responds to defibrillation
- Remember a ventricular fibrillation arrest may have been the actual cause of the accident
- e. If the AED protocol is interrupted by the return of a normal rhythm, continue AED monitoring of the patient
 - a. Do not turn the unit off as the machine will reset back to the initial shock status.

7. Procedure

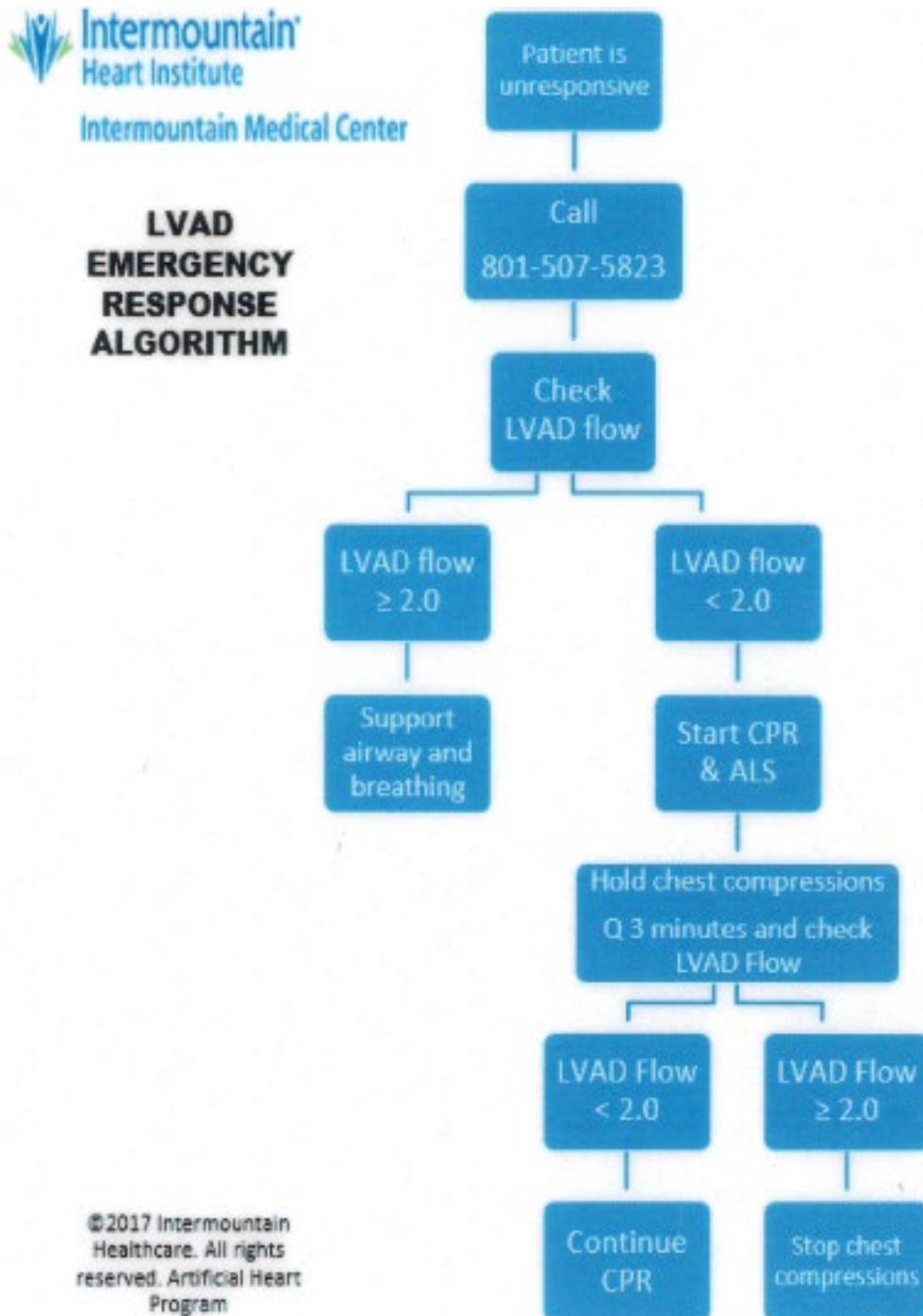
- a. Verify unresponsiveness, apnea, and the absence of a pulse
- b. Perform CPR as indicated by current AHA guidelines and ready LUCAS and AED equipment (reference 3003.12)
- c. Call for ALS if not already enroute
- d. Turn on the AED
- e. Apply the pads to the patient's bare chest
- f. Follow all AED screen and voice prompts during the rhythm analysis
- g. Administer shocks as indicated
- h. Continue CPR for two minutes (5 cycles)
- i. Repeat f, g, and h until:
 - The ALS unit arrives and takes over resuscitative efforts.
 - The Emergency Room Physician orders you to discontinue efforts.

LVAD

The following algorithm is the current treatment algorithm for patients with an LVAD emergency.

Algorithms and patient conditions change. For all LVAD patient emergencies call for help and guidance.

LVAD Emergency Assistance Contact Number: (801)-507-5823



HYPERKALEMIA

POLICY:

Hyperkalemia can lead to sudden death from cardiac dysrhythmias, so any suggestion of hyperkalemia requires an immediate ECG to ascertain whether signs of electrolyte imbalance are present.

Hyperkalemia has been associated with a markedly increased risk of mortality and morbidity – as high as 67% - and accordingly, managing this blood chemistry shift is extremely important. The extremely elevated potassium level is the primary cause of morbidity and death for these patients because of potassium's effect on the myocardium. In order to ensure resuscitative efforts are appropriate and effective, consider this procedure whenever severe hyperkalemia is suspected.

Beyond those with advanced diabetes mellitus and renal failure / end-stage renal disease, patients with known or suspected rhabdomyolysis (trauma and/or burn patients, hepatic failure, military / fire recruits, etc.), cancer patients (tumor lysis), and even elderly patients predisposed to polypharmacy can be at a significant risk for hyperkalemia. Additionally, otherwise healthy diabetics who are (often) taking ACE-inhibitors or angiotensin receptor blockers are at increased risk for hyperkalemia.

Please keep these things in mind when considering the best course of treatment for cardiac arrest victims (or even patients with marked QRS widening and hypotension) that may belong to one of the above groups. Consider for VT/VF, PEA or Asystole often seen on monitor with a "sine wave" appearance.

PROCEDURE:

1. Calcium Chloride 500 – 1000 mg (5mL) over 2-3 minutes IV.
 - a. Stop infusion if bradycardia develops
2. 5-10 units regular insulin preferably with D50 1-2 amps given at same time, unless BGL >250 then consider holding D50
 - a. Administer only if able to find patient's own prescription or during Critical Care interfacility transfer
3. Follow "Central Line Access" (3003.5) procedure if necessary
4. Consider fluid bolus of NS
5. Albuterol 5mg via continuous nebulizer, PRN.
6. Treat associated signs and symptoms as appropriate

NASAL ATOMIZATION

POLICY:

Nasal atomization can be performed as an alternative and less invasive way to administer certain medications. The nasal mucosa is an excellent place to absorb drugs and medications. It provides a route for medication administration that is quick and effective. Not all medications can be delivered via the intranasal (IN) route. The viscosity cannot be too high (too thick of a liquid) and the chemical makeup of the medication has to be correct to cross the cell membranes (lipophilic drugs are easily absorbed). The following medications are approved for IN administration:

- Anticonvulsants: Midazolam, Lorazepam
- Antidotes: Naloxone
- Anti-Hypoglycemic Agents: Glucagon

PROCEDURE:

Damaged nasal mucosa may inhibit absorption of the medication. For this reason, contraindications for nasal atomization include the following conditions:

- Facial trauma
- Epistaxis
- Nasal congestion or discharge
- Any recognized nasal mucosal abnormality

Use the following steps to deliver medication with the nasal atomizer:

1. Inspect each nostril for significant blood or discharge
 - a. Suction if necessary
2. Prepare the equipment
3. Check the medication
4. Draw the medication into the syringe
 - a. See dosing chart below for recommended dosages
 - b. Maximum adult administration: 1 mL per nostril
 - c. Maximum pediatric administration: 0.5 mL per nostril
5. Expel all of the air from the syringe
6. Securely attach the nasal atomizer to the syringe
7. The patient should be in a recumbent or supine position. If the patient is sitting, compress the nares after administration.
8. Briskly compress the syringe plunger to properly atomize the medication
 - a. Where possible, administer $\frac{1}{2}$ the medication into each nare
9. Monitor the patient

DOSING CHART:

Drug	Intranasal Dosage (Adult and Pediatric)
Midazolam	0.2 mg/kg to max of 10 mg
Lorazepam	0.1 mg/kg to max of 4 mg
Naloxone	0.8-4.0 mg, repeat as needed
Glucagon	0.1 mg/kg to max of 2 mg

Lucas Compression Device

POLICY:

Except as noted below the LUCAS Compression Device will be used on all cardiopulmonary arrest patients.

PROCEDURE:

Indications:

- Cardiopulmonary arrest. Reference (2002.2 Cardiac Emergencies, 3003.7 Cardiopulmonary Resuscitation)

Contraindications:

- If it is not possible to position the LUCAS device safely or correctly on the patient's chest.
- Too small patient: if the LUCAS device alerts with 3 fast signals when lowering the Suction Cup and you cannot enter the PAUSE mode or ACTIVE mode.
- Too large patient: If you cannot lock the Upper Part of the LUCAS device to the Back Plate without compressing the patient's chest.

Precautions:

The International Liaison Committee on Resuscitation (ILCOR) states these side effects of CPR.

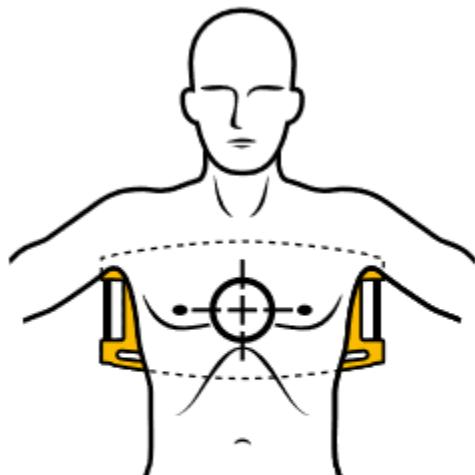
- Rib fractures and other injuries are common but acceptable consequences of CPR given the alternative of death as a result of cardiac arrest. After resuscitation, all patients should be reassessed and re-evaluated for resuscitation-related injuries.
- Apart from the above, skin abrasions, bruising and soreness of the chest are common during the use of the LUCAS Chest Compression System.

Procedure:

Keep interruptions to CPR to a minimum when applying the LUCAS device to the patient.

Application Procedure: (see evolution 105.1)

- Provider 1 determines the patient is in cardiac arrest and initiates chest compressions when patient is in an appropriate position. (Determine if patient needs to be moved to effectively perform resuscitation and move patient.)
- Provider 2 power on Lucas device and prepare backplate.
- Provider 2 places backplate under patient either during patient positioning or after 30 compressions by provider 1.
- Provider 1 continues compressions.
- Provider 2 prepares Lucas device and attaches it to their near side of back plate ensuring controls are also on their near side.
- Provider 1 attaches Lucas device to their near side of back plate.
- Provider 2 press 1 on device, lower puck to contact patients' skin, press 2 and then 3 to start device.
- Both providers place patients' arms in wrist straps and attach the neck strap to Lucas device.



Note: An accurate position of the Back Plate makes it easier and faster to position the Suction Cup correctly.

Removal Procedure:

- Push ON/OFF for 1 second to power off the device.
- If a LUCAS Stabilization Strap is attached to the LUCAS device, remove the neck strap, which is part of the Stabilization Strap, from the support leg straps.
- Pull the release rings to remove the Upper Part from the Back Plate.
- If the patient's condition allows it, remove the Back Plate.

Push Dose Pressor

For the adult patient in the peri-Rapid Sequence Intubation (RSI) time frame it is important to ensure that the patient has adequate systolic blood pressure (SBP) (>90 systolic). Patients who are subjected to RSI with inadequate SBP are at risk of adverse outcomes, with a greater likelihood of suffering peri-RSI cardiac arrest. This risk extends after the RSI procedure. In patients who are not responding to volume resuscitation, the risk can be attenuated by the use of Push Dose Pressors (PDP) in the peri-RSI period. Madison Fire Department (MFD) Critical Care Paramedics may use PDP for documented hypotension in the time frame of 15 minutes before to 15 minutes after the RSI procedure. Three medications are approved for use as PDP within the MFD EMS system:

Phenylephrine is a pure alpha agonist with no intrinsic inotropy and should cause *no increase in heart rate*.

Norepinephrine is an α- and β-adrenergic agonist which exerts effects on blood vessels to induce vasoconstriction and thereby raise blood pressure. Generally there is little effect on heart rate.

Epinephrine has alpha, beta1, and beta 2 effects, it is an inopressor, and may cause an increase in heart rate.

POLICY

Adult patient only: if the patient is not responding to volume resuscitation and has a systolic blood pressure less than 90 mmHg, administer **ONE** of the following push dose pressors as outlined:

Phenylephrine

Mixing Instructions:

- Draw 1 ml (10 mg) of phenylephrine from the vial (vial contains phenylephrine 10 mg/mL)
- Inject this into a 100 mL bag of NS
- Now you have 10 mg/100 mL of phenylephrine. This is 100 mcg/mL
- Draw several mL into a syringe; each ml in the syringe is 100 mcg/mL

Dose: 0.5-2 mL (50-200 mcg) every 2-5 minutes until SBP ≥ 90 mmHg

Onset: 1 minute

Norepinephrine

Mixing Instructions:

- Mix 4 mg norepinephrine in 250 mL
- Fill a syringe with 9 mL of saline
- Into this syringe draw up 1 mL of the 4 mg/250 mL norepinephrine solution
- Concentration of norepinephrine is now 16 mcg/10 mL

Dose: 6-10 mcg for BP <90 by giving 3.75 mL to 6.25 mL IVP

Onset: near immediate to 1 minute

Epinephrine

Mixing Instructions:

- Take a 10 mL syringe with 9 ml of normal saline
- Into this syringe, draw 1 mL of epinephrine from the cardiac amp (Cardiac amp contains Epinephrine 100 mcg/mL)
- Now you have 10 mL of Epinephrine 10 mcg/mL

Dose: 0.5-2 ml (5-20 mcg) every 2-5 minutes until SBP ≥ 90 mmHg

Onset: 1 minute

At 15 minutes post RSI if blood pressure still requires support, even after fluids and PDP, consider a vasopressor drip. It is not necessary to wait the full 15 minutes to start a vasopressor drip.

DETERMINATION OF DEATH ON SCENE

Patients encountered by EMS personnel in Madison County that appear to have expired will not be resuscitated or transported if ALL four (4) presumptive signs of death AND AT LEAST one (1) conclusive sign of death are identified.

