SCHERTZ EMERGENCY MEDICAL SERVICES

STANDARD MEDICAL OPERATING PROTOCOLS

Version 2025

Schertz EMS System SMOPs

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Schertz EMS
Cover/Signature Page

Dear SCHERTZ EMS/First Responder Organization (FRO) Member:

This booklet, otherwise known as the Standard Medical Operating Protocols (SMOP), has been carefully developed with current standards of emergency care in mind.

These protocols are intended to be used as guidelines to establish appropriate care for all certification levels. They are to be used in the general day-to-day practice of pre-hospital medicine as a means of establishing the clinical practices that we should strive to employ based upon our patient assessment and evaluation. Since no two patients are the same, our expectations will not be the same from patient to patient, but we do expect the concept and intent of these protocols to be used during every patient encounter.

There are exceptions to every rule, and, no doubt, exceptions will be made to some of the "rules" set out in this manual. We will constantly review the manual, and revisions will be made in order to keep our operations and procedures current with local, state and national standards of care. Your questions and comments are not only encouraged but mandated in order for us to achieve success in our patient encounters.

There is no substitute for *good common sense and sound thought processes*, and I expect every one of you to put forth your best effort to give our patients the very best care possible.

In addition, no question, concern, or issue while in the presence of the patient is too small or unimportant for On-Line Medical Control consultation. As you practice under these SMOP's, never hesitate to contact online medical control as outlined in these guidelines.

Sincerely,



R. DONOVAN BUTTER, D.O.

Effective Date: December 1, 2025
Expiration Date: November 30, 2027

Supplies List

The following is a list of supplies required on Schertz EMS ambulances. This list shows the minimum required supplies to be carried on an in-service unit.

Airway Management	
Bougie	1
BVM (Small Adult/Pedi)	1
BVM Infant	1
CPAP, Adult Circuit	1
Endotracheal Tube Holder	2
ET Tube, 2.5-8.5	1ea
ETCo2 Microline Filter	2
iGel Airway (3,4,5)	1ea
Lubricating Jelly, Sterile	2
Nasal Cannula (ETCo2)	2
Nebulizer	2
Non-Rebreather, Adult	2
Non-Rebreather, Pediatric	2
NPA – 30, 32, 34	1ea
OPA Kit	1
Suction Canister	1
Suction Catheters:	
#6 FR	1
#8 FR	1
#10 FR	1
#12 FR	1
#14 FR	1
Yankeur, Tonsil tip	2
Suction Tubing	2
PPE / Biohazard	
Bio Bags, Med	5
Disinfectant Spray	1
Exam Gloves, Ex-Large	1
Exam Gloves, Large	1
Exam Gloves, Medium	1
Exam Gloves, Small	1
Eye Protection	2
Eye Wash	1
Hydrogen Peroxide	1
Infection Control Kit	2
Respirator, N95	2
Sharps Container, Large	1
Sharps Container, Small	1
Sharps Shuttle	1

Trauma Management	
4X4 Non-Sterile	20
4X4 Sterile	3
5X9 Combi-Dressing	1
Ace Wrap	1
Bandaid, ¾"	10
Burn Sheet	1
C-Collar, Select Adult	2
C-Collar, Select Pediatric	2
Chest Decompression Needle	1
Cold Compress	2
Combat Gauze	1
Duct Tape, Medical	1
Head Chocks (pair)	2
Hot Pack	2
Multi-Trauma Dressing	2
Occlusive Dressing	3
Roller Gauze, 4.5 Sterile	5
Roller Gauze, 4" Non-Sterile	2
SAM Splint (Reg & XL)	1ea
Tourniquet (CAT)	1
Trauma Pressure Dressing	1
Trauma Shear	1
Triangular Bandage	5
Patient Assessment	
Disposable LP15 BP Cuff:	
Adult	1
Ex-Large Adult	1
Large Adult	1
Small Adult	1
Child	1
Disposable Pulse Ox Probe:	
Adult	1
Infant	1
Pediatric	1
ECG Electrodes	30
ECG Paper	1
Glucometer Test Strips	5
Lancets	5
Multifunction Pads, Adult/Pedi	2
Pen Light	1
Probe Cover (Thermometer)	15
Razor, Shave Prep	1

11/01/2025

R. Donovan Butter, D.O.
Medical Director

Effective: December 1, 2025
Expires: November 30, 2027

Supplies List

This list is a minimum listing and these items may be carried in larger amounts if necessary, based upon call volume and operational needs.

Vascular Access	
EZ IO Needle:	
25mm (Blue)	1
45mm (Yellow)	1
IV Arm Board	2
IV Cath:	
16ga.	5
18ga.	5
20ga.	5
22ga.	5
24ga.	5
IV Pressure Bag	1
MAD	1
Needles	
18ga.	2
25ga	2
Normal Saline 0.9% 10ml Flush	5
Saline Lock	5
Syringes	
1cc (with needle)	2
5cc & 10cc	2ea
30cc	1
Tourniquet, Latex	2
Veni-Gard, IV Dressing	5

Miscellaneous Supplies	
Alcohol Prep Pads	20
Bed Pan	1
Benzoin Tincture Comp. Swab	5
Blanket, Emergency	1
Blanket, Winter	1
Disposable Sheet, Tissue Poly	5
Emesis Bags	2
Fitted Sheet, Stretcher	5
Gastric Tube (8, 12, 14, 18)	1ea
Iodine, Povidone Prep Pads	10
Nail Polish Remover	1
Obstetrical Kit	1
Pillow, Single Use	1
Sterile Water, 500cc Btl	1
Tape, 1" Surgical	2
Tape, 2" Cloth	2
Urinal	1

11/01/2025

R. Donovan Butter, D.O.
Medical Director

Effective: December 1, 2025
Expires: November 30, 2027

Equipment List

The following is a list of the minimum required equipment carried to include quantities.

Binder Lift	1
BP Cuff, Adult	1
BP Cuff, Child	1
BP Cuff, large Adult	1
Car Seat, Pedimate	1
Cardiac Monitor	1
Cell Phone	1
Clip Board	1
Disposable Straps	2
Emergency Traffic Cones	3
EZ IO Drill Kit	1
Fire Extinguisher	1
Flash Light	1
Glucometer	1
Hand Cleaner	1
Hazmat Guide Book	1
Intubation Bag	1
- Laryngoscope Handle	1
- Mac#2, 3, 4	1ea
- Miller #0, 1, 2, 3	1ea
- Spare batteries (laryngoscope)	2
IV Bag	1
Jump Bag	1
KED	1
Man Sack	1

Mechanical CPR Device	1
Medication Bag	1
No Smoking Sign	2
Oxygen Cylinder D Type	2
Oxygen Cylinder M Type	1
Pediatric Length Based Tape	1
Portable Radio	1
Protocols (electronic)	1
Regulator, D Cylinder	1
Regulator, Wall Mounted	1
Safety Vest	3
Scoop	1
Spare Monitor Batteries	1
Stair Chair	1
Stethoscope	2
Stretcher W/Straps	1
Suction Unit, On Board	1
Suction Unit, Portable	1
Thermometer	1
- Oral Probe	1
- Rectal Probe	1
Traction Splint	1
Triage Kit	1
Unit Radio	1

11/01/2025

This list is a minimum listing and these items may be carried in larger amounts if necessary, based upon call volume and operational needs.

R. Donovan Butter, D.O.
Medical Director

Effective: December 1, 2025
Expires: November 30, 2027

Medication List

The following list contains an item description and the minimum number required on each Schertz EMS unit.

Medication	Amount	Supply
Acetaminophen (liquid)	4 oz.	1
Acetaminophen (IV)	1gram	1
Adenosine	6 mg	5
Albuterol	2.5 mg	2
Amiodarone	150 mg	3
ASA (chewable)	81mg/tab	1 btl.
Atropine	1 mg	2
Calcium Chloride	1 gram	1
Cardizem	25 mg	1
Ceftriazone	2grams	1
Dexamethasone	10 mg	1
Dextrose	25g	3
Diphenhydramine	50 mg	2
Droperidol	5mg	1
Epinephrine 1:10000	1 mg	1

Medication	Amount	Supply
Epinephrine 1:10000	1 mg	1
Epinephrine 1:1000	1 mg	2
Etomidate	40mg	1
Glucagon	1 mg	1
Levalbuterol	1.25 mg	2
Lidocaine	100 mg	2
Magnesium Sulfate	1 gram	2
Naloxone	2 mg	2
Norepinephrine	4 mg	1
Nitro-Spray	0.4 mg	1
Ondansetron	4 mg	2
Promethazine	25 mg	2
Rocuronium	100 mg	2
Sodium Bicarbonate	50 mEq	2
Terbutaline	1 mg	2
Tranxemic Acid (TXA)	1000 mg	1

Narcotics	Amount	Supply
Fentanyl	100 mcg	2
Ketamine	500 mg	1
Midazolam	10 mg	1

IV Fluids	Amount	Supply
Normal Saline	50 cc	2
Normal Saline	500 cc	6
Lactated Ringers	1000 cc	2

11/1/2025

Unless otherwise specified, generics and brand name products are considered interchangeable. These are minimums necessary to maintain an ambulance as "in-service".

There are times which Schertz EMS is not able to obtain some medications as described above, as noted with (*), due to ongoing national back orders. When the listed medications are not available, the substitution of alternative doses or concentrations will be permitted at the discretion and approval of the Schertz EMS Medical Director. These alternate doses and medications are noted with "***" and will be placed on an in-service unit while the preferred dose (**) is not available.

R. Donovan Butter, D.O.
Medical Director

Effective: December 1, 2025
Expires: November 30, 2027

Schertz EMS
Protocol Update Log

This page will be utilized to update future changes/additions to the protocols

Date	Protocol Changed	Comment
11/21/25	Carbon Monoxide Poisoning Protocol	New Addition
12/3/226	Ventilator Guidelines	New Addition
01/06/26	Termination of Efforts	Update
05/11/2026	Patient in Custody	New Addition
05/11/26	Intraosseous Access	Update
10/07/26	Traction Splint	Updated application procedure
10/11/26	Critical Crashing Pt/M15 Hypotension/M16-17 Sepsis	Blood pressure parameter for medications
10/11/26	Chest Pain / ACS	NTG infusion criteria wording
10/11/26	Reactive Airway Disease (Adult)	Magnesium infusion time
10/11/26	Overdose/Poisoning (Adult / Pedi)	Naloxone administration routes
10/11/26	Diphenhydramine	Add Dystonic reaction to match OD/Poisoning protocol
10/11/26	Glucagon	Adjusted administration route to match OB/Poisoning protocol
10/11/26	IV Pump Infusion Reference	Removed TXA, added NTG infusion

GENERAL GUIDELINES

AUTHORITY OF THE MEDICAL DIRECTOR

AUTHORITY OF THE MEDICAL DIRECTOR

The Medical Practice Act, Regulations of the Texas Medical Board, and the Texas Health and Safety Code 773.

RESPONSIBILITIES OF THE MEDICAL DIRECTOR

The regulations of the Texas Medical Board delegates the following responsibilities of the Medical Director:

- Satisfy him/herself as to the ability and competence of the emergency medical technician
- Authorize the emergency medical technician to perform such duties, which do not require the exercise of independent judgment
- Retain telephonic, radio, or direct control and supervision of the emergency medical technician
- Be responsible for appropriate medical records being maintained, including but not limited to information on transport forms, procedures performed, and medications administered by the emergency medical technician
- The Medical Director may at his discretion delegate some or all these duties.

AUTHORIZATION

The Medical Director herby authorizes emergency medical technicians of all levels in the Schertz EMS System (the System) including Schertz EMS and their corresponding First Responder Organizations (FRO) to practice according to the standards established in this document and other accepted standards, provided:

- Authorization has not been specifically withdrawn
- Prior notification is given to the Medical Director of the technician's acceptance into one of the System's agencies
- The technician retains a copy of these SMOP'S in their on-duty unit
- Technician is wearing the uniform of one of the System's agencies that clearly identifies the person's name, certification level and agency affiliation. The only exception to this is an unplanned response to an emergency within the System's service area.
- The technician must periodically pass a written test over the contents of these pages and show competence in the skills prescribed herein.
- The technician shall only practice those skills in which he/she is proficient. Clinical Services will determine proficiency. The technician may not practice those skills that proficiency has not been documented. Retesting of skills and documentation of proficiency shall be required periodically
- The technician shall maintain attendance and satisfactory performance in the continuing education program
- The technician must be certified or licensed by the Texas Department of State Health Services at all times.

REMOVAL OF AUTHORIZATION

- The Medical Director reserves the right to remove authorizations to practice. Disciplinary action against an individual to practice is at the discretion of field operations, Clinical Services, the agencies Director or designee and/or the Medical Director
- Removal of an individual's authorization to practice may be appealed according to each agency's in-house appeals process.
- Deviations from these SMOP'S will be dealt with on a case-by-case basis by Clinical Services and the Medical Director

AUTHORITY OF THE MEDICAL DIRECTOR

STANDARD OF CARE

- The SMOP'S will act as a guideline for all normal situations.
- For all other situations or items not covered by the SMOP'S, technicians are expected to follow established standards of emergency care and/or contact On-Line Medical Control (OLMC).

GEOGRAPHICAL AREA

- These protocols shall only be utilized under the Medical Director's direction in the Schertz EMS primary service area or outside of our service area while functioning in an official capacity. This includes mutual aid or state-wide disaster responses.

DUTY STATUS

- Authorized personnel shall utilize these protocols under medical direction only when acting in their official capacity representing Schertz EMS or one of its FRO's.
- **REMINDER: All personnel are required to display their name, current DSHS certification level and agency name at all times while on an EMS response.**

CREDENTIALING

For personnel operating in any Organization covered by these protocols to practice at their skill level, they must be "credentialed". A non-credentialed EMT, AEMT or Paramedic may only do BLS skills as defined by the Texas Department of State Health Services (DSHS) (i.e., CPR, oxygen, bandaging and splinting, but not additional skills outlined in this document). A certified person may work up to their skill level when supervised by a credentialed medic (i.e., a non-credentialed paramedic may work up to their skill level if another credentialed paramedic is on scene).

Current Operating Levels of Schertz System FRO / EMS Agencies		
Basic Life Support (BLS)	**Advanced Life Support (ALS)**	**Paramedic Level**
Lake Dunlap Fire Department	Bracken Fire Department	Schertz Fire Department
Marion Fire Department	Cibolo Fire Department	Schertz EMS
McQueeney Fire Department	Live Oak Fire Department	Universal City Fire Department
	Selma Fire Department	
	Guadalupe Co. Fire Rescue	

BLS / EMTASIC

To be credentialed at the BLS/EMT level:

- Document 10 BLS calls
- Written BLS protocol test
- Should be completed within 6 months of beginning protocol process

ALS / ADVANCED EMT (AEMT)

To be credentialed at the ALS/AEMT level:

- Document 15 ALS calls
- Written ALS protocol test
- Scenario test with Medical Director or Clinical Services
- Should be completed within 6 months of beginning protocol

PARAMEDIC LEVEL

To be credentialed at the Paramedic level:

- Document 30 calls
  - 18 of these calls can be as minimal as an IV attempt.
  - 12 of these calls must be another paramedic level skill (ETT, 12 lead interpretations, multiple medication administrations, etc.)
- Written paramedic credentialing test
- Scenario test with Medical Director/Clinical Services
- Should be completed within 6 months of beginning protocol process

NOTES

- Any agency may add additional criteria and requirements that exceed these basic standards. Clinical Services will assist with this process in anyway requested by the agency adding additional criteria.

CREDENTIALING – SCOPE OF PRACTICE

Providers performing emergency medical care within the Schertz EMS service area are required by the System and the Texas Department of State Health Services to be certified to practice ("credentialed") by the Medical Director and/or Clinical Services to perform at a specific level. When referring to the *Standard Medical Operating Protocols*, the terms: **ECA**, **EMT, AEMT,** and **PARAMEDIC** may appear in each category of illness or injury. These terms refer to the Medical Director's system credentialed level, not the State of Texas (DSHS) Certification/Licensure level.

EMERGENCY CARE ATTENDANT

Formal training programs consist of 71 hours of noninvasive emergency medical care. For this skill only, there is no hospital/ambulance rotation time required for course completion. Basic Life Support consists of CPR, hemorrhage control, splinting, bandaging, immobilization, and extrication of the patient at the scene, and administration of oxygen.

EMERGENCY MEDICAL TECHNICIAN (EMT)

Formal training programs for the EMT consist of 120 hours of noninvasive emergency medical care. Basic Life Support consists of CPR, hemorrhage control, administration of oxygen, splinting, bandaging, immobilization, and extrication of the patient at the scene. At the discretion of the paramedic or the AEMT, the EMT may place electrodes or prepare IV fluid "set-ups". The EMT is primarily taught to do no further harm to the patient. Because these maneuvers are "potentially harmless", they are generally not subject to on-line medical control. However, the medical supervision of all levels of EMT's is increasing as systems increase in sophistication. Upon credentialing with "the system", EMT's may initiate Supraglottic airways and assist or administer specified medications, to include Albuterol, ASA, epinephrine IM, naloxone IN and Xopenex. A credentialed EMT may also initiate a tibial intraosseous line after being trained and cleared by EMS Clinical Services.

ADVANCED EMT (AEMT)

The AEMT is officially defined as having the following skills along with Basic Life Support skills; utilization of endotracheal tube (ET), supraglottic airways, and initiation of and monitoring of peripheral intravenous lines. There are local variations in requirements, not only in the length of training, but also in essential skills at this level. Medications administered by the AEMT are to include dextrose, Narcan, Nitro, Albuterol and Brethine as outlined by these SMOP'S.

PARAMEDIC (EMT-P & LICENSED PARAMEDIC)

The paramedic training varies in length depending on the program and licensing authority, but usually requires at least 480 hours of training beyond that of the EMT. Paramedics maintain full Advanced Life Support certification. Capabilities include intravenous therapy, parenteral drug administration, cardiac monitoring, external pacing, cardiac defibrillation and cardioversion, endotracheal tube placement, and additional skills defined locally. Although they typically function while under direct medical control, they often have specific standing orders to allow for treatment in the absence of the control authority or failure of communications in life threatening situations.

CREDENTIALING – SCOPE OF PRACTICE

Airway Management	ECA	EMT	Credentialed EMT	Credentialed AEMT	Credentialed Paramedic
Airway - Nasopharyngeal	X	X	X	X	X
Airway - Open and Maintain	X	X	X	X	X
Airway - Oropharyngeal	X	X	X	X	X
Colorimetric Device				X	X
CPAP				X	X
Cricoid Pressure (Sellicks Maneuver)	X	X	X	X	X
Delayed Sequence Intubation (DSI)					X
End Tidal CO2 Monitoring				X	X
Esophageal Detector Device (EDD)				X	X
ETT Intubation				X	X
ETT Suctioning				X	X
Gastric Tube Placement				X	X
Obstructed Airway Management	X	X	X	X	X
Oxygen Administration - Bag Valve Mask	X	X	X	X	X
Oxygen Administration - Mouth to Mask	X	X	X	X	X
Oxygen Administration - Nasal Cannula	X	X	X	X	X
Oxygen Administration – NRB Mask	X	X	X	X	X
Suctioning - Oral		X	X	X	X
Suctioning - Nasal		X	X	X	X
Supraglottic Airway Placement			X	X	X
Trach Tube Replacement				X	X
Trach Tube Suctioning				X	X
Cardiac Management					
Automated External Defibrillation (AED)	X	X	X	X	X
Cardiopulmonary Resuscitation (CPR)	X	X	X	X	X
Manual Defibrillation					X
Monitor Lead Placement			X	X	X
Rhythm Interpretation					X
Synchronized Cardioversion					X
Transcutaneous Pacing (TCP)					X
Vagal Maneuvers					X

CREDENTIALING – SCOPE OF PRACTICE

Trauma Management	ECA	EMT	Credentialed EMT	Credentialed AEMT	Credentialed Paramedic
Bleeding / Soft Tissue Management	X	X	X	X	X
Cervical Immobilization Device (CID)	X	X	X	X	X
Helmet Removal	X	X	X	X	X
Hemostatic Agent			X	X	X
Kendrick Extrication Device (KED)	X	X	X	X	X
Long Backboard	X	X	X	X	X
Management of Suspected Fractures	X	X	X	X	X
Needle Decompression of the Chest					X
Spinal Motion Restriction	X	X	X	X	X
Spinal Motion Restriction Inclusion Protocol			X	X	X
Stair Chair		X	X	X	X
Stretcher - Ambulance		X	X	X	X
Stretcher - Scoop		X	X	X	X
Tourniquets			X	X	X
Traction Splint		X	X	X	X
Medical Management					
Childbirth Management	X	X	X	X	X
Glucometer			X	X	X
Hemorrhage Control	X	X	X	X	X
Intranasal Drug Administration (MAD)			Narcan	Narcan	X
IO Initiation			X**	X	X
IV Initiation			X**	X	X
IV Setup		X	X	X	X
Nebulizer Treatment			X	X	X
Pulse Oximetry		X	X	X	X
Thermometer	X	X	X	X	X
Vital Signs (Pulse, BP, Respirations)	X	X	X	X	X

** Credentialed EMT may initiate IV or IO access after receiving training and clearance from Schertz EMS Clinical Services

CREDENTIALING – SCOPE OF PRACTICE

Medication Administration	ECA	EMT	Credentialed EMT	Credentialed AEMT	Credentialed Paramedic
Acetaminophen (oral)			X	X	X
Acetaminophen IV					X
Adenosine					X
Albuterol			X	X	X
Amiodarone					X
Aspirin			X	X	X
Atropine					X
Brethine					X
Brethine Neb				X	X
Calcium					X
Dexamethasone					X
Dextrose (IV/IO)				X	X
Diltiazem (Cardizem)					X
Diphenhydramine (Benadryl)					X
Droperidol					X
Epinephrine 1:1000			X	X	X
Epinephrine 1:10,000					X
Epinephrine 1:100,000					X
Etomidate					X
Fentanyl					X
Glucagon					X
Instant Glucose			X	X	X
Ketamine					X
Lidocaine					X
Magnesium					X
Midazolam (Versed)					X
Naloxone			X (IN route)	X	X
Nitroglycerine				X	X
Norepinephrine					X
Ondansetron					X
Oxygen	X	X	X	X	X
Promethazine					X
Rocuronium					X
Sodium Bicarbonate					X
Tranexamic Acid (TXA)					X
Xopenex			X	X	X
Whole Blood (LTOWB)					X

EMS PERSONNEL GUIDELINES

PRE-HOSPITAL CARE PROVIDERS

Within the Schertz EMS organization, an individual will progress to higher levels of competence and responsibility by:

- Successful completion of specific courses with State Certification
- Approval of Medical Director
- Approval by Clinical Services

SKILLS REVIEW

- Skills proficiency and CPR certification shall be reviewed by Clinical Services and/or the Medical Director periodically.

CONTINUING EDUCATION

- Continuing education for pre-hospital personnel is defined as “those learning activities intended to build upon the education and experience of pre-hospital EMS personnel for the enhancement of practice, education, administration, research or theory development, to strengthen the quality of care provided.” Because CE is a method used by many to maintain licensure or certification it is vital that all system Credentialed medics attend the system CE

OTHER MEDICAL PERSONELL SITUATIONS

Physician on Scene

- Control of a medical emergency should be the responsibility of the individual in attendance who is most appropriately trained and knowledgeable in providing pre-hospital emergency stabilization and transport. When an EMS response is initiated for an emergency; a doctor/patient relationship has been established between the patient and the physician providing medical direction. Schertz EMS and it’s FRO’s are responsible for the management of the patient and act as the agent of medical direction unless the patient’s physician is present and willing to assume all care for the patient.
- A technician on an emergency scene should relinquish care and responsibility for the patient when the on scene physician has identified him/herself as a licensed physician in the State of Texas with training and proficiency to properly care for the needs of the patient, and has demonstrated a willingness to assume responsibility for the patient. This shall include accompanying the patient to the appropriate hospital in the ambulance and documenting his interventions in a manner that is acceptable and in accordance with TMB rules and Schertz EMS common charting practices. When these conditions exist, the technician should defer to the wishes of the physician on scene. If the treatment at the scene differs from that outlined in the local protocol, the physician should agree in advance to accompany the patient to the hospital. However, in the event of a mass casualty incident or disaster, patient care needs may require the physician to remain at the scene.
- This policy is not intended to discourage any qualified on scene physician from providing treatment or assisting the EMS crew when treatment conforms to Schertz EMS protocols.
- Technicians are advised to maintain a professional attitude in dealing with physicians on the scene. Courtesy is expected when dealing with physicians as well as patients and bystanders.
- At any time during this process, do not hesitate to contact OLMC for guidance or for the physician to discuss care with the OLMC physician

OTHER MEDICAL PERSONELL SITUATIONS

Physician on Telephone

- The patient's physician on the telephone shall be treated with respect and their instructions followed if in agreement with the SMOP's. The physician should be made aware of the patient condition at the present time and provided information as to destination and any treatment that will be rendered.
- **DO NOT** argue with the physician on the phone about patient care; simply refer them to your Medical Director and/or agency director.
- At no time will the physician on the telephone take the place of the SMOP's or OLMC direction.
- At any time during this process, do not hesitate to contact OLMC for guidance or for the physician to discuss care with the OLMC physician.

Paramedic Release of Patient to lower level certifications

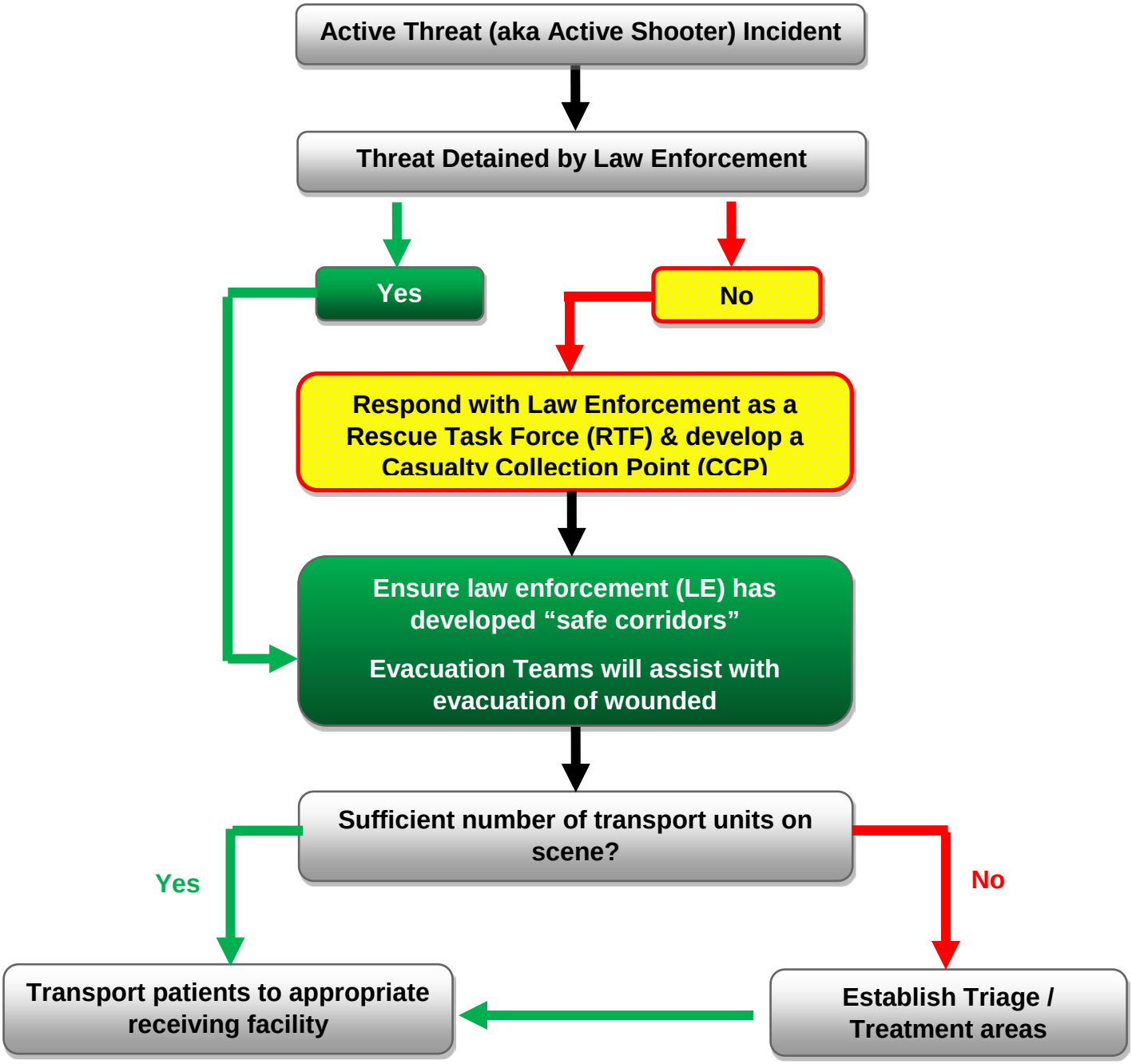
- Paramedics may turn over patient care to lower level certification if patient condition justifies a lower level of care. Extreme caution must be used to ensure that the patient will not develop further symptoms or need advanced care at any time during the remainder of the system's contact with the patient. If the patient has received any medication or advanced airway procedure outside the scope of practice of the lower level certified personnel or the patient's condition warrants an emergency transport the Paramedic must attend the patient.
- Personnel **MAY NOT** operate outside of their state certification level at any time unless specifically directed to by OLMC or the Medical Director.
- Personnel who are in training to attain a higher level of State Certification may only perform the additional skills while in a "student" role. This is defined as being enrolled in the class and performing a clinical rotation. This does not carry over to "duty" shifts outside of the clinical rotation environment.
- Scene authority and transition of patient care may occur in several levels in our system. Paramedics have attained the highest level of certification or licensure in the State of Texas. Based on their medical knowledge and mastery of practical skills they must assume the role of pre-hospital team leaders on all calls. In the event multiple Paramedics are providing patient care, patient care is the ultimate responsibility of the ***senior-most system Credentialed transport agency Paramedic on the scene***. In the event there are no Paramedics on the scene, ultimate patient care responsibility and authority rests with the provider with the highest level of System Certification.
- After arrival on scene, the transport provider will assess the scene and then receive a report from the First Responders. The transport provider acknowledges that they will develop and foster a teamwork approach to the orderly transfer of patient care as outlined in the SMOP's. Realizing that the transport provider will have ultimate authority and accountability for all patient care activities on scene after they arrive, the transport provider will work to develop mechanisms to resolve on-scene conflicts in an expeditious manner.

ACTIVE THREATS

Purpose

The purpose of this guideline is to establish a unified framework that outlines roles and responsibilities during Active / Ongoing Threat incidents. This guideline is intended to provide direction for the first 30 minutes of the incident.

Rules of engagement for active threat events have changed. No longer will law enforcement agencies establish a command post with initial arrival units. Instead, direct intervention and entry will occur to stop the active threat. Schertz EMS units responding to these types of events should be prepared to establish incident command and stage responding resources in a safe and secure place.



ACTIVE THREATS

Definitions

- **Casualty Collection Point (CCP)** - Located inside the structure, this is where civilians are collected and triaged prior to evacuation. Law Enforcement (LE) may establish and secure CCPs prior to RTF entry. Patient movement must be coordinated with LE.
- **EMS Transport Corridor**- the EMS route from Staging to the Ambulance Exchange Point (AEP) and then to area hospitals.
- **Evacuation Corridor**- main path of egress/ingress. Identified by LE, this is the path the RTFs will take. There may be multiple Evacuation Corridors.
- **Rescue Task Force (RTF)**- A combined team of LE and Fire personnel who will operate in the Warm Zone. Personnel may only participate on an RTF if they have undergone RTF training and have ballistic equipment.

General Information

Integration and developing a unified command are of primary importance. Coordination plays a critical role in the overall success and safety of the incident. Law Enforcement shall remain the lead agency in the event and may designate a different command post. Schertz EMS System personnel shall be responsive to the needs of law enforcement and shall be prepared to move to a new command post and integrate into a unified command structure.

The goal is to ensure successful coordination and communication between agencies resulting in effective scene control, maximum patient treatment and survival, and evidence preservation. Active Shooter incidents differ greatly from routine incidents due to an increase in safety requirements and the necessity of a Unified Incident Command (UIC) structure for mitigation of the emergency and coordination of our resources.

Law Enforcement shall be responsible for identifying zones and perimeters, moving patient out of the hot zone to casualty collection points (CCP), estimating and communicating the number of injured back to the unified command. Law Enforcement will also be responsible for identifying and maintaining the security of evacuation corridors.

Procedure

1. During Active Shooter incidents, first arriving law enforcement (LE) personnel are trained to neutralize the threat upon their arrival. **LE is the lead agency in any Active Shooter incident.**
2. All Active Shooter scenes are to be considered HOT (i.e., not a safe or secure area) until LE determines otherwise. *Zones will be established for identification and concise communications. These zones are dynamic and can change as the incident develops and expands.*
   A. The term **HOT ZONE** is used to indicate an area that is **unsecured** and where there is an **imminent threat**. Only SWAT Medics are trained to operate in this zone.
   B. The term **WARM ZONE** is used to indicate an area that has been **secured** by law enforcement but still has a **moderate threat**. RTFs may operate in this zone.
   C. The term **COLD ZONE** is used to indicate an area that may be **secured** by law enforcement and has a **low threat**.
3. Fire and EMS will meet with the Incident commander/Unified Command and determine the medical need. If RTF is indicated, all EMS and Fire personnel must be readily identified as Fire/EMS. Fire and EMS personnel will, if available, don appropriate ballistic protection equipment, other personal protection equipment, medical equipment and prepare for entry. RTF members should have RFT training.

4. Depending on the size and location of the incident, injured victims may need to be placed in a Casualty Collection Point (CCP) before transition to the cold zone.
5. Deployment:
    - The Rescue Task Force may be deployed for the following objectives:
        - Victim Triage (Interior Triage Team)
            - Place triage tag or colored survey tape on either wrist
        - Victim treatment of life threats
        - Victim removal from the Warm Zone to the Cold Zone (Interior Rescue Team)
        - Movement of supplies from the Cold Zone to the Warm Zone.
        - Any other duties deemed necessary to accomplish the mission.
    - Once Incident Command/Unified Command has authorized Rescue Task Force deployment, teams will be assembled to begin victim rescue. Minimum of two Medical responders per task force may be more depending on available resources.
        - Each Rescue Task Force shall deploy with at least two law enforcement officers - Protection Element.
        - A Law Enforcement Officer, Fire Officer, or EMS Officer will be assigned to coordinate Rescue Task Force assignments and communication between the Rescue Task Force(s) and the Casualty Collection Point.
        - The first Rescue Task Force to enter should advise their immediate supervisor to advise EMS Branch Director of an approximate victim count.
    - When the Rescue Task Force is operating in the Warm Zone, if possible, all patients encountered by the Rescue Task Force will be triaged with a triage tag and treated for life threats as they are accessed.
        - Patients should be triaged, and life threats should be treated by the first Rescue Task Force and left for additional Rescue Task Forces to move the victim.
        - The initial Rescue Task Force should continue triaging victims and treating life threats as they encounter additional victims.
        - Any patient that can ambulate without assistance will be directed to self-evacuate down the cleared corridor under police direction.
        - Any patient who is dead will be marked by black triage tags to allow for easy identification and to avoid repeated evaluations by additional Rescue Task Forces.
    - Once victims have been triaged, they should be moved to the Casualty Collection Point (CCP) for treatment and transport.
    - The Treatment Group will evaluate and provide necessary treatment while awaiting transport of victim away from scene.

Medical Shift Commander (MSC) Duties

The Medical Shift commander (MSC) is responsible for coordinating with incident command to support the needs of the incident. This may include establishing and EMS Branch including Triage, Treatment, and Transport groups and staging branch. The MSC shall also coordinate with the IC and law enforcement to provide medical personnel to establish Rescue Task Forces (RTFs).

1. For a confirmed Active Threat incident request additional resources as needed.
2. Coordinate (ensure) the establishment of a Rescue Task Force (RTF) Group
   a. As needed, assign an RTF member as the RTF Group Supervisor.
   b. Coordinate with LE and form multiple RTFs utilizing an On-Deck model.
      i. Ensure that no more the two EMS units (crews) are assigned to an RTF, the Casualty Collection Point or Triage. The goal is to have as many EMS units as possible available for transport.
      ii. When adequate resources are available, rotate the EMS unit (crews) assigned to RTFs, Casualty Collection Points or Triage out so they will be available to assist with transporting casualties.
   c. The first RTF will proceed towards (or establish) the Casualty Collection Point. The first RTF is considered the Anchor Team and *may* remain inside to manage patient care.
   d. Once immediate RTF needs are met, establish an RTF Rapid Intervention Team (RIT). This team would be used for any first responder patients.
   e. Each RTF will have a designation (RTF1, RTF2, etc.) and RTF Leader.
3. Establish a Medical Branch.
   a. Coordinate with LE to identify the Ambulance Exchange Point (AEP) and the EMS Transport Corridor
   b. When directed by IC / Operations, activate the *Medical channel* and coordinate Medic Units on this channel. Communicate face-to-face with IC/ Operations.
   c. Evaluate patients and EMS resources. Anticipate non-trauma medical emergencies at the incident.
   d. Coordinate with Dispatch and Medical Command on hospital availability.
4. Identify the EMS Transport Corridor and coordinate with LE Traffic.

Considerations

- Medical Branch (or Transport Officer) should advise MEDCOM (1-800-233-5815) with total number of patients to facilitate appropriate transport destinations.

CANCELLATION OF RESPONDING UNITS

When responding to a request for assistance of any kind, there will be occasions where either first responders or the transport provider is asked to cancel that response prior to arriving on scene. When this occurs, the following protocol will be followed:

CANCELLATION OF RESPONDING UNIT BY ON SCENE EMS RESOURCES

1. When either the first responder or the transport provider arrives on scene and determines, after completing a patient assessment, that other responding resources are not needed, the on-scene personnel are to contact the responding units via radio to advise them to cancel and for what reason.
2. When this occurs, the responding unit is to downgrade to non-emergency as soon as it is safe to do so. The responding unit is to acknowledge the cancellation and then advise if they will cancel or not.
3. It is the discretion of the responding unit to continue to the scene after cancellation in the non-emergency mode if they so desire.
4. If the patient is dead on scene, only an on-scene paramedic with protocol certification may cancel responding paramedic resources, however if it meets the criteria of obvious death, responding paramedic units may be downgraded to non-emergency by any skill level that has protocol certification. (See Obvious Death Protocol)

CANCELLATION OF RESPONDING UNITS BY LAW ENFORCEMENT ON SCENE

1. If while enroute to the scene, Law Enforcement advises that there are no “patients” on scene and that EMS can cancel, ALL responding agencies will downgrade to non-emergency as soon as it is safe to do so.
2. Based on the information received, it will be at the discretion of the responding unit(s) to continue to the scene after cancellation in the non-emergency mode if they so desire

CANCELLATION OF RESPONDING UNITS BY REQUESTING PARTY

1. Whenever any person requests EMS resources, an EMS resource must travel to the scene and attempt to evaluate the patient, offer EMS transport, and obtain refusals if transport is not accepted.
2. When advised that the calling party has called back and wishes to cancel EMS, ALL responding agencies should downgrade to non-emergency, as soon as it is safe to do so, and make location
    a. If the calling party requesting cancellation has identified themselves as a physician, physician assistant, nurse practitioner, or Hospice nurse, is on location with the patient AND has previously established a healthcare provider / patient relationship, responding agencies may cancel the response at their discretion.

CANCELLATION OF RESPONDING UNITS BY ALARM COMPANIES

1. If the response is for an activated medical alarm, and the alarm company has spoken to the caller or resident AND has received the appropriate cancellation code ALL responding units may cancel.

CRITICAL / "CRASHING" PATIENT

Patients are frequently encountered that are in extremis and quickly deteriorating to the point of cardiac arrest, often while packaging and loading these patients. It is important to rapidly recognize the deteriorating patient and take immediate action where you encounter the patient to stabilize the condition before loading and transporting. The following provides a prioritization of the goal directed treatments to stabilize the patient and prevent deterioration. Unless scene safety is a factor, moving the patient prior to stabilization attempts should be the last resort.

History	Signs and Symptoms	Differential
• Events leading to call • Time of symptom onset • Past medical history • Medications • Existence of Terminal illness / DNR • Renal Failure / Dialysis	• Pale, Cool, Clammy Skin • Respiratory Insufficiency • Cardiac Dysrhythmias • Hypotension • Altered Mental Status • Abnormal ETCO2 Levels • Hypoxia	• Hypovolemia • Hypothermia • Drug overdose • Massive myocardial infarction • Hypoxia • Tension pneumothorax • Pulmonary embolus • Acidosis/Sepsis • Hyperkalemia

Immediate Actions: First 2 - 5 minutes after arrival

Treat any immediate life threats once identified

- **Airway: Assess need for needed interventions**
  - Ensure the patient has a patent airway
  - Assist ventilations as needed
    - Insert NPA/OPA as tolerated/indicated based on LOC
    - Use suction as necessary to clear the airway
    - Assess need for advance airway
- **Breathing:** If respiratory failure or distress is noted, sit patient up if tolerated.
  - Provide oxygen therapy as needed to maintain SpO2 readings >94%
  - If signs of severe respiratory distress or respiratory failure are noted:
    - Use CPAP early of if no contraindications are present. Follow appropriate CHF or Reactive Airway Protocol.
  - If respirations are inadequate, give positive pressure ventilation with BVM + oxygen at 15 lpm.
    - Two-Person, Two-Thumbs-Down technique is most effective
    - Utilize PEEP as necessary up to 15 cm H20. Target SPo2 >94%
    - Consider PPV by BVM if not following commands or SpO2 < 90%
- **Circulation:** Assess quality and rate of peripheral and central pulses
- **Patient Monitoring:** NIBP, EKG, SpO2, EtCO2

Actions within first 5 – 10 minutes

- **Reassess response to interventions**
  - ABC's being maintained
- **Treat Unstable dysrhythmias**
  - If BP < 90 and Dysrhythmia follow appropriate protocol
    - Electrical Therapy: (pacing or cardioversion as appropriate)
    - Establish IV/IO access
    - Rapid Infusion of 500ml Fluid Bolus (utilize pressure bag)

CRITICAL / "CRASHING" PATIENT

Actions within first 10 – 15 minutes

- **Reassess response to interventions**
  - Airway/Breathing
    - If patient unable to maintain own airway place an advanced airway, follow DSI protocol
- **Treat any noted hypotension (SBP<100 and/or MAP<65)**
  - Initiate or Repeat NSS 500 mL bolus as indicated
  - If bradycardia, consider atropine 0.5 mg IV/IO, if indicated
  - If no response to IV fluids utilize the following vasopressor and/or blood products as appropriate to target SBP >100 and/or MAP > 65
    - "Push-Dose" Epinephrine 1:100,000 10 mcg (1cc) IV/IO (dilute 1 mL of 1:10,000 with 9 mL NS)
      - Repeat up to 100mcg total dose or target blood pressures are met
    - Norepinephrine infusion 1-10 mcg/min
    - 1 Unit LTOWB rapid infusion (if blood transfusion criteria met)
- Re-assess response to treatments and continue fluids/vasopressors (push dose or infusion) as indicated by appropriate protocol.

Once critical actions have been completed, move the patient to ambulance for transport

SPECIAL CONSIDERATIONS

DO NOT EXERT THE PATIENT BY STANDING OR WALKING!

- The specific lengths of time are approximate to provide a sense of urgency and to prioritize actions.
- If scene security is a concern, document actions taken. Provider safety is of utmost importance; however, a public location or roadway incident is not a reason alone to delay treatments.
- Care for these patients should be given as quickly as possible, but safety considerations and the scene environment may lead to times that are longer than these stated goals. When conditions make it impossible to meet these goals, the reasons should be documented in your PCR.
- Repositioning patient to the stretcher may be appropriate for better access/airway positioning but should not delay these immediate live-saving interventions. Moving to the unit before completing these treatments is inappropriate and places the patient at risk for Post Arrival Respiratory/Cardiac Arrest (PARCA).
- Actions listed should be simultaneous and not in any specific order. Choice of vasopressor medication is based on patient presentation and clinical judgement to determine order of use.

CRITICAL / "CRASHING" PATIENT

TRAUMA PATIENTS

Follow appropriate Trauma Guidelines w/ critical trauma

Initial Assessment/Primary Survey

General Impression of Patient in Extremis
New Onset ALOC
Airway Compromise
Significant Respiratory Distress
Signs of Shock

If no pulse, follow appropriate Cardiac Arrest Protocol

DO NOT INITIATE MOVEMENT TO AMBULANCE

! INTERVENE ASAP !

Respiratory Distress
Initiate appropriate O2/Resp Treatment
- MAINTAIN SPo2 >94%

Severe Respiratory Distress
- RAD: CPAP w/ Inline NEBS
- CHF: CPAP w/ SL Nitro

Request Additional Resources as Necessary

Assess Respiratory Status
Place BLS Airways as Indicated.
Suction vomitus/secretions if present
Initiate ECG, SpO2, BP, & EtCO2 Monitoring

Respiratory Failure
- Poor respiratory effort
- Unable to speak
- Loss of muscle tone
- Unable to sit up
- SpO2 < 90% despite O2
- Altered mental status
- Increasing EtCO2
- Hypoventilation

If Respiratory Status Worsens

Assess Circulatory Status

BP < 90 And Suspected Dysrhythmia
- Pacing per Bradycardia Protocol C-14
- Cardioversion per appropriate tachycardia protocol: C-12, C-22, C-24

Initiate IV/IO Access

Treat Hypotension/Shock
BP < 90
- Rapid IV fluid bolus
- Push Dose EPI
- Norepinephrine
- Whole blood (If criteria met)

Immediate Ventilations with BVM
- 2 Person Technique
- Elevate head of bed
- High-flow 100% oxygen
- BVM PEEP valve as needed up to 15 cm

If No Contraindications
Secure Airway per DSI Protocol Proc - 58

Initiate Patient Movement/Transport
Do Not Exert Patient (i.e. standing/walking)

FAMILY VIOLENCE

PROCEDURE

If you suspect that your patient's injuries may have been caused by family violence, you need to do three things. They are:

1. Immediately provide the person with information regarding the nearest family violence shelter; and
2. Document in your patient care report that you gave the patient the above information and why you suspect the injuries were caused by family violence; and
3. Give the person a written notice in both English and Spanish.

The notice must be substantially in this form:

NOTIFICATION TO ADULT VICTIMS OF FAMILY VIOLENCE

It is a crime for any person to cause you any physical injury or harm **EVEN IF THAT PERSON IS A MEMBER OR FORMER MEMBER OF YOUR FAMILY OR HOUSEHOLD.**

You may report family violence to a law enforcement officer by calling the following numbers:

Schertz Police Department	(210) 619-1200		Guadalupe Co. Sheriff's Office	(830) 379-1224
Universal City Police Department	(210) 658-5353		Comal County Sheriff's Office	(830) 609-3921
Live Oak Police Department	(210) 653-0033		Garden Ridge Police Dept.	(210) 651-6441
Selma Police Department	(210) 651-5368			

If you, your child or any other household resident has been injured or if you feel you are going to be in danger after a law enforcement officer investigating family violence leaves your residence or at a later time, you have a right to:

Ask the local prosecutor to file a criminal complaint against the person committing family violence; and apply to a court for an order to protect you. You may want to consult with a legal aid office, a prosecuting attorney or a private attorney. A court can enter an order that:

1. Prohibits the abuser from committing further acts of violence;
2. Prohibits the abuser from threatening, harassing or contacting you at home;
3. Directs the abuser to leave your household; and
4. Establishes temporary custody of the children or any property.

A VIOLATION OF CERTAIN PROVISIONS OF COURT-ORDERED PROTECTION MAY BE A FELONY.

CALLTHE FOLLOWING VIOLENCE SHELTERS OR SOCIAL ORGANIZATIONS IF YOU NEED PROTECTION:

_____

_____

The act also provides immunity for persons reporting suspected family violence from civil liability. The exception to this immunity clause is: a person who reports the person's own conduct or who otherwise reports family violence in bad faith.

FIRE REHAB

REQUIRED REHAB EQUIPMENT

The following equipment should be taken with the responding unit to provide the proper rehab needed:

1. Canopy for shade cover,
2. Fans, heaters (as appropriate for season)
3. Misting system
4. Rehab station forms, clipboard, and writing utensils
5. BP cuffs (multi pack or six)
6. Thermometers and probe covers
7. Medical supplies needed to provide first aid and ALS treatment until transporting unit arrives.
8. Cardiac monitor
9. Water and electrolyte replacement drink
10. Towels
11. Cups
12. Approved nutritional snacks
13. Oxygen supply and a multi-port oxygen delivery manifold
14. Trash bags
15. Blanket as needed

SPECIAL CONSIDERATIONS

Re-hydration is a crucial component of rehab. Ample water or liquids should be available for consumption to reduce the risk of heat related emergencies. Fluids, however, should not be served in temperature extremes (for example: on hot days fluids should be cool when given, and on cold days fluids should be warm). It is recommended that personnel consume anywhere between 12 and 32 oz of fluid during high activity events or events that require intense physical activity. It is also recommended that the fluids that they receive not exceed 350 mOsm/liter (thickness of the fluid), to reduce the risk of nausea, vomiting, and exacerbation of the dehydration and the heat related emergencies. In the summer months a cool, shady place should be set up for the rehab station; and in the colder months a warm place that does not subject the rescue personnel to the winter elements should be considered.

CONCLUSION

With proper re-hydration and rehab, rescue personnel will be able to work longer on the scene. This also provides the EMS personnel an active role in the rescue and in the prevention of on the job injury or illness at these scenes.

FIRE REHAB

Firefighting, extended rescues, and special operations create hazardous and physically demanding situations that push the limits of the human body. Rehab operations should closely monitor all rescue personnel during periods of increased physical and mental stress. The goal of emergency incident rehab is a prevention of illness and injury during scene operations. Formal rehab set up will provide an area for the personnel to have a chance to get away from the situation and divert their attention to relaxing and taking care of themselves. It will also provide an establishment for treatment of injuries that may be sustained during scene operations but may not warrant transport to the hospital. It will also be a symbol for safety and awareness of all personnel that are involved so that all tasks can be completed as needed and no personnel are lost. Instances for a rehab would include a "working" structure fire or fires that will require firefighting operations that last greater than 30 minutes, wild land fires, hazardous material incident, crime scenes and or stand offs, any emergency incident in high risk weather conditions as high heat indexes or cold weather days with an even lower wind chill, search activities, public events, training activities.

GOALS FOR SCENE REHAB

1. Hydrate and rest personnel to minimize any heat or stress related illnesses or injuries.
2. Provide ongoing monitoring to identify potential health related issues.
3. Immediately identify and treat any potentially serious medical conditions detected during evaluation.
4. Treat any traumatic injuries.
5. Classify personnel into three categories
   a. Return to duty
   b. Removal from duty- evidence of illness or injury
   c. Transport for further evaluation to a medical facility.

ESTABLISHMENT OF A REHAB AREA

The rehab area should be established based on need per each incident encountered but should include some basics that should never change. The location will be at the discretion of the highest-ranking EMS personnel in cooperation with and direction of the incident commander. It should be out of the area that the rescue crews are working in but should be within a reasonable walking distance from the site. Other considerations when setting up the rehab area include all of the following:

1. Upwind/uphill from incident.
2. Free of exhaust fumes.
3. Sheltered area (if it's cold- somewhere that is warm; if it is hot- somewhere shady and cool).
4. Reduced noise level so that the rescue crews can fully relax and concentrate on re-hydrating themselves.
5. Close to the scene without interfering with the scene activities or compromising scene safety.
6. Easily accessible for incoming and outgoing EMS trucks for transporting patients and other incoming emergency apparatus
7. Avoid crowds and traffic area to keep unauthorized persons out of the area.
8. Near the SCBA refill area (when applicable).
9. Near scene command.

FIRE REHAB

It is almost impossible to have the “ideal” rehab area. The rehab shall be established in coordination with IC so that the rehab area does not interfere with fire ground/rescue operations. Areas to consider: level yards, public buildings with large covered areas, empty parking lots or fields, enclosed fire/rescue/EMS vehicles. When establishing the rehab area there should be only one entry and one exit so that this will allow for all responders to be processed in an orderly fashion and in which potential problem are not likely to be overlooked

PERSONELL ENTERING REHAB AREA

1. Each person entering the rehab unit will be logged, and any medical information collected about that person would be logged also on form provided.
2. Each person entering the area will take off protective equipment (as appropriate), turn over accountability tag and be logged in. Any person entering rehab area is under the direction of the medical personnel and is not permitted to leave until final evaluation has been done and accountability tag is returned.
3. After logging in, each person will have the following taken to determine whether they need to go to medical evaluation area or go to the rest and refreshment area:
   a. Blood pressure/heart rate/respirations
   b. Skin temp (hot or cold, dry or sweaty)
   c. Cap refill time and pulse oximetry
   d. Pupils
   e. Lung sounds
   f. Temperature
   g. GCS
   h. CO monitoring (if available)
   i. Any complaints that they may have
4. Entry evaluation findings that mandate automatic triage at the medical evaluation area are:
   a. Heart rate >120 bpm
   b. Blood pressure >200 mm Hg systolic or <90 mm Hg systolic; or >110 mm Hg diastolic
   c. Any injuries
   d. Temperature >99.5 degrees F
5. If patient is sick or injured, please refer to protocols for management.
6. If during medical evaluation any symptoms listed below are discovered, the person is to be treated and transported to appropriate facility and crew will notify the Safety officer or Incident Command
   a. Chest pain
   b. Shortness of breath
   c. Palpitations
   d. Altered mental status (confusion, seizures, dizziness, etc.)
   e. Skin that is hot and dry to touch
   f. Irregular pulse
   g. Pulse greater than 150 bpm at any time
   h. Pulse greater than 140 bpm after cooling down
   i. Systolic blood pressure greater than 200 mm Hg after cooling down
   j. Diastolic blood pressure greater than 120 mm Hg at any time
7. While in the rehab area, personnel should be provided with and should drink 32 oz. of re-hydration fluids and/or a snack with proper sugar and carbohydrates to replenish their energy.
8. Personnel will be encouraged to enter the rehab area after the use of two bottles or as assigned by Incident Command
9. Incident Command will be notified of elevated vital signs, or any condition that would preclude the firefighter form returning to duty and will make the final decision if the firefighter will return to duty.

HOSPITAL SELECTION CRITERIA

• GENERAL CRITERIA

1. Stable patients **SHALL BE** transported to the hospital of their choice providing the hospital is appropriate for their condition.
2. Unstable, critically ill patients shall be transported to the closest **appropriate** emergency department for evaluation and stabilization.
3. All trauma patients meeting the Regional Trauma alert criteria **shall be** transported to an appropriate trauma center.

HOSPITAL DIVERSION

The Texas Department of State Health Services (DSHS) defines "diversion" as **"a procedure put into effect by a hospital facility to insure appropriate patient care when that facility is unable to provide the level of care demanded by a patient's injuries/illness or when the facility has exhausted its resources."**

A request by a hospital for diversion status is only a request. If there are other appropriate destinations for the patient, then every effort should be made to honor the diversion request. Schertz EMS crews may override hospital diversions depending upon certain conditions. The following lists are conditions where diversion overrides may be appropriate:

1. The patient has special medical circumstances such as previously discharged in the last 72 hours, transplant patients, recent surgical patients from that facility, OB patients, etc.
2. The patient specifically requests to be taken to a hospital that is on diversion status. The patient will not consent to transport to any other facility. Before honoring this request, EMS agency will inform the patient. Hospitals make diversion decisions based on patient safety and real-time capabilities. Prior to transport, EMS must allow the patient to make an informed decision regarding delays in care at their facility of choice. These include delays in being seen, delays in treatment, and the potential for an adverse outcome because of these delays.
3. The following patients will be transported to the closest facility regardless of diversion status:
    1. CPR in progress (Adult/Pedi)
    2. Emergent Airway/Intubation required (Adult/Pedi)
    3. Systolic BP < 70 mmHg with signs/symptoms of shock (Adults only)
4. A patient in active labor may be transported to their hospital of choice regardless of the diversion status of that hospital as long as it is an appropriate facility for the patient and is not specifically on diversion to "Active Labor".

HOSPITAL SELECTION GUIDE

Version: Aug 2025

Pediatric
Adult
Service not available

System		Trauma Designation	Adult (Age 18 and older)			Heart Alert	Resuscitation Center	Stroke Alert	OB	Bariatric CT (Wt/Girth)	Pediatric (Age 17 and under)		
			P-1	P-2							P-1	P-2	
			Medical	Trauma	Medical						Medical	Trauma	Medical
Baptist Health System	Baptist Medical Center	L4	YES	YES	YES	PCI	Primary	Primary	NO	600 / 26	NO[2]	YES	YES
	Mission Trail Baptist Hospital	L4	YES	YES	YES	PCI		Primary	YES	450 / 26	NO[2]	YES	YES
	North Central Baptist Hospital	L3	YES	YES	YES	PCI		Primary	YES	450 / 26	NO[2]	NO	NO
	Baptist Children's at North Central		NO	NO	NO	NO		NO	NO	450 / 26	YES	YES	YES
	Northeast Baptist Hospital	L3	YES	YES	YES	PCI		Advanced	NO	675 / 30	NO[2]	YES	YES
	Resolute Baptist Hospital	L4	YES	YES	YES	PCI		Primary	YES	675 / 27	NO[2]	YES	YES
	St. Luke's Baptist Hospital	L4	YES	YES	YES	PCI		Comprehensive	YES	450 / 26	NO[2]	YES	YES
	Westover Hills Baptist Hospital		YES	NO	YES	PCI		NO	YES	450 / 27	NO	NO	NO
CHRISTUS Health	CHRISTUS Children's Hospital	L3	NO	NO	NO	NO		NO	YES	660 / 28	YES	YES	YES
	CHRISTUS Santa Rosa New Braunfels	L4	YES	YES	YES	PCI	Primary	Primary	YES	450 / 28	NO[2]	YES	YES
	CHRISTUS Santa Rosa Westover Hills	L4	YES	YES	YES	PCI	Primary	Primary	YES	450 / 28	NO[2]	YES	YES
Methodist Healthcare System	Methodist Hospital	L3	YES	YES	YES	PCI	Comprehensive	Comprehensive	YES	660 / 30	NO[2]	NO	NO
	Methodist Hospital | Children's		NO	NO	NO	YES		NO	NO	660 / 30	YES	YES	YES
	Methodist Hospital | Landmark		NO	NO	NO	NO		NO	NO		NO	NO	NO
	Methodist Hospital | Metropolitan	L4	YES	YES	YES	PCI		Primary	YES	450 / 28	NO[2]	YES	YES
	Methodist Hospital | Northeast	L3	YES	YES	YES	PCI		Primary	NO	660 / 28	NO[2]	YES	YES
	Methodist Hospital | Specialty and Transplant	L4	YES	YES	YES	NO		NO	NO	650 / 27	NO[2]	YES	YES
	Methodist Hospital | Stone Oak	L3	YES	YES	YES	PCI		Primary	YES	450 / 28	NO[2]	YES	YES
	Methodist Hospital | Texsan	L4	YES	YES	YES	PCI		NO	NO	425 / 27	NO[2]	YES	YES
	Methodist Hospital | Westover Hills		YES	NO	YES	PCI		NO	YES	625 / 29	NO	NO	NO
Other Bexar/Guada-Comal Hospitals	Guadalupe Regional Medical Center	L4	YES	YES	YES	NO		NO	YES	600 / 32	NO[2]	YES	YES
	San Antonio Military Medical Center *	L1	YES	YES	YES	PCI		NO	YES	500 / 30	NO[2]	YES	YES
	South Texas Veteran's Health Care Center **		NO	NO	YES	NO		NO	NO	650 / 28	NO	NO	NO
	University Hospital	L1	YES	YES	YES	PCI	Comprehensive	Comprehensive	YES	650 / 27	NO[2]	NO	NO
	University Children's	L1	NO	NO	NO	YES		YES[1]	NO	650 / 27	YES	YES	YES

- Resuscitation – Primary/Comprehensive for Resuscitation Centers
- Stroke Alert: Level I Comprehensive - Comprehensive Stroke Center certified facility (VAN Positive); Level II (Advanced) Thrombectomy Capable Stroke Center (VAN Positive); Level III =Primary Stroke Center certified facility Level (VAN Negative patients)
- Sexual assault patients 18 yr or greater (NO Red/Blue Trauma Criteria) transport to closest appropriate ED/FSED (Hospital will call MEDCOM to initiate SANE exam) Sexual assault patients 17 yr or younger transport to Christus Children's (NO Red Trauma Criteria)

*SAMMC accepts only TriCare beneficiaries; ** VA beneficiaries only

1-Accepts Pediatric Stroke; 2-Except P1 Override/Patients in Extremis

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HOSPTIAL SELECTION - EMERUS

EMS Pt Report Line (210) 651-0717

BEH facilities are designed to provide full service emergency care as well as basic inpatient services. Appropriate candidates for ambulance transport to BEH facilities are those that will require treatment in the emergency department and discharge home, or those that may need basic inpatient services NOT to include any type of inpatient specialty consultation, surgical procedures, ICU level care or inpatient pediatrics.

EXAMPLES OF APPROPRIATE PATIENTS

1. Low risk chest pain patients without EKG changes
   a. Reproducible or increases with palpation
   b. Non cardiac in nature
2. Dyspnea without EKG changes
   a. Reactive airway disease with symptom relief on initial treatment
   b. Pneumonia symptoms with SPO2 of 90% or greater on room air, increasing to 96-100% with supplemental oxygen
3. Abdominal pain with stable vital signs
   a. No evidence of requiring surgical intervention
4. Minor MVCs (No Regional Trauma alert criteria except Age > 65 or any of the excluded injuries)
5. Vomiting, diarrhea, dehydration
6. Sprains, strains and minor fractures and dislocations
   a. Non-displaced fractures with good distal pulses
   b. No long-bone fractures (humerus, femur) or fractures requiring surgical intervention (hip, pelvis, spine)
   c. No open fractures
7. Headache without neurological deficits
8. Minor head trauma with normal GCS
   a. Pt alert with no abnormalities (repetitive questions, amnesia of event, etc.)
   b. Patient is not on anticoagulant therapy
9. Back pain without neurological deficit
10. Non-critical Pediatrics
11. Other **low** acuity patients that meet the general criteria above (Priority 3 patients)

EXAMPLES OF INAPPROPRIATE PATIENTS

1. All priority 1 patients (including all alerts (Heart, Stroke, Trauma, Sepsis)
2. All obstetrics (any possibility of pregnancy included)
3. All CVA/TIA patients (Stroke Alerts)
4. Psychological emergencies where the patient has injured themselves (even minor injury), ingested any substance (toxic amounts) or is or has been violent
5. Chest pain with EKG changes
6. Abdominal pain with abnormal vital signs
7. Long bone or pelvic fractures and amputations
8. Head injury with GCS less than 15
9. Facial trauma requiring ENT/OMF or plastics
10. GI bleed patients
11. Headache with altered mental status
12. Hemodialysis patients who could require emergency dialysis
13. Febrile seizures

INFECTION CONTROL / EXPOSURE

INTRODUCTION

- The following diseases are reported from the hospital to the Texas Department of State Health Services. The Texas Health and Safety Code require emergency personnel, peace officers, and firefighters will be notified of the following reportable diseases:
  - AIDS/HIV
  - Amebiasis
  - Campylobacter
  - Chicken Pox (Varicella)
  - Hepatitis A
  - Hepatitis B
  - Influenza
  - Measles (Rubeola)
  - Meningitis
  - Mumps
  - Pertussis (Whooping Cough)
  - Salmonella
  - Shigella
  - Tuberculosis
- The best treatment for infectious diseases is prevention. Always follow proper universal precautions, according to OSHA, for gloves, mask, eye shields, gowns, etc., per departmental guidelines
- Pre-hospital personnel with clothing contaminated with blood or body fluids should change clothes as soon as possible.
- All pre-hospital personnel must be offered appropriate immunizations including Hepatitis A, Hepatitis B, Tetanus, Influenza, Pneumonia and TB testing
- **When dealing with a patient with a suspected communicable disease, personnel should wear gloves, a mask and gown. A mask may also be placed on the patient if appropriate.**

NEEDLE STICK OR EXPOSURE

- If exposed to blood or body fluids, it is important to wash off contaminate as soon as possible. Antiseptic products should be used in the field if no handwashing facilities are immediately available
- Report any percutaneous or permucosal exposures of blood, saliva, urine, or feces to the on-duty supervisor as soon as possible. Also notify receiving hospital if the patient was transported, so necessary baseline laboratory data can be obtained on the patient if warranted.
- Fill out appropriate paperwork provided for exposures and contacts as needed for City of Schertz records and treatment.
- The risk of blood borne pathogen transmission depends on several things:
  1. Depth of needle penetration
  2. Visible blood on the device causing injury
  3. Device previously placed in source patient's vein
  4. Volume of blood exposed to
  5. Length of skin/mucosal membrane contact
  6. Disease titers of organism in the source patient's blood

INFECTION CONTROL / EXPOSURE

Blood Borne Pathogen	Risk of Transmission with Hollow Point Needle of Infected Patient	Incubation Period	Available Vaccine	Length Virus Can Live in Environment
Hepatitis B	1 in 4 (25%)	30 – 180 days	Yes	Weeks-Months
Hepatitis C	1 in 20 (5%)	15 – 160 days	No	Hours (until blood is dried)
HIV/AIDS	0.3% (needle) 0.09% (mucous membrane)	21 days – 3+ years	No	Hours (until blood is dried)

PREVENTION AND CLEAN UP

Routine maintenance and cleaning of medical equipment and patient care areas is essential to the operation of EMS units.

1. **Cleaning Solutions**: All cleaning supplies shall be kept in labeled containers. Cleaning solutions will be made-up according to manufacturer's instructions. Each shift shall check these cleaning solutions and replace as needed. Bleach/water solution shall be 1 1/2 cups of bleach to 1 gallon of water.
2. **Daily Cleaning**: Each day shift shall:
   a. Wipe down all surfaces in the crew and patient care areas with a cleaning solution.
   b. Check the availability of all items stocked and complete the appropriate restock procedure.
3. Cleaning After Each Patient Contact. After each patient contact, the crew shall:
   a. Wash hands.
   b. Wipe down stretcher, cabinet doors, walls and floor with a tuberculocidal disinfectant.
4. After each usage, clean all non-disposable items.
5. Place dirty linens in bay side washing machine. Gloves must be worn when handling dirty linens. Whenever a patient is encountered with a suspected infectious disease process, place dirty linens in biohazard bags, LABEL "Contaminated", dispose of immediately in Biohazard room.
6. Clean all items that come in contact with the mucous membranes in hot soapy water then soak in a bleach/water solution for 15 to 30 minutes and let air-dry.
7. Use non-disposable gloves; gown/apron and eye protection when washing contaminated equipment.
8. **Gloves**: Use of disposable gloves during all patient contacts is **REQUIRED**.

MASS CASUALTY / DISASTER

GENERAL GUIDELINES

- A mass casualty incident (MCI) is any an incident that exceeds the normal resources for emergency response available in the jurisdiction where the incident takes place.
- The Schertz EMS System will utilize the Regional Field Triage Algorithm on any incident with more than five patients.
- Pulsara and TX ems Wristbands are expected to be used on all MCI Incidents

EMS RESPONSE

1. **INITIAL RESPONSE**-. The senior medic on the first arriving EMS unit on an incident with multiple patients will take the following actions:
   a. Establish Incident Command as needed
      i. Establish Unified command with law enforcement and fire department personnel as soon as possible
      ii. Establish Medical Branch (as needed based on number of patients and size of event)
   b. Perform scene size-up, advise dispatch or command of your findings over the assigned channel.
   c. Designate the MCI level *(based on criteria below)*, notify MEDCOM and establish an MCI Event in Pulsara
      i. Based upon the scope of the incident additional resources will be requested.
   d. Ensure triage is started (triage needs to be performed before treatment)
   e. Confirm EMS Battalion Chief is enroute
   f. As additional resources arrive establish the following:
      i. Triage group
      ii. Treatment group
      iii. Transport group
2. **"SECONDARY" RESPONSE** – additional arriving units will take to following actions:
   a. Contact command for instructions (if command has not been established, coordinate with units on scene to ensure command is established)
   b. Report to staging, unless otherwise instructed by command
3. Ensure a Treatment Group (and area) has been established
   a. Once a patient has been triaged and is able to be moved – the patient shall be moved from the site to the appropriate treatment area based on the designated triage category of the patient.
      i. **Priority 1** treatment area
      ii. **Priority 2** treatment area
      iii. **Priority 3** treatment area
      iv. **Morgue** (fatalities will only be moved from the initial site if needed to facility patient care or at the direction of law enforcement, Justice of the Peace or Medical examiner)
4. Medical Command may be transferred to an EMS Supervisor / Command Staff only after a detailed report has been given. Dispatch shall be notified of the transfer of command.

