



Standing Orders & Emergency Medical Guidelines

Guidelines Valid from March 1, 2023 to March 31, 2025



Brooke Radley Dorotik, MD, Medical Director

2/9/23

Date

Table of Contents

General Guidelines

Preface	pg. 06
GP01 Standard of Care	pg. 07
GP02 Protocol Research & Development	pg. 08
GP03 Standing Orders	pg. 09
GP04 Medical Control Authorization Levels	pg. 10
GP05 Minimum Equipment List	pg. 14
GP06 Drug Formulary / Minimum Medication List	pg. 17

Adult Medical

AM01 Adult Universal Guidelines	pg. 20
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Cardiac Arrest

AM02 Adult CPR Guideline	pg. 21
AM03 Asystole/PEA	pg. 22
AM04 Cardiac Arrest Due to Hypothermia	pg. 23
AM05 Post-Resuscitation Management	pg. 24
AM06 Ventricular Fibrillation/Pulseless Ventricular Tachycardia	pg. 25

Cardiac Dysrhythmia

AM07 Acute Coronary Syndrome	pg. 26
AM08 AICD/Pacemaker Malfunction	pg. 27
AM09 Bradycardia	pg. 28
AM10 Cardiogenic Shock	pg. 29
AM11 Narrow Complex Tachycardia	pg. 30
AM12 Ventricular Ectopy	pg. 31
AM13 Wide Complex Tachycardia	pg. 32

Respiratory

AM14 Adult Difficult/Obstructed Airway	pg. 33
AM15 Adult Failed Airway	pg. 34
AM16 Bronchospasm	pg. 35
AM17 Pulmonary Edema	pg. 36

Medical

AM18 Abdominal Pain	pg. 37
AM19 Allergic Reaction/Anaphylaxis/Angioedema	pg. 38
AM20 Altered Mental Status of Unknown Etiology	pg. 39
AM21 Cyanide Poisoning/Smoke Inhalation	pg. 40
AM22 Emotional/Mental Distress	pg. 41
AM23 Environmental Emergency – Hyperthermia	pg. 42
AM24 Environmental Emergency – Hypothermia	pg. 43
AM25 Excited Delirium	pg. 44
AM26 Flank Pain/Renal Colic	pg. 45
AM27 Gastro-Intestinal Hemorrhage	pg. 46
AM28 Hypertensive Crisis	pg. 47
AM29 Hypoglycemia/Hyperglycemia	pg. 48
AM30 Nausea/Vomiting	pg. 49
AM31 Non-Fatal Drowning	pg. 50
AM32 Sedation	pg. 51
AM33 Seizure	pg. 52
AM34 Sepsis	pg. 53
AM35 Stroke/CVA/TIA	pg. 54
AM36 Toxic Exposure/Poisoning	pg. 55

Table of Contents

Adult Trauma

AT01 Amputation/Hemorrhage	pg. 57
AT02 Burn	pg. 58
AT03 Envenomation	pg. 59
AT04 Eye Injury	pg. 60
AT05 Head Injury	pg. 61
AT06 Multi-System Trauma	pg. 62
AT07 Musculoskeletal/Soft Tissue Injury	pg. 63
AT08 Spinal/Neurogenic Shock	pg. 64
AT09 Traumatic Arrest	pg. 65

OB/GYN

OB01 Management of Uncomplicated Delivery	pg. 67
OB02 Management of Obstetric Complications	
Pre-Eclampsia/Eclampsia	pg. 68
Prolapsed Cord	pg. 69
Limb Presentation	pg. 69
Breech (Buttocks) Presentation	pg. 70
Shoulder Dystocia	pg. 70
Uterine Inversion	pg. 71
OB03 Management of Vaginal Hemorrhage	pg. 72
OB04 Neonatal Resuscitation	pg. 73

Pediatric Medical

PM01 Pediatric Universal Guideline	pg. 75
PM02 Pediatric Systematic Approach Algorithm	pg. 76
PM03 Pediatric CPR Guideline	pg. 77

Cardiac Arrest

PM04 Asystole/PEA	pg. 78
PM05 Cardiac Arrest Due to Hypothermia	pg. 79
PM06 Post-Resuscitation Management	pg. 80
PM07 Ventricular Fibrillation/Pulseless Ventricular Tachycardia	pg. 81

Cardiac Dysrhythmia

PM08 Bradycardia	pg. 82
PM09 Narrow Complex Tachycardia	pg. 83
PM10 Wide Complex Tachycardia	pg. 84

Respiratory

PM11 Bronchiolitis	pg. 85
PM12 Bronchospasm	pg. 86
PM13 Croup/Epiglottitis	pg. 87
PM14 Pediatric Difficult/Obstructed Airway	pg. 88
PM15 Pediatric Failed Airway	pg. 89

Table of Contents

Pediatric Medical (continued)

PM16 Abdominal Pain	pg. 90
PM17 Allergic Reaction/Anaphylaxis/Angioedema	pg. 91
PM18 Altered Mental Status of Unknown Etiology	pg. 92
PM19 Cyanide Poisoning/Smoke Inhalation	pg. 93
PM20 Emotional/Mental Distress	pg. 94
PM21 Environmental Emergency – Hyperthermia	pg. 95
PM22 Environmental Emergency – Hypothermia	pg. 96
PM23 Hypoglycemia/Hyperglycemia	pg. 97
PM24 Nausea/Vomiting	pg. 98
PM25 Non-Fatal Drowning	pg. 99
PM26 Sedation	pg. 100
PM27 Seizure	pg. 101
PM28 Shock & Sepsis	pg. 102
PM29 Stroke/CVA/TIA	pg. 104
PM30 Toxic Exposure/Poisoning	pg. 105

Pediatric Trauma

PT01 Amputation/Hemorrhage	pg. 107
PT02 Burn	pg. 108
PT03 Envenomation	pg. 109
PT04 Eye Injury	pg. 110
PT05 Head Injury	pg. 111
PT06 Multi-System Trauma	pg. 112
PT07 Musculoskeletal/Soft Tissue Injury	pg. 113
PT08 Spinal/Neurogenic Shock	pg. 114
PT09 Traumatic Arrest	pg. 115

Clinical Policies

CP01 Air Transport	pg. 117
CP02 Child Abuse Recognition and Reporting	pg. 118
CP03 Consent for Treatment/Transport/Refusal	pg. 119
CP04 Crime Scene Management	pg. 122
CP05 Criteria for Death/Withholding Resuscitation	pg. 123
CP06 Definition of a Patient	pg. 124
CP07 Destination Determination	pg. 125
CP08 Domestic Violence and Elder Abuse Recognition and Reporting	pg. 130
CP09 EMS Screening	pg. 131
CP10 Fire Stand-By Events	pg. 132
CP11 Hospital Diversion	pg. 133
CP12 Infant Abandonment	pg. 134
CP13 Interfacility Transports	pg. 135
CP14 Out of Hospital Do Not Resuscitate (OOH-DNR)	pg. 137
CP15 Patients with Special Healthcare Needs	pg. 139
CP16 Poison Control Center	pg. 140
CP17 Rapid Transport	pg. 141
CP18 Triage	pg. 142

Procedures

PR01 Central Line Access	pg. 144
PR02 Chest Seal	pg. 145
PR03 Code Stroke	pg. 146
PR04 Combat Application Tourniquet	pg. 147
PR05 CPAP/BiPAP (Non-Invasive)	pg. 148

Table of Contents

Procedures (continued)

PR06 Delayed Sequence Intubation – Adult	pg. 151
PR07 Delayed Sequence Intubation – Pediatric	pg. 154
PR08 Diagnostic Tools and Procedures	pg. 157
PR09 ECG Monitoring	pg. 160
PR10 Endotracheal Introducer (Bougie)	pg. 161
PR11 Endotracheal Tube Suctioning	pg. 162
PR12 External Jugular IV	pg. 163
PR13 Extraglottic Device	pg. 164
PR14 EZ IO	pg. 166
PR15 Finger Thoracostomy	pg. 169
PR16 Firefighter Assessment	pg. 170
PR17 Intranasal Medication	pg. 171
PR18 Intravenous Access	pg. 172
PR19 Intravenous Infusion Pump	pg. 173
PR20 Law Enforcement Blood Draw	pg. 174
PR21 Left Ventricular Assist Device	pg. 175
PR22 LUCAS Chest Compression System	pg. 177
PR23 Nasogastric Tube Insertion	pg. 178
PR24 Nebulized Medication	pg. 179
PR25 Needle Chest Decompression	pg. 180
PR26 Needle Cricothyrotomy	pg. 181
PR27 Orotracheal Intubation	pg. 182
PR28 Pain Management	pg. 184
PR29 Pediatric Emergency Tape: Broselow or Handtevy	pg. 185
PR30 Physical Restraints	pg. 186
PR31 Push Dose Vasopressors	pg. 187
PR32 QuickClot Gauze	pg. 188
PR33 Spinal Motion Restriction	pg. 189
PR34 STEMI Alert	pg. 191
PR35 Surgical Airway	pg. 192
PR36 Termination of Resuscitation	pg. 193
PR37 Tissue Referral	pg. 194
PR38 Transcutaneous Pacing	pg. 195
PR39 Tru-Cuff	pg. 196
PR40 Ventilator	pg. 197
PR41 Video Laryngoscopy	pg. 198