- The four (4) presumptive signs of death that MUST be present are:
 1. Unresponsiveness
 2. Apnea
 3. Pulselessness
 4. Fixed dilated pupils
- Conclusive signs of death include:
 1. Lividity of any degree
 2. Rigor mortis of any degree
 3. Body decomposition
 4. Injuries incompatible with life, such as decapitation
 5. Arrest from severe blunt trauma
 6. Penetrating head or neck injury
 7. No electrical activity present on cardiac monitor

If there is any question regarding patient viability resuscitation will be initiated and the patient transported for physician examination.

Once it has been determined that the patient has expired and resuscitation will not be attempted, cover the body with a clean sheet or other suitable item. Immediately notify the appropriate authority. DO NOT remove any property from the body or the scene for any purpose.

- If the scene is a potential crime scene, e.g., possible homicide, and the body is in an area that can be isolated from public view, *DO NOT* cover the body. If the body cannot be isolated from public view, *ONLY* cover the body with a clean sheet obtained from the EMS vehicle upon direction from on scene Law Enforcement.

Resuscitation that is started in the field by EMS personnel CANNOT be discontinued without a physician order. EMS personnel are not obligated to continue resuscitation efforts that have been started by other persons at the scene.

Resuscitation started in the field may be discontinued by physician order when the following conditions have been met:

- The patient remains in persistent asystole or agonal rhythm despite appropriate ALS intervention such as:
 1. CPR
 2. Effective ventilation with 100% oxygenation
 3. Successful IV access
 4. Rhythm appropriate medications
- The patient develops, or is found to have one of the following conclusive signs of death at any point during the resuscitative effort:
 1. Lividity
 2. Rigor mortis
 3. Injuries incompatible with life

NEVER leave a body unattended, if possible. Once a responsible person (coroner's investigator, police) is present at the scene, you may leave.

NEVER transport/move a body without permission from the coroner's office, except for assessment or its protection.

If the death is not witnessed by medical professionals, or there are suspicious circumstances surrounding the death, and resuscitation has been discontinued in the field, all medical interventions should be left in place for the coroner.

Consider the needs of survivors when discontinuing resuscitative efforts:

- In early grief, it is easy to misinterpret even well-meaning expressions of concern, be careful as to what you say.
- Resuscitation efforts may encourage misguided optimism. Provide appropriate psychological support to grieving survivors if resuscitation efforts are called off by on-line medical control.

CLEARING C-CPINE IN THE FIELD

PURPOSE

The following provides paramedic responders with guidelines to determine whether or not immobilization is appropriate at an accident scene. Other levels of EMS provider should default to immobilization. This procedure is based upon the Nexus Protocol (a national standard for c-spine clearance) and coincides with the documentation found on the ePCR.

PROCEDURE

1. Assess for:
 - Absence of tenderness at the posterior midline of C-spine
 - Absence of a focal neurologic deficit
 - Normal level of alertness
 - No evidence of intoxication
 - Absence of clinically apparent pain that might distract the patient from the pain of a C-spine injury
2. If patient has any of these symptoms, **IMMOBILIZE**.
3. If patient's history or physical exam is reliable, go to step #4 -- If not, **IMMOBILIZE**.
4. If there is no pain, tenderness, or deformity at any point on the entire spine, go to step #5 -- If there is pain, tenderness, or deformity then **IMMOBILIZE**.
5. If circulation, motor, and sensory are normal, consider immobilization -- If circulation, motor, or sensory are not normal, **IMMOBILIZE**.
 - NOTE: Clearing Cervical Spine (C-Spine) is Paramedic protocol only. If a paramedic clears the cervical spine of a patient based on this protocol, it is to be documented on the Patient Care Report and also reported to the receiving facility.
 - When in doubt, **IMMOBILIZE**.

AIR TRANSPORT

POLICY

Air transport should be utilized whenever patient care can be improved by Air Ambulance providers and their equipment or where decreasing transport time to a specialized care facility could be critical to reduction of patient morbidity/mortality. The Madison Fire Department (MFD) uses the Helicopter EMS (HEMS) service of Air Idaho Rescue (AIR) & Portneuf Regional Medical Center. MFD also uses the fixed wing services of AIR and various services from Utah.

PURPOSE

- Improve patient care in the pre-hospital setting
- Allow for expedited transport in serious or mass-casualty trauma and medical settings
- Provide life-saving treatments that are not available by Madison Fire Department ambulance

PROCEDURE

- Air transport should be *considered* if any of the following criteria apply:
 1. High priority patient (trauma or medical) with >30-minute transport time to appropriate facility
 2. Entrapped patients with >15-minute estimated extrication time
 3. Multiple casualty incidents with immediate and delayed patients
 4. Penetrating injury to the head, chest, or abdomen
 5. Extremity amputations
- If a potential need for air transport is anticipated, but not yet confirmed, initiate dispatch of aeromedical services.
- Air transport can be cancelled if patient situation improves, if scene conditions improve, or if air transport is determined to be unnecessary.
- Information needed to request a flight:
 1. The person or agency requesting the flight and a phone number.
 2. Specific location of the scene (GPS coordinates are helpful – consider What3Words to help determine GPS coordinates).
 3. Known or suspected injuries or illness.
 4. Radio frequencies of ground personnel and call name of scene officer.
 5. On-site weather (wind, visibility, and ceiling).
- Patient update information which should be provided:
 1. Number of patients
 2. Age and sex of patients
 3. Mechanism of Injury or Chief Complaint
 4. Patient weight
- When there exists a situation that has both the Madison Fire Department and aeromedical transport teams caring for a single or multiple patients at the scene, the aeromedical team generally has jurisdiction over patient care.
- Fixed wing services are generally initiated by physicians within the hospital and our role, in these situations, is to provide transport services to and from the healthcare facility. The transport team is responsible for total patient care. Madison Fire Department personnel are encouraged to assist these teams at their direction as long as it does not conflict with scope of practice issues.
- Sometimes aeromedical services are not able to respond due to weather issues. If one aeromedical agency turns down a flight request, because of poor weather, do not call and request another agency – transport should be provided by ground to the hospital or

rendezvous with aeromedical services at an area where weather is not a factor (whichever leads to fastest arrival at needed/definitive care).

- **Landing Zone Safety:**

1. The recommended landing zone dimensions are 80'x 80' daylight and 100' x 100' at night. The area needs to be clear of obstacles, trees, wires, buildings, and litter. There should be less than a 5-degree slope.
2. Only one person should be pointing out the LZ. All others should be 100' away.
3. Loose articles of all kinds should be removed from the area. Rotor wash can be up to 100 mph. Take off hats and scarves unless they can be tied down. Secure all sheets and bags.
4. The scene MUST be kept clear of all bystanders during landing and take-off.
5. The tail rotor is invisible when spinning and highly dangerous. The main rotors can dip to head level when slowing down.
6. ALWAYS approach the helicopter from the front or side so the pilot can see you and from the DOWNHILL side.
7. Never approach the helicopter with anything held higher or taller than your head.
8. No smoking within 100 feet of the helicopter.
9. Dust, sand, and snow destroy visibility, whenever possible, water it down or pack the snow down.
10. Notify the helicopter of the wind direction and approximate speed. If the wind is >20 mph they must land into the wind. A 10-mph wind will mess up your hair, a 20-mph wind will take your cap off.
11. The approach path should be clear of trees, buildings, wires, poles etc.
12. To indicate a night LZ, cross TWO beams together on the LZ. Do NOT point the lights at the helicopter. Cars should be at least 50' from the LZ.
13. Example of information for the pilot from the scene commander:
 - "We have a 100'x100' LZ, there are 200' power lines 1/4 mile east, a radio tower on the west across the road, trees to the north edge about 80 feet high. We have wet down an area on the west side of the road. Winds from the south at about 10 knots. A patrol car in the SW corner, a pumper in the NW corner with headlights crossed. Some 2-3 foot stumps on the east edge."

Trauma Leveling Criteria

POLICY

(*The following is taken from EIRMC's Trauma Leveling Criteria*):

- Leveling criteria should be guidelines only. Leveling should be guided by rationale for each level and clinical judgment. May activate a trauma up to 48 hours post injury.
- Activate the trauma team as soon as possible by contacting EIRMC-ER.
 - Be prepared to identify your patient as either a 'Full' or 'Partial' trauma patient.

PROCEDURE

Full Team – Patient Unstable

Need for immediate trauma resuscitation or immediate OR.

Team includes: Trauma surgeon, ED MD, Anesthesia, ED RN's, ICU RN, Labs, X-Ray, CT tech, Respiratory, Pharmacy, Recorder, House supervisor, Social services, and admissions.

Airway and Breathing

- Intubated patients
- Threatened or compromised airway
- Pneumothorax or ventilation compromise
- Grunting or stridor in child
- Respiratory rate < 10 or > 29 (< 20 infant < 1 year)
- Flail Chest

Circulation

- Systolic BP < 90
- Transfer patient's receiving blood to maintain vital signs.

Disabilities

- GCS of 12 or less
- Open or depressed skull fracture
- Paralysis or focal neurological deficit.

Mechanism of injury

- Burns > 20% TBSA or to head, face, genitals.
- High voltage injury (including lightning)
- Penetrating injury to torso, neck, head, or proximal to elbow or knee.

Other

- Unstable pelvic fracture
- Bilateral femur fracture
- Open fractures in multiple trauma
- Pulseless extremity / limb threatened
- Traumatic amputation / mangled limb / crushed / de-gloved / impaled.
- MD or RN discretion.

Partial Team – Patient Stable

Mechanism suggests possible significant injury. Need expedited evaluation.

Team Includes: ED MD, ED RN, Lab, X-Ray, and admissions.

Mechanism of injury

- MVC w/ speed of 45 mph or more
- Auto vs. pedestrian or bicycle
- Death in same collision
- Ejection from vehicle/ rollover
- Motorcycle / ATV / snowmobile crash
- Thrown from horse
- Fall > 15 ft., pediatric fall twice the patient's height or more.

Injuries

- Isolated-open fractures
- 2 or more proximal long-bone fractures (bilateral femur fractures = full trauma)
- Subcutaneous emphysema
- Possible spinal fractures without CNS involvement
- Maxillofacial trauma without airway compromise

Consider activation for high risk patient's

- Age >55 or < 5
- Multiple co morbidities
- Blood thinners or other bleeding/clotting disorders
- Major auto deformity, intrusion at least 12 inches into compartment
- Extrication > 20 minutes
- Pregnancy > 20 weeks
- Hypo or Hyperthermia symptoms

Other

- Stable transfers from outside hospital ED with injuries resulting from traumatic mechanism (in ED or inpatient < 24 hours)
- MD or RN discretion

CINCINNATI STROKE TEST

The pre-hospital stroke test, developed in Cincinnati, effectively identifies patients with stroke. This scale evaluates three major physical findings: facial droop, motor / arm weakness, and speech abnormalities. The condensed examination can be accomplished with a series of simple tests that can help pre-hospital care providers to quickly identify a stroke patient who requires rapid transport to the hospital. A more extensive examination or institution of supportive therapies can be accomplished en-route to the hospital and in the emergency department. If possible, pre-hospital care providers should establish the time of onset of stroke signs and symptoms. This timing will have important implications for potential therapy. If the time of onset of symptoms is viewed as time zero, all assessments and therapies can be related to that time.

PROCEDURE:

1. **Facial droop** – Have the patient show their teeth or smile.
 - a. Normal – Both sides of face move equally well.
 - b. Abnormal – One side of the face does not move as well as the other.
2. **Arm drift** – The patient closes their eyes and holds both arms out.
 - a. Normal – Both arms move the same direction or do not move at all (pronator grip may be helpful).
 - b. Abnormal – One arm does not move, or one arm drifts down compared to the other.
3. **Speech** – Have the patient say “you can’t teach an old dog new tricks”
 - a. Normal – The patient uses the correct words with no slurring
 - b. Abnormal – The patient slurs their words, uses inappropriate words or is unable to speak.

Report specific findings for example: left side facial drooping, slurred speech.

A.P.G.A.R.

POLICY

To be performed on newborns at 1 minute and again at 5 minutes after birth.

PROCEDURE

Appearance:

Extremities as well as trunk are pink	= 2
Trunk is pink, feet and hands are blue	= 1
Entire body is blue (cyanotic) or pale	= 0

Pulse:

Heart rate > 100	= 2
Heart rate < 100	= 1
No pulse	= 0

Grimace:

Stimulation causes grimace, sneeze, cough, or crying	= 2
Only some facial grimace	= 1
No reflexive activity	= 0

Activity:

Actively moving around	= 2
Some flexion without active movement	= 1
Is limp with no extremity movement	= 0

Respiration:

Good respiration and strong cry	= 2
Slow or irregular respirations with weak cry	= 1
No respiratory effort	= 0

1. A score of 7 – 10 = active and vigorous newborn
2. A score of 4 – 6 = moderately depressed newborn
3. A score of 0 – 3 = severely depressed newborn

ORTHOSTATIC VITAL SIGNS

Orthostatic vital signs are used to evaluate patients with fluid loss, hemorrhage, syncope or autonomic dysfunction. They are also used to assess the patient's response to therapy. When shock exists, assessment of blood volume deficit is straightforward. It is preferable that volume loss be detected before loss of physiologic compensation and shock occurs.

Many techniques have been advocated to assess blood volume status. Serial vital sign measurements have been used for assessing blood loss, but they do not reliably detect small degrees of blood loss. Up to 15% of the total blood volume can be lost with minimal hemodynamic changes or any alteration of supine vital signs.

When the volume status of a patient is assessed by use of orthostatic vital signs, several points should be remembered. Many factors influence orthostatic blood pressures including age, pre-existing medical conditions including pregnancy, the use of medications and autonomic dysfunction. The pre-hospital care provider must consider the condition of the patient as well as the orthostatic vital signs in evaluating a patient for volume depletion.

Orthostatic vital signs are indicated as part of the evaluation of any patient with a known or suspected volume loss or a history of syncope. The use of orthostatic vital signs is unnecessary and dangerous in a patient with supine hypotension, shock, an altered mental status, possible spinal injuries, and in patients with lower extremity or pelvic fractures.

Once the decision to obtain orthostatic vital signs has been made, the blood pressure and pulse are recorded after the patient has been in the supine position for two to three minutes. No invasive procedures should be performed during the test. The patient is then asked to stand. The pre-hospital care provider should be prepared to assist the patient if severe symptoms develop.

If severe symptoms develop (defined as syncope or extreme dizziness requiring the patient to lie down) on standing, the test is considered positive and should be terminated. If the patient is not symptomatic, the blood pressure and pulse should be recorded after the patient has been standing for one to two minutes.

PROCEDURE:

1. Obtain baseline vital signs after patient has been lying down for 2-3 minutes.
2. Assist patient to standing. After 1-2 minutes in standing position obtain a second set of vital signs.
3. A test is considered positive if the patient has dizziness, increased weakness, nausea, vomiting, or syncope. It is also considered positive if SBP decreases 20 mmHg or more or if DBP decreases 10 mmHg or more.
4. Heart rate changes are expected, but do not strongly indicate orthostatic hypotension. An increase in heart rate of >30 beats per minute in the absence of orthostatic hypotension suggests postural tachycardia syndrome.