MASS CASUALTY / DISASTER

SITUATION IN WHICH COMMAND SHOULD BE ESTABLISHED

1. EMS unit arrives on scene first.
2. Five (5) or more patients have been identified on scene
3. Three (3) or more ambulances are responding to the same scene
4. Mutual Aid is requested
5. Any Situation for which a formalized command would be beneficial

TRIAGE, TREATMENT AND STAGING AREAS

a. These areas, except the morgue, shall be in a safe place, protected from inclement weather, and far enough from the disaster scene to avoid interfering with the extrication and transportation functions.

b. Each treatment area will have a designated paramedic officer, who will control the movement of patients out of his area, monitor supply requirements and ensure that as many patients as possible are being treated.

c. When patients are ready for transport, they will be brought to the attention of the transport officer, who will call in ambulances, from the staging area. The transport officer will designate the appropriate hospital.

d. **IDENTIFICATION**- No patient will be allowed to leave the scene without first being identified, if possible

EXTRICATION & DECONTAMINATION

1. No personnel shall enter a contaminated area until it is secured by appropriate personnel.
2. Extrication will proceed under the direction of the senior medical member first on the scene, who will set priorities for extrication and direct two essential medical therapies: (1) Airway Management and (2) Control Hemorrhage.
    a. Patients with uncontrolled hemorrhage will be extricated first, followed by patients with breathing difficulties.
    b. Pulseless and/or apneic patients will be extricated last.
3. Most extrication functions will be conducted by fire department personnel.

TRIAGE OFFICER RESPONSIBILITIES

1. Determine the location, number and condition of patients.
2. Determine, in coordination with extrication, if triage will be performed at the treatment area.
3. Determine resources needed for triage. Communicate need to Medical Branch.
4. Assign and supervise triage teams
5. Ensure that patient triage is based on the Regional Triage Guidelines and that only life-saving treatment is provided.
6. Ensure patients are accounted for and tagged appropriately in Pulsara.
7. Ensure safety and accountability of all assigned personnel.
8. Provide progress reports to Medical Branch.
9. Coordinate activities with other groups
10. When triage is complete, provide Medical Branch with a “triage report”
11. Terminate triage activities and report to Medical Branch for reassignment

TREATMENT OFFICER RESPONSIBILITIES

1. Determine whether patient treatment will occur “in place” or in a designated treatment area.
2. Determine resource needs
3. Establish a treatment area. If incident is large, establish separate areas (Priority 1, 2 or 3)
4. Assign and supervise treatment areas
5. Ensure all patients have been assessed and triaged.
6. Ensure all patients have a wristband and are entered into Pulsara
7. Aggressive treatment and packaging of patients
8. Provide frequent progress reports to Medical Branch
9. Ensure safety and accountability of all patients and assigned personnel
10. Verify transportation priorities with transport group.
11. Coordinate with other groups.
12. Notify Medical Branch when all patients have been moved from the treatment area.

TRANSPORT OFFICER RESPONSIBILITIES

1. Determine/request resources.
2. Determine with Medical Branch, the Ambulance Exchange Point and helicopter landing zone as needed.
3. Determine hospital availability status through EMResource/MEDCOM
4. Coordinate patient allocation and destination with Treatment and/or Triage group.
5. Aggressively supervise the movement of patients from the treatment area to the ambulance exchange point or helicopter landing zone.
6. Ensure accounting of all patients and patient destinations in Pulsara
7. Ensure the safety and accountability of all assigned personnel.
8. Provide frequent progress reports to Command.
9. Coordinate activities with other groups, especially Treatment.
10. Notify Medical Branch when all Red/Priority 1 patients have been transported.
11. Notify the Medical Branch when all patients are transported, and operations are terminating.

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Regional Field Triage Algorithm

v_August 2021

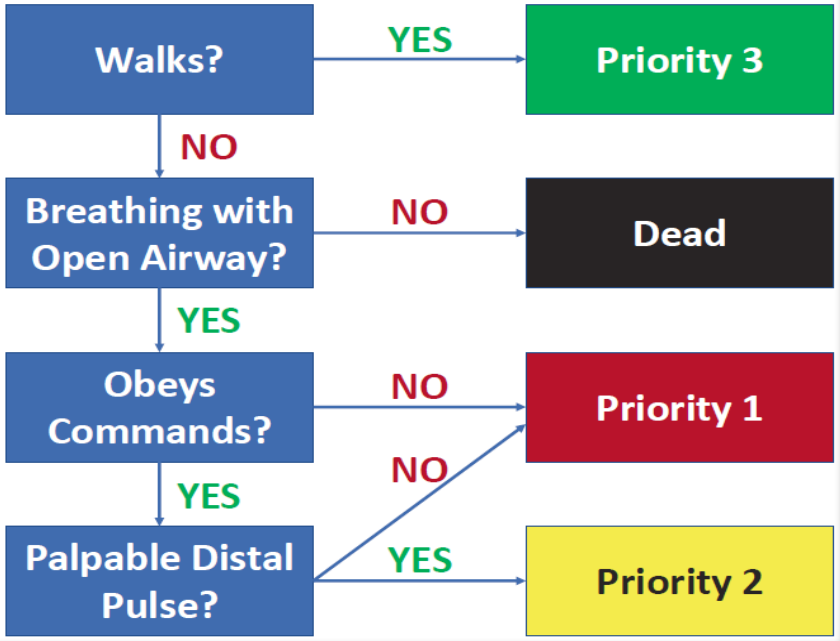
During assessment life-saving interventions of: Control Massive Bleeding & Basic Airway Maneuvers

If equipped and time/resources allow

- ❑ Chest Seals (vented if available)
- ❑ Temperature Regulation (Hypo/hyperthermia)
- ❑ Reassessment of patients (to include "Dead")

If your system/agency allows:
Consider Needle Decompression

For initial sorting & classification, consider placing colored marking tape in lieu of triage tags.



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Regional MCI Alarm (RMA)

Final, Version 6/13/2023

To activate a Regional MCI, contact:
MEDCOM 24/7 (210) 233-5815
Or TEXT MEDCOM (210) 254-4073

Levels of MCI

LEVEL ONE NOTIFICATION

- *5-8 Patients on Scene (or number of patients exceeds local capabilities).*
- *Local Mutual Aid response only, no regional assets deployed unless requested (cafeteria plan).*
- *Notification to effected areas as needed (MEDCOM notification to receiving hospitals).*

LEVEL TWO NOTIFICATION

- *9-40 Patients on Scene or at Multiple Locations.*
- *Upon declaration of Level II, auto dispatch one RMA package.*
- *Additional packages at request.*

LEVEL THREE NOTIFICATION

- *>40 Patients on Scene or at Multiple Locations.*
- *Upon declaration of Level III, auto dispatch one RMA package.*
- *Additional packages at request.*

**Number of packages requested determined by Authority Having Jurisdiction (AHJ)*

1* package

2* packages

3* packages

Response Packages

STANDARD PACKAGE RMA

Package put together for "most" responses; agency can request specific assets (cafeteria plan).

- ❑ 1 – Ambulance Strike Team (AST) and 1 Ambulance Strike Team Leader (ASTL)
- ❑ 1 – AMBUS
- ❑ 4 – Medical Incident Support Team (MIST) Personnel
- ❑ Optional: 1 MCI Whole Blood Pushpack on standby
- ❑ Optional: 1 Air Medical Strike Team (AMST) and 1 Air MIST

MEDICAL CONTROL – MANDATORY NOTIFICATION

Credentialed providers operating within the system do so under the authority of the Medical Director. As such, any incident which potentially has an adverse or negative impact on the patient or system must be immediately reported to the Medical Director or Clinical Services as soon as practical after completion of the call.

MANDATORY NOTIFICATION

The EMS Medical Director or Clinical Services is to be notified when any of the following occurs:

- Respiratory or cardiac arrest possibly resulting from any medication administration, treatment, or procedure performed by system providers.
- Incorrect medication administration or use (i.e., wrong medication, excessive amount, wrong dose, route, etc.).
- Any cardiac and/or respiratory arrest or patient injury while attempting physical or chemical restraint.
- Any unusual circumstance or intervention that potentially causes or caused patient harm.
- Provider who has operated outside of his/her level of certification and/or training (i.e., non-Credentialed state certified Paramedic, who is operating at the EMT level, initiating an IV or performing endotracheal intubation).
- Any deviation from the SMOPS that were not authorized by online medical control

MEDICAL CONTROL - ONLINE

These protocols cannot specifically address every possible variation of disease or injury; it does provide the foundation of acute care for most patients we see. Education, experience, and judgment should always be a part of a sound clinical decision-making process. In many cases, contacting **On-Line Medical Control (OLMC)** for authorization for treatment not specifically addressed in these protocols may be appropriate.

While contacting the Schertz EMS System Medical Director is preferred, situations may occur in which the medical director may not be readily available. In situations that the medical director is not readily available, on-call Command staff may be utilized to provide guidance to crews caring for patients. Command staff that may be utilized, includes Senior Administrative staff (EMS Director or Division Chiefs)

Online Medical Control (OLMC) – (210) 619-1408

SYSTEM ONLINE MEDICAL CONTROL

For incidents in which transport is not indicated, the crew will call the System On-Line Medical Control for these instances:

- Patient refusal after administration of **ANY** medication administration
- Cease Resuscitation Efforts

RECEIVING FACILITY ON-LINE MEDICAL CONTROL

If while transporting, a need arises requiring guidance from the receiving on-line medical control, the crew may contact the receiving facility. If contact is made with the ED physician at the receiving facility, the following will be documented:

- Name of physician
- Treatment authorized and performed

When contacting the receiving facility for authorization for treatment, a plan of proposed treatment **will** be established to discuss with the receiving physician prior to calling.

Situations to consider contacting the receiving facility:

- Patients with unusual presentations that are not addressed in these protocols
- Patients who may benefit from uncommon treatments (e.g. unusual overdose with specific antidotes)
- Any case for consultation, advice or guidance

If unable to contact the physician at the receiving facility, continue to treat patient following the appropriate SMOPs for the presenting condition.

MEDICAL DEVICE / MEDICATION STORAGE

All equipment and supplies shall be stored in an orderly manner and maintained according to the manufacturer's recommendations. All equipment will be tested (portable suction, laryngoscope light, cardiac monitor, etc.) daily. All kits will be checked for contents daily. All defective or missing equipment shall be replaced or repaired immediately. Maintenance and cleaning will be documented on a check list to be signed by the technician performing the scheduled (daily) maintenance and reported appropriately.

CONTROLLED MEDICATION STORAGE AND SECURITY

Schertz EMS currently carries Fentanyl, ketamine, and midazolam that are DEA controlled substances. To meet DEA standards for chain of custody the following procedures will be followed at all times:

- All controlled pharmaceuticals that have not been issued to on duty personnel need to be kept in the controlled medication locker in the supply room.
- Controlled substances are stored in a locked box that is not removable from the truck. Along with each medication is an accountability card with the pharmaceuticals lot number printed on it. After using the pharmaceuticals, the card needs to be completely filled out by the reporting paramedic. This includes the patient name, run number; amount used, amount wasted, date, and signatures of both crewmembers. This card is necessary to replace used medications on each unit.
- At each shift change, the oncoming and off going crews need to verify that midazolam, ketamine and Fentanyl are present in quantities as outlined in the medication inventory list in these protocols. All crewmembers shall then sign the Narcotic Accountability Log for that truck.

OTHER MEDICAL DEVICES AND MEDICATION STORAGE

- Medical pharmaceuticals are known to be vulnerable to extreme changes of heat, cold, and prolonged exposure to light. To keep pharmaceuticals from becoming adulterated and to prevent damage to sensitive medical devices, supplies not on response vehicles need to be kept in a temperature-controlled environment. This will prevent unnecessary adulteration and possible misuse or shrinkage of supplies.
- Medical devices and pharmaceuticals that are stored in ambulances are more difficult to keep at constant temperatures. Since it is believed that temperatures in ambulance compartments could exceed manufacturer's temperature regulations, it is necessary to take appropriate steps to limit the amount of exposure to excessive temperature extremes. For this reason, at any time a vehicle is not in operation with either heat or air conditioning in use; it will be kept inside the ambulance bay and out of the direct sunlight in hot weather months and in the heated bays during cold weather months.
- The ultimate solution is to use on-board heaters and air-conditioners to maintain constant temperatures in the patient care or equipment storage compartments of our emergency response vehicles. All vehicles that are equipped with this equipment MUST be connected to shoreline power at all times while in station, and at any other time possible (such as standby's, public demonstrations, etc.), or the unit should remain running at idle.

OBESE PATIENT GUIDELINES

GOAL

1. Provide safe emergency transportation for patients that exceed the weight and/or width of conventional ambulance stretchers who need emergency care and make every attempt to maintain the patient's dignity.
2. Decrease the risk to emergency personnel while caring for these patients.

CRITERIA

1. Patient who weighs 400 pounds or more
2. Patient who is wider than 26 inches

ASSESSMENT

1. Initial assessment will not vary from that of other patients; however, there are some differences that must be considered.
   a. Blood pressure cuff must be correctly sized
      - Electronic reading should be accurate, assuming the cuff size is correct
   b. Breath sounds
      - If possible, listen on the back while the patient takes a deep breath through the mouth
2. Airway management
   a. The obese patient will likely have diminished lung volume and respiratory strength, coupled with CO2 retention.
   b. Positioning – elevate the head 45 degrees when possible
   c. BVM ventilation will be difficult due to increased airway pressures

SAFETY

- At **no time** should a patient who weighs more than 400 pounds be moved without at least four individuals to assist. Additional assistance may be obtained from law enforcement, other safety personnel and if needed, additional mutual aid.
- The patient should be loaded onto the stretcher in the **lowest position**.
- The stretcher is to be placed in the lowest position while moving the patient.

CONSIDERATIONS

- Notify the receiving facility well in advance, so the appropriate preparations can be made before arrival of the patient
- Consider what hospital is appropriate for transport. Some hospitals have special bariatric services and equipment (extra-large CT scan).
- The working load limits for the stretchers are:
  - Stryker Power Pro XT – 700 lb.

PATIENT

PATIENT DEFINITION

A patient **is**:

1. A person who asks for EMS treatment and/or transport for themselves.
2. A person for whom a loved one, someone in loco parentis or other special relationship (home health nurse, assisted living staff, hospital staff) asks for treatment and/or transport.
3. A person who EMS observes to be visibly ill or injured.
4. A minor who experienced some type of illness or injury. (See definition of a minor below)
5. Is mentally disabled or incapacitated, and their mental status cannot be verified as normal by someone familiar with the individual.

A patient **is NOT**:

1. Someone involved in an incident or incidents, for who a bystander or other third party has called 911.

Complete and proper documentation MUST be completed on ALL affected individuals classified as patients.

If there is any doubt, an individual should be deemed a patient, an appropriate evaluation should be provided and documented in a PCR.

ADULT / PEDIATRIC PATIENT

The definition of a minor is: a person under the age of 18 who is not and has never been married or who has not been emancipated by a court.

For the purpose of treatment (i.e., medication dosing), the following definition should be utilized.

- Adult – any patient > 37 kg (82 lbs.)
- Pediatric – any patient < 37 kg (82 lbs.)

Hospital selection will still be based on patient condition, needs and age following guidance listed in "Hospital Selection Guide"

NO PATIENT

Personnel arrive on scene and are advised by on-scene responders that they can cancel. Arriving personnel should contact the on-scene crews and determine patient disposition and if there is a need for transfer of care. If a transfer of care is not needed, unit will be placed back in service and documentation will be completed by the on-scene responders who cancelled the crew. Contact with on-scene crews will not be unnecessarily delayed.

Any call where a person is verified to be at their baseline mental status AND who is not ill or injured will be documented on a non-patient contact form (i.e., motor vehicle accidents where drivers and/or passengers did not request assistance and do not want to be evaluated).

LIFT ASSIST

In the case where only lifting assistance is required and **no assessment** is needed, refusal documentation is not required. In this case, the **Cancelled - No Patient** outcome will be used. In the narrative portion of the Patient Care report, the lift assist details and the absence of complaint or injury before and after the move need to be documented. Obtaining vitals is not required.

If an assessment was necessary prior to or after the lift assist and the patient refuses any further assessment or treatment, the **Refusal Treatment/Transport** outcome will be used. In the narrative portion of the chart, the lift assist details, and the details of the refusal need to be documented.

In the event the individual who requests a lift assist has a complaint of illness or injury, a regular assessment (including vital signs) will be performed, and transport will be offered, and a refusal will be obtained if they refuse.

PATIENT CLASSIFICATION

In our regional healthcare system, there has historically been a variety of terms used to describe both the patient's condition and how the transport vehicle is driven. The following terms will be used in describing a patient's condition during normal, day-to-day EMS transport operations. During times of Mass Casualty Incidents, appropriate triage system will be used and either these terms or colors will be used. In addition, the terms relating to how the ambulance is driven will be the only terms acceptable in radio and telephone communications with other healthcare facilities and public safety responders.

Priority 1 - Critical

Patient has an acutely life-threatening illness or injury

Examples:

• Trauma Alert with STRAC Red Criteria	• Heart Alert
• Cardiac Arrest	• Stroke Alert
• Acute threat to maternal / fetal viability	• Status Epilepticus
• Unstable Vitals ◆ Systolic BP < 80 ◆ Heart rate < 40 or > 150	• Anaphylaxis unresponsive to treatment
• Respiratory Distress with one / more of the following: ◆ SpO2 < 90% despite O2 therapy ◆ RR > 30 (Adult) ◆ RR > 40 (Pedi)	• HTN (BP > 220/120) with one / more ◆ Altered LOC ◆ Chest Pain ◆ Neuro deficits

Priority 2 - Urgent

Patient currently stable, but has a condition that may become unstable if not evaluated / treated rapidly

Examples:

• Trauma Alert meeting 2 STRAC Blue criteria	• Altered mental status (not deteriorating)
• Hemodynamically stable chest pain (w/o signs of a STEMI)	• Seizure (post ictal, not actively seizing)
• Stroke with symptom onset > 6 hours	• Hemodynamically stable abdominal pain

Priority 3 - Non-Urgent

Patient needs medical evaluation but does not have potential life-threatening illness/injury

Examples:

• Chronic pain exacerbation	• Minor sprains
• Minor lacerations	

PATIENT CONSENT

CONSENT

Consent for medical treatment is based upon the concept that every mentally competent adult has the right to determine what is to be done with or to his/her own body. For consent to be legally valid, it must be informed. Except in emergency situations in which an individual has what appears to be a potentially life-threatening injury or illness, a person must be made aware of, and understand the risks of any procedures performed, medications administered, or the consequences of refusal of treatment and/or transportation. In addition, the patient must be informed of alternatives to evaluation, treatment and transport by EMS.

IMPLIED CONSENT

In life-threatening situations, consent to treatment is not required. The law presumes that if the individual with a life-threatening injury or illness were conscious and able to communicate, they would consent to treatment. Consent for treatment is not required for any minor (under the age of 18) who is suffering from a life-threatening injury or illness and whose parent or guardian is not present and/or not able to provide consent

MINORS - CONSENT

A minor may consent to treatment under the following circumstances:

1. Is active duty with the armed forces of the Unites States of America
2. Is:
   a. 16 years of age or older and resides separate from his/her parents
      AND
   b. Manages his/her financial affairs
3. For the diagnosis and treatment of an infectious, contagious or communicable disease that is required by law or rule to be reported to the Department of State Health Services
4. Is unmarried and pregnant and consents to treatment, other than abortion, related to the pregnancy
5. Consents to examination and treatment for drug or chemical addiction
6. Is unmarried and has custody of the minor's biological child and consents to treatment for the child
7. Is legally married
8. Has been emancipated by a court of law (minor should have court order as evidence)

The following people may give consent for treatment if a parent or guardian cannot be contacted:

1. A grandparent of the child
2. An adult (18 or older) brother or sister of the child
3. An adult (18 or older) aunt or uncle of the child
4. An educational institution in which the child is enrolled that has received written authorization for consent from a person having that right to consent
5. An adult who has control, care and possession of a child under the jurisdiction of a juvenile court
6. A peace officer that has lawfully taken custody of the child, if the peace officer has reasonable grounds to believe the minor needs treatment

CONFIDENTIALITY

All information obtained while treating and transporting a patient is confidential. Providers have an ethical responsibility to handle all information and documentation regarding a patient with a high degree of confidentiality. Patient information is only to be shared with those individuals who are part of the continuity of patient care. Patient records should only be shared according to the Health Insurance Portability and Accountability Act (HIPAA). Once a patient care report has been completed, it is considered a medical record and, therefore, is confidential. Every effort should be made to ensure that the record will not be left unattended, open for public view, or stored haphazardly in a way which will compromise the confidentiality of the patient and the record contents. Similarly, it is our responsibility to not discuss patient care issues with anyone other than those medical professionals involved in that patient's care.

PATIENTS IN CUSTODY

DESCRIPTION

Patients encountered in police custody or under Emergency Detention require both medical and legal considerations. EMS retains full responsibility for patient care, while law enforcement retains responsibility for custody and security. Professionalism, patient dignity, and safety for all parties must be always maintained.

POLICE CUSTODY VS. EMERGENCY DETENTION

Police Custody:

A patient is considered "in custody" when law enforcement has placed them under arrest or emergency detention. EMS evaluates and transports if medical conditions require continued treatment and transport to a hospital.

Patients who are in custody retain the right to refuse medical treatment provided they demonstrate medical decision-making capacity. This is defined as the ability to understand their medical condition and the recommended care, the ability to recite the potential risks and consequences of refusal, and the ability to reason through available options. Patients who are in custody do not have the right to refuse transport, which may be completed by EMS or Law Enforcement.

Emergency Detention (ED):

Emergency detention refers to an individual being detained under Texas HSC §573.001 due to risk of harm to self or others, or inability to ensure personal safety due to mental illness.

PROCEDURE

- Ensure scene safety; confirm with law enforcement before patient contact.
- Confirm custody status (arrest vs. ED) and document reason.
- Verify law enforcement has searched the patient PRIOR to ambulance loading.
- Perform full medical assessment per EMS protocols.
- Observe and document restraints. NO "HOG TYING" OR PRONE POSITIONING
- Maintain professional demeanor and respect patient dignity.
- Notify receiving facility of custody/ED status.
- Document officer name, badge number, and agency.

TRANSPORTS

Ambulance transport REQUIRED for:

- Any acute medical condition for which continued medical monitoring and/or treatment is required.
- Patients who are medically restrained or sedated, heavily intoxicated, or at risk of instability.

Police vehicle transport permitted ONLY if patient is:

- Alert, oriented, cooperative with stable vital signs.
- Not sedated, medically restrained, or requiring ongoing monitoring/intervention.

SPECIAL CONSIDERATIONS

- Refusals are not permitted for patients that do not present with the capacity to refuse.
- Minors: Involve parent/guardian when available. Contacting via telephone to obtain verbal consent is acceptable. Obtain contact info and document thoroughly.
- If safety allows, restraints should be positioned in front of the patient for medical access. A law enforcement officer **MUST** ride in the patient compartment if handcuffs are in use.
- If questions or conflicts arise, contact BC, MOF, or Medical Control for further guidance.

REFUSALS

REFUSAL PROCEDURE

All patients deemed alert and oriented and who have the capacity for decision making have the right to refuse treatment and/or transport. In the event of a refusal, the patient will receive a comprehensive assessment (including complete vitals). In the event a comprehensive assessment is refused or is not possible, this will be documented in the narrative.

Patients should be informed of assessment findings, provided with recommendations that include treatment and transport options (i.e. what hospital would they like to be transported to) and have the capacity to refuse care.

Patients are to be advised of the risks and possible consequences of refusing care which could include the risk of death (if appropriate). In the case of a refusal on behalf of a minor, the parent or guardian must take responsibility for care of that patient.

The patient (or guardian) must sign the refusal form. The provider should advise the patient they may re-request assistance at any time. In the event a guardian is not on location, a verbal refusal may be documented in the narrative and noted on the patient signature line of the refusal form.

If a patient declines to sign the refusal form a witness signature should be obtained, if possible. A detailed explanation should be included in the narrative.

CAPACITY TO REFUSE CARE

A patient (who is at least 18 years of age) or parent/guardian of a minor will be considered to have capacity to refuse care only if the following criteria are met. All of the following must be documented on the associated PCR.

- They demonstrate they are oriented to person, place, time and events
- Can recite back the nature of their condition
- Can recite back the risks and benefits of the proposed treatment and need for transport
- Can recite back the risks and possible consequences of refusing treatment / transport

ASSESSMENT

Patient assessment is the foundation for treatment and other considerations. However, not all individuals desire an assessment, treatment or transport to a medical facility. Therefore, the assessment will always serve as the basis for determining medical competency as it relates to that patients' ability to refuse care.

These criteria are to be considered in the widest, most inclusive sense. If there is any question or doubt, the individual should be treated as a patient in every respect (e.g. assessment, treatment, documentation).

HIGH RISK REFUSAL CRITERIA

- Heart rate < 60 or > 110 beats per minute (or outside the establish "normal" for the patient's age)
- Systolic BD < 90 mmHg or > 200 mmHg and/or MAP of < 65 or > 120
- Respiratory rate < 12 or > 30
- Blood Glucose levels < 70 or > 300
- SpO2 readings of < 94% on room air or with supplement O2
- A serious chief complaint or provider impression (i.e. chest pain, shortness of breath, syncope, etc.
- Significant mechanism of injury or high suspicion of injury

If a person consider "high risk" is refusing treatment and transport, the following MUST be read.

- *"There is a potential that you have a serious underlying medical condition that resulted in your injury or complaint or that occurred as a result of your injury or complaint. You have received a basic screening only and we are unable to fully evaluate for a large number of potential illnesses or injuries. Despite this, you are refusing treatment and/or transport for a more thorough evaluation by a physician or advance provider."*

For any patient consider a "High Risk Refusal" medical control should be consulted for advice.

TRANSPORTS - AMBULANCE

PATIENT / PRISONER

We are at times dispatched to transport a patient who, for various reasons, has been placed under arrest. Our obligation is to administer medical care to the patient, and we cannot assume responsibility for the security of the patient as a prisoner during transport or at the hospital. Therefore, if the Law Enforcement agency desires to keep custody of the prisoner, they must have an officer accompany the ambulance to the hospital. Their department must make arrangements to return the officer to his/her city. In cases where the prisoner is restrained with handcuffs or leg cuffs, an officer MUST accompany the prisoner, in the ambulance, during transport and into the hospital.

Also, there may be times when a violent patient, not under arrest must be transported to a hospital. If circumstances warrant, request back-up assistance or, if possible, request that a police officer accompany the crew in the ambulance to insure safety of the crew.

CAR SEAT

All children under the age of 12 will not sit in the front seat. All children will be seated in a child safety seat or on the stretcher. The following will be seated in an approved child safety seat unless patient is on a backboard, KED or Pedi immobilization board which then must be secured to the stretcher with straps:

- Infants: birth – 1 year up to 20lbs, or
- Toddlers: over 1 year and between 20-40lbs.

All patients should be properly restrained on the stretchers. **No patient regardless of age or size, should be held in the arms of any other occupant during transport.**

TRANSPORTS - HELICOPTER

A decision by any system personnel to call for helicopter transport may be necessary. Selecting the most appropriate time and patient, for helicopter transport may be difficult. The following guidelines for helicopter transport are to assist in that decision:

HELICOPTER CRITERIA

Any Trauma Alert patient

- Regional Trauma alert criteria met OR paramedic intuition with significant physiological changes.
- Air transport **must be faster** than ground transport (time of day, traffic, etc.)

Prolonged extrication

- Extrication time exceeds response time of the helicopter
- Patient is a Trauma Alert
- Patient needs interventions during extrication not available from Schertz EMS

Pediatric Trauma Alert:

- Air transport **faster** than ground transport (time of day, traffic, etc.)

Mass Causality Incidents

- When resources are overwhelmed, air transport should be used to better disperse patients across the region.

When in doubt air transport resources should be requested. These resources can be cancelled at any time for any reason. (i.e., patient ready to transport, helicopter not on scene, patient's injuries do not warrant air transport, or delayed response by air transport)

First Responders may, at their discretion, call air transport. Once requested air transport will not be cancelled until EMS transport resources have arrived on scene and evaluated patient(s).

In the Schertz EMS response district, there are three air medical transport providers available. They should be requested and utilized according to availability, provided ETA to location and capabilities (i.e., number of patients needing transport)

TRANSPORTS - INTERFACILITY

PATIENT CARE IN THE HOSPITAL

1. The following will be completed in an expeditious manner by both crew members: Patient assessment, preparing the patient for transfer, performing any necessary procedures, and contacting medical direction if required.
2. The crew will perform a primary and secondary assessment and perform any procedures necessary to better stabilize the patient for transport. These procedures will be done in cooperation with the transferring physician and as per Schertz EMS Systems Protocols, recognizing the patient may not be able to be completely stabilized at the referring hospital.
3. Patients that are being transferred to a tertiary care facility may have certain treatment modalities initiated prior to Schertz EMS arrival at the facility. These may include airway management procedures (basic and/or advanced), IV access (including peripheral and/or central venous access), decompression of a tension pneumothorax, tube thoracotomy, foley catheter placement, IV medication infusion, gastric tube and other interventions as necessary to stabilize the patient prior to transport. **These treatment modalities will be maintained at the discretion of the sending physician during transport, as noted on the memorandum of transfer (MOT).**
4. Trauma patients may require spinal motion restriction as needed for transport, unless the transferring physician has documented the patient has been cleared clinically or by radiograph or the patient is cleared through Schertz's Standing Medical Operating Protocols —Spinal Motion Restriction Inclusion / Exclusion Clearance.
5. **The crew will anticipate patient problems and review orders with the referring physician if care required is outside the scope of these Standing Medical Operating Guidelines.** Remember, the sending physician maintains actual responsibility for the patient until arrival at the receiving facility, which allows he/she to provide orders for medical treatment during transport. **Schertz EMS medical director is ultimately responsible for all patient care oversight even if the patient is being transported under orders from another facility physician. Schertz Medical direction should be contacted in the event of any concerns over the orders received by the sending physician.** However, if the transferring physician provides orders to the Schertz EMS medics that are beyond the usual scope of practice and training, or conflict with Schertz EMS medical protocols, the transferring physician and EMS medical control physician should be notified, and the orders modified to conform to pre-hospital capabilities prior to transport if possible.

PATIENT CARE ENROUTE TO RECEIVING HOSPITAL

1. Patient vital signs will be monitored enroute.
2. Routine reassessment will be performed and changes in patient care will be addressed as necessary following Standard Medical Operating Guidelines for the specific illness or injury.
3. Report will be called to the accepting unit at the receiving hospital.

PATIENT REPORT AND TRANSFER OF CARE A RECEIVING HOSPITAL

1. A verbal patient report will be given to the receiving nurse or physician upon delivery of the patient.
2. The completed Patient Care Record will be auto-FAXED to the receiving facility's designated collection point upon completion and synchronization of the electronic Patient Care Record.

TRANSPORTS – NON-PARAMEDIC ATTENDANT

The protocols shall be utilized to define patients that cannot be transferred to a provider other than a Credentialed Paramedic

General Guidelines

- At least one Credentialed Paramedic will be on-board the ambulance during transport of all patients unless natural disaster or other exceptions as approved by policy or the Medical Director.
- The provider with the highest level of Schertz EMS Credentialing shall conduct a detailed physical assessment and subjective interview with the patient to determine his/her chief complaint and level of distress. If this provider determines that the patient is stable and ALL patient care needs can be managed by a provider with a lower level credentialing, patient care may be transferred to a technician of lower certification for transport to the hospital. All personnel are encouraged to participate in patient care while on-scene, regardless of who "attends" with the patient while en-route to the hospital.
- The determination of who attends should be based upon the patient's immediate treatment needs and any reasonably anticipated treatment needs while enroute to the hospital.
- The highest-credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient's clinical condition or needs.

Criteria for Transfer of Care

- The patient has a patent airway, maintained without assistance or adjuncts.
- The patient is hemodynamically stable. Vital signs should be commensurate with the patient's condition.
- The patient is at baseline mental status and not impaired as a result of medications or drug ingestion.
- No cardiac, respiratory, or neurological complaints that warrant ALS intervention exist.
- The crewmember that will be in attendance is comfortable with the patient's condition and will assume care.

Patients that CANNOT be Transferred to a Lower Credentialing Level

- Any patient who requires additional or ongoing medications, interventions and/or monitoring beyond the scope of practice of the Credentialed EMT or AEMT.
- Any patient that receives medications beyond the scope of practice of the Credentialed EMT or AEMT.
- Any patient classified as a Trauma, Stroke, Sepsis or Heart Alert
- Any of the following potentially "High Risk" patients
  - Chest pain of suspected cardiac origin or Cardiac Arrhythmias
  - Moderate to Severe Respiratory or Respiratory Patient not responsive to initial treatment
  - Imminent Childbirth
  - Postictal seizure patients who have not returned to baseline mental status
  - Abnormal vital signs (any patient with vital signs reading listed as "abnormal" in the vital signs protocol page G43-44)

Exceptions to Patients that Cannot be Transferred to a Lower Credentialing Level

- Patients who received a **single dose** of intranasal (IN) narcotic for the purpose of pain control in a traumatic injury **NOT involving** the head, chest, or abdomen
- Patient who has received a single dose of ondansetron with relief of symptoms
- Patients having a Syncopal episode, who are < 50 yrs. old, have a normal blood sugar, and a normal ECG.
- Monitor IV saline locks may be monitored by a credentialed EMT

TRAUMA ALERT CRITERIA

INDICATIONS

Any patient who, after rapid assessment, is revealed to have any of the following:

- **One or more "RED" Criteria Met**
  - **Transport to a Level 1 Trauma Center**
- **Two or more "BLUE" Criteria**
  - **Transport to a Level 1 or Level 3 Trauma Center**
- **One Blue Criteria Met**
  - **Transport to Level 3 or 4 Trauma Center**

OPTIONS

- If the patient **does not** meet the Regional Trauma alert criteria
  - The patient may be transported to:
    - **any** hospital of his/her choice
    - the closest appropriate
    - or a non-diverted facility

CONSIDERATIONS / PRECAUTIONS

- If the patient does not meet the Regional Trauma Alert criteria, but after the evaluation by the paramedic, it is determined that this patient needs evaluation by Trauma Center staff, the patient should be transported to the closest, most appropriate Level I Trauma Center based upon Paramedic Intuition.
- The use of lights and sirens during transport will be based solely on the condition of the patient weighed against the time saved running emergency and the risk involved. The priority of your patient's condition will NOT dictate the use of lights and sirens.

- **Level 1 Trauma Centers**
  - University Hospital
  - San Antonio Military Medical Center (SAMMC)
- **Pediatric Trauma Center**
  - University Hospital
- **Level 3 Trauma Centers**
  - North Central Baptist (Adult)
  - Northeast Baptist
  - Methodist Hospital
  - Methodist - Northeast
  - Methodist – Stone Oak
  - Christus Children's

TRAUMA ALERT CRITERIA

Regional (TSA-P) Trauma Alert Criteria

STRAC Southwest Texas Regional Advisory Council

Pedi ≤17		Adult ≥18, <65		Geri ≥65	
IF *ANY* RED CRITERIA MET, TRANSPORT TO LEVEL 1 TRAUMA CENTER					
R1	Unable to follow commands (GCS Motor Score <6)	R1	Unable to follow commands (GCS Motor Score <6)	R1	Unable to follow commands (GCS Motor Score <6)
R2	Respiratory distress or need for airway/ventilation support (more than supplemental O2) or room air pulse ox <90%	R2	Respiratory distress or need for airway/ventilation support (more than supplemental O2) or room air pulse ox <90%	R2	Respiratory distress or need for airway/ventilation support (more than supplemental O_2) or room air pulse ox <90%
R3	Weak carotid/femoral pulse or absent distal pulses	R3	No radial pulse AND heart rate >120, or heart rate greater than systolic BP (shock index >1)	R3	No radial pulse, or heart rate greater than systolic BP (shock index >1)
R4	ANY (BP <90 age >10)	R4	ANY BP <90 systolic	R4	ANY BP <90 systolic
R5	Pelvic instability or chest wall instability or crepitus	R5	Pelvic instability, chest wall instability or crepitus	R5	Pelvic instability, chest wall instability or crepitus
R6	Acute paralysis, loss of sensation, or suspected spinal cord injury	R6	Acute paralysis, loss of sensation, or suspected spinal cord injury	R6	Acute paralysis, loss of sensation, or suspected spinal cord injury
R7	Amputation proximal to wrist or ankle	R7	Amputation proximal to wrist or ankle	R7	Amputation proximal to wrist or ankle
R8	≥5% BSA partial/full thickness burns	R8	> 10% BSA partial / full thickness burns	R8	≥5% BSA partial/full thickness burns
R9	Penetrating injury (i.e. GSW, stabbed, impalement) to head, neck, torso, extremities proximal to elbow or knee, excluding superficial wounds	R9	Penetrating injury (i.e. GSW, stabbed, impalement) to head, neck, torso, extremities proximal to elbow or knee, excluding superficial wounds	R9	Penetrating injury (i.e. GSW, stabbed, impalement) to head, neck, torso, extremities proximal to elbow or knee, excluding superficial wounds
R10	Crushed, degloved, mangled, or pulseless injured extremity	R10	Crushed, degloved, mangled, or pulseless injured extremity	R10	Crushed, degloved, mangled, or pulseless injured extremity
R11	Two or more proximal long bone fracture sites	R11	Two or more proximal long bone fracture sites	R11	Two or more proximal long bone fracture sites
R12	Any active bleeding that requires a tourniquet or wound packing with continuous pressure	R12	Any active bleeding that requires a tourniquet or wound packing with continuous pressure	R12	Any active bleeding that requires a tourniquet or wound packing with continuous pressure
R13	Skull deformity	R13	Skull deformity	R13	Skull deformity

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Regional (TSA-P) Trauma Alert Criteria

STRAC Southwest Texas Regional Advisory Council

Pedi ≤17		Adult ≥18, <65		Geri ≥65	
IF ONE BLUE CRITERIA MET, TRANSPORT TO LEVEL 3 OR LEVEL 4 TRAUMA CENTER *OR,* IF TWO OR MORE BLUE CRITERIA MET, TRANSPORT TO LEVEL 1 OR LEVEL 3 TRAUMA CENTER					
B1	Reliable history of any LOC and/or amnesia	B1	Reliable loss of consciousness >5min	B1	Reliable loss of consciousness >5min
B2		B2	Sustained respiratory rate ≥30 or ≤10	B2	Sustained respiratory rate ≥30 or ≤10
B3, B4		B3, B4		B3, B4	
B5	Pregnancy >20 weeks	B5	Pregnancy >20 weeks	B5	
B6	Single closed long bone fracture site	B6	Fracture to the humerus or femur due to motor vehicle crash	B6	Fracture to the humerus or femur due to motor vehicle crash
B7	Falls >2X child's height or >10 feet	B7	Fall from >10 feet	B7	Fall from ≥3 feet
B8		B8		B8	Age ≥65
B9	Ejection from vehicle (excludes open vehicles)	B9	Ejection from vehicle (excludes open vehicles)	B9	Ejection from vehicle (excludes open vehicles)
B10	Driver with deformed steering wheel	B10	Driver with deformed steering wheel	B10	Driver with deformed steering wheel
B11	Death in same vehicle	B11	Death in same vehicle	B11	Death in same vehicle
B12	Pedestrian, Bicycle/Scooter rider struck, run over or with significant impact	B12	Pedestrian, Bicycle/Scooter rider struck, run over or with significant impact	B12	Pedestrian, Bicycle/Scooter rider struck, run over or with significant impact
B13		B13	Patient on anticoagulant with suspected TBI*	B13	Patient on anticoagulant w/ suspected TBI* (includes daily ASA use)
B14	Weight <10Kg (<22lbs) or RED or PURPLE Broselow Tape Zone	B14		B14	
B15	Suspicion of non-accidental trauma	B15		B15	Significant injuries to two or more body systems
B16	Rider separate from transport vehicle w/ significant impact (motorcycle, ATV, horse, scooter, etc.)	B16	Rider separate from transport vehicle w/ significant impact (motorcycle, ATV, horse, scooter, etc.)	B16	Rider separate from transport vehicle w/ significant impact (motorcycle, ATV, horse, scooter, etc.)
B17	Child ages 0-9 years unrestrained or in an unsecured child safety seat (with injuries)	B17		B17	

***** Paramedic intuition may serve as Red/Blue Criteria override.***

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*Signs/Symptoms of TBI include:

- ❑ *Witnessed or reported LOC*
- ❑ *Dizziness, vertigo, or 'lightheadedness'*
- ❑ *Nausea and/or Vomiting*
- ❑ *Changes in vision, photophobia or double vision*
- ❑ *Ataxia or new problems walking, standing, or maintaining balance*
- ❑ *Change in mental status, level of functioning or speech quality*

VITAL SIGNS

DOCUMENTATION OF VITAL SIGNS

Vital signs are a key component in the evaluation of any patient. As such, vital signs are to be documented to assist in "painting" the picture of the patient's presentation.

- Patients who are transported will have a minimum of two sets of vital signs documented.
- Patients who refuse transport will have a minimum of one set of vital signs documented.

PROCEDURE

1. A full set of vital signs will be obtained as soon as possible during the assessment of the patient.
   a. During initial assessment, **the first full set of vital signs will be obtained manually**. After obtaining a manual set of vital signs, the patient may be placed on the cardiac monitor for automated reading.
      i. If there is a discrepancy during patient care between the vital signs obtained via the cardiac monitor and patient presentation and/or appearance, a manual set of vital signs will be obtained to confirm.
   b. Initial vital signs may deferred in order to provide lifesaving interventions (i.e. ventilations, bleeding control, etc.) or until transport in severe trauma when other treatments and packaging may take, priority and vital signs may interfere with the timely execution of these priorities.
   c. Any abnormal vital sign should be repeated and monitored closely.
   d. Time intervals for monitoring vital signs should be adjusted based on patient condition:
      i. **Not critical/non-severe**: obtain every 10 minutes (default setting on monitor)
      ii. **Critical/severe**: obtain every 3 – 5 minutes (monitor may be manually adjusted for this time interval)

2. **A complete set of vital signs includes:**
   - Pulse rate
   - Systolic AND diastolic blood pressure
   - Respiratory rate
   - Pulse Oximetry
   - GCS
   - Skin condition

3. Based on patient condition and complaint, vital signs may also include:
   - Temperature
   - End Tidal CO2 (refer to the EtCO2 protocol)
   - Pain / severity (when appropriate to patient complaint and after administration of any analgesia)
   - Blood glucose level
     - any condition in which the patient condition may be due to a blood glucose problem

4. While routinely obtaining a temperature and/or glucose is not normal, both should be obtained on all critically ill pediatric patients.

5. If the patient refuses this evaluation, document the refusal in the PCR in accordance with the Refusal of Treatment or Transportation protocol.

6. When the vital signs are obtained using the cardiac monitor, the data should be exported electronically to the patient care report. If vital signs are obtained on a FRO monitor or manually, they should be documented in the patient's PCR
   a. It is appropriate to delete partial sets of vital signs (i.e. entries from the monitor containing only heart rate and respiratory rate)

VITAL SIGNS

7. EMT-Basic personnel may attend patients who have the four-lead cardiac monitor attached for the purpose of collecting vital signs.
   a. However, cardiac rhythm interpretation is only within scope of practice for Paramedics. A Paramedic will attend any patient who requires repeat or continuous 12 lead monitoring.
8. Generally, children > 3 years of age should have a BP measured. For young children, the need for BP measurement should be determined on a case-by-case basis considering the provider's rapport with the child and the child's clinical condition.
   a. If unable to obtain a blood pressure on a young child, the following will be documented: HR, RR, Skin condition and GCS will be documented.
9. Document situations that preclude the evaluation and/or documentation of a complete set of vital signs.

ABNORMAL VITAL SIGNS

Patients with the following presentation requires a complete assessment and should be transported:

- History / physical assessment revealing potentially life-threatening situation.
- Abnormal vitals with associated signs and/or symptoms for the presenting vital signs.

Adult						
Age	Systolic BP	Heart Rate	Resp. Rate	SpO2	EtCO2	Cap. Refill
>14 years of age or >40 kg	< 90 or > 220	< 50 or > 110	< 12 or > 20	< 94%	< 35 or > 45	> 3 sec.

Pediatric		
Blood Pressure		
Age	Systolic BP	Capillary Refill Time
Term Neonate (<28 days)	< 60	> 3 seconds
Infant (1 month to 12 months)	< 70	> 3 seconds
Children (1 to 10 years)	< 70 + (age in years x 2)	> 3 seconds
Children (> 10 years)	< 90	> 3 seconds

Heart Rate		
Age	Awake Heart Rate	Sleeping Heart Rate
Newborn to 3 months	<100 or > 205	< 80 or > 160
3 months to 2 years	< 90 or > 190	< 75 or > 160
2 years to 10 years	< 60 or > 140	< 60 or > 90
> 10 years	< 60 or > 100	< 50 or > 90

Respiratory Rate		
Age	Rate	SpO2
Infant (1 - 12 months)	< 30 or > 60	< 94%
Toddler (1 - 3 yrs.)	< 24 or > 40	< 94%
Preschooler (3 - 5 yrs.)	< 22 or > 34	< 94%
School Age (6 - 13 yrs.)	< 18 or > 30	< 94%
Adolescent (14+ yrs.)	< 12 or > 20	< 94%

CARDIAC

CARDIAC ARREST MANAGEMENT

Initial Patient Contact
Pulseless / Apneic (abnormal or ineffective breathing)

Arrest witnessed by FRO / EMS personnel?
Or
Is HP-CPR in progress upon contact?

NO

YES

Chest Compressions 200-220 or 2 minutes (Use metronome with manual compressions)

Assess pulse / rhythm
No longer than 10 sec

No Pulse noted?
If AED advises or
V-fib / V-tach noted
Defibrillate @ 360j

Chest Compressions 200-220 or 2 minutes

Assess pulse / rhythm
No longer than 10 sec

No Pulse noted?
If AED advises or
V-fib / V-tach noted
Defibrillate @ 360j

Continue cycles until ROSC is achieved, or efforts are ceased

Once presenting rhythm has been identified – Follow appropriate protocol

Return of Spontaneous Circulation (ROSC)

Signs of possible ROSC

- Sharp increase in ETCO2 readings
- Rhythm change

DURING CHEST COMPRESSIONS

Monitor ETCO2

- Nasal Cannula
- In-line with Adv. Airway

Airway Management

1. Manage airway with OPA/NPA and BVM
2. Place supraglottic airway after CPR is established and time allows
3. If no advanced airway is established, consider ETI
   - (**DO NOT** interrupt compressions – 1 attempt only)

Ventilations

Rate: 1 every 6-8 seconds

2. Volume: enough to see the chest rise only (350-500cc)
3. NO PEEP

Medications

- Epinephrine 1mg IV/IO After 10 minutes Initiate Epi Infusion (2mg/250cc NS) Max Total Dose: 3mg

Anti-dysrhythmic Administer per protocol

CARDIAC
ARREST MANAGEMENT

Cardiac arrest is the loss of spontaneous circulation, which can be caused by many different rhythms and circumstances. Recent research indicates the focus should be on not only providing optimal circulation to the heart but also the brain through high performance CPR (HP-CPR) with at least 100 - 120 compressions/min is the key to survival for the patient. Optimal management of a patient in cardiac arrest requires a team approach therefore we utilize the "Pit Crew" model for CPR. Roles should be pre-defined based upon the amount of team members, and equipment available. If there are only one or two providers available, they should assume the roles in traditional CPR until more team members arrive.

History	Signs and Symptoms	Differential
• Events leading to arrest • Estimated downtime • Past medical history • Medications • Existence of Terminal illness / DNR • Renal Failure / Dialysis	• Unresponsive • Apneic • Pulseless	• Medical vs. Trauma • VF vs. Pulseless VT • Asystole • PEA • Primary Cardiac event vs. Respiratory arrest or Drug Overdose

HIGH PERFORMANCE CPR (HP-CPR)

- Immediately initiate CPR with an unconscious patient with abnormal/ineffective breathing
- Chest compressions **FIRST**: rate of 100-120 per minute, depth of a minimum of 2 inches
- Allow complete chest recoil (without recoil blood flow is decreased to the heart)
- Minimize chest compression interruptions: provide continuous chest compressions
- Avoid excessive ventilations: low volume, low frequency (350-500 cc and approximate 10 per minute)
- Place LUCAS after two cycles (4 minutes) of HP-CPR using "rapid deployment technique"

PROCEDURE

When scene is safe – ALL cardiac arrests should have resuscitation efforts performed on scene.

First arriving providers: *(Establish roles prior to making patient contact)*

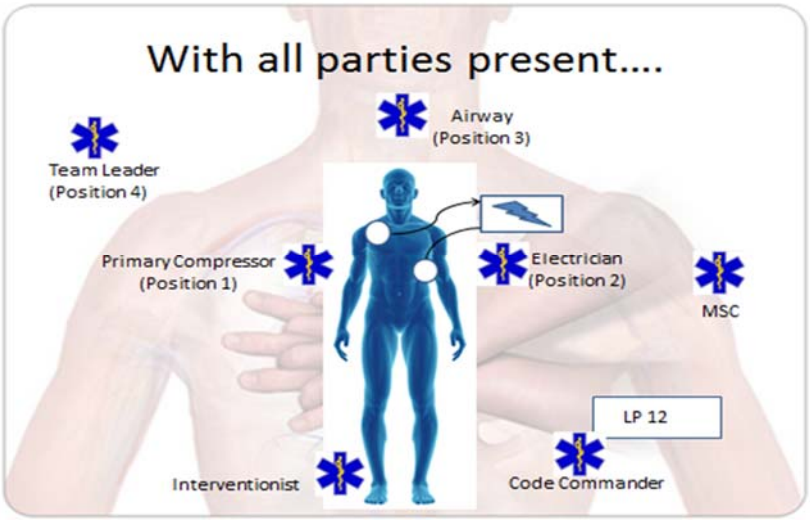
- **Position 1** (Patient's right side)
  - Assesses responsiveness / pulses (**pulse check should take no more than 10 seconds)**
  - Begins chest compressions if needed (HP-CPR)
    - Infant (Begin compressions with a heart rate less than 60)
  - Alternates chest compressions every 2 minutes until the Lucas device is placed (If applicable)
- **Position 2 (**patient's left side)
  - Applies the AED/Cardiac Monitor multi-function pads immediately
  - Operates the AED/Cardiac Monitor after each 2-minute compression cycle or when the AED advises
  - Alternates chest compressions with Position 1
  - May assist with airway placement
- **Position 3** (Patient's head)
  - Ensures patient's airway is open
    - Place nasal / oral airway
    - Provide low tidal volume, controlled rate ventilations via BVM
      - Rate: 1 every 6-8 seconds (Approximate 10 per minute)
      - Tidal Volume: enough to see chest rise/fall, approximately ½ of BVM (350-500cc)
      - NO PEEP
    - Place supraglottic airway, when possible, **DO NOT** interrupt chest compressions
    - If advance provider available, consider ETI (do not stop chest compression to perform intubation.

- **Position 4** (If available)
  - Rotates and assists wherever needed
  - Functions as a team leader

LUCAS chest compression system may be placed after 4 minutes of CPR utilizing the "quick deployment" method, only if there is adequate number of personnel on scene (3 or more)

ALS/MICU Integration:

- **Code Commander** (PARAMEDIC in control of the monitor)
  - Communicates and integrates with providers on scene
  - Sets up and operates monitor/defibrillator (If not done so PTA by FRO)
  - Makes all patient treatment decisions
- **Intervention PARAMEDIC** (positioned at the feet when possible)
  - Initiates IV/IO access
  - Administers medications/treatments as designated by code commander
  - Anticipates the needs of the code commander



If the Pit Crew model cannot be performed, follow the CPR guidelines below.

ALL LEVELS

- Check adequacy of any bystander CPR and take over if indicated
- Check responsiveness / pulses / breathing ***(pulse check should take no more than 10 seconds)***
- **Begin HP-CPR**
- Ensure patient's airway is open
  - Place nasal / oral airway
  - Provide low tidal volume, controlled rate ventilations
    - Rate: 1 every 6-8 seconds (Approximate 10 per minute)
    - Tidal Volume: enough to see chest rise/fall, approximately ½ of small adult BVM (350-500cc)
    - NO PEEP
- **If unwitnessed arrest**: perform CPR (220 Compressions) prior to attaching the AED
- **If witnessed arrest**: immediately attach an AED. If an AED is not readily available, begin CPR until one arrives.
- Continue HP-CPR with chest compressions at 110 per minute

ARREST MANAGMENT

CREDENTIALED EMT

- Supraglottic Airway placement and confirm/secure tube as per protocol
  - **Placement should NOT interfere with chest compressions**
- Monitor End Tidal CO2
  - If ETCO2 < 10 with good waveform, ensure CPR is effective
  - Consider no pulse check if no rhythm change is noted
- Obtain IO access **(if credentialed for procedure)** – initiate normal saline infusion with pressure bag
  - Femoral site

AEMT

- Follow EMT guidelines
- If supraglottic airway in not established, consider intubation ***(ET placement should not interfere with chest compressions)***
- Vascular Access (minimum of 2 vascular access sites needed)
  - IV access – large veins i.e., antecubital fossa (AC) or larger
    - If unable to obtain IV in larger vein, smaller vein may be utilized
  - IO access – site: humeral or femoral (place on pressure infusion bag)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Identify & treat rhythm

PROCEDURE

- **During CPR**
  - Push hard and fast (At least100-120/min)
  - Ensure full chest recoil
  - Check rhythm & rotate compressors every 2 minutes
  - Minimize interruptions in chest compressions (10 seconds or less)
  - Avoid hyperventilation (slow, low tidal volume ventilations)
- **Every effort will be made to minimize interruptions to chest compressions.** When there is an interruption, the interruption will be kept to **less than 10 seconds**.
  - **Acceptable Reasons to interrupt chest compressions:**
    - Placing the chest compression system (should take less than 10 seconds)
    - Switching compressors (occurs during pulse checks)
    - AED/AED Mode on heart monitor
      - During analyze phase
      - During defibrillation phase
    - Heart Monitor in manual mode
      - Every 2 minutes with rhythm and pulse checks
      - During defibrillation, but only if manual CPR is being performed
  - **Unacceptable reasons to interrupt chest compressions:**
    - Airway placement
    - Defibrillation with the chest compression system (LUCAS) in place and running
    - IV/IO Access
    - After a medication has been administered (unless it is the 2-minute mark)
    - After defibrillation unless the patient immediately shows signs of ROSC

SPECIAL CONSIDERATIONS

- **Every effort should be made to initiate care where the patient is found**, understanding that there will be special circumstances when the patient needs to be taken to another location for access to the patient, or for privacy concerns.
- Search for and treat possible contributing factors (6 H's, 5 T's)

Hypovolemia	**T**oxins
Hypoxia	**T**amponade, cardiac
Hydrogen ion (acidosis)	**T**ension pneumothorax
Hypo/hyperkalemia	**T**hrombosis (coronary, pulmonary)
Hypoglycemia	**T**rauma
Hypothermia	

CARDIAC

ARREST MANAGEMENT – ASYSTOLE/PEA

History	Signs and Symptoms	Differential

• Events leading to arrest
• Estimated "downtime"
• Significant medical history
• Suspected hypothermia
• Suspected overdose
  ▪ Tricyclic
  ▪ Digitalis
  ▪ Beta blockers
  ▪ Calcium channel blockers
• DNR
	• Pulseless
	• Apneic
	• No electrical activity on ECG
	• No heart tones on auscultation
		• Hypovolemia
		• Cardiac tamponade
		• Hypothermia
		• Drug overdose
		• Massive myocardial infarction
		• Hypoxia
		• Tension pneumothorax
		• Pulmonary embolus
		• Acidosis
		• Hyperkalemia

When the scene is safe, ALL resuscitation efforts should be performed on scene

ALL LEVELS

- Check for responsiveness / pulses / breathing (***pulse check should take no more than 10 seconds)***
- Initiate manual HP-CPR
  - Utilize metronome on cardiac monitor
  - Check pulse every two minutes
- Placement of AED and follow prompts as instructed.
  - If utilizing a LifePak 15 monitor, initial pad placement should be anterior/posterior
- Ensure patient's airway is open
  - Place nasal / oral airway
  - Provide low tidal volume, controlled rate ventilations
  - Rate: 1 every 6-8 seconds (Approximate 10 per minute)
  - Tidal Volume: enough to see chest rise/fall, approximately ½ of small adult BVM (350-500cc)
  - NO PEEP
- Place LUCAS after two cycles (4 minutes) of HP-CPR using "rapid deployment technique" (only if an adequate number of personnel are available (3 or more) – **CPR will not be interrupted for more than 10 seconds**

Credentialed EMT

- Supraglottic Airway placement and confirm/secure tube as per protocol
  - **Placement should NOT interfere with chest compressions**
- Monitor End Tidal CO2
  - If ETCO2 < 10 with good waveform, ensure CPR is effective
  - Consider no pulse check if no rhythm change is noted
- Obtain IO access **(if credentialed for procedure)** – initiate normal saline infusion with pressure bag
  - Femoral site

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- If supraglottic airway is not established or not working effectively, consider intubation ***(ET placement should not interfere with chest compressions)***
- Vascular Access (minimum of 2 vascular access sites needed)
  - IV access – large veins i.e., antecubital fossa (AC) or larger
    - If unable to obtain IV in larger vein, smaller vein may be utilized
  - IO access – site: humeral or femoral (place on pressure infusion bag)
- If suspected opioid overdose – Naloxone 2mg IV/IO/IN (IN route no more than 1cc per nostril)

ARREST MANAGEMENT – ASYSTOLE/PEA

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor and confirm asystole in more than one lead
- Epinephrine 1mg (1:10,000) rapid IV/IO (administer as soon as vascular has been established)
  - 10 min after initial Epi – initiate Epi infusion at 100 mcg/min
    - Mix: 2mg in 250 ml @ 750cc/hr via IV pump
- Only If high suspicion of hyperkalemia ***(wide complex PEA, history of renal failure/dialysis)***
  - Calcium (depending on availability) *1st line treatment for hyperkalemia*
    - Calcium Chloride 1gram IV/IO (flush with 10cc NS)
    - Calcium Gluconate 2 grams IV/IO (flush with 10cc NS)
  - If no change is noted with Calcium administration, consider
    - Sodium Bicarbonate 1 mEq/kg (flush with minimum of 10cc IV fluids after administration)
- If patient "responsive" during CPR
  - Consider Ketamine 1mg/kg IV/IO (max single dose: 100 mg)
  - May repeat once after 2 – 3 min if sedation is inadequate

SPECIAL CONSIDERATIONS

- If PEA is "bradycardic" rhythm, consider TCP
- Consider causes (6 H's, 5 T's)

Hypovolemia	**T**oxins
Hypoxia	**T**amponade, cardiac
Hydrogen ion (acidosis)	**T**ension pneumothorax
Hypo/hyperkalemia	**T**hrombosis (coronary, pulmonary)
Hypoglycemia	**T**rauma
Hypothermia	

- If after 40 minutes of aggressive treatment – there has not been a rhythm change or ROSC, and ETCO2 readings remain <10 mmHg - consider ceasing resuscitation efforts

ARREST MANAGEMENT – V-FIB/V-TACH

ALL LEVELS

- Check for responsiveness / pulses / breathing (***pulse check should take no more than 10 seconds)***
- Initiate manual HP-CPR
  - Utilize metronome on cardiac monitor
  - Check pulse every two minutes
- Placement of AED and follow prompts as instructed.
  - If utilizing a LifePak 15 monitor, initial pad placement should be anterior/posterior
- Ensure patient's airway is open and provide ventilations via BVM
  - Utilize two-person ventilation method, if possible
  - Place OPA / NPA
  - Provide ventilation to visually see chest rise/fall (350cc – 500cc)
  - Ventilation rate 1 every 6 – 8 seconds (approximately 10 per minute)
- Place LUCAS after two cycles (4 minutes) of HP-CPR using "rapid deployment technique"

CREDENTIALED EMT

- Supraglottic Airway placement and confirm/secure tube as per protocol
  - **Placement should NOT interfere with chest compressions**
- Monitor End Tidal CO2
  - If ETCO2 < 10 with good waveform, ensure CPR is effective
  - Consider no pulse check if no rhythm change is noted
- Obtain IO access **(if credentialed for procedure)** – initiate normal saline infusion with pressure bag
  - Femoral site

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- If supraglottic airway in not established or not working effectively, consider intubation ***(ET placement should not interfere with chest compressions)***
- Vascular Access (minimum of 2 vascular access sites needed)
  - IV access – large veins i.e., antecubital fossa (AC) or larger
    - If unable to obtain IV in larger vein, smaller vein may be utilized
  - IO access – site: humeral or femoral (place on pressure infusion bag)
- If suspected opioid overdose – Naloxone 2mg IV/IO/IN (IN route no more than 1cc per nostril)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Continue HP-CPR – reassess pulses every 2 min
  - Pulse checks should take less than 10 seconds
- Cardiac monitor / defibrillator
  - If placing initial pads – utilize the anterior/posterior position
- Defibrillate every 2 minutes (as needed) **(joule settings for all attempts: 360j)**
  - Pre-charge defibrillator at the 1m45sec mark
- **After 1st defibrillation administer (remains in V-Fib/ Pulseless V-Tach)**
  - Amiodarone 300mg IV/IO
    - May repeat 150mg IV/IO after 5 minutes

      OR
  - Lidocaine 1 – 1.5 mg/kg IV/IO
    - May repeat at 0.5 – 0.75 mg/kg IV/IO after 5 minutes (Max total dose: 3 mg/kg)

ARREST MANAGEMENT – V-FIB/V-TACH

PARAMEDIC

- **After two defibrillations:**
  - Epinephrine 1mg (1:10,000) rapid IV/IO (x1 dose)
    - 10 min after initial Epi – initiate Epi infusion at 50 mcg/min
- **After third Defibrillation**
  - Magnesium 2g IV/IO *(consider earlier administration if Torsade de Pointes is suspected)*
  - Only If high suspicion of hyperkalemia ***(history of renal failure/dialysis)***
    - Calcium (depending on availability) *1st line treatment for hyperkalemia*
      - Calcium Chloride 1gram IV/IO (flush with 10cc NS)
      - Calcium Gluconate 2 grams IV/IO (flush with 10cc NS)
    - If no change is noted with Calcium administration, consider
      - Sodium Bicarbonate 1 mEq/kg (flush with minimum of 10cc IV fluids after administration)
- After third defibrillation, perform one of the following
  - Two defibrillators available – perform double sequential defibrillation
  - One defibrillator available – perform a vector change with the defibrillation pads
- If patient "responsive" during CPR
  - Consider Ketamine 1mg/kg IV/IO (max single dose 100 mg)
  - May repeat once after 2 – 3 min if sedation is inadequate

DOUBLE SEQUENTIAL DEFIBRILLATION

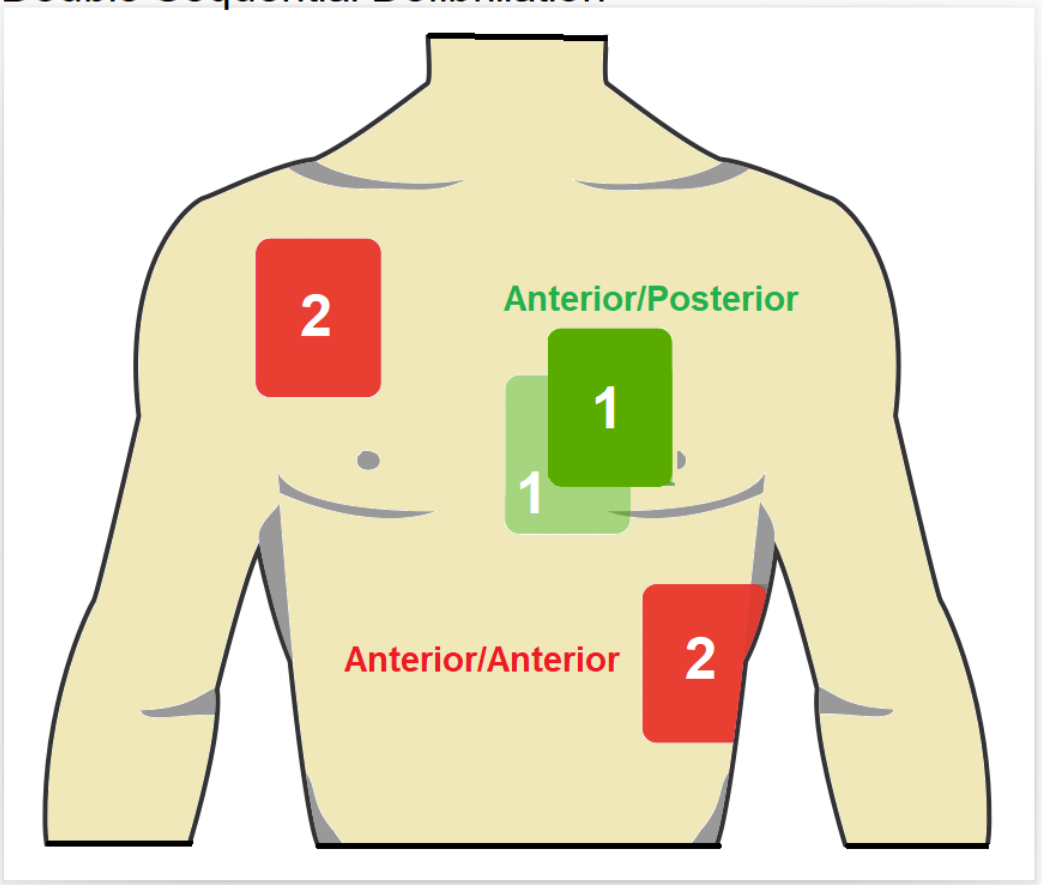
IF patient remains in V-fib / V-tach (pulseless) consider Double sequential defibrillation.

- **Criteria (*ensure all have been attempted*)**
  - Consider after third defibrillation if patient remains in V-Fib or V-Tach
- **Procedure:**
  1. Ensure interruptions in chest compressions are minimized.
  2. Apply additional set of defibrillation pads (anterior / posterior)
  3. Verify both monitors / defibrillators are attached & confirm V-Fib/V-tach on both.
  4. Charge both defibrillators to maximum energy settings
  5. Defibrillate – simultaneously press the "shock" buttons on both defibrillators.
  6. Follow defibrillation with immediate chest compression (MICCR)

SPECIAL CONSIDERATIONS

- **Quality chest compressions, defibrillation are priority over advance airway placement.**
- If after 40 minutes of aggressive CPR / ACLS therapies – there has not been a rhythm change or ROSC, and ETCO2 readings remain <10 mmHg - consider ceasing resuscitation efforts.
- The lidocaine dose should be decreased by 50% in patients greater than 70 years of age or impaired hepatic blood flow (i.e., chronic liver failure, chronic CHF)

Double Sequential Defibrillation



Pad Placement for DSD
1. Place first set in anterior/posterior position (ensure LUCAS piston is not directly on anterior pad)

2. Placed second set of pads in anterior/anterior position (when second defibrillator is available)

Vector change:
If only one defibrillator is available, move from using anterior/posterior to anterior/anterior placement

ARREST MANAGEMENT – POST RESUSCITATION

Post-resuscitation care refers to the period between restoration of spontaneous circulation (ROSC) and arrival to the ED. Proper care in this period can make a critical difference in the eventual outcome, especially neurological function. Patients may display a wide spectrum of responses from resuscitation, ranging from being awake and alert, with adequate spontaneous respirations and hemodynamic stability, to remaining comatose with apnea and cardiovascular instability.

ALL LEVELS

- Maintain airway as appropriate.
- NPA or OPA as needed and high flow O2 via NRB or assist ventilations with BVM as needed.
- Obtain vital signs every 5 min and re-evaluate.
- Vitals include pulse rate and quality, blood pressure, respirations, and GCS.
- Place patient in position of comfort unless other positioning needed to maintain blood pressure.
- Maintain airway security

CREDENTIALED EMT

- Supraglottic airway placement and confirm/secure tube as per protocol.
- Blood glucose

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Secure airway as required by ET Intubation and confirm/secure tube placement as per protocol.
- Ensure / Establish IV – maintain minimum systolic blood pressure between 90 to 100 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Initiate/complete Post ROSC checklist (below) before moving patient to unit or beginning transport.
- Obtain 12-lead EKG.
- Maintain heart rate, rhythm, and blood pressure as per appropriate protocols.
  - If hypotensive, consider vasopressor as per Hypotension protocol

SPECIAL CONSIDERATIONS

- If defibrillation (manual or AED) is successful prior to initiation of antiarrhythmic therapy, Amiodarone or Lidocaine should be initiated as a bolus followed by an infusion. If defibrillation is successful after initiation of antiarrhythmic therapy immediately begin infusion of most recent antiarrhythmic medication
  - Amiodarone
    - Maintenance infusion: 300mg in a 250cc bag of NS administered at 1 mg/min via IV pump.
    - Bolus: After initiating maintenance infusion, initiate bolus 150mg/10 via IV pump
  - Lidocaine – 100 mg in 50cc NS at 2 – 4 mg/min via IV pump (see medication page for contraindications)

ARREST MANAGEMENT – POST RESUSCITATION

POST ROSC CHECKLIST (SLOW PACKAGING / STABILIZATION)

If ROSC is obtained, the following steps will be completed prior to moving the patient to the ambulance for transport. If patient is in the unit, all will be complete before transport.

1. _____ Ensure an adequate / secured airway.
2. _____ Ensure & monitor central pulse (carotid or femoral)
3. _____ Ensure proper ventilation rate (8 – 10 breaths per minute)
4. _____ Ensure & maintain SpO2 readings of 94-99%
   a. Initiate PEEP at 5 cmH20 (titrate as needed to maintain SpO2 readings > 94%
5. _____ Ensure good ETCo2 readings and waveform.
6. _____ Obtain baseline vital signs (then one q 5 min, minimum of 2 prior to transport)
   a. Include blood glucose check on initial post resuscitation set if vital signs.
7. _____ Stabilize blood pressure (MAP > 65) and heart rate.
   a. Consider push dose Epi (utilize as a bridge until Norepinephrine infusion can be initiated)
   b. Consider pressors, if readily available (Norepinephrine)
   c. Initiate antidysrhythmic if converted from V-fib/V-tach.
8. _____ Obtain 12 lead (activate Heart Alert if indicated)
9. _____ Carefully place patient onto scoop or stretcher for movement to ambulance.