References

Drug Reference	pg. 200
RF01 Anatomical Reference	pg. 241
RF02 Approved Abbreviation List	pg. 246
RF03 Cincinnati Prehospital Stroke Scale (CPSS)	pg. 252
RF04 ECG Placement	pg. 253
RF05 Glasgow Coma Scale (GCS)	pg. 254
RF06 Pediatric Vital Signs	pg. 255
RF07 Adult/Pediatric Vasopressor Drip Calculations	pg. 256
RF08 Rapid Arterial Occlusion Evaluation Score (RACE)	pg. 258

Addendums

Addendums	pg. 260
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Preface

It is the requirement of all providers to be familiar with these guidelines and all skills associated with them. While referencing these guidelines is an acceptable practice during an emergency, it does not remove the above requirement for each provider to have a thorough knowledge of the prehospital emergency medicine they are expected to deliver to the patient.

All providers are to be knowledgeable with all drugs specified herein, including but not limited to indication, contraindication, anticipated effect, possible side effects, and dosage. Medications not included in these guidelines that are necessary for continuation of patient care require a Medical Consult if the provider is not familiar with the medication's indication, contraindication, anticipated effect, possible side effects, and dosage. If questions arise, about any medication being administered prior to assuming patient care, it is expected that the provider will educate themselves about the medication and ensure that the proper concentration and dosage is being administered before accepting the patient.

All providers may practice only to their credentialed level.

All providers performing patient care shall comply with department infection control policy, utilizing personal protective equipment for every patient in your care. Personal protective equipment shall include gloves for all patient encounters, but may also include the following, if indicated:

- Protective eye wear
- Respiratory protection
- Face shield
- Gown
- Helmet and work gloves
- Other protective equipment

Geographical Area

These guidelines are in effect within the service area covered by El Campo EMS, any area covered by mutual-aid agreements or understandings, event venues during an El Campo EMS event, during transport out of the El Campo EMS service area, when on transfers, and by Medical Director approved El Campo EMS employees acting in conjunction with law enforcement special response teams. Personnel operating on behalf of El Campo EMS will utilize these guidelines anytime contact is made with a patient.

Duty Status

El Campo EMS employees shall utilize these guidelines only when acting in their official capacity representing El Campo EMS.

Non-EMS certified or licensed medical personnel not associated with El Campo EMS

Non-EMS certified or licensed medical personnel may not operate under these guidelines without the authorization of the Medical Director, unless otherwise noted in these guidelines.

Standard of Care

Clinical competence and high standards are vital to provide quality prehospital emergency medical care to our patients. The following Standard of Care statement and treatment guidelines represent a guideline for the minimum level of patient care that is to be provided.

The Medical Director embraces the following concepts as fundamental components of Standard of Care:

The emergent patient benefits from early medical interventions, especially the early and aggressive establishment and maintenance of an airway, early administration of high-concentration oxygen, early appropriate spinal motion restriction, early initiation of definitive therapies, and rapid transfer to an institution of appropriate higher level of care. Appropriate oxygen therapy should never be withheld while initial patient evaluation takes place.

The provider's role is to provide the best care for all patients. To successfully do so requires that you educate yourself beyond your initial certification education and dedicate yourself to becoming an integral part of the total health care team. Healthcare providers will maintain mandatory continuing education as outlined throughout the course of the year. It is expected that you represent the leading edge of healthcare and strive to be the best Emergency Medical Services provider possible.

The patient determines the emergency. As providers you are often called upon to assist with social or psychological problems, and you must respond professionally and perform a thorough evaluation, as you would with all other patients. A thorough patient assessment should be performed and documented on all patients.

Patient care is by nature unpredictable. These guidelines are intended to be used to direct a provider's treatment regimen. It is impossible to create guidelines for every situation that may arise. Patients may require care derived from multiple guidelines or guidelines not yet devised, or providers may be required to provide care with the inability to contact Medical Control. The following guidelines are written with this reality in mind. The provider must use his/her best judgment, along with his/her knowledge, clinical manuals, references, and the use of Medical Control to ensure the best medical care be provided without further complicating the injury or illness. As is stated, the basis of medical care is: "Do no harm." Any deviation from these guidelines should be well documented, should be intended to further patient care, and attempts to inform Medical Control must be made prior to such deviations. The provider has no permission to perform any treatments or intervention in which s/he has not been trained to perform nor any therapies that would be considered outside the scope of the guidelines and/or the standard of prehospital emergency medical care.

Protocol Research & Development

The following resources were utilized to develop protocols and clinical guidelines that follow the most current standard of prehospital emergency medical care.

- National Association of Emergency Medical Services Physicians
 - Position Papers
- American Heart Association
 - Advanced Cardiac Life Support
 - Provider Manual
 - Guidelines (current to 2020) for CPR and ECC
 - AHA Position Papers
 - Pediatric Advanced Life Support
 - Provider Manual
 - Guidelines (current to 2020) for CPR and ECC
 - AHA Position Papers
- National Association of Emergency Medical Technicians
 - Prehospital Trauma Life Support Course
 - Provider Manual 9th Edition
 - Advanced Medical Life Support Course
 - Provider Manual 3rd Edition
 - Geriatric Emergency Medical Services Course
 - Provider Manual 2nd Edition
 - Emergency Pediatric Care Course
 - Provider Manual 4th Edition
 - Tactical Emergency Casualty Care Course
 - Provider Manual 2nd Edition
- American Burn Association
 - Advanced Burn Life Support Course
 - Provider Manual
- Paramedic Protocol Texts
 - Harris County Emergency Corps
 - Montgomery County Hospital District EMS
 - Harris County ESD 48 EMS
 - Harris County ESD 11 EMS
 - San Antonio Fire Department EMS
 - Williamson County
- Difficult Airway Course
 - Provider Manual
- Committee for Tactical Emergency Casualty Care
 - Guidelines (current 03/2019)
- American Academy of Pediatrics
 - Neonatal Resuscitation Program
 - Provider Manual 8th Edition
- Independent Literature Review

The attached protocols are written following current guidelines in emergency medical care. They are accurate to the best of this service's (El Campo EMS Command Staff) knowledge and research. They were reviewed by members of El Campo EMS for accuracy and approved. The committee consisted of El Campo EMS Command Staff and its Medical Director.

Standing Orders

The following guidelines are considered protocols by law, as they are written instructions providing prehospital personnel with a standardized approach to commonly encountered problems in the out-of-hospital setting, typically regarding patient care. These protocols include standing delegation orders to be implemented prior to, or in lieu of, establishing communication with direct Medical Control. Standing delegation orders are those therapies, interventions, and procedures which may be performed without or prior to any communication with direct Medical Control.

Standing delegation orders represent off-line Medical Control. They are superseded by any orders received by on-line Medical Control. The only physicians to dictate orders are the Medical Director or their designee, unless as noted below:

- If transporting to a hospital, orders may be received from the receiving physician. If the receiving physician is not available or the patient is not going to be transported, order may be obtained from the physician on duty at the El Campo Memorial Hospital Emergency Department.
- On hospital-to-hospital transfers, orders may be obtained from the sending or receiving physician.
- If the patient's personal physician is present and assumes responsibility for the patient's care, you should defer to the orders of said physician unless those orders conflict with these guidelines. The personal physician must continue to provide direct patient care and accompany the patient to the hospital.
- Should a physician licensed by the Texas Medical Board, who, without having established a prior physician/patient relationship with the emergency patient, express his or her willingness to assume responsibility for care of the patient, they may. The intervening physician must provide proof of a current medical license. They are to accompany the patient to the hospital should the intervener physician request patient transport.