12-LEAD ECG

The 12-Lead ECG stands at the center of decision making for the care of patients with acute coronary syndrome (ACS). The pre-hospital ECG has been demonstrated to be an effective means of rapidly identifying patients with acute myocardial infarction who might be eligible for reperfusion therapy. The 12-lead ECG increases the paramedic's sensitivity for the diagnosis of cardiac ischemia/infarction versus nonspecific chest wall pain. When used appropriately, the 12-lead ECG will also allow the evaluator to be more dynamic with decision-making, differential diagnosis, and specific treatment interventions.

The following list is a suggestion of patients that should be considered candidates for 12-lead ECG evaluation:

- Chest pain, dyspnea, syncope, near syncope, weakness, DKA, diaphoresis, palpitations
- CVA (CVA is often associated with large anterior wall MI's and/or dysrhythmias)
- Pre and post-cardioversion of stable patients
- Post-cardioversion of unstable patients, including post arrest
- Suspected electrolyte disturbances
- Overdose (unknown or suspected anti-depressants)
- Blunt chest trauma only if patient is stable and other appropriate care given
- Irregular pulse rates
- CHF
- Nausea and vomiting in females

The clinician should place the highest priority on being able to classify patients with acute coronary syndromes (ACS) into 1 of 3 ECG classification groups: 1) ST-segment elevation or new or presumably new Left Bundle Branch Block: suspicious for injury; 2) ST depression or dynamic T wave inversion: strongly suspicious for ischemia; 3) Non-diagnostic ECG: absence of changes in ST segment or T waves

The following graph illustrates anatomically contiguous lead groups used to demonstrate infarct location recognition

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral

ANATOMICALLY CONTIGUOUS LEADS

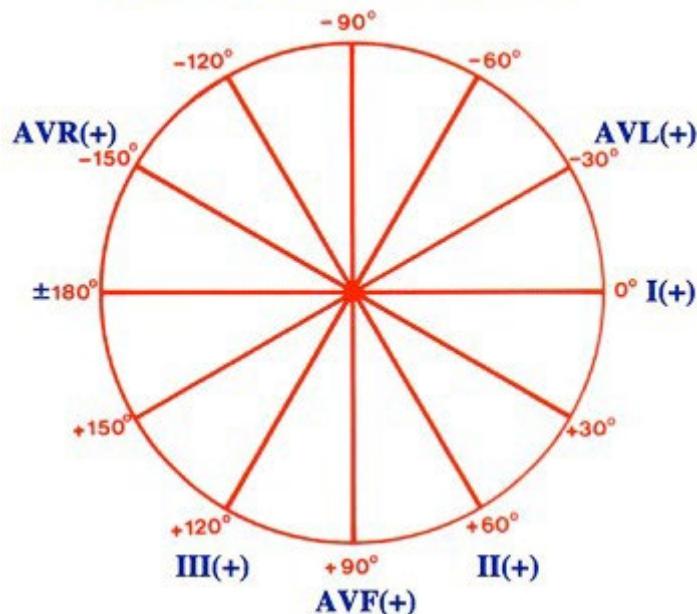
- When a right-side MI is suspected the provider should move V4 to the right side of the chest in the same location mid clavicular 5th intercostals space. The hard copy of the 12-lead should be labeled to reflect this change as V4R.

Rapid 12-Lead ECG Assessment:

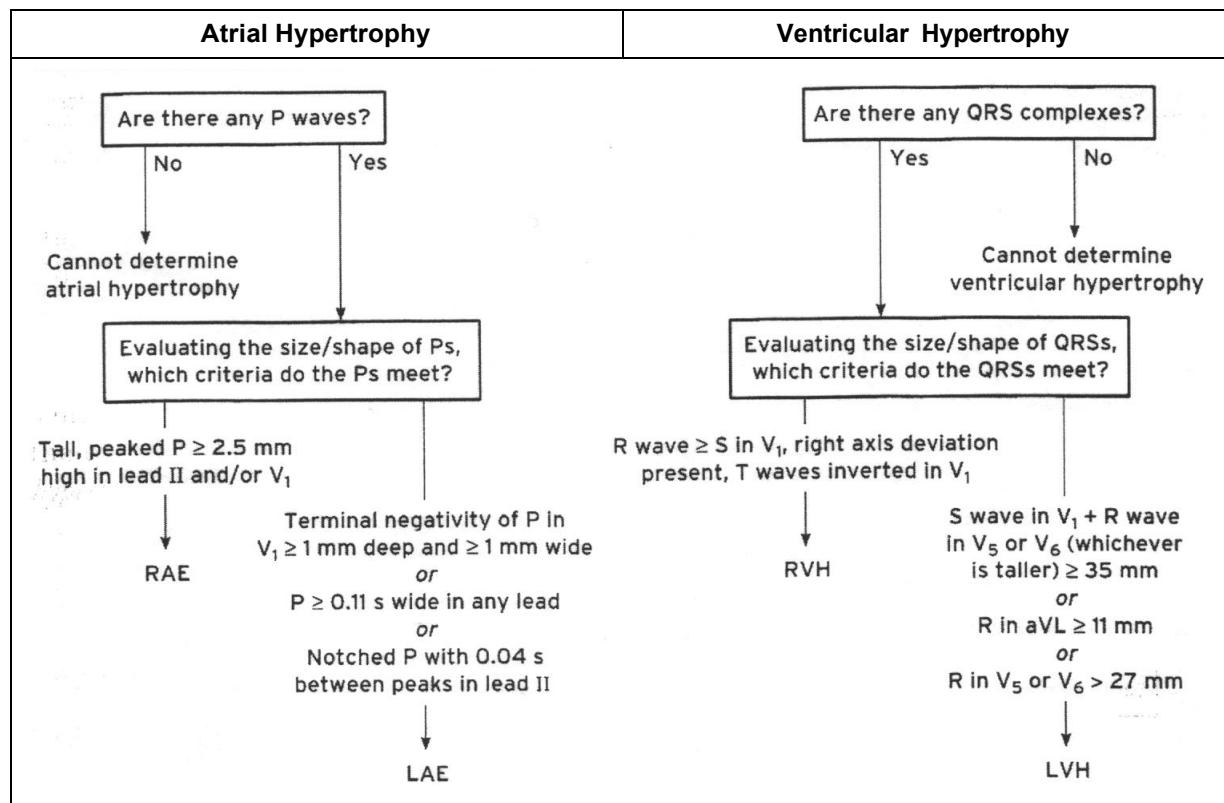
1. Verify that aVR is negative
2. Assess rate and rhythm
3. Determine the axis
4. Identify conduction abnormalities
 - a. Left Bundle Branch Block (LBBB)
 - b. Right Bundle Branch Block
 - c. Hemiblocks
 - d. Hypertrophy
 - i. Ventricular or Atrial
 - e. Aneurysm
 - f. Pericarditis
 - g. Drug or electrolyte imbalance effects
 - h. Early repolarization
5. Find signs of ischemia, injury, and infarction
 - a. T-wave inversions
 - b. ST-segment elevation
 - c. Significant Q waves
6. Identify acute MI patterns
 - a. Inferior
 - b. Lateral
 - c. Septal
 - d. Anterior
 - e. Posterior
 - i. Tall, wide R waves and reciprocal ST-segment depression in V1-V4
 - f. Right Ventricular
 - i. Suspect if ST-segment is elevated in inferior leads and ST-segment depression is present in V2.
 - ii. If Suspected, perform right sided ECG

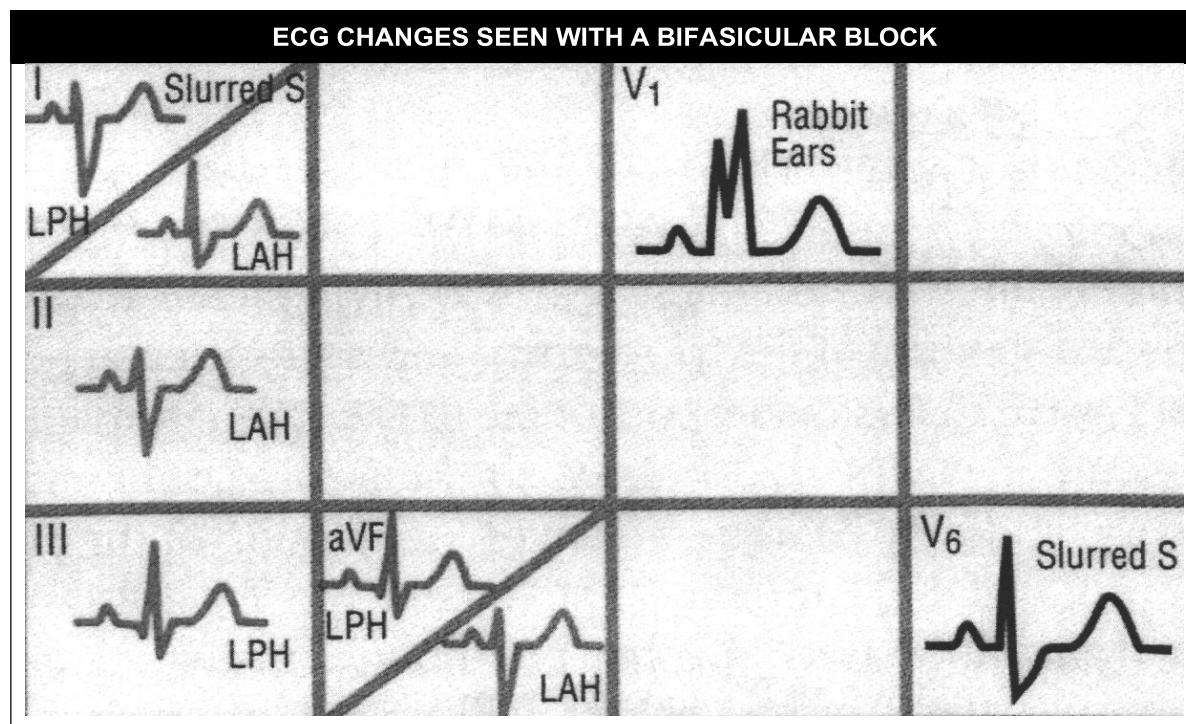
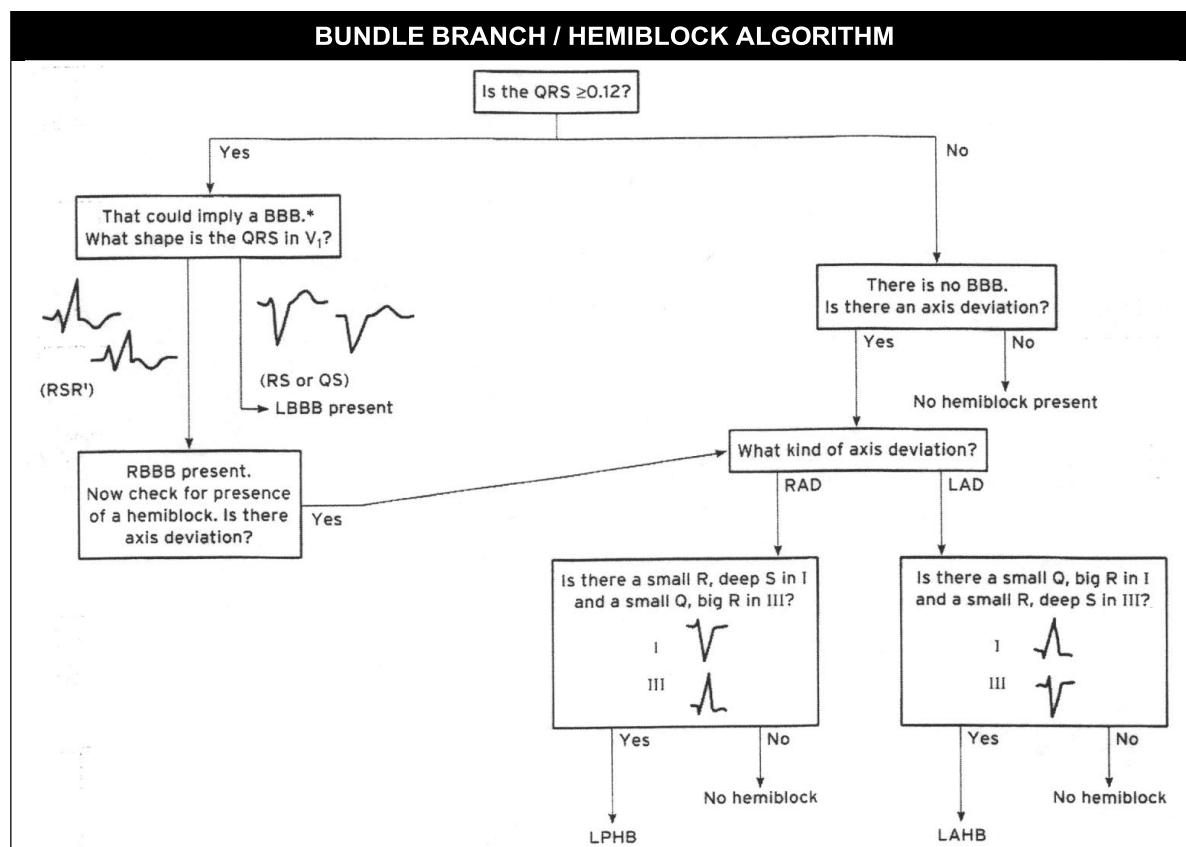
POSSIBLE CAUSES OF AXIS DEVIATION	
Axis Deviation	Possible Cause
Right	Right ventricular hypertrophy Left posterior hemiblock COPD Dextrocardia Ectopic beats and rhythms Normal in Children
Left	Left anterior hemiblock Left ventricular hypertrophy Inferior wall MI Ectopic beats and rhythms Obesity Pregnancy

Hexaxial Reference System



This algorithm will point out atrial and ventricular hypertrophy. Just answer the questions and follow the arrows. If none of the criteria are met, there is no hypertrophy.





VENOUS BLOOD SAMPLING

POLICY

Advanced EMTs, Paramedics, and Critical Care Paramedics may draw blood collection tubes in the field to assist receiving facilities in securing diagnostic laboratory tests more rapidly. It may also reduce the number of needle sticks experienced by the patient. Those technicians who have received proper training and evaluation in the technique of phlebotomy as part of starting an IV site may perform this procedure.

PROCEDURE

Patient Selection:

- Condition of the patient should be considered.
- Drawing blood in the field is **NOT REQUIRED** but will enable receiving facilities to complete diagnostic tests more rapidly and could mean faster definitive diagnosis and treatment for the patient.
- Never stop to draw blood if it will delay critical measures (ex: drug administration during cardiac arrest or transport in a multi-systems trauma).

Contraindications:

- None when performed properly and coinciding with needed IV establishment.

Equipment:

- Blood tubes
- Vacutainer with luer lock adapter
- IV set along with Normal Saline or Saline Lock

Process:

- Select a site that is appropriate for IV cannulation, as well as phlebotomy.
- Prepare all necessary equipment.
- Cannulate the vein in the normal fashion.
 - Do not attach IV tubing.
- Attach vacutainer **OR** 10cc or larger syringe to the IV catheter hub.
- Draw blood in prescribed order: Red tube, Blue tube, Tiger/Yellow, Purple tube.**
- If blood draw is difficult or flows extremely slow **DO NOT** lose patent IV site to draw blood in the field.
- Attach IV tubing to IV catheter hub or extension set and flush with Normal Saline.
- Note time of blood draw on ePCR and blood tubes.
- Label each individual tube with patient's last name, date of birth and provider initials.
- Tape tubes directly to IV bag, or place in zip lock style bag and attach to IV bag.
- Upon arrival at ED, transfer blood to ED staff with appropriate patient identifying information and time of blood draw.