ROSC should be maintained for minimum of 10 minutes before moving or transporting patient.

ATRIAL FIBRILLATION / ATRIAL FLUTTER

Atrial fibrillation is the chaotic firing of multiple electrical foci in the atria. It can only be confirmed by ECG monitoring but can be suspected by an "irregularly irregular" pulse. Atrial fibrillation can be associated with other cardiac abnormalities like hypertension, hypoxia, and increased atrial pressure secondary to a pulmonary embolus, pericarditis, and many other conditions.

Atrial Flutter refers to a supraventricular rhythm with atrial flutter waves (usually at a rate of 300 beats/min.). The ventricular rate is limited by AV nodal conduction, typically with a 2:1 or 4:1 block. Flutter waves are best seen in leads II, III and aVf of the 12-Lead ECG. Atrial flutter seldom occurs in the absence of underlying organic heart disease. Treatment of both atrial fibrillation and atrial flutter in the pre-hospital setting is focused on maintaining adequate perfusion, oxygenation, and determination of any potential underlying etiology.

History	Signs and Symptoms	Differential

• Medications
  ◦ (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
• Diet (caffeine, chocolate)
• Drugs (nicotine, cocaine)
• Past medical history
• History of palpitations / heart racing
• Syncope / near syncope
	• Heart Rate > 120
	• Systolic BP < 90
	• Dizziness, CP, SOB, AMS,
	• Diaphoresis
	• CHF
	• Potential presenting rhythm
	  ▪ Atrial/Sinus tachycardia
	  ▪ Atrial fibrillation / flutter
	  ▪ Multifocal atrial tachycardia
	  ▪ Ventricular Tachycardia
		• Heart disease (WPW, Valvular)
		• Sick sinus syndrome
		• Myocardial infarction
		• Electrolyte imbalance
		• Exertion, Pain, Emotional stress
		• Fever
		• Hypoxia
		• Hypovolemia or Anemia
		• Drug effect / Overdose (see HX)
		• Hyperthyroidism
		• Pulmonary embolus

ALL LEVELS

- Check for responsiveness
- Check ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- 12 lead EKG
- **If patient is unstable:**
  - Synchronized cardioversion (100, 200, 300, 360j)
    - Consider sedation with Versed 2.5-5mg IV/IN ***(if not contraindicated and time permits)***

ATRIAL FIBRILLATION / ATRIAL FLUTTER

PARAMEDIC (cont'd)

- **If patient stable:**
  - If HR > 120 **AND** BP > 120 Systolic:
    - Cardizem 10mg slow IVP
      - May repeat Cardizem 10mg slow IVP in 10 minutes (if HR > 120 and BP > 120 Systolic)
    - Consider Amiodarone 150mg over 10 minutes
      - 300mg/250ml NS via IV Pump
        - set the maintenance infusion 1mg/min, then set bolus of 150mg over 10 min.
      - *If IV pump is NOT available - 150mg in 50cc bag – Set Dial-a-Flow to 250*

SPECIAL CONSIDERATIONS

- **DO NOT cardiovert atrial fibrillation of unknown or chronic duration unless the patient is unstable, pharmacologic rate control is the preferred initial intervention**
- Unstable signs/symptoms primarily include hypotension which also may include altered mental status, ongoing chest pain, or other signs of shock
- Consider causes (6H's, 5T's)
- Consider calling medical control for guidance

BRADYCARDIA

While ACLS defines bradycardia as a heart rate less than 60 beats per minute, the hearts of many people, particularly trained athletes, will beat at much slower rates. Be aware of the concepts of **absolute bradycardia** (heart rate less than 60 beats per minute) and **relative bradycardia** (defined as rhythms that are faster than 60 bpm, but still inappropriately **SLOW** for the clinical situation).

History	Signs and Symptoms	Differential

• Past medical history
• Medications
  ▪ Beta-Blockers
  ▪ Calcium channel blockers
  ▪ Clonidine
  ▪ Digoxin
• Pacemaker
	• HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
	• Chest pain
	• Respiratory distress
	• Hypotension or Shock
	• Altered mental status
	• Syncope
		• Acute myocardial infarction
		• Hypoxia
		• Pacemaker failure
		• Hypothermia
		• Sinus bradycardia
		• Head injury (elevated ICP) or Stroke
		• Spinal cord lesion
		• Sick sinus syndrome
		• AV blocks (1°, 2°, or 3°)
		• Overdose

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- If patient has adequate perfusion – observe/monitor
- If patient has poor perfusion caused by the bradycardia with a LOW degree heart block
  - Consider atropine 0.5mg IV/IO, may repeat every 5 min. to a max dose of 3mg
- If patient has poor perfusion caused by the bradycardia with a HIGH degree heart block
  - Prepare for TCP (treatment of choice for high degree heart blocks)
  - Consider atropine 0.5mg IV/IO while awaiting TCP, may repeat to a max dose of 3 mg

SPECIAL CONSIDERATIONS

- **If suspected MI with bradycardia and adequate perfusion refer to CP protocol**
- Consider causes (6H's, 5T's)
- Consider calling medical control for guidance
- If time permits, consider sedation with Versed 2.5-5mg IV/IN prior to TCP

CHEST PAIN / ACS

Myocardial infarction is the irreversible cellular injury and necrosis of cardiac muscle caused by prolonged ischemia. It results from the marked reduction or absence of blood flow through one or more coronary arteries. The morbidity and mortality from acute MI can be significantly reduced if the patient receives prompt medical attention following the onset of symptoms, and, if indicated, undergoes coronary revascularization as quickly as possible. The actual diagnosis of an acute MI is based on many factors, including history, risk factors, ECG findings, cardiac enzyme studies, and other diagnostic tools. Pre-hospital management of a potential acute MI is focused on maintaining ABCs, pain relief, rapid identification, rapid notification, and efficient transport to an appropriate ED.

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- 12 Lead EKG (within 5 minutes of patient contact if available)
  - If ***ST ELEVATION CRITERIA MET*** is the result, notify responding transport unit immediately.
- Administer 4 (four) 81mg ASA (324mg) tablets if no contraindications are present.
- Nitroglycerin 0.4mg SL (if SBP > 100 mmHg)
  - If patient has own NTG, may assist patient in self-administering one dose
  - May assist with administration on the request of the lead paramedic on scene caring for the patient
- Blood Glucose

ADVANCED EMT (AEMT)

- Follow EMT guidelines.
- Establish IV - with normal saline at a rate of TKO.
  - IV fluid bolus as needed to maintain a minimum systolic blood pressure >110 mmHg.
- Nitroglycerine 0.4mg SL may be repeated every five minutes if blood pressure maintains >100 systolic mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
  - If Heart Alert Criteria is met, then:
    - ***Transmit EKG and activate a Heart Alert within 10 minutes of identifying the STEMI***
    - Establish second IV if time allows, while enroute to the hospital
- If an **Inferior Wall MI** is noted on the 12 lead (elevation in Lead II, III, aVf)
  - Obtain a right sided 12 lead (minimum V4R)
- **If there is evidence of a right sided MI**
  - **NO** Vasoactive medications (i.e. NTG) *(unless receiving physician requests)*
  - Administer IV fluids 1-liter NS (may administer in 250 – 500cc increments)
    - Monitor patient for signs of fluid overload, if present, decrease flow rate

CHEST PAIN / ACS

PARAMEDIC (Cont'd)

- Administer analgesia
  - Fentanyl
    - 0.5 – 2 mcg/kg slow IVP over 30-60 seconds (titrate to effect)
    - May repeat in 5-10 minutes
- If patient continues with ACS symptoms and/or ST segment elevation and **NO** contraindications exist:
  - Consider NTG Infusion – initiate at 5 – 10 mcg/min
    - titrate 5 mcg/min every 5 min to a max dose of 50 mcg/min or SBP ≥ 100
    - If SBP drops below 100, stop infusion and initiate a normal saline bolus (250cc)
- **During patient report to hospital, ask if receiving physician has any further treatment requests**

SPECIAL CONSIDERATIONS

- Evaluation and treatment should be initiated as soon as possible and continued throughout patient contact, including the transition time to the unit.
- If the patient is experiencing ACS symptoms and/or signs of a STEMI – every effort is to be made to **NOT** allow them to walk to the stretcher or unit
- Administer ASA regardless of how many the patient self-administered, prior to arrival, if no contraindications are present. 324mg ASA should be administered to all patients unless a healthcare professional on scene administered 324mg ASA prior to arrival. As many as 40% of patients with signs and symptoms of an inferior wall infarct may be experiencing a right sided infarct as well.
- **ALL** patients (male or female) who would receive nitroglycerin according to this standard must be questioned about taking **Viagra (sildenafil citrate), Levitra (vardenafil), or Cialis (tadalafil).** Any patient who has taken Viagra or Levitra within the past **12 hours**, and Cialis within the previous **24 hours** should not receive any form of nitrates as irreversible hypotension may occur. Contact OLMC for further guidance in correctly treating these patients.
- **Use extreme caution** when administering analgesia or nitroglycerin together in a short time period as profound hypotension, reducing myocardial blood flow, perfusion, and oxygenation, may ensue. **Administer only those medications that are in the best interest of your patient.**
- An attempt should be made to transmit any 12-lead which indicates a STEMI is present, if unable to transmit,
- Isolated or non-VT PVCs is not treated with an anti-arrhythmic. In the setting of an acute myocardial infarction, PVCs indicate the need to aggressively treat the ischemia / infarction with oxygen, nitroglycerin and re-vascularization. Simply making the PVCs diminish with lidocaine does little to the underlying pathology and can lure providers into an invalid clinical security that the problem has been solved.
- It is important to remember that a patient may be suffering from an acute MI with a perfectly normal 12- lead ECG or may have no evidence of an acute MI in the face of an abnormal ECG.
- Diabetic, female and geriatric patients often have atypical pain or generalized complaints (nausea, vomiting, weakness, etc.) Use extreme caution to make sure these patients are not overlooked as ACS patients.

HEART ALERT CRITERIA

The goal of this program is to quickly assess, recognize, treat and transport patients to an appropriate facility if they are showing the signs and symptoms of ST Elevation Myocardial Infarction (STEMI). The goal is 90 minutes form first medical contact (FMC) to "balloon".

INDICATIONS

Patients in which a STEMI should be **suspected**, but needs to be **confirmed** include:

- Patients with chest or upper abdominal discomfort suggestive of Acute Coronary Syndrome.
- New onset of cardiac dysrhythmia
- Syncope or near syncope
- Unexplained acute weakness with or without diaphoresis
- Acute onset of dyspnea suggestive of CHF (hypertension, hypotension, diaphoresis, "wet" breath sounds, etc.)
- Other signs or symptoms of acute coronary syndrome
- 12-lead ECG with any of the following:
  - ST Elevation of 1mm or more in 2 or more contiguous leads
  - A monitor interpretation of "***ST ELEVATION CRITERIA MET***"
- Diabetic, elderly, female patients with atypical MI presentations

PROCEDURE

When you encounter a patient that meets one or more of the above criteria, the following shall be done immediately:

1. Place patient on oxygen to titrate to an SpO2 $\geq$ 94%
2. Obtain a 12-lead ECG **(goal of <5 minutes of arrival on scene)**
   a. 12-lead should only be delayed for life-saving treatment
3. If signs and symptoms and 12-lead findings indicate that "Heart Alert" criteria has been met, then:
   a. Transmit 12-lead to appropriate system approved primary PCI center within 10 minutes of identifying a "Heart Alert".
   b. If 12-lead cannot be transmitted, the receiving facility should be contacted and advised of incoming Heart Alert within 10 minutes of identifying a "Heart Alert."
4. Continue with patient treatment per Chest Pain Protocol. **Do not delay transport - treatment and transport shall be done simultaneously**. Treatment should not be delayed moving the patient to the ambulance. Movement to the unit should be done during appropriate times (i.e. in between NTG doses, etc.) so that algorhythm is followed appropriately but transport or treatment is not delayed.
5. **Patient should be left on all interventions and monitoring devices at all times. This includes oxygen, ECG, SPO2, ETCO2, NIBP, etc.** Anytime a patient is disconnected from any treatment or monitoring, this shall be documented as to the length and reasons for this disconnect. As soon as the patient is reconnected to the EKG a repeat 12-Lead should be done to re-establish ST segment monitoring.
6. "Heart Alert" patients, or suspected MI/ACS patients who do not meet "Heart Alert" criteria, **WILL NOT** be allowed to walk for any reason. These patients shall be moved by caregivers on the scene via cross-chest carry, stair chair, and stretcher to avoid any unnecessary exertion or increases in myocardial oxygen demand.
7. Any interventions or changes in patient condition shall warrant a repeat 12-lead ECG. These include pain relief, pain increases, significant vital sign changes, and changes in LOC or overall patient condition.

HEART ALERT CRITERIA

8. "Heart Alert" patients shall be transported without delay with no lights/siren. Sirens have a profound psychological effect on patients that increases anxiety and potentially increases myocardial oxygen demand. If a lights/siren transport is necessary, appropriate steps should be taken to properly explain to the patient why (dense traffic, unstable rhythm, inability to relieve pain with or without worsening 12-lead, etc.) and mild sedation may be warranted.
9. Upon arrival at PCI Center, thorough and concise report shall be given to ED physician along with initial 12-lead and any follow-up 12-leads. Patient will be placed on hospital stretcher unless specifically instructed to move directly to the cath lab. If this occurs, the patient shall be moved to the cath lab and report given.

Heart Alert Criteria

1. Patients with signs and symptoms of an Acute Coronary Syndrome (ACS)*

AND

2. ST segment Elevation of 1mm or more in 2 contiguous leads

If your patient does not meet Criteria 1 AND 2, a consult should be done with the receiving ED physician prior to declaring a Heart Alert

*ACS Symptoms include but are not limited to chest pain/tightness; radiation to back, abdomen, arm(s), neck, jaw or any combination; dyspnea; diaphoresis; nausea/vomiting; fatigue; weakness; palpitations; indigestion; syncope; pulmonary edema

**Heart Alert Criteria are regionally approved clinical and analytical findings which result in early activation of Interventional Cardiology services. The criteria identify a sub-group of cardiac patients who benefit from these time sensitive treatments. The criteria do not identify, or address other cardiac disorders/diseases that may require Emergency Department admission, evaluation and treatment.

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CONGESTIVE HEART FAILURE (CHF)

Congestive Heart Failure (CHF) is a symptom, not a diagnosis. The underlying cause of CHF is usually organic heart disease or hypertension but may also be volume related (renal failure) or toxin related. As with most medical emergencies, in the conscious and awake patient with CHF, reassurance will greatly aid treatment. As the patient becomes more agitated, respiratory distress is worsened. Care goals include high flow oxygen, ventilatory assistance with positive pressure ventilation, if needed, B/P reduction, and cardiac monitoring.

History	Sign & Symptoms	Differential
• Congestive Heart Failure • Past Medical History • Medications (ex: digoxin, Lasix) • Cardiac History - MI	• Respiratory distress • Bilateral Rales • Apprehension, orthopnea • Jugular vein distention • Pink, frothy sputum • Peripheral edema, diaphoresis • Hypotension, shock • Chest pain	• Myocardial infarction • Asthma • Aspiration • COPD • Pleural effusion • Pneumonia • Pulmonary embolism • Toxic exposure

ALL LEVELS

- Check for responsiveness.
- Check ABCs.
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs

CREDENTIALED EMT

- Blood glucose
- Lead placement
- Nitroglycerin 0.8mg SL (if SBP > 100 mmHg)
  - May assist with administration at the request of the lead paramedic on scene caring for the patient

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO.
- Nitroglycerine 0.8mg SL
  - **Shall** be repeated every 3-5 minutes if blood pressure maintains >100 systolic mmHg or palpated radial pulses.
- If patient has observable difficulty breathing.
  - Initiate NIPPV (CPAP or Bi-Level)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- 12 lead EKG

CONGESTIVE HEART FAILURE (CHF)

PARAMEDIC

- If patient SBP is >160 and has moderate/sever respiratory distress, consider.
  - Push dose Nitroglycerin – 1mg (2cc) slow IV/IO push (May repeat x1 after 5 minutes)
    - Mix 1cc of 5mg/ml into 9cc normal saline (0.5 mg/ml)
    - If SBP drops below 100, initiate a normal saline bolus (250cc)
- If patients SBP is > 100 and has moderate/severe respiratory distress, consider:
  - Nitroglycerin Infusion – initiate at 5 – 10 mcg/min
    - titrate 5 mcg/min every 5 min as needed to a max dose of 50 mcg/min or SBP ≥ 100
    - If SBP drops below 100, stop infusion and initiate a normal saline bolus (250cc)

SPECIAL CONSIDERATIONS

- **If the patient is having chest pain, follow the chest pain protocol in conjunction with the CHF protocol.**
- If the patient is suffering from fulminating pulmonary edema, rapid transport is the priority, treatment should be attempted enroute or done at hospital.
- Do not delay transport for an IV attempt, no more than 2 attempts should be made. If the patient is in extremis, consider IO placement.
- Allow patient to be in their position of comfort to maximize their breathing effort; sitting up with legs dangling can help displace pulmonary edema to lower extremities.
- Careful monitoring of LOC, blood pressure and respiratory status with above interventions is essential.
- If patient is febrile or has other sign/symptoms of pneumonia, contact medical control prior to the administration Nitroglycerine.
- Administration of nitrates should be done with caution in patients with right ventricular infarct. These patients may be sensitive to nitrates. 12 lead EKG should be obtained and if possibility of right ventricular infarct exists, contact medical control prior to the administration of nitrates.
- **ALL** patients (male or female) who would receive nitroglycerine according to this standard must be questioned about taking **Viagra (sildenafil citrate), Levitra (vardenafil), or Cialis (tadalafil).** Any patient who has taken Viagra or Levitra within the past **12 hours**, and Cialis within the previous **24 hours** should not receive any form of nitrates as irreversible hypotension may occur. Contact OLMC for further guidance in treating these patients.

SUPRAVENTRICULAR TACHYCARDIA

This is a distinct clinical syndrome characterized by repeated episodes (paroxysms) of tachycardia, with an abrupt onset, lasting from a few seconds to many hours. These episodes usually end abruptly and can often be terminated by vagal maneuvers. Paroxysmal supraventricular tachycardia frequently occurs in otherwise healthy individuals. As such, it is usually well tolerated. If the rate is particularly rapid (> 180 beats/min), or the arrhythmia is sustained, CHF may occur.

History	Sign & Symptoms	Differential
• Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin) • Diet (caffeine, chocolate) • Drugs (nicotine, cocaine) • Past medical history • History of palpitations / heart racing • Syncope / near syncope	• Symptomatic ▪ Sustained Heart Rate > 150 ▪ Systolic BP < 90 ▪ Dizziness, CP, SOB, AMS, ▪ Diaphoresis ▪ CHF • Potential presenting rhythm ▪ Atrial/Sinus tachycardia ▪ Atrial fibrillation / flutter ▪ Multifocal atrial tachycardia ▪ Ventricular Tachycardia	• Heart disease (WPW, Valvular) • Sick sinus syndrome • Myocardial infarction • Electrolyte imbalance • Exertion, Pain, Emotional stress • Fever • Hypoxia • Hypovolemia or Anemia • Drug effect / Overdose • Hyperthyroidism • Pulmonary embolus

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- **If patient is unstable:**
  - Synchronized cardioversion
    - If time permits & patient condition allows
      - Consider sedation with Versed 2.5-5mg IV/IN prior to cardioversion
- **If patient stable:**
  - Vagal maneuvers
  - Adenosine 6 mg rapid IV push (over 1-3 sec.), followed with 20cc NS flush
    - Repeat Adenosine 12mg (x2 doses) rapid IV push after 1-2 minutes, followed with 20cc NS flush
  - Consider Amiodarone 150mg over 10 minutes (if no change with Adenosine)
    - 300mg/250ml NS via IV Pump – set the maintenance infusion 1mg/min, then set bolus of 150mg over 10 min.
    - *If IV pump is NOT available - 150mg in 50cc bag – Set Dial-a-Flow to 250*

SUPRAVENTRICULAR TACHYCARDIA

SPECIAL CONSIDERATIONS

- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- Given the very short durations of adenosine, it must be given in a proximal IV site (antecubital, IO, or external jugular)
- Document all rhythm changes with monitor strips and obtain strips with each therapeutic intervention
- Unstable signs/symptoms primarily include hypotension which also may include altered mental status, ongoing chest pain, or other signs of shock
- Synchronized cardioversion for SVT – 100, 200, 300, 360j
- It is often difficult to differentiate ectopic beats (or VT) from supraventricular rhythms with aberrant ventricular conduction. When in doubt or patient is unstable, treat as VT
- Consider causes (6H's, 5T's)
- Vagal maneuvers shall be Valsalva type – assure the patient is attached to the EKG (**DO NOT use carotid sinus massage)**

WIDE COMPLEX TACHYCARDIA (WITH A PULSE)

Ventricular tachycardia (VT) is defined as three or more successive beats of ventricular origin at a rate greater than 100 beats per minute. There are no normal looking QRS complexes and the rhythm is usually regular, but it can be irregular. VT may be either well tolerated or associated with grave, life-threatening hemodynamic compromise. The hemodynamic consequences of VT depend largely on the presence or absence of myocardial function (such as ischemia or infarction) and on the rate of VT. Treatment is based on presence or absence of a pulse.

History	Sign & Symptoms	Differential
• Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin) • Diet (caffeine, chocolate) • Drugs (nicotine, cocaine) • Past medical history • History of palpitations / heart racing • Syncope / near syncope	• Symptomatic ▪ Heart Rate > 150 ▪ Systolic BP < 90 ▪ Dizziness, CP, SOB, AMS, ▪ Diaphoresis ▪ CHF • Potential presenting rhythm ▪ Atrial/Sinus tachycardia ▪ Atrial fibrillation / flutter ▪ Multifocal atrial tachycardia ▪ Ventricular Tachycardia	• Heart disease (WPW, Valvular) • Sick sinus syndrome • Myocardial infarction • Electrolyte imbalance • Exertion, Pain, Emotional stress • Fever • Hypoxia • Hypovolemia or Anemia • Drug effect / Overdose • Hyperthyroidism • Pulmonary embolus

ALL LEVELS

- Check for responsiveness
- Check ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- 12 lead EKG

Monomorphic Ventricular Tachycardia

- If patient is unstable:
  - Synchronized cardioversion (100, 200, 300, 360j)

WIDE COMPLEX TACHYCARDIA (WITH A PULSE)

PARAMEDIC (cont'd)

Monomorphic Ventricular Tachycardia (cont'd)

- If patient is stable:
  - If rhythm is regular in nature, consider Adenosine 6mg rapid IV push followed by 20cc flush
  - Amiodarone 150mg IV over 10 minutes
    - 300mg/250ml NS via IV Pump – set the maintenance infusion 1mg/min, then set bolus of 150mg over 10 min.
    - *If IV pump is NOT available - 150mg in 50cc bag – Set Dial-a-Flow to 250*
  - Consider Lidocaine (if no change with Amiodarone after 10 minutes) 1-1.5mg/kg,
    - May repeat with 0.5-0.75mg/kg to a max dose of 3mg/kg

Polymorphic Ventricular Tachycardia (Torsades)

- If patient is unstable:
  - Defibrillate at 200, 300, 360j
- If patient is stable:
  - Magnesium Sulfate (10% solution) 1g slow IVP, over 1-2min (drug of choice)
  - If not resolved, may repeat in 2 min 1g slow IVP over 1-3 min

SPECIAL CONSIDERATIONS

- **IMPLANTABLE CARDIAC DEFIBRILLATOR (ICD) PATIENT:**
  - These patients should be treated according to the appropriate protocol.
  - If an arrhythmia is causing the ICD to fire, treat with the appropriate antiarrhythmic.
  - If ICD is firing and no arrhythmia is present, consider sedation with Versed 2mg IV
    - May repeat if needed.
- If time permits, consider sedation with Versed 2.5-5mg IV/IN prior to cardioversion or defibrillation
- Look closely at the rhythm strip for evidence of pacemaker spikes. Patients with pacemakers have wide QRS complexes and do not need lidocaine
- 50% solutions of magnesium sulfate are never to be administered by direct IV bolus without prior dilution. To make a 10% solution, add 4 mL of 50% magnesium (2 grams) to 16 mL of NS.
- Consider causes (6H's, 5T's)
- If defibrillation or cardioversion is successful prior to initiation of antiarrhythmic therapy, Amiodarone or Lidocaine should be initiated as a bolus followed by an infusion. If defibrillation or cardioversion is successful after initiation of antiarrhythmic therapy immediately begin infusion of most recent antiarrhythmic medication
  - Amiodarone – 150mg in a 500cc bag of NS administered at 1 mg/min via IV pump
  - Lidocaine – 100mg in 50cc NS at 2 – 4 mg/min via IV pump
- The Lidocaine dose should be decreased by 50% in patients greater than 70 years of age or impaired hepatic blood flow (i.e., chronic liver failure, chronic CHF)
- **DO NOT** administer Lidocaine if the patient's heart rate is <60 beats per minute or if the patient has a 2nd or 3rd degree heart block, regardless of previous ventricular ectopy or Lidocaine use

MEDICAL

ABDOMINAL PAIN

Abdominal pain may be caused by a wide spectrum of illnesses. Usually other symptoms will accompany the pain such as nausea, vomiting, diarrhea, urinary symptoms, etc. Treatment for life threatening causes of abdominal pain should be treated in the field by initial stabilization and rapid transport to an appropriate facility.

History	Sign & Symptoms	Differential
• Age • Past medical / surgical history • Medications • Onset • Palliation / Provocation • Quality (campy, constant, sharp, dull, etc.) • Region / Radiation / Referred • Severity (1-10) • Time (duration / repetition) • Last oral intake • Last bowel movement / emesis • Menstrual history (pregnancy)	• Pain (location / migration) • Nausea • Vomiting • Diarrhea • Dysuria • Constipation • Vaginal bleeding / discharge • Pregnancy **Associated symptoms: (Helpful to localize source)** Fever, headache, weakness, malaise, myalgia, cough, HA, mental status changes, rash	• Pneumonia or Pulm. embolus • Liver (hepatitis, CHF) • Peptic ulcer disease / Gastritis • Gallbladder • Myocardial infarction • Pancreatitis • Kidney stone • Abdominal aneurysm • Appendicitis • Bladder / Prostate disorder • Diverticulitis • Bowel obstruction • Ovarian and Testicular Torsion

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Blood glucose
- Lead placement

Advanced EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPECIAL CONSIDERATIONS

- Evidence of peritonitis (rigid abdomen, absent abdominal sounds, rebound tenderness) usually indicates a surgical abdomen.
- Abdominal pain in women of childbearing age should be treated as pregnancy related until proven otherwise.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain or back pain especially in patients over 50 and / or patients with shock/ poor perfusion.

ALLERGIC REACTION / ANAPHYLAXIS

Allergic reactions and anaphylaxis represent a spectrum of the same problem. At its extreme end, anaphylactic reactions are life threatening requiring swift action. Care is focused on reducing or stopping the allergic reaction. The cardinal signs of anaphylaxis are stridor, bronchospasm, and hypotension.

History	Sign & Symptoms	Differential
• Onset and location • Insect sting or bite • Allergy/exposure (food/meds) • New clothing, soap, detergent • History of reactions • Past medical history • Medication history	• Itching or hives • Coughing / wheezing or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotension or shock • Edema • N/V	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration / Airway obstruction • Vasovagal event • Asthma or COPD • CHF

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Assist patient with their prescribed Epi-pen
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Consider Albuterol 2.5mg nebulizer for minor dyspnea/wheezing
- Epinephrine 1:1000 IM if severe respiratory distress or indicators (wheezing, stridor, etc.)
  - Adult 0.3 cc IM
  - Pedi (30 – 65lbs) 0.2 cc IM
  - Pedi (< 30 lbs.) 0.1 cc IM
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Benadryl
  - **Mild to moderate** allergic reactions - 25mg IV/IM
  - **Severe** allergic reactions or anaphylaxis - 50mg IV/IM
- **Patient in Extremis** - Epinephrine 1:10,000 0.3mg IV for patients

SPECIAL CONSIDERATIONS

- The patient who is in true anaphylaxis rarely presents with hypertension
- Remember: when administering Epinephrine an elevation in pulse and blood pressure and may produce unstable cardiac dysrhythmias.
- Patients with drug or food reaction that have been ingested may have an extended onset of symptoms as the antigens continue to be absorbed from the GI tract.

ALTERED MENTAL STATUS

Altered mental status is a symptom, not a diagnosis, with many possible causes, both medical and traumatic. Altered mental status of a known etiology (such as hypoglycemia or narcotic overdose), should be treated using the appropriate Standard Medical Operating Protocols. Multiple patients with an altered mental status suggest toxic exposure/drug ingestion (always remember carbon monoxide or other toxic gases).

History	Sign & Symptoms	Differential
• Known diabetic, medic alert tag • Drugs, drug paraphernalia • Report of illicit drug use or toxic ingestion • Past medical history • Medications • History of trauma • Change in condition • Changes in feeding or sleep habits	• Decreased mental status/lethargy • Change in baseline mental status • Bizarre behavior • Hypoglycemia • Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration) • Irritability	• Head trauma • CNS (stroke, tumor, seizure, infection) • Cardiac (MI, CHF) • Hypothermia • Infection (CNS and other) • Shock (septic, metabolic, traumatic) • Diabetes (hyper / hypoglycemia) • Toxicological or Ingestion • Acidosis / Alkalosis • Environmental exposure • Pulmonary (Hypoxia) • Electrolyte abnormality • Psychiatric disorder

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- If suspected overdose, follow overdose protocol

CREDENTIALED EMT

- Blood glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Consider intubation if GCS < 8

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

BEHAVIORAL EMERGENCIES

Behavioral emergencies require careful assessment. It is important to maintain a professional demeanor with the necessary degree of authority in one's voice. In all cases, substance-induced disorders (intoxication, withdrawals, etc.), organic causes (cerebral lesions etc.), endocrine emergencies (hypoglycemia and hyperglycemia, etc.), and hypoxia must be ruled out before a patient's condition is provisionally diagnosed as psychiatric. Remember that these patients are often agitated, suicidal, and may be under the influence of alcohol or drugs. This creates a particularly hazardous situation for pre-hospital providers.

History	Signs & Symptoms	Differential
• Situation crisis • Psychiatric illness / Medication • Injury to self or threat to others • Medic alert tag • Substance abuse / OD • Diabetes	• Anxiety, agitation, confusion • Affect change, hallucinations • Delusion thoughts • Combative / violent • Expression of suicidal / homicidal thoughts	• Alert mental status • Hypoxia • Intoxication • Toxin / substance abuse • Withdrawal syndromes • Mental illness disorders

ALL LEVELS

- **SCENE SAFETY**
- Check for responsiveness & ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Continuously observe for indicators of dangerous behavior and for potentially dangerous situations
- If patient is physically harmful use soft restraints (cravats)
- Spinal Motion Restriction, if indicated

CREDENTIALED EMT

- Lead placement
- Blood glucose

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Cardiac monitor / 12 lead EKG

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- If unable to physically restrain patient safely with soft restraints, consider chemical sedation
  - Midazolam 1 – 3 mg IV/IN or 5 mg IM (Max: 10mg)
    - Age > 65 0.5mg – 1mg IV/IN or 2.5mg IM
- **Maintain blood pressure ≥ 100mmHg**

BEHAVIORAL EMERGENCIES

HYPERACTIVE DELIRIUM WITH SEVERE AGITATION / VIOLENT PATIENT

If the patient is presenting with the following symptoms:

- Paranoia
- Disorientation
- Hallucination
- Tachycardia
- Increased strength
- Hyperthermia

- IV access (preferably 2 large bore)
- Normal Saline 1L bolus
  - May repeat 500cc (x2 as indicated)
- **If unable to physically restrain patient safely with soft restraints, consider chemical sedation**
- **The decision to chemically sedate will be made after a complete assessment by EMS personnel**
  - Midazolam 3 mg IV/IN or 5mg IM
    - May repeat to max dose of 10mg

    or
  - Droperidol
    - 2.5 – 5 mg IV/IO
    - 5mg – 10mg IM

    or
  - Ketamine 2 mg/kg IV (admin over 60 seconds and dilute with equal volume of 0.9% Saline)
    - 2-3 mg/kg IM (approximately 3 – 5-minute onset of action)
    - **Max Dose: 300 mg**

SPECIAL CONSIDERATIONS

- **If adequate sedation is not obtained with a single medication, follow the Medical Control protocol and seek advice for administering a different medication.**
- Does the patient have a history of psychological / psychiatric illness? Is the patient under treatment for any psychiatric condition? Is the patient taking psychotropic medications for a behavioral condition?
- What precipitated the event? Any other pertinent medical history? Significant recent stressor? Is there a history of recent alcohol or drug use?
- **Suicidal patients are not permitted to sign a refusal for care transport. Consultation with law enforcement, mental health professionals, or Online Medical Control should guide disposition.**
- Hypoglycemia, hypoxia, neurotrauma and other metabolic abnormalities can mimic an acute psychiatric decompensation. **Always rule out organic causes**.

MEDICAL

CARBON MONOXIDE

Carbon monoxide (CO) is a colorless, odorless, tasteless gas that is highly toxic. CO is primarily produced from the incomplete combustion of carbon-based material. Common sources of CO in EMS patients are smoke inhalation and exhaust from motor vehicles, gas heaters, or gas-powered equipment. CO binds to hemoglobin with an affinity 200 to 250 times greater than oxygen. CO causes hemoglobin to carry less oxygen and therefore leads to less oxygen being delivered to the body's tissues

History	Sign & Symptoms	
	MILD to MODERATE	**SEVERE**
• Incidents involving multiple patients with similar complaints • People with smoke inhalation • Person with known CO exposure • People with suspected CO exposure (space heaters, vehicle fumes, enclosed spaces, etc.) • Patients exposed to methylene chloride (paint remover, carburetor cleaner) - may have prolonged symptoms	• Headache (mild to moderate) • Shortness of breath • Chest pain • Nausea / vomiting • Dizziness / fatigue • Tachypnea • Hypertension/hypotension	• Altered mental status / LOC • Seizures • Severe headache • Tachycardia, cardiac arrhythmias, ST segment changes • Apnea / Respiratory distress

VULNERABLE / HIGH RISK POPULATION

- Pregnant patients (a fetus has a much higher risk to small doses of CO – up to 15% higher than the mother's reading
- Patients who are unable to give history or describe symptoms
- Children
- Elderly
- Suspected chronic CO exposure (several hours+) with flu-like symptoms

ALL LEVELS

- Scene Safety / remove patient from continue exposure
- Check for responsiveness / ABCs
- Oxygen therapy high flow via non-rebreather
- Obtain vital signs
- Carbon Monoxide & ETCO2 monitoring, if available
- Place patient in position of comfort

CREDENTIALED EMT

- Lead placement
- **If SpCO reading ≤ 10%, no symptoms and no history of asthma, COPD or cardiac disease**
  - Initiate/continue Oxygen via non-rebreather
- **If SpCO ≥ 11% OR SpCO ≥ 4% and vulnerable/high risk population**
  - If wheezing is present
    - Albuterol 2.5mg via nebulizer (may repeat in 5 minutes)
      - **DO NOT** administer if: >140bpm or if the patient experiences > 6 PVC's per minute on the monitor
    - Xopenex 1.25mg via nebulizer

ADVANCED EMT (AEMT)

- Follow EMT guidelines

CARBON MONOXIDE

- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SPECIAL CONSIDERATIONS

- "Cherry Red" skin is NOT a reliable indicator of carbon monoxide poisoning. If it is present, it is usually a late sign.
- Pulse oximetry is NOT a reliable indicator of oxygenation in patients with carbon monoxide poisoning.
- Smokers may have a base COHb level of 5-7%, consider this when evaluating your patient's signs/symptoms.
- When evaluating patients with potential carbon monoxide poisoning, you MUST consider carbon monoxide levels AND the patient presentation (signs/symptoms/factors)

DESTINATION DECISION MATRIX

ANY FACILITY	BAMC or University Hospital	BAMC

• Patients with mild symptoms & CO reading < 15
  ◦ Headache
  ◦ Nausea
  ◦ Cherry red lips
• Asymptomatic patients with CO reading < 25
	• Patients with moderate symptoms
	  ▪ Headache (mild to moderate)
	  ▪ Shortness of breath
	  ▪ Chest pain
	  ▪ Vomiting
	  ▪ Dizziness/fatigue
	  ▪ Tachypnea
	  ▪ Hypertension/hypotension
	• Asymptomatic with CO > 25
	• Asymptomatic pregnant patient with CO exposure
		• Patients with severe symptoms
		  ▪ AMS / LOC
		  ▪ Severe headache
		  ▪ Tachycardia, arrythmias, ST segment changes
		  ▪ Apnea / respiratory distress
		• Patient with smoke exposure
		• Intubated patients
		• Patients requiring vasoactive medications
		• Cardiac arrest with ROSC

DIABETIC EMERGENCIES

Diabetes is a disease in which the body does not produce or properly use insulin. Diabetics may have abnormally high or low blood glucose leading to symptoms. The goal in managing diabetic conditions in the pre-hospital setting is glucose measurement, treatment of identified abnormalities, and search for precipitating causes. The blood glucose level at which hypoglycemia occurs in an individual is variable but is generally accepted as < 70 mg/dL. Therefore, **for simplification**, hypoglycemia is defined as a blood glucose level < 70 mg/dL, with any degree of altered mentation.

History	Sign & Symptoms	Differential
• Past medical history • Medications • Recent blood glucose check • Last meal	• Altered mental status • Combative / irritable • Diaphoresis • Seizures • Nausea / vomiting / dehydration • Weakness • Deep / rapid breathing	• Alcohol / drug use • Toxic ingestion • Trauma; head injury • Seizure • CVA • Altered baseline mental status

ALL LEVELS

- Check for responsiveness & ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs

CREDENTIALED EMT

- Blood glucose
- Oral Glucose if glucose value <70mg/dl with signs/symptoms of hypoglycemia **AND** the patient is able to maintain airway
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- If BGL <70 mg/dl with signs/symptoms of hypoglycemia
  - **Administer Dextrose 10% (D10) 100cc (10grams) IV bolus**
    - Then reevaluate blood glucose level and LOC
    - If no response is noted, then administer additional IV boluses up to a total of 250cc.

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Glucagon 1mg IM/IN if unable to obtain peripheral venous access
- If hyperglycemia (BS > 300 mg/dl) with associated signs and symptoms of hypoperfusion.
  - Infuse 1 liter of NS over 30 to 60 minutes, followed by NS at 150 mL/hr.
  - Carefully and closely monitor patient for signs / symptoms of fluid overload in those patients at increased risk *(i.e. extensive cardiac, renal, etc.)*

DIABETIC EMERGENCIES

SPECIAL CONSIDERATIONS

- **All patients being treated for hypoglycemia will receive repeat blood glucose level testing in between all attempts at correcting glucose levels.**
- Often hyperglycemic patients who have been compliant with their insulin have an underlying source of infection (or stressor) causing their increased blood glucose level
- Ideally all hypoglycemic patients who receive IV dextrose in the field **SHOULD BE** transported. However, if patient is A&Ox4 and is refusing to be transported, medical control should be contacted with all cases.
- At an absolute minimum, patients who were found to be hypoglycemic prior to dextrose administration must eat a high starch meal and must be left in the presence of a responsible family member or friend who can stay with the patient. They must be educated on the signs and symptoms of hypoglycemia and must be instructed to monitor the patient closely. **All attempts should be made to not leave patient alone.**
- Alcoholic patients frequently present with hypoglycemia (poor glycogen liver stores)
  - Always check glucose on a patient with alcohol on breath and altered mental status.
  - Always check glucose on patients who are intoxicated and will be released to law enforcement
- Fluid therapy in hyperglycemia should be used with extreme caution in patients who cannot tolerate sudden, extreme fluid increases (renal failure, dialysis, CHF, elderly etc.).
- Glucagon requires stored liver glycogen and may not work in a malnourished patient. Glucagon's onset is usually within 10 minutes.

DIVING ILLNESS / INJURIES

Barotrauma is the most common serious affliction of divers. It is defined as tissue damage resulting from contraction or expansion of gas spaces that occur when the gas pressure in the body, or its compartments, is not equal to ambient pressure. Dysbaric air embolism (DAE) results from entry of gas bubbles into the systemic circulation through ruptured pulmonary veins. After passing through the heart, bubbles lodge in small arteries, occluding the more distal circulation. DAE usually presents immediately after a diver surfaces, at which time high intrapulmonic pressure resulting from lung over-expansion is relieved, which allows air bubble-laden blood to return to the heart. The presenting manifestations of DAE are sudden, dramatic, and often life-threatening: coronary occlusion, cardiac arrest, focal paralysis, sensory disturbances, blindness, deafness, CVA, vertigo, dyspnea, seizures, and aphasia may all occur.

History	Sign & Symptoms	Differential
• Submersion in water (any depth) • Any Trauma • Duration of immersion • Temperature of water or possibility of hypothermia • Degree of water contamination • SCUBA (length of dive)	• Unresponsive • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing, Wheezing, Rales, • Rhonchi, Stridor • Apnea	• Trauma • Pre-existing medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness • Post-immersion syndrome

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction (if indicated)
- Check patients core temperature
- Provide and maintain warmth

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SPECIAL CONSIDERATIONS

- Transport patient's Dive Computer to hospital with patient, if used and available.
- Rescue / removal of a patient in a water related accident should always be performed by trained providers.
- Sudden loss of consciousness on surfacing should always be assumed to be due to gas embolism until proven otherwise. All cases of suspected DAE must be evaluated for potential recompression treatment--hyperbaric oxygen therapy--as quickly as possible.

DROWNING / NEAR DROWNING

Drowning can occur anywhere from a residential bathroom to area lakes. Near drowning is defined as a submersion accident with recovery of vital signs and survival greater than 24 hours post incident. The primary mechanism of death in drowning is hypoxia and suffocation due to lack of oxygen or atelectasis of lung tissue. Concomitant factors of trauma from surface impacts, spinal cord injuries, orthopedic, and tissue injuries are common. Patient survival is based largely on early access, aggressive airway management and resuscitation intervention

History	Sign & Symptoms	Differential
• Submersion in water (any depth) • Any Trauma • Duration of immersion • Water temperature / hypothermia • Degree of water contamination • SCUBA (length of dive)	• Unresponsive • Mental status changes • Decreased / absent vital signs • Vomiting • Abnormal breath sounds • Apnea	• Trauma • Pre-existing medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness • Post-immersion syndrome

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if indicated)***
- Check patients core temperature
- Provide and maintain warmth

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SPECIAL CONSIDERATIONS

- A significant number of near-drownings involve injuries to the cervical spine due to diving accidents. Spinal precautions should be employed at all stages of rescue and treatment for the patient.
- **RESCUE MODE (full resuscitation efforts indicated):** Active phase of response operations, which includes rescuers searching for patient with the intent of full resuscitative efforts upon locating patient with a reliable "point last seen" or witnessed submergence of 1 hour or less in surface temperature water of **70 degrees or less,** or 30 minutes in surface water >70 degrees.
- **RECOVERY MODE (no resuscitative efforts indicated):** Phase of operations that begins after the expiration of the "rescue mode" time. Operations in this phase focuses on recovery of the body with no plans for resuscitation.

MEDICAL

HEAT EMERGENCIES

This protocol may be utilized for patients ≥ 12 years of age.

History	Sign & Symptoms	Differential
• Age • Past Medical History • Medications • Exposure to environment (even in "normal" temperatures) • Exposure to extreme heat • Extreme exertion • Drug use • Fatigue/Muscle cramping	• Evidence of heat exposure • Altered LOC • Hot, Dry or sweaty skin • Mental status changes • Seizures • Hypotension or shock • Nausea / vomiting • Dizziness • Rapid pulse	• Fever • Dehydration • Medications • Hyperthyroidism (storm) • Agitated Delirium • Heat Cramps • Heat Exhaustion • Heat Stoke • CNS Lesion

"Minor" Heat Related Illness	Heat Stroke (Life-Threatening)

• Heat edema
• Heat rash
• Heat cramps / tetany
• Heat syncope
• Heat exhaustion
  ○ Weakness
  ○ Dizziness
  ○ Chest pain
  ○ N/V
  ○ ABD pain
	• Altered LOC
	• Elevated body temperature
	  ○ Body temp usually > 103.9°F
	  ○ If pt has other symptoms **DO NOT** exclude heat stroke with temp < 103.9°F
	• Dry skin (lack of sweating) or profuse sweating
	  ○ Not all patients with heat stroke will have anhidrosis. **DO NOT** use the lack of anhidrosis to exclude heat stroke
	• Patient will often have signs of heat exhaustion and heat syncope before developing heat stroke

Persons at Risk for Heat Stroke – infants, elderly, athletes, laborers, alcoholics/substance abusers, homeless, firefighters, obese

ALL LEVELS

- Remove from heat source / move to cooler environment
- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- If patient has altered mental status – obtain core (rectal preferred) temperature.
  - If core (rectal) temperature < 103.9°F (102°F oral) – place cold packs to groin and axilla.
  - If core (rectal) temperature > 103.9°F (102°F oral) – Initiate active cooling measures (before transport)
    - Remove clothing and utilize water mist, fans or air conditioning to begin cooling
    - Place patient in TEMP bag (fill bag with cool water and/or ice – approximately 1 inch over patient)
      - Have Schertz dispatch contact EMS Battalion Chief for ice
    - Monitor patient temperature every 5 minutes, stop cooling if LOC returns to baseline or temperature drops below 101°F rectally (99°F oral)
    - Delay transport for 10 minutes after initiating active cooling, this will allow for good monitoring of the patient. If after 10 minutes, temps are not responding to cooling, initiate transport.

CREDENTIALED EMT

- Blood glucose
- Lead placement

HEAT EMERGENCIES

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Obtain advanced airway as needed.
- Establish IV/IO access – Initiate fluid bolus with cool normal saline (1000cc)
  - Monitor patient for pulmonary edema

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- If shivering, seizures or agitation is noted, consider
  - Midazolam
    - Adult
      - 2.5 mg IV/IO, may repeat to a total of 10 mg, or
      - 5 mg IM/IN, may repeat to a total of 10 mg.
    - Pediatric
      - 0.2 mg/kg IV/IO/IM **(Max single dose: 2mg IV/IO and 5mg IM)**
      - **Max dose: 10 mg**

SPECIAL CONSIDERATIONS

- **Active cooling should be stopped once the temperature drops below 101°F (rectal)/99°F (oral) or LOC improves.**
- **Once patient reaches desired temperature or LOC improves, cut the TEMP bag to allow water/ice to drain. This may be completed in the ED bay.**
- **Water sources: fire department engine (gravity fed), hydrants, garden hoses, etc.**
- Not all patients with heat stroke have anhidrosis (lack of sweating). DO NOT use the lack of anhidrosis to exclude heat stroke.
- Intense shivering may occur as patient is cooled.
- Heat cramps consist of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- Heat Exhaustion consists of dehydration, salt depletion, dizziness, fever, HA, cramping, N/V. Vital signs usually consist of tachycardia, hypotension, and elevated temperature.
- Heat Stroke – hyperthermia and an altered mental status or seizures with an elevated temperature.
- Pediatric patients should have continuous monitoring of body to ensure temperature is not dropped below the desired threshold of normal body temperatures

MEDICAL

HYPERTENSION

Hypertension is not a disease, but a result of multiple disease processes. There are multiple underlying causes of hypertension, though the primary factor is an increase in peripheral vascular resistance. Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms, which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. **Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on those specific protocols.**

History	Sign & Symptoms	Differential
▪ Documented Hypertension ▪ Related diseases: Diabetes; CVA; Renal ▪ Failure; Cardiac Problems ▪ Medications for Hypertension ▪ Compliance with HTN Meds ▪ Erectile Dysfunction meds ▪ Pregnancy	**One of these** ▪ Systolic BP 220 or greater ▪ Diastolic BP 120 or greater **AND at least one of these** ▪ Severe Headache ▪ Chest Pain ▪ Dyspnea ▪ Altered	• Hypertensive encephalopathy • Primary CNS Injury ▪ Cushing's Response with ▪ Bradycardia and ▪ Hypertension • Myocardial Infarction • Aortic Dissection / Aneurysm

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs **(*elevated BP is based on 2 – 3 sets of vital signs, each several minutes apart)***
- **Complete Cincinnati Stroke Scale assessment**

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SPECIAL CONSIDERATIONS

- If symptomatic – transport with head of stretcher at 30 degrees
- The trend in medicine is to avoid aggressive lowering of elevated blood pressure unless required by evidence of immediate end-organ damage (hemorrhagic stroke, etc.).

HYPOTENSION (NON-TRAUMA)

A thorough assessment and physical examination are vital when attempting to find the underlying etiology of hypotensive states. Non-traumatic hypotension may be caused by a variety of conditions such as hypovolemia (severe dehydration, GI bleeding), anaphylaxis, diminished cardiac output, sepsis, neurologic dysfunction, or an acute MI with left ventricular dysfunction.

History	Sign & Symptoms	Differential

• Blood loss - vaginal or GI bleeding, AAA, ectopic
• Fluid loss - vomiting, diarrhea, fever
• Infection
• Cardiac ischemia (MI, CHF)
• Medications
• Allergic reaction
• Pregnancy
• History of poor oral intake
	• Restlessness, confusion
	• Weakness, dizziness
	• Weak, rapid pulse
	• Pale, cool, clammy skin
	• Delayed capillary refill
	• Hypotension
	• Coffee-ground emesis
	• Tarry stools
		• Shock
		  ▪ Hypovolemic
		  ▪ Cardiogenic
		  ▪ Septic
		  ▪ Neurogenic
		  ▪ Anaphylactic
		• Ectopic pregnancy
		• Medication effect / OD
		• Vasovagal

ALL LEVELS

- Check for responsiveness & ABCs
- Assess for potential causes (i.e., hypovolemia, sepsis, anaphylaxis, etc.)
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place the patient in supine position. (Use caution with COPD, CHF and extremely obese patients.)

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines.
- Cardiac monitor/ 12 lead EKG
- If after administering 500 of IV fluids and SBP<90, continue IV fluids and consider:
  - Push Dose Epinephrine (1:100,000)
    - 1 ml (10mcg) every 1 – 2 minutes to maintain MAP>65.
  - Norepinephrine 1 – 10 mcg/min IV infusion for persistent hypotension unresponsive to fluid therapy to maintain a SBP of > 100 mm Hg or MAP>65 **(Utilize an IV pump for administration)**
    - Monitor patient for signs of IV infiltration and cardiac arrhythmias

SPECIAL CONSIDERATIONS

- **Norepinephrine should not be given to a patient who is significantly volume depleted.** Hypovolemia must be corrected prior to norepinephrine infusion to maximize potential for improved perfusion.
- When administering Norepinephrine, larger IVs (18g or larger are preferred). Larger IV access with assist with decreasing possible extravasation.

HYPOTENSION – SUSPECTED SEPSIS

A thorough assessment and physical examination are vital when attempting to find the underlying etiology of hypotensive states. Non-traumatic hypotension may be caused by a variety of conditions such as hypovolemia anaphylaxis, diminished cardiac output, sepsis, or an acute MI with left ventricular dysfunction.

History	Signs & Symptoms	Differential
• Age (common in elderly & very young) • Presence and duration of fever • Use of acetaminophen or ibuprofen • Use of antibiotic or recent admission • Previously documented infection or illness (UTI, pneumonia, meningitis, encephalitis, cellulitis, abscess etc.) • Recent surgery / invasive procedure • Immunocompromised (transplant, HIV, diabetes, cancer, use of daily steroids) • Bedridden or immobile patients • Prosthetic or indwelling devices • History of IVDU (consider endocarditis)	• Hyper or hypothermia • Headache • Altered Mental status • Chills • Dyspnea or SOB • Abdominal pain • Changes in urine output • Delayed capillary refill • Skin rash, warmness, bruising, cold, clammy, warm, flushed • Elevated blood glucose	• Cardiogenic shock • Hypovolemic shock • Allergic reaction/anaphylaxis • Toxicological emergency • Medication/drug interaction • Dehydration • Pneumonia, UTI, intraabdominal infection, skin infection, • Catheter or device infection • Endocrinology emergencies: (DKA, HHS,Thyroid storm) • Environmental (Heat stroke)

INDICATIONS FOR SEPSIS

- **Obvious or suspected infection**
- **ETCO2 ≤ 30**

And any TWO of the following:

- Altered Mental Status (GCS < 15, confusion, any change from baseline)
- SBP ≤ 100 mmHg
- HR > 90 bpm
- Respiratory Rate ≥ 20

It is imperative, once sepsis is identified, that the patient is kept from becoming hypotensive, any episodes of hypotension significantly increase morbidity and mortality
Early antibiotic administration also shows to decrease mortality

- Patients with known or suspected pneumonia with rales, history of CHF or ESRD still need IV fluids (in the patient has a history of severe Aortic Stenosis, monitor for fluid overload)
- Monitor SpO2 and ETCO2 readings during fluid administration

ALL LEVELS

- Check for responsiveness / ABCs
- Assess for potential causes (i.e. hypovolemia, sepsis, anaphylaxis, drugs/medication, heat stroke etc.)
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs including temperature and ETCO2 monitoring
- Place the patient in a supine position. (Use this position with caution in patients with COPD, CHF, or extreme obesity since this position may induce respiratory distress or failure.)
- Document initial time of any intervention, including time for IVF, time for antibiotics and or time for vasopressors.

HYPOTENSION – SUSPECTED SEPSIS

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV / IO Access (preferably 2 vascular access sites)
- **If Sepsis criteria is met:**
  - Normal saline or lactated ringers 500cc – 1000cc (may repeat to max of 2000cc)
    - After each 500cc bolus and monitor/evaluate for changes

PARAMEDIC

- Follow EMT and AEMT guidelines.
- Cardiac monitor / 12 lead EKG
- Ceftriaxone 2 grams IV/IO (mixed in 50cc Normal Saline, *infused over 30 minutes via IV Pump – Preferred*)
  - Alternate administration: 1gram (10cc) IV/IO over 2 minutes
    - If no reactions are noted, administer an additional 1 gram (10cc) in 5 - 10 minutes.
  - Assess for allergies to ceftriaxone or "-cillin" antibiotics, if present withhold ceftriaxone.
- If after administering 500cc of IV fluids and SBP<100 and/or MAP<65, continue IV fluids and consider:
  - Push Dose Epinephrine (1:100,000)
    - 1 ml (10mcg) every 1 – 2 minutes to maintain MAP>65 (Max dose: 10 cc)
  - Norepinephrine 1 – 10 mcg/min IV infusion for persistent hypotension unresponsive to fluid therapy to maintain a SBP of > 100 mm Hg and/or MAP>65 **(Utilize an IV pump for administration)**
    - Monitor patient for signs of IV infiltration and cardiac arrhythmias

SPECIAL CONSIDERATIONS

- **IV fluid therapy is the most important prehospital treatment for sepsis**. In the emergent setting IV fluids, whether crystalloid solution (i.e. NS) or a balance crystalloid (i.e. LR), are paramount for appropriate treatment of the septic patient. If the Sepsis criteria is met, the patient should receive IV fluid boluses, regardless of the patient's blood pressure. Ensure breath sounds are checked/monitored while administering IV fluids.
- Contact Medical Director in case patient is not meeting full criteria but your still suspecting sepsis based on your clinical judgement.
- **Remember, hypothermia is also a bad sign, especially in elderly patients due to loss of thermoregulation response.**
- **Patients experiencing septic shock have the best prognosis when antibiotics are delivered within one hour of onset of hypoperfusion**. Elevated serum lactate levels or decreased ETCO2 are a useful marker of hypoperfusion in sepsis.
- When administering Norepinephrine, larger IVs (18g or larger are preferred). Larger IV access with assist with decreasing possible extravasation.
- Septic patients are especially susceptible to traumatic lung injury and ARDS. If artificial ventilation is necessary, avoid ventilating with excessive tidal volumes. **If CPAP is utilized, airway pressure should be limited to 5 cmH2O.**
- Elevated blood glucose levels are a common but nonspecific finding in sepsis secondary to increased metabolic demand.

HYPOTHERMIA

Hypothermia, by definition, is a patient with a core temperature of less than 95 degrees. According to ACLS guidelines, body temperatures from 93 to 95 degrees constitute **"mild"** hypothermia. When between 86 and 93 degrees, **"moderate"** hypothermia exists. Below 86 degrees **"severe"** hypothermia is present and according to ACLS guidelines, modifications in the treatment of the cardiac arrest patient should be made. Death in hypothermia must be defined as a failure to revive with rewarming; unless there is strong evidence that the patient is not viable (severe trauma). In general, in the arrested hypothermic patient, aggressive attempts at resuscitation *should be continued* until the patient's core temperature is at least 95 degrees F. Most hypothermic patients are also volume depleted to some degree and should receive warmed IV fluids to improve coronary artery blood flow and correct hypovolemia.

History	Sign & Symptoms	Differential
• Age, very young and old • Exposure to decreased temperatures but may occur in normal temperatures • PMH / Medications • Drug use: Alcohol, barbiturates • Infections / Sepsis • Length of exposure / Wetness / Wind chill	• Altered mental status / coma • Cold, clammy • Shivering • Extremity pain or sensory • abnormality • Bradycardia • Hypotension or shock	• Sepsis • Environmental exposure • Hypoglycemia • CNS dysfunction ▪ Stroke ▪ Head injury ▪ Spinal cord injury

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Obtain an accurate body temperature (rectal preferred).
  - **PATIENT UNRESPONSIVE OR IN CARDIAC ARREST:**

    Confirm pulselessness for **30 to 45 seconds** if severe hypothermia is suspected or known. If no pulse is detected and no other signs of life are present, CPR should be initiated immediately while an AED is being applied (limit AED shocks to one when or if, severe hypothermia is known with certainty to exist).
  - **PATIENT NOT IN CARDIAC ARREST:**

    For body temperatures of 86 **to 93** degrees F., remove all wet clothing and apply warm heat packs to neck, armpits, and groin only.
    - Avoid aggressive rewarming in patients with a temperature of less than 86 degrees. Simply prevent further heat loss.
    - Temperatures above 93 degrees F. may be rewarmed in the normal fashion.
- In severe hypothermia (temperature **< 86 degrees** F.), oxygen use should be limited to those instances in which hypoxia is present (un-warmed oxygen may increase hypothermia).
- Keep the patient horizontal to avoid aggravating hypotension through orthostatic mechanisms.
- Blood glucose assessment. (Hypoglycemia can cause hypothermia and vice-versa, so all patients must be evaluated for such).

HYPOTHERMIA

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Intubation should be avoided in the severely hypothermic patient with spontaneous respirations unless urgently needed, since intubation has been suggested to increase the risk of VF in these patients.

  NOTE: ABOVE DOES NOT APPLY IF PATIENT IS ALREADY IN CARDIAC ARREST:

- Infuse 250 to 500 mL of **warmed NS** as an IV bolus, and then infuse the remaining liter @ 250 mL/hr.

  - Monitor for signs/symptoms of fluid overload

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- If the patient is in cardiac arrest, modifications should be made using the following guidelines:

DEFIBRILLATE VF/ VT <u>ONCE</u> AT 360J THEN PROCEED AS FOLLOWS:

CORE TEMPERATURE LESS THAN 86 DEGREES F.

- Continue CPR.
- Withhold all IV medications.
- Limit shocks for VF/ VT to a maximum of 3.
- Transport as soon as possible to hospital.

CORE TEMPERATURE GREATER THAN 86 DEGREES F.

- Continue CPR.
- Give IV medications as needed, but at longer than standard intervals.
- Repeat defibrillation for VF/VT as core temperature rises.

SPECIAL CONSIDERATIONS

- When specifically, and urgently indicated, intubation should not be withheld, but used with extreme caution (excessive manipulation may induce VF/VT).
- Improvement of blood circulation to the heart decreases the risk of rewarming shock and VF.
- Rapidly expanding the blood volume with warmed IV fluids increases B/P, flow through coronary arteries, and oxygen delivery to the myocardium.
- Fluids should be warmed to as close to **109 degrees F**. when at all possible prior to infusion. This may be accomplished by either warming on a unit heater vent or wrapping bag with a chemical heat pack.
- IV Fluids should **NOT** be warmed in a microwave oven.

NAUSEA / VOMITING

Nausea is the sensation that there is a need to vomit. Nausea can be acute and short-lived, or it can be prolonged. Usually vomiting is harmless, but it can be a sign of a more serious illness. Adults, usually, have a lower risk of becoming dehydrated than children because they can usually detect the symptoms of dehydration.

History	Sign & Symptoms	Differential
• Age • Time of last meal • Last bowel movement/emesis • Improvement or worsening with food or activity. • Duration of problem • Past medical/surgical history • Menstrual history (pregnancy) • Bloody emesis / diarrhea	• Abdominal Pain? • Character of pain (constant, intermittent, sharp, dull, etc.) • Distention • Constipation • Diarrhea • Anorexia • Radiation	• CNS Issues • Myocardial infarction • Drugs • GI or Renal disorders • Diabetic ketoacidosis • Infections (pneumonia, influenza) • Food or toxin induced. • Medication or Substance abuse • Pregnancy

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain orthostatic vital signs.
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Blood glucose
- If active nausea/vomiting, Isopropyl alcohol pad – inhale for 1 minute
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Zofran 4mg slow IVP; repeat once after 5 minutes if nausea/vomiting persists.
  - Consider IM administration if unable to establish venous access.
- If actively vomiting
  - Consider promethazine
    - 25 mg deep IM (gluteus maximus or lateral thigh)
    - 12.5mg slow IVP with a SBP >90 mmHg **(diluted with 5-10 cc of NS)**
  - May repeat once if nausea/vomiting persists
- Refractory Nausea (no response with ondansetron or promethazine administration)
  - Consider
    - Droperidol 1.25 – 2.5 mg IV/IO/IM
    - **If patient has received both ondansetron and promethazine, contact Medical Control for droperidol**

NOSEBLEED (EPISTAXIS)

History	Sign & Symptoms	Differential
• Documented HTN • Documented use of blood thinners • Previous history of epistaxis • Age • Gender • Documented history of hemophilia • Trauma to nostrils/nasal cavity	• Bleeding • Trauma • Pain	• HTN • Hemophilia • Trauma to nasal cavity • La Forte Fracture • Infections • Lesions • Uncontrolled nosebleed

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs

CREDENTIALED EMT

- Blood glucose
- No active bleeding noted.
  - Monitor PT as needed, treat any signs or symptoms to protocol standards.
- **Active bleeding noted.**
  - Apply "nose clip" to apply direct pressure for 5 -10 minutes.
  - Tilt the patient's head forward and allow the patient to be in a position of comfort

Advanced EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and intermediate guidelines
- If refractory to direct pressure and there is continued active bleeding after appropriate **FIRM** direct pressure for 5 to 10 minutes, consider the following:
  - Administered TXA 1cc (100 mg) IN via MAD **(Effected Nostril Only)**
    - May repeat in 3-5 minutes x2 – Max total dose: 300 mg (per effected nostril)

SPECIAL CONSIDERATIONS

- All patients receiving TXA **must be transported**
- Transport patient in a sitting up position
- Avoid TXA with TBI
- Contact OLMC for PTs with history of CVA, MI, PE or DVT for administration

OVERDOSE / POISONING

It is impossible to include all potential toxic exposures or poisonings in this Standard. Management of the poisoned / exposed patient focuses on several principles; *decontamination* limits further absorption and minimizes the extent of toxicity; *supportive care* limits the effects of the serious complications of poisoning on the primary systems at risk; and *definitive care* limits the severity or duration of toxicity using pharmacologic antagonists (antidotes) or enhances elimination of the toxin itself. The poisoning / exposure may be accidental or intentional

History	Sign & Symptoms	Differential
• Ingestion (suspected) of a potentially toxic substance • Substance ingested, route, quantity • Time of ingestion • Available medications in home • PMH, medications	• Mental status changes • Hypotension / hypertension • Decreased respiratory rate • Tachycardia, dysrhythmias • Seizures • S.L.U.D.G.E. • D.U.M.B.B.E.L.S	• Acetaminophen (Tylenol) • Aspirin • Depressants • Stimulants • Anticholinergic • Cardiac medications • Insecticides (organophosphates)

ALL LEVELS

- **Scene safety (park unit upwind, use appropriate Personal Protective Equipment).**
- **Identify substance and assure appropriate patient decontamination (completed by trained, equipped providers).**
- Check for responsiveness / ABCs
- Flush skin / mucous membranes with appropriate solution, if indicated.
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
  - If breathing is inadequate, assist ventilations with BVM **(see chart for signs of inadequate ventilations)**
- Obtain vital signs
- Obtain substance name and contact Poison Control **1-800-222-1222**

CREDENTIALED EMT

- Blood glucose
- Lead placement
- **If overdose is from a known or suspected opioid and ventilations are inadequate (see below)**
  - **Ensure ventilations are being assisted with a BVM (see chart for signs of inadequate ventilations)**
  - **If Ventilations do not improve**
    - Consider naloxone 0.5 mg IN (may repeat if respirations do not improve x3 – max total dose 2 mg)

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- If ventilations do not improve with BVM assist
  - Narcan suspected or known narcotic overdoses with **respiratory depression**.
    - 0.5 mg IV/IO/IM
    - 1 mg IN
      - Repeat as needed for respiratory improvement or a maximum of 4 mg (**ALL** routes combined)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead

OVERDOSE / POISONING

INDICATORS OF INADEQUATE VENTILATIONS	
All of the following are indicators of inadequate ventilations: • Spontaneous respirations < 10 per minute • SpO2 readings < 92% • EtCO2 readings > 45	**If ALL of the indicators are present, do the following:** • **Assist ventilations with BVM for 2 minutes** ○ **Continue as needed**

SPECIFIC TREATMENTS

PHENOTHIAZINE INGESTION WITH DYSTONIC REACTION

- Diphenhydramine 25 mg IV or IM
- May repeat one 25 mg dose, if no response in 10 minutes, (maximum dose is 50 mgs).

SYMPTOMATIC TRICYCLIC ANTIDEPRESSANT OVERDOSE

- IF: tachycardia > 120 bpm, widened QRS complex (>.10 sec), or hypotension not responsive to IV fluids:
  - Sodium Bicarbonate 1 mEq/kg IV bolus over 2 minutes x 1.

COCAINE or AMPHETAMINE OVERDOSE

- If: HR > 140 BPM, SOB, palpitations, feeling of heart racing
  - Midazolam 2 - 5 mg IV/IM/IN/IO every 10 minutes until HR decreases below 100 BPM

SYMPTOMATIC CALCIUM CHANNEL BLOCKER OVERDOSE

- IF: bradycardia, conduction delays, hypotension, lethargy, slurred speech, or nausea / vomiting:
  - Atropine 1mg IV push for symptomatic bradycardia.
  - Calcium 1,000mg slow IV push
- **If no response to initial Atropine dose, consider;**
  - Glucagon 1mg IV Push

SYMPTOMATIC BETA BLOCKER OVERDOSE

- IF: dyspnea, blurred vision, hypotension, confusion:
  - Glucagon 1 mg IV/IM

SYMPTOMATIC ORGANOPHOSPHATE POISONING

- IF: muscle fasciculation, diarrhea, wheezing, abdominal cramping, salivation, seizures, altered mental status, or pinpoint pupils:
  - Atropine 2mg rapid IV bolus.
  - Repeat atropine every 5 to 15 minutes until signs of atropinization occur (pupillary dilatation, tachycardia, flushing, diminished diaphoresis, or drying of secretions).
    - **Note:** Atropine will not reduce respiratory depression associated with OPP.
    - We **DO NOT** carry enough Atropine to provide long-term treatment, rapid decontamination and transport is essential to patient survival

SPECIAL CONSIDERATIONS

- Consider contacting On Line Medical Control for complex overdoses / poisonings / exposures.
- Intubated patients **SHOULD NOT** be Narcan. Narcan is only used to improve ventilatory status.
- It is important to remember that a toxic exposure poses a significant risk to both rescuer and patient. Appropriate scene management and decontamination are critical.

REACTIVE AIRWAY DISEASE

Reactive airway disease is a spectrum of illnesses, which includes asthma, emphysema and chronic bronchitis. **Asthma** is characterized by episodic bronchospasm and hypersecretion of mucous with intervals of relative or complete good health. Most patients will have a prolonged expiratory phase of respiration and wheezing (often audible without a stethoscope). **Emphysema** is defined as destruction of lung tissue with fusion of tissue in the alveoli. **Chronic bronchitis** is an inflammatory process with mucous production and bronchospasm.