In the event of communication failure, treatment is authorized on the standing delegation order to include those therapies, interventions, and procedures only within these guidelines.

Medical Control Authorization Levels

The following are patient care activities that are authorized to be performed by providers using these guidelines. The Medical Director determines who practices using these guidelines and their credentialing level. The Medical Director also has the authority to delegate beyond the guidelines, if needed.

First Responder Organization (FRO) providers within the operational boundaries of El Campo EMS, **not** credentialed under the following guidelines, are covered under their respective guidelines provided by their Medical Director. Upon arrival of an El Campo EMS unit, the El Campo EMS provider will assume patient care. FRO providers may provide assistance to the El Campo EMS provider per their respective guidelines.

The El Campo EMS attending provider dispatched to a scene by communications is responsible for the patients' assessment, care, mode of transport, destination determination, and medical scene control when encountering a scene in which other medical personnel are present (co-workers or medical care providers from other services and/or facilities).

The only persons who may dictate or give orders for a patient's care counteracting the attending provider's judgement/decision are the Medical Director or Medical Control. A higher credential provider or command staff may also supersede the attending provider but must subsequently assume the attending provider role and transport the patient if a disagreement in care plan continues to exist.

This guideline only pertains to patient care issues and mode of transport; it does not apply to operational issues.

Medical Control Authorization Legend

INDEPENDENT Independent performance of skill or care.	ASSIST May assist a higher-level credential provider in performance of skill.
MEDICAL CONTROL May only perform after contact with Medical Control.	SPECIAL CONSIDERATIONS As outlined in specific skill.

Medical Control Authorization Levels

INDEPENDENT	ASSIST	MEDICAL CONTROL	SPECIAL CONDITIONS
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EMT-B			
GENERAL THERAPIES			
AED + CPR			
Lucas Placement			
Bleeding Control + Tourniquet			
V/S + BGL + Temp			
AIRWAY/OXYGEN			
Oral Suctioning			
Basic Airway Adjuncts			
EGD			
Oxygen – NC, NRB, BVM			
Ventilator Use – CPAP/BiPAP only			
EtCO2 Sidestream			
EtCO2 ETT			
CARDIAC MONITOR			
ECG 3 + 12 Lead Placement			
VENOUS ACCESS			
IV (see Intravenous Access guideline)			
NS lock without fluids (on interfacility transfers ONLY)			
MEDICATIONS			
Epinephrine IM			
Nebulized Medications (guideline specific)			
NTG SL			
ASA			
Oral Glucose			
Naloxone			
Pepcid Complete			
CARE/PROCEDURES			
Bandaging + Splinting			
Spinal Precautions			
Spinal Motion Restriction			
Chest Seal			

** The terms EMT-B and EMT may be used interchangeably but are in reference to the same level of provider.

Medical Control Authorization Levels

INDEPENDENT	ASSIST	MEDICAL CONTROL	SPECIAL CONDITIONS
AEMT			
GENERAL THERAPIES AED + CPR Lucas Placement Bleeding Control + Tourniquet V/S + BGL + Temp			
AIRWAY/OXYGEN Oral & Tracheal Suctioning Basic Airway Adjuncts EGD Oxygen – NC, NRB, BVM EtCO2 side stream + ETT Orotracheal Intubation Ventilator Use Video Laryngoscope Chest Decompression			
CARDIAC MONITOR ECG 3 + 12 Lead Placement Transmission of 12-lead EKG			
VENOUS ACCESS/MED ROUTE IV, IM, IN, IO, EJ Blood draw			
MEDICATIONS Acetaminophen Epinephrine IM Epinephrine IV/IO (guideline specific) Methylprednisolone Nebulized Medications (guideline specific) NTG SL ASA Oral Glucose Dextrose Diphenhydramine Lidocaine IO (in EZ-IO Procedure (PR11 - ONLY)) Naloxone NS/LR Pepcid Complete TXA (guideline specific) IV fluids including IV maintenance fluids with or without KCl (on interfacility transfers ONLY)			
CARE/PROCEDURES Bandaging + Splinting Spinal Precautions Spinal Motion Restriction Chest Seal			

** The terms EMT-I and AEMT may be used interchangeably but are in reference to the same level of provider.

Medical Control Authorization Levels

INDEPENDENT	ASSIST	MEDICAL CONTROL	SPECIAL CONDITIONS
EMT-P/LP			
GENERAL THERAPIES AED + CPR Lucas Placement Bleeding Control + Tourniquet V/S + BGL + Temp Chest Decompression			
AIRWAY/OXYGEN Oral and Tracheal Suctioning Basic Airway Adjuncts EGD Oxygen – NC, NRB, BVM EtCO2 side stream + ETT Orotracheal Intubation DSI Surgical Airway Ventilator Use NG/OG Placement Finger Thoracostomy			
CARDIAC MONITOR ECG 3 + 12 Lead Placement & Interpretation Defibrillation + Synchronized Cardioversion + Transcutaneous Pacing			
VENOUS ACCESS/MED ROUTE IV, IM, IN, IO, EJ Central Line Access Blood draw			
MEDICATIONS All medications (guideline specific) Blood products (on interfacility transfers ONLY) Medication infusions not listed in guidelines but ordered by MD (on interfacility transfers ONLY)			
CARE/PROCEDURES Bandaging + Splinting Spinal Precautions Spinal Motion Restriction Chest Seal Termination of Resuscitation			

** The terms EMT-P/LP and Paramedic may be used interchangeably but are in reference to the same level of provider.

Minimum Equipment List

This equipment is normally carried in each unit. Replacements are available in our supply room and/or through our local hospital (El Campo Memorial Hospital). These are only the minimum amounts allowed. More is normally carried on each unit.

	Airway
1 set	Oropharyngeal airways (pedi thru adult)
1	Portable suction
1	Vehicle mounted suction
1 each	Bag valve mask, oxygen capable (adult, child, infant)
2	Portable oxygen containers, "D" size or larger
1	Portable oxygen regulator
2	Piped in oxygen (minimum "H" cylinder) w/ regulator
3 each	Oxygen delivery devices (nasal cannula and non-rebreather)
2	Nebulizer kit with face mask
1 each	Oxygen delivery devices (child non-rebreather and infant simple face mask)
1 each	Stylet (adult , infant)
1 each	Laryngoscope handles (large, small)
1 each	Laryngoscope blades (Mac #1, 2, 3, 4 and Miller #1)
2 each	ET tubes (2.5 thru 8.5)
1 each	Magil forceps (adult, infant)
	Assessment
1 set	Set of BP cuffs with stethoscope (cuff sizes: large adult, adult, child, and infant)
1	Cardiac monitor/defibrillator w/ AED capabilities & accessories required to carry out protocols (Zoll X Series)
1	Zoll X Series battery (1 primary)
1	Zoll X Series spare battery or alternate power source (AC adapter)
1	Glucometer w/ strips
	IV
2	Saline locks
2 each	IV catheters (16, 18, 20, 22, 24)
3 each	Basic administration sets (10 & 60 gtts solution sets)
3 each	Syringes with needles (1 mL, 5 mL, 10 mL)
	OB
1	Sealed OB kit with a non-porous infant insulator
	Personal Protection
10 pr/ea	Protective non-porous gloves (XL, L, M, & S) - latex free when possible
2	Medical eye protection for EMS personnel
2	Medical respiratory protection
2	Medical protection gowns

Continued on next page

Minimum Equipment List

	Trauma
3	Multi-trauma dressings
40	Sterile gauze pads
4	Occlusive dressings
10	Soft roller adhering bandages
4	Rolls of adhesive tape
6	Triangle bandages
3	Sterile burn sheets
2	Long back boards / CombiCarriers
1	Short spinal immobilization device
3 each	Extrication collars (adult and child)
1	Assortment of extremity splints (sufficient sizes for all extremities)
1	Adjustable traction splint
	Miscellaneous
2	Sharps containers (1 in unit and 1 portable)
1	Hand disinfectant/cleanser
3	Biohazard bags
1	Fire extinguisher (location obvious via labeling)
2	NO SMOKING signs in the cab and patient compartment
1	Emergency Response Guidebook (most current edition; electronic or hard copy)
3	Emergency warning triangles
2	Bandage shears
1	Pen light
1	Protocol book
1	Operating lights and sirens
1	Air conditioner/heater
1	Flashlight
1	Two-way radio
1	Name of service on both sides of the vehicle
2	Spare C batteries for critical patient equipment
2	Spare AA batteries for critical patient equipment
25	Triage Tags
1	Multi-level stretcher with 2 clean sheets and a blanket

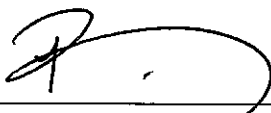
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Minimum Equipment List

The chart below serves as a list of equipment, and its serial numbers, which may be present on an El Campo EMS ambulance.