**Collection tubes, except the red top, contain anticoagulation agents. Red blood cells in the collected blood can hemolyze and make the specimen unusable. Do not use significant negative pressure on a syringe to withdraw blood, nor should you unnecessarily agitate the collection tubes.

LAB AND DIAGNOSTIC TEST INTERPRETATION

POLICY

When performing interfacility transports, ALS providers should review and interpret the associated labs and diagnostic tests. Pertinent findings, including values, should be included in the ePCR.

The following is a list of common lab tests as well as normal values. Please note that each facility may have a different normal than is listed below. Use the facility's normal when making your diagnosis as each machine is calibrated differently. High and low values are of greater importance than differentiating between the norms listed below and the norms listed by the facility.

ARTERIAL BLOOD GAS			
Test	Normal	High	Low
pH <i>Acidity of the blood</i>	7.35-7.45	Alkalosis	Acidosis
PCO ₂ <i>Partial pressure of CO₂ in the blood</i>	35-45 mmHg	Respiratory Acidosis Hypoventilation	Respiratory Alkalosis Hyperventilation
PO ₂ <i>Partial pressure of oxygen in the blood</i>	80-100 mmHg	Over-oxygenation Hyperventilation	Hypoxia Hypoventilation
HCO ₃ ⁻ <i>Bicarbonate-ion concentration</i>	24-30 mEq/L	Base excess Metabolic alkalosis Bicarbonate ingestion	Base deficit Metabolic acidosis Increased serum chloride
SaO ₂ <i>Percentage of hemoglobin saturated with oxygen</i>	95-100%	Not clinically significant	Hypoxia Hypovolemia
Hgb <i>Amount of hemoglobin present</i>	12-18 g/dL	Dehydration Polycythemia Smokers	Overhydration Anemia Hemorrhage

DISTINGUISHING ACID BASE IMBALANCES			
Abnormality	pH Value	Physiological Cause	Physiological Compensation
Respiratory Acidosis	<7.35	Increased PaCO ₂	Increased HCO ₃ ⁻
Respiratory Alkalosis	>7.45	Decreased PaCO ₂	Decreased HCO ₃ ⁻
Metabolic Acidosis	<7.35	Decreased HCO ₃ ⁻	Decreased PaCO ₂
Metabolic Alkalosis	>7.45	Increased HCO ₃ ⁻	Increased PaCO ₂

CARDIAC ENZYMES AND MARKERS			
Test	Normal	High	Low
CK <i>Creatinine Kinase</i>	Men: 60-100 U/L Women: 40-150 U/L Isoenzymes: -CK-I (BB): 0-1% -CK-II (MB): <3% -CK-III (MM): 95-100%	Muscle disease Exercise IM Injections Shock Tumors	Not clinically significant
CK-MB <i>Creatine kinase (MB Fraction)</i>	<10 U/L: MI improbable 10-12 U/L: inconclusive >12 U/L: MI probable	Cardiac Damage	Not clinically significant
LDH <i>Lactate Dehydrogenase (Sepsis)</i>	Adult: 40-90 U/L Isoenzymes: -LDH1: 17-27% -LDH2: 21-28% -LDH3: 18-28% -LDH4: 5-15% -LDH5: 5-15%	-Anemias elevate LDH1 and LDH2 -Pulmonary embolism elevates LDH3 -Liver damage elevates LDH4 and LDH5 -MI causes reversal of LDH1 and LDH2 ratio	Not clinically significant
Myoglobin	50-120 mcg/dL	Rhabdomyolysis MI IM Injections Strenuous exercise Myocardial necrosis	Not clinically significant
Troponin	Troponin I: <6ng/mL >1.5ng/mL (MI) Troponin T: >0.1-0.2 ng/mL (MI)	Myocardial necrosis	Not clinically significant
BNP <i>B-natriuretic peptide</i>	5-100 pg/dL	Abnormal ventricular function Congestive heart failure	Not clinically significant

CBC VALUES			
Test	Normal	High	Low
Hgb <i>Amount of hemoglobin present</i>	12-18 g/dL	Dehydration Polycythemia Smokers	Overhydration Anemia Hemorrhage
Hematocrit <i>% of RBCs in the plasma</i>	Men: 37-49% Women: 36-46%	Dehydration Polycythemia Smokers	Overhydration Anemia Hemorrhage
WBC <i># of WBC per cubic millimeter of blood</i>	4,500-11,000/mm ³	Infection Leukemia Steroids	Viral infection Immunodeficiency
RBC <i># of RBC per cubic millimeter of blood</i>	Men: 4.5-5.3 million/mm ³ Women: 4.1-5.1 million/mm ³	Polycythemia High altitudes	Bone marrow suppression Abnormal loss/suppression of erythrocytes

MCV <i>Mean corpuscular volume (size of RBC)</i>	Men: 78-100 μm^3 Women: 78-102 μm^3	Folic acid deficiency B12 deficiency Alcoholism	Iron deficiency anemia Lead poisoning
MCH <i>Mean corpuscular hemoglobin (amount of hemoglobin present in one cell)</i>	25-35 pg	Folic acid deficiency B12 deficiency	Iron deficiency anemia Thalassemia
MCHC <i>Mean corpuscular hemoglobin concentration (the proportion of each cell occupied by hemoglobin)</i>	31-37%	Folic acid deficiency B12 deficiency	Iron deficiency anemia Thalassemia
RDW <i>Red blood cell distribution width (calculated from the MCV and RBC)</i>	11.5-14.0%	Iron deficiency Thalassemia minor	
WBC DIFFERENTIAL			
Bands or stabs <i>% of young or immature neutrophils</i>	0-5%	Bacterial infection Severe stress	Typhoid Tularemia Brucellosis Cancer Bone marrow depression
PMNs or Segs <i>% of segmented or mature neutrophils</i>	45-70%	Bacterial infection Severe stress	Typhoid Tularemia Brucellosis Cancer Bone marrow depression
Eosinophils <i>% of eosinophils present</i>	0-8%	Allergies Parasites	Corticosteroid therapy
Basophils <i>% of basophils present</i>	0-3%	Leukemia Not well understood	Corticosteroid therapy Allergic reactions
Lymphocytes <i>% of lymphocytes present</i>	16-46%	Viral infections Leukemia	AIDS Autoimmune disease
Monocytes <i>% of monocytes present</i>	4-11%	Tuberculosis Protozoan infections Leukemia	

CHEMISTRIES			
Test	Normal	High	Low
Na ⁺ <i>Sodium</i>	135-145 mEq/L	Hypernatremia -Dehydration -Excess saline administration -Excess transfusion with stored blood -Impaired renal function	Hyponatremia -Overhydration -Sodium loss (vomiting, diarrhea, sweating, GI suctioning) -Increased renal sodium loss (diuretics, DKA, Addison's disease, renal disease)
K ⁺ <i>Potassium</i>	3.5-5.0 mEq/L	Hyperkalemia -Renal failure -Excess K ⁺ replacement -Massive tissue damage -Associated with metabolic acidosis	Hypokalemia -Diuretics -Inadequate intake -Large steroid doses -Associated with metabolic alkalosis
Cl ⁻ <i>Chloride</i>	100-108 mEq/L	Hyperchloremia -Increased Na ⁺ level -Decreased HCO ₃ ⁻ levels -Renal failure	Hypochloremia -Vomiting -Gastric suction -Diarrhea -Diuretic use
HCO ₃ ⁻ <i>Bicarbonate</i>	24-30 mEq/L	Base excess metabolic alkalosis -Loss of gastric contents -Diuretic use	Base deficit metabolic acidosis -Consumption of bicarbonate -Loss of bicarbonate -Increase in serum chloride level
Mg ⁺⁺ <i>Magnesium</i>	1.4-1.9 mEq/L	Hypermagnesemia	Hypomagnesemia
Ca ⁺⁺ <i>Calcium</i>	4.3-5.3 mEq/L	Hypercalcemia -False rise due to dehydration -Hyperparathyroidism -Malignant tumors -Immobilization -Thiazide diuretics -Vitamin D intoxication	Hypocalcemia -Hypoparathyroidism -Chronic renal disease -Pancreatitis -Massive blood transfusions -Severe malnutrition -False decrease due to low albumin levels
PO ₄ ³⁻ <i>Phosphate</i>	1.8-2.6 mEq/L	Hyperphosphatemia -Hypoparathyroidism -Renal Failure -Increased growth hormone -Vitamin D intoxication	Hypophosphatemia -Hyperparathyroidism -Diuresis -Malabsorption -Malnutrition -Carbohydrate loading -Antacid use
BUN <i>Blood urea nitrogen (renal function)</i>	8-25 mg/dL	Renal disease/damage Dehydration Shock CHF GI bleeding High Protein diets	Overhydration Increased ADH secretion
Creatinine <i>Renal function</i>	Men: 0.6-1.4 mg/dL Women: 0.6-1.1 mg/dL	Kidney Disease Renal toxic medication	Low muscle mass Muscle atrophy

BUN / CREATININE RATIO			
Ratio	Meaning	Cause	Treatment
>10:1	Extrinsic Disease	Prerenal Causes: -Decreased renal perfusion (hypovolemia, CHF) -Increased urea load (GI Bleed, corticosteroids) Postrenal Causes: -Obstruction (prostate) -Kidney stone	Treat underlying cause: -Hydration -Kidney stone removal -Foley catheter
10:1	Renal Disease	Normal Chronic renal failure Decreased urea load (low protein diet, liver failure) Inhibited creatinine secretion due to medications Dialysis	Remove offending medications Dialysis (if severe)
LIVER / PANCREATIC FUNCTION			
Test	Normal	High	Low
Total Bilirubin	0.1-1.0 mg/dL		
Indirect Bilirubin <i>Unconjugated</i>	0.1-1.0 mg/dL Mean = 0.5 mg/dL	Sickle cell disease Autoimmune disease Hemorrhage Drug Toxicity	
Direct Bilirubin <i>Conjugated</i>	0.0-0.4 mg/dL Mean = 0.1 mg/dL	Obstructive jaundice Gallstones Congenital biliary tract abnormalities Medications	
ALP <i>Alkaline Phosphate</i>	Men: 45-115 U/L Women: 30-100 U/L	Bone abnormality Liver abnormality Eclampsia	Scurvy Genetic defects Excessive Vitamin D intake
GGT <i>Gamma-glutamyl transferase</i>	Men: 1-94 U/L Women: 1-70 U/L	Liver disease Alcohol use Liver failure Reye's syndrome	
Ammonia	10-80 mcg/dL	Liver failure Reye's syndrome	
ALT <i>Alanine transaminase</i>	Men: 10-55 U/L Women: 7-30 U/L	Severe hepatitis Cirrhosis Mononucleosis	Liver Failure
AST <i>Aspartate transaminase</i>	Men: 10-40 U/L Women: 9-25 U/L	MI Hepatitis	Liver Failure
Aldolase	0-7 U/L	Muscular disorders	
Amylase	53-123 U/L	Pancreatitis Pancreatic trauma	Pancreatic destruction
Lipase	3-19 U/L	Pancreatitis Pancreatic trauma	

COAGULATION TESTS

Test	Normal	High	Low
D-Dimer	<250 µg/L	Presence of clots: -Abruptio placenta -DIC or -DVT -Pulmonary embolism	
PT <i>Prothrombin time</i>	11-2-13.2 seconds	Liver cirrhosis Low vitamin K levels DIC	
PTT <i>Partial thromboplastin time</i>	22.1-34.1 seconds	Heparin therapy Hemophilia	
INR <i>International Normalized Ratio</i>	1.5-2.5	Increased clotting times	Blood too thick

URINALYSIS

Test	Normal	High	Low
pH <i>Acidity of urine</i>	5-9 (mean of 6)	UTI Bicarbonate use	Acidosis
Specific Gravity <i>Concentration of urine</i>	Adult: 1.001-1.035 Child: 1.001-1.018	Dehydration Increased ADH secretion	Overhydration
Protein	Negative	Renal disease Preeclampsia/PIH	
Sugar	Negative	Diabetes Stress	
Ketone	Negative	Malnutrition DKA Dieting	
Nitrates <i>Indicative of infection</i>	Negative	UTI	
Leukocytes esterase <i>Indicative of infection</i>	Negative	UTI	
Bilirubin <i>Indicative of liver problems</i>	Negative	Liver Disease	
Urobilinogen <i>Indicative of liver problems</i>	Negative	Liver Disease	
Microscopic crystals	Variable	Gout	
Microscopic casts	Variable	Cancers	
Microscopic WBCs	<4-5 per HPF	UTI	
Microscopic RBCs	<2-3 per HPF	Trauma Infection Kidney stones	

BASIC CHEST X-RAY INTERPRETATION

Use a systematic approach whenever analyzing an X-ray.

- Check X-ray for:
 - Date
 - Patient's name
 - Position
 - Orient the X-ray and remember which is the PATIENT's right or left
 - Review the technical quality of the X-ray
- Next analyze the X-ray for the A,B,C,D,S:
- Airway – Aorta
 - Airway
 - Position
 - Is it mid-line? If not: Rotation? Pathology? Tension?
 - Corina
 - Helps with placement of ET tube depth
 - Caliber
 - Steepling – hints towards croup as Dx
 - Aorta
 - Location
 - Helps Identify Left vs Right on x-ray
 - Helps you find left mainstem bronchus
 - Calcifications
 - Nice but not particularly significant
 - Size (Mediastinum)
 - Big -> possible aortic pathology
- Breathing – Bones
 - Breathing
 - Look at the lung fields
 - Hazy/White = pneumonia/infiltrate or mass
 - Too Dark (or absence of markings)
 - Possible Pneumothorax
 - Possible Bulla
 - Bones (Focus on Ribs)
 - Fractures
 - Points towards degree of injury/mechanism
 - Gives us clues of possible underlying injuries
- Circulation – Cardiac
 - Cardiac
 - "Big" or "Not Big"
 - Well defined Margins
 - Subtle bumps (RV enlargement)
- Diaphragm – Deformity
 - Diaphragm
 - Configuration
 - 2 rounded humps
 - Sharp Margins
 - Sharp Sulci
 - Look underneath
 - Gas where it should or shouldn't be
 - NG tube
 - Deformity (All the other Bones)
 - Clavicle fractures/Dislocations
 - Humeral fractures/Dislocations
 - Scapula

- Follow the curve of the tip
- Look for Fracture
- **Soft tissues – Shoulder**
 - Soft Tissues
 - Air
 - Foreign Bodies (Including chest tube placement)
 - Shoulder
 - Fracture
 - Dislocation

HEMODYNAMIC MONITORING

POLICY

- Invasive lines for monitoring will be transduced and monitored throughout transport.
- Pulmonary artery catheters will be constantly transduced, with waveform monitored, throughout transport.