History	Signs & Symptoms	Differentials
▪ Asthma; COPD (chronic bronchitis, emphysema, CHF) ▪ Home treatment ▪ Medications (inhalers, steroids) ▪ Toxic exposure	▪ Shortness of breath ▪ Pursed lip breathing ▪ Decrease ability to speak ▪ Increase respiratory effort ▪ Breath sounds ▪ Use accessory muscles ▪ Fever, cough	▪ Asthma ▪ Anaphylaxis ▪ Aspiration ▪ COPD (emphysema, bronchitis) ▪ Pneumonia ▪ Cardiac (MI or CHF) ▪ Inhaled toxin

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Assist patient with their metered dose inhaler
- Place patient in position of comfort

CREDENTIALED EMT

- Lead placement
- Albuterol 2.5mg via nebulizer (may repeat in 5 minutes)
  - **DO NOT** administer if: >140bpm or if the patient experiences >6 PVC's per minute on the monitor
- Xopenex 1.25mg via nebulizer

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- If no improvement with initial nebulizer treatment
  - Consider Brethine 1-2mg diluted in 3ml NS via nebulizer
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- **If no improvement with initial treatment**
  - CPAP (with inline nebulizer and one of the following)
    - Xopenex 1.25 mg
    - Albuterol 2.5 mg
    - **If the patient is not tolerating the mask**
      - Coach / Calm the patient into allowing the device to work
      - Consider mild sedation
        - Midazolam 1 – 2 mg IV/IM/IN

REACTIVE AIRWAY DISEASE

PARAMEDIC (cont'd)

- Brethine 1-2mg diluted in 3ml NS via nebulizer OR 0.25mg SQ
- If patient is not responding to treatment with severe respiratory distress AND signs of impending respiratory failure
  - Signs/Symptoms of impending Respiratory Failure
    - SpO2 readings <85%
    - Increasing ETCO2 readings despite treatment (>50)
    - Paradoxical abdominal movement
    - unable to speak in complete sentences
    - absent or greatly diminished breath sounds
- Consider
  - Dexamethasone 10 mg IV/IO/IM
    - *(DO NOT administer to patients with audible rales and/or elevated temp)*
  - Magnesium Sulfate 40mg/kg IV/IO in 50ml NS over 10-15 minutes. (Max dose: 2 grams)
    - *(DO NOT administer Magnesium with audible stridor or symptom of croup)*
  - Ketamine *(for bronchodilation effects – **NOT** for sedation)*
    - Adult – 0.5 mg/kg IV/IO
  - If no evidence of active ischemic heart disease AND age less than 50 years of age.
    - Epinephrine 1:1000 0.3mg IM

SPECIAL CONSIDERATIONS

- **Epinephrine 1:1000 must NEVER be given by direct IV push in the non-arrest patient.**
- Xopenex may be considered as the primary bronchodilator
- **DO NOT** withhold high flow oxygen on a COPD patient if they are in severe respiratory distress and is experiencing dysrhythmias. Often high flow oxygen can help them. If prolonged transport time, look closely for hypoventilation and assist with BVM as needed

SEIZURES

Seizures are defined as an episode of abnormal neurological function caused by an abnormal electrical discharge of brain neurons. Status epilepticus is a true medical emergency defined as either continuous seizure lasting at least five minutes or as two or more seizures between which there is incomplete recovery of consciousness. Most patients with seizures evaluated by EMS are postictal.

History	Sign & Symptoms	Differential
• Reported / witnessed seizure activity • Previous seizure history • Medical alert tag information • Seizure medications • History of trauma • History of diabetes • History of pregnancy • Time of seizure onset • Document number of seizures • Alcohol use, abuse or abrupt cessation • Fever	• Decreased mental status • Sleepiness • Incontinence • Observed seizure activity • Evidence of trauma • Unconscious	• CNS (Head) trauma • Tumor • Metabolic, Hepatic, or Renal failure • Hypoxia • Electrolyte abnormality • Infection / Fever • Alcohol withdrawal • Eclampsia • Stroke • Hyperthermia • Hypoglycemia

ALL LEVELS

- Check for responsiveness / ABCs
- Remove all possible hazards to protect the patient from further injuries.
- Avoid physical restraint unless absolutely necessary to protect the patient.
- Do not attempt to put anything in the patient's mouth.
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Suction as needed to clear the airway.
- Obtain vital signs.
- Spinal Motion Restriction (if indicated)
- If suspected overdose, follow overdose protocol, if eclampsia is suspected follow OB protocol

CREDENTIALED EMT

- Blood Glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Midazolam (*May repeat every 5 minutes to Max dose of 20 mg*)
  - 2.5 mg IV / IO
  - 5 mg IN
  - 10 mg IM (if unable to establish IV/IO)

SEIZURES

SPECIAL CONSIDERATIONS

- **All first-time seizure patients should be transported to the Emergency Department for evaluation**
- Always assess blood glucose level to rule out a hypoglycemic-induced seizure.
- Always protect the airway since the patient could aspirate and obstruct the airway.
- Febrile seizures are common in patients <6 years old, but they still require further medical treatment and evaluation. Every effort should be made to transport these patients to the Emergency Department.
- If present during initial onset of seizure, thoroughly document onset of seizure including:
  - Type of seizure activity- tonic/clonic, focal motor, Jacksonian March, absence, etc.
  - Time of seizure onset and duration
- Most seizure deaths are caused by hypoxia. It is often very difficult to determine the difference between a postictal patient and a hypoxic patient. Always err to the side of caution and treat for hypoxia until proven otherwise.
- Patient's emerging from seizures are confused, agitated, and embarrassed. Rescuers should make every effort to protect the patient's privacy, empty the room of all unnecessary personnel, and speak on the patient's level in a very soft, quiet voice. Every effort should be made to have one responder establish and maintain patient contact until the patient has emerged from their postictal state. All extraneous noise (radios, equipment, etc.) should be minimized.
- Seizure medications carried by System units should not be used to "prevent" seizures. They are intended to stop or reduce witnessed seizures, status epilepticus, and to help with postictal patients that cannot be safely controlled by non-pharmacological methods.

SNAKEBITES

Snakebites are a difficult medical emergency to accurately assess. Two venomous snake groups naturally reside in Central Texas, the *Crotalidae* (viperine), frequently called "pit vipers" and include: rattlesnakes, copperhead, and water moccasins. The other group known as the *Elapidae*, is the family in which the coral snake belongs. Snake venom is classified as heme- or neuro- toxic. Unfortunately, snakebites do not affect "just" the hematologic or neurologic systems, although they are primarily one or the other and contain elements of both. Hemotoxic poisons, found primarily in the Crotalidae, attack the blood system causing lysis of capillary cells, local thrombosis, gangrene, and intravascular clotting. This is due to the presence of thrombase, hemorrhagin, and anticoagulant in the venom. Neurotoxic venom acts by attacking the respiratory center and the 9th through 12th pair of cranial nerves. Snake identification is crucial, and the following may assist in identification: Coral Snakes: *"red touch black, venom lack, red touch yellow, kill a fellow."* Pit vipers may be identified by their angular shaped heads.

ALL snakebites should be transported and evaluated at an Emergency Department.

History	Sign & Symptoms	Differential

• Type of snake
  ▪ Coral
  ▪ Pit viper
  ▪ Exotic
• Time, location of bite
• Previous bites
• Tetanus and Rabies risk
• PMH / Medications
• Immunocompromised patient
	• Puncture wound / abrasion
	• Pain, soft tissue swelling, redness
	• Blood oozing from the bite wound
	• Shortness of breath, wheezing
	• Allergic reaction, hives, itching
	• Hypotension or shock
		• Poisonous bite
		• Nonpoisonous bite
		• Insect / Spider bite

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Provide and maintain body warmth
- Minimize activity; remove tight clothing and jewelry on affected area. If on an extremity: splint (to minimize movement) at heart level

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SNAKEBITES

SPECIAL CONSIDERATIONS

- **Constricting bands, tourniquets, and cryotherapy (ice packs) are NOT appropriate and should not be used.**
- **Contact the receiving facility early to insure the availability of anti-venin**
- **Pit Viper:** Symptoms are acute and marked: Tissue swells at bite mark within 3 minutes and continues for up to 1 hour. Swelling spreads, possible to a point where the skin “bursts.”
- **Coral Snake:** Symptom onset is not as acute as with pit vipers. Circulatory impairment with arrhythmias, hypotension, weakness, and exhaustion terminating into shock. Severe headache, dizziness, hearing difficulty, confusion, unconsciousness, respiratory difficulty to paralysis, skin sensations (paresthesia), diaphoresis, chills and rapid onset of fever.
- **DO NOT** bring the snake to the Emergency Department

STROKE / CVA

In a stroke, a clot forms in a blood vessel in the brain or travels from a distant blood vessel. Embolic strokes are common in the middle cerebral artery. An Intracerebral Hemorrhage is usually the result of severe hypertension with bleeding into the brain tissue. A Subarachnoid Hemorrhage is bleeding into subarachnoid space, which is usually the result of the rupture of a congenital aneurysm, or after head trauma. A Transient Ischemic Attack is a reversible neurological event.

History	Sign & Symptoms	Differential
• Previous CVA, TIA's • Previous cardiac / vascular surgery • Associated diseases: diabetes, hypertension, CAD • Atrial fibrillation • Medications (blood thinners) • History of trauma	• Altered mental status • Weakness / Paralysis • Blindness or other sensory loss • Aphasia / Dysarthria • Syncope / Vertigo / Dizziness • Vomiting • Headache • Seizures • Respiratory pattern change • Hypertension / hypotension	• Altered Mental Status • TIA (Transient ischemic attack) • Seizure • Todd's Paralysis • Hypoglycemia • Tumor • Trauma • Dialysis / Renal Failure

Scene Time: Goal on Stroke Alerts is to keep scene time to < 15 minutes

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction (if indicated)
- If suspected overdose, follow overdose protocol

CREDENTIALED EMT

- Blood glucose
- Complete a stroke assessment
  - Complete a Cincinnati Stroke Exam (CSE)
    - If arm drift/weakness is present complete a VAN assessment
  - **If either assessment is positive and stroke alert criteria is met:**
    - Active a Stroke Alert (Advised receiving facility of type – VAN or CSE
    - Transport to appropriate hospital (see destination selection guide for this protocol)
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
  - **DO NOT** delay transport to initiate IV access

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

STROKE / CVA

STROKE EXAM

Cincinnati Stroke Exam (CSE) / FAST Exam	VAN - Large Vessel Occlusion (LVO) Exam

• **F**acial Droop
• **A**rm drift
• **S**peech abnormality
• **T**ime of onset (Last know well time)
 	
If arm drift/weakness is present, complete a VAN assessment
	Arm weakness **(required)** **AND** one of the following:
	• **V**ision deficit / fixed gaze
	  ○ loss of vision or gaze to right or left (usually the affected side)
	• **A**phasia (*not slurred speech*)
	  ○ unable to say name of objects (i.e. pen) or repeat a phrase
	• **N**eglect
	  ○ does not feel the left side when both arms are touched

REGIONAL STROKE ALERT CRITERIA

CSE / FAST Exam Stroke Alert	VAN – Large Vessel Occlusion (LVO) Stroke Alert
• Positive Cincinnati Stroke Exam / FAST Exam AND • Last Known well time: Less than 6 hours AND Blood Glucose: Between 60 – 600mg/DL	• Positive VAN Assessment for LVO AND • Last Known Well Time: < 24 hours AND • Blood Glucose: Between 60 – 600 mg/DL

DESTINATION SELECTION

If only positive for Cincinnati Stroke Exam transport to one of the following facilities:	If VAN positive assessment - transport to one of the following facilities:
• NE Methodist (Primary) • NE Baptist (Interventional Stroke Center) • NC Baptist (Primary) • Stone Oak – Methodist (Primary) • Christus Santa Rosa – NB (Primary) • Resolute Hospital (Primary)	• NE Baptist (Advanced) • University Hospital (Comprehensive) • Methodist-Main (Comprehensive) • St. Luke's Baptist (Comprehensive)

SPECIAL CONSIDERATIONS

- **Provide early notification to receiving facility that patient meets stroke alert criteria.**
- **Thoroughly document** exactly when symptoms began. Have they improved / worsened?
- A stroke exam must be completed on all patients with S/S of CVA.
- Remember, if your patient is aphasic, it does not mean they cannot hear or comprehend what is occurring. Extreme care must be taken to communicate with and explain everything that is occurring with the patient.

SYNCOPE

Syncope is temporary loss of consciousness and posture, described sometimes as "fainting" or "passing out." It's usually related to temporary insufficient blood flow to the brain. It most often occurs when the blood pressure is too low (hypotension) and the heart doesn't pump a normal supply of oxygen to the brain. It may also be caused by several heart, neurologic, psychiatric, metabolic and lung disorders, emotional stress, pain, pooling of blood in the legs due to sudden changes in body position, overheating, dehydration, heavy sweating or exhaustion.

History	Sign & Symptoms	Differential
▪ Cardiac history, stroke, seizure ▪ Occult blood loss (GI, ectopic) ▪ Females: LMP, vaginal bleeding ▪ Fluid loss: nausea, vomiting, diarrhea ▪ Past medical history ▪ Medications	▪ Loss of consciousness with recovery ▪ Lightheadedness, dizziness ▪ Palpitations, slow or rapid pulse ▪ Pulse irregularity ▪ Decreased blood pressure	▪ Vasovagal ▪ Orthostatic hypotension ▪ Cardiac syncope ▪ Stroke ▪ Hypoglycemia ▪ Seizure ▪ Toxicological (Alcohol) ▪ Medication effect (hypertension) ▪ PE ▪ AAA

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if indicated)***
- If suspected overdose, follow overdose protocol

CREDENTIALED EMT

- Blood glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SPECIAL CONSIDERATIONS

It is not normal for patients to have syncopal episodes. Consider the possibilities: diabetic problems (hypoglycemia or hyperglycemia), alcohol or drug intoxication, metabolic abnormalities, seizures or postictal states, toxic exposures, hypoxia, sepsis, stroke, and head trauma. These patients should be seen for a medical evaluation. If signs or symptoms are present, go to the appropriate protocol

Obstetric Emergencies

OBSTETRICS

OBSTETRICAL EMERGENCIES - GENERAL

Most pregnancies progress in an orderly, normal fashion. Abnormalities during pregnancy affect both mother and child. Thus, care of the pregnant patient focuses on the evaluation and treatment of both the mother and in-utero child. Common emergencies encountered in the pre-hospital environment are bleeding, abnormal presentation of child, complicated deliveries, and abdominal pain. Rapid assessment and recognition of acute problems; including the possibility of having to support two or more lives with complications is the primary focus in the pre-hospital environment. It is impossible to address all potential illnesses and injuries in the pregnant patient in these standards

MANUAL VAGINAL EXAMS ARE NEVER TO BE DONE IN THE PRE-HOSPITAL SETTING. AN EXAMINER'S FINGER CAN PUNCTURE THE PLACENTA, IF PLACENTA PREVIA IS PRESENT, CAUSING PROFOUND SHOCK AND FATAL HEMORRHAGE TO BOTH MOTHER AND BABY.

History	Signs & Symptoms	Differential
• Due date • Time contractions started / how often • Rupture of membranes • Time / amount of any vaginal bleeding • Sensation of fetal activity • Past medical & delivery history • Medications • Gravida / Para Status • High Risk pregnancy	• Spasmodic pain • Vaginal discharge or bleeding • Crowning or urge to push • Meconium	• Abnormal presentation - Buttock - Foot - Hand • Prolapsed cord • Placenta previa • Abruptio placenta

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- If the obviously pregnant woman **greater than 20 weeks gestation** requires Spinal Motion Restriction, securely package her supine on long spine board and **tilt board** (with patient firmly secured to board) **15 degrees to the patient's left**.
- Collect any aborted tissues and transport with patient (place in paper bag and then plastic bag).
- Transport all non-trauma OB patients greater than **20 weeks** gestation on their left side to prevent supine hypotensive syndrome (if patient can tolerate and is able to comply).

CREDENTIALED EMT

- Lead placement

INTERMEDIATE

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Assess fetal heart rate via doppler stethoscope, if available.

OBSTETRICAL EMERGENCIES - GENERAL

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- A pregnant patient in cardiac arrest should be managed with rapid transport to an OB capable hospital and early notification to the ED that the patient in arrest is pregnant (this allows the ED to mobilize a team for emergent C-section if necessary).
  - Pregnant arrests should be managed with a small elevation (pillow, sheet, etc.) placed under the right hip to shift the uterus off the great vessels in the pelvis during resuscitation attempts.

SPECIAL CONSIDERATIONS

- If a delivery occurs, remember you now have two patients and documentation needs to be completed on both patients.
- Consider the possibility of pregnancy in any female of child bearing age with complaints of vaginal bleeding, menstrual cycle irregularity, abdominal cramping and/or pain, low back pain (not associated with trauma), or shoulder pain (not associated with trauma)
- One of the major considerations in managing a pre-hospital delivery is timing. If birth is imminent, stay and deliver the baby. If high risk or complicated, attempt delivery en-route to the hospital.
- **50% solutions of magnesium sulfate are never to be administered by direct IV bolus without prior dilution.** To make a 10% solution, add 4 mL of 50% magnesium (2 grams) to 16 mL of NS.
- Obtain APGAR scores at 1 minute and 5 minutes post-delivery. Do not delay resuscitation or cardio-pulmonary support to obtain APGAR scores.
- A **premature birth** is considered anything less than 37 weeks gestation or 5.5 lbs. of body weight.
- **Contact OLMC for guidance with any complicated field delivery, when time and patient condition allows.**

NORMAL DELIVERY

NORMAL UNCOMPLICATED BIRTH

Uncomplicated pregnancy with appropriate prenatal care. No recent history of substance abuse.

- Assess for amniotic sac rupture. If not yet ruptured, **DO NOT prematurely rupture membranes until complete delivery of the baby has been accomplished**. Once delivery has been accomplished and the membranes are still intact, carefully tear them open and immediately suction the infant.
- Place the mother in a comfortable position (supine) with legs drawn up at edge of bed (if still in house). Proper position may prevent shoulder impaction by baby.
- Coach the mother to breathe deeply between contractions. Advise mother to "pant-breathe" with each contraction, and to relax between contractions.
- Apply slight pressure to perineum as the head emerges. Gently assist its passage out of the birth canal. Do not allow an explosive delivery as vaginal tearing may result.
- **Check for umbilical cord around neck (nuchal cord).** If present, slip cord off over the head. If cord is too tight to remove, **immediately clamp in two places and cut between clamps**.
- As soon as the head is visible, instruct the mother to stop pushing, immediately suction first the mouth, then the nose, to remove fluid and mucous before the baby takes its first breath or the body is delivered. If meconium is present, and intubation equipment is unavailable, thoroughly attempt to suction the airway with a bulb syringe as much as possible.
- Once you have suctioned, tell mother to resume pushing, supporting the infant's head as it rotates.
- Deliver the anterior shoulder first, then the posterior shoulder. The body will soon follow.
- Remember to keep the baby at the level of the vagina to prevent over or under transfusion of blood from the placenta until the cord is cut. **Never "milk" the cord (milking causes destruction of blood cells)**.
- Once pulsations cease in the cord, securely clamp (or tie) the umbilical cord (if not already done for **nuchal cord**). Place the first clamp approximately 7 inches from baby. Place the second clamp approximately 3 inches above the first. Carefully cut the umbilical cord **between** the clamps.
- Allow the infant to nurse, if possible and infant is stable. This will help to promote uterine contractions (do not allow baby to nurse if multiple births are suspected!).
- After birth the vagina should continue to ooze blood. Do not pull on the umbilical cord to expedite placental delivery. Eventually the cord will lengthen which indicates separation of the placenta from the uterine wall (usually within 20 minutes).
- Following delivery inspect the mother's perineum and external vagina for tears. If any tears are present, apply direct pressure to control hemorrhage.
- The placenta should then be delivered and transported with the mother for evaluation. Do not delay transport waiting for the placenta to deliver.

OBSTETRICAL COMPLICATIONS

APRUPTIO PLACENTA

Premature separation of the placenta from the wall of the uterus with complaints of severe

- Signs / Symptoms
  - Constant abdominal pain without external hemorrhage
  - Rapid uterine contractions
- Maintain a minimum systolic blood pressure >90 mmHg

BREECH BIRTH

- **Delivery of a breech baby is best left to hospital personnel whenever possible**. **DO NOT** attempt breech delivery unless no other options exist, or baby and/or mother is in distress.
- **If delivery is imminent:** Position mother with buttocks at the edge of firm bed (if available). Ask her to hold her legs in a flexed position if possible.
- As the infant delivers, do not pull on the legs, simply support them. Allow the entire body to be delivered with contractions only while you support the infant.
- As the head passes the pubis, apply gentle upward traction until the mouth appears over the perineum.
- If the head does not deliver and the baby begins to spontaneously breathe with its face pressed against the vaginal wall, place a gloved hand in the vagina with the palm toward infant‘s face.
- Form a “V” with the index and middle finger on either side of the infant’s nose and push the vaginal wall away from the infant’s face.
- Maintain this position, and immediately transport with early notification to the receiving ED.

ECLAMPSIA

- When suspected and patient is experiencing active, **sustained**, tonic-clonic seizure activity
  - Administer **magnesium sulfate 10%, 2 to 4 grams IV ”rapid infusion”**
    - Add 2 – 4 grams to 50cc IV bag,
    - Utilize IV pump andset infusion rate at 600 cc/hr (=5 min)
      - infusion time at no greater than 1 gram per minute)
    - Until seizure stops or a maximum dose of 4 grams has been given.

MULTIPLE BIRTHS

- Follow guidelines outlined for normal birth. Be aware that multiple births are generally smaller and may present with babies in multiple positions (i.e., normal, breech etc.).
- Deliver first baby, clamp and cut cord as previously indicated. Deliver second (or additional) babies as previously indicated.
- Be prepared to provide cardio-pulmonary support since multiple births generally produce much smaller and less developed babies, requiring more intensive care.
- Do not begin fundal massage or allow the mother to breast feed until it is known for certain that all babies have been delivered (consider confirming with doppler stethoscope if unsure).

OBSTETRICAL COMPLICATIONS

PLACENTA PREVIA

Development of the placenta over the cervix

- Should be considered with painless, bright red vaginal bleeding.
- Maintain a minimum systolic blood pressure >90 mmHg
- Transport Immediately

PROLAPSED UMBILICAL CORD / LIMB PRESENTATION

- **DO NOT** attempt to push cord or limb back in!
- Insert two fingers of gloved hand into vagina to raise the presenting part of the fetus off the cord.
- Simultaneously, check cord for pulsations in vagina, and push baby's head away to keep pressure off the cord (maintain this throughout transport.)
- Place mother in a **knee-chest position** (if possible). If mother unable to comply, place in a Trendelenburg position instead.
- Continue to hold pressure off cord. Keep cord moist with sterile saline.
- Transport immediately with early notification to receiving ED.



RUPTURED ECTOPIC PREGNANCY

Pregnancy outside of the uterus with complaints of sudden abdominal pain

- Consider in the following:
  - Any female of childbearing age
  - Unilateral lower abdominal pain
  - Know pregnancy or missed menstrual period
- Maintain minimum SBP > 90 mmHg
- Transport Immediately

SHOULDER DYSTOCIA

Occurs when infant's shoulders are larger than its head

- Occurs most frequently with diabetic, obese mothers, and post-mature pregnancies.
- Do not pull on head. Have the mother drop her buttocks off the end of the bed.
- Next, have her flex her thighs upward to facilitate delivery (McRobert's Position), and apply firm pressure with an open hand immediately above the symphysis pubis.
- **If delivery does not occur**, immediately transport with early notification to the receiving ED, (maintain airway patency).

OBSTETRICAL COMPLICATIONS

SPONTANEOUS ABORTION

Delivery of the fetus or placenta before the 20th week of gestation

- Signs / Symptoms
  - Cramping
  - Abdominal Pain / Backache
  - Vaginal bleeding
- Maintain SBP > 90 mmHg
- Collect any tissue or fetal parts present. Place in paper bag, and then into plastic bag for physician examination.
- **Do not dispose of any tissue or fetal parts.**

UTERINE INVERSION

- Place the patient supine. Do not attempt to detach the placenta or pull on the cord.
- Make one attempt to replace the uterus with the palm of the hand, push the fundus of the inverted uterus toward the vagina. If one attempt is unsuccessful, **do not continue.**
- Cover the uterus with towels moistened with saline and rapidly transport.

UTERINE RUPTURE

Tearing / Rupture of the uterus

- Signs / Symptoms
  - Severe abdominal pain (tender/rigid abdomen)
  - Absent FHTs / Fetal Movement
  - Shock
- Maintain SBP > 90 mmHg

Trauma

GENERAL TRAUMA MANAGEMENT

The general initial assessment and management of a traumatically injured adult and child are essentially the same. Airway and breathing must be evaluated and managed first, followed by assessment of circulation, then a brief neurological examination and complete exposure of the patient to identify all Red/Blue Criteria. One of the most important responsibilities of the pre-hospital provider is to spend as little time on the scene as possible to evaluate the patient, to perform lifesaving maneuvers, and to prepare the patient for transport to the hospital.

Our goal is to be on-scene no longer than 10 minutes with Trauma Alerts

ALL LEVELS

- Scene safety
- Check responsiveness / ABC's
- Stabilize C-spine as needed.
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Control gross external bleeding with direct pressure. Remember to also hold pressure over penetrating trauma sites (gunshot wounds, stab wounds, etc.) to stop any internal bleeding into the tissue.
- Perform brief neurological exam (Level of consciousness (AVPU), pupil reactivity, gross motor function)
- Spinal Motion Restriction ***(if criteria is met)***
- Immobilize and splint obviously injured extremities.
- Vital signs to include pulse oximetry, pulse, respirations, and blood pressure.
- Expose patient as needed and perform a secondary survey. Remember to preserve body heat and to not expose patient in public view.
- Obtain history from patient, family members and bystanders

CREDENTIALED EMT

- Blood glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish large bore IV access. Establish a second IV line if patient is hemodynamically unstable and if time allows.
- Administer IV fluids LR bolus of 250-1000cc as needed if patient is hypotensive or showing signs of possible shock. Follow shock protocol as needed and titrate blood pressure >90mmHg systolic

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12-Lead (if complaint of chest pain and time allows enroute)
- If patient is suspected of having tension pneumothorax, follow chest injury protocol and perform chest decompression as needed.
- Follow pain management protocol as needed to control pain of isolated extremity trauma.
- Contact receiving facility with patient report and report Trauma Alert

GENERAL TRAUMA MANAGEMENT

UNCONTROLLABLE HEMORRHAGE

If patient has experienced blunt or penetrating trauma and is suspected or known to be experiencing uncontrollable hemorrhage

- Consider administering Tranexamic Acid (TXA)
  - If the injury occurred within the last 3 hours **AND** one of the following:
    - Systolic blood pressure < 70 mmHg or,
    - Systolic blood pressure , 90 mmHg and HR >110 bpm, or
    - ETCO2 < 25, or
    - Age > 65 with SBP < 100 AND HR > 100 bpm
- **Dose:** 2 grams IV/IO slow push.
  - **Patients receiving TXA will be transported to a Level 1 Trauma center (i.e., SAMMC or University)**

Contraindications for TXA:

- **Do not administer other medications or blood products in the same IV/IO line while infusion in progress**
- Hemorrhagic shock not caused by trauma
- Isolated Head Injury
- Known pregnancy
- Patient <16 years of age

ANTIBIOTICS FOR SEVERE TRAUMA

Criteria: Open fractures, extensive soft tissue trauma, life or limb threatening penetrating trauma

- Consider: Ceftriaxone 2 grams over 30 minutes via IV pump
  - Alternate administration: 1gram (10cc) IV/IO over 2 minutes
    - If no reactions are noted, administer an additional 1 gram (10cc) in 5 - 10 minutes.

Priority: recognition and treatment of any life-threatening injuries

SPECIAL CONSIDERATIONS

- Rapid Trauma Assessment should be focused on identifying all Red/Blue Criteria (RBC). Any patient with ONE Red or TWO Blue is a Trauma Alert and every effort should be made to package the patient and depart the scene prior to any other interventions except airway management, chest decompression CPR and SMR.
- **For Trauma Alerts:** IV's, cardiac monitoring, pain management, etc. should all be done enroute to the hospital unless scene specific situations dictate otherwise (extrication, pain management before moving, etc.)
- Always remember that traumatic injuries may have been precipitated by a medical event. Proper evaluation and assessments are necessary on all trauma patients to recognize, treat, and/or correct potentially life-threatening medical problems.
- Never remove any penetrating object from the body unless the object is impaled in the face and will block effective airway management.
- Use caution when administering analgesics in patients who have consumed alcohol. Airway and respiratory compromise can be potentiated in these patients.
- Critically injured trauma patients are susceptible to heat loss and preservation of body heat is paramount; keep the patients warm. Hypothermia in critical trauma patients is a leading indicator of mortality. Every effort needs to be made to keep these patients warm, including blankets, warm IV fluids (body temperature) and shutting down air-conditioning in patient compartment enroute to the Trauma Center.

AMPUTATIONS

The partial or complete severance of a digit or limb is an amputation. It often results in the complete loss of the limb at the site of severance. The surgeon may re-implant the amputated part or use the skin for grafting, as they repair the remaining limb. In general, the younger the patient is, the more potential lifetime benefit replantation has to offer

ALL LEVELS

- Check Responsiveness & ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Remove or cut away restrictive clothing or jewelry
- Control hemorrhage, apply sterile dressing to open fractures
- Prevent heat loss
- DO NOT attempt to replace protruding bones
- Assess neurological status of extremity
- Splint and immobilize extremity in position of function if adequate distal pulses are present. You may attempt to realign the extremity if and only if distal circulation is acutely compromised
- Reassess distal neurovascular-motor function after the extremity has been splinted
- Ice musculoskeletal injury if it is available, and if injury is less than 12hours old.
- Gently irrigate amputated parts to remove gross contaminants and wrap in moisten sterile gauze. Place in airtight plastic bag and put bag on ice packs. DO NOT freeze amputated parts. Cover amputated stump with a wet sterile dressing and apply uniform pressure across entire stump.

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPECIAL CONSIDERATIONS

- Pain severity (0 – 10) is a vital sign and should be assessed before and after each medication administration
- Vitals signs (including SpO2 and ETCO2) should be obtain before analgesia administration, post administration and upon arrival at receiving facility
- Never freeze the amputated part by placing it directly on the ice or by adding any other coolant. This could cause irreversible damage to the tissue.
- Cooling may increase the prospect of successful replantation, because it decreases the metabolic rate and inhibits bacterial growth.

BLEEDING CONTROL

In Trauma, one of the most correctible causes of death is uncontrolled hemorrhage. As a patient bleed, they lose vital oxygen carrying hemoglobin molecules that volume expanding colloids do not replace. Shock is defined is Hypo-profusion at the cellular level and its most common cause in trauma is from hypovolemia. Recent research has indicated that the early use of field tourniquets and hemostatic agents prevent the loss of hemoglobin and greatly increase the patient's survival to discharge. A common misconception is that application of a tourniquet means that the patient's limb will automatically be amputated. War time research has disproved this. Medical treatment for hemorrhagic shock should concentrate on stopping the cause of the fluid loss. While Hypovolemic shock is not the only cause of shock in trauma patients all shock should be considered hypovolemic until proven otherwise.

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Completely expose area and apply direct pressure and pressure bandage (Israeli Bandage) to control bleeding.
- If bleeding is **not** controlled with direct pressure and emergency pressure bandage:
  - If bleeding is from extremity trauma apply tourniquet.
    - If bleeding is not controlled by tourniquet, leave tourniquet in place and apply hemostatic agent to the wound.
  - If bleeding is not located on an extremity, then apply hemostatic agent along with a new pressure dressing.
- Prevent heat loss
- Assess neurological status of extremity

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor

BURNS

Chemical burns represent a hazard to both patient and rescuer, and extreme care should be taken to avoid exposure to offending agents. Although the pathophysiology of tissue damage from all types of burns is similar, the medical consequences can be quite different. The eyes are particularly vulnerable to chemical burns and, in general, acids tend to not burn as deeply as alkalis which penetrate very deeply as the tissue is de-fatted. Therefore, eye irrigation should be started early and continue for at least 15 minutes. The care of **electrical burns** should be guided by safety. The heart is most susceptible to voltage below 400 volts. Above this level internal burns are a major complication. *Remember that most injuries in electrical burns are internal*. Fatal arrhythmias are usually a very early problem, but other arrhythmias may occur at any time if the heart has been electrically injured. Care of the patient with **thermal burns** should be guided by scene safety, cooling the burn (if appropriate), maintaining normal body temperature, and protecting the airway. Shock in the very early stages of a burn is generally not associated with the burn, thus one should rule out other life-threatening injuries.

History	Signs and Symptoms	Differential
• Type of exposure (heat, gas, chemical) • Inhalation injury • Time of injury • PMH & Medications • LOC	• Burns, pain, swelling • Dizziness • LOC • Hypotension / shock • Airway compromise (hoarseness/wheezing)	• Superficial 1st degree (do not include in TBSA) • Partial thickness 2nd degree • Full thickness • Thermal injury • Chemical injury • Blast Injury • Radiation Injury

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Remove or cut away restrictive clothing or jewelry
- Prevent heat loss
- Apply dry sterile dressing (may use moist sterile dressing for partial thickness burns <10% BSA)
- Irrigate chemical burn site with water if appropriate to chemical (*if powdered chemical, brush off first before flushing)*

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- **Consider** early intubation if airway compromise develops from inhalation of superheated gases or smoke. Have a high index of suspicion in cases of facial burn, sooty sputum, singed facial hair, etc.
- Establish IV with fluid therapy as noted **(no IV fluid boluses, unless hypotensive due to other trauma)**
  - If TBSA < 20%, Lactated Ringers TKO
  - If TBSA > 20% (2nd/3rd degree) – Lactated Ringer at 500 cc/hr
  - IO access may be utilized if needed, DO NOT obtain access through burns

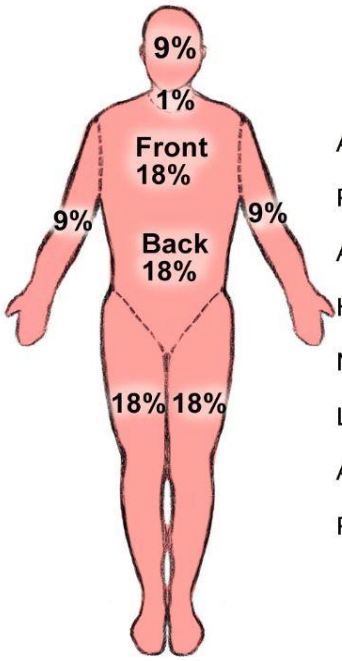
BURNS

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- 12 lead EKG if;
  - inhalation injury, or
  - age is greater than 35, or
  - patient has history/risk factors/physical findings of ischemic heart disease
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPECIAL CONSIDERATIONS

- Critical / severe burns - require direct transport to a burn center. Local facility should be utilized only if critical interventions such as airway management are not possible in the field.
- Burn patients are often trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Pain severity (0 – 10) is a vital sign and should be assessed before and after each medication administration
- Vitals signs (including SpO2 and ETCO2) should be obtain before analgesia administration, post administration and upon arrival at receiving facility



Adult body	% of total
Part	BSA
Arm	9%
Head	9%
Neck	1%
Leg	18%
Anterior trunk	18%
Posterior trunk	18%

CLOSED HEAD INJURY

Closed head injuries usually result from blunt trauma, the most common mechanism being a motor vehicle accident. Providers should attempt to obtain a history from bystanders or family members regarding the patient's condition immediately after the injury. Calculation of a Glasgow Coma Score has prognostic value. Head injury remains a significant cause of death from trauma. Early aggressive management, airway maintenance, oxygenation, spinal motion restriction, and rapid transport to a Trauma Center are the goals of pre-hospital management.

History	Signs & Symptoms	Differential
• Time of injury • Mechanism (blunt v. penetrating) • LOC • Bleeding • PMH / Medications • Evidence of multi-trauma	• Pain, swelling, bleeding • Altered mental status • Unconscious • Respiratory distress / failure • Vomiting • Seizure • Major MOI	• Skull fracture • Brain injury (concussion/contusion) • Epidural hematoma • Subdural hematoma • Subarachnoid hematoma • Spinal injury

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Evaluate patient for needed advance airway management (Delayed sequence intubation)

SPECIAL CONSIDERATIONS

- When treating a patient with a suspected head injury, it is important to find a balance between providing effective brain perfusion (delivering oxygenated blood to the brain) and not allowing for an increase in intracranial pressure (ICP). CO2 is a potent vasodilator. As CO2 levels rise, the resulting hypoxia and hypercarbia result in brain tissue swelling and increased ICP. Studies have shown that when a patient is hyperventilated, the cerebral arteries constrict, decreasing cerebral perfusion. We know that decreasing blood flow to the acutely injured brain is potentially harmful and increases mortality.
- In order to ventilate patients in a manner that mitigates rises in ICP, but still provides generous oxygenation of brain tissue (very, very important in early traumatic brain injury), it is critical that we pay close attention to our ventilatory rates. The adult patient with suspected head injury should be ventilated at 16 breaths per minute. If ETCO2 is available, ventilation should be targeted at keeping the ETCO2 range between 32-35 mmHg

CLOSED HEAD INJURY

SPECIAL CONSIDERATIONS (cont'd)

- As ICP rises, the brain has nowhere to go except to herniate (push through) the tentorium and/or foramen magnum. The chances of patient recovery or survival decrease significantly when cerebral herniation begins. If signs and symptoms of herniation are present, immediate hyperventilation at 20-24 breaths per minute is indicated. If ETCO2 is available, an ETCO2 of 32-35 mmHg is desirable. The theory is that hyperventilation will rapidly drop the CO2 which results in a constriction of the blood vessels, decreased blood flow to the brain, thereby reducing ICP.
- Field evaluation of the seriousness of head injury patients requires a constant evaluation of level of consciousness and vital signs to see if your patient's condition is improving or declining.
- Isolated injury is not an etiology for shock and IV fluids should be reserved for evidence of hypovolemia.
- Look for Cushing's Triad (hypertension-widening of pulse pressure, bradycardia, and irregular respirations) which could indicate herniation

CRUSH INJURIES

Victims entrapped and crushed due to heavy, fallen debris from a structural collapse present a unique challenge. The crushing objects place prolonged and continuous pressure on the extremities that may result in skeletal muscle death (rhabdomyolysis) with release of its cellular contents (myoglobin) into the plasma. These adverse effects are called the **Acute Crush Syndrome**. After the skeletal muscle injury occurs and the crushing object is removed, all of those accumulated cellular toxins (myoglobin) and electrolytes (potassium) are released into circulation and can possibly cause lethal cardiac arrhythmias, acute renal failure, and sudden death. The systemic effects of the Acute Crush Syndrome only occur when the crushing object is removed, and the injured extremity is reperfused. Removal of the object causes massive fluid shifts into the injured muscle, resulting in acute hypovolemia and hypotension. **Large volumes of NS** must be given to the patient intravenously both before and after the crushing object is removed. **DO NOT administer lactated ringers**. The addition of a buffering agent such as sodium bicarbonate to the IV solution can help prevent the myoglobin deposition in the renal tubules and counteract hyperkalemia.

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Prevent heat loss

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- **Prior to being freed from object**: Fluid therapy 10 to 20 mL/kg rapid IV bolus (1 to 2 liters) using normal saline (do not use Lactated Ringer's since it contains potassium).
- **After being freed from object**: Fluid therapy 5 mL/kg/hr (300 to 500 mL/hr).

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Sodium Bicarbonate 1 mEq/kg (maximum of 100 mEq) added to IV fluids and infused as outlined above.
  - **Should not be used unless patient is entrapped more than an hour.**
  - Its use is indicated when evidence of distal ischemia is present – commonly known as the six "Ps." Pain, Pallor, Pulselessness, Paralysis, Paresthesia, Poiklothermia (cool to touch)
- Versed 2.5mg slow IV push (over 2 minutes) if needed for sedation.
  - May repeat twice at the same dose, if no effect in 3 minutes and the SBP > 90 mm Hg
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPECIAL CONSIDERATIONS

- Pain severity (0 – 10) is a vital sign and should be assessed before and after each medication administration
- Vitals signs (including SpO2 and ETCO2) should be obtain before analgesia administration, post administration and upon arrival at receiving facility

EXTREMITY / MUSCULOSKELETAL TRAUMA

Attention should be given to extremity injuries to limit further damage and discomfort for the patient. However, extremity care should never interfere with lifesaving decisions or interventions and should not delay transport of trauma patients.

ALL LEVELS

- Scene safety
- Check responsiveness / ABC's
- Stabilize C-spine as needed
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Return extremity to anatomic position if possible as resistance/pain allows
- Apply splints and re-check neurovascular status after each manipulation and periodically enroute.
- Control bleeding with direct pressure
- Cover open fractures with sterile gauze
- Splint all dislocations (joint injuries) in position found and transport as soon as possible.
- Immobilize all fractures above and below the injury
- Spinal Motion Restriction ***(if criteria is met)***
- Vital signs to include pulse oximetry, pulse, respirations, and blood pressure
- Obtain history from patient, family members and bystanders

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV access

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12-Lead (if complaint of chest pain and time allows enroute)
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPLINTING CONSIDERATIONS

- **Hand and Wrist**
  - Splint to include wrist
  - Assess distal function (pulse, sensation and motion) before and after splinting.
- **Elbow Dislocation**
  - Splint in position found
  - Assess distal function (pulse, sensation and motion) before and after splinting
- **Upper Arm**
  - Splint and swathe arm
  - Assess distal function (pulse, sensation and motion) before and after splinting

EXTREMITY / MUSCULOSKELETAL TRAUMA

- **Shoulder Fracture and Dislocations**
  - Splint in position of comfort, sling and swathe as warranted;
  - Assess distal function (pulse, sensation and motion) before and after splinting
- **Clavicle**
  - Sling and swathe arm
- **Scapula**
  - Sling and swathe arm
  - Assess respiratory status
- **Ribs**
  - Assess respiratory status
  - Flail chest assessment; tape Trauma Dressing to affected area
- **Pelvis**
  - Place on long board immobilization device
  - Do not roll patient
  - Treat for shock, if present
  - Splint legs together, padding under knees for comfort
- **Femur**
  - Splint using traction splint
  - Assess distal pulses and neurologic status before and after splinting;
  - Treat for shock, if present.
- **Fibula-Tibia**
  - Splint adjacent joint
  - Assess distal pulses and neuro status before and after splinting
  - Treat for shock, if present
- **Hip Fracture or Dislocations**
  - Stabilize in position of comfort
  - Assess distal pulses and neuro status before and after splinting
  - Treat for shock, if present.
- **Knee Fractures and Dislocations**
  - Splint in position found;
  - Assess distal pulses and neuro status before and after splinting
- **Foot and Ankle Fractures**
  - Splint but do not apply traction splint;
  - Assess distal pulses and neuro status before and after splinting

PHYSICAL / SEXUAL ASSAULTS

Sexual Assault is a violent crime. Injuries commonly encountered during a sexual assault are usually facial or extremity. Gynecological injuries only account for approximately 7 percent of all injuries. Elderly victims are twice as likely to incur physical not genitalia injuries.

ALL LEVELS

- Check for responsiveness & ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Do not examine the genitalia unless the patient is complaining of bleeding and a dressing is required to control it.
- Apply dressings (only if necessary) to the genital area with the utmost care and consideration for your patient's well-being and for the preservation of criminal evidence. Work in a calm, professional, and non-judgmental manner.
- In cases of severe emotional upset, it may be better to have a same sex provider care for a rape victim's injuries (if possible). If not, a same sex police officer or bystander of the patient's choosing should be present during this time.
- Save any clothing you had to remove during your care. Handle the clothing as little as possible.
- Place items in a paper bag if possible (avoid plastic bags as they may induce moisture into clothing).
- Advise patient not to urinate, defecate, douche, or wash before an emergency department Sexual Assault Nurse Examiner (SANE) or physician has had a chance to do an examination

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor/12-lead EKG (if indicated)

SPECIAL CONSIDERATIONS

- The decision on which of these facilities to use should be made in concert with the investigating law enforcement (LE) agency. LE will usually try to have the patient examined in the county in which the assault occurred...however this may not always be the case. Taking a few minutes to have a discussion with PD will go a long way to helping the patient and helping the crime get solved and properly convicted.
- **Transport destination**: STRAC has a program in place allowing sexual assault patients to be transported to the closest appropriate facility based on findings of the patient assessment. Upon arrival at the facility, the hospital will contact MEDCOM to initiate the regional SANE program.
    - Patients ≥ 18 years of age (No Red/Blue Criteria): Transport to the closest appropriate Emergency department (Free Standing Emergency Departments may be considered)
    - Patient ≤ 17 years of age (No Red/Blue Criteria): Transport to Christus Children's Hospital

SPINAL TRAUMA

Spinal trauma, if not recognized and properly managed in the field, can result in significant life-long injury and impairment. Any patient who has sustained an injury indicative of spinal loading or stretching, significant injury above the clavicles, significant blunt trauma to the torso, a head injury resulting in an altered level of consciousness, or a major fall must be suspected of suffering a potential spinal cord injury and should be maintained in a neutral in-line position (unless contraindicated).

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction (SMR) ***(if criteria is met)***

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac Monitor

SPECIAL CONSIDERATIONS

- Spinal neurogenic shock is a result of the vasomotor instability due to the loss of sympathetic tone. If present, you can expect to see developing hypotension and a normal or bradycardic heart rate without changes to skin.
- Pulse, motor and sensory should be evaluated prior to and after SMR.
- Is there any loss of sensation or movement? If paralysis or parenthesis is present, its location should be monitored and documented for progression or improvement.
- Always consider head injury in cases of spinal trauma and spinal trauma in cases of head injury.

TRAUMA ARREST

Cardiac arrest due to a traumatic injury is associated with a very poor outcome. Unless the underlying condition is identified and corrected, the patient is not likely to be resuscitated. Pre-hospital management of a patient who has suffered a traumatic cardiac arrest is limited to fluid resuscitation and rapid transport to hospital. Scene time should be kept to an absolute minimum because of the overriding need to transport the patient to hospital.

Assessment Requirements	May present as:	Consider Possible Causes
• Assessment: Full Head to toe • EKG monitoring • ETCO2 monitoring • Temperature (core) • Glucose reading	Penetrating / Blunt Trauma: • apneic • pulseless o V-Fib / V-tach o PEA (>40bpm) ---------- **DO NOT attempt resuscitation if patient meets Apparent Death: Traumatic Arrest criteria**	**Medical Condition preceding the "traumatic" arrest** • If suspected follow "normal" cardiac arrest guidelines while integrating guidelines below **Traumatic Causes** • Airway obstruction • Tension pneumothorax • Open chest wounds • Hypovolemic shock o External/internal hemorrhage o Unstable pelvic fracture o Displaced long bone fractures

ALL LEVELS

- Check responsiveness / ABCs
- CPR beginning with chest compressions as needed
  - o Uninterrupted and high frequency CPR (at least 100 compressions/min) is the key to survival for the patient
- Place OPA/NPA and assist ventilations with BVM (Placement of airway devices should not interfere with chest compressions)
- Attach an AED (if available) and follow the AED protocol
  - o Perform CPR (30:2) for 2-3 minutes prior to attaching the Automated External Defibrillator
- Control any substantial exsanguinating hemorrhage (if extremity involved, apply an approved tourniquet)
- Place pelvic binder on any potentially unstable pelvis

CREDENTIALED EMT

- Supraglottic airway placement and confirm/secure tube as per protocol
- Apply chest seals to any open wound between the neck and umbilicus (anterior or posterior)
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Secure airway as required by ET intubation and confirm tube placement as per protocol
- Monitor End Tidal CO2
- Establish Vascular (IV/IO) access - with LR and initiate fluid bolus
  - o IO access - immediately if available or after unable to obtain IV access in 2 attempts

PARAMEDIC

TRAUMA ARREST

- Follow EMT and AEMT guidelines
- Cardiac monitor
- If any possibility of chest injury, perform bilateral chest needle decompression
- If LTOWB is readily available, initiate transfusion as per guidelines.
  - Witnessed traumatic cardiac arrest < 5 min. prior to provider arrival & continuous CPR
- If cause of arrest is determined to be non-traumatic related
  - Identify & treat rhythm as per Cardiac Arrest SMOPs for V-Fib/V-tach or PEA arrests
- Consider termination of care

TRAUMA ARREST – OBVIOUS DEATH CRITERIA

1. If a medical event is suspected, treat as a normal medical cardiac arrest.
   a. If the victim presents in ventricular fibrillation, the likelihood of a medical event precipitating the traumatic event is more likely. Treat as per Medical Cardiac Arrest protocols.

**** If ALL the following criteria are met, no resuscitation efforts should be initiated. ****

2. If the victim is a trauma patient, they should be considered Obviously Dead if the following is found:
   a. The patient is without vital signs, is a victim of blunt or penetrating injury and the arrest was not witnessed by FRO/EMS showing other signs of obvious death **AND has**
      - No respiratory effort on examination over a 30 second time frame.
      - No palpable carotid pulse on examination over a 30 second time frame.
      - No pupillary response.
      - No painful stimuli response (e.g., Trapezius muscle squeeze, sternal rub, fingernail bed pressure).
      - Asystole or PEA < 40 bpm on the monitor in 2 or more leads.
        - A patient who presents in asystole with the above criteria should be considered deceased.

SPECIAL CONSIDERATIONS

- Regardless of the severity of the injury **if the patient has a pulse**, immediately transport to a trauma center.
- During CPR
  - Push hard and fast (at least 100/min)
  - Ensure full chest recoil
  - Minimize interruptions in chest compressions (10 seconds or less)
  - Avoid hyperventilation (ventilate at 8-10 breaths per minute)
  - After an advanced airway is placed:
    - No longer deliver cycles of CPR – give continuous chest compression
    - Give 1 breath every 6-8 seconds
- Check rhythm every 2 minutes
- Rotate compressors every 2 minutes with rhythm checks
- For rescue breathing with a pulse – give 1 breath every 5-6 seconds
- Search for and treat possible contributing factors (6 H's, 5 T's)

PEDIATRIC

(<37 kg)

ALLERGIC REACTION / ANAPHYLAXIS

Allergic reactions and anaphylaxis represent a spectrum of the same problem. Care is focused on reducing or stopping the allergic reaction. The cardinal signs of anaphylaxis are stridor, bronchospasm, and hypotension. The symptoms associated with anaphylaxis may begin within seconds of exposure to an allergen or may be delayed up to 1 hour. However, typical response begins within minutes of exposure and primarily involves the cardiovascular and respiratory system.

History	Signs & Symptoms	Differential
• Onset and location • Insect sting or bite • Food allergy / exposure • Medication allergy / exposure • New clothing, soap, detergent • Past medical history / reactions • Medication history	• Itching or hives • Coughing / wheezing or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotension or shock • Edema	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration / Airway obstruction • Vasovagal event • Asthma / COPD / CHF

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Assist patient with their prescribed Pediatric Epi-pen (0.15mg) (with signs and symptoms of anaphylaxis – significant respiratory distress and/or shock)
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Consider Albuterol 2.5mg nebulizer for minor dyspnea/wheezing
- Epinephrine 1:1000 IM if severe respiratory distress or indicators (wheezing, stridor, etc.)
  - Pedi (30 – 65 lbs.) 0.2 cc IM
  - Pedi (< 30 lbs.) 0.1 cc IM
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- 12 lead EKG if cardiac history
- Benadryl 1mg/kg slow IVP (over 2 minutes) – max dose 50mg

SPECIAL CONSIDERATIONS

- The patient who is in true anaphylaxis rarely presents with hypertension
- Patients with drug or food reaction that have been ingested may have an extended onset of symptoms as the antigens continue to be absorbed from the GI tract.

ALTERED MENTAL STATUS

Altered mental status is evidence of impaired brain function. Children with altered mental status show a change in personality, behavior, or responsiveness. Patients may appear anxious, agitated, or combative, or they may be somnolent, difficult to rouse, or completely unresponsive. An understanding of age-appropriate behavior may help you determine whether altered mental status is present; note, however, that a particular child's normal mental status and functional abilities can vary from what is considered typical for the age. It is important to ask the parents whether the child's mental status and behavior seem unusual. The parents are generally the most reliable source of information on what is normal for their child. Altered mental status often results in hypotonia. Left untreated, this can lead to life-threatening problems, including airway obstruction, inefficient respiration, hypoxemia, and respiratory failure. It is important for you to recognize the signs of altered mental status in children, assess for possible causes, and provide appropriate interventions.

History	Signs & Symptoms	Differential
• Medications • Recent illness • Irritability • Lethargy • Changes in feeding / sleeping • Diabetes • Potential ingestion • Trauma • CVA	• Decrease in mentation • Change in baseline mentation • Decrease in Blood sugar • Cool, diaphoretic skin • Increase in Blood sugar • Warm, dry, skin, fruity breath, kussmaul respirations, signs of dehydration	• Hypoxia • CNS (trauma, stroke, seizure) • Shock • Diabetes (hyper/hypoglycemia) • Toxicological • Acidosis / Alkalosis • Environmental exposure • Electrolyte abnormalities • Psychiatric disorder

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if indicated)***
- If suspected overdose, follow overdose protocol

CREDENTIALED EMT

- Blood glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 Lead EKG

SPECIAL CONSIDERATIONS

- Sepsis with fever or hypothermia may cause an altered mentation in children.
- Is the patient a newborn of a narcotic using mother?
- Any evidence of trauma?
- Is patient under a physician's care for this condition?

BRADYCARDIA

Hypoxemia, hypotension, and acidosis interfere with normal function of the sinus node and AV junctional tissue and slow conduction through normal pathways. Sinus bradycardia, sinus node arrest with a slow junctional or ventricular escape rhythm, and various degrees of AV block are the most common pre-arrest rhythms in children. Bradycardia (heart rate less than 60 bpm in infants / children and < 100 bpm in neonates) associated with poor systemic perfusion should be treated in any infant or child, even if the B/P is normal. Adequate ventilation with 100% oxygen must be ensured, chest compressions performed, and epinephrine and atropine administered, when indicated.

History	Signs & Symptoms	Differential
• Past medical history • Foreign body exposure • Respiratory distress or arrest • Apnea • Toxic or poison exposure? • Congenital disease • Medication (maternal or infant)	• Decreased heart rate • Delayed capillary refill or cyanosis • Mottled, cool skin • Hypotension or arrest • Altered level of consciousness	• Respiratory failure (Hypoxia) • Foreign body • Infection (croup, epiglottitis) • Hypovolemia (dehydration) • Trauma • Toxin or medication • Hypoglycemia

ALL LEVELS

- Check for responsiveness / ABCs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
  - Aggressive oxygenation and assisted ventilations may be required
- Obtain vital signs
- Perform chest compressions if despite oxygenation and ventilation, a persistent heart rate < 60 / minute in infant / child

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Epinephrine1:10,000 IV / IO: 0.01 mg/kg (0.1 mL/kg), repeat every 3 to 5 minutes as needed.
  - **Epi IV should only be used in a hemodynamically unstable patient. (Severe Hypotension, AMS, Respiratory Failure, Peri-Arrest)**
- Atropine IV / IO: 0.02mg/kg (Max dose – 1mg) repeat every 5 minutes

SPECIAL CONSIDERATIONS

- Sinus bradycardia is a common manifestation of hypoxia in the infant. The older child may present with specific symptoms such as syncope, chest pain, shortness of breath, or palpitations.
- For structural cardiac disease (AV node disease etc.), atropine should be administered in the unstable or poorly perfused patient. For ischemic/hypoxic bradycardia epinephrine is recommended by Pediatric Advanced Life Support (PALS).

CARDIAC ARREST – ASYSTOLE / PEA

If found in asystole, perform 200-220 compressions (approx. 2 min) of CPR prior to beginning any other treatment

History	Signs & Symptoms	Differential
• Events leading to arrest • Estimated downtime • Past medical history • Medications • Existence of terminal illness • Airway obstruction • Hypothermia • Suspected abuse; shaken baby • syndrome, pattern of injuries • SIDS	• Unresponsive • Cardiac Arrest • Signs of lividity or rigor	• Respiratory failure • Foreign body • Hyperkalemia • Infection (croup, epiglottitis) • Hypovolemia (dehydration) • Congenital heart disease • Trauma • Hypothermia • Toxin or medication • Hypoglycemia

ALL LEVELS

- Check for responsiveness / ABCs
- Initiate CPR
- Placement of AED and follow prompts as instructed (greater than 1 year of age)
- NPA/OPA with assisted ventilations via BVM as soon as available

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Secure airway as required by ET Intubation and confirm tube placement as per protocol
- Monitor End Tidal CO2
- Obtain IV access – initiate fluid bolus

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor (**Confirm asystole in more than one lead**)
- IO access (immediately if available)
- Epinephrine 0.01mg/kg (1:10,000) rapid IV/IO push every 3-5 minutes
  - If IV/IO not available - Epinephrine 0.1mg/kg (1:1,000) ETT add 3-5 NS
- Consider Sodium Bicarbonate 1 mEq/kg **(for prolonged cardiac arrest)**
- If no rhythm change or ROSC after 25 minutes of aggressive CPR and ACLS therapies, consider Ceasing Resuscitation Efforts

SPECIAL CONSIDERATIONS

- Consider reversible causes (6 H's, 5 T's)
- Acidosis in children is primarily a problem of ventilation and oxygenation. Sodium Bicarbonate **should not** be used during brief resuscitation episodes but may be beneficial when other therapies are ineffective, and **resuscitation is prolonged (> 10 minutes).**
- Double the dose of Epinephrine when dealing with an arrest scenario possibly involving an overdose on beta-blockers or calcium channel blockers

CARDIAC ARREST – VFIB / PULSELESS VTACH

If un-witnessed arrest, perform **220 Compressions** (approx. 2-3 min) of CPR prior to beginning treatment
If witnessed arrest – identify and treat rhythm

History	Signs & Symptoms	Differential
• Events leading to arrest • Estimated downtime • Past medical history • Medications • Airway obstruction • Hypothermia	• Unresponsive • Cardiac Arrest	• Respiratory failure / Airway obstruction • Reversible Causes (5 Hs / 5 Ts) • Congenital heart disease

ALL LEVELS

- Check for responsiveness / ABCs
- Initiate CPR
- Placement of AED and follow prompts as instructed (greater than 1 year of age)
- NPA/OPA with assisted ventilations via BVM as soon as available

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Secure airway as required by ET Intubation and confirm tube placement as per protocol
- Monitor End Tidal CO2
- Obtain Vascular access – initiate fluid bolus

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Defibrillate once at 2 j/kg
- Continue CPR for 5 cycles (2-3 minutes)
- IO access (immediately if available or after unable to obtain IV access in 2 attempts)
- Epinephrine 0.01mg/kg (1:10,000) rapid IV/IO push every 3-5 minutes
  - If IV/IO not available - Epinephrine 0.1mg/kg (1:1,000) ETT add 3-5 NS
- Defibrillate once at 4 j/kg
- Amiodarone 5mg/kg IV/IO, may repeat after 10 minutes
- Defibrillate once at 4j/kg
- Lidocaine 1mg/kg IV/IO,
  - May repeat after 5 minutes for max dose of 3 doses or 3mg/kg

SPECIAL CONSIDERATIONS

- Consider reversible causes (6 H's, 5 T's)
- Acidosis in children is primarily a problem of ventilation and oxygenation. Sodium Bicarbonate **should not** be used during brief resuscitation episodes but may be beneficial when other therapies are ineffective, and **resuscitation is prolonged (> 10 minutes).**
- Double the dose of Epinephrine when dealing with an arrest scenario possibly involving an overdose on beta-blockers or calcium channel blockers

DIABETIC EMERGENCIES

Diabetes is a disease in which the body does not produce or properly use insulin. Diabetics may have abnormally high or low blood glucose leading to symptoms. The goal in managing diabetic conditions in the pre-hospital setting is glucose measurement, treatment of identified abnormalities, and search for precipitating causes. Type 1diabetes is the most common form of diabetes in children: 90-95 per cent of children under 16 with diabetes have this type. It is caused by the inability of the pancreas to produce insulin. Type 1diabetes is classified as an autoimmune disease, meaning a condition in which the body's immune system 'attacks' one of the body's own tissues or organs. In Type 1 diabetes it's the insulin-producing cells in the pancreas that are destroyed.

History	Signs & Symptoms	Differential
• Past medical history • Medications • Recent blood glucose check • Last meal	• Altered mental status • Combative / irritable • Diaphoresis • Seizures • Abdominal pain • Nausea / vomiting • Weakness • Dehydration • Deep / rapid breathing	• Alcohol / drug use • Toxic ingestion • Trauma; head injury • Seizure • CVA • Altered baseline mental status

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs

CREDENTIALED EMT

- Blood glucose
  - If blood glucose value < 70mg/dl with signs/symptoms of hypoglycemia administer glucose
- Oral Glucose (15 grams), if the patient is awake and able to maintain airway
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Administer D10 (If BGL < 70 with signs/symptoms)
  - **Pediatric:** Administer 2 – 4 ml/kg IV bolus, reevaluate blood glucose and LOC
    - If no response administer additional bolus, the reevaluate
  - **Neonate (<1y.o.):** Administer 2 ml/kg IV bolus, reevaluate blood glucose and LOC
    - If no response administer additional bolus, then reevaluate

DIABETIC EMERGENCIES

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Glucagon 0.5 mg IM if unable to obtain peripheral venous access
- If hyperglycemia (BS > 300 mg/dl) with associated signs and symptoms of hypoperfusion.
  - Infuse 100cc of NS over 30 to 60 minutes, followed by NS at 100 mL/hr.
- **Carefully and closely monitor** patient for signs / symptoms of fluid overload

SPECIAL CONSIDERATIONS

- The blood glucose level at which hypoglycemia occurs in an individual is variable but is generally accepted as < 70 mg/dL. Therefore, for simplification, hypoglycemia is defined as a blood glucose level < 70 mg/dL, with any degree of altered mentation.
- Ideally all hypoglycemic children who receive IV dextrose in the field should be transported. However, if the patient is A&Ox4 and the parents are refusing, medical control should be contacted with all cases.
- All patients being treated for hypoglycemia will receive repeat blood glucose level testing in between all attempts at correcting glucose levels.
- Glucagon requires stored liver glycogen and may not work in a malnourished patient. Glucagon's onset is usually within 10 minutes.

DROWNING / NEAR DROWNING

The primary mechanism of death in drowning is hypoxia and suffocation due to lack of oxygen or atelectasis of lung tissue. Drowning can occur anywhere from a residential bathroom to area lakes. Near Drowning is defined as a submersion accident with recovery of vital signs and survival greater than 24 hours post incident. Concomitant factors of trauma from surface impacts, spinal cord injuries, orthopedic, and tissue injuries are common. Patient survival is based largely on early access, aggressive airway management and resuscitation intervention

History	Sign & Symptoms	Differential
• Submersion in water (any depth) • Any Trauma • Duration of immersion • Water temperature / hypothermia • Degree of water contamination • SCUBA (length of dive)	• Unresponsive • Mental status changes • Decreased / absent vital signs • Vomiting • Abnormal breath sounds • Apnea	• Trauma • Pre-existing medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness • Post-immersion syndrome

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Check patient's core temperature
- Provide and maintain warmth

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor

SPECIAL CONSIDERATIONS

- A significant number of near drownings involve injuries to the cervical spine due to diving accidents. Spinal precautions should be at all stages of rescue and treatment for the patient.
- Type of incident (surface impact, submerged object strike, propeller trauma). If submerged, how long under and how deep?
- Weather conditions, water temperature, temperature at depth recovered (if SCUBA recovery).

DROWNING / NEAR DROWNING

SPECIAL CONSIDERATIONS

- Remember that successful resuscitation is possible with prolonged submersion in cold water.
- Hypothermic patients have slowed uptake and circulatory functions, remember: No one is dead until they are warm and dead!

RESCUE MODE (full resuscitation efforts indicated): Active phase of response operations, which includes rescuers searching for patient with the intent of full resuscitative efforts upon locating patient with a reliable "point last seen" or witnessed submergence of 1 hour or less in surface temperature water of **70 degrees or less,** or 30 minutes in surface water >70 degrees.

RECOVERY MODE (no resuscitative efforts indicated): Phase of operation that begins after the expiration of the "rescue mode" time. Operations in this phase focus on recovery of the body with no plans for resuscitation.

HEAT RELATED EMERGENCIES

Heat cramps occur as a result of the patient replacing his/her fluid and salt loss with just fluid, resulting in low salt level and muscle cramps. Patient may complain of muscle cramps, possible severe, especially in the legs and abdomen. Mental status will remain clear. Patient may exhibit nausea, vomiting, dizziness, hypotension, exhaustion; pulse may be rapid, skin pale and moist and may progress to heat exhaustion if not treated. **Heat exhaustion** commonly occurs in high heat, high humidity situations and tends to occur in people working or exercising in these situations. Signs and symptoms may be preceded by thirst, headache, fatigue, weakness, nausea and vomiting, abdominal cramping, impaired judgment, or may come about suddenly. Body temp will remain normal or decreased, pale and moist. Pulse is rapid and weak, breathing is shallow and fast, blood pressure may be decreased, and pupils dilated. **Heat stroke** is a life-threatening emergency. Signs and symptoms may include high temperature of up to 106 degrees, hot and dry flushed skin, rapid and bounding pulse initially, headache, dizziness, dry mouth, coma, and seizures. Do not let the presence of diaphoresis allow you to miss the patient who is suffering from Heat Stroke.

History	Signs & Symptoms	Differential
• Exposure to increased temperatures and / or humidity • PMH / Medications • Time and duration of exposure • Poor PO intake, extreme exertion • Fatigue and / or muscle cramping	• Altered mental status / coma • Hot, dry or sweaty skin • Hypotension or shock • Seizures • Nausea	• Fever (Infection) • Dehydration • Medications • Hyperthyroidism (Storm) • Delirium tremens (DT's) • Heat cramps, exhaustion, stroke • CNS lesions or tumors

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***
- Obtain an accurate body temperature (rectal preferred).
- Move to cooler environment and remove excess clothing, protect from further heat gains.
- **HEAT EXHAUSTION ONLY:** Carefully begin rehydration with **oral isotonic solutions or water**, if the patient can tolerate liquids. Do not give large amounts of fluid rapidly or administer fluids by mouth to any patient who has an altered mentation.
- **HEAT EXHAUSTION:** If temperature is > 103 degrees F., cool patient with ice packs, cool wet towels, or fans and spray water applied to areas where major vessels come close to the skin surface, (i.e., carotids, femorals, brachials).
  - Remove cooling agents when temperature reaches 100 degrees F. to avoid too rapid of a temperature drop which may initiate the shivering process (which will increase temperature).
- **HEAT STROKE:** Aggressive evaporative cooling is indicated (using fine mist water spray and forced air stream with fans), apply ice packs to groin and axillae.
  - Continue cooling until core temperature reaches or is less than 104 degrees (to avoid too rapid of a temperature drop), or shivering begins (which will increase temperature).

CREDENTIALED EMT

- Lead placement

HEAT RELATED EMERGENCIES

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Blood Glucose (follow diabetic protocol if BG <70 or >300 mg/dl)
- **HEAT EXHAUSTION:** If evidence of hypovolemia or hemodynamic compromise, or severe heat cramps with painful, involuntary, muscle spasms.
  - Fluid therapy 10 to 20 mL/kg IV NS
- **HEAT STROKE:** If evidence of hypovolemia or hemodynamic compromise exists,
  - Cautious fluid therapy initially at 250 mL/hr. of NS
  - Then initiate fluid therapy at 10 to 20 mL/kg rapid IV bolus.
- **Monitor for signs or symptoms of volume overload**

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor

SPECIAL CONSIDERATIONS

- Heat cramps-> heat exhaustion-> heat stroke is an entire spectrum of symptoms. Historically heat exhaustion involved a sweating patient while heat stroke involved a non-sweating patient. However, currently the definition of heat stroke involves altered mental status, seizures, or coma (i.e. neurological changes) regardless if the patient is sweating or not
- Usually the very young (infants) and the very old are the most affected by heat related emergencies
- **DO NOT over cool a hyperthermic patient.** If shivering occurs, stop cooling and lightly cover the patient. Shivering will generate an enormous amount of heat in the already hyperthermic patient.
- The major difference between heat exhaustion and heat stroke is generally CNS impairment.
- The treatment of heat exhaustion is rest with fluid volume and electrolyte replacement.
- Severe heat cramps will respond to intravenous rehydration with NS

PEDIATRIC

HYPOTENSION (NON-TRAUMA)

Bleeding can occur from a variety of sources, many of them hidden. Often a patient's past medical history will suggest an etiology. Tachycardia and tachypnea should always raise the question of occult bleeding. Pre-hospital care is primarily supportive and focused on maintaining adequate oxygenation, fluid replacement, and monitoring vital signs.

History	Signs & Symptoms	Differential
• Blood loss • Fluid loss • Vomiting • Diarrhea • Fever • Infection	• Restlessness, confusion, weakness • Dizziness • Tachycardia • Hypotension (Late sign) • Pale, cool, clammy skin • Delayed capillary refill • · Dark-tarry stools	• Shock ▪ Hypovolemic ▪ Cardiogenic ▪ Septic ▪ Neurogenic ▪ Anaphylactic • Trauma • Infection • Dehydration • Congenital heart disease • Medication or Toxin

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Spinal Motion Restriction (if indicated)
- Oral Glucose 15-30gm (if suspected hypoglycemia)
- Obtain Temperature

CREDENTIALED EMT

- Lead placement

ADVENCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Blood Glucose (follow diabetic protocol if BG <70 or >300 mg/dl)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- If Sepsis is suspected (see criteria below)
  - Ceftriaxone 50 mg/kg IV/IO Slow push (Max: 2 grams)

SPECIAL CONSIDERATIONS

- Was there any trauma sustained prior to the bleeding?
- Is the patient taking any medications, which may cause bleeding?
- Internal bleeding from abuse? Be observant

HYPOTENSION (NON-TRAUMA)

PEDIATRIC SEPSIS CRITERIA	
Suspected Infection ** & End Tidal CO2 < 30 mmHg & Altered Mental Status or Poor Perfusion (Capillary refill > 3 seconds, mottled skin, cool/clammy skin, weak/thready pulse)	**All Pediatric patients are at risk of Sepsis, however, infection should be strongly considered in patients with: • Indwelling lines • Need for ventilator or tracheostomy support • Recent surgery/hospitalization • History of immunocompromise/unvaccinated • Cancer • Sickle cell disease • Cystic fibrosis • Congenital heart disease • Transplanted organ • diabetes

NAUSEA / VOMITING

Nausea is the sensation that there is a need to vomit. Nausea can be acute and short-lived, or it can be prolonged. All stimuli that cause nausea work via the vomiting center in the brain which gives rise to the sensation of nausea and coordinates the physical act of vomiting. Usually vomiting is harmless, but it can be a sign of a more serious illness. Adults, usually, have a lower risk of becoming dehydrated than children because they can usually detect the symptoms of dehydration.