Zoll X Series Monitor/Defibrillator	Stryker Stretcher	Ferno Stretcher
AR19F041757	130140991	L-792339
AR19H042577	111139688	
AR19H042643	111139689	
AR19H042663	100840733	
AR19H042667	170339299	
AR19H042669		

Minimum Equipment List valid from March 01, 2023 to March 31, 2025



Brooke Radley Dorotik, MD, Medical Director

2/9/23

Date

Drug Formulary / Minimum Medication List

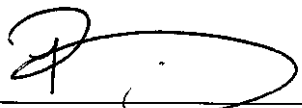
The attached minimum medication list must be stocked in our ambulances, unless due to the following exceptions:

- Medications on minimum stock list may be supplied in concentrations or quantities other than those indicated. Regardless of the way medications are supplied, equivalent total amounts must be present. It is the paramedic's responsibility to be certain that correct dosages are administered to patients.
- Unless specified otherwise, generics and brand name products are considered interchangeable.
- Higher quantities of medication may be stocked.
- New medication may be added because of a change in the standard of care, addition of new protocols, revision of protocols, or during patient transfers.
- Medications may be removed totally from the ambulance because of changes in patient care, revision of protocols, or if they become unavailable from suppliers.

Drug Formulary / Minimum Medication List

1000 mg	Acetaminophen IV (Ofirmev)
24 mg	Adenosine (Adenocard)
7.5 mg	Albuterol Sulfate (Proventil)
450 mg	Amiodarone (Cordarone)
3 capsules	Ammonia Inhalant
1 bottle (min 486 mg)	Aspirin
4 mg	Atropine Sulfate
1 g	Calcium Chloride
1 bottle (min 600 mg)	Clopidogrel (Plavix)
25 g	Dextrose (D10 or D50 based on availability and current stocking)
25 mg	Diltiazem (Cardizem)
50 mg	Diphenhydramine (Benadryl)
5 mg	Epinephrine (Adrenalin) 1:1000
2 mg	Epinephrine (Adrenalin) 1:10,000
100 mg	Esmolol (Brevibloc)
40 mg	Etomidate (Amidate)
500 mcg	Fentanyl (Sublimaze)
2 tubes	Glucose Paste/Gel (Oral Glucose)
5000 u	Heparin
1 mg	Ipratropium Bromide (Atrovent)
1000 mg	Ketamine
2000 mL	Lactated Ringers
300 mg	Lidocaine
4 mg	Lorazepam (Ativan)
5 g	Magnesium Sulfate
125 mg	Methylprednisolone (Solu-Medrol)
10 mg	Midazolam (Versed)
2 mg	Naloxone (Narcan)
25 mg	Nicardipine (Cardene)
1 bottle (min 2.4 mg)	Nitroglycerin Tabs
5 mg	Nitroglycerin IV
4 mg	Norepinephrine (Levophed)
8 mg	Ondasetron (Zofran)
1 main tank (min 500 psi)	Oxygen (Main)
2 portable tanks (min 500 psi)	Oxygen (Portable)
1 bottle (min 2 tablets)	Pepcid Complete
100 mg	Rocuronium
100 mEq	Sodium Bicarbonate
500 mL	Sodium Chloride
2 g	Tranexamic Acid (TXA)

Minimum Medication List valid from March 01, 2023 to March 31, 2025



Brooke Radley Dorotik, MD, Medical Director

2/9/23

Date



Adult Medical

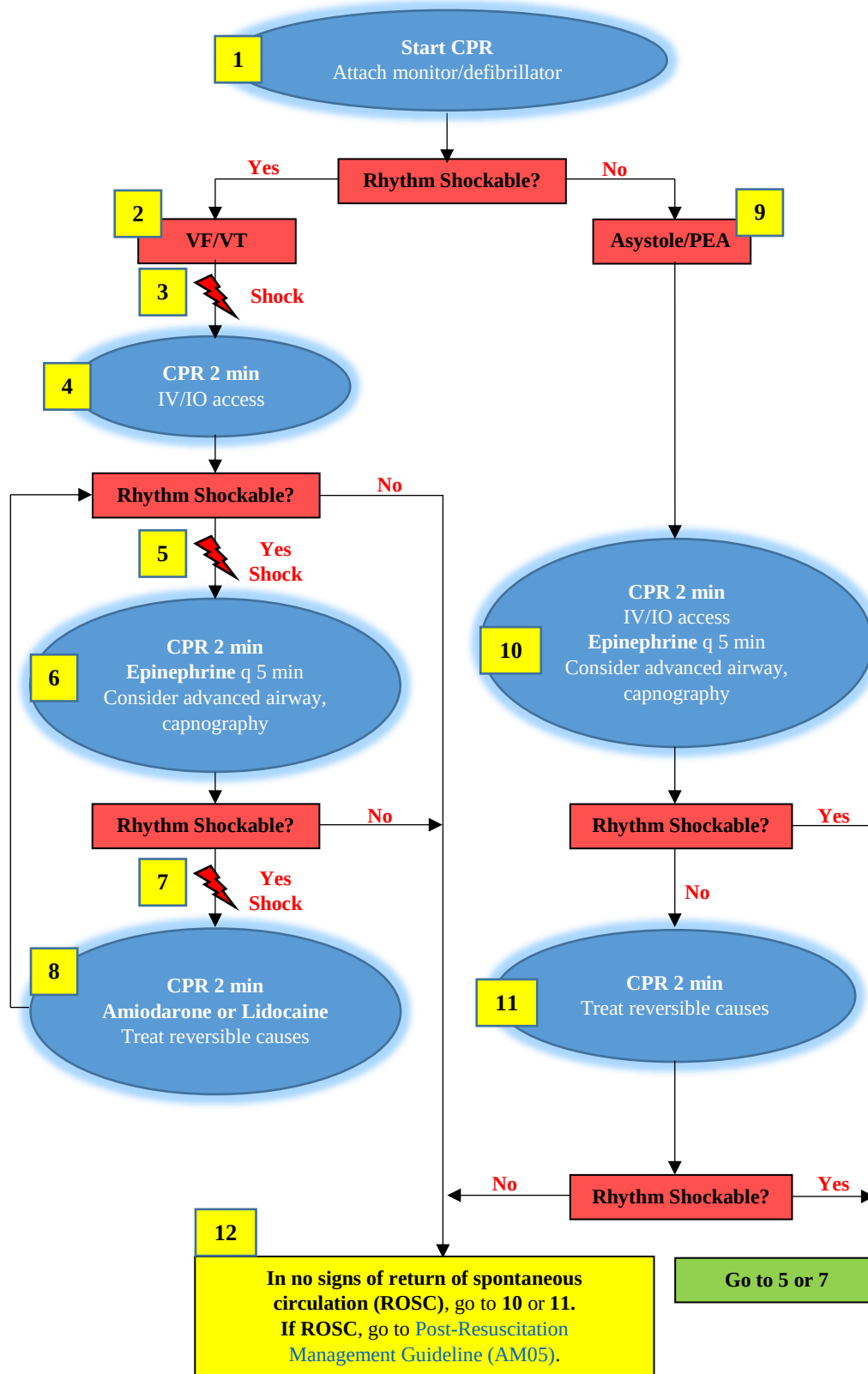
Adult Universal Guideline

B	<ul style="list-style-type: none"> • Scene/Crew Safety/PPE. • Appropriate equipment to patient side. • Perform focused patient assessment including vital signs. • Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$, unless otherwise directed. • Place patient in position of comfort, unless contraindicated. • Appropriate airway management, procedure, and equipment to credential level. Consider viral/bacterial filter. • Consider Spinal Motion Restriction Procedure (PR32). • Consider glucose assessment per Diagnostic Tools and Procedures (PR08). • Consider pain management per Pain Management Procedure (PR27). 	B
A	<ul style="list-style-type: none"> • Establish IV of LR TKO or saline lock as needed. • If the patient presents with signs and symptoms of hypoperfusion, administer fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> • Cardiac monitoring including 12 Lead ECG as appropriate. • Delayed Sequence Intubation per Delayed Sequence Intubation Procedure (PR06). • Consider nausea/vomiting treatment per Nausea/Vomiting Guideline (AM30). 	P
MC	<ul style="list-style-type: none"> • For deviation from any guideline. • For any additional orders beyond the guidelines. • To obtain recommendations. • Certain toxic exposures per Toxic Exposure/Poisoning Guideline (AM36). • Termination of resuscitation per Termination of Resuscitation Procedure (PR35). 	MC