PROCEDURE

Arterial Line:

- Patients with an arterial line that was placed to monitor the patient's blood pressure should be transduced and monitored throughout transport
- Steps for transducing an A-Line:
 1. Assess the site for bleeding or a hematoma.
 2. Ensure the limb has adequate circulation.
 3. Assemble all necessary equipment. Often the line is already being monitored so all you will have to do is set up the monitor and plug in the cable from the monitor to the transducer.
 - If it is not set up already use steps 4 through 6.
 4. Use a 1000 cc bag of NS, invert the bag, and spike the bag with the IV transducer tubing. Remove the spike and squeeze all air from the bag while maintaining sterility of bag and spike.
 5. Run fluid through the tubing by opening the roller clamp and pulling the flush device ensuring that you get all of the air out of the tubing. Tap on any points where air tends to collect to purge all air.
 6. Place IV bag in pressure bag and inflate to 300 mmHg.
 7. Replace all open stop cock caps with sterile caps. Assure all sites and caps are tight.
 8. Attach the transducer cable to the monitor.
 9. Locate the phlebostatic axis (4th intercostal space midaxillary line) and tape the transducer over that point.
 10. Get the waveform on the screen.
 11. Zero the system by removing the cap and turning the stop cock handle to open to atmospheric air.
 12. Zero the monitor.
 13. Close stop cock.

Central Line:

- Central lines can provide valuable information about the fluid status of a patient. However, not all central lines need to be or should be monitored. General rule of thumb would be if the sending facility is monitoring a central line the transport team may monitor the central line. A note should be made indicating the depth of insertion at the sending facility as well as at the receiving facility. This information should be documented in the PCR.
- Steps for transducing a Central Line:
 1. Assess the site for bleeding or a hematoma.
 2. Assess insertion depth as indicated on catheter.

3. Assemble all necessary equipment. If the line is already being monitored all you will have to do is set up the monitor and plug in the cable from the monitor to the transducer. If it is not set up already use steps 4 through 6.
4. Use a 1000 cc bag of NS, invert the bag, and spike the bag with the IV transducer tubing. Remove the spike and squeeze all air from the bag while maintaining sterility of bag and spike.
5. Run fluid through the tubing by opening the roller clamp and pulling the flush device ensuring that you get all of the air out of the tubing. Tap on any points where air tends to collect to purge all air.
6. Place IV bag in pressure bag and inflate to 300 mmHg.
7. Replace all open stop cock caps with sterile caps.
8. Attach the transducer cable to the monitor.
9. Locate the phlebostatic axis (4th intercostal space midaxillary line) and tape the transducer over that point.
10. Get the waveform on the screen.
11. Zero the system by removing the cap and turning the stop cock handle to open atmospheric air.
12. Zero the monitor.
13. Close stop cock.

EMT / EMT w/MODULES and ADVANCED EMT MEDICATIONS

POLICY:

Medications that may be administered by the **EMT or Advanced EMT** in the pre-hospital setting:

1. EMTs and Advanced EMT may administer/assist the following medications if indicated:
 - a. All levels of provider may administer metered dose nasal narcan to suspected narcotic overdose patients.
 - b. Patient's metered dose inhaler (MDI) per prescription.
 - c. Patient's Epinephrine auto-injector per prescription. (a)
 - d. EMT w/Modules may administer epinephrine 1:1000 IM only (a)
 - e. Patient's Nitroglycerin per prescription SL tab if SBP is > 100 mmHg. (b)
 - f. Oral glucose paste for patients with hypoglycemia.
 - g. Aspirin 81 mg PO chewed to total 324 mg (1-4 tablets). May only be administered for suspected cardiac chest pain. (c)
 - h. Advanced EMTs may administer D10W for patients with hypoglycemia. (d)
 - i. EMT w/Modules will be allowed to administer vaccinations under the direction of the Department Infection control officer.

NOTE:

- a. A single dose may not reverse the effects of an anaphylactic reaction. Administer additional Epinephrine auto-injections, as needed. Bring additional auto-injectors with the patient for use during transportation, if necessary.
- b. Nitroglycerin should be used in patients with established coronary artery chest pain, symptoms of cardiac ischemic events and who are already taking Nitroglycerin by prescription. Patients who have taken the medication Viagra (or similar medications) within twenty-four (24) hours of the onset of chest pain should not be given Nitroglycerin.
- c. All patients with the complaint of cardiac chest pain should receive aspirin unless they are allergic to it.
- d. EMTs and EMTs w/modules are not allowed to administer D10W.

SEDATION & PAIN MANAGEMENT

POLICY

Pain and/or sedation medication is indicated for patients experiencing extreme pain due to illnesses and injuries such as musculoskeletal injuries, burns, abdominal pain, kidney stones, renal colic, and cancer pain. Sedation can also be used as outlined during advanced airway procedures, after significant injury, and should also be considered and used for restraint to keep patient and providers safe. Nausea medication should be administered for patients experiencing, or are at risk for experiencing, nausea and/or vomiting.

Pain inhibits the healing process and may make the history and assessment more difficult to conduct. Assessment of pain should provide an evaluation of pain on a numerical scale, for those who are able to understand and respond. For children consider such tools as the Wong-Baker Faces scale. It is policy for Madison Fire Department for all patients, if the patient reports pain of 3/10 or greater, that pain medication should be offered, along with education for the patient that explains the physiological problem of "roller coaster" pain medication use that happens when pain is allowed to become so great that in order to control it again large doses are needed. Instead, the goal is to keep pain at 3/10 or less with more frequent, smaller doses of medication administered after initial control of pain. For those patients unable to explain their pain judicious use of pain medication should be utilized for physiologic signs of pain, such as: increased heart rate, blood pressure, respiratory rate, tearing, grimace, moans, etc.

Care should be used while administering Fentanyl to Children and Small stature adults as ridged chest wall syndrome may occur if Fentanyl is administered too fast. Treatment for ridged chest wall starts with naloxone titrated to respiratory status and relief of the ridged chest wall. If naloxone is unsuccessful the next step is a paralytic agent and RSI per protocol.

PROCEDURE

Sedation (Use as Appropriate)

The following may be used for chemical sedation in order to provide for patient or provider safety. Also, use the following to reduce trauma related anxiety as needed.

- Ketamine for sedation/post RSI sedation: 0.5-1 mg/kg repeated every 10-30 minutes prn.
- Versed for sedation: Adult 1-5 mg increments. Pediatric 0.05 mg/kg, not to exceed adult dose. Titrate as needed for sedation if respirations and BP are stable.
- Ativan for anxiety: 0.02 to 0.04 mg/kg IM/IV (maximum single dose: 4 mg)
- Ativan for sedation: 0.05 mg/kg IM/IV (maximum single dose: 4 mg)
- Fentanyl for sedation: 1-2 mcg/kg over 1-2 min and then 1-2 mcg/kg/hr infusion to effect

Head Trauma / Injury (Use as Appropriate)

Use in patients with facial trauma and external head injuries. Can still be administered to reduce pain associated with closed head injury but should be administered cautiously.

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.

Musculoskeletal / Multi-System Trauma (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

Cardiac Chest Pain (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.

Burns (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

Abdominal Pain (*Use as Appropriate*)

Use to minimize pain and anxiety. Masking pain sometimes makes hospital diagnosis difficult.

Treatment should be directed towards pain reduction rather than pain elimination.

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 1-2 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
 - Do not use Toradol for treatment of abdominal pain.

Kidney Stones (*Use as Appropriate*)

- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100mcg every 3-5 min. for pediatrics and geriatrics.

Other (*Use as Appropriate*)

For illnesses or injuries not mentioned above (i.e. Cancer, other injuries, or other major / terminal illnesses).

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

PAIN MANAGEMENT & SEDATION

POLICY

Pain and/or sedation medication is indicated for patients experiencing extreme pain due to illnesses and injuries such as musculoskeletal injuries, burns, abdominal pain, kidney stones, renal colic, and cancer pain. Sedation can also be used as outlined during advanced airway procedures, after significant injury, and can also be considered for restraint. Nausea medication should be administered for patients experiencing, or are at risk for experiencing, nausea and/or vomiting.

Pain inhibits the healing process and may make the history and assessment more difficult to conduct. Assessment of pain should provide an evaluation of pain on a numerical scale, for those who are able to understand and respond. For children consider such tools as the Wong-Baker Faces scale. It is policy for Madison Fire Department for all patients, if the patient reports pain of 3/10 or greater, that pain medication should be offered, along with education for the patient that explains the physiological problem of "roller coaster" pain medication use that happens when pain is allowed to become so great that in order to control it again large doses are needed. Instead, the goal is to keep pain at 3/10 or less with more frequent, smaller doses of medication administered after initial control of pain. For those patients unable to explain their pain judicious use of pain medication should be utilized for physiologic signs of pain, such as: increased heart rate, blood pressure, respiratory rate, tearing, grimace, moans, etc.

Care should be used while administering Fentanyl to Children and Small stature adults as ridged chest wall syndrome may occur if medication is administered too fast. Treatment for ridged chest wall includes naloxone titrated to respiratory status and relief of the ridged chest wall. Followed by paralytic agent and RSI per protocol if unable to relieve the condition with the use of naloxone.

PROCEDURE

Head Trauma / Injury (*Use as Appropriate*)

Use in patients with facial trauma and external head injuries. Can still be administered to reduce pain associated with closed head injury but should be administered cautiously.

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.

Musculoskeletal / Multi-System Trauma (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

Cardiac Chest Pain (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable. Use initially for significant injuries.

Burns (*Use as Appropriate*)

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

Abdominal Pain (*Use as Appropriate*)

Use to minimize pain and anxiety. Masking pain sometimes makes hospital diagnosis difficult. Treatment should be directed towards pain reduction rather than pain elimination.

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine @ 1-2 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
 - Do not use Toradol for treatment of abdominal pain.

Kidney Stones (*Use as Appropriate*)

- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100mcg every 3-5 min. for pediatrics and geriatrics.

Other (*Use as Appropriate*)

For illnesses or injuries not mentioned above (i.e. Cancer, other injuries, or other major / terminal illnesses).

- Fentanyl @ 25-100 mcg increments for adults and 0.5-1.0 mcg/kg with a max single dose of 100 mcg every 3-5 min. for pediatrics and geriatrics.
- Morphine 2-5 mg increments for adults and 0.1 mg/kg for pediatrics and infants. Titrate as needed for pain provided respirations and BP are stable.
- Ketamine for pain control at 0.1-0.35 mg/kg IV may repeat in 10-30 minutes prn.

Sedation (*Use as Appropriate*)

Use for chemical sedation and to reduce trauma related anxiety as appropriate.

- Ketamine for sedation/post RSI sedation: 0.5-1 mg/kg repeated every 10-30 minutes prn.
- Versed for sedation: Adult 1-5 mg increments. Pediatric 0.05 mg/kg, not to exceed adult dose. Titrate as needed for sedation if respirations and BP are stable.
- Ativan for anxiety: 0.02 to 0.04 mg/kg IM/IV (maximum single dose: 4 mg)
- Ativan for sedation: 0.05 mg/kg IM/IV (maximum single dose: 4 mg)
- Fentanyl for sedation: 1-2 mcg/kg over 1-2 min and then 1-2 mcg/kg/hr infusion to effect

TARGETED TEMPERATURE MANAGEMENT

Targeted Temperature Management (TTM) by way of inducing mild hypothermia or at least fever prevention after return of spontaneous circulation (ROSC) decreases death and improves neurologic outcomes in cardiac arrest patients. TTM should be initiated on most ROSC patients after first ensuring adequate oxygenation and blood pressure (see exceptions below).

POLICY

Therapeutic hypothermia will be initiated on patients that meet the following criteria:

- Patient who remains comatose after ROSC regardless of initial presenting rhythm
- Patient that is intubated with ETCO₂ that is equal to or greater than 20 mmHg
- Adequate oxygenation (SpO₂ ≥93%)
- Adequate blood pressure (SBP ≥90 mmHg or MAP ≥65 mmHg)

Therapeutic hypothermia will NOT be initiated on patients that meet the following criteria:

- Cardiac arrest due to trauma
- Known hemorrhagic stroke
- Continuing hemorrhagic condition
- Ongoing unstable cardiac rhythm
- GCS >8
- Patients whose SpO₂ and/or blood pressure is not yet stabilized

PROCEDURE

1. Criteria is met for initiation of therapeutic hypothermia
2. Obtain 12-lead EKG
3. Expose patient
4. Start passive cooling process through any/all of the following techniques as appropriate:
 - a. Cool patient compartment to as low as providers can tolerate
 - b. Apply ice packs to patients axilla, groin, and neck
 - c. Moisten a sheet and cover patient
5. Administer sedation/analgesic medications and if necessary, non-depolarizing paralytic to ensure patient does not shiver
6. Monitor ETCO₂ and keep in normal range (35-45 mmHg)
7. Support blood pressure by use of fluid bolus and/or vasopressor medication
8. If esophageal/foley temperature probe available monitor temperature and seek to establish and maintain temperature between 89.6-96.8° F (32-36°C)
9. Report to receiving facility your attempts at TTM

FORMULARY

Adenosine (Adenocard)

Class of Drug	Antidysrhythmic.
Mechanism of Action	Slows conduction time through the AV node interrupting the reentry pathways through the AV node and can restore normal sinus rhythm in patients with PSVT, including PSVT associated with WPW syndrome. Adenosine is antagonized competitively by methylxanthines such as caffeine and theophylline and potentiated by blockers of nucleotide transport such as dipyridamole.
Indications	PSVT including that associated with accessory bypass tracts (WPW). When clinically advisable, appropriate vagal maneuvers should be attempted first. Not effective in A-fib, A-flutter, or V-tach.
Contraindications	Second-degree or third-degree A/V block (except in patients with a functioning artificial pacemaker). Sick sinus syndrome (except in patients with a functioning artificial pacemaker). Known hypersensitivity to adenosine.
Adverse Effects	Cardiovascular: Facial flushing, headache, sweating, palpitations, chest pain, hypotension. Respiratory: SOB/dyspnea, chest pressure, hyperventilation, head pressure. CNS: Lightheadedness, dizziness, tingling in arms, numbness, apprehension, blurred vision, burning sensation, heaviness in arms, neck, and back pain. G/I: Nausea.
Precautions	Use with caution in asthmatics, cases of bronchospasm have been reported. Use with caution in hepatic and renal failure.
Dosing/Administration	Adult: 6 mg rapid IV bolus over 1-2 seconds, 20 mL flush. Repeat prn 1-2 min later at 12 mg and 3 rd dose prn at 12 mg. Pediatric: 0.1 mg/kg (max 6 mg) over 1-2 seconds, 20 mL flush. Repeat prn 1-2 min later at 0.2 mg/kg (max 12 mg) over 1-2 seconds and 3 rd dose prn at 0.2 mg/kg (max 12 mg)
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Albuterol (Proventil, Ventolin)