History	Sign & Symptoms	Differential
• Age • Time of last meal • Last bowel movement/emesis • Improvement or worsening with food or activity • Duration of problem • Past medical/surgical history • Menstrual history (pregnancy) • Travel history • Bloody emesis / diarrhea	• Abdominal Pain? • Character of pain (constant, intermittent, sharp, dull, etc.) • Distention • Constipation • Diarrhea • Anorexia • Radiation	• CNS Issues • Myocardial infarction • Drugs • GI or Renal disorders • Diabetic ketoacidosis • Gynecologic disease • Infections (pneumonia, influenza) • Food or toxin induced • Medication or Substance abuse • Pregnancy

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain orthostatic vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Blood glucose
- If active nausea/vomiting, Isopropyl alcohol pad – inhale for 1 minute
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG
- Zofran 0.1 mg/kg slow IV/IO; repeat once after 10 minutes if nausea/vomiting persists.
  - Max total dose 4mg
  - **Do not give to child with age less than 6 months old**

NEWBORN RESUSCITATION

Most full-term newborns require no resuscitation beyond maintenance of temperature, suctioning of the airway, and mild stimulation. Most neonatal resuscitations in the pre-hospital setting occur without prior notice. Since the best resuscitation results are obtained in a well-equipped and well-staffed delivery room, every reasonable and safe effort should be made to delay birth until the mother can be transported to a delivery room. Pre-hospital transport delays should always be kept to a minimum when possible.

History	Signs & Symptoms	Differential

• Due date and gestational age
• Multiple gestation (twins etc.)
• Meconium
• Delivery difficulties
• Congenital disease
• Medications (maternal)
• Maternal risk factors
  ▪ substance abuse
  ▪ smoking
	• Respiratory distress
	• Peripheral cyanosis or mottling (normal)
	• Central cyanosis (abnormal)
	• Altered level of responsiveness
	• Bradycardia
		• Airway failure
		• Secretions
		• Respiratory drive
		• Infection
		• Maternal medication effect
		• Hypovolemia
		• Hypoglycemia
		• Congenital heart disease
		• Hypothermia

ALL LEVELS

- Assess responsiveness, breathing, and pulse
  - Palpate base of umbilical cord, brachial or femoral artery
  - Auscultation of apical heart sounds
- Place the newborn on his/her back with the head in a neutral position to avoid hyperextension or flexion of the neck.
- If meconium staining is present, as soon as recognized
  - Suction the mouth with bulb suction before suctioning the nose or providing ventilations.
  - If meconium is observed during delivery, you must suction prior to delivery of the body.
- After delivery, use mild stimulation (drying, warming, and suctioning) as needed.
  - If spontaneous and effective respirations are not established after 5 to10 seconds of stimulation, ventilatory assistance (40 - 60 breaths/minute) with an infant BVM is required.
- If the newborn's heart rate is less than 60 beats per minute and does not increase after BVM ventilation with 100% oxygen for approximately 30 seconds
  - Chest compressions should be initiated, (refer to BLS guidelines for proper depth and technique).
- Dry the newborn, wrap in towel, head cap, or blanket and maintain warmth.
  - **DO NOT** allows the newborn to become hypothermic.
- Record time of delivery when patient status allows.

ADVANCED EMT (AEMT)

- **Endotracheal intubation is indicated when**:
  - BVM ventilation is ineffective & positive-pressure ventilation is necessary (with ETCO2 use)
  - tracheal suctioning is required for aspiration of thick, particulate meconium using a meconium aspirator
- Fluid resuscitation therapy should be instituted when signs and symptoms of shock (rare) are present.
  - 10 mL/kg IV/IO bolus of NS administered as rapidly as possible (in less than 20 minutes).
  - Reassess the newborn and if signs and symptoms of shock persist, repeat bolus of 20 mL/kg NS IV/IO.

PARAMEDIC

- Follow specific algorithms in cases of bradycardia, tachycardia, or cardiopulmonary arrest.

NEWBORN RESUSCITATION

NEWBORN DELIVERY / RESUSCITATION FLOWCHART:

1. Deliver head.
2. Suction mouth, then nose and posterior pharynx with bulb syringe.
3. Complete delivery

If meconium is absent:

- *Dry, stimulate, cover head, keep warm*

Thick / particulate meconium present:

- *Visualize and suction hypopharynx.*
- *Intubate and perform deep suctioning.*
- *Repeat until free of meconium.*

Respiratory rate spontaneous with good effort

Respiratory rate slow/gasping or absent:

- *Position airway and support ventilations with BVM and 100% Oxygen at a rate of 40 – 60 per minute for 15 – 30 seconds*

Evaluate Heart Rate

HR < 60 BPM
Continue Ventilations
Begin CPR @ 120/min

HR 60 – 80 BPM
Support Ventilations with 100% Oxygen

HR > 100 BPM
Reassess Ventilations
Evaluate Color
APGAR scores

Evaluate Heart Rate

No Change in Heart Rate

- Epinephrine (1:10,000) IV / IO / ET
  - 0.01 – 0.03 mg/kg
  - May repeat every 3 – 5 min
- Narcan 0.1 mg/kg (IV/IO/SQ/ET)
  - If substance abuse if suspected

HR > 100 BPM

- **If Cyanotic**
  - O2, IO, Monitor, SpO2
- **If Pink**
  - Support ABCs, keep warm, transport

Consider a fluid bolus of NS @ 10 ml/kg for hypovolemia & hypoperfusion is noted

Consider Sodium Bicarbonate 1mEq/kg IV / IO if indicated (dilute 1:1 for premature infant)

NEWBORN RESUSCITATION - APGAR

- All newborns have difficulty tolerating a cold environment. Depressed infants are especially at risk for complications of cold stress, and recovery from acidosis is delayed by hypothermia. Heat loss may be prevented by (1) quickly drying the amniotic fluid covering the infant; (2) removing wet linens from contact with the baby. Methods of warming include blankets, warming mattresses, warm towels, and placement of towel-wrapped latex gloves filled with warm water around the infant.
- IO access should be attempted if no peripheral access can be obtained after 3 attempts or 90 seconds in patients with cardiovascular collapse
- Acidosis in children is primarily a problem of ventilation and oxygenation. Sodium bicarbonate should not be used during brief resuscitation episodes but may be beneficial when other therapies are ineffective, and resuscitation is prolonged (> 10 minutes).
- Standard 8.4% sodium bicarbonate is very hyperosmolar and repeated doses can produce symptomatic hypernatremia and hyperosmolarity as well as transient vasodilatation and hypotension. In premature infants or infants with low birth weight, a 4.2% solution should be used by mixing an equal amount of bicarbonate with normal saline.
- Small amounts of meconium may merely discolor the amniotic fluid with no particles of meconium visible. Special management with deep tracheal suctioning is not necessary.
- Criteria for NOT resuscitating a newborn are confirmed gestational age of less than 23 weeks, birth weight less than 400grams, or anencephaly.

	0	1	2
Appearance	Blue All Over	Blue extremities, Pink Body	Normal
Pulse	Absent	<100 bpm	>100 bpm
Grimace	No response to stimulation	Grimace/feeble cry when stimulated	Pulls away when stimulated
Activity	None	Some flexion	Active Movement
Respiration	Absent	Weak	Strong

OVERDOSE / POISONING

It is impossible to include all potential toxic exposures or poisonings in this Standard. Management of the poisoned / exposed patient focuses on several principles; *decontamination* limits further absorption and minimizes the extent of toxicity; *supportive care* limits the effects of the serious complications of poisoning on the primary systems at risk; and *definitive care* limits the severity or duration of toxicity through the use of pharmacologic antagonists (antidotes) or enhances elimination of the toxin itself. The poisoning / exposure may be accidental or intentional

History	Sign & Symptoms	Differential
• Ingestion or suspected ingestion of a potentially toxic substance • Substance ingested, route, quantity • Time of ingestion • Reason (suicidal, accidental, criminal) • Available medications in home • PMH, medications	• Mental status changes • Hypotension / hypertension • Decreased respiratory rate • Tachycardia, dysrhythmias • Seizures • S.L.U.D.G.E. • D.U.M.B.B.E.L.S	• Tricyclic antidepressants (TCAs) • Acetaminophen (Tylenol) • Aspirin • Depressants • Stimulants • Anticholinergic • Cardiac medications • Chemicals • Insecticides (organophosphates)

ALL LEVELS

- **Scene safety (park unit upwind, use appropriate Personal Protective Equipment).**
- **Identify substance and assure appropriate patient decontamination (completed by trained, equipped providers).**
- Check for responsiveness / ABCs
- Flush skin / mucous membranes with appropriate solution, if indicated.
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Obtain substance name and contact Poison Control **1-800-222-1222**

CREDENTIALED EMT

- Blood glucose
- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Narcan 0.1 mg/kg IV/IM/IN/IO for known narcotic overdoses with respiratory depression.
  - Max single dose 0.5 mg (Total Max: 2 mg)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead

PEDIATRIC

REACTIVE AIRWAY DISEASE

History	Signs & Symptoms	Differential

• Time of onset
• Possibility of foreign body
• Past Medical History
• Medications
• Fever / Illness
• History of trauma
• History / possibility of choking
• Ingestion / OD
• Congenital heart disease
	• Respiratory Effort – accessory muscle use, retractions, pursed lips, tripod position
	• Neurological – impaired LOC, not interactive
	• Difficulty speaking
	• Breath Sounds
	  ○ Wet/rales/crackles – pneumonia
	  ○ Expiratory wheezing – asthma
	  ○ Diminished – pneumonia, pneumothorax, asthma
	  ○ Inspiratory stridor – croup, bronchiolitis
	  ○ Hoarseness/Drooling – upper airway obstruction, epiglottitis
	• Fever
		• Croup
		• Bronchiolitis
		• Asthma
		• Epiglottitis
		• Aspiration
		• Anaphylaxis
		• Pneumonia
		• Sepsis
		• Toxic Inhalation
		• Upper Airway Obstruction

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Assist patient with their metered dose inhaler
- Place patient in position of comfort

CREDENTIALTED EMT

- Lead placement
- Albuterol 2.5mg via handheld nebulizer (may repeat in 5 minutes)

  OR
- Xopenex
  - < 6 y.o. – 0.625 mg via handheld nebulizer
  - > 6 y/o – 1.25 mg via handheld nebulizer

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

REACTIVE AIRWAY DISEASE

PARAMEDIC

- Follow EMT and AEMT guidelines.
- Cardiac monitor
- If stridor or "barky cough" is present, or Asthma refractory to albuterol or Xopenex treatments
  - Racemic Epinephrine 0.5 ml (2.25% solution) mixed in 3 ml NS via nebulizer
    - may repeat every 10 minutes as needed with continued respiratory distress)

If patient is not responding to treatment with severe respiratory distress AND signs of impending respiratory failure

- Signs/Symptoms of impending Respiratory Failure
  - SPo2 readings <85%
  - Increasing ETCO2 readings despite treatment (>50)
  - Paradoxical abdominal movement
  - unable to speak in complete sentences
  - absent or greatly diminished breath sounds
- Consider
  - Epinephrine 1:1000 IM if severe respiratory distress or indicators (wheezing, stridor, etc.)
    - Pedi (30 – 65 lbs.) 0.2 cc IM
    - Pedi (< 30 lbs.) 0.1 cc IM
  - Dexamethasone 0.6 mg/kg IV/IM/IO (Max dose: 10 mg)
    (DO NOT administer to patients with audible rales and/or elevated temp)
  - Magnesium Sulfate 40mg/kg IV/IO in 50ml NS over 20 minutes. (Max dose: 2 grams)
    - Administer via IV pump

    (DO NOT administer Magnesium with audible stridor or symptom of croup)

SPECIAL CONSIDERATIONS

- In upper airway disorders (i.e., epiglottitis, croup, foreign body airway obstruction), invasive airway maneuvers should **ONLY** be attempted if patient is in respiratory arrest, as aggravation of irritated tissues can cause further airway obstruction.
- Epinephrine should be reserved for those patients who are unable to generate adequate tidal volume to deliver aerosolized drug to the bronchial tree. Do not use epinephrine excessively, it tends to thicken secretions, deplete glycogen stores, and increase apprehension

SEIZURES

Seizures are defined as an episode of abnormal neurologic function caused by an abnormal electrical discharge of brain neurons. Remember that "everything which falls down and shakes is not a seizure." There are many episodic disturbances of neurological function, which can mimic a seizure. Status epilepticus is a true medical emergency defined as either continuous seizures lasting at least 5 minutes or two or more discrete seizures between which there is incomplete recovery of consciousness. Most patients with seizure disorders evaluated by EMS are postictal, having seized prior to EMS arrival. ALL first-time seizures, including seizures associated with a fever, should be evaluated by a physician.

History	Signs & Symptoms	Differential
• Fever, Sick contacts • Prior history of seizures • Medication compliance • Recent head trauma • Whole body vs unilateral seizure activity • Duration, Single/multiple	• Fever; hot, dry skin • Seizure activity • Incontinence • Tongue trauma • Rash • Nuchal rigidity • Altered mental status	• Simple Febrile seizure • Infection • Head trauma, Medication or Toxin • Hypoxia or Respiratory failure • Hypoglycemia • Metabolic abnormality / acidosis • Tumor

ALL LEVELS

- Check responsiveness / ABCs
- Remove all possible hazards to protect the patient from further injuries
- Avoid physical restraint unless absolutely necessary to protect the patient
- Do not attempt to put anything in the patient's mouth
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Suction as needed to clear the airway.
- Obtain vital signs
- If suspected overdose, follow overdose protocol
- Check for responsiveness

CREDENTIALED EMT

- Blood glucose
- Lead placement
- If fever is greater than 101.0 degrees F (rectal or oral) with or without seizure activity:
  - Acetaminophen 15 mg/kg PO (if mental status allows PO administration)

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg
- Blood glucose (follow diabetic protocol if BG <70 or >300 mg/dl)

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Administer
  - Midazolam
    - 0.2 mg/kg IV/IO/IM/IN (**Max single dose: 2mg IV/IO and 5 mg IM/IN)**
    - May repeat every 5 minutes for seizures to a max dose of 10 mg

SEIZURES

POSSIBLE FEBRILE SEIZURES AND REFUSAL OF TRANSPORT GUIDANCE

- Febrile seizures are common in patients <6 years old, but they still require further medical evaluation and treatment. Every effort should be made to transport these patients to the Emergency Department
- If the parent or guardian is refusing treatment/transport, the following questions should be utilized to provide guidance to the parent/guardian with continuing with the refusal.
  - Has the patient recently been ill?
  - Does the patient have a history of seizures or is this the first?
  - How many seizures have occurred with this incident?
  - Do you have a Primary Care physician (PCP) to follow-up with for further evaluation?
- If the parent/guardian continues to refuse treatment/transport after discussing the above questions, follow the Refusal guidelines and obtain a signed refusal.

SPECIAL CONSIDERATIONS

- **All first-time seizure patients should be transported to the Emergency Department for evaluation.**
- ********Patient must be transported if acetaminophen is given********
- Always assess blood glucose level to rule out a hypoglycemic-induced seizure.
- Always protect the airway since the patient could aspirate and obstruct the airway.
- If present during initial onset of seizure, thoroughly document onset of seizure including:
- Type of seizure activity- tonic/clonic, focal motor, Jacksonian March, absence, etc.
- Time of seizure onset and duration
- Most seizure deaths are caused by hypoxia. It is often very difficult to determine the difference between a postictal patient and a hypoxic patient. Always err to the side of caution and treat for hypoxia until proven otherwise.
- Patients emerging from seizures are confused, agitated, and embarrassed. Rescuers should make every effort to protect the patient's privacy, empty the room of all unnecessary personnel, and speak on the patient's level in a very soft, quiet voice. Every effort should be made to have one responder establish and maintain patient contact until the patient has emerged from their postictal state. All extraneous noise (radios, equipment, etc.) should be minimized.
- Seizure medications carried by System units should not be used to "prevent" seizures. They are intended to stop or reduce witnessed seizures, status epilepticus, and to help with postictal patients whose seizures cannot be safely controlled by non-pharmacological methods.
- Appropriate cooling measures include: (1) unwrapping the patient if covered with clothing or blankets *slowly* sponging with tepid bath water (too cold water can cause vascular collapse).

Tylenol Dose Chart

lb.	11	13	15	18	20	22	24	26	29	31	33	35	37
kg.	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
15mg/kg	75	90	105	120	135	150	165	180	195	210	225	240	255
Dose(cc)	**2.3**	**2.8**	**3.3**	**3.8**	**4.2**	**4.7**	**5.2**	**5.6**	**6.1**	**6.6**	**7.0**	**7.5**	**8.0**

lb.	40	42	44	46	48	51	53	55	57	59	62	64	66
kg.	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
15mg/kg	270	285	300	315	330	345	360	375	390	405	420	435	450
Dose(cc)	**8.4**	**8.9**	**9.4**	**9.8**	**10.3**	**10.8**	**11.3**	**11.7**	**12.2**	**12.7**	**13.1**	**13.6**	**14.1**

TACHYCARDIA (POOR PERFUSION)

By far the most common arrhythmia seen in the pediatric age patient is paroxysmal supraventricular tachycardia (PSVT), which may occur in all age groups but is most common in infancy. Presentation in infancy is characterized by poor feeding, rapid breathing or irritability. The infant may appear very ill and be misdiagnosed with sepsis. The diagnosis of PSVT is suspected in the child who presents with a heart rate between 200 and 300 beats/minute. Congestive heart failure may be present. Wide complex tachycardia is presumed to be ventricular in origin, since PSVT with aberration is extremely rare in children.

History	Signs & Symptoms	Differential
• Past medical history • Medications or Toxic Ingestion • (Aminophylline, Diet pills, • Thyroid supplements, • Decongestants, Digoxin) • Drugs (nicotine, cocaine) • Congenital Heart Disease • Respiratory Distress • Syncope or Near Syncope	• Heart Rate: ▪ Child > or < 180/bpm? ▪ Infant > or < 220/bpm? • Pale or Cyanosis • Diaphoresis • Tachypnea • Vomiting • Hypotension • ALOC • Pulmonary Congestion • Syncope	• Heart disease (Congenital) • Hypo / Hyperthermia • Hypovolemia or Anemia • Electrolyte imbalance • Anxiety / Pain / Emotional stress • Fever / Infection / Sepsis • Hypoxia • Hypoglycemia • Medication / Toxin / Drugs • Pulmonary embolus • Trauma • Tension Pneumothorax

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 ≥ 94%
- Obtain vital signs
- Place patient in position of comfort unless other positioning needed to maintain blood pressure

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor / 12 lead EKG

SIGNS / SYMPTOMS OF UNSTABLE TACHYCARDIA

- Poor perfusion / shock
- Altered mental status
- Respiratory distress / failure

Low blood pressure

- 0 – 28 days old < 60 mmHg
- 1 month – 1 year < 70 mmHg
- 1 – 10 years old < 70 + (2 x age in years) mmHg
- >10 years of age < 90 mmHg

TACHYCARDIA (POOR PERFUSION)

SINUS TACHYCARDIA

- QRS duration normal, <0.08 seconds
- P waves present and normal
- Variable R-R with constant P-R
- Infants: rate usually less than 220 bpm
- Children: rate usually less than 180 bpm

Identify and treat possible causes:

- Fever
- Shock
- Hypovolemia
- Cardiac tamponade
- Hypoxia
- Drug ingestions
- Pneumothorax
- Abnormal electrolytes

SUPRAVENTRICULAR TACHYCARDIA (SVT)

- P waves absent or abnormal.
- Abrupt rate change to or from normal.
- Typical heart rates for PSVT in infants and children:
  - Infants: 220 to 300/min.
  - Children 1-5 years: 200/min.
  - Children 5-10 years: 180 to 200/min.

- **Vagal Maneuvers**
  - If no response in 1 to 2 minutes – consider Adenosine
- **Adenosine** 0.1 mg/kg rapid IV/IO push followed by 2 to 3 mL flushes of NS.
  - May repeat 0.2 mg/kg rapid IV/IO push followed by a 2 – 3 mL flush of NS
  - Maximum combined total dose of 0.3 mg/kg or 12 mg
- **If patient is unstable:**
  - Synchronized Cardioversion:
    - 1 J/kg initial first dose
    - 2 J/kg repeat doses

VENTRICULAR TACHYCARDIA

- Amiodarone 5 mg/kg IV over 20 – 60 minutes (Initiate infusion)
- **If patient is unstable:**
  - Synchronized Cardioversion:
  - 1 J/kg initial first dose
  - 2 J/kg repeat doses

TORSADES DE POINTS

- Magnesium Sulfate 40 mg / kg IV / IO Over 10 minutes

SPECIAL CONSIDERATIONS

- **Remember: pediatric patients may sustain rates > 200 bpm for 12 hours or more before they become symptomatic, so urgency of treatment may not be necessary.**
- Differentiation between very rapid sinus tachycardia associated with sepsis or hypovolemia and PSVT may be difficult, particularly because either rhythm may be associated with poor systemic perfusion.
- Ventricular tachycardia (VT) is uncommon in the pediatric age group. In the presence of VT, the ventricular rate may vary from near normal to more than 400 beats per minute. Slow rates may be well tolerated, but rapid ventricular rates compromise stroke volume and cardiac output and may degenerate into VF. Most children who develop VT have underlying structural heart disease or prolonged QT syndrome.
- Consider On-Line Medical Control for consultation. These patients can be extremely complex.

GENERAL TRAUMA MANAGEMENT

The general initial assessment and management of a traumatically injured adult and child are essentially the same. Airway and breathing must be evaluated and managed first, followed by assessment of circulation, then a brief neurological examination and complete exposure of the patient to identify all Red/Blue Criteria. One of the most important responsibilities of the pre-hospital provider is to spend as little time on the scene as possible to evaluate the patient, to perform lifesaving maneuvers, and to prepare the patient for transport to the hospital.

Our goal is to be on-scene no longer than 10 minutes with Trauma Alerts

ALL LEVELS

- Scene safety
- Check responsiveness / ABC's
- Stabilize C-spine as needed
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Control gross external bleeding with direct pressure. Remember to also hold pressure over penetrating trauma sites (gunshot wounds, stab wounds, etc.) to stop any internal bleeding into the tissue
- Perform brief neurological exam (Level of consciousness (AVPU), pupil reactivity, gross motor function)
- Spinal Motion Restriction ***(if criteria is met)***
- Immobilize and splint obviously injured extremities
- Vital signs to include pulse oximetry, pulse, respirations, and blood pressure
- Expose patient as needed and perform a secondary survey. Remember to preserve body heat and to not expose patient in public view
- Obtain history from patient, family members and bystanders

CREDENTIALED EMT

- Blood glucose
- Lead placement

INTERMEDIATE

- Follow EMT guidelines
- Establish large bore IV access. Establish a second IV line if patient is hemodynamically unstable and if time allows
- Administer IV fluids NS bolus of 10 – 20 cc/kg as needed if patient is hypotensive or showing signs of possible shock. Follow shock protocol as needed and titrate blood pressure >90mmHg systolic

PARAMEDIC

- Follow EMT and EMT-I guidelines
- Cardiac monitor / 12-Lead (if complaint of chest pain and time allows enroute)
- If patient is suspected of having tension pneumothorax, follow chest injury protocol and perform chest decompression as needed
- Consider analgesia
  - Refer to Pain Management Procedure Protocol
- Contact receiving facility with patient report and report Trauma Alert

Primary Pediatric Trauma Center – University Hospital

GENERAL TRAUMA MANAGEMENT

SPECIAL CONSIDERATIONS

- Rapid Trauma Assessment should be focused on identifying all regional trauma alert criteria. If the patient meets regional trauma alert criteria every effort should be made to package the patient and depart the scene prior to any other interventions except airway management, chest decompression CPR and SMR.
- **For Trauma Alerts**; IV's, cardiac monitoring, pain management, etc. should all be done enroute to the hospital unless scene specific situations dictate otherwise (extrication, pain management before moving, etc.)
- Always remember that traumatic injuries may have been precipitated by a medical event. Proper evaluation and assessments are necessary on all trauma patients to recognize, treat, and/or correct potentially life-threatening medical problems.
- Never remove any penetrating object from the body unless the object is impaled in the face and will block effective airway management
- Pain management should be used appropriately to relieve pain from any traumatic injury as time permits on-scene or enroute to the hospital.
- Use caution when administering analgesics in patients who have consumed alcohol. Airway and respiratory compromise can be potentiated in these patients.
- Critically injured trauma patients are susceptible to heat loss and preservation of body heat is paramount; keep the patients warm. Hypothermia in critical trauma patients is a leading indicator of mortality. Every effort needs to be made to keep these patients warm, including blankets, warm IV fluids (body temperature) and shutting down air conditioning in the patient compartment enroute to the Trauma Center.

AMPUTATIONS

The partial or complete severance of a digit or limb is an amputation. It often results in the complete loss of the limb at the site of severance. The surgeon may re-implant the amputated part or use the skin for grafting, as they repair the remaining limb. Candidates for reimplantation include victims of amputation of the scalp, hand, digit, penis, and selected portions of distal-most extremities. In general, the younger the patient is, the more potential lifetime benefit replantation has to offer

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction (if indicated)
- Remove or cut away restrictive clothing or jewelry
- Control hemorrhage, apply sterile dressing to open fractures
- Prevent heat loss
- **DO NOT** attempt to replace protruding bones
- Assess neurological status of extremity
- Splint and immobilize extremity in position of function if adequate distal pulses are present. You may attempt to realign the extremity if and only if distal circulation is acutely compromised
- Reassess distal neurovascular-motor function after the extremity has been splinted
- Ice musculoskeletal injury if it is available, and if injury is less than 12 hours old.
- Gently irrigate amputated parts to remove gross contaminants and wrap in moist sterile gauze. Place in airtight plastic bag and put bag on ice packs. **DO NOT freeze amputated parts**. Cover amputated stump with a wet sterile dressing and apply uniform pressure across entire stump. ***(NO Dry Ice)***

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

BURNS

Chemical burns represent a hazard to both patient and rescuer and extreme care should be taken to avoid exposure to offending agents. Although the pathophysiology of tissue damage from all types of burns is similar, the medical consequences can be quite different. The eyes are particularly vulnerable to chemical burns and in general, acids tend to not burn as deeply as alkalis which penetrate very deeply as the tissue is de-fatted. Therefore, eye irrigation should be started early and continue for at least 15 minutes. The care of **electrical burns** should be guided by safety. The heart is most susceptible to voltage below 400 volts. Above this level internal burns are a major complication. Remember that most injuries in electrical burns are internal. Fatal arrhythmias are usually a very early problem, but other arrhythmias may occur at any time if the heart has been electrically injured. Care of the patient with **thermal burns** should be guided by scene safety, cooling the burn, maintaining normal body temperature, and protecting the airway. Shock in the very early stages of a burn is generally not associated with the burn, thus one should rule out other life-threatening injuries

History	Signs & Symptoms	Differential
• Type of exposure (heat, gas, chemical) • Inhalation injury • Time of Injury • Past medical history and Medications • Other trauma • Loss of Consciousness • Tetanus/Immunization status	• Burns, pain, swelling • Dizziness • Loss of consciousness • Hypotension/shock • Airway compromise/distress • could be indicated by • hoarseness/wheezing	• Superficial (1st Degree) red - painful (Don't include in TBSA) • Partial Thickness (2nd Degree) blistering • Full Thickness (3rd Degree) painless/charred or leathery skin • Thermal • Chemical – Electrical

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction (if indicated)
- Remove or cut away restrictive clothing or jewelry
- Prevent heat loss
- Apply dry sterile dressing (may use moist sterile dressing for partial thickness burns <10% BSA)
- Irrigate chemical burn site with water if appropriate to chemical (if powdered chemical, brush off).

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Consider early intubation if airway compromise develops from inhalation of superheated gases or smoke. Have a high index of suspicion in cases of facial burn, sooty sputum, singed facial hair, etc.
- Establish IV with fluid therapy as noted **(no IV fluid boluses, unless hypotensive due to other trauma)**
  - If TBSA < 20%, Lactated Ringers TKO
  - If TBSA > 20% (2^{nd}/3^{rd} degree)
    - o 5 years of age or less - Lactated Ringer at 125 cc/hr.
    - o 6 – 12 years of age – Lactated Ringers 250 cc/hr.
    - o 13 years of age or greater – Lactated Ringers 500 cc/hr.
- IO access may be utilized if needed, DO NOT obtain access through burns

BURNS

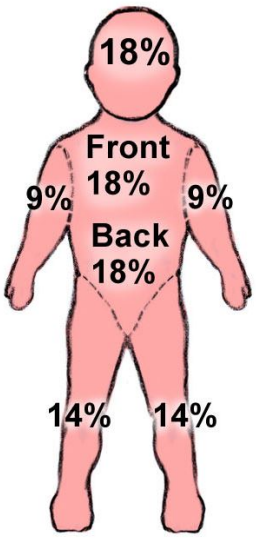
PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor
- Consider analgesia
  - Refer to Pain Management Procedure Protocol

SPECIAL CONSIDERATIONS

- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.

Child body	% of total
Part	BSA
Arm	9%
Head and neck	18%
Leg	14%
Anterior trunk	18%
Posterior trunk	18%



CLOSED HEAD INJURY

In closed head injuries, airway and ventilatory support is often required. Providers must obtain a history from observers or family regarding the patient's condition immediately after the injury. This includes respiratory effort, duration of unconsciousness, verbalization, and movement of the extremities. In addition, the mechanism of injury, the time of injury, the presence of a lucid interval, and prior use of drugs and alcohol should be noted. Therefore, ongoing observations by pre-hospital personnel are essential to patient diagnosis and treatment.

History	Signs & Symptoms	Differential
• Time of injury • Mechanism (blunt vs. penetrating) • Loss of consciousness • Bleeding • Past medical history • Medications • Evidence for multi-trauma	• Pain, swelling, bleeding • Altered mental status • Unconscious • Respiratory distress / failure • Vomiting • Major traumatic mechanism of injury • Seizure	• Skull fracture • Brain injury (Concussion, Contusion, • Hemorrhage) • Epidural hematoma • Subdural hematoma • Subarachnoid hemorrhage • Spinal injury • Abuse

ALL LEVELS

- Check for responsiveness / ABCs
- Oxygen therapy as needed via appropriate device for patient's condition to maintain Spo2 $\geq$ 94%
- Obtain vital signs
- Spinal Motion Restriction ***(if criteria is met)***

CREDENTIALED EMT

- Lead placement

ADVANCED EMT (AEMT)

- Follow EMT guidelines
- Establish IV - with normal saline at a rate of TKO or bolus (10 to 20ml/kg) as needed to maintain a minimum systolic blood pressure >90 mmHg

PARAMEDIC

- Follow EMT and AEMT guidelines
- Cardiac monitor

SPECIAL CONSIDERATIONS

- When treating a patient with a suspected head injury, it is important to find a balance between providing effective brain perfusion (delivering oxygenated blood to the brain) and not allowing for an increase in intracranial pressure (ICP). CO2 is a potent vasodilator. As CO2 levels rise, the resulting hypoxia and hypercarbia result in brain tissue swelling and increased ICP. Studies have shown that when a patient is hyperventilated, the cerebral arteries constrict, decreasing cerebral perfusion. We know that decreasing blood flow to the acutely injured brain is potentially harmful and increases mortality

CLOSED HEAD INJURY

SPECIAL CONSIDERATIONS

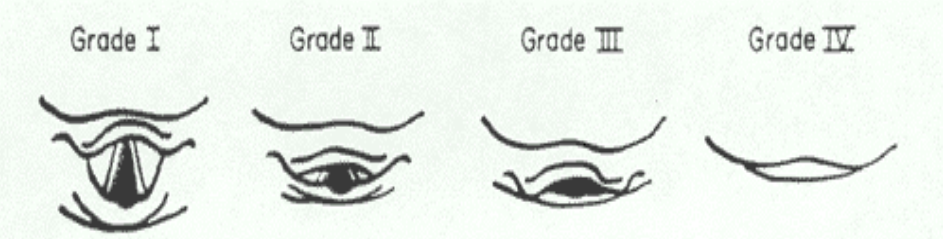
- In order to ventilate patients in a manner that mitigates rises in ICP, but still provides generous oxygenation of brain tissue (very, very important in early traumatic brain injury), it is critical that we pay close attention to our ventilatory rates. If ETCO2 is available, ventilation should be targeted at keeping the ETCO2 range between 32-35 mmHg.
- As ICP rises, the brain has nowhere to go except to herniate (push through) the tentorium and/or foramen magnum. The chances of patient recovery or survival decrease significantly when cerebral herniation begins.
  - If signs and symptoms of herniation are present, immediate hyperventilation at 20-24 breaths per minute is indicated.
  - If ETCO2 is available, an ETCO2 of 32-35 mmHg is desirable.
  - The theory is that hyperventilation will rapidly drop the CO2 which results in a constriction of the blood vessels, decreased blood flow to the brain, thereby reducing ICP.
- Field evaluation of the seriousness of head injured patients requires a constant evaluation of level of consciousness and vital signs to see if your patient's condition is improving or declining.
- Isolated injury is not an etiology for shock, and IV fluids should be reserved for evidence of hypovolemia.
- Look for Cushing's Triad (hypertension-widening of pulse pressure, bradycardia, and irregular respirations) which could indicate herniation

PROCEDURES

AIRWAY CLASSIFICATION / COMPARISON

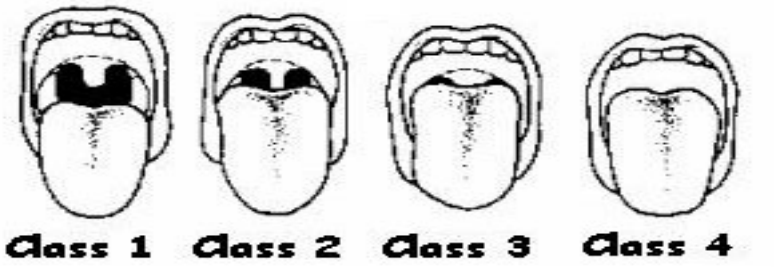
Cormack and Lehane Classification

Grade I: complete glottis visible
Grade II: anterior glottis not seen
Grade III: epiglottis seen, but not glottis
Grade IV: epiglottis not seen



Mallampati Classification

Class 1: soft palate, fauces, uvula, pillars
Class 2: soft palate, fauces, portion of uvula
Class 3: soft palate, base of uvula
Class 4: hard palate only



	Epiglottis	Croup
Age	Infants, children or adults	6 months to 6 years
Onset	Sudden	Gradual
Location	Supraglottic	Subglottic
Temperature	High fever	Low-grade fever
Dysphagia	Severe	Mild / Absent
Dyspnea	Present	Present
Drooling	Yes	Maybe
Cough	Uncommon	Bark-like cough
Position	Sitting forward with open mouth	Comfortable in various positions

AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)

The Automated External Defibrillator (AED) is a device which allows early defibrillation to be performed by persons without the need for the operator to be trained to recognize specific rhythms. The AED is attached to the patient via large self-adhesive disposable electrodes which record the EKG signal and deliver preset defibrillation energy levels. The AED incorporates a computerized detection system that analyzes the cardiac rhythm and distinguishes rhythms which should be defibrillated from those which should not.

INDICATIONS

- Patients who are pulseless and apneic

CONTRAINDICATIONS

- OOH DNR
- Signs of obvious death (use Cessation of Resuscitation Protocol)

PROCEDURE

1. Check adequacy of any bystander CPR and take over if indicated
2. Check responsiveness
3. Check for Breathing
4. Check pulse
5. Place OPA/NPA and assist ventilations with BVM as soon as possible
6. **If unwitnessed arrest**: perform CPR (30:2) for 2-3 minutes prior to attaching the Automated External Defibrillator
7. Rapidly attach an AED (minimize interruption of compression)
8. Press the “on” button
9. Stop CPR and press the “analyze” button (if available, if no analyze button AED with automatically analyze)
10. Keep clear of patient while analyzing
11. If shock advised and after unit charges, confirm that all providers are clear of patient and press the “shock” button to deliver one shock
12. After the one shock or if the AED advises not to shock - continue 5 cycles of CPR (30:2)
13. After 2 minutes of CPR, stop and press the “analyze” button
14. Follow steps 10 and 11
15. **If witnessed arrest**: immediately attach an AED and go to step 6
16. Notify additional responding units of CPR in progress

APPARENT DEATH / DOS / TERMINATION OF EFFORTS

Encountering patients at or near their time of death is often one of the most complex and difficult responses that pre-hospital providers can make. Often, on-scene family members, bystanders, or other concerned individuals compound the decision-making process because of the normal emotions encountered when human beings die. Additionally, there is a need to make rapid decisions during these encounters, as any hopes of resuscitation must include rapid and appropriate interventions.

Any pulseless and apneic patient, in whom it is not immediately apparent meets the criteria for Obvious Death, should receive aggressive and appropriate resuscitative measures without delay as prescribed in this SMOP manual. All patients, regardless of personal opinions of the validity of the resuscitation, will receive the highest level of care and treatment until it is determined that resuscitation measures should be stopped.

INDICATIONS

Obvious Death:

- Patients must meet one or more of the following criteria if resuscitation efforts are to be withheld or stopped if initiated by bystanders prior to EMS arrival. If there is ample evidence (as qualified by the following criteria) that a patient will not survive a resuscitation effort, there is no ethical reason to initiate or continue resuscitation in the field.

Signs of Obvious Death include one or more of the following:

- Decomposition
- Dependent lividity
- Decapitation
- Rigor Mortis (normo-thermic patients)
- Total Body Surface burns
- Obvious Mortal Wounds WITH NO spontaneous pulse and respiration

If resuscitation efforts were inappropriately initiated when criteria for Obvious Death are present, any credentialed provider may cease resuscitation efforts.

Once it is decided that the patient is an Obvious Death, the body should be covered from public view and the family notified of the patient's condition. Until the scene is cleared by law enforcement, every effort should be used to limit access to the scene.

PROCEDURE

Termination of Resuscitation:

In situations in which a patient has experienced cardiac arrest and advanced cardiac life support efforts have been unsuccessful, prehospital resuscitation may be discontinued.

1. Contact Medical control for guidance in terminating resuscitation efforts. (primary procedure)
2. In the rare circumstances in which Medical Control is not available, the senior crew member on scene may follow the guidelines below for discontinuing resuscitation efforts without Medical Control. The on-duty Battalion Chief, if not on scene, should be notified of the inability to contact Medical Control
   - This step will **ONLY** be performed if Medical Control is not available (this will be noted in the PCR).

APPARENT DEATH / DOS / TERMINATION OF EFFORTS

PROCEDURE

Criteria for Discontinuation of Resuscitation Efforts without Online Medical Control

- Persistent pulseless/apneic patient
  - Must have received adequate CPR for at least 40 minutes, with
    - Advanced airway management (intubation or supraglottic airway)
    - Vascular access (IV or IO)
    - Appropriate medication for presenting rhythm as per standard medical operating procedures
- Documented persistent ETCO2 ≤ 20 mmHg.
- No cardiac motion is visible via ultrasound, if available.
- If the patient is in cardiac arrest due to trauma, resuscitation efforts may be ceased, when all of the above have been met, in addition to the following:
  - All reversible causes have been addressed.
  - Ventilations are delivered without difficulty via an advanced airway
  - appropriate fluid resuscitation has been administered.
  - If evidence of thoracic or abdominal trauma is present, needle chest decompression(s) have ruled out possible tension pneumothorax.
- If resuscitation efforts were inappropriately initiated when criteria for Obvious Death are present, any credentialed provider may cease resuscitation efforts.

Resuscitation Efforts MAY NOT be discontinued without Medical Control in any patient with the following:

- Persistent ventricular fibrillation or ventricular tachycardia
- Any neurological activity (eye opening, motor responses, etc.)
- Patients who are pregnant
- Patient in view of the public
- Patient family requests transport after explanation of reasons for stopping efforts

1. If the patient meets the criteria for discontinuation of resuscitation efforts, the EMS Battalion Chief, or senior paramedic, will consult with the family or responsible party (if available) about discontinuation of the resuscitative efforts.
2. If any family member or responsible party indicates their objection to the concept of discontinuation of resuscitation efforts, the resuscitation efforts will continue until care is assumed by the receiving emergency room physician.
3. Once the approval to discontinue the resuscitation efforts is acknowledged by the family or responsible party, the EMS crew leave all advanced airway and vascular access site in place.
4. If not on scene, law enforcement shall be notified.
5. Personnel shall be attentive to the psychological needs of the “survivors” at all times and provide support as needed.
6. Documentation:
   a. Complete the associated “Termination of Resuscitation Efforts” checklist in ImageTrend.
   b. Document Medical Control Contact intervention (note whether contact was successful or not)

APPARENT DEATH / DOS / TERMINATION OF EFFORTS

PROCEDURE

Traumatic Arrests:

At a trauma scene, careful consideration should be taken as to the cause of the cardiac arrest. This includes the possibility that a medical event (MI, CVA, seizure, etc.) preceded the trauma event. Survival from a traumatic cardiac arrest is extremely rare and several factors in your initial assessment can help determine if resuscitation is warranted.

1. If a medical event is suspected, treat as a normal medical cardiac arrest.
2. If the victim is a trauma patient, they should be considered Obviously Dead if the following is found:
   a. The patient is without vital signs, is a victim of blunt or penetrating injury, showing other signs of obvious death **AND has**
      - No respiratory effort on examination over a 30 second time frame.
      - No palpable carotid pulse on examination over a 30 second time frame.
      - No pupillary response.
      - No painful stimuli response (e.g. Trapezius muscle squeeze, sternal rub, fingernail bed pressure).
      - Asystole or PEA < 40 bpm on the monitor in 2 or more leads.

   **** If all the above criteria are met, no resuscitation efforts should be initiated. ****

      - A patient who presents in asystole with the above criteria should be considered deceased. Traditionally a patient in asystole has had an extremely poor outcome from traumatic arrest. (2013 NAEMTP/ASCOT position statement)
3. Regardless of the severity of the injury **if the patient has a pulse**, immediately transport to a trauma center.
4. If the victim presents in ventricular fibrillation, the likelihood of a medical event precipitating the traumatic event is more likely. Treat as per Medical Cardiac Arrest protocols.
5. If the patient is found with a narrow complex QRS in PEA, this may suggest profound hypovolemia, which could respond to aggressive fluid resuscitation. Rapid extrication and transport are appropriate.
6. If the patient is entrapped and extrication will be prolonged, and while in progress the patient declines to asystole with a loss of vital signs, Medical Control should be contacted to determine if resuscitation can be terminated. The procedures outlined above should be followed for ceasing resuscitation.

SPECIAL CONSIDERATIONS

Calls involving deaths will often invoke all types of issues including social, psychological, emotional, moral, religious, and a host of others. Some additional things to keep in mind when responding to these calls include:

1. Families of patients with valid OOHDNR may change their mind when EMS arrives on scene and request resuscitation to begin. These issues are often very complex and go beyond the actual end of life event you have responded to. Using your best judgment, it is often best to begin resuscitation unless the Obvious Death criteria are met. If no response to resuscitation is realized, then this protocol can still be used to terminate the resuscitation efforts. Constant and vigilant communication must be maintained with the family throughout this process.
2. Often cardiac arrests occur in public places. When you arrive on scene and resuscitation is warranted, it is not appropriate to terminate these efforts while in a public place. This will require a transport to the hospital even though there is no response to resuscitation efforts. Your judgment and Medical Control will be vital in this decision-making process.
3. Pediatric patients in cardiac arrest pose their own sets of difficulties. From emotional issues for family as well as rescuers, it may not be appropriate to terminate resuscitation in the field on these patients. Evaluating the emotional and psychological needs of the family as well as the healthcare team must be done prior to making a decision regarding the efficacy of ceasing resuscitation or transporting the patient to the hospital.
4. Additional considerations will always arise in these instances. Medical Control is an invaluable asset and should be used at any time to help work through and overcome all issues that arise during a cardiac arrest. Never hesitate to contact Medical Control at any time for any reason.

BLOOD DRAW FOR TEXAS JUSTICE OF THE PEACE

This protocol is put into place to follow the law as outlined in the Code of Criminal Procedure, Article 49.10 (j), that states, in the state of Texas –

"a Justice of the Peace may order a physician, qualified technician, paramedic, chemist, registered professional nurse, or licensed vocational nurse to take a specimen of blood from the body of a person:

(1) who died as a result of a motor vehicle accident if the justice determines that circumstances indicate that the person may have been driving while intoxicated" or

(2) to aid in the confirmation of determination of the cause and manner of death while conducting an inquest.

Under this law we as paramedics are only allowed to draw blood under specific order, whether in person or via phone, of the Justice of the Peace. This law does not allow this order to come from a peace officer or DPS Troopers.

PROCEDURE

1. Procedure should be done under the supervision of the Justice of the Peace that is requesting the blood draw.
2. In order to obtain the blood sample, EMS will use the blood draw kit supplied by the J.P.
3. Use appropriate personal protective equipment.
4. Cleanse area of blood draw with providine-iodine prep pad, as the use of alcohol prep pads will alter the accuracy of the test results.
5. Establish IV site with 18 or 20ga catheter
6. Withdraw blood into 2 gray top tubes using the needleless vacutainer equipment. Invert each tube 5 times to ensure accurate mixing of the blood with the anticoagulant powder.
7. Paramedic should write his/her initials, date and time of draw on the tube prior to handing it over to the J.P.
8. Discontinue use of the IV unless otherwise indicated.
9. Person drawing the sample shall sign any and all required forms or labels and observe tubes being sealed by the officer
10. Document well the circumstances and events of the of the call to include name of J.P. and officer requesting procedure, site of the blood draw, time preformed and time the sample was released to the Peace officer. Also include documentation of site preparation as well as the use of betadine or providine solution in case of results being challenged in court.
11. Have officer or other authorized individual sign saying that he/she has received blood sample to document chain of custody.

CHEST COMPRESSION SYSTEM (LUCAS)

The Lucas Chest Compression System is to be used for performing external cardiac compressions on adult patients who have acute circulatory arrest defined as absence of spontaneous breathing and pulse and loss of consciousness. It is designed to only be used in cases where manual chest compression would be used.

INDICATIONS

- Patients in cardiac arrest

CONTRAINDICATIONS

- If it is not possible to position Lucas safely or correctly on the patient's chest
- Too small patient: If you cannot enter the PAUSE mode or ACTIVE mode when the pressure pad touches the patient's chest and Lucas alarms with 3 fast signals
- Too large patient: If you cannot lock the upper part of Lucas to the back plate without compressing the patient's chest

PRECAUTIONS:

- If unable to use the Lucas, provide manual compressions

PROCEDURE

1. Confirm cardiac arrest
2. Perform CPR
3. Remove the Lucas device from the bag
4. Push ON/OFF for 1 second to power up device
5. Place the back plate under the patient
6. Place the upper part of the Lucas over the patient's chest and lock the support legs into place
7. Lower the suction cup – centered over the sternum – until the pressure pad inside the suction cup touches the patient's chest without compressing the chest
8. Push PAUSE to lock the start position
9. Push ACTIVE (continuous) OR ACTIVE (30:2) to start compressions
10. Apply stabilization strap
11. Secure patient's arms to the device

CHEST DECOMPRESSION

INDICATIONS

- This procedure is performed for a patient with progressive respiratory distress and known or suspected thoracic trauma to resolve a tension pneumothorax. It involves introducing a needle/catheter into the pleural space of the chest cavity.
- **Patients who are deteriorating with clinical signs of shock, absent or decreased breath sounds and at least one of the following signs/symptoms:**
  a. Shortness of breath (or increased resistance to ventilations)
  b. Decreased SPO2 readings or readings that remain < 90 with Oxygen therapy
  c. Hyperresonance to percussion
  d. Jugular venous distension (JVD) (*May not always be present if there is associated severe hemorrhage*)
  e. Tracheal deviation (Late Sign)
  f. Cyanosis (Late Sign)
- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

CONTRAINDICATIONS

- Pleural decompression is **NOT** indicated for a suspected simple pneumothorax or hemothorax.

PROCEDURE

1. Provide oxygen and ventilatory assistance.
2. Prepare for rapid transport.
3. Determine necessity for chest decompression.
4. Select the site and cleanse the site.
   a. 2nd or 3rd intercostal space midclavicular line, or
   b. 4th or 5th intercostal space anterior axillary line
5. Ensure the needle entry into the chest is NOT medial to the nipple line and is NOT directed toward the heart. The needle must be inserted above the rib to avoid neurovascular damage.
6. Remove flash chamber cap from large bore (12-14ga) 3-3.25-inch catheter and insert the catheter over the top margin of the rib. May attach a 10cc syringe partially filled with saline or water to the end of their angiocath/needle set. This allows visualization of the “rush of air” which may otherwise not be heard in a noisy environment.
7. Air should escape under pressure.
8. After the needle is inserted, lay the catheter parallel with the chest and advance the catheter toward the clavicle/shoulder (same side as insertion). Advance the catheter only to the hub.
9. Remove the needle and syringe, leaving the catheter in place in the chest wall.

SPECIAL CONSIDERATIONS

- In an intubated patient, always check the depth of the tube before performing pleural decompression.
- If respiratory status does not improve, or worsens, multiple needle decompressions may be required to resolve a tension pneumothorax.
- Catheter does not require a one-way valve.
- All open and/or sucking chest wounds should be treated by immediately applying a chest seal/occlusive dressing to cover the injury. Monitor the patient for the potential development of a subsequent tension pneumothorax. If the casualty develops increasing hypoxia, respiratory distress, or hypotension and a tension pneumothorax is suspected, treat by temporarily lifting the dressing to burp the wound or by needle decompression.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

Continuous Positive Airway Pressure (CPAP) rapidly improves gas exchange, respiratory mechanics, and the sense of dyspnea. It may reduce the need for endotracheal intubation in patients with respiratory distress related to asthma, COPD, pulmonary edema, heart failure, near drowning, and pneumonia.

INDICATIONS

Patients with moderate to severe respiratory distress secondary to:

- Reactive airway disease (COPD/Asthma)
- Heart failure / Acute Pulmonary Edema
- Hypoxia and shortness of breath in other non-traumatic settings

AND one or more is present with no improvement after initial treatment:

- Pulse Oximetry < 90%
- Accessory muscle use/retractions
- Respiratory rate > 26
- Signs of fatigue/respiratory failure

CONTRAINDICATIONS

- Patient is in respiratory arrest
- Patient is suspected of having a pneumothorax
- Patient has a tracheostomy
- Agonal respirations
- Unconscious
- Shock associated with cardiac insufficiency (hypotension)
- Penetrating chest trauma
- Persistent nausea/vomiting
- Facial anomalies / facial trauma
- Has active upper GI bleeding

PROCEDURE

1. Make sure patient does not have a pneumothorax!
2. EXPLAIN THE PROCEDURE TO THE PATIENT
3. Ensure adequate oxygen supply to ventilate device
4. Continuously monitor SpO2 and ETCO2 readings (monitor ETCO2 with nasal cannula)
5. Continue to monitor vital signs every 5 minutes
6. Place the delivery device over the mouth and nose
7. Secure the mask with provided straps or the other provided devices
8. Use up to 10 cm H20 of pressure
9. Check for air leaks
10. Monitor and document the patient's respiratory response to the treatment
11. Continue to coach patient to keep mask in place and readjust as needed
12. If respiratory status deteriorates, remove device and consider intermittent positive pressure ventilation with or without endotracheal intubation

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

REMOVAL PROCEDURE:

1. CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask or experiences continued or worsening respiratory failure
2. Intermittent positive pressure ventilation and/or intubation should be considered if the patient is removed from CPAP therapy

SPECIAL CONSIDERATIONS

PRECAUTIONS:

- Use care if patient:
- Has impaired mental status and is not able to cooperate with the procedure
- Had failed at past attempts at noninvasive ventilation
- Complains of nausea or vomiting
- Has inadequate respiratory effort
- Has excessive secretions
- Has a facial deformity that prevents the use of CPAP
- Intubation should be performed if respiratory or cardiac arrest

SPECIAL NOTES:

- Advise receiving hospital as early as possible so they can be prepared for the patient
- Do not remove CPAP until hospital therapy is ready to be placed on patient
- Most patients will improve within 5 minutes
- Watch patient for gastric distention

CRIME SCENES

When pre-hospital personnel encounter a dead person or if they enter a scene where a crime is suspected, or being considered, the following guidelines should be strictly adhered to:

PROCEDURE

1. If dispatched to a potentially unsafe scene where staging is necessary units should respond in the non-emergency mode until the scene is secured by law enforcement.
2. Establish scene safety. Make sure law enforcement is enroute if not already present. Do not enter an unsafe scene until it is safely secured. It may be necessary to stage in an area close to the scene. When staging responders should not be visible from the location of the incident.
3. Be careful not to touch any surroundings unless it is absolutely necessary. Do not leave any items at the scene. If anything at the scene is moved (including patient), law enforcement must be advised.
4. Limit access of the immediate scene to essential personnel only. Entry and exit routes should remain the same. When establishing if a patient is still alive (especially at a homicide scene), it is often best if only one crewmember enters the immediate patient area initially.
5. Any suicide note should not be handled.
6. If a viable patient is encountered, proceed with proper resuscitation and/or protocols as needed. The following situations and responses may indicate resuscitation:

a. Hangings- leave all knots intact, including the knot that the rope is suspended from and the knot making the noose. Cut the rope in an area halfway between the noose and the suspension point in the rope.

b. Weapons- EMS personnel should not move any weapons. If possible, this should be left to law enforcement. If necessary, for scene safety and law enforcement is not on scene the weapon should be removed to a safe place, away from the patient and bystanders. Weapons should not be tampered with, opened, or unloaded by responders at any time. When treating a patient that has sustained a penetrating wound and the clothes need to be removed, do not cut through knife or bullet holes (may affect subsequent evidence analysis).

c. Sexual assault- it is important that victims of sexual assault be moved quickly to a safe environment. It is vital that the patient not shower or wash any part of their body or clothing, change clothing, or use the bathroom.

7. Bodies of patients determined to be dead at the scene are not to be moved until authorized to do so by the Justice of the Peace/ME. This may require in some instances that the ambulance remain on scene until released by the Justice of the Peace/ME.

Document well: Document surrounding's, patient condition, patient injuries, interventions, transported to which facility, or time pronounced, any objects that needed to be moved in order to work on the patient, if the body had to be moved, etc.

DELAYED SEQUENCE INTUBATION

***** PROCEDURE IS ONLY TO BE PERFORMED BY SCHERTZ EMS PARAMEDICS CREDENTIALED FOR THE PROCEDURE*****

While most airways can be controlled with basic airway adjuncts and a bag valve mask (BVM), there is a certain group of patients that need emergent advanced airway management that are not considered "crash airways", defined as those usually in respiratory and/or cardiac arrest. This procedural guideline outlines the steps to secure the airway for the conditions listed below.

CLINICAL INDICATIONS

- Critical patients requiring advance airway management inhibited by an intact gag reflex or trismus.

INDICATION FOR DSI

- Insufficient respiratory status / impending respiratory failure
  - SpO2 readings <85% despite treatment
  - Extreme patient fatigue due to respiratory status
- Severe head injury or CVA
  - Signs of herniation (Cushing reflex, unresponsive dilated pupils, seizures or posturing)
- Burns with airway involvement with impending loss of airway
  - Blistering in/or around the mouth, hoarseness, stridor, edema in oropharynx
- Inability to maintain an airway and/or ventilate with other adjuncts
- Any patient requiring airway management with trismus

CONTRAINDICATIONS

- **Anticipated "difficult airway" (identified with airway assessment prior to initiating procedure)**
  - Inability to ventilate patient with a BVM
  - Major facial or laryngeal trauma
  - Known airway deformity
- Significant Burns > 24hrs
- Crush injuries > 8hrs or suspected hyperkalemia
- Patient age < 12 years
- Known neuromuscular disease
- Known history malignant hyperthermia

*****TIME OUT*****

(If any of the following are encountered, take appropriate measures to stabilize the patient)

- Once reached, if SpO2 readings drop below 94% **during** an intubation attempt (ventilate the patient)
- Peri-Intubation Arrest
- Significant decrease in heart rate (excluding head trauma)
- If the "Lead" Medic calls for a "time out"

DELAYED SEQUENCE INTUBATION

PROCEDURE

- **Obtain vital signs** ***(SpO2 and ETCO2 readings WILL be monitored throughout & after procedure)***
- **NRB mask** ***(maintain SpO2 reading above 94%)***
  - If respirations are inadequate assist with BVM
  - Place NC with ETCO2 monitoring
- **Perform airway assessment**
- **Prepare equipment** (suction, intubation equipment, supraglottic airway, medications, etc.)
- **Position patient to optimize success**
  - Elevate the head approximately 15 degrees
  - Place patient head in the "ear to sternum" position (padding under the head or partner may lift)
  - If c-spine injury is suspected, maintain manual inline stabilization
- **Manage Hypotension (SBP <100)**
  - Epi 10 mcg/ml 1 cc IV/IO every 3 – 5 minutes **(1:100,000 – Push Dose)**
    - Titrate to SBP > 100
    - Max Total dose: 100 mcg (10cc)
- **Medicate patient** (for sedation)

  Ketamine 2mg/kg IV/IO (for sedation and analgesia)

  or

  Fentanyl 1mcg/kg IV/IO (Max single dose: 100mcg)
  Etomidate 0.3 mg/kg slow IV/IO (Max single dose: 30 mg)
  May repeat once after 3 minutes
  Versed 2 – 5mg IV/IO **(do not administer if hypotensive)**
- Allow 1 -2 minutes for medications to take effect
- Ventilate patient after sedation has occurred **(utilize two hand mask seal and PEEP)**
- **Pre-Oxygenate**
  - Ensure SpO2 readings are >94%, **if below 94% ventilate the patient**
  - Upon obtaining SpO2 >94%
    - **Start 3-minute countdown while ventilating and maintain SpO2 at 94%**
  - Increase Nasal Cannula to 15lpm (apneic oxygenation)

****If patient has adequate sedation with Ketamine or Fentanyl, Etomidate and/or Versed, Intubation may proceed without paralytics****

****If unable to obtain or maintain SpO2 >94% with BVM assisted ventilations – DO NOT administer paralytics****

- **Rocuronium 1 mg/kg IV/IO**
  - Allow 1 minute for neuromuscular blockade
- **Place ET tube** ***(ensure SpO2 readings are maintained > 94%, If not ventilate patient prior to ETI attempt)***
- **Use of the video laryngoscope will be utilized for ETI attempts**
  - Utilize continuous suctioning to maintain a clear oropharynx
  - If attempt is unsuccessful, ventilate to ensure SpO2 >94%
  - ***Only 2 attempts at intubation will be made***

*****If unable to place an ET tube after two attempts – Utilize a supraglottic airway for airway protection*****

- **Confirm Airway placement**
  - Place inline ETCO2 monitor *(Change one channel on the LifePak to monitor ETCO2 waveform)*
  - Auscultate breath sounds
  - Visualize with video laryngoscopy

DELAYED SEQUENCE INTUBATION

PROCEDURE

12. **Secure ET tube**
    - Note depth of ET tube at the teeth
    - Reconfirm breath sounds
    - Monitor ETCO2 & obtain strip
13. **Maintain sedation, paralysis BP as needed (maintain SBP>100mmHg)**
    - Ketamine 1mg/kg IV/IO
      or
    - Etomidate 0.3 mg/kg IV/IO
    - Fentanyl 1mcg/kg IV/IO
    - Versed 2 – 5 mg slow IV/IO may repeat every 5 min. (Max total dose: 10 mg)
      - DO NOT administer if patient is hypotensive
    - Rocuronium 1 mg/kg
    - Epi 10 mcg/ml 1 cc IV/IO every 3 – 5 minutes **(1:100,000 – Push Dose)**
      - Titrate to SBP > 100
      - Max Total dose: 100 mcg (10cc)
14. **Upon arrival at receiving facility**
    - Obtain ETCO2 strip
    - ED staff must verify breath sounds before transfer of patient care
    - Note the name of the staff member in the PCR

SPECIAL CONSIDERATIONS

1. **Schertz EMS Paramedic credentialed for DSI MUST be on scene**
2. **DO NOT** perform procedure if a “difficult airway” is predicted after the airway assessment
3. **DO NOT** use NMB if a Grade III / IV airway is predicted
4. **IF SpO2 readings fall below 94% at any time, stop procedure and ventilate patient**
5. Consider transport time before initiating procedure on scene.
6. Maintain ETCO2 readings at 35 – 45 (consider 32 – 35 with signs of herniation).

Delayed Sequence Intubation Suggested Medication Doses					
Weight (Lbs.)	Weight (Kgs)	Fentanyl 1 mcg/kg	Versed 2-5 mg	Etomidate 0.3 mg/kg	Rocuronium 1 mg/kg
100	45	45	2	15	45
125	57	60	2	20	60
150	68	70	3	20	70
175	79	80	3	25	80
200	91	90	4	25	90
225	102	100	4	30	100
250	114	100	4	30	120
275	125	100	5	30	125
300	136	100	5	30	140

ENDOTRACHEAL INTUBATION

VIDEO LARYNGOSCOPY

When available, the video laryngoscope will be utilized for all endotracheal intubation attempts.

The following are exceptions to utilizing the video laryngoscope:

- Pediatric patient requiring the use of a laryngoscope blade smaller than a Size 1

INDICATIONS

Any unconscious or unresponsive patient when an adequate BLS airway cannot be maintained

- May included:
  - Respiratory arrest or imminent respiratory arrest
  - Obstructed or suspected obstructed airway
  - Facial/Respiratory Burns (unconscious patient)
  - Respiratory distress with associated ventilatory failure
  - Major trauma or head trauma, associated with decreased level of consciousness or unconscious.

PROCEDURE

1. Prepare, position and oxygenate the patient.
2. Position head in “sniffing” or “ear to sternum” position
   - Pad under the adult patient’s head to ensure a “ear to sternum” position
   - Pad under the pediatric patient’s head to ensure a “sniffing’ position
3. Insert laryngoscope blade on the right side of the mouth, displacing the tongue to the left.
4. Lift tongue and mandible with laryngoscope, **avoiding a “prying” action**.
5. Visualize vocal cords and pass the ETT tip through cords to proper depth (approx. 1cm past proximal cuff end)
6. Inflate cuff with 5-10cc’s of air. **(Do NOT overinflate the cuff)**
7. Ventilate patient via bag-valve device.
8. Auscultate for bilateral breath sounds and no sounds over the epigastrium.
9. Confirm proper placement (ETCO2 Monitoring).
   - If < 10, check for adequate circulation, equipment and ventilator rate.
   - If ETCO2 remains < 10 without explanation, REMOVE the ET tube and ventilate with BVM.
10. Secure endotracheal tube.
11. **Continuous monitoring of SpO2 and ETCO2 is required throughout patient contact**
12. Consider placement of an OG / NG tube to clear stomach contents, after the airway is secured

ENDOTRACHEAL TUBE INTRODUCER (BOUGIE)

The Flex Guide Endotracheal Tube Introducer (a.k.a. gum-elastic bougie) is used to facilitate endotracheal intubation on difficult airways. It should not be confused with the more rigid stylet, which is inserted into the ET tube and used to alter its shape prior to intubation. Unlike the stylet a bougie is inserted independently of the ET tube and is used as a guide. Since the bougie is considerably softer, more malleable, and blunter than a stylet, this technique is considered to be a relatively atraumatic procedure

INDICATIONS

- Difficult intubation with a restricted view of the glottic opening. This may occur due to short, thick (bull) neck
- Pregnancy
- Laryngeal edema (anaphylaxis, burns)
- Anatomical variation
- Tumors above the glottic opening
- Inability to appropriately position the patient for intubation
- May be utilized with any intubation attempt

CONTRAINDICATIONS

- Use of ET tube <6.0 mm

PROCEDURE

1. Perform an optimal direct laryngoscopy

   - At a minimum, the tip of the epiglottis must be visible

2. Begin insertion of introducer
   - Tactile confirmation of tracheal clicking will be felt as the distal tip of the introducer bumps against the tracheal rings
   - If tracheal clicking cannot be felt, continue to gently advance the introducer until “hold up” is felt (against the carina)
   - Tracheal “clicking” and “hold up” are positive signs that the introducer has entered the trachea
   - Lack of tracheal clicking or hold-up is indicative of esophageal placement
3. Continue advancement of introducer to a depth of approximately 25 cm.
   - This places the distal tip at least 2 to 3 cm beyond the glottic opening
4. While holding the introducer securely, and without removing laryngoscope, advance endotracheal tube over the proximal tip of the introducer
   - As the tip of the endotracheal tube passes beyond the teeth, rotate the tube 90 degrees counter clockwise (1/4 turn to the left) so tube bevel does not catch on the arytenoids cartilage
5. Advance endotracheal tube to the proper depth
6. Holding endotracheal tube securely, remove introducer
7. Verify correct placement of ET tube

SPECIAL CONSIDERATIONS

- Soft tissue damage or bronchial rupture may occur
- This is a single-use device. Do not attempt to clean or sterilize
- For optimal use, store flat in the same shape as packaged. **Do not fold or roll up to save space**.

EPINEPHRINE ADMINISTRATION - ANAPHYLAXIS

Allergic reactions in some individuals can progress very rapidly into anaphylactic shock after exposure to a specific antigen (as wasp venom or penicillin) after previous sensitization. This is characterized especially by respiratory symptoms, fainting, itching, urticaria, and eventually hypotension. When these symptoms become severe, rapid treatment is necessary in order to preserve the patient's life.
Epinephrine is an alpha and beta agonist drug that mimics the sympathetic nervous system and constricts blood vessels, dilates bronchioles, and increases heart rate and contractility. Because of these properties, it relieve breathing difficulty as a result of allergic reactions.

INDICATIONS

- Patient showing signs and symptoms of allergic reaction including itching, urticaria (hives), swelling **AS WELL AS** respiratory difficulty, wheezes, or complaints of airway closing/swelling shut and/or hypotension.

CONTRAINDICATIONS

- Patients having mild allergic reactions with no airway or respiratory compromise. These patients may have urticaria, itching, or localized swelling to the exposure site. Patients who do not have any respiratory complaints or those patients who have clear and audible breath sounds should not receive epinephrine unless these complaints develop.

PROCEDURE

1. Establish and maintain an open airway.
2. Suction secretions.
3. If breathing is inadequate, provide positive pressure ventilation with supplemental oxygen at 15 lpm via Bag Valve Mask with reservoir at 12 to 20 ventilations/minute.
4. If breathing is adequate, administer oxygen via non-rebreather mask at 15 lpm.
5. If Indications of severe allergic reaction are met (respiratory distress; wheezing breath sounds; swelling or closing of airway).
    - **Epinephrine adult dose: (over 65lbs) 0.3 mg (0.3 cc) 1:1000 IM**
    - **Epinephrine pediatric dose: (30 – 65 lbs.): 0.2 mg (0.2 cc) 1:1000 IM**
    - **Epinephrine pediatric dose (<30 lbs.) 0.1 mg (0.1 cc) 1:1000 IM**

    a. Check medication.
    b. Place patient on EKG monitor if available or have AED standing by.
    c. Prepare and draw up correct amount of medication
    d. Select and prepare injection site
        - Adult – Deltoid or mid to lateral thigh
        - Pediatric – lateral thigh

    e. Dispose of injector in biohazard sharps container.
    f. Record time and reassess patient.
6. Notify responding EMS transport unit of treatment
7. If skill level available, initiate IV of Normal Saline, TKO.
8. Perform an ongoing assessment every 5 minutes watching for disappearance or reoccurrence of symptoms.

SPECIAL CONSIDERATIONS

- Caution should be used in administering epinephrine to severely hypoxic patients and the patient should be on an EKG monitor and a defibrillator should be at patient's side.
- Caution should be used in administering epinephrine to patients with known heart conditions and/or the elderly.
- Caution should be used in administering epinephrine to patients who are hypertensive or have a history of hypertension.

ETCO2 MONITORING

End-tidal carbon dioxide (ETCO2) is the measurement of carbon dioxide in the airway at the end of each breath. Capnography provides a numeric reading (amount) and graphic display (waveform) of the ETCO2 throughout the respiratory cycle. EtCO2 is very useful in both the intubated and non-intubated patient for determining ventilation adequacy and perfusion. In order for there to be measurable CO2, there must be cardiac output (even compressions), lungs that are being ventilated and perfused, and a way for the CO2 to be excreted (airway).