Pearls:

- If Medical Control is required, the patient is the responsibility of the EMS personnel with the highest certification level on scene.
- All patients with any respiratory compromise, altered mental status, sepsis, or with medication administration that may have sedative effect should be placed on End Tidal CO_2 (ETCO_2).
- Any patient who a $\text{GCS} < 15$, who is not in a normal state, must have a blood glucose checked.
- All transported patients should have at least two sets of vital signs.
- Vital signs should be documented at clinically appropriate levels (i.e. patients on vasoactive medications or beta-blockers q5 min, critical patients q5 min, stable patients q15 min, or shorter based on provider judgement)
- If Medical Control is unavailable, follow the appropriate guideline and contact Medical Control as soon as possible.
- Oxygen should be titrated to lowest level required to achieve $\text{SpO}_2 \geq 94\%$ to avoid potential oxygen toxicity.

Adult CPR Guideline



CPR Quality

- Mechanical CPR should be implemented as soon as operationally possible to provide high quality CPR.
- Push hard (> 2 in [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilations.
- Rotate compressor every 2 min.
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
 - If EtCO₂ < 10 mm Hg, attempt to improve CPR quality.
- Intra-arterial pressure
 - If relaxation phase (diastolic) pressure < 20 mmHg, attempt to improve CPR quality.

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in EtCO₂ (typically ≥ 40 mm Hg).
- Spontaneous arterial pressure waves with intra-arterial monitoring.

Shock Energy

- Biphasic: Zoll X Series dose 120J – 150J – 200J.

Drug Therapy

- Epinephrine IV/IO dose:
 - 1 mg q 5 min (max 2 mg)
- Amiodarone IV/IO dose:
 - First dose: 300 mg bolus.
 - Second dose: 150 mg after 5-10 min.
- OR-
- Lidocaine IV/IO dose:
 - First dose: 1-1.5 mg/kg bolus.
 - Second dose: 0.5-0.75 mg/kg after 5-10 min.

Advanced Airway

- Extraglottic device or endotracheal intubation.
- ETCO₂ to confirm and monitor ET tube placement.
- 10 breaths per min. with continuous chest compressions.

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Hypoglycemia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Asystole/PEA

Consider reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/Hyperkalemia
- Hypothermia

Adult Universal Guideline (AM01)

Consider reversible causes:

- Tamponade (cardiac)
- Tension pneumothorax
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

AT ANY TIME:

Return of spontaneous pulses, go to
Post-Resuscitation Management Guideline (AM05)

AT ANY TIME:

Change in rhythm, go to
Appropriate Guideline

B

- Adult CPR Guideline (AM02)

B

A

- **Epinephrine 1mg [1:10,000] IV/IO q 5 min. (max total 2 mg).**

A

P

OPTIONS:

- If hyperkalemia or TCA overdose is suspected, **Sodium Bicarbonate 1 mEq/kg IV/IO.** Routine use is NOT recommended.
- If hyperkalemia or calcium channel blocker overdose suspected, **Calcium Chloride 10% 1 g mixed into 100cc NS IV/IO** infused over 10 min. Routine use is NOT recommended.

P

No ROSC

ROSC

MC

Consider **Termination of Resuscitation Procedure (PR35)**

MC

Post-Resuscitation Management Guideline (AM05)

Pearls:

- Always confirm asystole in more than one lead.
- Reversible causes must be identified and addressed by their respective guideline/procedure.

Cardiac Arrest Due to Hypothermia

Adult Universal Guideline (AM01)

AT ANY TIME:

Return of spontaneous pulses, go to
Post-Resuscitation Management Guideline (AM05)

AT ANY TIME:

Change in rhythm, go to
Appropriate Guideline

B

- Adult CPR Guideline (AM02)
- Treat hypothermia aggressively per Environmental Emergency: Hypothermia Guideline (AM24).

B

P

- If rectal temperature $<30^{\circ}\text{C}$ (90°F):
 - BLS and aggressive rewarming take priority.
 - Medications should be withheld until temperature $>30^{\circ}\text{C}$ (90°F).
 - If VF and initial defibrillation attempt is unsuccessful, withhold additional defibrillation attempts until patient warmed.
- If rectal temperature $>30^{\circ}\text{C}$ (90°F), treat per appropriate dysrhythmia guideline.

P

No ROSC

ROSC

Core Temperature $32^{\circ}\text{--}35^{\circ}\text{C}$ ($90^{\circ}\text{--}95^{\circ}\text{F}$)

Post-Resuscitation Management Guideline
(AM05)

MC

Consider Termination of
Resuscitation Procedure (PR35)

MC

SPECIAL CONSIDERATIONS:

- Handle patients gently, as rough handling may induce VF.
- Consider external active and passive rewarming techniques.

Post-Resuscitation Management

Adult Universal Guideline (AM01)

B	<p>Optimize oxygenation and ventilation.</p> <ul style="list-style-type: none"> Do not hyperventilate Maintain SpO₂ ≥ 94% <p>Obtain frequent vital signs.</p>	B
A	<p>Optimize oxygenation and ventilation.</p> <ul style="list-style-type: none"> Goal is to maintain EtCO₂ 35-40 mmHg. Other targets may be tolerated for specific patients <ul style="list-style-type: none"> Higher EtCO₂ tolerable for patients with acute lung injury or high airway pressure. Lower EtCO₂ tolerable for treating suspected cerebral edema (avoid hyperventilation which may induce cerebral vasoconstriction). <p>If hypotensive:</p> <ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A
P	<p>Optimize oxygenation and ventilation</p> <ul style="list-style-type: none"> Analgesia and sedation per DSI Procedure (PR06) if intubated. <p>If hypotensive, use one or more of the following to maintain MAP 75-90 mmHg:</p> <ul style="list-style-type: none"> Norepinephrine 8 mcg (0.5 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min. IV/IO. Epinephrine 10 mcg (1 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min IV/IO. <p>Obtain a 12 Lead ECG. If evidence of STEMI, active STEMI Alert (PR33).</p>	P

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion		Drip: 0.1-0.5 mcg/kg/min					Mix: 4mg in 250 mL NS yields		
Titrate by 0.02 mcg/kg/min q 5 min.		16 mcg/mL							
Patient kg	40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min	15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min	18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min	21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min	27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min	30	38	45	53	60	68	75	83	90

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion		Drip: 0.05-0.5 mcg/kg/min				Mix: 1mg [1:1000] in 100 mL NS yields 10 mcg/mL			
Titrate by 0.05 mcg/kg/min q 10 min.									
Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

PEARLS:

- Over-ventilation is a common cause of hypotension post-arrest.
- Selection of vasopressor is provider preference.
- Epinephrine infusion is recommended if ROSC is suspected to be reliant on Epinephrine bolus.