Class of Drug	Bronchodilator, adrenergic beta 2 agonist.
Mechanism of Action	Albuterol is a bronchodilator that exerts effects primarily on the Beta-2-adrenergic receptors on bronchial smooth muscle causing relaxation and facilitating optimal airflow. It affects all airways, from the trachea to the terminal bronchioles. Albuterol can cause cardiovascular effects, as there is a small population of Beta-2 receptors in the cardiac muscle including tachycardia, elevated blood pressure, and EKG changes.
Indications	Acute bronchospasm.
Contraindications	Sensitivity to albuterol or any of its components in the above forms.
Adverse Effects	<ul style="list-style-type: none">▪ Common adverse effects reported are palpitations, chest pain, rapid heart rate, and tremors or nervousness. <p>DRUG INTERACTIONS:</p> <ul style="list-style-type: none">▪ MAOI/TCA's: Use caution within 2 weeks of taking MAOI's or TCA's as cardiovascular effects may be enhanced.▪ DIURETICS: May further affect EKG changes and hypokalemia from potassium wasting diuretics.
Precautions	<ul style="list-style-type: none">▪ Monitor closely patients with cardiovascular disorders, as fluctuations in heart rate, blood pressure, and EKG changes may occur.▪ There are reports of transient hypokalemia associated with use of albuterol.
Dosing/Administration	Adult and Pediatric: 2.5 mg/3 mL nebulized PRN
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Amiodarone (Cordorone)

Class of Drug	Antiarrhythmic with predominantly class III effects.
Mechanism of Action	Amiodarone is generally considered a class III antiarrhythmic drug, but it possesses electrophysiological characteristics of all four classes. Like class I it blocks Na ⁺ channels at rapid pacing frequencies, and like class II drugs it exerts a noncompetitive antisympathetic action. One of its main effects is to lengthen the cardiac action potential, a class III action. It also has negative chronotropic effect much like class IV drugs. It also blocks both K ⁺ and Ca ⁺ channels which contribute to the slowing of conduction. Its vasodilatory action can decrease cardiac workload decreasing myocardial oxygen consumption. Onset: within min of IV administration. Duration: hours to days not firmly established.
Indications	<ul style="list-style-type: none">▪ Treatment and prophylaxis of VF refractory to other therapy.▪ Treatment and prophylaxis of hemodynamically unstable VT refractory to other therapy.
Contraindications	<ul style="list-style-type: none">▪ Known hypersensitivity.▪ Cardiogenic shock.▪ Marked sinus bradycardia.▪ Second- or third-degree AV blocks unless functioning pacemaker is available.
Adverse Effects	Bradycardia (4.9%), CHF (2.1%), asystole (2.9%), hypotension (16%), VT (2.4%), nausea (3.9%), fever (2%).
Precautions	May cause worsening of existing dysrhythmias or precipitate a new dysrhythmia. Patients with hypokalemia or hypomagnesemia should have the condition corrected whenever possible before treatment with amiodarone, as these disorders can exaggerate the degree of QTc prolongation and increase the potential for Torsades de Points.
Dosing/Administration	<u>Pulseless VF/VT</u> Adult: 300 mg IVP followed prn in 3-5 min by an additional 150 mg IVP Pediatric: 5 mg/kg IVP (not to exceed adult dose) may be repeated in 3-5 min X 2 times <u>Perfusing Dysrhythmia Initial Bolus Infusion:</u> 150 mg over 10 min. Dilute in at least 50 mL D5W or NS. <u>Followed by slow IV load:</u> 360 mg over the NEXT 6 hours (1 mg/min). Add 360 mg to 250 mL D5W (concentration = 1.8 mg/mL). Rate 42 mL/hr. Not to exceed 2.2 grams in a 24-hour period.
Pregnancy Category	Class D Unsafe – evidence of risk that may be justifiable in certain circumstances

FORMULARY

Aspirin

Class of Drug	Analgesic, antipyretic, salicylate.
Mechanism of Action	Reduction of platelet aggregation in patients with ACS and subacute cardiovascular disease. Though its effects are varied, aspirin's primary function in the emergency care setting is to reduce blood coagulability as a means of preventing acute coronary syndromes (ACS) and improving outcomes from ACS events.
Indications	Acute Coronary Syndrome
Contraindications	Hypersensitivity to aspirin or other nonsteroidal anti-inflammatories. Recent history of GI bleed, intracranial bleed, or history of bleeding disorder.
Adverse Effects	GI: Dyspepsia, thirst, nausea/vomiting, GI bleeding and/or ulceration. SENSORY: Tinnitus (sign of toxicity), vertigo, reversible hearing loss, visual changes. HEMATOLOGIC: Prolonged bleeding time. INTEGUMENTARY: Urticaria, angioedema, anaphylaxis.
Precautions	Use caution in patients with asthma, nasal polyps, or nasal allergies. Not recommended as an antipyretic for children and teenagers. Use caution in severe liver damage, hypoprothrombinemia, vitamin K deficiency, or surgical patients.
Dosing/Administration	Acute Coronary Syndrome: 162-325 mg PO X 1.
Pregnancy Category	Class D Unsafe – evidence of risk that may be justifiable in certain circumstances

FORMULARY

Atropine

Class of Drug	Anticholinergic, vagolytic.
Mechanism of Action	Blocks acetylcholine's effects on the SA and AV nodes, increasing conduction velocity. Also increases sinus node discharge rate and decreases the AV node's refractory period. Result is an increased heart rate. Decreases the action of the parasympathetic nervous system on bronchial, salivary, and sweat glands resulting in decreased secretions. Decreases cholinergic effects on the iris, ciliary body and bronchial smooth muscle.
Indications	Symptomatic bradycardia. Need to diminish cardiac vagal reflexes (prelaryngoscopy). Anticholinesterase insecticide poisoning.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Bradycardia, anaphylaxis, headache, dry mouth, GI distress, blurred vision, mydriasis, constipation, delirium, tachycardia, ataxia, tremor, dry hot skin.
Precautions	Small doses may lead to a paradoxical slowing of the heart rate. Use with caution in acute cardiac ischemia, glaucoma, obstructive uropathy, paralytic ileus, toxic megacolon, myasthenia gravis.
Dosing/Administration	Bradycardia: Adult: 0.5 – 1 mg repeated every 5 min to max of 0.04 mg/kg Pediatric: 0.02 mg/kg repeated every 5 min to max of 0.04 mg/kg Nerve Agent Poisoning: Adult: 2 mg IV/IO every 5 – 10 min prn (2 – 4 mg for moderate symptoms, 6 mg for severe symptoms). Pediatric: 0.05 mg/kg IM or 0.02 mg/kg IV every 5 – 10 min (0.05 mg/kg for moderate and 0.1 mg/kg for severe symptoms).
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Calcium Chloride / Calcium Gluconate

Class of Drug	Electrolyte
Mechanism of Action	Increases cardiac contractile state (positive inotropic effect) May enhance ventricular automaticity Helps stabilize the cell membrane
Indications	Hyperkalemia Magnesium Sulfate overdose Calcium Channel Blocker toxicity
Contraindications	Hypercalcemia V-Fib during cardiac resuscitation Digitalis toxicity
Adverse Effects	Bradycardia, asystole, hypotension, peripheral vasodilation, metallic taste, local necrosis, coronary and cerebral artery spasm, vomiting.
Precautions	May worsen dysrhythmias secondary to digitalis May antagonize effects of Verapamil
Dosing/Administration	Adult: 500 – 1000 mg of 10% solution slowly IV/IO over 5 minutes; may repeat in 10 minutes; maximum 1 Gram dose Pediatric: 20 mg/kg of 10% solution slow IV/IO over 5 minutes; may repeat in 10 minutes; maximum 1 Gram dose
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Cefazolin (Ancef)

Class of Drug	Antibiotic
Mechanism of Action	Cephalosporin that exerts a bactericidal effect by inhibiting cell wall synthesis of bacteria. Cefazolin has been shown to be effective against multiple pathogens. Cefazolin is absorbed systemically, with a half-life of 1.8 hours for IV administration and 2 hours for IM administration. Cefazolin crosses the placenta and is excreted in breast milk.
Indications	Significant open trauma Open fractures Burns
Contraindications	Known allergy to cephalosporin or anaphylaxis reaction to penicillin.
Adverse Effects	Diarrhea, oral candidiasis, vomiting, nausea, abdominal cramping, and pseudomembranous colitis have all been reported.
Precautions	Lower dosages must be administered in patients with low urinary output secondary to renal dysfunction.
Dosing/Administration	Cefazolin is available in sterile powder, 500 mg or 1 g, for reconstitution and administration intravenously or intramuscularly. Adult: 1-2 g IV/IO over 15-20 minutes Pediatric: Infants/Children: 25-100 mg/kg IV/IO over 15-20 min Neonates: 40-60 mg/kg IV/IO over 15-20 min
Pregnancy Category	Class B: Presumed safety based on animal studies

FORMULARY

Dextrose D10

Class of Drug	A concentrated source of carbohydrate calories.
Mechanism of Action	Provides calories necessary for amino acid anabolism and helps maintain blood glucose levels in the absence of sufficient oral intake. Dextrose is readily metabolized and it increases blood glucose concentrations.
Indications	Treatment or prevention of hypoglycemia.
Contraindications	None in the presence of an indication.
Adverse Effects	Fever, venous thrombosis or phlebitis extending from the venous site, extravasation, localized pain and rarely vein irritation may occur.
Precautions	Dextrose should NOT be administered in the SC or IM routes.
Dosing/Administration	For hypoglycemia in adults administer 25 g of D10 IV/IO. Monitor glucose levels and repeat administration as indicated. For hypoglycemia in pediatrics administer 2.5 mL/kg of D10 IV/IO. Monitor glucose levels and repeat administration as indicated.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Dexamethasone (Decadron)

Class of Drug	Corticosteroid, Anti-Inflammatory
Mechanism of Action	Dexamethasone is a glucocorticoid agonist. Dexamethasone inhibits leukocyte infiltration at the site of inflammation, interferes in the function of mediators of inflammatory response, suppresses the humoral immune responses and reduces edema or scar tissue.
Indications	Bronchoconstriction as a result of croup, asthma, COPD or anaphylaxis.
Contraindications	Sensitivity to dexamethasone and systemic fungal infections.
Adverse Effects	<ul style="list-style-type: none">▪ The most commonly occurring side effects have included alteration in glucose tolerance, behavioral and mood changes, increased appetite, and weight gain; the incidence generally correlates with dosage, timing of administration, and duration of treatment.
Precautions	<ul style="list-style-type: none">▪ Use dexamethasone with caution during pregnancy if benefits outweigh risks.▪ Dexamethasone is excreted in breast milk; it is not recommended for use while breastfeeding.
Dosing/Administration	Adult: 4-10 mg IV, IM, PO or Nebulized (max of 10 mg). Pediatric: 0.6 mg/kg IV, IM, PO or Nebulized up to a max dose of 10 mg.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Diltiazem (Cardizem)

Class of Drug	Calcium Channel Blocker
Mechanism of Action	Blocks influx of calcium ions into cardiac muscle Arterial and venous vasodilator Reduces pre-load and afterload Reduces myocardial oxygen demand
Indications	Atrial flutter / atrial fibrillation with rapid ventricular rates
Contraindications	Wide complex tachycardia Sick sinus syndrome Cardiogenic shock
Adverse Effects	Bradycardia, second or third-degree AV blocks, chest pain, CHF, syncope, V-fib, V-tach, nausea, vomiting, dizziness, dry mouth, dyspnea, headache.
Precautions	Use with caution in patients with renal or hepatic dysfunction
Dosing/Administration	<p>Adult:</p> <p>Initial Bolus: 0.25 mg/kg (average dose 20 mg) IV/IO over 2 minutes. If inadequate response, may re-bolus in 15 minutes: 0.35 mg/kg IV/IO over 2 minutes.</p> <p>Continuous Infusion: 5-15 mg/hr if patient responds well to bolus</p> <p>Pediatric:</p> <p>Not recommended</p>
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Diphenhydramine (Benadryl)

Class of Drug	Antihistamine, H-1 receptor antagonist.
Mechanism of Action	Competes with histamine for receptor sites in the body. Histamine is a naturally occurring byproduct of the amino acid histidine, and exerts inflammatory and vasodilatory effects on the body, as well as increasing gastrointestinal secretions. Histamine release may be inappropriately stimulated by the body's response to an allergen. Blocking the histamine receptor sites will decrease the effectiveness of histamine and therefore minimize the resultant symptoms.
Indications	Urticaria, angioedema, adjunct in anaphylaxis. Transfusion reactions. Dystonic reactions.
Contraindications	Hypersensitivity to drug or components. Newborn or premature infant. Breastfeeding.
Adverse Effects	Hypotension, wheezing, anticholinergic toxicity, convulsions, sedation, dizziness, dry mucous membranes and thickened secretions, blurred vision, paradoxical CNS stimulation, tachycardia, urinary retention, confusion, tremor, chest tightness, rash.
Precautions	Do not inject SC or intradermal.
Dosing/Administration	Benadryl for injection is available in 50 mg/mL vials. Adult: 25 – 50 mg slow IV/IO or deep IM, every 6 hours (max 300 mg/day). Pediatric: 1 mg/kg slow IV/IO deep IM every 6 – 8 hours (max 300 mg/day).
Pregnancy Category	Class B Presumed safety based on animal studies

FORMULARY**Epinephrine (Adrenaline)**

Class of Drug	Adrenergic stimulant.
Mechanism of Action	Directly stimulates alpha and beta adrenergic receptors in the sympathetic nervous system. Relaxes bronchial smooth muscle, stimulates cardiac muscle and dilates skeletal muscle vasculature.
Indications	Cardiac arrest. Severe anaphylaxis or asthma. Hypotensive shock. Shock in peri-RSI state (ADULT PATIENT ONLY) Bradycardia.
Contraindications	None in the presence of a true indication.
Adverse Effects	Pulmonary edema, dysrhythmia, hypertension, angina, tachycardia, pallor, sweating, dizziness, weakness, tremor, headache, anxiety.
Precautions	Use with caution in patients with cardiac disease.
Dosing/Administration	Available as 1:1000 or 1:10,000. <u>Cardiac Arrest: (1:10,000)</u> Adult: 1 mg IV/IO every 3-5 min. Pediatric: 0.01 mg/kg IV/IO every 3-5 min. <u>Asthma or Anaphylaxis: 1:1000</u> Adult: 0.1 – 0.5 mg IM repeated prn every 5 min. Pediatric: 0.01 mg/kg IM (max of 0.5 mg) repeated prn every 5 min. (May use 1:10,000 IV in severe shock). Pediatric Stridor: 1:1000 5 mL nebulized. <u>Hypotensive Shock</u> <i>Epinephrine Infusion:</i> Adult: 2-10 mcg/min IV/IO. Pediatric: 0.03-0.2 mcg/kg/min IV/IO. <u>Epinephrine Push Dose Pressor (ADULT PATIENT ONLY):</u> 1 mL of 1:10,000 in a syringe with 9 mL saline (now 1:100,000) For BP < 90 in peri-RSI state push 0.5-2 mL (5-20 mcg) every 1-5 minutes as needed <u>Bradycardia</u> Adult: 2-10 mcg/min epinephrine infusion Pediatric: 0.01 mg/kg IVP repeated every 3-5 min as needed. For persistent bradycardia continuous infusion at 0.1-0.3 mcg/kg/min.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Etomidate (Amidate)