INDICATIONS

- All intubated patients
- Any patient having received narcotic or benzodiazepine medications **(apply before administration)**
- Any difficulty breathing
- All patients with a potential, or actual, change in metabolic, circulatory, and/or respiratory function
- Hypoventilation
- Shock
- Chest pain with respiratory distress
- Congestive Heart Failure
- Patients experiencing altered mental status

CONTRAINDICATIONS

- None

PROCEDURE

- Turn on monitor and adjust contrast as needed
- Verify EtCO2 display is on and functioning in Channel 3
- Open tubing connector door and connect EtCO2 Filterline tubing by turning clockwise
- Tubing should be connected to monitor before being connected to patient's airway
- Connect tubing to patient airway
- To record waveform:
  - Press "PRINT"- This will print real time capture

SPECIAL CONSIDERATIONS

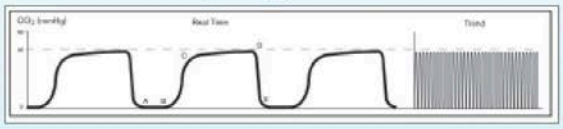
- A patient with normal cardiac and pulmonary function should have an EtCO2 level between 35-45mmHg
- When no CO2 is detected, 3 factors must be quickly evaluated for cause:
  - Loss of airway function- improper tube placement, apnea
  - Loss of circulatory function- massive PE, cardiac arrest, exsanguination
  - Equipment malfunction- tube dislodgement or obstruction
- All intubated patients will have capnography (when available) applied and a printed copy of the post intubation readings attached to the Patient Care Record (PCR).

END-TIDAL CO_2

Normal and Abnormal Capnogram Waveforms

Normal Capnogram Waveform

Indications:
- ET tube is correctly positioned
- Proper ventilation is occurring



A-B: Baseline
B-C: Expiratory Upstroke
C-D: Expiratory Plateau
D: End-tidal Concentration
D-E: Inspiration

Abnormal Capnogram Waveforms

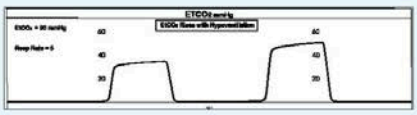
Esophageal Intubation

Observations:
- No CO_2 sensed
- Small transient waveforms



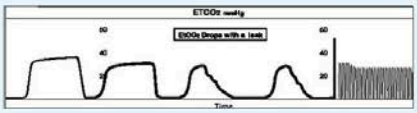
Increasing $EtCO_2$ Level

Possible Causes:
- Decrease in respiratory rate and/or tidal volume (hypoventilation)
- Increase in metabolic rate
- Rapid rise in body temperature (malignant hyperthermia)



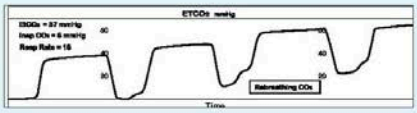
Leak

Possible Causes:
- ET tube cuff may be deflated or ruptured
- ET tube in the vocal cords
- Mask or Bag Mask Valve leak
- Artificial airway is too small for patient



Rebreathing

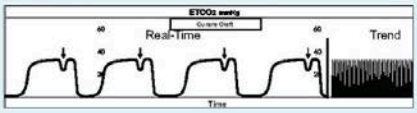
Possible Causes:
- Mechanical dead space
- Mechanical ventilator failure



Muscle Relaxants (Curare Cleft)

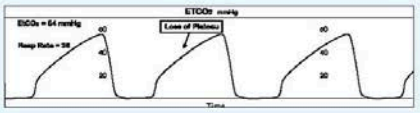
Possible Causes:
- Patient is mechanically ventilated

Observations:
- Depth of cleft is proportional to degree of drug activity



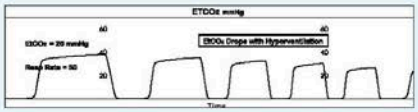
Airway Obstruction

Possible Causes:
- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Bronchospasm
  - Elevated end-tidal CO_2 valve
  - Loss of alveolar plateau



Decreasing $EtCO_2$ Level

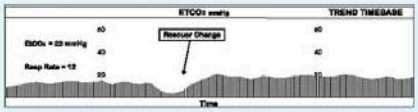
Possible Causes:
- Increase in respiratory rate and/or tidal volume (hyperventilation)
- Decrease in metabolic rate
- Fall in body temperature

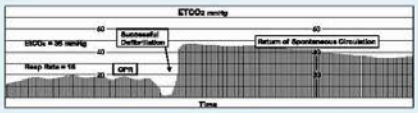


$EtCO_2$ During Cardiac Arrest

$EtCO_2$ increases significantly with the return of effective heart function.

Observations:
- $EtCO_2$ drops during cardiac arrest
- As rescuer tires, a decrease in $EtCO_2$ is observed
- Increases with effective chest compressions and heart function





GASTRIC TUBE PLACEMENT

Gastric tubes are of limited use in the prehospital environment. Their use should be limited to adult and pediatric resuscitation, gastric decompression after endotracheal intubation, or when requested by OLMC. If the nasal route is unavailable, the orogastric route may be used.

INDICATIONS

- Adult and pediatric cardiac arrest after endotracheal intubation or placement of a supraglottic airway has been performed.
- When requested by On-Line Medical Control.

CONTRAINDICATIONS

- Actual or suspected laceration or perforation of the esophagus.
- Suspected fractures of the cribriform plate as evidenced by severe maxillofacial trauma.
- Ingestion of a caustic substance.
- Anticoagulant use (e.g., Coumadin, warfarin) or disorders of coagulopathy (hemophilia).

PROCEDURE

1. Utilize BSI.
2. Select appropriate sized tube according to patient size and measure the correct length for insertion.
   a. Pediatric sizes: refer to Broslow tape or Pedi Wheel (8F, 12F, 14F)
   b. Adult size: 18F
3. **TO MEASURE:** While holding the distal end of the tube, measure the distance from the patient's earlobe to the bridge of his/her nose, and additionally from there to a point just below the xiphoid. Mark this length with a piece of tape to serve as a future guide point.
4. Lubricate the distal 3 to 6 inches of the tube (preferably with lidocaine jelly) and select the widest patent nostril.
5. With your free hand, support the back of the patient's head and gently move it forward into a slightly flexed position while you insert the tip of the tube into the selected nostril. Use caution to not displace ET tube. **FLEXION IS CONTRAINDICATED IF CERVICAL SPINE TRAUMA IS SUSPECTED**.
6. Advance the tube **STRAIGHT BACK** (in an anterior-to-posterior position, not cephalad, direction) into the nostril. If resistance is felt, rotate the tube slightly to help advance the tube into position.
7. Continue to insert the tube past the glottic opening and into the esophagus. Continue to insert the tube into the nose until your pre-measured mark reaches the front edge of the nostril.
8. After you reach the predetermined mark and confirmation is made that the tube has not curled up into the oropharynx or pharynx, aspirate 20 to 30 mL of air into a 60 mL syringe and while listening over the epigastrium, inject the air into the tube and listen for "gurgling" to indicate proper placement of the tube. Aspirate and observe for gastric contents (may not always be present).
9. If no sounds are heard over the epigastrium and you notice fogging or misting in the tube, **immediately withdraw the tube and oxygenate your patient**.
10. If tube placement has been confirmed, securely tape the proximal end of the tube where it enters the nostril to the bridge of the nose.
11. After the tube is firmly secured, connect the proximal end to suction device and aspirate as needed.
    a. Attach the tube to continual low suction, approximately 150 mm Hg using the onboard or portable suction.

GLUCOMETER

If you suspect that your patient's medical condition may be caused by a blood glucose problem, you should follow these steps. They are:

1. Check their glucose level with the Glucometer.
2. Record the glucose level of the patient in the PCR.
3. Treat the patient accordingly to the condition of the patient, and by our Standard Medical Operating Protocols for diabetic patients.

All persons who are members of Schertz EMS, and all of our First Responders will be trained on the use of the Glucometer annually.

All personnel will use the Glucometer following the manufacturer recommendations.

Printed operating instructions of the Glucometer will be kept in each ambulance and stored near the Glucometer. These instructions are to be kept with each Glucometer and are to be easily accessible to all EMS personnel.

The Glucometer is automatically re-calibrated each time a new test strip(s) is loaded into the device.

The Glucometer and test strips should be stored in accordance with our Medical Device and Pharmaceuticals Storage protocol.

INTRANASAL DRUG ADMINISTRATION

The Mucosal Atomization Device (MAD) atomizes medications at the typical particle size of 30 microns. MAD Nasal allows delivery of a mist like spray of medication into the nose, targeting the desired mucosal region of the patient. For the Intra Nasal (IN) route to be effective, medications should be highly concentrated and have low volume dosages (no more than 1.0 mL per adult nostril/0.5ml per pediatric nostril). Studies have shown that the most effective method to deliver a medication through the IN route is to atomize it across the nasal mucosa. Atomized particles (10 to 50 microns) adhere to the nasal mucosa over a large surface area, preventing waste and improving absorption of the medication. It is also appropriate to administer half the dose in each nostril to increase the surface area, and further improves absorption.

INDICATIONS

- Seizures (Adult and Pediatric) in which IV access cannot be obtained (MIDAZOLAM)
- Opiate Overdose (Adult and Pediatric) in which IV access cannot be obtained (NALOXONE)
- Hypoglycemia (Adult and Pediatric) in which IV access cannot be obtained (GLUCAGON)
- Sedation for Cardioversion or Transcutaneous Pacing (Adult and Pediatric) in which IV access cannot be obtained (MIDAZOLAM)
- Pain Management (Adult and Pediatric) in which IV access cannot be obtained (FENTANYL)

MEDICATIONS / DOSAGES

Adult / Pediatric:

- Midazolam (Versed) 2-5mg
- Naloxone (Narcan) 1-2 mg
- Glucagon 1.0 mg
- Fentanyl – Adult: 1 mcg/kg Pedi: 0.5 – 1 mcg/kg
- Ketamine 0.5 mg/kg (max single dose 25mg)

PROCEDURE

- Dose appropriate medications should be drawn up unto Syringe.
- Attach MAD device to syringe.
- Administer medications by aerosolizing medication in patient nostril (limit of 1.0 mL per nostril)
- Due to fluids contamination dispose of in an approved sharps container.



INTRAOSSEOUS INFUSION (EZ-IO)

Intraosseous infusion is the best solution for the rapid, secure and safe delivery of intraosseous drugs and fluids when existing methods of vascular access are not achievable.

INDICATIONS

- When IV therapy is critical, but a peripheral IV site cannot be established in 2 attempts **AND** has one or more of the following:
  - An altered mental status (GCS of 8 or less).
  - Respiratory compromise (Sa O2 80% after appropriate oxygen therapy, respiratory rate <10 or >40 per min).
  - Hemodynamic instability (Systolic BP of <90).
- EZ – IO **may** be considered PRIOR to peripheral IV attempts in the following situations:
  - Cardiac arrest (medical or trauma)
  - Profound hypovolemia with alteration of mental status
  - Patients in anaphylactic shock with immediate need for delivery of medications and/or fluids
- ***If patient is conscious with GCS > 8 contact OLMC for approval of IO***
  - Administer 20-50mg Lidocaine 2% slow IO bolus (over 1 minute) prior to 10ml saline flush in ALL conscious patients

CONTRAINDICATIONS

- Fracture in the targeted bone (consider alternate site).
- Previous orthopedic procedures at site of insertions (knee/shoulder replacement) (consider alternate site)
- IO access in targeted bone within past 48 hours
- Infection at insertion site (consider alternate site)
- Inability to locate landmarks (significant edema or excess tissue)

EQUIPMENT

- EZ-IO Driver
- EZ-IO Needle set
- Alcohol or Betadine Swab
- IV or Extension Set
- 10 ml Syringe
- Tape or Gauze

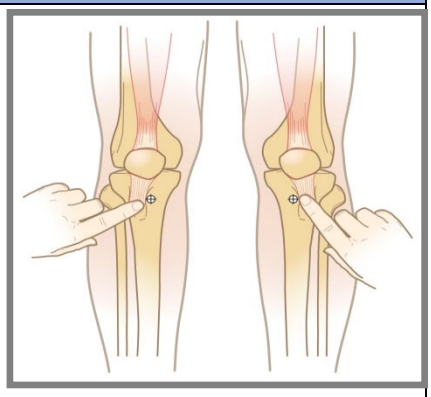
CONSIDERATIONS / PRECAUTIONS:

- 10 ml rapid bolus (flush) with a syringe **MUST** be administered after confirmation of placement
  - Use a pressure bag/BP cuff for continuous infusions
- ALL patients requiring IO infusion will be transported to the hospital
- The EZ-IO shall not be used for prophylactic use.
- For trauma patients: DO NOT delay scene times with multiple attempts

INTRAOSSEOUS INFUSION (EZ-IO)

PROCEDURE: PROXIMAL TIBIAL SITE

1. Wear approved Body Substance Isolation equipment.
2. Locate insertion site:



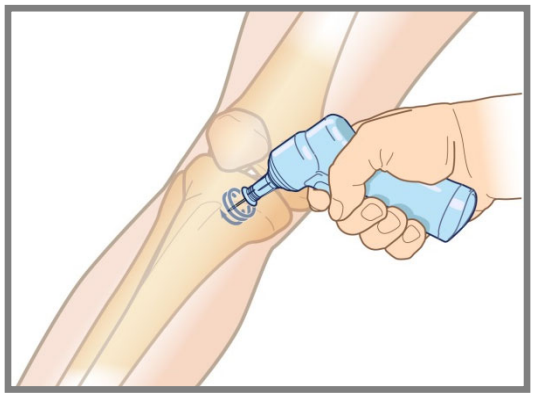
Adult tibial insertion: There are three anatomical landmarks of the insertion site that MUST be identified before using the device.

- The first landmark is the patella. To locate it, feel the front surface of the leg just below the femur for a "floating" bony structure.
- The second landmark is approximately 2 finger widths below the patella. It is the tibial tuberosity, a round oval elevation on the anterior surface of the tibia.
- One finger width medial of the tibial tuberosity is the final landmark. This is the insertion site for the EZ-IO.

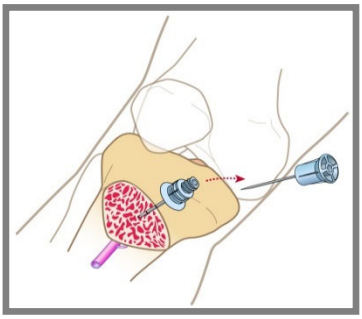
Pediatric tibial insertion:

- If the tibial tuberosity cannot be palpated, the insertion site is two finger widths below the patella and then medial along the flat aspect of the tibia.
- If the tibial tuberosity can be palpated, the insertion site is one finger width below the tuberosity and then medial along the flat aspect of the tibia.

3. Clean the insertion site with alcohol.



4. Prepare the EZ-IO driver and needle set:
   a. Open the EZ-IO case
   b. Remove the driver and one EZ-IO cartridge
   c. Attach the needle set to the driver
   d. Remove the needle set from the cartridge
   e. Remove the safety cap from the needle set
5. Begin insertion of the EZ-IO needle set
   a. Hold the EZ-IO driver in one hand while stabilizing the leg near the insertion site with the opposite hand.
   b. Position the driver at the insertion site with the needle at a 90-degree angle to the surface of the bone. Power the needle set through the skin at the insertion site until you feel the needle set tip encounter the bone
   c. At this point if there is any doubt that the needle set is not long enough verify that you can see the 5 mm marking on the catheter. If the mark is not visible, you should abandon the procedure as the needle set may not be long enough to penetrate the IO space.

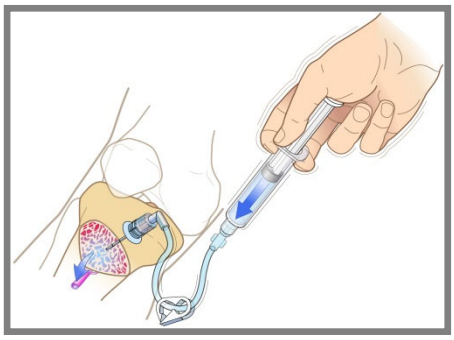


6. Continue to insert the EZ-IO
   a. Apply firm, steady pressure on the driver and power through the cortex of the bone, ensuring the driver maintained a 90 degree angle at all times
   b. Release the driver's trigger and stop the insertion process when a sudden "give or pop" is felt upon entry into the medullary space or when desired depth is obtained
   c. Remove driver from the needle set
   d. While supporting the needle set in one hand, gently pull straight up on the driver and lift
   e. Return the driver to its case
7. Remove the stylet from the catheter. While grasping the hub firmly with one hand, rotate the stylet counter clockwise. Pull the stylet out of the catheter and dispose of sharps.

INTRAOSSEOUS INFUSION (EZ-IO)

PROCEDURE: PROXIMAL TIBIAL SITE (cont'd)

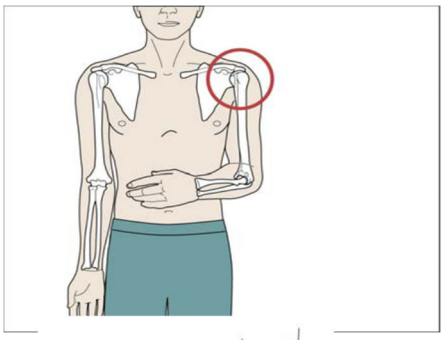
3. Confirm proper EZ-IO catheter tip position:
   a. The IO catheter stands straight up at a 90 degree angle
   b. Blood at tip of the stylet
   c. Aspiration of a small amount of bone marrow with a syringe
   d. A free flow of drugs or fluid without difficulty and with no evidence of extravasation underneath the skin
4. Attach the primed EZ-Connect set and syringe to the EZ-IO hub.
   a. Flush the IO space with 10ml of normal saline**.**
   b. **FOR PEDIATRICS:** flush the IO space with 5ml of normal saline.
5. Initiate infusion – A apply a pressure bag
6. Notify receiving hospital of EZ-IO placement

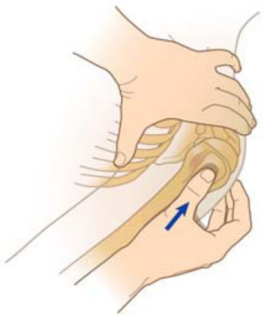


PROCEDURE: PROXIMAL HUMERAL SITE

1. Wear approved Body Substance Isolation equipment.
2. Locate insertion site:

- Position the arm for maximum humeral head exposure.
- Expose shoulder and adduct humerus (place the patient's arm against the patient's body) resting the elbow on the stretcher or ground.
- 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 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.



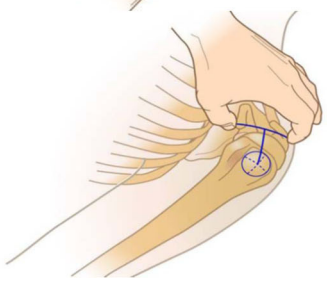






Alternate insertion site identification method

- 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 connecting the coracoid process and the acromion while the "point" reaches inferiorly and slightly anteriorly -approximately two finger widths- on the midline of the humerus

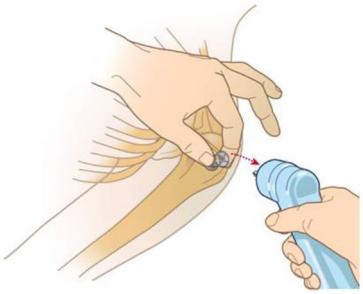


INTRAOSSEOUS INFUSION (EZ-IO)

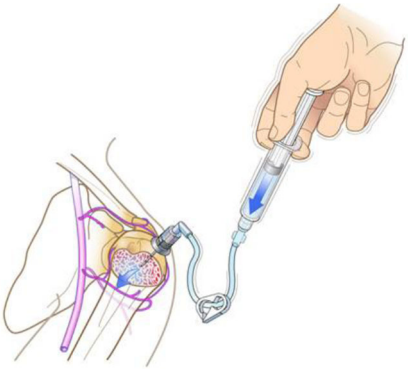
PROCEDURE

Once you have identified the greater tubercle - confirm the specific insertion site by palpation of the greater tubercle's outer margins ultimately resting your finger on the most prominent aspect of that structure

1. Clean the insertion site with alcohol.
2. Prepare the EZ-IO driver and needle set:
   - Open the EZ-IO case
   - Remove the driver and one EZ-IO cartridge
   - Open the EZ-IO cartridge and attach the needle set to the driver
   - Remove the needle set from the cartridge
   - Remove the safety cap from the needle set



3. Begin insertion of the EZ-IO needle set
   - Hold the EZ-IO driver in one hand while stabilizing the arm near the insertion site with the opposite hand.
   - Position the driver at the insertion site with the needle at a 90-degree angle to the surface of the bone. Power the needle set through the skin at the insertion site until you feel the needle set tip encounter the bone
   - At this point if there is any doubt that the needle set is not long enough verify that you can see the 5 mm marking on the catheter. If the mark is not visible, pick a longer needle or you should abandon the procedure as the needle set may not be long enough to penetrate the IO space
4. Continue to insert the EZ-IO
   - Apply firm, steady pressure on the driver and power through the cortex of the bone, ensuring the driver maintained a 90 degree angle at all times
   - Release the driver's trigger and stop the insertion process when a sudden "give or pop" is felt upon entry into the medullary space or when desired depth is obtained
5. Remove driver from the needle set
   - While supporting the needle set in one hand, gently pull straight up on the driver and lift
   - Return the driver to its case
6. Remove the stylet from the catheter. While grasping the hub firmly with one hand, rotate the stylet counter clockwise. Pull the stylet out of the catheter and dispose of sharps.
7. Confirm proper EZ-IO catheter tip position:
   - The IO catheter stands straight up at a 90 degree angle
   - Blood at tip of the stylet
   - Aspiration of a small amount of bone marrow with a syringe
   - A free flow of drugs or fluid without difficulty and with no evidence of extravasation underneath the skin

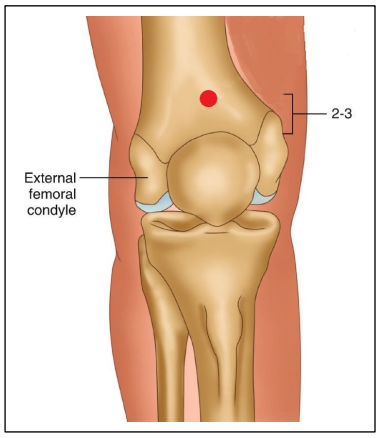


8. Attach the primed EZ-Connect set and syringe to the EZ-IO hub.
   a. Flush the IO space with 10ml of normal saline**.**
   b. **FOR PEDIATRICS: flush the IO space with 5ml of normal saline.**
9. Initiate infusion – A pressure bag/BP cuff may be needed
10. Notify receiving hospital of EZ-IO placement

INTRAOSSEOUS INFUSION (EZ-IO)

PROCEDURE: DISTAL FEMORAL

1. Wear approved Body Substance Isolation equipment.
2. Locate insertion site:

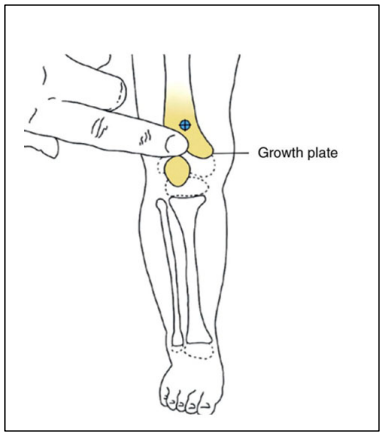


Adult distal femur insertion: There are anatomical landmarks of the insertion site that MUST be identified before using the device.

- The first landmark is the patella. To locate it, feel the front surface of the knee for the "floating" bony structure.
- The second landmark is the superior border of the patella.
- Approximately 2–3 cm above the superior border of the patella, in the midline of the femur, is the insertion site for the EZ-IO.

Pediatric distal femur insertion:

- The first landmark is the patella.
- The second landmark is the superior border of the patella.
- The insertion site is 1–2 finger widths above the patella in the midline of the femur.



3. Clean the insertion site with alcohol.
4. Prepare the EZ-IO driver and needle set:
   a. Open the EZ-IO case
   b. Remove the driver and one EZ-IO cartridge
   c. Attach the needle set to the driver
   d. Remove the needle set from the cartridge
   e. Remove the safety cap from the needle set
5. Begin insertion of the EZ-IO needle set
   a. Hold the EZ-IO driver in one hand while stabilizing the leg near the insertion site with the opposite hand. Ensure the foot is pointing upwards ("12 o'clock position"), forward.
   b. Position the driver at the insertion site with the needle at a 90-degree angle to the surface of the bone. Push the needle set through the skin at the insertion site until you feel the needle tip encounter the bone.
   c. At this point, if there is any doubt that the needle set is not long enough verify that you can see the 5 mm marking on the catheter. If the mark is not visible, you should abandon the procedure as the needle set may not be long enough to penetrate the IO space.
6. Continue to insert the EZ-IO
   a. Apply firm, steady pressure on the driver and power through the cortex of the bone, ensuring the driver maintained a 90-degree angle at all times.
   b. Release the driver's trigger and stop the insertion process when a sudden "give or pop" is felt upon entry into the medullary space or when desired depth is obtained.
   c. Remove driver from the needle set.
   d. While supporting the needle set in one hand, gently pull straight up on the driver and lift.
   e. Return the driver to its case.
7. Remove the stylet from the catheter. While grasping the hub firmly with one hand, rotate the stylet counterclockwise. Pull the stylet out of the catheter and dispose of sharps.
8. Attach the primed EZ-Connect set and syringe to the EZ-IO hub.
   1. Flush the IO space with 10ml of normal saline**.**
   2. **FOR PEDIATRICS:** flush the IO space with 5ml of normal saline.
9. Initiate infusion – A apply a pressure bag

IV ACCESS

INDICATIONS

- Patients requiring intravenous fluids
- Patients in which a high potential for hemodynamic compromise or vascular system instability exists
- *IV fluid therapy required* - Patients that will (or possibly) receive the following potentially caustic medications:
  - Norepinephrine
  - Sodium Bicarbonate
  - Promethazine
  - Midazolam

Suitable venipuncture sites

- All skills levels (Paramedic, AEMTs and EMTs (credentialed to initiate IV access)
  - Back of the hand
  - Forearm
  - Antecubital fossa
  - Leg / Foot
- Paramedic only
  - Jugular

WHO MAY PERFORM

- EMT (credentialed by Schertz EMS)
- Advanced EMT
- Paramedic

PROCEDURE

1. Body Substance Isolation (BSI)
2. Locate suitable venipuncture site
3. Place constricting (enough to halt venous return, not arterial flow) band above the chosen site
4. Select a suitable vein. If possible, it should be well fixed, firm, and free of proximal valves.
5. Using alcohol or iodine swabs, and a circular motion inside to outside, thoroughly cleanse the IV site
6. Choose proper size angiocath
7. With the bevel of the needle facing up, enter the site at a 30-45 degree angle until a “pop” is felt
8. After the “pop” and blood return is seen in the flash chamber, advance approximately 1 cm more
9. Carefully slide the catheter off the needle into the vein until the hub stops at the skin
10. Remove the needle and place into an approved receptacle for disposal
11. Attach the distal end of the administration set to the IV hub
12. Confirm flow of IV fluid. If infiltration occurs stop the flow and replace.
13. Securely tape the catheter into place
14. Adjust the flow rate as needed according to patient presentation

IV SALINE LOCKS

The Saline Lock provides an alternative to conventional IV therapy using a continuous fluid drip to keep the catheter open for precautionary IV access. The purpose of this protocol is to define the indications, contraindications and insertion/maintenance procedures for this skill

INDICATIONS

- A saline lock is indicated for patients who need precautionary IV access but:
  - **DO NOT** require continuous infusion of an IV solution
    - (Ex: hemodynamically stable patient presenting with TIA signs and symptoms)

  OR

  - **NOT** expected to receive any of the following medications that are potentially caustic.
    - Dextrose
    - Norepinephrine
    - Promethazine
    - Sodium bicarbonate
    - Midazolam

- May be used as a second IV site (Ex. Heart Alerts, cardiac arrest, hemodynamically stable trauma patients)

CONTRAINDICATIONS

- If the patient is at risk for (or presents with) hypoperfusion, intravenous fluids will be initiated.
  - Examples of these patients include cardiac arrest patients, trauma patients, patients with physiological signs and symptoms of shock of ANY origin, and burn patients

PROCEDURE

1. All equipment should be prepared before beginning the procedure. This includes preparing the 10 cc saline flush, assembling the saline lock hub, and extension tubing and filling it with saline and preparing all other IV initiation supplies (catheter, constricting band, Veniguard, etc.)
2. After successful IV cannulation, the hub should be securely inserted into the IV catheter. The hub and catheter should be manually secured while being flushed.
3. Insert the saline syringe onto the distal end of the lock hub device. Draw back on the syringe plunger and observe blood flow into the catheter and extension set. Slowly inject 10 cc of saline into the lock hub device. Observe for signs of infiltration during this injection. Discard syringe into sharps container.
4. Secure the catheter and saline lock hub device with a Veniguard.
5. If a continuous IV infusion or IV push medication is needed, your IV administration set can be connected to either the IV catheter after removing the saline lock hub device.
6. Continuous monitoring of the IV site is warranted with a saline lock to insure patency of the IV at all times.

MEDICATION ADMINISTRATION

This section deals with the administration routes and techniques of various medications. Always check the six-rights of medication administration ("right" patient, "right" drug, "right" dose, "right" route, "right" time and "right" documentation). Verify the expiration date on the medication

MEDICATION PREPARATION

- The crewmember administering a medication to a patient WILL personally prepare the medication prior to administration. This includes drawing up the medication, assembling the syringe, confirm the "5 Rs", etc.
- If this procedure is not followed, the incident will be a **mandatory notification** to the on-duty MSC and Clinical Services.

INTRAVENOUS (IV) / INTRAOSSEOUS (IO) MEDICATION

- **All medications that are given IV can also be given IO at the same dosage.**
- Provides direct medication access to the venous circulation by direct injection of a medication into an IV or IO line

Procedure:

1. Make sure air is expelled from IV tubing or syringe
2. Cleanse the Medication port with alcohol prep pad
3. Inject the medication at the appropriate rate and the flow IV or flush line to ensure all medication was delivered

ENDOTRACHEAL (ETT) MEDICATIONS

ETT is no longer a preferred route of medication administration and should ONLY be used when IV and/or IO cannot be obtained.

- The medications are absorbed in the alveoli (where the pulmonary capillary beds are located)
- The medications must be given in a sufficient volume (or flush) to ensure that they are delivered into the base of the lungs and not merely adhere to the side of the endotracheal tube or to the main bronchi
- Only 4 medications are to be given by the endotracheal route (LEAN):
  - Atropine
  - Lidocaine
  - Epinephrine
  - Narcan
- **The meds given by the ETT should be double the normal IV dose**

Procedure:

1. Oxygenate the patient with 100% oxygen
2. Disconnect the BVM and administer the medication after it has been diluted or a flush has been prepared to use afterward.
3. Reconnect the BVM and ventilate with 5 breaths

MEDICATION ADMINISTRATION

SUBCUTANEOUS (SQ) MEDICATIONS

The only medications which should be administered subcutaneously are

a. Brethine

b. vaccinations

Procedure:

1. Expose the skin at the site of injection and cleanse the area with an alcohol prep
2. Inject the medication into the subcutaneous tissue
3. Aspirate

NEBULIZED MEDICATIONS

Hand-Held Nebulized Meds:

- The HHN delivers medications into the bronchioles for patients who are having trouble breathing
- Have the oxygen flow rate high enough to cause misting of the medication
- Patient can hold a HHN (mouth-piece) if old enough or awake and cooperative, or medication may be administered via a nebulizer face mask

Nebulizing an intubated patient: assemble the nebulizer, but instead of placing the mouthpiece on one end, attach the 90 degree endotracheal tube adapter to the endotracheal tube and the other end to the 6" tube

ORAL (PO) MEDICATIONS

- Provides medications directly into the digestive system
- Includes aspirin and Tylenol

Procedure:

1. Patient must have intact gag reflex
2. Administer pills by having patient chew (ASA) or swallow (Tylenol)

SUBLINGUAL (SL) MEDICATION

- Provides medications underneath the tongue where it is dissolved and absorbed
- Includes NTG

Procedure:

1. Patient must have intact gag reflex
2. Administer medication underneath tongue

BUCCAL MUCOSA

- Provides medications between the cheek and gum for a quick absorption
- Includes Oral Glucose

Procedure:

1. Patient must have intact gag reflex
2. Administer between cheek and gum

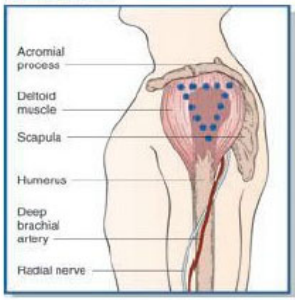
MEDICATION ADMINISTRATION

INTRAMUSCULAR (IM) MEDICATIONS

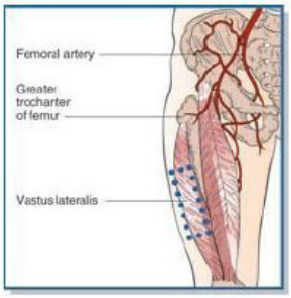
Provides meds into deep muscles for absorption into the venous circulation

1. Utilize BSI
2. Prepare your equipment.
   - **Appropriate needle length:** 5/8 to 1 inch for deltoid and 1 to1.5 inch for larger muscles.
   - **Appropriate needle gauge:** 22 to 25-gauge needle for aqueous and 21 gauge for oily or thicker medications. A 3- or 5-ml syringe, medication, alcohol swabs, and band-aids.
3. Check the label, date, and appearance of the medication to be administered.
4. Locate the appropriate site for the injection. **Use only the following sites**:
   - **Posterior Deltoid** for injections of 2 mL or less (preferred site) in adults
   - **Dorsogluteal site** for injections of 2 to 5 mL in adults or 2 mL or less in children > age 3.
   - **Vastus Lateralis** for injections of 2 mL or less in children and adults.
   - **Ventrogluteal site** for injections of 2 to 5 mL in adults or 2 mL or less in children.
5. If the **posterior deltoid** is used, first identify the landmarks of the upper arm. Find the bony portion of the shoulder where the clavicle and scapula meet (the acromioclavicular joint). Then measure 3 to 4 finger-widths down the arm from the AC joint. Then slide one to two finger-widths posteriorly on the arm. Cleanse skin with alcohol and allow to dry. **Do not** inject large volumes of irritating medications into this muscle (i.e., steroids, etc.).
6. If the **dorsogluteal site** is used, first identify the posterior superior iliac spine. Draw an imaginary line to the head of the trochanter (have the patient lie prone and point his/her toes inward to help relax the muscles), the injection is given lateral and superior to this line.
7. The **vastus lateralis** sites are located on the anterior and lateral aspects of the thigh. Divide the area into thirds between the greater trochanter of the femur and the lateral femoral condyle. The injection should be given into the middle third (**preferred site for epi-pen injections**).
8. If using the **ventrogluteal site**, place the heel of your right palm on your patient's greater trochanter of the femur. Place your index finger on the anterior superior iliac spine and spread your other fingers posteriorly. The injection is given in the V formed between the index finger and the second finger.
9. With one hand, stretch or flatten the skin overlying the selected site (this allows for a smoother entry of the needle). Hold the syringe like a dart in the other hand and quickly thrust the needle into the tissue and muscle at a 90-degree angle.
10. Aspirate the syringe to ensure that an inadvertent venous administration is avoided. If any blood is aspirated into the syringe withdraw the syringe and needle and dispose of the medication. Begin again at a new site. **DO NOT administer any medication mixed with blood**.
11. If no blood is aspirated, slowly inject the medication. After all the medication is injected, quickly withdraw the syringe, dispose of the sharps in an approved container, and gently massage over the injection site to increase absorption and medication distribution. Apply firm pressure and place a bandage over the injection site.

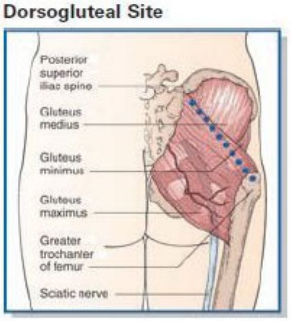
Deltoid Site



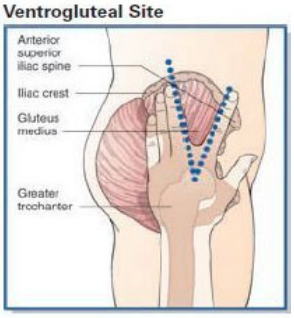
Vastus Lateralis Site



Dorsogluteal Site



Ventrogluteal Site



MEDICATION INFUSION - AMIODARONE

Amiodarone is an antiarrhythmic agent used for various types of tachyarrhythmias, both ventricular and supraventricular arrhythmias. Amiodarone is categorized as a class III antiarrhythmic agent and prolongs phase 3 of the cardiac action potential. It has numerous other effects however, including actions that are similar to those of antiarrhythmic classes IA, II and IV. Amiodarone shows beta blocker-like and calcium channel blocker-like actions on the SA and AV nodes, increases the refractory period via the sodium and potassium channel effects, and slows intra-cardiac conduction of the cardiac action potential via the sodium channel effects.

INDICATIONS

- Atrial-Flutter
- Atrial-Fibrillation
- Ventricular Tachycardia with a pulse
- Post- bolus therapy for suppression of ventricular arrhythmias

PROCEDURE

- Atrial Fibrillation, Atrial Flutter, Ventricular Tachycardia with a pulse
  - 150mg over 10 minutes (15 mg/min)
    - 300mg/250ml NS via IV Pump – set the maintenance infusion 1mg/min, then set bolus of 150mg over 10 min.
    - *If IV pump is NOT available - 150mg in 50cc bag – Set Dial-a-Flow to 250*
- Post-bolus therapy for suppression of ventricular arrhythmias
  - 300mg/250ml NS via IV Pump – set the maintenance infusion 1mg/min
  - If IV pump NOT available: 150mg in a 250cc bag of NS administered at 1 mg/min
    - Set Dial-a-Flow to 200

CONSIDERATIONS / PRECAUTIONS:

- Patients with hypersensitivity to drug
- Severe sinus node disease resulting in preexisting bradycardia
- Second- or third-degree AV block unless artificial pacemaker is present
- Those in whom bradycardia has caused syncope

MEDICATION INFUSION - NOREPINEPHRINE

INDICATIONS

- Hypotension (non-hemorrhagic)
- Shock
  - Cardiogenic
  - Neurogenic
  - Septic
  - Hypovolemia (after adequate fluid resuscitation)

CONTRAINDICATIONS

- Abdominal aortic aneurysm

DOSAGE

Adult:

- 1 – 10 mcg/min
  - Mix 4mg / 250 ml NS (Administer via IV pump)

CONSIDERATIONS / PRECAUTIONS:

- **DO NOT** mix with Sodium Bicarb. Be sure to flush the line well prior to starting the drip.
- **DO NOT** use with hypotension due to uncorrected hypovolemia that will be ruled out in your patient assessment and history.
- When administered with other sympathomimetics it may cause hypertension.
- **Always look at patient presentation and your assessment when considering whether the patient is hypotensive and needs norepinephrine.** In other words, the BP does not just have to be below 90 mmHg for the patient to be symptomatic and just because the BP is below 90 mmHg, does not mean the patient needs norepinephrine.

OUT OF HOSPITAL – DO NOT RESUSCITATE (DNR)

Patients in the State of Texas have the individual right, if they are sound in mind, to refuse any attempts at EMS care up to and including CPR. Currently, the only way for a patient to refuse CPR, however, is through complete and thorough documentation on a State of Texas out of Hospital Do Not Resuscitate (OOHDNR) form. An OOH-DNR order allows a patient with a terminal condition to direct health care professionals in the out-of-hospital setting to withhold or withdraw specific life-sustaining treatments in the event of respiratory or cardiac arrest.

PROCEDURE

1. When responding to a call for assistance, personnel shall honor an OOH-DNR in accordance with statewide protocols.
2. Identify the DNR order. The original OOH-DNR or copy must be present and appear valid or the patient must be wearing the approved device.
3. Approved devices include:
   a. White vinyl, hospital-style, Texas Out-Of-Hospital Do-Not-Resuscitate bracelet with the patient's name, physician's name and the patient ID number entered on the back side of the bracelet.
   b. Stainless steel Texas OOH-DNR bracelet with the patient's name, physician's name and the patient ID number engraved on the backside of the bracelet.
   c. Stainless steel Texas OOH-DNR necklace with the patient's name, physician's name and the patient ID number engraved on the backside of the necklace.
   d. All other DNR orders not on an approved State of Texas OOH-DNR form or device cannot be honored by pre-hospital professionals in Texas. If presented with one immediately begin/continue resuscitative efforts while a crew member contacts OLMC for permission to honor DNR.
4. Resuscitation efforts shall be withdrawn or withheld in the pulseless and apneic patient if the above criteria have been met. Resuscitation efforts would include the following:
   a. CPR.
   b. Defibrillation
   c. Cardiac resuscitation medications
   d. Advanced airway management
   e. Artificial ventilation
   f. Transcutaneous cardiac pacing.
5. Patient care documentation must include:
   a. Detailed physical assessment of the patient.
   b. Confirmation that OOH-DNR order was presented and what format was accepted.
   c. Any problems encountered accepting the DNR order.
   d. Name of the patient's attending physician with the address and phone number.
   e. Name, address and phone number of witnesses used for patient identification.
   f. Name, address and phone number of hospice agency, if any.
6. The OOH-DNR **may** be revoked by the:
   a. Patient or someone with the patient and at the patient's discretion destroys the form and removes any ID devices.
   b. Person executing order or someone in this person's presence and at the patient's discretion destroys form and removes any ID devices.
   c. Patient communicating his/her intent to revoke.
   d. Person executing order orally states his/her intent to revoke.
7. **THE OOH-DNR ORDER IS AUTOMATICALLY REVOKED IN CASE OF**:
   a. Known pregnancy of the patient.
   b. Suspected criminal activity involving the patient.

OUT OF HOSPITAL – DO NOT RESUSCITATE FORM

Figure: 25 TAC §157.25 (h)(2)

OUT-OF-HOSPITAL DO-NOT-RESUSCITATE (OOH-DNR) ORDER

TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Person's full legal name: _____ **Date of birth:** _____ ☐ **Male** ☐ **Female**

This document becomes effective immediately on the date of execution for health care professionals acting in out-of-hospital settings. It remains in effect until the person is pronounced dead by authorized medical or legal authority or the document is revoked. Resuscitation measures include cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation. Comfort care will be given.

A. **Declaration of the adult person:** I am competent and at least 18 years of age. **I direct that no resuscitation measures be initiated or continued for me.**
Person's signature: _____ Date: _____ Printed name: _____

B. **Declaration by legal guardian, agent, or proxy on behalf of the adult person who is incompetent or otherwise incapable of communication:**
I am the ☐ legal guardian, ☐ agent in a Medical Power of Attorney, or ☐ proxy in a directive to physicians of the above-noted person who is incompetent or otherwise mentally or physically incapable of communication.
Based upon the known desires of the person or a determination of the best interest of the person, **I direct that no resuscitation measures be initiated or continued for the person.**
Signature: _____ Date: _____ Printed name: _____

C. **Declaration by a qualified relative of the adult person who is incompetent or otherwise incapable of communication:** I am the above noted person's ☐ spouse, ☐ adult child, ☐ parent, or ☐ nearest living relative, and I am qualified to make this treatment decision under Health and Safety Code §166.088.
To my knowledge the adult person is incompetent or otherwise mentally or physically incapable of communication and is without a legal guardian, agent, or proxy. Based upon the known desires of the person or a determination of the best interests of the person, **I direct that no resuscitation measures be initiated or continued for the person.**
Signature: _____ Date: _____ Printed name: _____

D. **Declaration by physician, based on directive to physicians by a person now incompetent or nonwritten communication to the physician by a competent person:** I am the above-noted person's attending physician and have
☐ seen evidence of his/her previously issued directive to physicians by the adult, now incompetent, or ☐ observed his/her issuance before two witnesses of an OOH-DNR in a nonwritten manner.
I direct that no resuscitation measures be initiated or continued for this person. License Number: _____
Attending physician's signature: _____ Date: _____ Printed name: _____

E. **Declaration on behalf of the minor person:** I am the minor's ☐ parent, ☐ legal guardian, or ☐ managing conservator.
A physician has diagnosed the minor as suffering from a terminal or irreversible condition. **I direct that no resuscitation measures be initiated or continued for the person.**
Person's signature: _____ Date: _____ Printed name: _____

TWO WITNESSES: (See qualifications on backside.) We have witnessed the above-noted competent adult person or authorized declarant making his/her signature above and, if applicable, the above-noted adult person making an OOH-DNR by nonwritten communication to the attending physician.
Witness 1 signature: _____ Date: _____ Printed name: _____
Witness 2 signature: _____ Date: _____ Printed name: _____
The above noted person personally appeared before me and signed the above noted declaration on this date: _____.
Notary in the State of Texas and County of _____.
Signature & seal: _____ **Notary's printed name:** _____ *Notary Seal*
[Note: Notary cannot acknowledge the witnessing of the person making an OOH-DNR order in a nonwritten manner.]

PHYSICIAN'S STATEMENT: I am the attending physician of the above-noted person and have noted the existence of this order in the person's medical records. **I direct health care professionals acting in out-of-hospital settings, including a hospital emergency department, not to initiate or continue resuscitation measures for the person.** License Number: _____
Physician's signature: _____ Date: _____ Printed name: _____

F. **Directive by two physicians on behalf of the adult, who is incompetent or unable to communicate and without guardian, agent, proxy or relative: The person's specific wishes are unknown, but resuscitation measures are, in reasonable medical judgment, considered ineffective or are otherwise not in the best interests of the person. I direct health care professionals acting in out-of-hospital settings, including a hospital emergency department, not to initiate or continue resuscitation measures for the person.**
Attending physician's signature: _____ Date: _____ Printed name: _____ Lic. # _____
Signature of second physician: _____ Date: _____ Printed name: _____ Lic. # _____

All persons who have signed above must sign below, acknowledging that this document has been properly completed.
Person's signature: _____ Guardian/Agent/Proxy/Relative signature: _____
Attending physician's signature: _____ Second Physician Signature: _____
Witness 1 signature: _____ Witness 2 signature: _____ Notary signature: _____

This document or a copy thereof must accompany the person during his/her medical transport. **Page 1 of 2**

PAIN MANAGEMENT

In the practice of EMS, pain is the most common symptom that patients present with, spanning a wide variety of injuries and illnesses. This protocol is set up to do so by properly assessing the patient's pain and their vital signs to properly decide which intervention would best suit the patient to help control their pain.

History	Signs & Symptoms	Differential
• Age • Location • Duration • Severity (0-10) • PMH • Allergies • Medications	• Severity (pain scale or Faces scale) • Quality (dull, sharp, pressure, etc.) • Radiation • Anything make pain worse/better?	• Follow specific SMOP • Musculoskeletal • Cardiac • Pleural / respiratory • Neurogenic

INDICATIONS

- Patients who are experiencing pain

CONTRAINDICATIONS

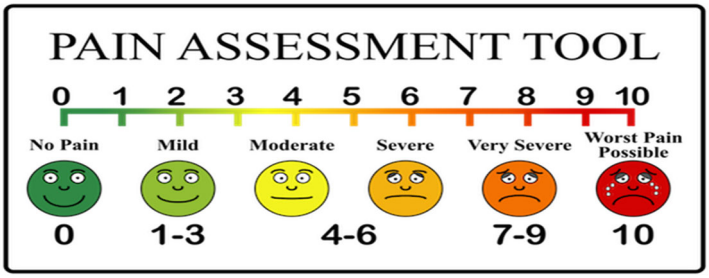
- Patients with acute mental status depression
- Patients with known hypersensitivity or allergy to pain control medications

ASSESSMENT

1. Proper assessment is the first step in identifying and appropriately treating the patient's pain.
2. When assessing the patient ask them if they have or have had any pain. If the answer is yes, ask the patient to tell you where the pain was and to describe the pain in his or her own words. Also asses the patient overall behavior and psychological state to help you determine the amount of stress that the patient is in from the pain.
3. Once they have described the pain to you, ask them to rate their pain on a 0-10 scale with 0= no pain and 10 = the worst pain they have ever felt. In addition, once they have picked a number, ask them to recall their worst pain experience before this instance, and ask if the pain is worse or better than that time.
4. Once the level of pain has been established, the corrective interventions should be done, and reassessment of the pain should be constantly monitored and documented.

PROCEDURE

1. Assess the patient.
2. Secure and maintain ABC's and administer oxygen (maintain SpO2 > 94%)
3. Consider non-pharmaceutical techniques:
   a. position the patient in the position where they feel comfortable
   b. splinting and/or ice packs with trauma (if applicable)
4. Monitor SpO2 and ETCO2 **(before administration of any narcotic)**
5. Monitor cardiac rhythm
6. Establish IV
7. Document patient response to medications (including pain scale before and after administration)



PAIN MANAGEMENT

Medications

Mild to Moderate Pain

- **Acetaminophen**
  - Adult
    - 15mg/kg PO (Max dose: 1gram)
    - 1gram IV over 15 minutes via IV pump
  - Pediatric
    - PO - 15 mg/kg administration if mental status allows for PO
    - IV – Pediatric patients (> 2 years old)
      - 12.5 mg/kg over 15 minutes (Max dose: 500 mg) via IV pump

****Credentialed EMT may administer acetaminophen PO for pain management****

Moderate to Severe Pain

- **Fentanyl**
  - Adult
    - 0.5 – 2 mcg/kg **slow** IV/IO (titrate to effect)
    - 1 mcg/kg Intramuscular (IM) or Intranasal (IN) – Max single IN/IM dose: 100mcg
    - May repeat in 5-10 minutes
  - Pediatric
    - 0.5 – 1 mcg/kg **slow** IV/IO or IM/IN
      - May repeat in 5-10 minutes (titrate to effect)
      - Max dose: Single dose 50 mcgs (Total: 3 mcg/kg)

Severe Trauma

- **Ketamine**
  - Adult
    - 25 mg (0.5cc) added to 50ml NS – Infuse over 5 – 10 minutes
      - *May be titrated to effects*
      - *Max single dose: 25 mg*
      - *May repeat dose x1*
    - 0.5 mg/kg Intranasal (IN) (may repeat x1 in 10 minutes)
      - *Max single dose: 25 mg*
    - 1mg/kg IM
    - **Max Dose all routes**
      - **Total cumulative dose: 100 mg**

SPECIAL CONSIDERATIONS

- Pain severity (0 – 10) is a vital sign and should be assessed before and after each medication administration
- **Vitals signs (including SpO2 and ETCO2) will be obtain before administration, post administration and upon arrival at receiving facility**

PATIENT RESTRAINT

Behavioral episodes may range from despondent and withdrawn to aggressive and violent behavior. Behavioral changes may be a symptom of a number of medical conditions including head injury, trauma, substance abuse, metabolic disorders, stress and psychiatric disorders. Patient assessment and evaluation of the situation is crucial in differentiating medical intervention needs from psychological support needs. There are two common threads present prior to sudden death during transport of agitated patients. The first is a state of "**excited delirium**", which refers to qualities of irrational behavior, aggression, violence, and paranoia in the patient. This state can result from a number of causes including cocaine intoxication, psychiatric illness, hypoglycemia, and other medical illnesses. During the excited delirium, the patient often becomes significantly hyperthermic. Excited delirium increases the body's need for oxygen by increasing the workload and stress on the heart while at the same time the hyperactivity increases the use of oxygen by the muscles. The second factor which contributes to death in these patients is restraint. The term "**positional asphyxia**" has been used to describe the situation where the placement of the body interferes with breathing, resulting in a lack of oxygen delivery to the blood cells. Once the blood oxygen level falls below that needed to support life, the brain begins to die. The deleterious positional effect may result either from interference with the muscular or mechanical component of respiration or from obstruction of the upper airway. These patients have a combination of high demand for oxygen coupled with a decreased supply because of the way they are restrained. This combination is sometimes lethal.

PROCEDURE

- Make the scene safe. Law enforcement should be used as needed to determine scene safety.
- Never turn your back nor leave the patient alone.
- Look for a possible cause.
- Assess and treat hypoglycemia as per protocol.
- Encourage the patient to talk. Listen carefully.
- Be confident, respectful, calm and honest.
- Explain all movements and procedures.
- Provide interventions for possible medical causes.
- Patient Restraint
  - Restrained patients should always be transported in a supine position. Use cravats, not tape and use caution when placing straps/cravats over chest and neck (cravats should be loose enough to allow you to slide your hand between the strap and chest if the patient were relaxed). Verify that the straps and cravats across the chest are not compressing the chest from its full recoil position.
  - All patients should receive supplemental oxygen and be placed on pulse oximetry and cardiac monitoring at ALL times during and after restraint.
- **Chemical Restraint**
  - The goal of chemical restraint is to safely manage the patient without injuring the patient or the care-providers.
  - Refer to the **Behavior Emergencies Protocol** for medications
- **Personnel shall document the following information on the PCR:**
  - The patient's behavior that necessitated restraint usage
  - The type of restraint used
  - The time the restraint was applied
  - Assessment of the patient's condition after restraints were applied (e.g., airway patency, distal extremity circulation) and every 5 minutes after the initial application.

PRE-EXISTING CENTRAL CATHETERS

INDICATIONS

In the presence of a life-threatening condition, in a patient with a pre-existing central catheter with clear indications for immediate use for medications or IV fluids.

CONTRAINDICATIONS

- Prophylactic IV access
- Suspected infection at the site
- Inability to yield a blood return when aspirating as placement in the vessel cannot be confirmed

PROCEDURE

Implanted Catheter (Port-a-Cath, PAS port, Medi-Port)

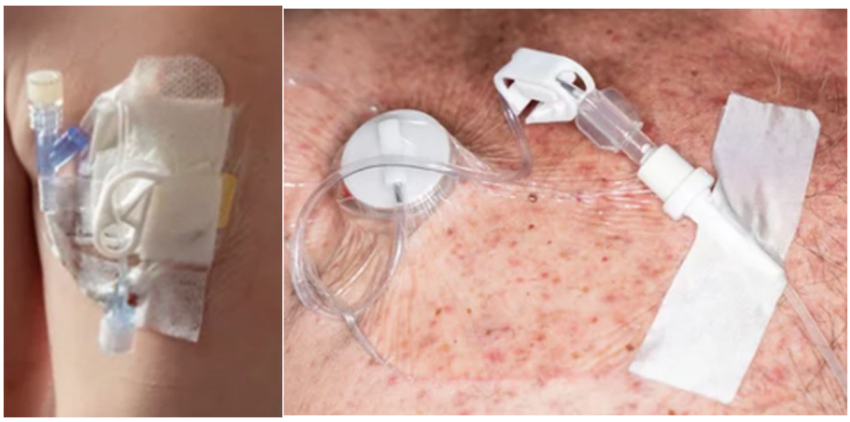
The site MUST have previously been accessed with the appropriate Huber or Haberman needle already in place with a saline (heparin) lock already. EMS personnel will NOT access the port with a needle

1. Prepare all necessary equipment:
   a. 10 mL syringe (empty)
   b. Two 10 mL syringes 0.9% NaCl
   c. Sterile gloves (if available).
2. Identify the access site; usually located in the chest. Thoroughly cleanse the site.
3. Attach the 10mL syringe (empty) to the saline (heparin) lock
4. Aspirate 3 – 5 mL of blood with the syringe.
   a. **If unable to aspirate blood**, re-clamp the catheter and do not attempt further use.
   b. **If clots are present**, contact Medical Command before proceeding.
5. Flush the catheter with 3 – 5 mL 0.9% NaCl using a 10 mL syringe.
   a. If the catheter **does not** flush easily, **DO NOT** attempt further use.
6. Attach IV administration set and observe for free flow of IV fluid.
7. If shock is not present, allow fluid to run at rate of KVO to prevent the central line from clotting.

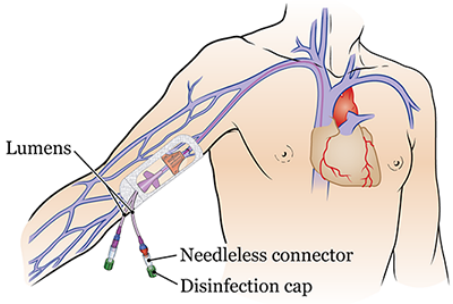
Peripherally Inserted Central Catheter PICC) And Tunneled Catheter (Broviac, Hickman, Groshong, Etc.)

1. Prepare equipment:
   a. 10 mL syringe (empty)
   b. 10 mL syringe 0.9% NaCl
   c. Sterile gloves (if available).
2. If more than one lumen is available, select the largest lumen available.
   a. PICCs and Boviacs can have one, two, or three lumens
3. Thoroughly clean/prep the cap of the lumen alcohol or with chlorhexidine (if available).
4. Unclamp the catheter lumen and using a 10 mL syringe, (after unclamping the lumen) aspirate 3 – 5 mL of blood with the syringe and discard.
   a. If unable to aspirate blood, re-clamp the lumen and attempt to use another lumen (if present).
   b. If clots are present, contact Medical Command before proceeding.
5. Flush the lumen with 3 – 5 mL 0.9% NaCl using a the 10 mL syringe.
   a. If the catheter does not flush easily, re-clamp the selected lumen and attempt to use another lumen (if present). (note that a PICC line will generally flush more slowly and with greater resistance than a typical intravenous catheter)
6. Attach IV administration set and observe for free flow of IV fluid.
7. Allow titrate fluid to run at a rate of 10 mL/hour to prevent the central line from clotting.

PRE-EXISTING CENTRAL CATHETERS



Examples of Port-a-cath with saline (heparin) locks attached



Peripherally Inserted Central Catheter (PICC)

Considerations:

- Never allow a central line to be open to air
- Avoid taking a blood pressure reading in the same arm as the PICC.
- If utilized, allow chlorhexidine mixture to dry completely
- When clamps are use on the distal end of catheter, do not unclamp prior to attaching syringe or IV tubing to catheter
- Always use at least a 10ml syringe, smaller size syringes deliver too much pressure into catheter and can damage the Central line tubing.
- Maximum flow rates for a central line is 125ml/hr. Not to be used for rapid fluid bolus administration.

PUSH DOSE PRESSOR - EPI

Push dose epinephrine is for use in profoundly hypotensive patients after standard treatments fail to improve blood pressure

Indications

- Hypotension (Cardiogenic Shock, Septic Shock, Post ROSC)
- Septic shock
- Suspected neurogenic shock (suspected spinal cord injury & hypotension in a trauma patient including extremity weakness, numbness or sensory loss)

Consider using in cases in which a Norepinephrine infusion is delayed or not available

Contraindications

- Hypovolemic shock (hemorrhagic or volume depletion)
- Using push pressor before IV fluid administration/bolus

Procedure

1. Obtain a 10 mL syringe prefill with sterile normal saline and push 1 ml out of syringe
2. Into the syringe, draw up 1 ml of epinephrine 1:10,000 (from a cardiac arrest amp, concentration is 100mcg/mL) and vigorously roll syringe between your hands to ensure it is well mixed
3. Label the syringe “Epinephrine: 1:100,000” or 10 mL of Epinephrine 10mcg/mL

Dosage

- Hypotension
  - 0.5 - 1 ml every 1-2 minutes (5-10 mcg) to maintain MAP > 65
    - This is equivalent to dose of epinephrine given via infusion (5-10 mcg/min)
  - **Confirm medication as “Push dose Epi” – Epi 1:100,000**

Special Considerations

- **Use your critical thinking. Ask yourself why your patient is hypotensive? If rate related, treat that. *Fill the tank first***
- ***Do not bolus cardiac arrest doses of epinephrine (1:10,000) unless the patient is pulseless***
- ***Ensure your use of the correct dosage of epinephrine***
- Utilize the smallest dose necessary to alleviate undesirable symptoms and titrate your dosing to patient effect
- Epinephrine has both *α- and β-adrenergic* activity and will therefore stimulate the heart in addition to causing vasoconstriction. This will increase myocardial oxygen demand
- Pressors can be given via peripheral IV but carefully monitor your IV site for S/S of extravasation. If extravasation is noted, discontinue use of this site and reestablish reliable IV access at another site

SAM® PELVIC SLING

INDICATIONS

- Suspected pelvic fracture
  - Used to control pain and possible hemorrhage in patients with suspected pelvic fractures

CONTRAINDICATIONS

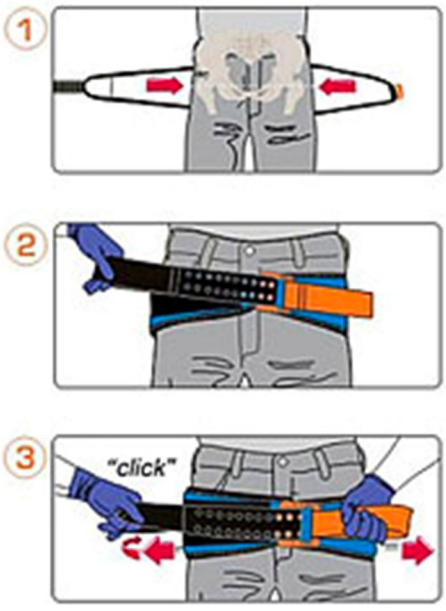
- None noted

PROCEDURE

- **Remove** objects from the patient's pockets and/or pelvic area
- Place the SAM pelvic sling under the patient (printed side down) at the level of the buttocks (greater trochanters / symphysis pubis)
- Wrap the non-buckle side of the sling around the patient
- Firmly wrap the buckle side of the sling around the patient, positioning the buckle at the midline. Secure it in place by velcroing the blue flap to the sling.
- Life the black strap away from the sling by pulling upward
- Firmly pull the orange and black straps in opposite directions until you hear and feel the buckle click. HOLD Tension on the sling.
- Immediately press the black strap onto the blue flap on the sling to secure it. DO NOT be concerned if you hear a second click after the sling is secure

SPECIAL CONSIDERATIONS

- Consider the potential need for SMR – this can be utilized in conjunction with spinal motion restriction
- Assess pulse, motor and sensation before and after placing the splint



SPINAL MOTION RESTRICTION

When arrival on scene and only after a complete patient exam, the following protocol will be followed:

Does the patient have signs of traumatic injuries?

NO → **Patient DOES NOT require a LSB**

YES ↓

Did the patient sustain ONLY penetrating trauma?

YES → **Patient DOES NOT require a LSB**

NO ↓

Is the patient ambulatory on scene at the time of FRO / EMS arrival?

YES → **Patient DOES NOT require a LSB**

NO ↓

Is the patient able to follow commands?

- No language barriers
- Calm / cooperative
- No significant AMS
- No impairment rendering patient incapacitated

YES → **Patient DOES NOT require a LSB**

NO ↓

If altered mental status

Is it due to a known seizure disorder (post-ictal) or known

YES → **Patient DOES NOT require a LSB**

NO ↓

Place in FULL Spinal Motion Restriction (SMR) with

C-Collar and LSB

Patient DOES NOT require a LSB

Place patient on the stretcher (the stretcher mattress should provide sufficient restriction of lateral spinal movement)

↓

Does the Patient have / complain of:

- Neck Pain
- Neck tenderness on palpation
- Neurologic deficits / paresthesia
- Other potentially "distracting injuries"

YES ↓

Place C-Collar

(Before placing on stretcher)

Ask Patient not to move head/neck

NO ↓

C-Collar NOT needed

The GOAL of "spinal immobilization" is to reduce stress on the spine

Patients should **NOT** be forcefully restrained, IF they can be managed with verbal techniques.

- Backboards are useful for carrying patient to a stretcher
- Self-extrication from a vehicle with assistance is likely better than "normal" extrication procedures

SPINAL MOTION RESTRICTION

Traditional full spinal immobilization may cause airway compromise, skin breakdown, and pain in virtually everyone, which often leads to unnecessary diagnostic procedures. The primary purpose of SMR is to prevent movement that could worsen an unstable spinal fracture (which occur in <1% of major trauma victims). These injuries are recognized with a careful history and thorough physical assessment. As with any aspect of medicine, a patient should not have a procedure performed upon them for which there are no indications. SMR that increases patient movement and/or pain should be avoided.

INDICATIONS

- Any patient involved in a traumatic event will be assessed for spinal trauma

CONTRAINDICATIONS

- Patient with isolated extremity injury

PRECAUTIONS

- Spinal motion restriction means that the head, neck and torso move as a unit and cannot move independently
- Significant mechanism includes high-energy event such as ejections, high falls and abrupt deceleration crashes and may indicate the need for SMR.
- Use SMR with caution in patients presenting with dyspnea and place in a position of comfort as appropriate. In patients with acute or chronic difficulty breathing, SMR has been found to limit respiratory function an average of 17% with the greatest effect experience by geriatrics and pediatrics.
- Use caution when immobilizing the elderly and pediatric patients
- Consider the use of padding to fill the gaps to keep patient in line

DEFINITIONS

- **Intoxication** – Patients should be considered intoxicated if any of the following apply:
  a. A history provided by the patient, or an observer, of intoxication or recent ingestion of alcohol or other mind-altering substance, including drugs.
  b. Evidence of intoxication on exam to include but not limited to an odor of alcoholic type beverage, slurred speech, ataxia, or other findings consistent with intoxication
- **Altered LOC / AMS** – this will be considered if any of the following are present
  a. A GCS of 14 or less (disorientation to person, time or events)
  b. A delayed or inappropriate response to external stimuli, or other findings
- **Distracting injury** – while no precise definition of a painful distracting injury is possible, the following will be considered when making the determination
  a. Any condition thought, by the provider, to be producing pain or anxiety sufficient to distract the patient from another injury. These injuries may include, but not limited to, ANY long bone fracture, a significant abdominal injury, large open wound, crush injuries, large burns, or any other injury causing acute functional impairment.

SPINAL MOTION RESTRICTION (SMR)

The patient shall receive a neurological exam prior to and after any spinal protection, except in cases of shock trauma or if the following findings are documented:

- Pulseless
- Shock
- Apneic

PROCEDURE: SMR CLEARANCE

A. Maintain manual stabilization of the head and neck and ask the patient "Does your neck hurt?" If the answer is "yes", apply c-collar and initiate the SMR inclusion assessment. If the answer is "no", continue to step B.

B. Palpate the posterior cervical spine beginning at vertebrae prominence (C7) while asking, "Does this cause you any pain?" If the answer is "yes", apply c-collar and initiate the SMR inclusion assessment. If the answer is "no", continue palpating along the entire cervical spine. If at any point the patient complains of tenderness, apply spinal movement restrictions and transport. Upon reaching the occiput, if the patient has not complained of any tenderness, move on to step C.

C. Tell the patient, "I am going to ask you to slowly move your head." Instruct the patient to immediately stop and tell you if you're moving their head or neck causes them any pain in the neck or funny sensation like "pins and needles" in either of their arms or hands. Then, have the patient:
   1) Slowly move the head forward moving the chin to the chest, then backward, then side-to-side.
   2) If the patient reports any discomfort or paresthesia, slowly return their head to neutral position and apply spinal movement restrictions and transport.
   3) If there is no discomfort, spinal movement restrictions are not required.
   4) **DOCUMENT** each of these steps on the PCR and indicate "cervical spine clinically cleared".
   5) Palpate the remainder of the patient's spine. If there is any midline tenderness, place the patient on a rigid spine board for transport. **If there is no midline tenderness, a spine board is not indicated. (Reference: NAEMSP Position Paper – EMS Spinal Precautions and the Use of the Long Backboard)**
   6) If moving the patient's neck into a more neutral position causes pain/discomfort, then immobilize the spine in the less painful position, as optimally as possible.

D. Patients with penetrating trauma without spinal pain or neuro deficits, **DO NOT** require SMR.

PROCEDURE: SPINAL MOTION RESTRICTION

Methods/tools to achieve SMR that are allowable: semi-fowler's or fowler's position with cervical collar only, pillows, vacuum mattress, children's car seats, KED, backboards with adequate padding, head immobilizers or straps.

A. Provide manual stabilization restricting gross motion. Alert and cooperative patients may be allowed to self-limit motion if appropriate with or without cervical collar.
B. Apply cervical collar.
C. If needed, extricate patient in a manner that limits flexion, extension, rotation and distraction of spine.
D. Considerations for patient movement when decision to SMR has been made:
   1) Assisted self-extrication is allowable if it can be performed while minimizing gross movement and pain.
   2) Pull sheets, other flexible devices, scoops and scoop-like devices can be employed if necessary. Hard backboards should **only** be utilized if no other method is adequate or appropriate.
E. When utilizing a rigid back board, ensure adequate padding to minimize tissue ischemia and increase comfort.
F. Place patient in position best suited to protect airway.
G. Regularly reassess motor/sensory function (including wrist/finger extension, plantar/dorsal flexion of the feet and sharp/dull exam if possible).
H. Utilize SpO2 and EtCO2 to monitor respiratory function.

STANDBY / SPECIAL EVENT

PURPOSE

- Treat minor complaints in the setting of special events and spectator event coverage
- Provide wellness care to spectators
- Maintain operational wellness of team members

GENERAL INFORMATION

- Refer to appropriate protocol as needed. Critical conditions identified during assessment require definitive ALS care and transport.
- Minor complaints may be treated on scene. Team members may administer over the counter medications per package directions.
- If patients need extended rehab for heat stress
  - IV fluids and oral over the counter medications may be administered without immediate ambulance transport.
- If patient improves after fluid resuscitation and on scene treatment with no other priority symptoms they may be released and IV discontinued without the need for Medical Control contact.
- All patients should be evaluated if symptoms do not resolve or worsen.
- Contact Medical Control for consultation as needed.