Ventricular Fibrillation/ Pulseless Ventricular Tachycardia

Consider reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/Hyperkalemia
- Hypothermia

Adult Universal Guideline (AM01)

Consider reversible causes:

- Tamponade (cardiac)
- Tension pneumothorax
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

AT ANY TIME:

Return of spontaneous pulses, go to
Post-Resuscitation Management Guideline (AM05)

AT ANY TIME:

Change in rhythm, go to
Appropriate Guideline

B	<ul style="list-style-type: none"> • Adult CPR Guideline (AM02) 	B
A	<ul style="list-style-type: none"> • Epinephrine 1mg [1:10,000] IV/IO q 5 min. (max total dose 2 mg). 	A
P	<ul style="list-style-type: none"> • Defibrillation: Biphasic: Use manufacturer recommendations <ul style="list-style-type: none"> ○ Zoll X Series recommended adult dose: 120J – 150J – 200J ○ If Zoll X Series unavailable, use manufacturer recommendations or, if unknown, use maximum available. Second and subsequent doses should be equivalent. Higher dose may be considered. <p>CONSIDER:</p> <ul style="list-style-type: none"> • If refractory VF/Pulseless VT: Amiodarone 300 mg IV/IO. May give second dose of 150 mg after 5-10 min. -OR (if Amiodarone unavailable)- Lidocaine 1.5 mg/kg IV/IO. May repeat 0.75 mg/kg bolus q 5 min. (max total 3 mg/kg) • Esmolol 50 mg slow IV/IO push over 1 min., followed by 50 mg mixed into 100 mL NS infused IV/IO over 10 min. • If drug-induced prolonged QT interval associated or Torsades-de-Pointes suspected, Magnesium Sulfate 2 g mixed in 100 mL NS IV/IO infused over 15 min. • If hyperkalemia or TCA overdose is suspected, Sodium Bicarbonate 1 mEq/kg IV/IO. Routine use is NOT recommended. • If hyperkalemia or calcium channel blocker overdose suspected, Calcium Chloride 10% 1 g mixed into 100 mL NS IV/IO infused over 10 min. 	P

No ROSC

ROSC

MC	Consider Termination of Resuscitation Procedure (PR35)	MC
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[Post-Resuscitation Management Guideline \(AM05\)](#)

SPECIAL CONSIDERATION:

- Reversible causes must be identified and addressed by their respective guideline/procedure.

Acute Coronary Syndrome

Adult Universal Guideline (AM01)

If suspected STEMI:

Refer to [STEMI Alert \(PR33\)](#)

B	<ul style="list-style-type: none"> Aspirin to complete 324 mg PO total dose (including what pt. has taken in last 12 hours). Pepcid Complete 1 tablet PO, for suspected gastric reflux/heartburn ONLY. 	B
A	<ul style="list-style-type: none"> Nitroglycerin 0.4 mg SL q 3-5 min. PRN if SBP > 100 mmHg. (A 12-lead ECG must be obtained and transmitted, and a patent IV must be established before administration of NTG) 	A
P	<ul style="list-style-type: none"> 12 Lead ECG. Consider right sided and posterior ECG if indicated. Nitroglycerin 0.4 mg SL q 3-5 min. PRN if SBP > 100 mmHg. Nitroglycerin 50 mcg/min (15mL/hr.) IV/IO infusion (Mix 50 mg into 250 mL NS). May increase by 50 mcg/min. q 10 min. to max of 200 mcg/min. (Captain and above ONLY) <p>CONSIDER:</p> <ul style="list-style-type: none"> Fentanyl per Pain Management Procedure (PR27). Ondansetron per Nausea/Vomiting Guideline (AM30). Cardiogenic Shock Guideline (AM10) if MAP < 60 mmHg. 	P
MC	<ul style="list-style-type: none"> If cocaine associated chest pain is suspected, consider contacting Medical Control for possible benzodiazepine administration. <p>For STEMI:</p> <ul style="list-style-type: none"> Clopidogrel (Plavix) 600 mg PO, if ordered by receiving Cardiologist/MD. <ul style="list-style-type: none"> 600 mg = 8 of the 75 mg tablets Heparin 5000 units IVP, if ordered by receiving Cardiologist/MD. 	MC

SPECIAL CONSIDERATIONS:

- NTG is contraindicated in patients with a history of aortic stenosis, with use of Viagra (Sildenafil) or Levitra (Vardenafil HCl) within last 24 hrs. or with use of Cialis (Tadalafil) within the last 48 hrs.
- Do not provide NTG in setting of suspected right sided MI, as it may precipitate hypotension.
- Any pain of the chest/back/shoulder/neck/jaw/epigastrium, SOB, nausea, diaphoresis, syncope, and/or generalized weakness/fatigue may be indicative of myocardial ischemia.
- Atypical presentations are often seen in certain patients (females, diabetics, and elderly).

AICD/Pacemaker Malfunction

Adult Universal Guideline (AM01)

INDICATION:

Verified frequent and recurrent inappropriate automatic implantable cardio-defibrillator (AICD) firing.

P

- 12 Lead ECG
- Continuous ECG monitoring with defibrillation pads in place

CONSIDER:

- **Sedation and/or pain management** if inappropriate firing is significantly uncomfortable (do not utilize if MAP < 65 mmHg).
 - Pain management per [Pain Management Procedure \(PR27\)](#).
 - Sedation per [Sedation Guideline \(AM32\)](#).

P

Bradycardia

Adult Universal Guideline (AM01)

INDICATION:

Symptomatic patient with HR < 50 bpm.

OPTIONS:

- **Atropine Sulfate 0.5 mg IV/IO**, may repeat q 3-5 min. (**max total 3 mg**) if beneficial response. (Do not delay initiating transcutaneous pacing for severe symptoms).
- **Transcutaneous Pacing (PR37)**, with initial rate of 80 bpm.

If hypotensive with mechanical capture during pacing:

- **Epinephrine 10 mcg (1 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min IV/IO** and titrate to patient response.

CONSIDER:

- **Sedation and/or pain management** while using transcutaneous pacing if MAP >65 mmHg.
 - Pain management per [Pain Management Procedure \(PR27\)](#).
 - Sedation per [Sedation Guideline \(AM32\)](#).

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Drip: 0.05-0.5 mcg/kg/min

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

SPECIAL CONSIDERATIONS:

- Symptomatic bradycardia may include weakness, dizziness, chest pain, pulmonary edema, AMS, and/or MAP < 60 mmHg.
- Atropine is **ineffective** in Type II 2° AVB, 3° AVB, and transplanted hearts.
- Consider beta blocker or calcium channel blocker overdose; refer to [Toxic Exposure/Poisoning Guideline \(AM36\)](#).

Cardiogenic Shock

Adult Universal Guideline (AM01)

INDICATION:

Hypotension (MAP < 60 mmHg) **and/or** is symptomatic (AMS, chest pain, dyspnea, evidence of hypoperfusion) **without**:

- Evidence of hypovolemia, dehydration, sepsis, or other non-cardiogenic source of hypotension.
- Bradycardia or tachydysrhythmia (refer to appropriate guideline).

A

Titrate to MAP > 65 mmHg.

- **Fluid bolus LR 250 mL IV/IO.** May repeat up to 2 L if no evidence of pulmonary edema.

A

P

Titrate to Map > 65 mmHg using one or more of the following vasopressors. Use lowest dose necessary for shortest duration possible during peripheral line administration.

- **Norepinephrine 8 mcg (0.5 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min. IV/IO.**
- **Epinephrine 10 mcg (1 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min IV/IO.**

P

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Drip: 0.05-0.5 mcg/kg/min

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Drip: 0.1-0.5 mcg/kg/min

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5 min.

16 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min	15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min	18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min	21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min	27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min	30	38	45	53	60	68	75	83	90

Narrow Complex Tachycardia

Adult Universal Guideline (AM01)

INDICATION:

HR > 150/min. with pulses, **and** QRS complex < 0.12 sec.

Hemodynamically unstable with symptoms including rate-related cardiovascular compromise (AMS, chest pain, dyspnea, acute heart failure, or signs of hypoperfusion).

Symptomatic but no evidence of compromised perfusion.

Obtain 12 lead ECG

Immediate synchronized cardioversion:

- Consider sedation, see below.
- Initial dose:
 - Narrow regular:
 - 100-200 J
 - Narrow irregular:
 - 100-200 J (biphasic)
- Increase in stepwise fashion as needed.

CONSIDER:

- If it will not delay treatment, **Sedation and/or pain management** immediately prior to synchronized cardioversion (do not utilize if MAP < 65 mmHg).

OPTIONS:

- Pain management per [Pain Management Procedure \(PR27\)](#).
- Sedation per [Sedation Guideline \(AM32\)](#).

Narrow, Regular PSVT:

- **Vagal Maneuver** (Valsalva, no carotid sinus massage)
- **Adenosine 12mg rapid IV/IO** followed by 20 mL rapid flush. May repeat at **12 mg X 1**.
- **Diltiazem 0.25 mg/kg IV/IO** (max single dose 25 mg) over 3-5 min.

Narrow, Irregular (A-Fib/A-Flutter with RVR, Multifocal Atrial Tachycardia):

- **Diltiazem 0.25 mg/kg IV/IO** (max single dose 25 mg) over 3-5 min. Lower dose with age > 65 or hepatic/renal disease. –or–
- **Amiodarone 150 mg** mixed into 100 mL NS administered **IV/IO** over 10 min.