Class of Drug	Anesthetic/sedative.
Mechanism of Action	Decreases the firing rate of neurons within the ascending reticular activating system. Onset of action is within 60 seconds. Duration of action is 3 – 5 min.
Indications	Induction of anesthesia for Rapid Sequence Intubation
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Transient myoclonus, injection site pain, GI distress, apnea, hyper- or hypo-tension (rare).
Precautions	None in emergency setting.
Dosing/Administration	Available as 2 mg/mL for IV use. Adult and Pediatric: Induction: 0.3 mg/kg IV over 30 – 60 seconds.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Fentanyl (Sublimaze)

Class of Drug	Analgesic, anesthetic.
Mechanism of Action	Binds to opiate receptors as an agonist, altering perception of painful stimuli. CNS and respiratory effects comparable to morphine, however rarely causes histamine release.
Indications	Severe Pain. Adjunct during sedation for painful procedure.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Sedation, tachycardia, bradycardia, hypotension, GI distress, apnea, respiratory depression, chest wall rigidity, blurred vision.
Precautions	Chest wall rigidity most often seen with larger doses given rapidly and may be overcome by neuromuscular blockers. Concomitant use with other CNS depressants may potentiate the respiratory and CNS depression and hypotensive effects.
Dosing/Administration	Available as 50 mcg/mL for IV or IM use 25-100mcg increments every 3-5 min. for adults and 0.5-1.0 mcg/kg with a max single dose of 100mcg every 3-5 min. for pediatrics and geriatrics.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Ketamine (Ketalar)

Class of Drug	Anesthetic (Dissociative)
Mechanism of Action	A rapid-acting general anesthetic producing an anesthetic state characterized by profound analgesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, cardiovascular and respiratory stimulation, and occasionally a transient and minimal respiratory depression.
Indications	Induction agent for Rapid Sequence Intubation. Procedural/post RSI sedation. Pain control after, or in lieu of, narcotic analgesia.
Contraindications	Contraindicated in those whom a significant elevation of blood pressure would constitute a serious hazard and those who have shown hypersensitivity to the drug.
Adverse Effects	Rare, associated with rapid infusion: respiratory depression, laryngospasm. Others: emergence delirium, nausea/vomiting fasciculations, bradycardia, hypertension, or hypotension
Precautions	Risk/benefit consideration in pregnancy – increased uterine tone. Resuscitative equipment should be available for use.
Dosing/Administration	<p><u>Induction for RSI:</u> Adult: 2 mg/kg onset 30 seconds, duration 5-10 minutes Pediatric: same as adult</p> <p><u>Sedation/ongoing post RSI sedation:</u> Adult: 0.5-1 mg/kg every 10-30 minutes IV as needed Pediatric: same as adult</p> <p><u>Pain acute:</u> Adult: 0.1-0.35 mg/kg IV may repeat every 10-30 minutes as needed Pediatric: Same as adult</p>
Pregnancy Category	Pregnancy Class: C

FORMULARY

Glucose (Glutose)

Class of Drug	Nutrient
Mechanism of Action	Increase of circulating blood glucose through absorption in the mucous membranes and GI tract.
Indications	Hypoglycemia
Contraindications	Altered LOC
Adverse Effects	None in Emergency Setting
Precautions	Patient must be able to control their own airway
Dosing/Administration	Available as a 15 gram gel Administered Buccally
Pregnancy Category	A: No risk when indicated

FORMULARY

Hydromorphone (Dilaudid)

Class of Drug	Narcotic analgesic.
Mechanism of Action	Acts on the opiate receptors, altering the patient's perception of pain. Also has a depressant effect on CNS centers for breathing and on the cough reflex center.
Indications	Severe pain.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Sedation, euphoria, miosis, tachycardia, bradycardia, hypertension, hypotension, rash, pruritus, biliary spasm, nausea, vomiting, constipation, ileus, respiratory depression.
Precautions	Rapid IV administration intensifies respiratory depressant effect.
Dosing/Administration	Available for IV, IM injection in varying concentrations. Adult: 1-2 mg as needed, usual effective dose 1-4 mgs. Pediatric: The safety and effectiveness of hydromorphone have not been established in children – USE A DIFFERENT ANALGESIC
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Ipratropium Bromide (Atrovent)

Class of Drug	Anticholinergic bronchodilator.
Mechanism of Action	Inhibits vagally mediated reflexes by antagonizing acetylcholine at the muscarinic receptors on bronchial smooth muscle. This results in bronchodilation when inhaled.
Indications	Acute bronchospasm.
Contraindications	Sensitivity to Atrovent or any of its components. Peanut allergy.
Adverse Effects	Dizziness, headache, nervousness, chest pain, palpitations, blurred vision, dry mouth, GI distress, bronchospasm, cough, rash.
Precautions	Should not be relied upon as a sole agent for the treatment of acute respiratory distress (delayed onset of bronchodilation).
Dosing/Administration	We use ipratropium bromide 500 mcg/Albuterol 3 mg (DUONEB) Acute bronchospasm: Available as solution for nebulization 0.02%. Adult: 500 mcg nebulized up to six times a day. Pediatric: Doses not reported though often same as adult.
Pregnancy Category	Class B Presumed safety based on animal studies

FORMULARY

Ketorolac (Toradol)

Class of Drug	Nonsteroidal Anti-inflammatory Drug
Mechanism of Action	Exact mechanism unknown. Inhibits cyclooxygenase, reducing prostaglandin and thromboxane synthesis
Indications	Moderate to severe pain
Contraindications	Hypersensitivity to the drug, known pregnancy, NSAID induced asthma, active bleeding, expectant major surgery
Adverse Effects	GI bleeding, nausea, other GI symptoms,
Precautions	Elderly patients, renal impairment, asthma
Dosing/Administration	Adult: 60 mg IM X 1 or 30 mg IV X 1 Pediatric: 0.5 mg/kg IM/IV X 1 max 30 mg IM and 15 mg IV
Pregnancy Category	Do not use in pregnant patients in the out of hospital setting.

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Refer to the Department Protocols site for the most current version.

FORMULARY

Labetalol

Class of Drug	Antihypertensive with selective alpha-1 and non-selective beta-antagonist effects.
Mechanism of Action	Combines both selective, competitive, alpha- adrenergic blocking and non-selective, competitive, beta-adrenergic blocking activity in a single substance. The ratio of alpha-to beta- blocking has been estimated at 1:7 following intravenous administration. Due to the alpha 1 receptor blocking activity of labetalol, blood pressure is lowered more in the standing patient than in the supine position, and symptoms of postural hypotension can occur.
Indications	Severe hypertension.
Contraindications	Bronchial asthma. Cardiogenic shock. Greater than first degree heart block. Severe bradycardia. Other conditions associated with severe and prolonged hypotension. Patients with known hypersensitivity.
Adverse Effects	Fatigue, headache, paresthesia, syncope, orthostatic hypotension, ventricular dysrhythmias, nasal stuffiness, GI distress, sexual dysfunction, urinary retention, muscle spasm, bronchospasm, rash.
Precautions	Use with caution in patients with impaired hepatic or renal function since metabolism of the drug may be diminished.
Dosing/Administration	Adult: First dose of 20 mg slow IVP. May repeat every 10 min with additional doses of 40 mg and then 80 mg repeated at 80 mg until a maximum of 300 mg is administered. Obstetrical: 20 mg slow IVP (over 2 min). May repeat every 10 min with additional doses of 40 mg and then 80 mg until a maximum of 300 mg is administered. Continuous Infusion: Mix 200 mg in 250 mL of D5W and administer at 1 – 2 mg/min up to 60 mg/hour.
Pregnancy Category	C-Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Lorazepam (Ativan)

Class of Drug	Benzodiazepine: antianxiety agent, anticonvulsant, antiemetic, sedative.
Mechanism of Action	Depresses all levels of the CNS, including the limbic and reticular formation, probably through the increased action of gamma-aminobutyric acid (GABA), which is a major inhibitory neurotransmitter in the brain.
Indications	Status epilepticus Anxiety Sedation
Contraindications	Known hypersensitivity, Severe hypotension, Acute narrow angle glaucoma
Adverse Effects	CNS depression. Respiratory: Decrease in respiratory rate, apnea, laryngospasm. Cardiac: Tachycardia, chest pain. >10% CNS: Drowsiness, ataxia, amnesia, slurred speech, paradoxical excitement, rage, headache, depression, anxiety, fatigue, lightheadedness, insomnia.
Precautions	Extreme care must be used in administering to elderly patients, very ill patients, and to patients with limited pulmonary reserve because of the possibility that hypoventilation/hypoxic cardiac arrest may occur.
Dosing/Administration	Seizures: Adults: 4 mg IV. May repeat in 10 minutes X 1. Children: 0.05-0.1 mg/kg IV. Do not exceed adult dose. May repeat X 1 in 10 minutes. Anxiety: 0.5-1 mg IV X 1. May repeat X 1 in 10 minutes Sedation: 0.02-0.06mg/kg every 2-6 hours
Pregnancy Category	Class D Unsafe – evidence of risk that may be justifiable in certain circumstances

FORMULARY

Magnesium Sulfate

Class of Drug	Electrolyte
Mechanism of Action	Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholinesterase release at the myoneural junction; manages seizures in toxemia of pregnancy; induces uterine relaxation in pre-term labor; can cause bronchodilation after beta-agonists and anticholinergics have been used.
Indications	Acute asthma / bronchospasm Seizures of eclampsia/pre-eclampsia Pre-term labor Torsades de Pointes Hypomagnesemia TCA overdose induced dysrhythmias Class IIa agent for refractory V-Fib and V-Tach after Amiodarone
Contraindications	Heart blocks and renal diseases
Adverse Effects	Respiratory and CNS depression Hypotension, cardiac arrest, and asystole may occur Facial flushing, diaphoresis, depressed reflexes, and Circulatory collapse
Precautions	Recommended that the drug not be given in the 2 hours before delivery if possible May enhance the effects of other CNS depressants Serious changes in cardiac function may occur with cardiac glycosides IV Calcium chloride or calcium gluconate should be available as antagonist if needed
Dosing/Administration	Adult: Asthma / bronchospasm: 2-4 gm IV/IO over 5 minutes Eclampsia/Pre-eclampsia: 4-6 gm IV/IO over 10 min, then 2-4 gm/hr Pre-term Labor: 2-4 gm IV/IO over 20 minutes then 2-4 gm/hr Torsades de Pointes or Refractory VF/VT: 1-2 gm IV/IO over 1-2 minutes Pediatric: Asthma / bronchospasm: 25-50 mg/kg IV/IO over 10 minutes (Usually mixed in 50-100 mL of NS)
Pregnancy Category	Class D Positive Evidence of Risk – There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.

FORMULARY

Methylprednisolone (Solu-Medrol)

Class of Drug	Corticosteroid.
Mechanism of Action	Potent anti-inflammatory steroid synthesized in a laboratory. It has a greater anti-inflammatory potency than prednisolone and even less tendency than prednisolone to induce sodium and water retention.
Indications	Bronchoconstriction as a result of asthma, COPD or anaphylaxis.
Contraindications	Known hypersensitivity to drug or components. Use is contraindicated in premature infants. Should not be given in presence of systemic fungal infections.
Adverse Effects	Fluid Disturbances: Sodium retention, potassium loss, fluid retention, hypokalemic alkalosis, CHF in susceptible patients, hypertension. Musculoskeletal: Muscle weakness, loss of muscle mass, pathologic fracture of long bones, osteoporosis, vertebral compression fractures. Gastrointestinal: Peptic ulcer with possible perforation and hemorrhage, pancreatitis, and abdominal distention. Dermatologic: Impaired wound healing, increased sweating, petechiae, and thin fragile skin. Neurological: Increased ICP, vertigo, convulsions, headache. Endocrine: Menstrual irregularities, suppression of growth in children, increased requirements for insulin, manifestation of diabetes mellitus.
Precautions	Use cautiously in patients with renal disease, GI ulceration, osteoporosis, hypertension, diabetes, hypothyroidism, liver disease, diverticulitis, ulcerative colitis, emotional instability, ocular herpes simplex.
Dosing/Administration	Adult: 125-250mg IV/IO/IM Pediatric: 1-2mg/kg IV/IO/IM, max of 125mg
Pregnancy Category	Class C, Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Midazolam (Versed)

Class of Drug	Benzodiazepine.
Mechanism of Action	Facilitates the action of gamma aminobutyric acid to provide a short acting CNS depressant action. Absorption after IM injection is reliable and usually within 15 min. IV sedation is evident after 3 – 5 min.
Indications	Sedation Seizure Anesthesia induction/maintenance
Contraindications	Hypersensitivity to drug or components. Hypotension.
Adverse Effects	Retrograde amnesia, euphoria, confusion, ataxia, slurred speech, paresthesia, sedation, hypotension, tachycardia, hives, pruritis, blurred vision, nystagmus, miosis, GI distress, injection site irritation, laryngospasm, bronchospasm, respiratory depression, apnea.
Precautions	Use with caution in elderly or in patients with severe liver disease, renal failure, or CHF. May potentiate the effects of other CNS depressants.
Dosing/Administration	Conscious Sedation: Adult: 2-2.5 mg IV/IO/IM q 3-5 minutes, titrated to effect Pediatric Dose: 0.025-0.05 mg/kg IV/IO/IM every 3-5 minutes, titrated to effect Seizure: Adult: 2.5-5 mg IV/IO/IM. Intranasal dose 5 mg IN X 1; Max 2 doses/single episode Pediatric Dose 0.2 mg/kg IV/IO/IM X 1, max 5 mg/dose and 2 doses/single episode Intranasal dose 0.2 mg/kg X1, max 5 mg/dose and 2 doses/single episode Anesthesia Induction: 0.2-0.3 mg/kg IV/IO/IM Anesthesia Maintenance: 0.02-0.1 mg/kg/hour IV/IO/IM
Pregnancy Category	Class D Unsafe – evidence of risk that may be justifiable in certain circumstances

FORMULARY

Morphine

Class of Drug	Narcotic analgesic.
Mechanism of Action	Acts on the opiate receptors, altering the patient's perception of pain. Also has a depressant effect on CNS centers for breathing and on the cough reflex center.
Indications	Severe pain.
Contraindications	Hypersensitivity to drug or components. Extreme Caution in Right Ventricular MI.
Adverse Effects	Sedation, euphoria, miosis, seizures, tachycardia, bradycardia, hypertension, hypotension, rash, pruritus, biliary spasm, nausea, vomiting, constipation, ileus, respiratory depression.
Precautions	Rapid IV administration intensifies respiratory depressant effect.
Dosing/Administration	Acute Coronary Syndrome: If pain not responsive to Nitroglycerin 2-5 mg IV/IO/IM PRN All Other: 2-5 mg IV/IO/IM PRN Pediatric Dose 0.1 mg/kg IV/IO/IM PRN
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Naloxone (Narcan)

Class of Drug	Narcotic antagonist.
Mechanism of Action	Antagonizes the action of narcotic analgesics on opiate receptors in the CNS. Affects respiratory depression, sedation and hypotension. Duration of action is shorter than most opioids. Repeat doses may be required.
Indications	Respiratory depression, unwanted sedation or hypotension secondary to narcotic analgesics.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Tachycardia, hypertension, nausea, vomiting, tremors, sweating, pulmonary edema.
Precautions	Use in narcotic dependent patients can precipitate acute withdrawal.
Dosing/Administration	Adult: 0.4 – 4 mg IV, IM or if IN use 1 mL each nostril with atomization device. Repeat as needed. Pediatric: 0.1 mg/kg/dose up to 4 mg. Repeat as needed.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Nicardipine (Cardene)

Class of Drug	Calcium Channel Blocker
Mechanism of Action	Inhibits calcium ion influx into vascular smooth muscle and myocardium, producing peripheral and coronary vasodilation
Indications	Hypertension
Contraindications	Hypersensitivity, severe aortic stenosis
Adverse Effects	Headache, dizziness, hypotension, asthenia, angina, flushing, nausea, vomiting, tachycardia, palpitations, AV block
Precautions	Renal impairment, hepatic impairment, heart failure, portal hypertension, cerebral hemorrhage, cerebral infarct, pheochromocytoma
Dosing/Administration	IV infusion - titrate to effect: Start: 5 mg/h IV, may incr. by 2.5 mg/h q5-15min; Max: 15 mg/h
Pregnancy Category	Category C. Weigh risk vs benefit.