PROCEDURE

Symptoms	Medication	Adult Dose	Contraindications
Diarrhea/Heartburn	Pepto Bismol	2 Tablets/524 mg PO	Allergy, GI bleed, ulcers, age 12 or under
Diarrhea	Loperamide	2 tablets/ 4 mg PO	Allergy
Vomiting	Zofran ODT	4 mg	Allergy
Minor Pain	Acetaminophen	15 mg/kg PO (500 to 1000 mg)	Allergy, alcohol consumption, use of other acetaminophen products
Minor Pain	Ibuprofen	10 mg/kg PO (400 – 800 mg)	Allergy, alcohol consumption, pregnancy, ulcers
Minor Pain	Aspirin	324 mg PO	Allergy, Bleeding Disorders, G6PD deficiency

STANDBY / SPECIAL EVENT

General Rehab
Initial Process
1. Patients logged into General Rehabilitation Documentation
2. Assess / Record vital signs including temperature
3. Patients assessed for signs / symptoms

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Diastolic Blood Pressure ≤ 80

YES → **Go to appropriate protocol**

HEAT OR COLD STRESS

YES → **Heat Stress**
Active Cooling Measures
Cool wet towels
cold packs, cool mist fans,
Move Pt. to a cool area for 10–20 Minutes

YES → **Cold Stress**
Active Warming Measures
Dry patient
Place in warm area
Hot packs to axilla and/or groin

NO

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Cooling Measures

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Warming Measures

Signs of Significant Heat Exhaustion
IV Normal Saline 10-20ml/kg bolus as needed to maintain SBP > 90

Reassess individual after 20 Minutes in General Rehab Section.
Reassess VS

HR ≥ 110 and/or Temp ≥ 100.6

YES → Extend Rehabilitation Time Until VS Improve. **Consider transport**

NO → Discharge Individual from General Rehabilitation Section

If the patient is administered:
- **More than 2 liters of IV fluids**

OR

- **More than one dose of OTC medications**

The patient should be transported

SUPRAGLOTTIC AIRWAY (I-GEL)

INDICATIONS

- Following unsuccessful endotracheal intubation:
  - Two **(2)** unsuccessful attempts to place an endotracheal tube, **or** if it appears additional endotracheal intubation attempts would be unsuccessful, use of the i-Gel should be considered.
- The i-Gel Airway may be considered the initial airway of choice in the pulseless/apneic patient
  - **Endotracheal intubation provides a definitive airway. Every attempt should be made to secure an airway with an endotracheal tube**

CONTRAINDICATIONS

- Patients who are conscious or who have an intact gag reflex
- Patients under/overweight for airway size used
- Patients with known esophageal disease (varices, alcoholism, cirrhosis etc.) or ingestion of caustic substances
- Deforming facial / airway trauma that prevent proper seating of the airway device

CONSIDERATIONS / PRECAUTIONS:

- After placement, perform standard checks for breath sounds and utilize an appropriate carbon dioxide monitor as required by protocol.
- High airway pressures may divert gas either to the stomach or to the atmosphere.
- During transition to spontaneous ventilation, airway manipulations or other methods may be needed to maintain airway patency.

SIZE SELECTION (*should be determined using "ideal" body weight)*

Neonate	Infant	Small Pedi	Large Pedi	Small Adult	Med. Adult	Lg. Adult
Size 1	**Size 1.5**	**Size 2**	**Size 2.5**	**Size 3**	**Size 4**	**Size 5**
5 – 11 lbs. (2 – 5 kg.)	5 – 12 lbs. (11 – 25 kg.)	22 – 55 lbs. (10 – 25 kg.)	55 – 77 lbs. (25 – 35 kg)	65 – 130 lbs. (30 – 60 kg)	110 – 200 lbs. (50 – 90 kg)	200+ lbs. (90+ kg)
Pink	Light Blue	Grey	White	Yellow	Green	Orange

SUPRAGLOTTIC AIRWAY (I-GEL)

PROCEDURE: PRE-INSERTION PREPARATION

1. Open the i-Gel O2 package, and on a flat surface remove the inner tray containing the airway support strap and sachet of lubricant and place to one side
2. In the final minute of pre-oxygenation, remove the i-Gel o2 open the sachet of supplied lubricant and place a small bolus of the lubricant on the base of the inner side of the main shell of the packaging
3. Grasp the i-Gel O2 along the integral bite block and lubricate the back sides and front o f the cuff with a thin layer of lubricant. This process may be repeated if lubrication is not adequate, but after lubrication has been completed. Check that no BOLUS of lubricant remains in the bowl of the cuff or elsewhere on the device. Avoid touching the cuff of the device with your hands.
4. Ensure the supplementary oxygen port is firmly dosed with the integral cap until it is required for use.
5. Place the i-Gel back into the main shell of the packaging in preparation for insertion.

PROCEDURE

WARNING: REMOVE DENTURES OR REMOVABLE PLATES FROM THE MOUTH BEFORE ATTEMPTING INSERTION OF THE DEVICE. DO NOT APPLY EXCESIVE FORCE DURING INSERTION.

IT IS NOT NECESSARY TO INSERT FINGERS OR THUMBS INTO THE PATIENT'S MOUTH DURING THE PROCESS OF INSERTING THE DEVICE.

1. Grasp the lubricated i-gel 02 firmly along the integral bite block. Position the device so that the i-Gel cuff outlet is facing towards the chin of the patient.
2. The patient should be in the 'sniffing the morning air' position with head extended and neck flexed. The chin should be gently pressed down by an assistant before proceeding to insert the i-Gel.
3. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
4. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
5. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite-block
6. i-Gel should be secured with an appropriate size commercial tube holder **OR** taped down from maxilla to maxilla **and** secured with the airway support strap provided
7. Apply capnography if available
8. If an ITD is to be used it must be placed at this time, connected to the ETCO2 detector.
9. Confirm proper position by auscultation, chest movement and verification of CO2 by capnography/ capnometry after 6 breaths.
10. Once proper position in confirmed by auscultation and/or chest rise; secure the commercial tube holder to the i-gel and patient or; if taped and strapped, the provider must continue to stabilize the i-gel with their free hand.
11. Providers may continue to use backboards to assist in patient movement as needed.

SURGICAL CRICOTHYROTOMY

***** PROCEDURE IS ONLY TO BE PERFORMED BY SCHERTZ EMS PARAMEDICS CREDENTIALED FOR THE PROCEDURE*****

INDICATIONS

Establishment of an airway is imperative to patient survival. Cricothyrotomy is indicated for relief of life-threatening upper airway obstructions in situations in which manual maneuvers to establish an airway or ventilate have failed.

Indications for Surgical Cricothyrotomy

- Unable to secure the airway with Endotracheal intubation or alternative airway device (Supraglottic airway)

And at least one of the following:

- Inability to ventilate (includes inability to ventilate with BVM and airway adjuncts)
- Inability to oxygenate
- Inability to clear an obstructed airway

OR

- Massive facial/oral trauma preventing BVM, intubation or alternate airway placement

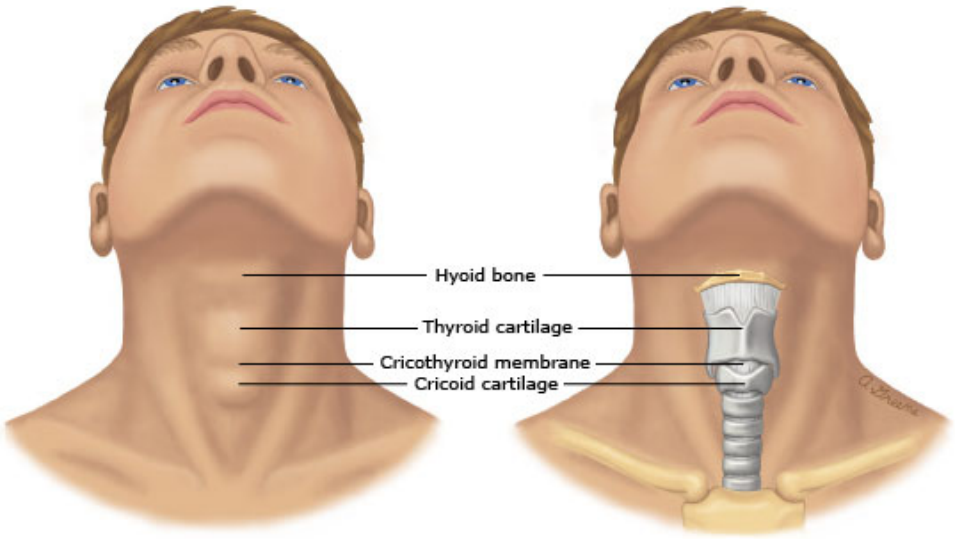
CONTRAINDICATIONS

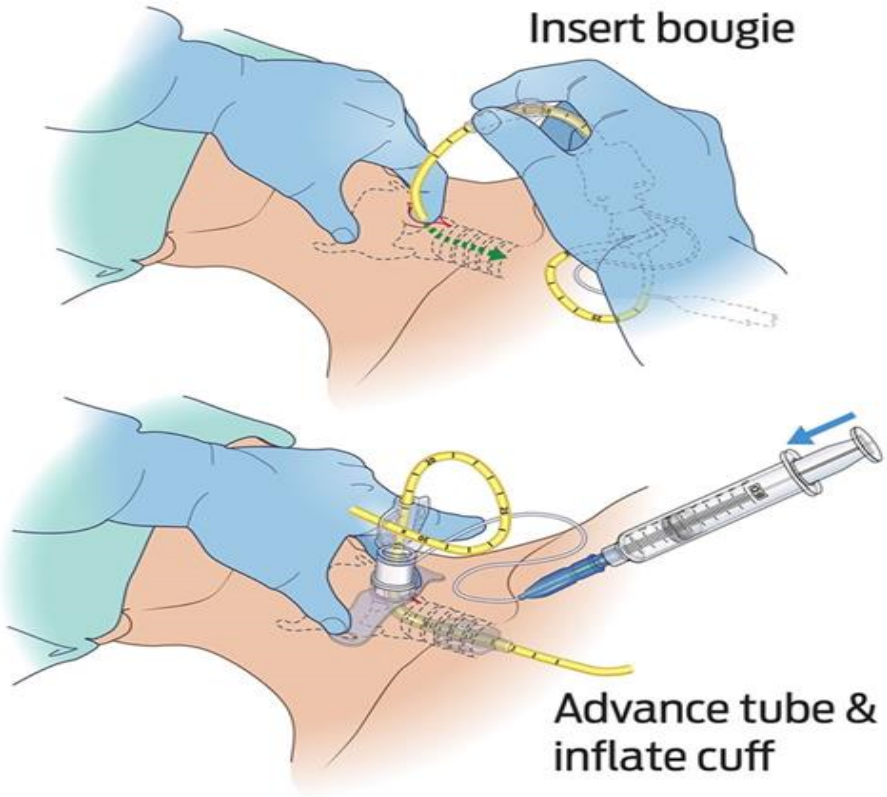
- Any instance in which a less invasive procedure will allow oxygenation of the patient
- Unable to locate landmarks due to abnormal neck anatomy or trauma
- Age < 10 years old

PROCEDURE

1. Assure inability to ventilate
2. Don appropriate PPE (Mask, eye protection and gloves)
   a. While incising through the membrane, blood may be aerosolized
3. Locate cricothyroid membrane
4. Prep area with Iodine
5. Inject with Epinephrine 1:10,000 SQ around incision site, if time permits.
6. Stabilize larynx with thumb and middle finger, while index finger palpitates membrane
7. Make a vertical incision in the skin with the scalpel.
8. After incising through skin to membrane, make a horizontal incision through membrane,
9. Remove scalpel while still stabilizing larynx and insert finger.
10. Slide Bougie into the incision next to your finger, and into the airway, until you can no longer progress forward.
11. Insert tube with tip pointed towards feet, using minimal force, until tube balloon is well into the opening.
12. Inflate balloon with adequate air from 10cc syringe.
13. Once inserted, check for correct placement of tube:
    a. Monitor waveform EtCO2
    b. Listening and feeling for air flow through tube
    c. Listening for breath sounds and noting the chest rise when ventilating.
14. Secure tube in place with tape and/or supplied commercial device.

SURGICAL CRICOTHYROTOMY





SYNCHRONIZED CARDIOVERSION

Synchronized cardioversion is shock delivery that is timed (synchronized) with the QRS complex. This synchronization avoids shock delivery during the relative refractory portion of the cardiac cycle, when a shock could produce VF. The energy (shock dose) used for a synchronized shock is lower than that used for unsynchronized shocks (defibrillation). These low-energy shocks should always be delivered as synchronized shocks because if they are delivered as *unsynchronized* shocks, they are likely to induce VF. Delivery of synchronized shocks (cardioversion) is indicated to treat unstable tachyarrhythmias associated with an organized QRS complex and a perfusing rhythm (pulses). The unstable patient demonstrates signs of poor perfusion, including altered mental status, ongoing chest pain, hypotension, or other signs of shock (e.g., pulmonary edema). Synchronized cardioversion is recommended to treat unstable supraventricular tachycardia due to reentry, atrial fibrillation, and atrial flutter. These arrhythmias are all caused by reentry, an abnormal rhythm circuit that allows a wave of depolarization to travel in a circle. The delivery of a shock can stop these rhythms because it interrupts the circulating (reentry) pattern. Synchronized cardioversion is also recommended to treat unstable monomorphic VT.

INDICATIONS

- Unstable ventricular tachycardia with a pulse.
- Unstable paroxysmal supraventricular tachycardia.
- Unstable atrial fibrillation / flutter with a rapid ventricular response.

CONTRAINDICATIONS

- V-Fib or V-Tach
- Repetitive, self-terminating, short-lived tachycardia (i.e., runs of non-sustained VT).
- Unstable Torsade de pointes (should be treated as VF and defibrillated beginning at 200J).

PROCEDURE

1. Confirm that the rhythm seen on the monitor coincides with a patient in an unstable condition.
2. If time permits, consider sedation with Versed 2-5mg IV/IN prior to Cardioversion
3. Apply Combo-pads on the sternum / apex position, ensuring firm contact with the patient's skin.
4. Depress the synchronize button on the machine, observing for R wave markers on each QRS complex. If they do not appear, or appear elsewhere on the ECG, adjust the ECG size or gain up or down until they appear on each R-wave.
5. If markers still do not appear, select another lead or reposition the ECG electrodes.
6. Select the appropriate energy level required as follows:
   - Monomorphic Ventricular Tachycardia: 100J, 200J, 300J, and 360J.
   - Supraventricular Rhythms (SVT / A-fib /A-Flutter): 100J, 200J, 300J, and 360J.
7. Charge the defibrillator to desired energy level.
8. Clear all personnel from direct patient contact.
9. Depress and hold the discharge button until electrical charge is delivered.
10. Reassess the patient and any rhythm changes seen on the monitor.
11. If rhythm deteriorates into VF / pulseless VT, switch to asynchronous mode and immediately defibrillate.

TASER INFORMATION / TREATMENT

PROCEDURE

1. Scene safety
2. Before approaching the patient, who has been subdued with the Taser device, inform the officer of your intentions, and verify that the probe wires have been removed from the hand-held unit.

Remember that the patient was at one time uncooperative. Use caution when dealing with these patients

ASSESSMENT / TREATMENT

1. When assessing a patient that has been subdued with the Taser device:
   - Identify the location of the probes on the patient's body.
   - If the probes are in one of the following areas, DO NOT remove them but transport patient to the ED to have probes removed by the physician:
     - Face
     - Neck
     - Groin
     - Any probe not removable by the technique below
2. Obtain from the police officers and document the condition of the patient since being Tased (level of consciousness, any complaints, activity, etc.).
3. Assess vital signs and EKG rhythm. If patient is greater than 35 years old, perform a 12-lead.
4. Determine from the patient and document:
   a. Chief complaint
   b. Date of last tetanus vaccination
   c. Any cardiac history
   d. Any seizure history
   e. Intake of any intoxicants or mind-altering substances
5. All complaints and assessment findings should be treated as per protocol.

REMOVAL OF TASER PROBE(S)

If, when you arrive on scene, the Taser probe(s) is/are still embedded in the patient's skin somewhere other than the areas listed above for ED removal, use the following techniques to remove them:

1. Verify that the probes are disconnected from the hand-held unit.
2. Place one hand flat on the patient's skin with the probe between the fingers to stabilize the skin and the imbedded probe.
3. With your second hand, firmly grasp the probe, and with one firm, fluid motion, pull the probe straight out of the skin.
4. Repeat this with the second probe.
5. Probes should be placed into device cartridge and place cartridge into a Sharp's Shuttle. The Sharp's Shuttle should be given to the police officer in charge of the patient.
6. Clean puncture sites with alcohol and bandage as appropriate.
7. If last tetanus shot was longer than 5 years, patient should be encouraged to obtain one.

Patients with priority medical complaints either before or after being Tased should be evaluated in an ED. If patient has a medical complaint and wishes to refuse transport, PD and Medical Control should be consulted. The patient and police officer should be instructed to alert EMS or transport the patient to an ED if abnormal signs or symptoms develop.

THERMOMETER

Temperature readings vary in different individuals. A normal temperature refers to each individual's average temperature while they are well.

INDICATIONS

- Febrile
- heat related emergencies
- hypothermia

PROCEDURE

1. Install proper tip (oral/rectal)
2. Place probe cover over the tip
3. Take temperature
4. Dispose of probe cover
5. Replace tip in thermometer

SPECIAL CONSIDERATIONS

- Normal average temperatures range from 97°F/36.1°C to 100°F/37.8°C when taken orally.
- **Rectal temperatures are generally considered true body temperature**
  - From an oral temperature, you may calculate a rectal equivalent temperature by adding 1°F/0.5°C
    - oral temperature of 98.6°F/ 37°C = 99.6°F/37.5°C rectal
  - Underarm temperature requires subtracting 1°F/0.5°C
    - oral temperature of 98.6°F/ 37°C = 97.6°F/36.4°C underarm

TRACTION SPLINT

INDICATIONS

- Closed proximal-third and mid-shaft femur fracture

PROCEDURE (SLISHMAN)

1. **Assess CSM:** Check **Circulation, Sensation, and Motor function** (pulses, feeling, and movement) in the affected foot before touching the injury.
2. **Expose the Injury:** Cut away clothing to fully inspect the thigh and ensure there are no conflicting injuries (like a pelvic or lower-leg fracture).
3. **Position the Splint:** Lay the splint along the **outside (lateral side)** of the injured leg
4. **Adjust for Height:** For patients taller than 5 feet, pull the middle telescoping tube out until the spring button clicks into place. Keep it retracted for shorter patients or children.
   a. Ensure the top structural curve (proximal end) points toward the hip, and the traction mechanism points toward the feet.
5. **Ankle Strap:** Wrap the ankle strap firmly around the ankle. If there is a lower-leg injury, wrap it just below the knee (proximal calf) instead.
6. **Groin Strap:** Slide the red groin strap under the patient's knee, slide it up to the groin, and click the buckle together on top. Pull the strap snug.
7. **Apply Tension:** Pull the red traction cord at the foot end of the splint straight out. Continue pulling until the patient experiences pain relief or the limb alignment is restored.
   a. **Lock the Cord:** Pull the cord down into the V-cleat notch to lock it. Wrap the excess cord around the integrated cleat wings to secure it.
8. **Secure the Feet:** Wrap the included mid-body or foot strap around both feet/ankles together to prevent the injured leg from rotating during transport.
9. **Reassess CSM:** Check **Circulation, Sensation, and Motor function** again to ensure the splint hasn't compromised blood flow or nerves. Monitor these vitals frequently.



TRANSCUTANEOUS PACING

Emergent pacing is required in patients with hemodynamically unstable bradycardia and high degree heart blocks. “Hemodynamically unstable” is defined as hypotension (systolic blood pressure less than 80 mm Hg), change in mental status, myocardial ischemia, or pulmonary edema. Transcutaneous pacing is recommended for treatment of symptomatic bradycardia when a pulse is present. Healthcare providers should be prepared to initiate pacing in patients who do not respond to atropine (or second-line drugs if these do not delay definitive management). Immediate pacing is indicated if the patient is severely symptomatic, especially when the block is at or below the His Purkinje level. If the patient does not respond to transcutaneous pacing, transvenous pacing is needed.

INDICATIONS

- Complete heart block.
- Symptomatic 2nd degree heart block.
- Symptomatic sick sinus syndrome.
- Drug induced bradycardias (digoxin, beta-blockers etc.).
- Permanent pacemaker failure.
- Idioventricular bradycardia.
- Refractory bradycardia during resuscitation of hypovolemic shock.
- Bradyarrhythmias with malignant ventricular escape beats.

PROCEDURE

- Oxygen, ECG monitor, IV (if possible) should be in place prior to pacing.
- ECG cables must be utilized for pacer to function.
- Confirm the presence of the dysrhythmia (include a copy of the EKG strip) and evaluate the patient's hemodynamic status.
- Adjust the QRS amplitude so the machine can sense the intrinsic QRS activity.
- Apply pacing pads to the patient's chest according to manufacture recommendations.
- Attach the pacing pads to the therapy cable from the machine.
- Turn the pacer on.
- Observe the ECG screen for a "sense" marker on each QRS complex. If a "sense" marker is not present, readjust ECG size or select another lead.
- Set the desired pacing rate (60-80).
- Start at the lowest setting and increase the current slowly while observing the ECG screen for evidence of electrical pacing capture.
- Assess the patient's response to the pacing therapy.
- Consider the use of Versed 2-5mg IV/IN for sedation, if blood pressure supports administration
- Document the dysrhythmia and the response to external pacing with ECG strips

WHOLE BLOOD ADMINISTRATION

Low Titer O+ Whole Blood (LTOWB) is being used to treat critically ill medical patients and severely injured trauma patients who have or are at risk for severe hemorrhage.

Indications

- Hemorrhagic Shock (Medical or Trauma) with signs of obvious bleeding.
  - Adult or Pediatric (≥ 6 y.o.)

Administer Blood with signs of acute hemorrhagic shock as evidence by any one of the following:

- Systolic blood pressure < 70 mmHg
- Systolic blood pressure < 90 with HR ≥ 110 bpm
- ETCO2 < 25
- Witnessed traumatic cardiac arrest < 5 min. prior to provider arrival & continuous CPR
- Age ≥ 65 y.o.
  - SBP ≤ 100 AND HR ≥ 100 bpm

***** When patient has been determined to need LTOWB – Contact Dispatch to notify/alert MSC*****

Contraindications

- Religious objection to receiving whole blood or blood products
- Patient < 6 y.o. (if patient is in hemorrhagic shock – Contact Receiving Facility)

Dose

- Adult
  - Administer 1 unit of LTOWB
- Pediatric
  - Administer 10 – 20 ml/kg of LTOWB (Max: 500 ml)

Procedure

1. Evaluate and confirm that transfusion criteria are met **(TXA should also be considered if infusing blood)**
2. Verify that there are no contraindications
3. If able, obtain informed consent from the patient. If unconscious, utilize implied consent
4. Assess patient for previous reactions to blood transfusions
5. Establish IV/IO access – minimum 2 sites *(If IV access, preferably 18g or larger)*
   (saline lock to allow for removal of blood tubing upon completion of transfusion)
   - Prime blood tubing with normal saline (Do **NOT** use lactated ringers)
   - ***No medications will be administered through the blood tubing/infusion***
6. Inspect and confirm blood type and expiration of available unit (Obtain & document ID number on bag)
7. Obtain vital signs:
   - Pre-administration vitals should including a temperature (no more than 10 minutes)
   - Obtain/monitor vitals every 5 – 10 minutes after initiation of infusion
8. Initiate blood administration
   - Attach the blood bag (set rate)
   - After completion of the administration, flush tubing with normal saline.
9. During administration – monitor patient for signs of transfusion reactions

WHOLE BLOOD ADMINISTRATION

10. If a transfusion reaction is noted, **STOP** the transfusion and disconnect the blood tubing
    - Treat patient for the associated reaction.
    - Contact the receiving facility and advise of transfusion reaction
    - Keep the LTOWB bag and admin set for testing
11. Upon completion of the transfusion or after delivering patient to the received facility
    - **Send the empty bag and all associated tubing with the patient**
    - Complete the Pre-Hospital Blood Product Transfusion Record (STRAC document)

Special Considerations

- Remember: Trauma Alert scene time should be < 10 min.
- Notify receiving facility as soon as possible the LTOWB and/or TXA have been administered
- **Patients (that meet criteria) can receive both TXA and blood products, but DO NOT administer in the same IV line**

Blood Transfusion Reactions (Signs & Symptoms)

Febrile Reaction	Hemolytic Reaction	Allergic Reaction / Anaphylaxis
• Headache • Tachycardia • Tachypnea • Fever / Chills • Anxiety	• Decreased / Increased BP • Low back pain • Chest Pain • Fever • Tachycardia • Hemoglobinuria • Apprehension	**Mild** • Facial Flushing • Hives / Rash **Severe** • Airway edema • Wheezing • Decreased BP

12 LEAD EKG

Most modern 12-lead ECG monitors record all 12 leads simultaneously but display them in the conventional 3 row by 4 column format. The primary advantages of using a 12-lead monitor are speed and accuracy. Because the leads are obtained simultaneously, only 10 seconds of sampling time is required. The 12-lead monitor allows evaluation of the patient for ischemia or infarction and dramatically facilitates care of the acute MI.

INDICATIONS

- ***12-lead ECGs should be obtained for the following patients: (as soon as available)***
  - Chest pain, pressure, tightening or squeezing
  - Syncope of any age
  - Unexplained pain in jaw, shoulder, back or arms
  - Decreased Level of Consciousness reported
  - Hypo/Hyperglycemia
  - Difficulty breathing
  - Diabetic history with any abnormal symptoms
  - Overdoses
  - Cardiac History
  - Abnormal Vital signs
    - Hypo/Hypertension
    - Unexplained tachycardia/bradycardia
  - CVA/TIA signs and symptoms
  - Unexplained onset of weakness
  - Abdominal pain
  - Seizure

PROCEDURE

1. Prep skin (roughen the skin with towel and wipe with alcohol, if time and patient condition allows).
2. Insert the precordial lead attachment into the main cable.
3. Attach the precordial lead electrodes to the chest as such: (Make sure to cleanse the site if at all possible prior to ECG electrode placement.)
   - V1 4th Intercostal space right side of the sternum.
   - V2 4th Intercostal space left side of the sternum.
   - V3 Directly between Leads V2 and V4.
   - V4 5th Intercostal space at midclavicular line.
   - V5 Level with V4 at left anterior axillary line.
   - V6 Level with V5 at left midaxillary line (directly under midpoint of armpit).
4. Place limb leads on right & left volar surface of forearms and right and left anteromedial tibial surface of legs. May be placed more proximal if distal positions not accessible.

12 LEAD EKG

PROCEDURE

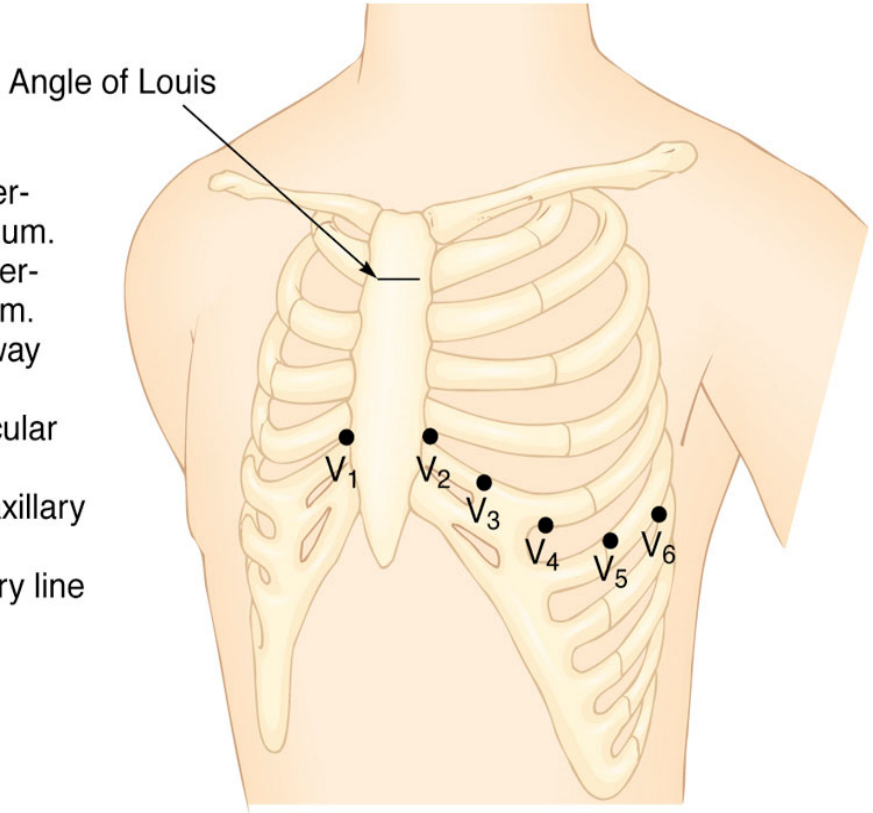
ACQUIRING A 12-LEAD ECG:

- Attach precordial cable to 4-lead patient ECG cable.
- Attach electrodes and wires as above.
- Press “12-LEAD” to obtain 12-lead ECG report.
- Enter appropriate age for patient and other pertinent data

CONSIDERATIONS

- When placing electrodes on female patients, always place leads V3-V6 under the breast rather than on the breast.
- Never use the nipples as reference points for locating the electrodes on men or women because nipple locations may vary widely.

Lead V_1 The electrode is at the fourth intercostal space just to the right of the sternum.
Lead V_2 The electrode is at the fourth intercostal space just to the left of the sternum.
Lead V_3 The electrode is at the line midway between leads V_2 and V_4.
Lead V_4 The electrode is at the midclavicular line in the fifth interspace.
Lead V_5 The electrode is at the anterior axillary line at the same level as lead V_4.
Lead V_6 The electrode is at the midaxillary line at the same level as lead V_4.



Chest Lead Placement

VENTILATOR MANAGEMENT

INDICATIONS

- Invasive Mechanical Ventilation (IMV)
  1. Patients with advanced airway needing ventilation support
- Non-Invasive Ventilation (NIV)
  1. Continuous Positive Airway Pressure
  2. Bi-Level Positive Airway Pressure

PROCEDURE

Start Up & Operational Test

- To perform the Start Up procedure, do the following:
  1. Connect appropriate patient circuit (Adult or Pedi).
  2. Turn on ventilator; select the proper setting (e.g. Adult, Pediatric, CPAP, Custom)
  3. After a breath or two, release the patient port while allowing the ventilator to operate. The PATIENT DISCONNECT alarm should be activated.
  4. Close the patient port with a clean gloved hand.
     - The HIGH AIRWAY PRESSURE LIMIT ALARM should activate after 2 breaths that reach the PIP High Limit.
     - If the AIRWAY PRESSURE HIGH ALARM fails to activate, check to determine that all the circuit connections are secure, the exhalation valve is closing during inhalation, and the High Airway Pressure Limit is set to 35 cm H2O or less.
  5. Connect the Test Lung and adjust settings for your patient. Visually confirm the ventilator is functioning properly prior to placing on your patient.

Keep BVM with Mask in arms reach of the patient at all times in case of complications

DAILEY OPERATIONAL TEST

1. Press the Manual Breath button; gas should flow out of the patient connection each time the button is pressed
2. With no other alarms occurring, remove external power from the ventilator.
   - The EXTERNAL POWER - LOW / DISCONNECT alarms should be activated. Reconnect external power to reset alarms.
   - If the HIGH AIRWAY PRESSURE, PATIENT DISCONNECT, or EXTERNAL POWER LOW / DISCONNECT alarms fail to activate, continue to manually ventilate the patient, check the patient circuit for leaks or a faulty exhalation valve and repeat the Operational Test.
3. Confirm Battery level

VENTILATOR MANAGEMENT

TROUBLESHOOTING

D – Displacement of the tube:

- Attach end-tidal CO2 to verify tube placement (Mandatory)
- Check depth (cm at lip).

O – Obstruction of the tube or circuit:

- Use suction catheter to remove mucus from tube and make sure patient is not biting down.
- Ensure that the circuit is not kinked or blocked.

P – Pneumothorax:

- Auscultate, assess, visualize chest wall, and perform needle decompression if needed.

E – Equipment Failure:

- Connect to BVM to buy time to evaluate your patient and the ventilator.
- Check O2 levels and flow rate

R – Rigidity and Resistance to Ventilation:

- Evaluate sedation and paralysis
- Evaluate for Pneumo and Stacked Breaths

S – Stacked Breaths (Auto PEEP, especially in COPD / Asthma):

- Disconnect from ventilator and allow open circuit exhalation.
- Increase I:E ratio (1:4), Decrease Respiratory rate or Tidal volume (or both) if tolerated.
- Consider bronchodilators and/or ETT suctioning.
- Consider opening circuit to atmosphere and allowing exhalation.

VENTILATOR MANAGEMENT

ADULT STANDARD

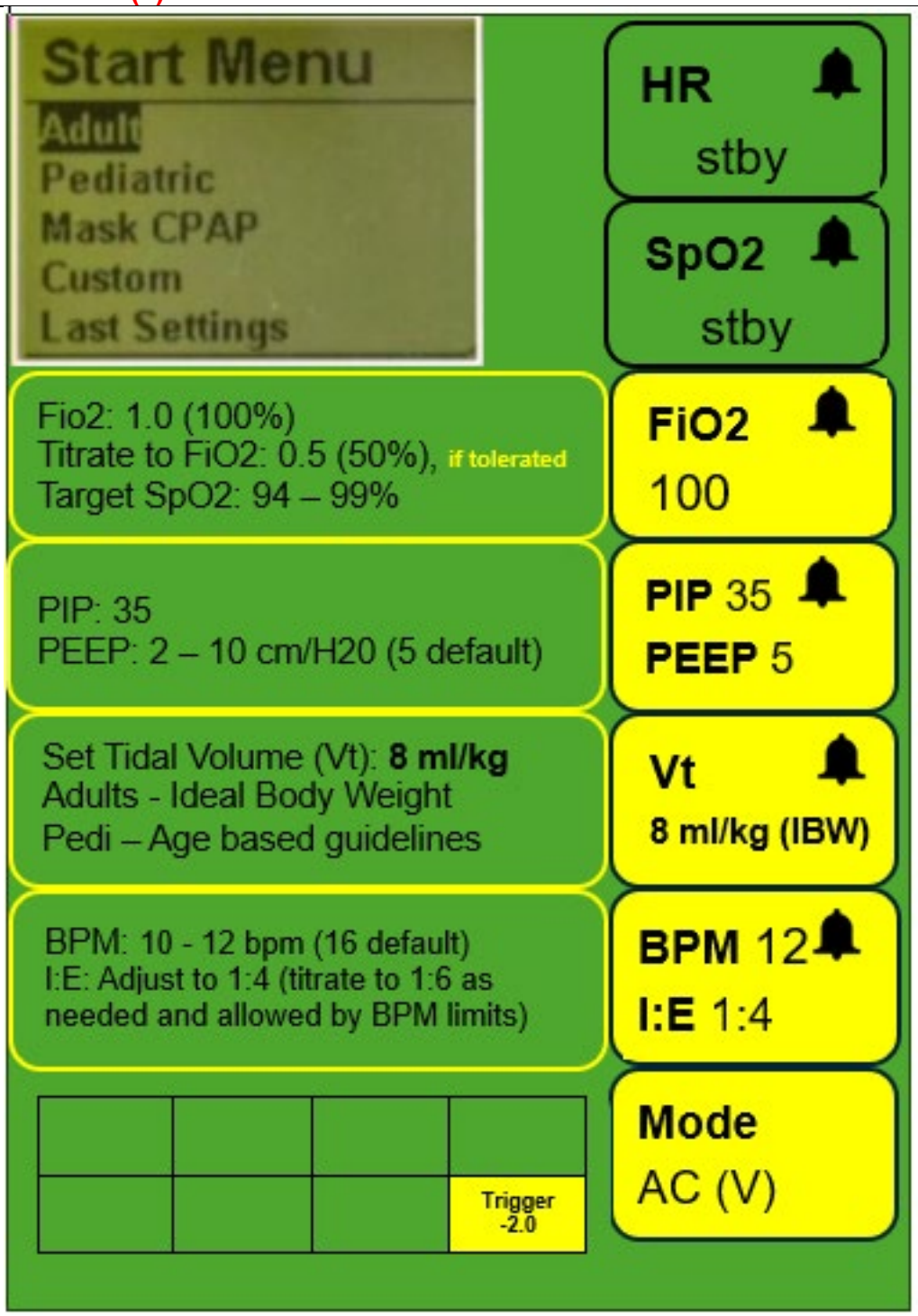
- Select **ADULT** from start menu
- Start at **FIO2 at 100** and titrate SPO2 of 94%
- Adjust **PEEP** to 5. **Set Vt** to **6 ml/kg IBW**
- Adjust **BPM**
- Select mode for **A/C (v)**



VENTILATOR MANAGEMENT

ADULT OBSTRUCTIVE (Asthma, COPD, etc.)

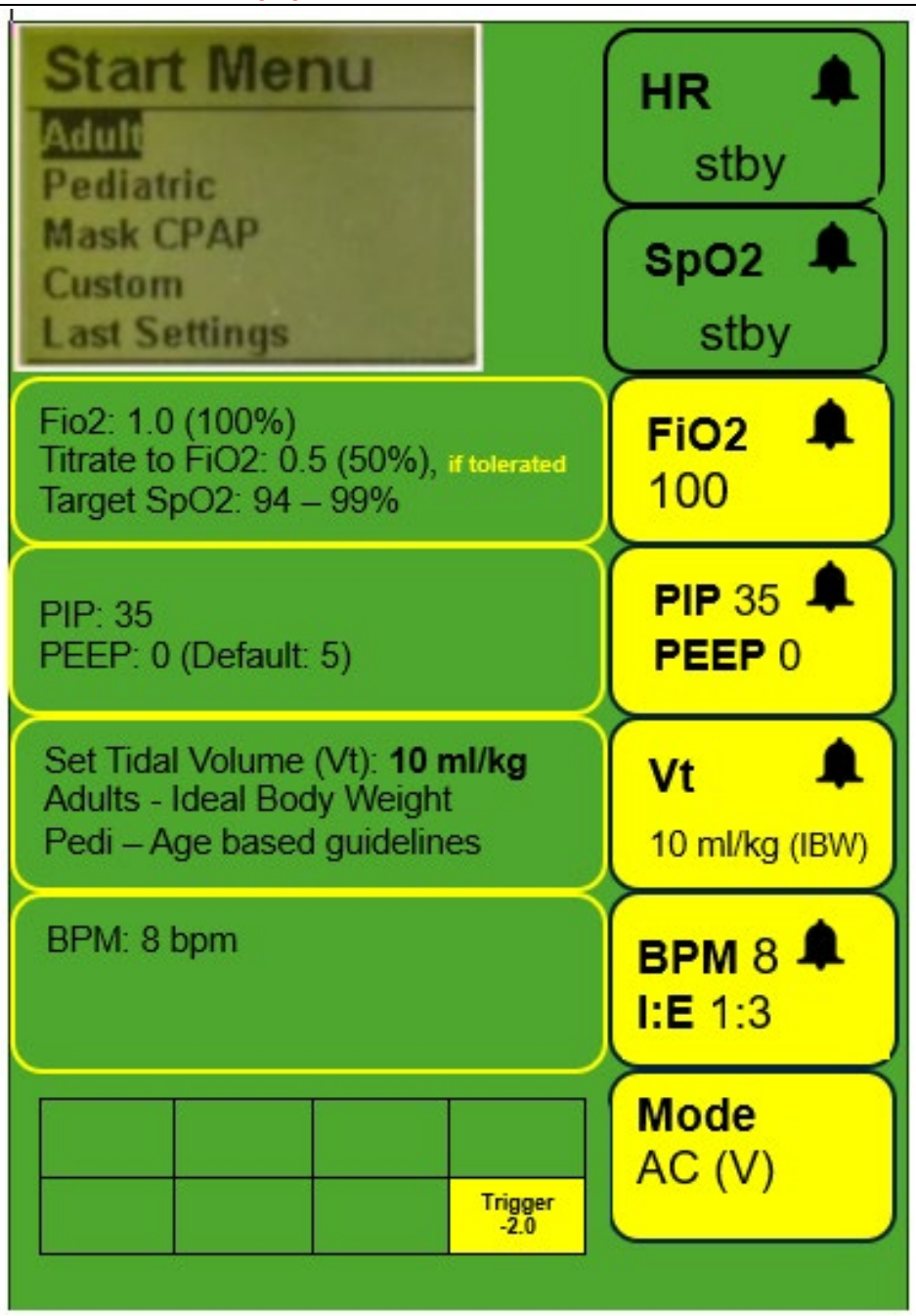
- Select **ADULT** from start menu.
- Start at **FIO2 at 100** and titrate to SPO2 of 94%. Adjust **PEEP** to 5. **Set Vt** to **8** ml/kg IBW
- Adjust **BPM**.
- Adjust **I:E to 1:4**
- Select mode for **A/C (v)**



VENTILATOR MANAGEMENT

ADULT HYPOTENSIVE TRAUMA

- When indicated: Select **ADULT** from start menu
- Start at **FIO2 at 100** and titrate to SPO2 of 94%
- Adjust **PEEP** to 0.
- **Set Vt** to **10** ml/kg IBW
- Adjust **BPM to 8**.
- Select mode for **A/C (v)**

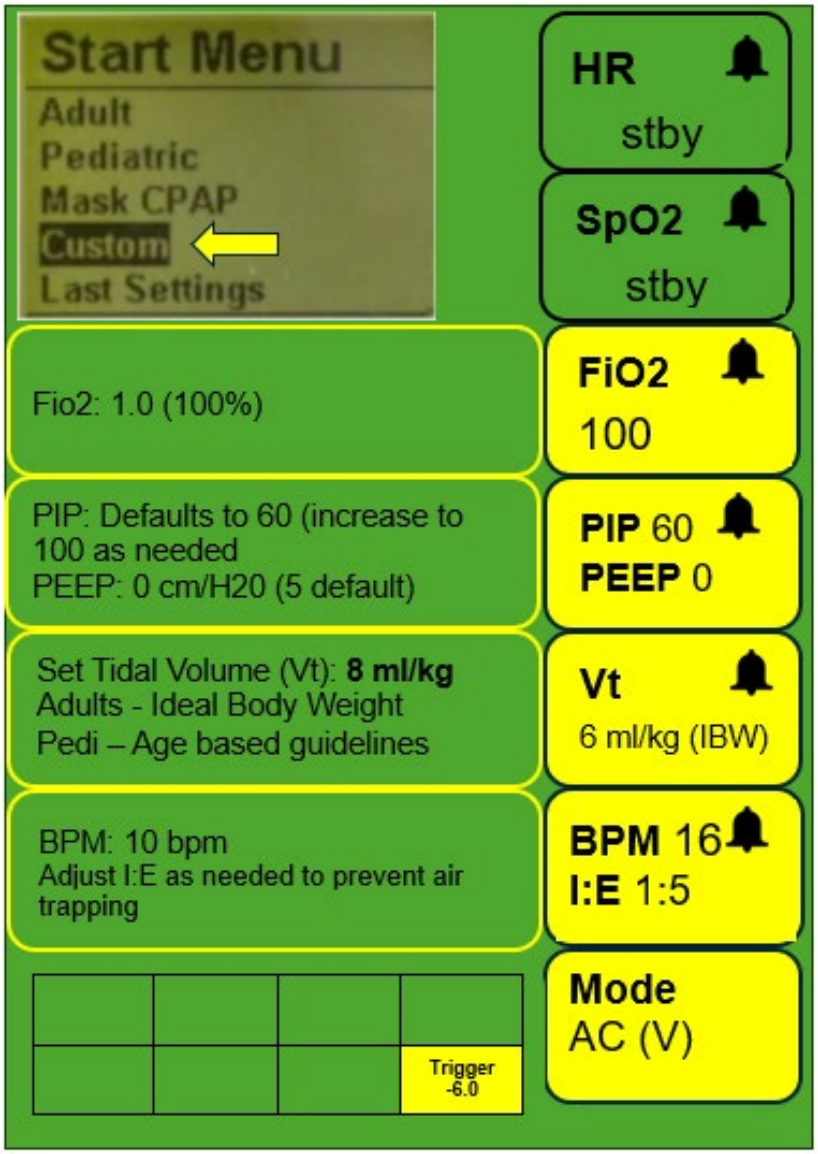


VENTILATOR MANAGEMENT

CPR IN PROGRESS



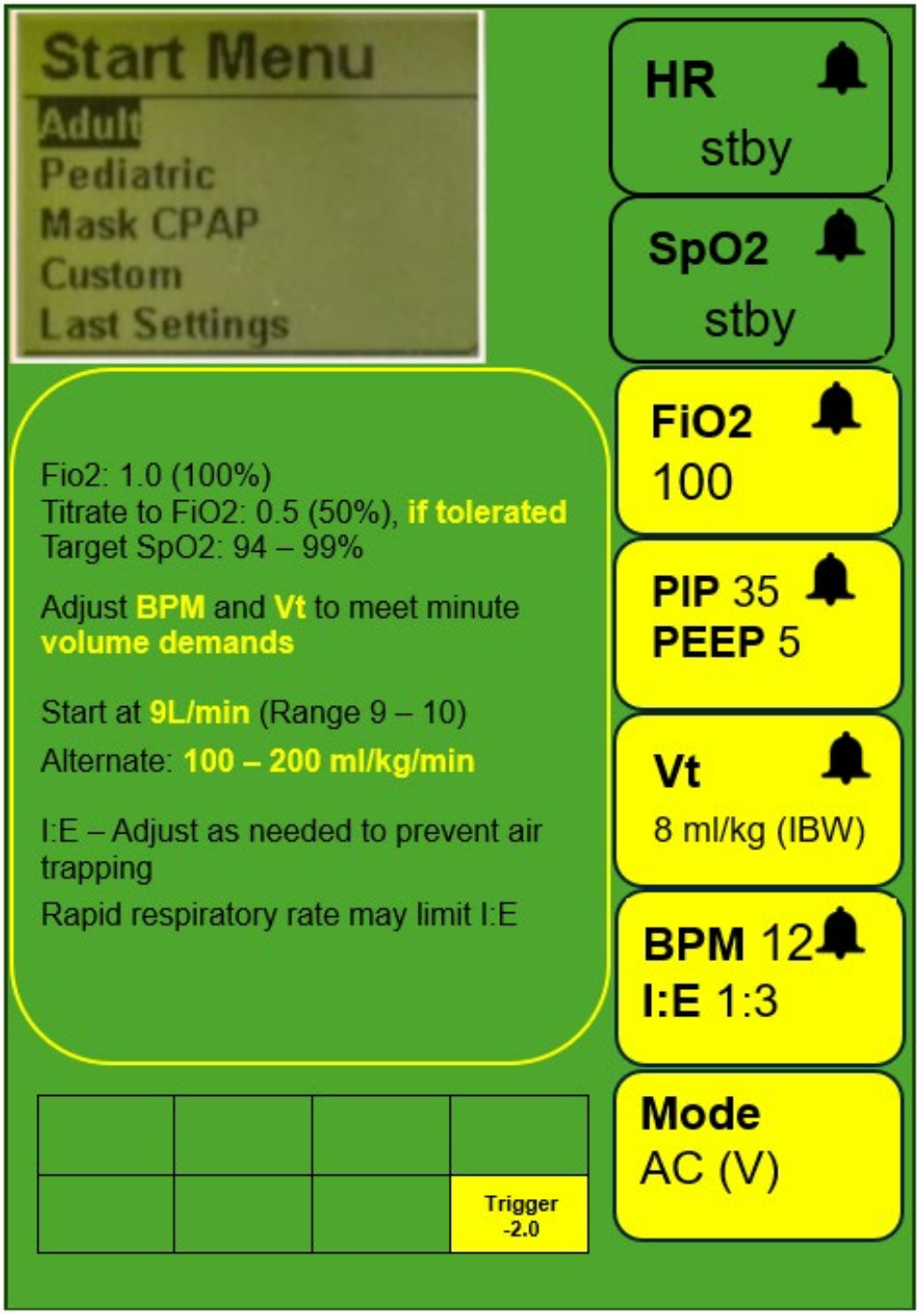
1. **Select Custom** in start-up menu
2. Confirm **FIO2 at 1.0** (100%)
3. Confirm **PIP Alarm** of **60 – 100**
4. Confirm **PEEP** is at **0**
5. **Set Tidal Volume** (Vt) **8 ml/kg** based on Ideal Body Weight (IBW) (Refer to chart)
6. Confirm **BPM** is set to **10**
7. Confirm Mode for **AC(v)**
8. Confirm trigger to **-6.0**
   - Will observe reduced tidal volumes when breath and compressions occur simultaneously
9. If ROSC occurs:
   - Return to standard settings and set mode to AC(v)
   - **Sedate patient appropriately**, as needed



VENTILATOR MANAGEMENT

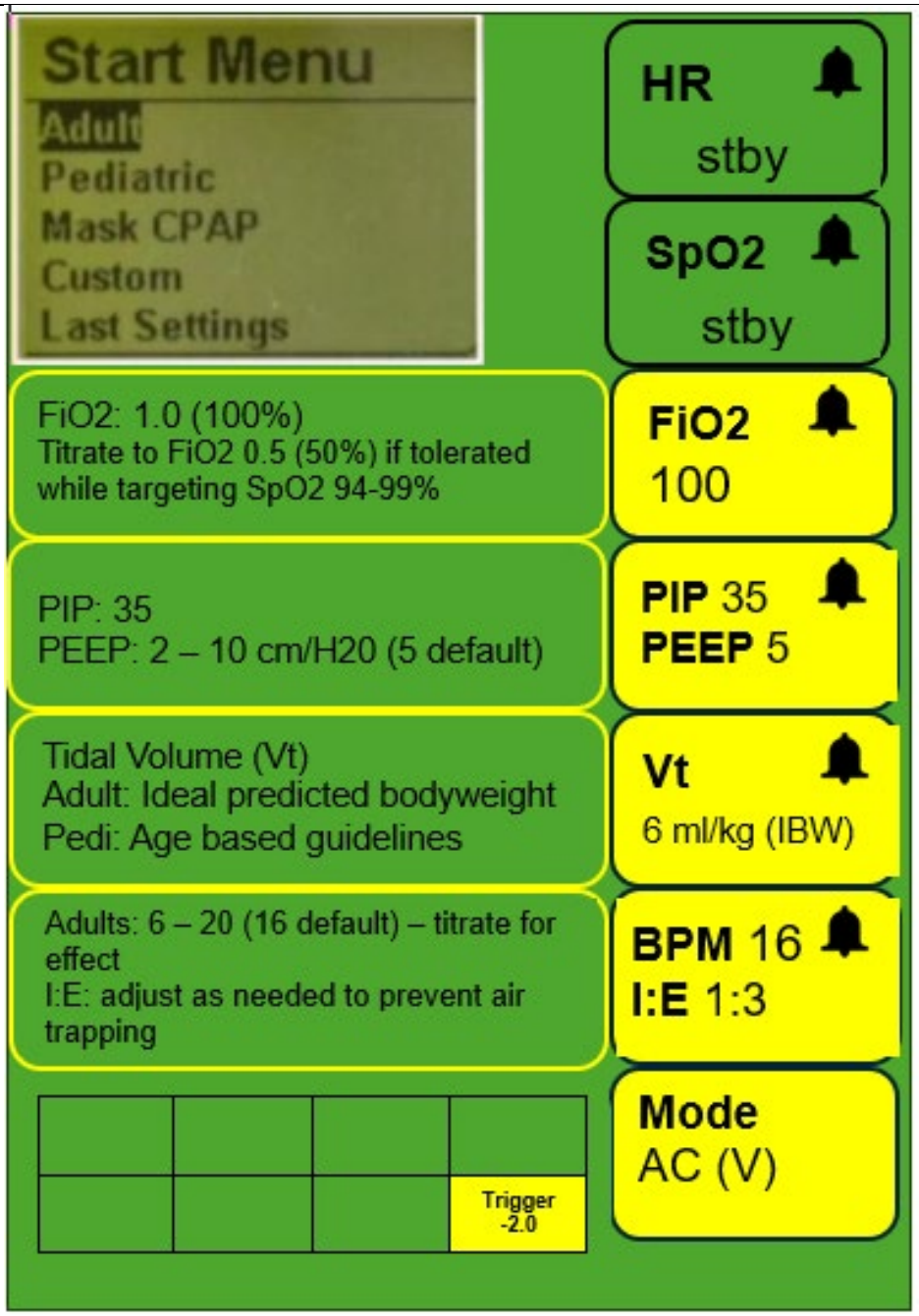
ADULT METABOLIC ACIDOSIS

- Select **ADULT** from start menu.
- Start at **FIO2 at 100** and titrate to SPO2 of 94%.
- Adjust **PEEP** to 5.
- **Set Vt** to **8 ml/kg IBW.** Titrate PRN.
- Adjust **BPM** and **Vt** to meet **MINUTE VOLUME DEMANDS**
- Select mode for **AC(v)**



VENTILATOR MANAGEMENT

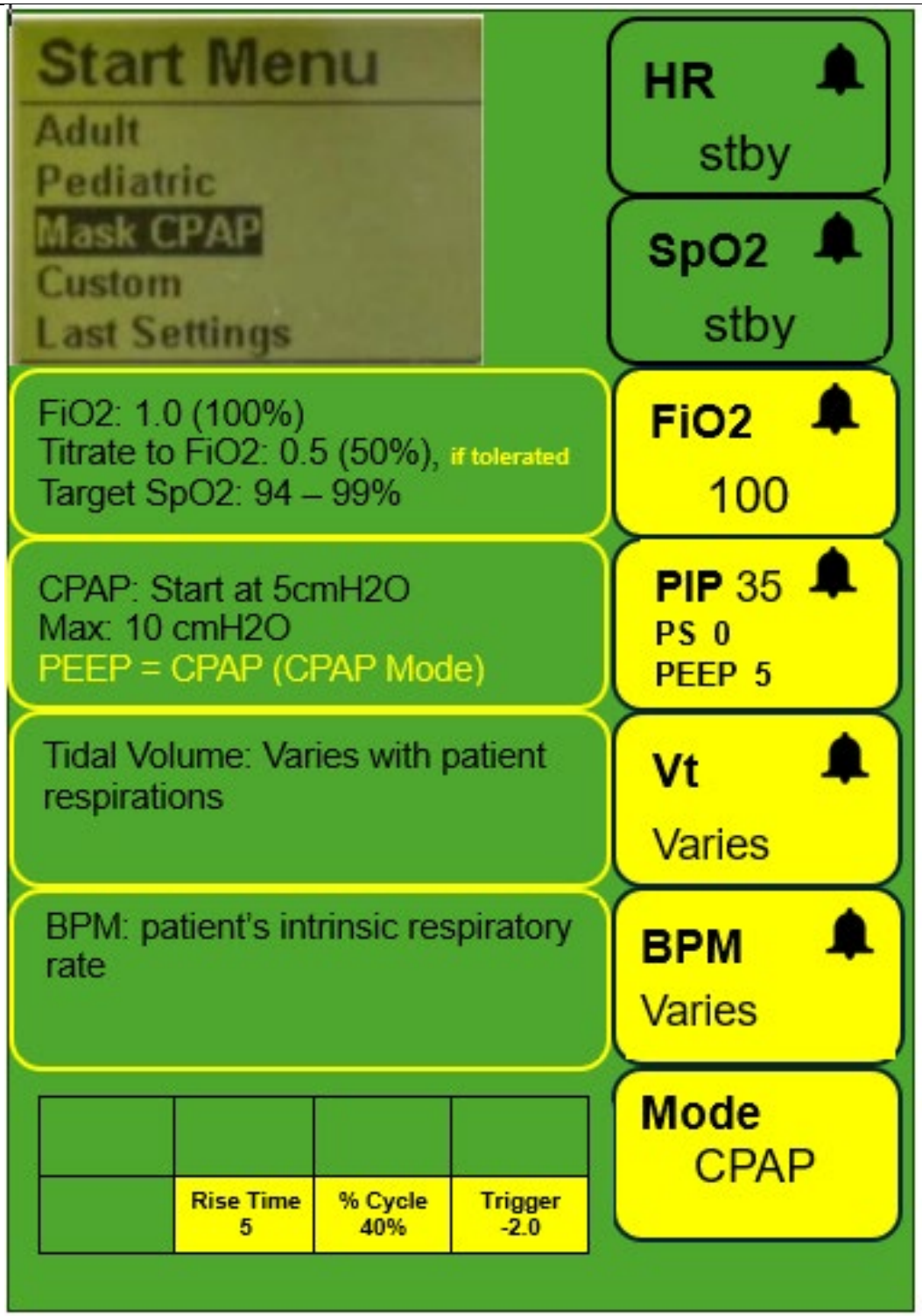
ADULT POST ROSC
When patient has return of spontaneous circulation. • Turn vent **off and on** again. • Select **ADULT** from start menu. • Start at **FIO2 at 100** and titrate to SPO2 of 94%. • Adjust **PEEP to 5**. • Set **Vt to 6 ml/kg** IBW • Adjust BPM to **12** BPM • Select mode for **AC(v) or SIMV**



VENTILATOR MANAGEMENT

ADULT CPAP

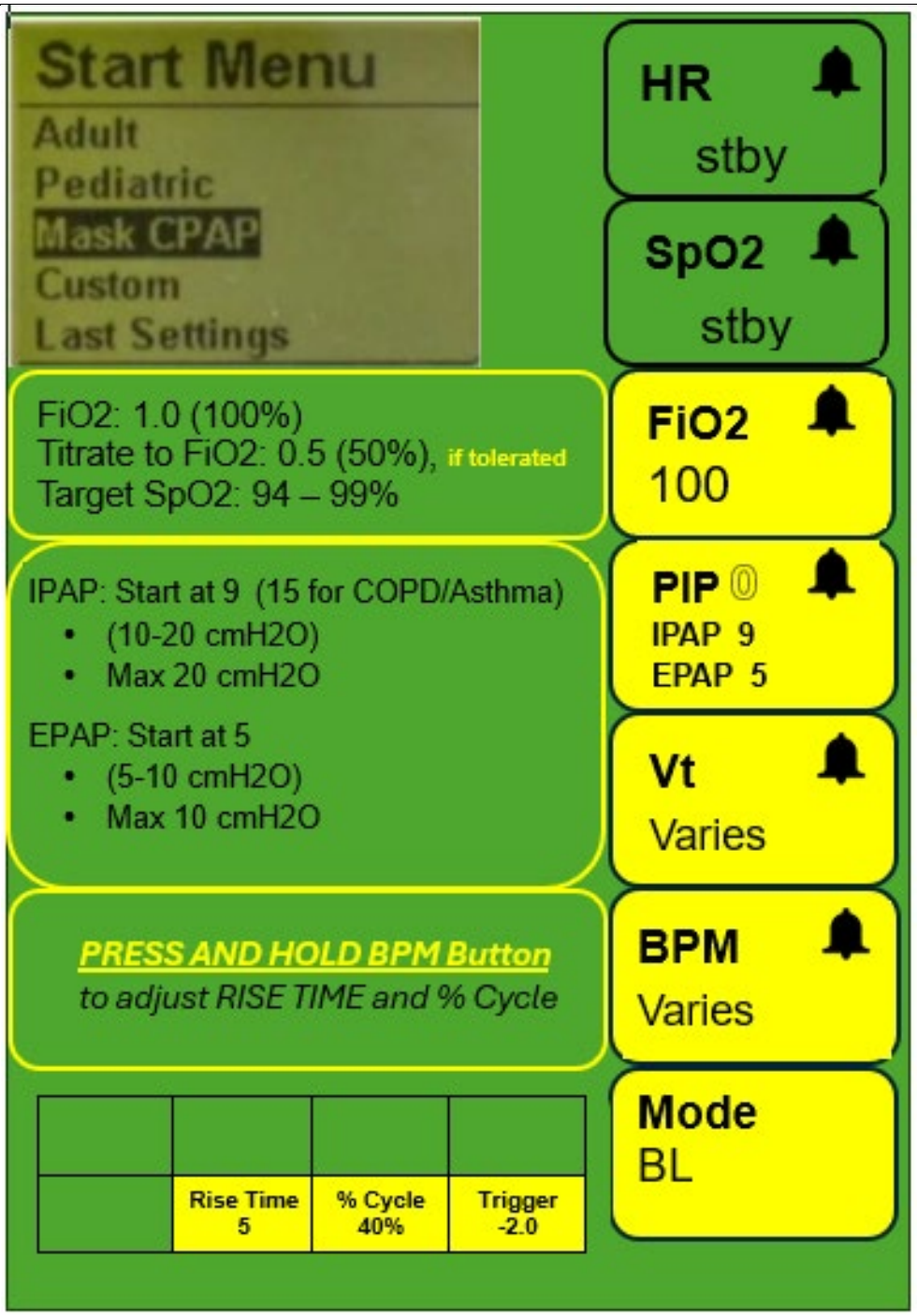
- Select **Mask CPAP** in the **Start-up Menu.**
- **Adjust FIO2 to 100%**
- **Multiple PRESS *and* SELECT the PIP button** to set **PEEP LEVEL at 5.**
  (PEEP = CPAP in CPAP mode)



VENTILATOR MANAGEMENT

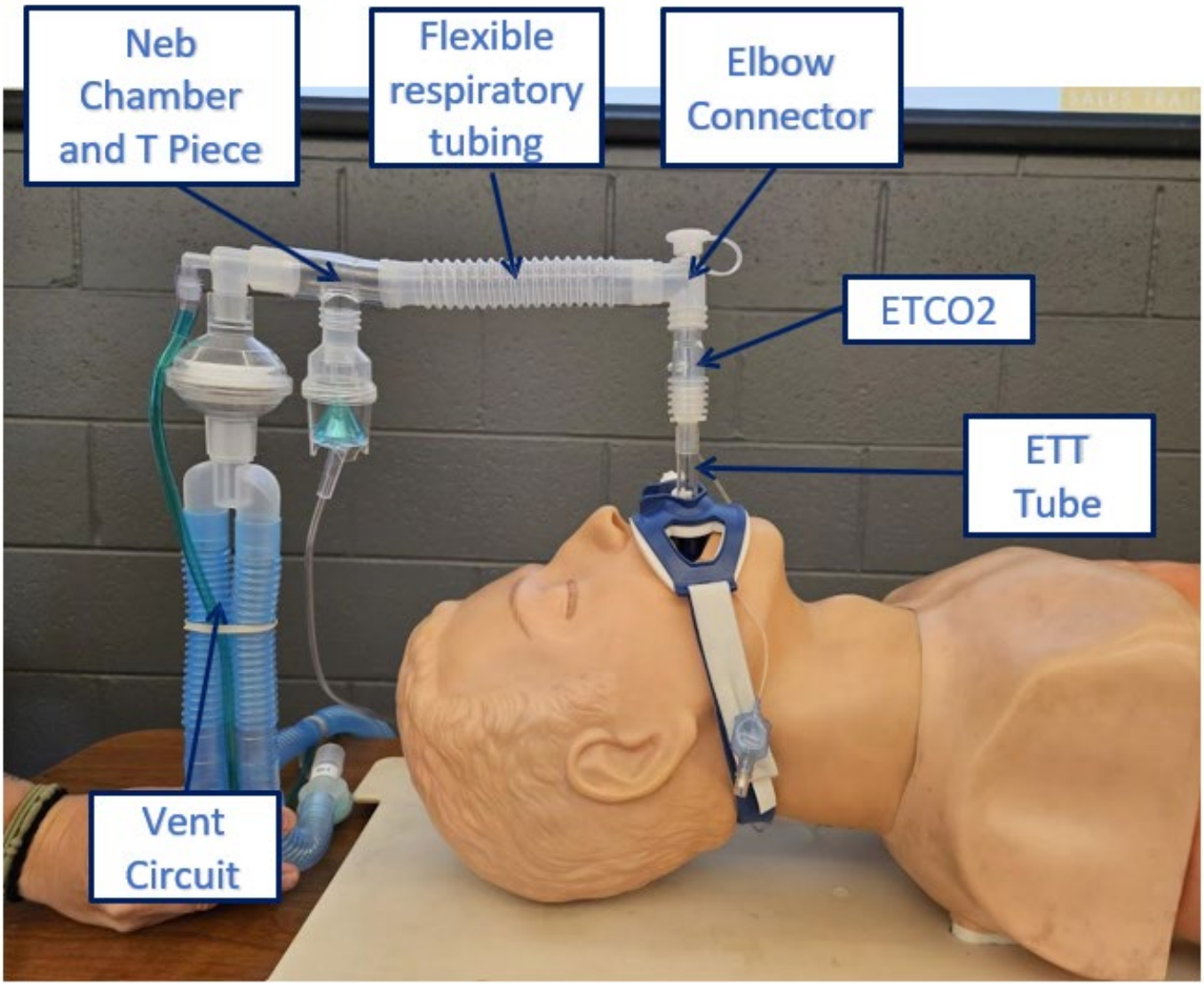
ADULT BI-LEVEL

- Select Mask CPAP in **Start-up Menu.**
- **PRESS and HOLD MODE button** to set **Mode to BL**.
- **PRESS and HOLD BPM button to** set up: **Rise Time**, **% Cycle** and **Trigger**.
  - Begin at **IPAP of 9** and **EPAP of 5**.
  - Once Pt is comfortable with BIPAP increase IPAP/EPAP as needed.
- Cycle defaults to 25% (25-40%). This is likely low for many patients.
  - Adjust to 40% for asynchrony, discomfort or tachypnea



VENTILATOR MANAGEMENT

INLINE NEBULIZER SETUP



VENTILATOR MANAGEMENT



ADULT MALE:

15+ years /Over 4'7"



Height	IBW KG	BPM - 25 Est. Vt 4ml/kg	BPM - 16 Est. Vt 6ml/kg	BPM - 12 Est. Vt 8ml/kg	BPM - 8 Est. Vt 10ml/kg	Est. Mv 100 ml/kg	Est. Mv 200ml/kg
Revert to 4'7" tidal volume for all Pts below 4'7" Add 20ml for each 1" for above 6'8"							
*For Vt < 200 ml, use Infant/Ped Circuit or set at ~~Vt @~~ 200 ml							
4'7"	39	156	234	312	390	3900	7800
4'8"	41	164	246	328	410	4100	8200
4'9"	43	172	258	344	430	4300	8600
4'10	45	180	270	360	450	4500	9000
4'11	48	192	288	384	480	4700	9400
5'0"	50	200	300	400	500	5000	10000
5'1"	52	208	312	416	520	5200	10400
5'2"	55	220	330	440	550	5500	11000
5'3"	57	228	342	456	570	5700	11400
5'4"	59	236	354	472	590	5900	11800
5'5"	62	248	372	496	620	6200	12400
5'6"	64	256	384	512	640	6400	12800
5'7"	66	264	396	528	660	6600	13200
5'8"	68	272	408	544	680	6800	13600
5'9"	71	284	426	568	710	7100	14200
5'10"	73	292	438	584	730	7300	14600
5'11"	75	300	450	600	750	7500	15000
6'0"	78	312	468	624	780	7800	15600
6'1"	80	320	480	640	800	8000	16000
6'2"	82	328	492	656	820	8200	16400
6'3"	85	340	510	680	850	8500	17000
6'4"	87	348	522	696	870	8700	17400
6'5"	89	356	534	712	890	8900	17800
6'6"	91	364	546	728	910	9100	18200
6'7"	94	376	564	752	940	9400	18800
6'8"	96	384	576	768	960	9600	19200

Source: Adapted from ARDSNET www.ardsnet.org



ADULT Female:

15+ years /Over 4'7"



Height	IBW KG	BPM - 25 Est. Vt 4ml/kg	BPM - 16 Est. Vt 6ml/kg	BPM - 12 Est. Vt 8ml/kg	BPM - 8 Est. Vt 10ml/kg	Est. Mv 100ml/kg	Est. Mv 200ml/kg
Revert to 4'7" tidal volume for all ADULT Pts below 4'7" Add 20ml for each 1" above 6'8"							
*For Vt < 200 ml, use Infant/Ped Circuit or set at Vt @ 200 ml							
4'7"	34	136	204	272	340	3400	6800
4'8"	36	144	216	288	360	3600	7200
4'9"	39	156	234	312	390	3900	7800
4'10"	41	164	246	328	410	4100	8200
4'11"	43	172	258	344	430	4300	8600
5'0"	46	184	276	368	460	4600	9200
5'1"	48	192	288	384	480	4800	9600
5'2"	50	200	300	400	500	5000	10000
5'3"	52	208	312	416	520	5200	10400
5'4"	55	220	330	440	550	5500	11000
5'5"	57	228	342	456	570	5700	11400
5'6"	59	236	354	472	590	5900	11800
5'7"	62	248	372	496	620	6200	12400
5'8"	64	256	384	512	640	6400	12800
5'9"	66	264	396	528	660	6600	13200
5'10"	68	272	408	544	680	6800	13600
5'11"	71	284	426	568	710	7100	14200
6'0"	73	292	438	584	730	7300	14600
6'1"	75	300	450	600	750	7500	15000
6'2"	78	312	468	624	780	7800	15600
6'3"	80	320	480	640	800	8000	16000
6'4"	82	328	492	656	820	8200	16400
6'5"	85	340	510	680	850	8500	17000
6'6"	87	348	522	696	870	8700	17400
6'7"	89	356	534	712	890	8900	17800
6'8"	92	368	552	736	920	9200	18400

Source: Adapted from ARDSNET www.ardsnet.org

VENTILATOR MANAGEMENT

Pediatrics

< 14 years old /Under 4'7

PEDIATRIC: > 14 years old / Under 4'7""

Age	IBW KG	Est. Vt 4ml/kg	Est. Vt 6ml/kg	Est. Vt 8ml/kg	Est. Vt 10ml/kg	100ml/kg	Est. Mv 200ml/kg	BPM
<1	< 5kg			CONTRAINDICATED				
1	10	40	60	80	100	1000	2000	30 (25-45/min)
2	12	48	72	96	120	1200	2400	30 (25-45/min)
3	14	56	84	112	140	1400	2800	25 (20-30/min)
4	16	64	96	128	160	1600	3200	25 (20-30/min)
5	18	72	108	144	180	1800	3600	25 (20-30/min)
6	25	100	150	200	250	2500	5000	25 (20-30/min)
7	28	112	168	224	280	2800	5600	20 (16-25/min)
8	31	124	186	248	310	3100	6200	20 (16-25/min)
9	34	136	204	272	340	3400	6800	20 (16-25/min)
10	37	148	222	296	370	3700	7400	20 (16-25/min)
11	40	160	240	320	400	4000	8000	20 (16-25/min)
12	43	172	258	344	430	4300	8600	20 (16-25/min)
13	46	184	276	368	460	4600	9200	16 (range 10 - 20)
14	49	196	294	392	490	4900	9800	16 (range 10 - 20)

For Grey Area consider Adult IPBW charts

For Vt > 300 ml , use Adult/Ped Circuits

For children whose height is over 4"7
USE ADULT CHARTS

MEDICATIONS

ACETAMINOPHEN

GENERIC NAME – Tylenol
CHEMICAL CLASS – Nonsalicylate, Paraaminophenol derivative
FUNCTIONAL CLASS – Non-opioid analgesic, Antipyretic

Pharmacokinetics
Absorption: Absorbed rapidly and completely by GI tract
Distribution: 25% protein bound. Plasma concentrations do not correlate well with analgesic effect but do correlate with toxicity.
Metabolism: From 90% to 95% metabolized in liver
Excretion: Excreted in urine
Half Life: 1-4 hours
Onset: PO – 10 to 30 minutes

Indications

- Adult
  - Mild to moderate pain
- Pediatric
  - Mild to moderate pain
  - fever of 101.0 degrees or higher, with or without seizure activity

Dosage

- Adult
  - 15mg/kg PO (Max dose: 1gram)
  - 1gram IV over 15 minutes via IV pump
- Pediatric
  - PO - 15 mg/kg administration if mental status allows for PO
  - IV – Pediatric patients > 2 years old
    - 12.5 mg/kg over 15 minutes (Max dose: 500 mg) via IV pump

Contraindications & Precautions

- Hepatic failure or impairment
- Use cautiously in pregnancy, consider half dose – 500 mg

Adverse Reactions

- Hematologic: Hemolytic neutropenia, leukopenia, pancytopenia, thrombocytopenia (rare)
- Hepatic: Severe liver damage with toxic doses, jaundice
- Skin: Rash, urticarial
- Other: Hypoglycemia

Drug Interactions

- **Drug-drug:**
  - *Barbiturates, carbamazepine, hydantoins, rifampin, sulfinpyrazone, isoniazid:* high doses or long-term use of these drugs may reduce therapeutic effects and enhance hepatotoxic effects of acetaminophen. Avoid concomitant use.
  - *Warfarin:* increased hypoprothrombinemic effects with long-term use with high doses of acetaminophen.
  - *Zidovudine:* may increase incidence of bone marrow suppression because of impaired zidovudine metabolism.
- **Drug-food:** *Caffeine:* may enhance analgesic effects of acetaminophen.
- **Drug-lifestyle:** *Alcohol use:* increased risk of hepatic damage.