Pre-excited atrial arrhythmias (WPW syndrome):

- Consider expert evaluation in emergency department.
- Consider synchronized cardioversion.

SPECIAL CONSIDERATIONS:

- All patients receiving medications within this guideline must have defibrillation pads in place.
- Avoid Adenosine use in patient with asthma and COPD.
- Adenosine dose should be reduced to 6 mg in patient's taking dipyridamole, carbamazepine, with transplanted hearts, or with central venous administration.
- Upper rate of sinus tachycardia is age-related (approximately 220/min – patient age in years). If judged to be sinus tachycardia, no specific drug treatment required. Instead, direct treatment to treat underlying cause.

Ventricular Ectopy

Adult Universal Guideline (AM01)

INDICATION:

- Symptomatic (chest pain, weakness, dizziness, or dyspnea).

AND any of the following:

- R-on-T Phenomenon.
- Multifocal PVCs > 6/min
- Runs of ≥ 5 PVCs.

- Obtain 12 Lead ECG:

CONSIDER:

- **Amiodarone** (preferred over Lidocaine)
 - Infuse **150 mg** mixed in **100 mL NS IV/IO** over 10 min.
 - Maintenance **1 mg/min** for 1st 6 hrs.
- OR-
- **Lidocaine 1 mg/kg IV.**
 - Additional boluses of **0.75 mg/kg** q 5 min. (max total 3 mg/kg).

MC

If not resolved, contact Medical Control.

MC

Amiodarone Bolus Infusion	Mix: 150mg in 100 mL NS yields 1.5 mg/mL
Amount to infuse using microdrip set (60 gtts/mL)	
150 mg/ 10 min	600 gtts/min (wide open)
Amiodarone Maintenance Infusion	Mix: 150mg in 100 mL NS yields 1.5 mg/mL
Amount to infuse using microdrip set (60 gtts/mL)	
1 mg/min	40 gtts/min

PEARLS:

- Treat underlying cause of ventricular ectopy (hypoxia is the most common, followed by fluid volume deficit, fever, etc.)
- Do NOT apply this guideline to ventricular escape rhythms.
- Place defibrillation pads on patient in preparation for decompensation.

Wide Complex Tachycardia

Adult Universal Guideline (AM01)

INDICATION:

- HR $\geq$ 120 / minute with pulses **and** QRS complex $\geq$ 0.12 sec.

Hemodynamically unstable, with symptoms including rate-related cardiovascular compromise (AMS, chest pain, dyspnea, acute heart failure, or signs of hypoperfusion).

Symptomatic but no evidence of compromised perfusion.

Obtain 12 lead ECG

Immediate cardioversion:

- Consider sedation, see below.
- Wide regular:
 - 100 J (biphasic), synchronized, increase in stepwise fashion as needed.
- Wide irregular:
 - Defibrillation dose 120-200J, unsynchronized.

CONSIDER:

- If it will not delay treatment, **Sedation and/or pain management** immediately prior to synchronized cardioversion (Do not utilize if MAP < 65 mmHg).

OPTIONS:

- Pain management per [Pain Management Procedure \(PR27\)](#).
- Sedation per [Sedation Guideline \(AM32\)](#).

Wide, Regular (VT or SVT w/ aberrancy):

- Adenosine 12 mg rapid IV/IO** followed by 20 mL rapid flush, *only if regular, monomorphic, and believed to be SVT with aberrancy*. May repeat at **12 mg X 1** if fails to convert.
- Amiodarone:**
 - Infuse **150 mg mixed into 100mL NS IV/IO** over 10 min.
 - Maintenance **1mg/min** for 1st 6 hrs.

Wide, Irregular (atrial fibrillation w/ bundle branch block or polymorphic VT/torsades de pointes):

- Amiodarone:**
 - Infuse **150 mg mixed into 100mL NS IV/IO** over 10 min.
 - Maintenance **1mg/min** for 1st 6 hrs.
- If Torsades, infuse **Magnesium Sulfate 2 g mixed into 100 mL NS IV/IO** over 15 min.

Amiodarone Bolus Infusion	Mix: 150mg in 100 mL NS yields 1.5 mg/mL
Amount to infuse using microdrip set (60 gtts/mL)	
150 mg/ 10 min	600 gtts/min (wide open)
Amiodarone Maintenance Infusion	Mix: 150mg in 100 mL NS yields 1.5 mg/mL
Amount to infuse using microdrip set (60 gtts/mL)	
1 mg/min	40 gtts/min

SPECIAL CONSIDERATIONS:

- All patients receiving medications within this guideline must have defibrillation pads in place.
- Avoid Adenosine use in patient with asthma and COPD.
- Amiodarone is contraindicated in pregnancy.
- Adenosine dose should be reduced to 6mg in patient's taking dipyridamole, carbamazepine, with transplanted hearts, or with central venous administration.

Adult Difficult/Obstructed Airway

Adult Universal Guideline (AM01)

B

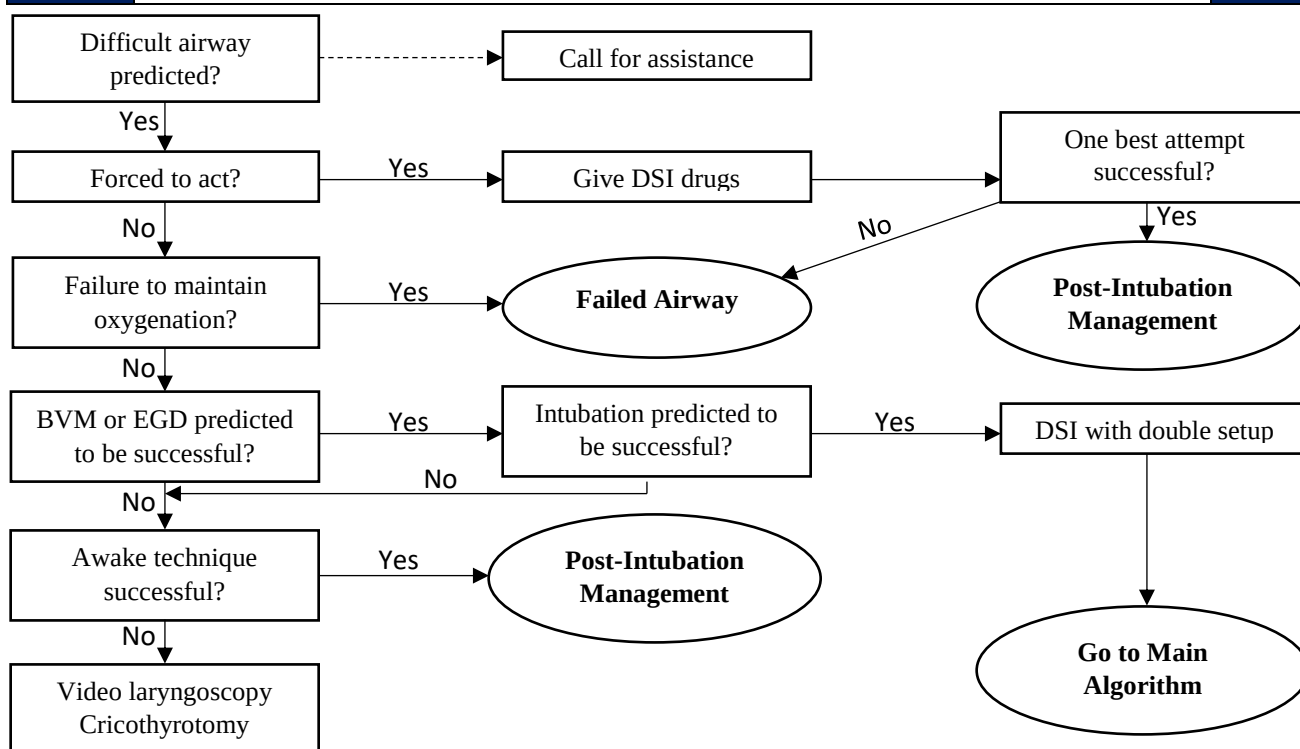
DIFFICULT AIRWAY:

- See flow diagram below (may only perform skills allowed under appropriate protocol for certification level).