FORMULARY

Nitroglycerin (Nitrostat)

Class of Drug	Nitrate
Mechanism of Action	Relaxes vascular smooth muscle both in venous and arterial beds causing a decrease in myocardial oxygen consumption, reduction in afterload and preload. Also dilates coronary vessels.
Indications	Congestive heart failure. Angina. Acute coronary syndrome
Contraindications	Hypersensitivity to drug or components Head trauma or cerebral hemorrhage, hypotension or uncorrected hypovolemia.
Adverse Effects	Hypotension, bradycardia, methemoglobinemia, headache, dizziness, flushing, postural hypotension, tachycardia, burning oral sensation (SL).
Precautions	Use with caution in head injured patients, glaucoma, hypovolemia, hypotension, right ventricular infarction, or any other preload dependent state.
Dosing/Administration	Available in tablets or metered dose spray canister at 0.4mg/dose, or as a solution for IV injection. Adult: 0.4 mg SL every 5 min or continuous infusion 10 mcg/min IV increasing by 10 mcg/min every 3 – 5 min (usual dose 5 – 200 mcg/min).
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Norepinephrine (Levophed)

Class of Drug	Adrenergic vasopressor.
Mechanism of Action	Directly stimulates alpha adrenergic receptors resulting in constriction of all vessels and an increase in peripheral vascular resistance, increase in systolic and diastolic blood pressure, decreased blood flow to vital organs, skin, and muscle. Directly stimulates beta-1 receptors with a positive inotropic effect.
Indications	Hypotension Push Dose Pressor in Peri RSI state
Contraindications	Hypersensitivity to drug or components. Patients with peripheral or mesenteric vascular thrombosis, profound hypoxia or hypercapnea, hypovolemia
Adverse Effects	Headache, weakness, dizziness, hypertension, severe peripheral and visceral vasoconstriction, dysrhythmias, bradycardia, GI distress, decreased urine output, necrosis with extravasation, dyspnea, apnea, pallor, cerebral hemorrhage, seizures, metabolic acidosis, hyperglycemia, hyperthermia.
Precautions	Caution in sulfite allergic patients.
Dosing/Administration	Hypotension: Mix 4 mg/250 mL in D5W or NS. Adult: 2 – 20 mcg/min IV infusion titrated to goal BP. Pediatric (< 2 years): 0.1 – 2 mcg/kg/min IV infusion titrated to goal BP. Rapid Sequence Intubation Push Dose for hypotension Critical Care Only: ADULT PATIENT ONLY <ul style="list-style-type: none">• Begin by mixing 4 mg norepinephrine in 250 mL• Obtain a 10 mL syringe and fill it with 9 mL of sterile normal saline• Into the syringe, draw up 1 mL of norepinephrine 4 mg/250 mL• Concentration of norepinephrine is now 16 mcg/10 mL Dose: 6-10 mcg for BP < 90 by giving 3.75 mL to 6.25 mL IVP Onset: near immediate to 1 minute Duration: 1 minute
Pregnancy Category	Class D Unsafe – evidence of risk that may be justifiable in certain circumstances

FORMULARY

Ondansetron (Zofran)

Class of Drug	Antiemetic.
Mechanism of Action	Selectively antagonizes serotonin 5-HT3 receptors resulting in a centrally mediated antiemetic action.
Indications	Nausea/vomiting.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Headache, akathisia, acute dystonic reactions, seizures, tachycardia, angina, diarrhea, constipation, rash, bronchospasm, hypokalemia.
Precautions	Use with caution in patients with liver disease.
Dosing/Administration	Available for IV/IM injection as 2 mg/mL in 2 mL vials. Adult: 4-8 mg IV/IM, repeat once if needed. Pediatric: 0.15 mg/kg IV once (do not exceed adult dose).
Pregnancy Category	Class B Presumed safety based on animal studies

FORMULARY

Oxytocin (Pitocin)

Class of Drug	Exogenous hormone, oxytocic.
Mechanism of Action	Increases the sodium permeability of uterine myofibrils, stimulating the contraction of uterine smooth muscle.
Indications	Reduction of post-partum bleeding after expulsion of placenta.
Contraindications	Hypersensitivity to drug or components. Normal labor Hypertonic patterns of labor are noted or when vaginal delivery is contraindicated.
Adverse Effects	Hypertension, seizures, hypotension, tachycardia, dysrhythmia, GI distress, titanic contractions, abruption placenta, impaired uterine blood flow, uterine rupture.
Precautions	Magnesium should be on hand to relax the uterus in the event of uterine tetany.
Dosing/Administration	Post-partum hemorrhage: Mix 10-40 mg/1000 mL and administer at 20-40 milliunits/min IV infusion. Alternative: 10 units IM after placental expulsion
Pregnancy Category	Class X Highly unsafe – risk of use outweighs any possible benefit

FORMULARY

Phenylephrine

Class of Drug	Pressor
Mechanism of Action	A sympathomimetic which stimulates smooth muscle alpha adrenergic receptors, thus producing vasoconstriction for support of blood pressure.
Indications	Adult Patients: Rapid Sequence Intubation: if patient BP is <90 systolic Hypotensive Shock NOT FOR PEDIATRIC PATIENTS
Contraindications	Hypersensitivity, hypertension, ventricular tachycardia,
Adverse Effects	Arrhythmia, AV block, bradycardia, heart failure exacerbation, pulmonary edema, extravasation necrosis,
Precautions	Elderly patients, Volume depleted patients, angina, coronary artery disease, heart block, heart failure.
Dosing/Administration	Adult Patients: Rapid Sequence Intubation: Mixing Instructions: <ul style="list-style-type: none">• Draw 1 ml (10 mg) of phenylephrine from the vial (vial contains phenylephrine 10 mg/mL)• Inject this into a 100 mL bag of NS• Now you have 10 mg/100 mL of phenylephrine. This is 100 mcg/mL• Draw several mL into a syringe; each mL in the syringe is 100 mcg/mL Dose: 0.5-2 mL (50-200 mcg) every 2-5 minutes until SBP \geq 90 mmHg Shock: Mixing Instructions: <ul style="list-style-type: none">• Draw 1 ml (10 mg) of phenylephrine from the vial (vial contains phenylephrine 10 mg/mL)• Inject this into a 100 mL bag of NS Dose: 100-180 mcg/min OR 0.5-6 mcg/kg/min – TITRATE to BP goal NOT FOR PEDIATRIC PATIENTS
Pregnancy Category	Category C: Potential risk to fetus based on animal studies, but no human studies exist.

FORMULARY

Promethazine (Phenergan)

Class of Drug	Antiemetic, antihistamine.
Mechanism of Action	Competitively blocks H1 receptor sites, does not block histamine release.
Indications	Treatment of motion sickness, nausea, and vomiting. Potentiates action of analgesics. Some sedative effects.
Contraindications	Known hypersensitivity to phenothiazines. Narrow angle glaucoma. Stenotic peptic ulcer. Prostatic hypertrophy. Comatose or severely depressed states. Child less than 2 years.
Adverse Effects	Sedation, tachycardia, bradycardia, hypotension, tremors, paresthesia, respiratory depression.
Precautions	Known sulfite sensitivity (additive). Decreased level of consciousness. May lower seizure threshold. Administer diluted, through running IV – vascular irritant.
Dosing/Administration	Adult: 12.5 mg IV OR 25 mg deep IM every 4 – 6 hours prn. Pediatric: 0.25 – 0.5 mg/kg IV/deep IM every 4 – 6 hours prn.
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Rocuronium (Zemuron)

Class of Drug	Non-depolarizing neuromuscular blocker.
Mechanism of Action	Antagonizes motor endplate acetylcholine receptors. Time of onset is within 3 min. Duration of action is typically 30 min.
Indications	Need for prolonged neuromuscular blockade.
Contraindications	Hypersensitivity to drug or components.
Adverse Effects	Dysrhythmias, bronchospasm, anaphylaxis, injection site pain, HTN, hypotension.
Precautions	Use with caution in patients with impaired liver function, severe obesity. Use with extreme caution in patients who may have a difficult airway to manage definitively.
Dosing/Administration	Available for IV injection. Adult and pediatric: 1 mg/kg IV.
Pregnancy Category	Class B Presumed safety based on animal studies

FORMULARY

Sodium Bicarbonate 8.4%

Class of Drug	Buffer, alkalinizing agent
Mechanism of Action	Reacts with hydrogen ions to form water and carbon dioxide thereby acting as a buffer for metabolic acidosis
Indications	Hyperkalemia TCA overdose Phenobarbital overdose Known pre-existing bicarbonate-responsive acidosis Upon ROSC after long arrest interval (draw labs first) Alkalization for treatment of specific intoxications
Contraindications	Metabolic and respiratory alkalosis Hypocalcemia and hypokalemia Hypochloremia secondary to GI loss and vomiting Do not administer in the same IV line as calcium containing solutions (precipitate)
Adverse Effects	Metabolic alkalosis, hypokalemia, hyperosmolarity, fluid overload Increase in tissue acidosis Electrolyte imbalance and tetany, seizures Tissue sloughing at injection site if extravasation occurs
Precautions	Vasopressors may be deactivated Must ventilate patient after administration Intracellular acidosis may be worsened by production of carbon dioxide May worsen CHF
Dosing/Administration	Adult: Metabolic Acidosis: 2-5 mEq (one dose only, base subsequent doses on lab values) ASA and TCA Overdose: 1-2 mEq/kg (one dose only, base subsequent doses on lab values) Pediatric: Metabolic Acidosis: 1 mEq/kg may repeat with 0.5 mEq/kg every 10 minutes ASA and TCA Overdose: 1 mEq/kg may repeat with 0.5 mEq/kg every 10 minutes
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Succinylcholine (Anectine)

Class of Drug	Depolarizing neuromuscular blocking agent (paralytic) and skeletal muscle relaxant used to facilitate intubation.
Mechanism of Action	Short acting skeletal muscle relaxant that exerts effects by binding with cholinergic receptor sites, producing depolarization and preventing the action of acetylcholine. This depolarization is observed as fasciculations of muscle groups. Flaccid paralysis occurs rapidly, within one min after IV administration. The duration of effect is approximately four to six min.
Indications	Rapid sequence intubation
Contraindications	<ul style="list-style-type: none">- Personal or family history of malignant hyperthermia.- Personal or family history of skeletal muscle myopathies.- Known hypersensitivity.- Known or suspected hyperkalemia.- Denervation of skeletal muscle or upper motor neuron injury may cause severe hyperkalemia which may result in cardiac arrest (prior spinal cord injury).
Adverse Effects	<ol style="list-style-type: none">1. Malignant hyperthermia: Likelihood increases with administration of general anesthetics. Presents with spasm of the masseter (jaw) muscles, progressive to generalized rigidity, tachycardia, tachypnea and elevated temperature.2. BRADYCARDIA is primarily noted in children. Pretreatment with atropine may reduce this instance. Reports of cardiac arrest, dysrhythmias, tachycardia, hypertension, increased ICP and IOP, hyperkalemia, muscle fasciculations, and rhabdomyolysis with the potential for acute renal failure.
Precautions	Electrolyte abnormalities and those who may have digitalis toxicity – cardiac dysrhythmia may occur. Patients must be maintained on a cardiac monitor during and after medication administration. This solution should be kept refrigerated or may be stored at room temperature for short periods only (up to 14 days).
Dosing/Administration	Adults/pediatrics: 2 mg/kg IV Onset: approximately one min Duration: 4 – 6 min
Pregnancy Category	Class C Uncertain safety – animal studies show adverse effect but no human studies exist

FORMULARY

Tranexamic Acid

Class of Drug	Antifibrinolytic
Mechanism of Action	Competitively inhibits multiple plasminogen binding sites and thereby decreases plasmin formation and fibrinolysis.
Indications	<p>Adult (12 y/o and older): hypovolemic shock secondary to trauma blood loss as manifested by SBP<90 mmHg or HR>110 after adequate pain control.</p> <p>Pediatric (<12 y/o): hypovolemic shock secondary to trauma blood loss relative to patients age & size (consider the formula (age X 2)+70 to help determine hypotensive shock)</p> <p>Postpartum hemorrhage: evidence of developing or actual hypotension attributable to the postpartum hemorrhage</p> <p>Consider also, and administer, for patients with significant mechanism of injury who are likely to require surgery or blood transfusion. For example: shock, elevated lactate, one or more major amputations, penetrating torso trauma, or other evidence of severe bleeding.</p>
Contraindications	> 3 hours since injury/childbirth. Hypersensitivity to drug.
Adverse Effects	Potentially lowers seizure threshold.
Precautions	May cause dizziness, hypotension if administered too fast.
Dosing/Administration	<p>Adults (12 y/o and older): 1 gram/10 min IV, then 1 gram/8 hours IV.</p> <p>Pediatric (< 12 y/o): 15 mg/kg over 10 minutes (maximum dose 1000 mg/10 min), then infusion at rate of 2 mg/kg/hour over 8 hours, not to exceed 1000 mg.</p>
Pregnancy Category	Category B

FORMULARY

Vecuronium (Norcuron)

Class of Drug	Neuromuscular blocker
Mechanism of Action	Antagonizes motor endplate acetylcholine receptors (non-depolarizing neuromuscular blocker)
Indications	Rapid Sequence Intubation, need for prolonged paralysis in the intubated and ventilated patient.
Contraindications	Hypersensitivity to the drug
Adverse Effects	Bronchospasm
Precautions	Neuromuscular diseases
Dosing/Administration	RSI: 0.1 mg/kg IV Ongoing paralysis: same as RSI dose, repeat prn
Pregnancy Category	Category C. It is not known whether vecuronium will harm an unborn baby.

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