Pregnancy Classification - B

ADENOSINE

GENERIC NAME – Adenocard
CHEMICAL CLASS – Endogenous nucleoside
FUNCTIONAL CLASS – Antiarrhythmic

Pharmacokinetics
Absorption: not applicable with I.V. administration
Distribution: rapidly taken up by erythrocytes and vascular endothelial cells
Metabolism: metabolized within tissues to inosine and adenosine monophosphate
Excretion: unknown. *Half-life:* less than 10 seconds

Indications
Supraventricular Tachycardia (SVT)
Pediatric Tachycardia

Dosage
- Adult: 6mg Rapid IVP followed by a 20cc NS flush
  - Repeat 12mg rapid IVP after 1 – 2 min (up to 2 repeat doses)
- Pedi: 0.1mg/kg rapid IVP follow by a 2-3cc NS flush
  - May repeat 0.2mg/kg rapid IVP followed by a 2-3cc NS flush
  - MAX total dose: 0.3mg/kg or 12 mg

Contraindications & Precautions
- Hypersensitivity
- Second or third-degree heart block
- Sick sinus syndrome unless artificial pacemaker is present
- Use cautiously in patients with asthma because bronchoconstriction may occur

Adverse Reactions
- **CNS:** apprehension, back pain, blurred vision, burning sensation, dizziness, heaviness in arms, light-headedness, neck pain, numbness, tingling in arms.
- **CV:** chest pain, facial flushing, headache, hypotension, palpitations, diaphoresis
- **GI:** metallic taste, nausea
- **Respiratory:** chest pressure, dyspnea, SOB, hyperventilation
- **Other:** tightness in throat, groin pressure

Drug Interactions
- **Drug-drug:**
  - Carbamazepine: higher degrees of heart block may occur.
  - Digoxin, verapamil: combined use rarely associated with ventricular fibrillation.
  - Dipyridamole: may potentiate adenosine's effects.
  - Methylxanthines: antagonism of adenosine's effects. Patients receiving theophylline or caffeine may require higher doses or may not respond to adenosine therapy.
- **Drug-food:**
  - Caffeine: may antagonize adenosine's effects.

Pregnancy Classification - C

ALBUTEROL SULFATE

GENERIC NAME – Proventil, Ventolin
FUNCTIONAL CLASS – Adrenergic B2 Agonist, bronchodilator, sympathomimetic

Pharmacokinetics
Absorption: after oral inhalation, albuterol appears to be absorbed over several hours from respiratory tract; however, most of dose is swallowed and absorbed through GI tract.
Distribution: does not cross blood-brain barrier
Metabolism: extensively metabolized in liver to inactive compounds
Excretion: rapidly excreted in urine and feces. *Half-life:* about 4 hours

Indications

- Allergic Reaction/Anaphylaxis
- Reactive Airway Disease
- Pediatric Allergic Reactions/Anaphylaxis
- Pediatric Asthma

Dosage

- Adult: 2.5mg via nebulizer
- Pedi: 2.5mg via nebulizer

Contraindications & Precautions

- Hypersensitivity to drug or drug components
- Breast-feeding women
- Use cautiously in patients with CV disorders, hyperthyroidism, or diabetes mellitus; in those unusually responsive to adrenergics; and during pregnancy

Adverse Reactions

- **CNS**: tremor, nervousness, dizziness, insomnia, headache
- **CV**: tachycardia, palpitations, hypertension
- **EENT**: drying and irritation of nose and throat
- **GI**: heartburn, nausea, vomiting
- **Respiratory**: bronchospasm
- **Other**: muscle cramps, hypokalemia (with high doses)

Drug Interactions

- **Drug-drug**
  - *CNS stimulants*: increased CNS stimulation.
  - *Levodopa*: risk of arrhythmias
  - *MAO inhibitors, tricyclic antidepressants*: increased adverse CV effects
  - *Propranolol, other beta blockers*: mutual antagonism.
- **Drug-food**
  - *Caffeine:* increased CNS stimulation.

Pregnancy Classification - C

AMIODARONE HYDROCHLORIDE

GENERIC NAME – Pacerone, Cordarone
FUNCTIONAL CLASS – Antidysrhythmic

Pharmacokinetics
Absorption: slow, variable absorption with oral administration
Distribution: distributed widely, accumulating in adipose tissue and in organs with marked perfusion, such as lungs, liver, and spleen. It is highly protein-bound (96%)
Metabolism: metabolized extensively in liver to active metabolite, desethyl amiodarone.
Excretion: main excretory route is hepatic through biliary tree. *Half-life:* 25 to 110 days (usually, 40 to 50 days)

Indications

- Atrial Fibrillation / Atrial Flutter
- Supraventricular Tachycardia
- Ventricular Tachycardia / Pulseless V-Tach
- Wide complex tachycardia/V-Tach with a pulse
- Pediatric Ventricular Fibrillation / Pulseless V-Tach

Dosage

- **Ventricular Fibrillation / Pulseless V-Tach**
  - 300 mg IV/IO
  - May repeat 150mg IV/IO after 5 minutes
- **Atrial Fibrillation, Atrial Flutter, Ventricular Tachycardia with a pulse**
  - 150mg over 10 minutes via IV pump
- **Post Resuscitation (V-Fib/V-Tach)**
  - 300mg in a 250cc bag of NS administered at 1 mg/min via IV pump
- **Pedi - Ventricular Fibrillation / Pulseless V-Tach**
  - 5mg/kg IV/IO (may repeat after 10 minutes)
- **Pedi Ventricular Tachycardia (with a pulse)**
  - 5mg/kg IV over 20 – 60 minutes via IV pump

Contraindications & Precautions

- Cardiogenic shock/hypotension
- Hypersensitivity (including to iodine which is one of the ingredients)
- Bradycardias and 2- or 3-degree heart blocks
- Patients taking Norvir (antiretroviral drug for HIV patients)
- Pregnancy or breast feeding, renal failure/dialysis, liver disease, thyroid disease
- Abnormal Mg or K levels, cardiomyopathy/left ventricular dysfunction

Adverse Reactions

- **CNS**: peripheral neuropathy, extrapyramidal symptoms, headache, muscle weakness, malaise, fatigue
- **CV**: bradycardia, hypotension, arrhythmias, heart failure, heart block, sinus arrest.
- **EENT**: corneal microdeposits, vision disturbances, blindness, optic neuritis / neuropathy
- **GI**: nausea, vomiting, constipation.
- **Hepatic**: altered liver enzymes test results, hepatic dysfunction
- **Respiratory**: ARDS, respiratory failure, severe pulmonary toxicity (pneumonitis, alveolitis).
- **Skin**: photosensitivity, blue-gray skin.
- **Other**: hypothyroidism, hyperthyroidism, gynecomastia, prolonged QTc, arrythmias: Torsades de pointes, v.fib, hepatic failure renal failure, thyroid dysfunction, cardiogenic shock/CHF, acute pulmonary hypertension death

AMIODARONE HYDROCHLORIDE

Drug Interactions

- **Drug-drug:**
  - *Antiarrhythmic:* amiodarone may reduce hepatic or renal clearance of certain antiarrhythmics (especially flecainide, procainamide, or quinidine); concomitant use of amiodarone with other antiarrhythmic (especially mexiletine, propafenone, quinidine, disopyramide, or procainamide) may induce torsades
  - *Antihypertensives:* increased hypotensive effect.
  - *Beta blockers, calcium channel blockers:* increased cardiac depressant effects; may potentiate slowing of sinus node and AV conduction.
  - *Cardiac glycosides:* increased serum digoxin level (average of 70% to 100%).
  - *Cimetidine:* interferes with action of amiodarone causing increased amiodarone levels.
  - *Cholestyramine:* decreased serum levels and half-life of amiodarone.
  - *Cyclosporine:* increased concentrations of cyclosporine
  - *Phenytoin:* may decrease phenytoin metabolism.
  - *Theophylline:* increased theophylline level with toxicity may occur.
  - *Warfarin:* increased INR (average of 100% within 1 to 4 weeks of therapy). Warfarin dosage should be decreased 33% to 50% when amiodarone is initiated.
  - Drugs with potential for adverse reactions: flouroquinolones (levaquin, cipro, etc), fluconazole, Diflucan, macrolides (erythromycin, zithromax, etc.) loratadine, Claritin, trazodone, Desyrel, digoxin, diuril, lasix, lozol, Coumadin, pronestyl, norvir, orap, zagam, norpace, mexitil, calcium channel blockers, beta blockers, Tagamet

- **Drugs with potential for adverse reactions:**
  - flouroquinolones (levaquin, cipro, etc), fluconazole, Diflucan, macrolides (erythromycin, zithromax, etc.) loratadine, Claritin, trazodone, Desyrel, digoxin, diuril, lasix, lozol, Coumadin, pronestyl, norvir, orap zagam, norpace, mexitil, calcium channel blockers, beta blockers, Tagamet

- **Drug-lifestyle:**
  - *Sun exposure:* photosensitivity reaction may occur. Avoid prolonged or unprotected sun exposure.

Checklist for stable supraventricular patients that may receive amiodarone: (any one item should preclude it's use unless medical control overrides its use):

- Pregnant or breast feeding, renal failure or dialysis, history of high or low Mg or K
- Allergic to amiodarone or iodine, liver disease or high liver enzymes, taking any drugs listed with potential for adverse reactions, unstable supraventricular arrhythmias (chest pain, hypotension, CHF, resp failure)
- Stable SVT (use Adenosine or vagal maneuvers)

Pregnancy Classification – D

ASPIRIN (ASA)

GENERIC NAME – Acetylsalicylic acid, ASA
FUNCTIONAL CLASS – non-opioid analgesic, antipyretic, nonsteroidal anti-inflammatory, antiplatelet

Pharmacokinetics
Absorption: absorbed rapidly and completely from GI tract
Distribution: distributed widely into most body tissues and fluids. Protein-binding to albumin is concentration-dependent; ranges from 75% to 90% and decreases as serum concentration increases.
Metabolism: hydrolyzed partially in GI tract to salicylic acid with almost complete metabolism in liver.
Excretion: excreted in urine as salicylate and its metabolites. *Half-life:* 15-20 minutes

Indications
- Chest Pain/ACS

Dosage
- 324mg PO (chew)

Contraindications & Precautions
- Patients with G6PD deficiency
- Bleeding disorders such as hemophilia, von Willebrand's disease, or telangiectasia
- NSAID-induced sensitivity reactions
- Hypersensitivity
- Use cautiously in patients with GI lesions, impaired renal function, hypoprothrombinemia, thrombotic thrombocytopenic purpura, or sever hepatic impairment

Adverse Reactions
- **EENT**: tinnitus, hearing loss
- **GI**: nausea, vomiting, GI distress, occult bleeding, dyspepsia, GI bleeding
- **Hematologic**: prolonged bleeding time, thrombocytopenia
- **Hepatic**: altered liver function studies, hepatitis
- **Skin**: rash, bruising, urticaria, angioedema
- **Other**: hypersensitivity reactions, (anaphylaxis, asthma), Reye's syndrome

Drug Interactions
- **Drug-drug**
  - Beta blockers: decreased antihypertensive effect.
  - Avoid long-term aspirin use if patient is taking antihypertensives.
- **Drug-food**
  - Caffeine: may increase the absorption of aspirin.
- **Drug-lifestyle**
  - Alcohol use: increased risk of GI bleeding

Pregnancy Classification - D

ATROPINE SULFATE

CHEMICAL CLASS – Belladonna alkaloid
FUNCTIONAL CLASS – Antiarrhythmic, vagolytic, anticholinergic parasympatholytic, antimuscarinic

Pharmacokinetics
Absorption: well absorbed after PO and IM administration; unknown for SC administration
Distribution: distributed throughout body, including CNS. Only 18% binds with plasma protein.
Metabolism: metabolized in liver to several metabolites
Excretion: excreted primarily through kidneys; small amount may be excreted in feces and expired air. *Half-life:* Initial, 2 hours; second phase, 12 1/2 hours.

Indications

- Bradycardia (with sign of poor perfusion)
- Calcium Channel Blocker Overdose (symptomatic)
- Organophosphate poisoning (symptomatic)
- Pediatric bradycardia

Dosage

- Adult:
  - Bradycardia - 0.5mg IVP (may repeat every 5 minutes) – Max Dose: 3mg
- Calcium channel blocker overdose – 1mg IVP with symptomatic bradycardia
- Organophosphate poisoning – 2mg IVP (repeat every 5 – 15 minutes)
- Pedi: 0.02mg/kg IV/IO

Contraindications & Precautions

- Contraindicated in patients with acute angle-closure glaucoma, obstructive uropathy, obstructive disease
- Of GI tract, paralytic ileus, toxic megacolon, intestinal atony, unstable CV status in acute hemorrhage,
- Asthma, myasthenia gravis, or hypersensitivity. Also not recommended for use in breast-feeding women.
- Use cautiously in patients with Down syndrome and in pregnant women.

Adverse Reactions

- **CNS**: headache, restlessness, ataxia, disorientation, hallucinations, delirium, coma, insomnia, dizziness; excitement, agitation, and confusion (especially in elderly patients).
- **CV**: tachycardia, palpitations (with 1-2 mg doses); tachycardia, angina (with doses over 2 mg).
- **EENT**: slight mydriasis, photophobia (with 1 mg dose); blurred vision, mydriasis (with 2 mg dose).
- **GI**: dry mouth (common even at low doses), thirst, constipation, nausea, vomiting.
- **GU**: urine retention
- **Hematologic**: leukocytosis
- **Skin**: flushing
- **Other**: severe allergic reactions, including anaphylaxis.

Drug Interactions

- **Drug-drug:**
  - Antacids: decreased absorption of anticholinergics. Separate administration times by at least 1 hour.
  - Anticholinergics, drugs with anticholinergic effects (such as amantadine, glutethimide, meperidine,
  - Antiarrhythmics, antiparkinsonian agents, phenothiazines, tricyclic antidepressants): additive anticholinergic effects. Use together cautiously.
  - Ketoconazole, levodopa: decreased absorption.
  - Methotrimeprazine: may produce extrapyramidal symptoms.
  - Potassium chloride wax matrix tablets: increased risk of mucosal lesions

Pregnancy Classification - C

CALCIUM CHLORIDE

FUNCTIONAL CLASS – Electrolyte replacement

Pharmacokinetics
Distribution: crosses placenta, enters breast milk
Excretion: urine and feces. *Half-life:* Unknown

Indications

- Cardiac Arrest
- Calcium Channel Blocker Overdose (symptomatic)

Dosage

- Calcium chloride 1gram IV/IO
- Calcium gluconate 2 grams IV/IO

Contraindications & Precautions

- Lactation, children, renal disease, respiratory disease, cor-pulmonale, respiratory failure

Adverse Reactions

- **CV**: Shortened QT, heart block, hypotension, bradycardia, dysrhythmias, cardiac arrest (IV)
- **GI**: Vomiting, nausea, constipation

Drug Interactions

- **None**

Pregnancy Classification – C

CEFTRIAXONE

TRADE NAME – Rocephin
FUNCTIONAL CLASS – antibiotic (broad spectrum)

Pharmacokinetics
Metabolism: half-life of 6 – 8 hours
Excretion: 33-67% excreted in the urine
Chemical Effect:

Indications

- **Suspected sepsis (M14-15)**
- **Major trauma (open fractures, extensive soft tissue trauma, life/limb threatening penetrating trauma)**

Dosage

- 2grams IV/IO
  - Reconstitute: Add 20 cc normal saline to the vial and mix thoroughly.
    - (**DO NOT** mix with calcium containing diluents such as Ringer Lactate.
    - Infuse the over 30 minutes via IV pump *(preferred administration method)*
      - Add the reconstituted medication to 50cc Normal Saline bag (total 70 cc)
    - Alternate administration: 1gram (10cc) IV/IO slow push (2 minutes)
      - If no reactions are noted, administer an additional 1 gram (10cc) in 5 - 10 minutes.

Contraindications & Precautions

- Do not administer with other medications
- Avoid administering with calcium containing solutions
- Known allergy to cephalosporin class of antibiotics (ascertain of patient has had reactions to cephalosporins or penicillin
- Do not administer with Clostridium difficile induced diarrhea

Adverse Reactions

- **CNS**: dizziness, HA
- **GI:** N/V, diarrhea
- **Skin:** warmth, tightness/pain over the injection site, rash
- **Other**: overactive reflexes, pain/swelling to the tongue

Drug Interactions

- Drug-drug: do not administer with any IV solutions containing calcium (including lactated ringers),

Pregnancy Classification - B

DEXAMETHASONE

FUNCTIONAL CLASS – corticosteroid, anti-inflammatory

Pharmacokinetics: stimulates the synthesis of enzymes to decrease the inflammatory response. Causes suppression of the immune system by reducing activity and volume of the lymphatic system
Absorption: rapid
Metabolism: metabolized in the liver
Excretion: un-metabolized drug excreted by the kidneys

Indications

- Reactive Airway (Asthma/COPD)
- Pediatric Asthma

Dosage

- Reactive Airway (Asthma/COPD)
  - 0.6 mg/kg IV/IO/IM
    - Max Dose – 10 mg
    - **DO NOT administer to patients with audible rales and/or elevated temp**

Contraindications & Precautions

- Advanced glaucoma
- Systemic infection
- Hypersensitivity

Adverse Reactions

- **Cardiovascular: bradycardia, arrhythmias, CHF, pulmonary edema**
- **CNS: Convulsion, depression, increase ICP, vertigo**
- **GI: ABD distention, nausea, pancreatitis**
- **Endocrine: increase blood glucose levels**

Drug Interactions

- **Drug-drug: digitalis, birth control pills, "blood thinners"**

Pregnancy Classification – B

DEXTROSE

FUNCTIONAL CLASS – Total parenteral nutrition (TPN) component, caloric agent, fluid volume replacement

Pharmacokinetics
Absorption: not applicable with IV administration
Distribution: distributed throughout plasma volume
Metabolism: metabolized to carbon dioxide and water
Excretion: excess excreted in urine

Indications

- Hypoglycemia (Adult & Pediatric)

Dosage

- Oral Glucose
  - 15 – 30 grams (patient must be able to maintain airway)
- Dextrose 10%
  - Adult – 100cc (10 grams) repeat as needed up to 250cc based on patient response
  - Pedi – 2-4 ml/kg repeat as needed base on patient response
  - Neonate – 2 ml/kg repeat as needed base on patient response

Contraindications & Precautions

- Contraindicated in patients in diabetic coma, while blood glucose level remains excessively high. Use of concentrated solution is contraindicated in patients with intracranial or intraspinal hemorrhage, in dehydrated patients with delirium tremens, and in patients with severe dehydration, anuria, hepatic coma, or glucose-galactose malabsorption syndrome
- Use cautiously in patients with cardiac or pulmonary disease, hypertension, renal insufficiency, urinary obstruction or hypovolemia

Adverse Reactions

- **CNS**: confusion, unconsciousness in hyperosmolar hyperglycemic nonketotic syndrome
- **CV**: pulmonary edema, exacerbated hypertension, heart failure (with fluid overload in susceptible patients); phlebitis, venous sclerosis, tissue necrosis (with prolonged or concentrated infusions, especially with peripheral administration).
- **GU**: glycosuria, osmotic diuresis
- **Metabolic**: hyperglycemia, hypervolemia, hyperosmolarity (with rapid infusion of concentrated solution or prolonged infusion); hypoglycemia from rebound hyperinsulinemia (rapid termination of long-term infusions).
- **Skin**: sloughing, tissue necrosis (if extravasation occurs with concentrated solutions)

Drug Interactions

- **Drug-drug:**
  - *Corticosteroids:* may cause salt and water retention and increased potassium excretion.

DILTIAZEM

GENERIC NAME – Cardizem
PHARMACOLOGIC CLASS – Calcium channel blocker
THERAPEUTIC CLASS – Antianginal

Pharmacokinetics
Absorption: about 80% of dose is absorbed rapidly from GI tract. Only about 40% of drug enters systemic circulation because of significant first-pass effect in liver.
Distribution: about 70% to 85% of circulating diltiazem is bound to plasma proteins.
Metabolism: metabolized in liver.
Excretion: about 35% excreted in urine and about 65% in bile as unchanged drug and inactive and active metabolites.
Half-life: 3 to 9 hours.

Indications

- Atrial Fibrillation / Atrial Flutter

Dosage

- 10mg slow IVP (if HR > 120 and BP > 120 Systolic)
  - May repeat 10mg slow IVP (if HR > 120 and BP > 120 Systolic)

Contraindications & Precautions

- Contraindicated in patients with sick sinus syndrome or second- or third-degree AV block in absence of artificial pacemaker, hypotension (systolic blood pressure below 90 mmHg), acute MI, pulmonary congestion (documented by X-ray), or hypersensitivity to drug.
- Breast-feeding should be discontinued during drug use.
- Use cautiously in elderly patients, in patients with heart failure, and in those with impaired liver or kidney function.
- Use cautiously in pregnant women.

Adverse Reactions

- **CNS**: headache, somnolence, dizziness, insomnia, asthenia.
- **CV**: edema, arrhythmias, flushing, bradycardia, hypotension, conduction abnormalities, heart failure, AV block, abnormal ECG.
- **GI**: nausea, constipation, vomiting, diarrhea, abdominal discomfort.
- **GU**: nocturia, polyuria.
- **Hepatic**: transient elevation of liver enzyme levels.
- **Skin**: rash, pruritus, photosensitivity.

Drug Interactions

- **Drug-drug:**
  - Anesthetics: effects may be potentiated.
  - Cimetidine: may inhibit diltiazem metabolism
  - Cyclosporine: diltiazem may increase serum cyclosporine levels, possibly by decreasing its metabolism, leading to increased risk of cyclosporine toxicity.
  - Digoxin: diltiazem may increase serum levels of digoxin.
  - Propranolol, other beta blockers: may precipitate heart failure or prolong cardiac conduction time

Pregnancy Classification – C

DIPHENHYDRAMINE

GENERIC NAME – Benadryl
CHEMICAL CLASS – Ethanolamine derivative antihistamine
FUNCTIONAL CLASS – Antihistamine (H1-receptor antagonist), antiemetic, antivertigo, antitussive, sedative, hypnotic, antidyskinetic (anticholinergic)

Pharmacokinetics
Absorption: well absorbed from GI tract after PO administration; unknown after IM administration
Distribution: distributed widely throughout body, including CNS; about 82% protein-bound
Metabolism: metabolized in liver
Excretion: drug and metabolites excreted primarily in urine. *Half-life:* about 3 ½ hours.

Indications

- Allergic Reactions/Anaphylaxis
- Pediatric Allergic Reaction
- Phenothiazine Ingestion with Dystonic reaction

Dosage

- Adult
  - Allergic Reaction/Anaphlaxis
    - 25mg IV/IM (mild to moderate allergic reactions)
    - 50mg IV/IM (severe allergic reactions)
  - Phenothiazine Ingestion with Dystonic reaction
    - 25 mg IV or IM
    - May repeat one 25 mg dose, if no response in 10 minutes, (maximum dose is 50 mgs).
- Pedi
  - 1 mg/kg slow IVP (Max dose: 50mg)

Contraindications & Precautions

- Contraindicated in patients with hypersensitivity to drug, during acute asthmatic attacks, and in newborns or premature neonates and breast-feeding women.
- Use with extreme caution in patients with angle-closure glaucoma, pyloroduodenal and bladder-neck obstruction, asthma/COPD, increased intraocular pressure, hyperthyroidism, CV disease, hypertension.
- Children under age 12 should use only as directed by doctor.

Adverse Reactions

- **CNS**: drowsiness, confusion, insomnia, headache, vertigo, sedation, sleepiness, dizziness, incoordination, fatigue, restlessness, tremor, nervousness, seizures.
- **CV**: palpitations, hypotension, tachycardia.
- **EENT**: diplopia, blurred vision, nasal congestion, tinnitus.
- **GI**: nausea, vomiting, diarrhea, dry mouth, constipation, epigastric distress, anorexia.
- **GU**: dysuria, urine retention, urinary frequency.
- **Hematologic**: hemolytic anemia, thrombocytopenia, agranulocytosis.
- **Respiratory**: thickening of bronchial secretions, nasal congestion.
- **Skin**: urticaria, photosensitivity, rash.
- **Other**: anaphylactic shock.

Drug Interactions

- **Drug-drug:**
  - CNS depressants: increased sedation.
  - MAO inhibitors: increased anticholinergic effects.
- **Drug-lifestyle**
  - Sun exposure: photosensitivity reactions may occur

Pregnancy Classification – B

DROPERIDOL

TRADE NAME – Inapsine
FUNCTIONAL CLASS – Sedative, tranquilizer

Pharmacokinetics: a butyrophenone derivative and dopamine antagonist; produces tranquilization and sedation. Causes CNS depression at subcortical levels of the brain, midbrain, and brainstem.
Metabolism: extensively in the liver
Excretion: primarily in the urine
Chemical Effect: antagonism of dopamine receptors in the central nervous system

Indications

- Behavioral – Excited Delirium/Violent Patient

Dosage

- Behavioral – Excited Delirium/Violent Patient
  - 2.5mg – 5mg IV/IO
  - 5mg – 10mg IM
  - Half dose in the elderly patient
- Refractory nausea/vomiting (not responsive to promethazine or ondansetron)
  - 1.25 mg – 2.5 mg IV/IO/IM

Obtain ECG/12 Lead as soon as possible – monitor hemodynamic status and ECG

Contraindications & Precautions

- Parkinson's Disease
- Pregnancy
- Know EKG – QTc over 500ms
- **DO NOT administer with elderly dementia psychosis patients.**

Adverse Reactions

- **CNS**: slow/shallow breathing, drowsiness
- **CV:** low BP, heart arrhythmias (QT interval prolongation, Torsades)
- **GI:** constipation
- **Skin:** rash, itching, hives, swelling face, lips, tongue, or throat
- **Other**: blurred vision, uncontrolled body movements, muscle stiffness, spasms

Drug Interactions

- Drug-drug: administration with amiodarone, procainamide or sotalol increases chance of prolonged QT or abnormal heart rhythm.
- May be able to potentiate the effects of CNS depressants: i.e. opiates, alcohol and other sedation medications

Pregnancy Classification – Class C

EPINEPHRINE

GENERIC NAME – Adrenaline
CHEMICAL CLASS – Catecholamine
FUNCTIONAL CLASS – Bronchodilator, vasopressor, cardiac stimulant, local anesthetic

Pharmacokinetics
Absorption: well absorbed after SC or IM injection. Rapidly absorbed after inhalation administration.
Distribution: distributed widely throughout body.
Metabolism: metabolized at sympathetic nerve endings, liver, and other tissues to inactive metabolites.
Excretion: excreted in urine, mainly as its metabolites and conjugates.

Indications

- Allergic Reaction / Anaphylaxis
- Cardiac Arrest
- Reactive Airway Disease

Dosage

- **Adult**
  - Allergic Reaction / Anaphylaxis
    - 0.3 mg IM 1:1000
    - Extremis: 0.3mg IV (1:10,000)
  - Cardiac Arrest
    - 1 mg IV/IO (1:10,000) as soon as vascular access established
      - 10 min after initial Epi, initiate Epi infusion - 2mg Epi in 250 cc NS via IV pump
        - Asystole/PEA: 100 mcg/min or V-Fib/V-Tach: 50 mcg/min **(Max Total Dose: 3mg)**
  - Reactive Airway Disease – 0.3 mg SQ 1:1000 (Patient in Extremis with no contraindications)
  - Shock/Hypotension – 0.5 - 1 ml (5 – 10 mcg) Conc: 100,000 Push Dose
- **Pediatric**
  - Allergic Reactions/Anaphylaxis, Asthma
    - 0.2 cc (30 – 65 lbs.) 1:1000
    - 0.1cc (< 30 lbs.) 1:1000
  - Bradycardia
    - 0.01mg/kg IV/IO (may repeat every 3-5 minutes)
  - Cardiac Arrest
    - 0.01mg/kg (1:10,000) rapid IV/IO push every 3-5 minutes
    - 0.1mg/kg (1:1,000) ETT add 3-5 NS if no vascular access

Contraindications & Precautions

- Patients with angle-closure glaucoma, shock (other than anaphylactic shock), organic brain damage, cardiac dilation, arrhythmias, coronary insufficiency, or cerebral arteriosclerosis.
- MAOI's may potentiate the effect of epinephrine.
- May be deactivated by alkaline solution (sodium bicarbonate).

Adverse Reactions

- **CNS**: nervousness, tremors, euphoria, anxiety, coldness of extremities, vertigo, headache, drowsiness, cerebral hemorrhage, CVA, increased rigidity and tremors (in patients with Parkinson's disease).
- **CV**: palpitations, widened pulse pressure, hypertension, tachycardia, ventricular fibrillation, ECG changes
- **GI**: nausea, vomiting.
- **Respiratory**: dyspnea
- **Skin**: urticaria, pain, hemorrhage (at injection site)
- **Other**: pallor, hyperglycemia, glycosuria

Pregnancy Classification – C

ETOMIDATE

BRAND NAME – AMIDATE
FUNCTIONAL CLASS – anesthetic

Pharmacokinetics – non-barbiturate hypnotic that acts at the level of the
Metabolism: hepatic
Excretion: approximately 75% in the urine during the first day of administration (half-life – 75 minutes)
Chemical Effect:

Indications

- Delayed Sequence Intubation

Dosage

- Delayed Sequence Intubation
  - 0.3 mg/kg slow IV/IO (Max single dose: 30 mg)
    - May repeat once after 2 – 3 minute

Contraindications & Precautions

- Known hypersensitivity
- Adrenal insufficiency, septic shock
- Liver failure: consider lower dosing
- Renal failure: consider lower dosing

Adverse Reactions

- **CNS**: respiratory depression, apnea,
- **CV:** bradycardia, hypotension
- **GI:** N/V
- **Skin:** injection site reaction
- **Other**: adrenocortical insufficiency, myoclonia

Drug Interactions

- Drug-drug:
  - Acetaminophen; Aspirin; Diphenhydramine**:** (Minor) Because sedating H1-blockers cause sedation, an enhanced CNS depressant effect may occur when they are combined with general anesthetics
  - Droperidol**:** (Major) Central nervous system (CNS) depressants (e.g., general anesthetics) have additive or potentiating effects with droperidol. Following administration of droperidol, the dose of the other CNS depressant should be reduced.
  - Epinephrine**:** (Major) General anesthetics are known to increase cardiac irritability via myocardial sensitization to catecholamines. These anesthetics can produce ventricular arrhythmias and/or hypertension when used concomitantly with epinephrine.
  - Fentanyl**:** (Major) Concomitant use of fentanyl with a general anesthetic may cause respiratory depression, hypotension, profound sedation, and death.

Pregnancy Classification - C

FENTANYL

GENERIC NAME – Sublimaze
CHEMICAL CLASS – Synthetic phenylpiperidine
FUNCTIONAL CLASS – Opioid analgesic

Pharmacokinetics
Absorption: not applicable with IV use.
Distribution: distributes and accumulates to adipose tissue and skeletal muscle.
Metabolism: metabolized in liver.
Excretion: excreted in urine. *Half-life:* about 3 ½ hours after parenteral use, 5 to 15 hours after transmucosal use, 18 hours after transdermal use.

Indications

- Pain management in Adults and Pediatrics

Dosage

- **Adult**
  - 0.5 – 2 mcg/kg **slow** IV/IO (titrate to effect)
  - 1 mcg/kg Intramuscular (IM) or Intranasal (IN) – Max single IN/IM dose: 100mcg
  - May repeat in 5-10 minutes
- **Pediatric**
  - 0.5 – 1 mcg/kg **slow** IV/IO or IM/IN
    - May repeat in 5-10 minutes (titrate to effect)
    - Max dose: Single dose 50 mcgs (Total: 3 mcg/kg)

Contraindications & Precautions

- Contraindicated in patients with known intolerance of drug.
- Use with caution in elderly or debilitated patients, pregnant or breast-feeding women, and patients with head injury, increased CSF pressure, COPD, decreased respiratory reserve, potentially compromised respirations, hepatic or renal disease, or bradyarrhythmias.

Adverse Reactions

- **CNS**: sedation, somnolence, clouded sensorium, euphoria, dizziness, headache, confusion, asthenia, nervousness, hallucinations, anxiety, depression, seizures (with large doses).
- **CV**: hypotension, hypertension, arrhythmias, chest pain, bradycardia.
- **GI**: nausea, vomiting, constipation, ileus, abdominal pain, dry mouth.
- **GU**: urine retention.
- **Respiratory**: respiratory depression, hypoventilation, dyspnea, apnea.
- **Skin**: reaction at application site (erythema, papules, edema), pruritus, diaphoresis.
- **Other**: physical dependence.

Drug Interactions

- **Drug-drug:**
  - CNS depressants, general anesthetics, hypnotics, MAO inhibitors, other narcotic analgesics, sedatives, tricyclic antidepressant: additive effects. Use together with extreme caution. Fentanyl doses should be reduced by one-quarter to one-third. Also give above drugs in reduced dosages.
  - Diazepam: CV depression when given with high doses of fentanyl. Monitor patient closely.
  - Droperidol: hypotension and decreased pulmonary arterial pressure. Monitor patient closely.
- **Drug-lifestyle:**
  - Alcohol use: additive effects. Avoid concomitant use.

Pregnancy Classification – C

GLUCAGON

CHEMICAL CLASS – Pancreatic hormone
FUNCTIONAL CLASS – Antihypoglycemic

Pharmacokinetics
Absorption: unknown
Distribution: unknown
Metabolism: drug in degraded extensively by liver, in kidneys and plasma, and at its tissue receptor sites in plasma membranes
Excretion: excreted by kidneys. *Half-life:* 3 to 10 minutes

Indications

- Hypoglycemia
- Calcium Channel Blocker Overdose (symptomatic)
- Beta Blocker Overdose (symptomatic)

Dosage

- Hypoglycemia
  - Adult
    - 1 mg IM/IN (if unable to establish venous access)
  - Pedi
    - 0.5 mg IM (if unable to obtain venous access)
    - 1 mg IN (if unable to obtain venous access)
- Calcium Channel Blocker Overdose – 1mg IVP
- Beta Blocker Overdose – 1 mg IV/IM

Contraindications & Precautions

- Contraindicated in patients with pheochromocytoma or hypersensitivity to drug.
- Use cautiously in patients with history of insulinoma or pheochromocytoma.

Adverse Reactions

- **GI**: nausea, vomiting
- **Other**: hypersensitivity reactions (bronchospasm, rash, dizziness, lightheadedness)

Drug Interactions

- **Drug-drug:**
  - Oral anticoagulants: anticoagulant effect may be increased
  - Phenytoin: inhibited glucagon-induced insulin release

Pregnancy Classification - C

KETAMINE

GENERIC NAME – Ketalar
FUNCTIONAL CLASS – Dissociative anesthetic

Pharmacokinetics
Absorption: rapid
Excretion: urine (85%-95%) feces (3%)
Onset: 30 sec seconds IV, 3 – 4 minutes IM IV/IO, 3 – 4 minutes IM

Indications

- Pain management
- Airway management
- Combative Patients / Excited Delirium

Dosage

- Airway Management (PAI)
  - 2 mg/kg IV/IO (admin over 60 seconds and dilute with equal volume of 0.9% Saline)
  - 1 mg/kg IV/IO **(Maintenance dose)**
- Behavioral Emergency / Excited Delirium / Violent Patients
  - Adult
    - 2 mg/kg IV (admin over 60 seconds and dilute with equal volume of 0.9% Saline)
    - 2-3 mg/kg IM (approximate 3 – 5 minute onset of action)
      - Larger doses should be administered deep IM
    - **Max Dose: 300 mg**
- Reactive Airway Disease
  - 0.5 mg/kg IV/IO
- Pain Management
  - Adult
    - 25 mg (0.5cc) added to 50ml NS – Infuse over 5 – 10 minutes
      - ***Max single dose: 25 mg***
      - *May repeat dose x1*
    - 0.5 mg/kg Intranasal (IN) (may repeat x1 in 10 minutes)
      - ***Max Single Dose: 25 mg***
    - 1mg/kg IM
    - **Max Dose**
      - **Total cumulative dose: 100 mg**

NOTE: Ketamine should not be injected IV without proper dilution. It is recommended the drug be diluted with an equal volume of Sodium Chloride Injection, 0.9%

Contraindications & Precautions

- **The IV dose should be administered over a 60 second period**
- Severe or Uncontrolled Hypertension
- Heart Failure
- Known hypersensitivity
- Pregnancy

Adverse Reactions

- CNS: Hallucinations, Tonic-Clonic movement, Increased ICP
- Cardiovascular: Hypertension, Tachycardia, Increased cardiac output, paradoxical myocardial depression

Drug Interactions

- **Drug-drug:**

Pregnancy Classification - B

LEVABUTEROL

GENERIC NAME – Xopenex
FUNCTIONAL CLASS – Bronchodilator, adrenergic B2 agonist

Pharmacokinetics
Absorption: respiratory tract, GI tract
Metabolism: liver, GI tract
Excretion: urine, feces, half-life – 3-4 hours

Indications

- Reactive Airway Disease
- Pediatric Asthma

Dosage

- Adult
  - 1.25 mg via nebulizer
- Pedi
  - 0.625 mg via nebulizer (< 6 years of age)
  - 1.25 mg via nebulizer (> 6 y.o. & < 12 y.o.)

Contraindications & Precautions

- Hypersensitivity to sympathomimetics, tachydysrhythmias, severe cardiac disease
- Diabetes, hypertension, seizures

Adverse Reactions

- **CNS**: tremors, anxiety, insomnia, headache, dizziness, flushing
- **CV**: tachycardia, palpitations, hypertension, angina, hypotension
- **EENT**: dry nose, irritation of nose and throat
- **GI**: heartburn, nausea, vomiting
- **Metabolic**: hypokalemia, hyperglycemia
- **Skin**: rash

Drug Interactions

- **Drug-drug**
  - Increase: action of aerosol bronchodilators
  - Increase: levalbuterol action – tricyclics, MAOI's other adrenergics
  - Decrease: levalbuterol action – other beta blockers

Pregnancy Classification – C

LIDOCAINE HYDROCHLORIDE

GENERIC NAME – Xylocaine
CHEMICAL CLASS – Aminoacyl amide
FUNCTIONAL CLASS – Antiarrhythmic

Pharmacokinetics
Absorption: nearly complete after IM administration
Distribution: distributed widely, especially to adipose tissue
Metabolism: most of drug metabolized in liver to two active metabolites
Excretion: less than 10% excreted in urine unchanged. *Half-life:* ½ to 2 hours (may be prolonged in patients with heart failure or hepatic disease)

Indications

- Ventricular Fibrillation / Pulseless Ventricular Tachycardia
- Post Resuscitation
- Wide Complex Tachycardia (with a pulse)

Dosage

- **Adult**
  - Ventricular Fibrillation / Pulseless Ventricular Tachycardia
    - 1-1.5mg/kg IV/IO
    - may repeat after 5 minutes with 0.5-0.75mg/kg - for max dose of 3 doses or 3mg/kg
  - Ventricular Tachycardia (with a pulse)
    - 1-1.5mg/kg IV/IO
    - may repeat with 0.5-0.75mg/kg to a max dose of 3mg/kg
- **Pediatric**
  - Ventricular Fibrillation / Pulseless Ventricular Tachycardia
    - 1mg/kg IV/IO (may repeat after 5 minutes for max dose of 3 doses or 3mg/kg)
- **Conscious IO**
  - 20-50mg slow IO bolus (over 1 minute) prior to saline flush
- **Infusions**
  - Post Resuscitation & Wide Complex Tachycardia (with a pulse)
    - 100mg in 50cc NS at 2 – 4 mg/min via IV pump

Contraindications & Precautions

- **DO NOT** administer lidocaine if the patient has 2nd or 3rd degree heart block or HR <60 beats per minutes
- Contraindicated in patients with hypersensitivity to amide-type local anesthetics, Adams-Stokes syndrome, Wolff-Parkinson-White syndrome or severe degrees of SA, AV, or intraventricular block in absence of artificial pacemaker.
- In elderly patients, in those with heart failure or renal or hepatic disease, and in those weighing below 50 kg. Reduced dosage in these patients is required.
- Safety of drug has not been established in children and in breast-feeding women.

Adverse Reactions

- **CNS**: confusion, tremors, lethargy, somnolence, stupor, restlessness, slurred speech, euphoria, depression, light-headedness, paresthesia, muscle twitching, seizures, respiratory arrest
- **CV**: hypotension, bradycardia, new or worsened arrhythmias, cardiac arrest
- **EENT**: tinnitus, blurred or double vision
- **Other**: anaphylaxis, soreness at injection site, cold sensation, status asthmaticus, diaphoresis

Drug Interactions

- **Drug-drug:**
  - Beta blockers, cimetidine: decreased metabolism of lidocaine.
  - Phenytoin, procainamide, propranolol, quinidine: additive cardiac depressant effects.
  - Tocainide: concomitant use may cause an increased incidence of adverse reactions.

Pregnancy Classification - B

MAGNESIUM SULFATE

FUNCTIONAL CLASS – Anticonvulsant, electrolyte

Pharmacokinetics
Absorption: unknown after IM administration
Distribution: distributed widely throughout body
Metabolism: none
Excretion: excreted unchanged in urine

Indications

- Eclampsia
- Polymorphic V-Tach (Torsades)
- Reactive Airway Disease
- Pediatric Asthma

Dosage

- Cardiac Arrest: V-Fib/V-Tach
  - After 3rd Defibrillation: 2g IV/IO
  - Consider earlier admin if Torsades de Pointes suspected
- Eclampsia
  - 2 – 4 grams slow IVP no greater than 1gram/minute
    - Add 2-4 grams to 50cc administer via IV pump (600cc/hr)
- Polymorphic V-Tach (Torsades)
  - 1-gram slow IVP
- Reactive Airway Disease / Pediatric Asthma
  - 40mg/kg IV/IO in 50ml NS over 20 minutes via IV pump (Max dose: 2 grams)
  - **DO NOT administer Magnesium with audible stridor or symptoms of croup**

Contraindications & Precautions

- Parenteral administration contraindicated in patients with heart block or myocardial damage.
- Drug is not recommended for use in breast-feeding women.
- Use cautiously in patients with impaired kidney function and in women who are in labor.

Adverse Reactions

- **CNS**: drowsiness, depressed reflexes, flaccid paralysis, hypothermia
- **CV**: hypotension, flushing, circulatory collapse, depressed cardiac function, heart block
- **Other**: diaphoresis, respiratory paralysis, hypocalcemia

Drug Interactions

- **Drug-drug:**
  - *Anesthetics, CNS depressants: may cause additive CNS depression*
  - *Cardiac glycosides: concomitant use may exacerbate arrhythmias*
  - *Neuromuscular blockers: may increase neuromuscular blockade*

Pregnancy Classification – B

MIDAZOLAM

GENERIC NAME – Versed
CHEMICAL CLASS – Benzodiazepine
FUNCTIONAL CLASS – Sedative, hypnotic

Pharmacokinetics
Absorption: absorption after IM use appears to be 80% to 100%
Distribution: drug has large volume of distribution; about 97% protein-bound
Metabolism: metabolized in liver
Excretion: excreted in urine. *Half-life:* 2 to 6 hours.

Indications

- Procedural Sedation (Cardioversion, Crush Injuries, TCP)
- Seizures
- Patient Restraint

Dosage

- Seizures
  - Adult
    - 2.5 mg IV / IO
    - 5 mg IN
    - 10 mg IM (if unable to establish IV/IO)
    - May repeat every 5 minutes to Max dose of 20 mg
  - Pediatric
    - 0.2 mg/kg IV/IO/IM/IN (**Max single dose: 2mg IV/IO and 5 mg IM/IN)**
      - May repeat every 5 minutes for seizures to a max dose of 10 mg
- Behavioral Emergency
  - 1-3mg IV/IN or 5mg IM (Max dose 10 mg)
  - If Age >65, decrease dose to 0.5-1mg IV/IN or 2.5mg IM
- Procedural Sedation
  - 2 - 5mg IV/IN (if time permits)
- Overdose: Cocaine or Amphetamine
  - 2 - 5 mg IV/IO/IM/IN every 10 minutes until HR decreases below 100 BPM

Contraindications & Precautions

- Contraindicated in patients with acute angle-closure glaucoma, shock, coma, acute alcohol intoxication, or hypersensitivity to drug.
- Drug is not recommended for use in pregnant women.
- Use cautiously in patients with uncompensated acute illness, in elderly or debilitated patients, and in breast-feeding women.

Adverse Reactions

- **CNS**: headache, over sedation, involuntary movements, combativeness, amnesia
- **CV**: variations in blood pressure (hypotension) and pulse rate, cardiac arrest
- **GI**: nausea, vomiting, hiccups
- **Respiratory**: decreased respiratory rate, apnea
- **Skin**: pain, tenderness (at injection site)

Drug Interactions

- **Drug-drug:**
  - CNS depressants: may increase risk of apnea.
  - Indinavir, ritonavir: possible prolonged or severe sedation and respiratory depression.
  - Verapamil: effects of benzodiazepine may be increased.
- **Drug-lifestyle:**
  - *Alcohol use:* may increase risk of apnea.

Pregnancy Classification – D

NALOXONE

GENERIC NAME – Narcan
CHEMICAL CLASS – Thebaine derivative
FUNCTIONAL CLASS – Opioid antagonist

Pharmacokinetics
Absorption: unknown after IM or SC administration
Distribution: rapidly distributed into body tissues and fluids
Metabolism: rapidly metabolized in liver
Excretion: excreted in urine. *Half-life:* 60 to 90 minutes in adults, 3 hours in neonates.

Indications

- Overdose/Poisoning with respiratory depression
- Cardiac Arrest with suspected/known opioid overdose.

Dosage

- **Adult**
  - Opioid overdose with respiratory depression
    - AEMT / Paramedic
      - 0.5 mg IV/IO/IM for known narcotic overdoses with respiratory depression.
      - 1 – 2 mg IN (no more than 1cc per nostril)
    - EMT
      - 0.5 mg IN for known narcotic overdoses with respiratory depression.
  - Cardiac Arrest due to suspected or known opioid overdose.
    - 2 mg IV/IO/IN (IN route no more than 1cc per nostril)
- **Pedi**
  - Opioid overdose with respiratory depression
    - 0.1 mg/kg IV/IO/IM/IN

Contraindications & Precautions

- Contraindicated in patients with hypersensitivity to drug.
- Use cautiously in pregnant women and in patients with cardiac irritability and opioid addiction. Abrupt reversal of opioid-induced CNS depression may cause nausea, vomiting, diaphoresis, tachycardia, CNS excitement, and increased blood pressure.
- Safety of drug has not been established in breast-feeding women.
- **DO NOT** use in a patient that is intubated.

Adverse Reactions

- **CNS**: seizures
- **CV**: tachycardia, hypertension (with high doses); ventricular fibrillation
- **GI**: nausea, vomiting (with high doses)
- **Respiratory**: pulmonary edema
- **Other**: tremors, withdrawal symptoms (in narcotic-dependent patients with higher than recommended doses)

Drug Interactions

- **No significant interactions**

Pregnancy Classification – B

NITROGLYCERINE

GENERIC NAME – Nitrostat, Nitro-Bid, Nitro-Dur, Nitrolingual
CHEMICAL CLASS – Nitrate
FUNCTIONAL CLASS – Antianginal, coronary vasodilator

Pharmacokinetics
Absorption: well absorbed from GI tract. However, because it undergoes first-pass metabolism in liver, drug is incompletely absorbed into systemic circulation. SL form: absorption from oral mucosa is relatively complete; topical or transdermal form: well absorbed. Data not reported for other forms.
Distribution: distributed widely; about 60% of circulating drug is bound to plasma proteins.
Metabolism: metabolized in liver.
Excretion: metabolites excreted in urine. Half-life: about 1 to 4 minutes.

Indications
- Chest Pain / ACS
- Congestive Heart Failure (CHF)

Dosage
- Chest Pain / ACS **(maintain SBP > 100)**
  - 0.4 mg SL (may repeat every 5 minutes, maintain SBP > 100)
  - NTG Infusion – initiate at 5 – 10 mcg/min
    - titrate 5 mcg/min every 5 min to a max dose of 50 mcg/min
- Congestive Heart Failure **(maintain SBP > 100)**
  - 0.8 mg SL (may repeat every 3 – 5 minutes)
  - Push dose Nitroglycerin – **If SBP > 160**, 1mg (2cc) slow IV/IO push (May repeat x1 after 5 minutes)
    - Mix 1cc of 5mg/ml into 9cc normal saline (0.5 mg/ml)
  - NTG Infusion – initiate at 5 – 10 mcg/min
    - titrate 5 mcg/min every 5 min to a max dose of 50 mcg/min

Contraindications & Precautions
- Contraindicated in patients with hypersensitivity to nitrates and those in which a right sided MI has been identified, severe anemia, increased intracranial pressure, angle-closure glaucoma, postural hypotension, and allergy to adhesives (transdermal form).
- IV nitroglycerine is contraindicated in patients with cardiac tamponade, restrictive cardiomyopathy, constrictive pericarditis, or hypersensitivity to IV form.
- Use cautiously in patients with hypotension or volume depletion and in pregnant or breast-feeding women.
- Safety of drug has not been established in children.

Adverse Reactions
- **CNS**: headache, sometimes with throbbing; dizziness; weakness.
- **CV**: orthostatic hypotension, tachycardia, flushing, palpitations, fainting.
- **GI**: nausea, vomiting.
- **Skin**: cutaneous vasodilation, contact dermatitis (with patch), rash.
- **Other**: hypersensitivity reactions, sublingual burning.

Drug Interactions
- **Drug-drug:**
  - Antihypertensives: may enhance hypotensive effect.
  - Sildenafil citrate (Viagra): may produce irreversible hypotension.
- **Drug-lifestyle:**
  - Alcohol use: may increase hypotension.

Pregnancy Classification – C

NOREPINEPHRINE

TRADE NAME – Levophed
FUNCTIONAL CLASS – sympathomimetic, alpha/beta agonist

Pharmacokinetics: Norepinephrine acts predominantly on the alpha-adrenergic receptor to produce constriction of blood vessels, thereby increasing systemic blood pressure and coronary artery blood flow. Norepinephrine also acts on beta-1 receptors. In relatively lower doses, the cardiac-stimulant effect of norepinephrine is predominant; with larger doses, the vasoconstrictor effects dominate.

Indications

- **Hypotension**
  - **Non-hemorrhagic shock**
  - **Sepsis**
  - **Post Resuscitation**

Dosage

- **1 – 10 mcg/min infusion (titrate to a SBP ≥ 100 or MAP >65)**
  - To decrease the chances of extravasation, administration of norepinephrine should ideally be done via a larger bore IV catheter, 18g or greater.
  - During administration, monitor patient for any signs of IV infiltration and cardiac arrythmias. If either occur, stop infusion

Contraindications & Precautions

- **Known Allergy**
- **Hypotension due to blood volume deficits, DO NOT administer to patient who are severely volume depleted**

Adverse Reactions

- **CNS**: Transient HA, anxiety
- **CV**: bradycardia (reflex reaction of rise in BP), arrythmias, tachycardia
- **Respiratory:** respiratory difficulty
- **Other**: Extravasation necrosis at injection site, severe hypertension with photophobia, stabbing retrosternal pain

Drug Interactions

Pregnancy Classification - B

ONDANSETRON

GENERIC NAME – Zofran
CHEMICAL CLASS – 5-HT3-receptor antagonist
FUNCTIONAL CLASS – Antiemetic

Pharmacokinetics
Absorption: GI Tract
Metabolism: liver
Excretion: urine, half-life: 3.5 - 4.7 hours

Indications

- Nausea / Vomiting

Dosage

- **Adult**
  - 4 mg IV/IO (may repeat one after 5 minutes, if N/V persists
  - May be administered IM – If vascular access is not available
- **Pediatric**
  - 0.1 mg/kg slow IV/IO – repeat once after 10 minutes if N/V persists
  - Max Total dose: 4mg

Contraindications & Precautions

- **Caution with patients with history of prolonged QT or with medications known to cause prolonged QT segments. (i.e. Amiodarone, promethazine, diphenhydramine)**

Adverse Reactions

- **CNS**: headache, dizziness, drowsiness, fatigue
- **GI**: diarrhea, constipation, abdominal pain, dry mouth

Drug Interactions

- **Drug-drug:**
  - Decrease: rifampin

Pregnancy Classification – B

PROMETHAZINE

GENERIC NAME – Phenergan
PHARMACOLOGIC CLASS – Phenothiazine derivative
THERAPEUTIC CLASS – Antiemetic, antivertigo agent, antihistamine (H1-receptor antagonist), sedative

Pharmacokinetics
Absorption: well absorbed from GI tract after PO use; absorbed fairly rapidly after PR or IM use.
Distribution: distributed widely throughout body.
Metabolism: metabolized in liver.
Excretion: excreted in urine and feces.

Indications
- Nausea

Dosage
- 12.5 mg slow IVP (must be diluted with 5 – 10 cc of NS)
- 25 mg IM (deep, large muscle)

Contraindications & Precautions
- Contraindicated in patients with intestinal obstruction, prostatic hyperplasia, bladder-neck obstruction, seizure disorders, coma, CNS depression, stenosing peptic ulcerations, or hypersensitivity to drug; in newborns and premature neonates; in breast-feeding women; and in acutely ill or dehydrated children.
- Use cautiously in patients with pulmonary, hepatic or CV disease or asthma.
- Safety of drug has not been established in pregnant women.
- **Caution with patients with history of prolonged QT or with medications known to cause prolonged QT segments. (i.e. Amiodarone, Ondansetron, diphenhydramine)**

Adverse Reactions
- **CNS:** sedation, confusion, restlessness, tremors, drowsiness (especially elderly patients).
- **CV:** hypotension.
- **EENT:** transient myopia, nasal congestion.
- **GI:** anorexia, nausea, vomiting, constipation, dry mouth.
- **GU:** urine retention.
- **Hematologic:** leukopenia, agranulocytosis, thrombocytopenia.
- **Other:** photosensitivity.

Drug Interactions
- **Drug-drug:**
  - Anticholinergics, phenothiazines, tricyclic antidepressants: increased effects.
  - CNS depressants: increased sedation.
  - Epinephrine: promethazine may block or reverse effects of epinephrine.
  - Levodopa: promethazine may decrease levodopa's antiparkinsonian action.
  - Lithium: promethazine may reduce GI absorption or enhance renal elimination of lithium.
  - MAO inhibitors: increased extrapyramidal effects.
- **Drug-lifestyle:**
  - Alcohol use: increased sedation.
  - Sun exposure: possible photosensitivity reaction.

Pregnancy Classification – C

RACEMIC EPINEPHRINE

GENERIC NAME – racepinephrine
FUNCTIONAL CLASS – sympathomimetic

Pharmacokinetics
Metabolism: rapidly inactivated in the body mostly by the enzymes COMT (catechol-O-methyltransferase) and MAO (monoamine oxidase)
Excretion: majority of the dose of epinephrine is seen excreted in the urine
Chemical Effect: Onset usually < 5minutes with peak effect 5 – 15 minutes

Indications:

- Pedi:
  - Respiratory distress with signs/symptoms of croup (stridor / "barky cough")
  - Asthma refractory to albuterol or Xopenex treatments

Dosage

- Pedi: 0.5 ml (2.25% solution) diluted in 3 ml NS via nebulizer
  - May repeat every 10 minutes as needed with continued respiratory distress

Contraindications & Precautions

- Epiglottitis
- Excessive use may cause bronchospasm
- May have rebound effect after drug wears off
- Use racemic epinephrine with caution in patients with cardiovascular diseases.
- Monitor patients closely for signs of systemic toxicity, such as palpitations or chest pain.
- Be cautious when administering to patients with a history of sensitivity to sympathomimetic drugs.
- Avoid overuse of racemic epinephrine to prevent potential side effects.

Adverse Reactions

- **CNS**: headache, tremors, dizziness
- **CV:** increase heart rate, palpitations, HTN
- **GI:** nausea
- **Skin:** pallor
- **Other**: anxiety

Drug Interactions

- Drug-drug:
  - mild reactions: bendroflumethiazide, bumetanide, chlorothiazide, chlorthalidone, cyclopenthiazide, ethacrynic acid, eucalyptus, furosemide, hydrochlorothiazide, indapamide, methyclothiazide, metolazone, noni juice, sage, thiothixene, torsemide, vasopressin
  - severe reactions: arsenic trioxide, cisapride, disopyramide, ibutilide, indapamide, iobenguane I 123, pentamidine, pimozide, procainamide, quinidine, sotalol

Pregnancy Classification – Not assigned by FDA

ROCURONIUM

Trade NAME – Zemuron
PHARMACOLOGIC CLASS – Non-Depolarizing Neuromuscular Blocker
THERAPEUTIC CLASS – Skeletal Muscle Relaxant

Pharmacokinetics
Distribution: Plasma protein
Metabolism: Liver
Excretion: Primarily liver

Indications

- Delayed Sequence Intubation

Dosage

- 1 mg/kg (Max Single Dose: 100mg)
  - o May repeat as needed to maintain chemical paralysis

Contraindications & Precautions

- **Administration must be accompanied by adequate anesthesia or sedation**
- Rocuronium is contraindicated in patients known to have a hypersensitivity to it.
- Severe Obesity or Neuromuscular Disease: Patients with severe obesity or neuromuscular disease may pose airway and/or ventilatory problems requiring special care before, during and after the use of neuromuscular blocking agents.
- Malignant Hyperthermia: Many drugs used in anesthetic practice are suspected of being capable of triggering a potentially fatal hypermetabolism of skeletal muscle known as malignant hyperthermia.
- There are insufficient data derived from screening in susceptible animals (swine) to establish whether rocuronium can trigger malignant hyperthermia.
- C.N.S.: Rocuronium has no known effect on consciousness, the pain threshold or cerebration.

Adverse Reactions

- The most frequent adverse reaction to nondepolarizing blocking agents as a class consists of an extension of the drug's pharmacological action beyond the time period needed. This may vary from skeletal muscle weakness to profound and prolonged skeletal muscle paralysis resulting in respiration insufficiency or apnea.

- **CV**: hypotension, hypertension, tachycardia
- **Respiratory**: prolonged respiratory depression, apnea, bronchoconstriction.
- **Other**: allergic or hypersensitivity reactions (anaphylaxis)

Drug Interactions

- Certain medications may prolong the duration of neuromuscular blockade when used in conjunction with rocuronium, i.e. Vancomycin, phenytoin, Magnesium, succinylcholine.

Pregnancy Classification – C

- There are no adequate and well-controlled studies in pregnant women. ZEMURON should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus

SODIUM BICARBONATE

CHEMICAL CLASS – $NaHCO_3$
FUNCTIONAL CLASS – Alkalinizer

Pharmacokinetics
Absorption: well absorbed after PO administration.
Distribution: bicarbonate is confined to systemic circulation.
Metabolism: none.
Excretion: bicarbonate is filtered and reabsorbed by kidneys; less than 1% of filtered bicarbonate is excreted.

Indications
Cardiac Arrest
Overdose – Symptomatic Tricyclic
Crush Injuries
Pediatric Cardiac Arrest

Dosage
- Adult
  - 1 mEq/kg IV/IO
- Pedi
  - 1 mEq/kg IV/IO

Contraindications & Precautions
- Contraindicated in patients with metabolic or respiratory alkalosis; in patients who are losing chlorides by vomiting or from continuous GI suction; in those receiving diuretics known to produce hypochloremic alkalosis; and in those with hypocalcemia in which alkalosis may produce tetany, hypertension, seizures, or heart failure. Oral sodium bicarbonate is contraindicated in patients with acute ingestion of strong mineral acids.
- Use with extreme caution in patients with heart failure or other edematous or sodium-retaining conditions or renal insufficiency.
- Use cautiously in pregnant or breast-feeding women.

Adverse Reactions
- **GI**: gastric distention, belching, flatulence.
- **Other**: metabolic alkalosis, hypernatremia, hypokalemia, hyperosmolarity (with overdose); local pain and irritation (at injection site).

Drug Interactions
- **Drug-drug**
  - Anorexiants, flecainind, mecamylamine, quinidine, sympathomimetics: increased urine alkalinization causes increased renal clearance of these drugs and reduced effectiveness.
  - Chlorpropamide, lithium, methotrexate, salicylates, tetracycline: urine alkalinization causes decreased renal clearance of these drugs and increased risk of toxicity.
  - Enteric-coated drugs: may be released prematurely in stomach.
  - Ketoconazole*:* concurrent use may decrease absorption.

Pregnancy Classification – C

TERBUTALINE

GENERIC NAME – Brethine
CHEMICAL CLASS – Catecholamine
FUNCTIONAL CLASS – Selective B2 agonist, bronchodilator

Pharmacokinetics
Absorption: respiratory
Metabolism: sulfate conjugate
Excretion: urine, half-life – 3.4 hours

Indications

- Reactive Airway Disease

Dosage

- 1 – 2 mg diluted in 3 ml NS (Nebulizer)
- 0.25 mg SQ

Contraindications & Precautions

- Hypersensitivity to sympathomimetic, narrow angle glaucoma, tachydysrhythmias
- Cardiac disorders, hyperthyroidism, diabetes, hypertension

Adverse Reactions

- **CNS**: tremors, anxiety, insomnia, headache, dizziness
- **CV**: palpitations, tachycardia, hypertension, dysrhythmia
- **GI**: nausea, vomiting

Drug Interactions

- **Drug-drug**
  - Incompatible with bleomycin
  - Increase: effects of both drugs, sympathomimetic
  - Decrease: action – beta blockers

Pregnancy Classification – B

TRANEXAMIC ACID (TXA)

GENERIC NAME – Tranexamic Acid (TXA)
FUNCTIONAL CLASS – antifibrinolytic

Pharmacokinetics
Metabolism: Only a small fraction is metabolized
Excretion: Urine
Chemical Effect: Synthetic derivative of the amino acid lysine. Competitively inhibits the activation of plasminogen to plasmin, a molecule responsible for the degradation of fibrin, the protein that forms the framework for blood clots.

Indications

- **Hemorrhagic Shock (due to trauma)**
  - Blunt or penetrating trauma with known or suspected uncontrollable hemorrhage
    - Injury must have occurred within 3 hours of administration **AND** one of the following:
      - Systolic blood pressure < 70 mmHg or,
      - Systolic blood pressure , 90 mmHg and HR >110 bpm, or
      - ETCO2 < 25, or
      - Age > 65 with SBP < 100 AND HR > 100 bpm
- **Uncontrolled Epistaxis**
  - Aerosolize (gentle) 100 mg (1cc) via MAD into affected nostril
    - May repeat in 3-5 minutes x2 – Max total dose: 300 mg (per effected nostril)

Dosage

- 2 grams IV/IO slow push

Contraindications & Precautions

- **Do not administer other medications or blood products in the same IV/IO line while infusion in progress**
- Hemorrhagic shock not caused by trauma
- Isolated Head Injury
- Known pregnancy
- Patient <16 years of age

Adverse Reactions

- **CNS**: drowsiness, decreased alertness, HA
- **CV:** hypotension (rapid injection), chest pain,
- **GI:** ABD pain, nausea, vomiting, diarrhea, difficulty swallowing
- **Skin:** Paleness, rash
- **Other**: visual abnormalities pain / swelling in the extremities, back pain

Drug Interactions

- Drug-drug: factor ix, prothrombin complex concentrate, hormonal birth control

****Discontinue administration if patient experiences any signs of severe allergic reactions or changes in vision**.

Pregnancy Classification - B

IV PUMP MEDICATION REFERENCE

Adult			
Medication	Concentration	Dose	Bolus / Infusion Rate
Amiodarone	300mg/250ml	1mg/min (Maintenance)	150mg in 10 min (15mg/min)
Ceftriaxone	2grams/50cc (Total 70cc with med added)	2grams	70 mg/min. (~2.5cc/min)
Epinephrine Cardiac Arrest	2mg/250ml	VF/VT 50mcg/min	375 cc/hr
		Asys/PEA 100mcg/min	750 cc/hr
Lidocaine	100mg/50ml	2 - 4 mg/min	2mg = 60cc/hr 3mg/min = 90 cc/hr 4mg/min = 120 cc/hr
Magnesium Reactive Airway	2grams/50ml	40mg/kg (>50kg = 2grams)	200cc/hr (15 min.) 275cc/hr (10 min.)
Magnesium Eclampsia	2grams/50ml 4grams/50ml	2 - 4 grams	600 cc/hr Infusion Time: 5 min
Nitroglycerin	50mg/250ml	5-10 mcg/min Tirate 5mcg/min q 5 min. Max Dose 50 mcg/min	Varies with dose selected
Norepinephrine	4mg/250ml	1-10 mcg/min	Varies with dose selected

Pediatric			
Medication	Mixing	Dose	Bolus / Infusion Rate
Amiodarone	300mg/250ml	5mg/kg (20 - 60 min.)	Calculated by pump varies with pt. weight
Magnesium Reactive Airway	2grams/50ml	40mg/kg	Calculated by pump varies with pt. weight

PREGNANCY CLASSIFICATION

Drugs have been categorized by the FDA according to the level of risk to the fetus. Many of the medications included in this site refer to the Pregnancy Category. The following are descriptions of each category

Category A- controlled studies in women fail to demonstrate a risk to the fetus in the first trimester and there is no evidence of risk on later trimesters; the possibility of fetal harm appears to be remote

Category B- either (1) animal reproductive study has not demonstrated a fetal risk but there are no controlled studies in women, or (2) studies in women and animals are not available. Drugs in this category should be given only if the potential benefit justifies the risk of the fetus.

Category C- either (1) studies in animals have revealed adverse effects on the fetus and there are no controlled studies in women, or (2) studies in women and animals are not available. Drug in this category should be given only if the potential benefit justifies the risk to the fetus.

Category D- there is positive evidence of human fetal risk, but the benefits for pregnant women may be acceptable despite the risk, as in life-threatening diseases for which safer drugs cannot be used or are ineffective. An appropriate statement must appear in the “Warnings” section of the label of drugs in this category

Category X- studies in animals or humans have demonstrated fetal abnormalities, there is evidence of fetal risk based on human experience or both; the risk of using the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are pregnant or may become pregnant. An appropriate statement must appear in the “Contraindications” section of the labeling of drugs in this category.