OBSTRUCTED AIRWAY:

- Manually open the airway/position the head (if no contraindications).
- Insert OPA if no gag reflex, or NPA.
- Attempt to ventilate, if no spontaneous ventilations.
- Attempt to visualize obstruction; if visible attempt to remove using finger sweep or Magill Forceps.
- If not visible, perform foreign body airway obstruction maneuvers (e.g. subdiaphragmatic abdominal thrusts).

B



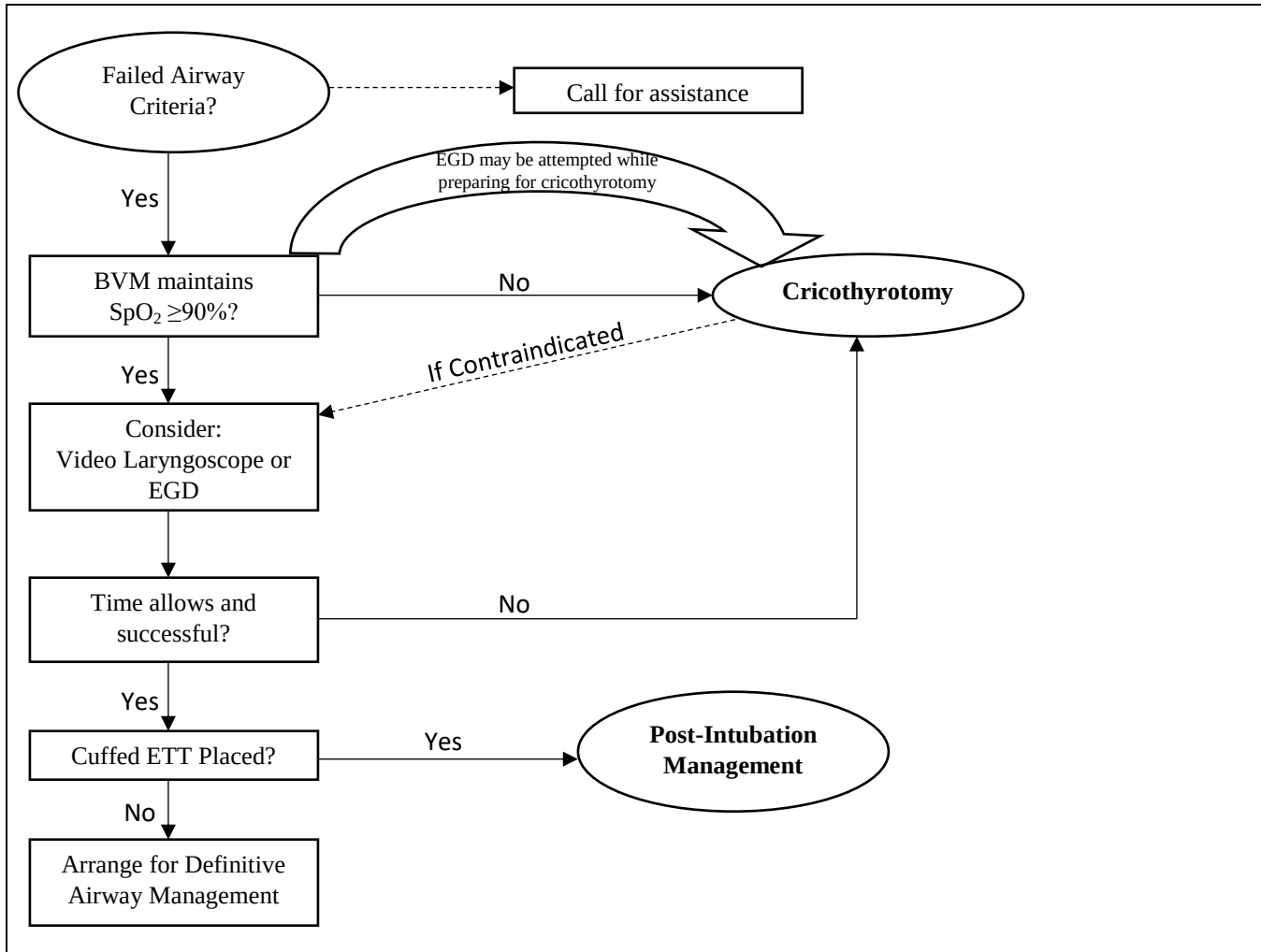
SPECIAL CONSIDERATIONS:

- **MOANS** (Mask Ventilation): **M**ask seal; **O**bstruction/**O**besity; **A**ged; **N**o teeth; **S**tiff (increased ventilator pressures, e.g. asthma, COPD, ARDS, term pregnancy).
- **LEMONS** (Laryngoscopy): **L**ook externally (gestalt); **E**valuate 3-3-2; **M**allampati; **O**bstruction/**O**besity; **N**eck mobility; **S**aturation/**S**ituation.
- **RODS** (Extraglottic Device): **R**estricted mouth opening; **O**bstructed/**O**besity; **D**istorted/**D**isrupted airway; **S**tiff (as for MOANS).
- **SMART** (Surgical Airway): **S**urgery; **M**ass; **A**ccess/**A**natomy; **R**adiation; **T**umor.
- An intubation attempt is defined as anytime the laryngoscope blade passes the plane of the teeth.

Adult Failed Airway

Adult Universal Guideline (AM01)

Notify receiving hospital ASAP regarding a patient's difficult or failed airway.



SPECIAL CONSIDERATIONS:

- **ELM:** External Laryngeal Manipulation may improve the view of the cords.

Bronchospasm

Adult Universal Guideline (AM01)

B	<p>SpO2 goal > 90% (> 95% in pregnant patients or those with significant heart disease).</p> <p>MILD OPTIONS:</p> <ul style="list-style-type: none"> • Albuterol 2.5 mg via nebulizer attached to Oxygen at 6 LPM, may repeat as needed. • Ipratropium 0.5 mg via nebulizer attached to Oxygen at 6 LPM, may repeat q 30 min. <p>MODERATE OPTION:</p> <ul style="list-style-type: none"> • CPAP/BiPAP (Non-Invasive) (PR05). 	B
A	<p>MODERATE OPTIONS:</p> <ul style="list-style-type: none"> • Fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. • Methylprednisolone 125 mg IV/IO. 	A
P	<p>SEVERE OPTIONS:</p> <ul style="list-style-type: none"> • Magnesium Sulfate 40 mg/kg mixed into 100 mL NS IV/IO over 15 min (max dose 2 g). • For severe anxiety associated with bronchospasm, Ketamine 0.3 mg/kg slow IV/IO push over 1 min., may repeat X 1 q 15 min. (max single dose 20 mg). • For impending respiratory failure secondary to reactive airway disease, Epinephrine 0.01 mg/kg (max dose 0.3 mg) [1:1,000] IM, if no clinical signs of improvement. Caution with use in patients >40 years old or with coronary artery disease. • Refer to Adult DSI Procedure (PR06) as needed. 	P

SPECIAL CONSIDERATIONS:

- To reduce hyperinflation, hypertension, and risk of tension pneumothorax, consider ventilation with a:
 - Slower respiratory rate.
 - Smaller tidal volume (6-8 mL/kg).
 - Shorter inspiratory time (80-100 mL/min).
 - Longer expiratory time (I/E 1:4 or 1:5)
- Patients who had reported bronchospasm and are found to be in cardiac arrest should have bilateral chest needle decompression performed immediately.

Pulmonary Edema

Adult Universal Guideline (AM01)

INDICATION:

Shortness of breath **WITH** evidence of pulmonary edema (crackles or wheezing).

B

- **CPAP/BiPAP (Non-Invasive) (PR05).**

B

P

- **Nitroglycerin** until improvement in respiratory effort or SBP <100 mmHg.
 - SBP > 100 mmHg, **NTG 0.4 mg SL** q 3-5 min.
 - SBP > 160 mmHg, **NTG 0.8 mg SL** q 3-5 min.
 - SBP > 200 mmHg, **NTG 1.2 mg SL** q 3-5 min.
- **-OR-**
- **Nitroglycerin 200 mcg (1 mL) IV/IO** push (mix 50 mg NTG in 250 mL NS), may repeat X 3 q 5 min. Followed by **50 mcg/min. IV/IO** infusion (15 mL/hr.), may increase by 50 mcg/min. q 5 min. to a total of 200 mcg/min.
- Refer to [Adult DSI Procedure \(PR06\)](#) as indicated.

P

SPECIAL CONSIDERATIONS:

- NTG is contraindicated in patients with history of aortic stenosis, with use of Viagra (Sildenafil Citrate) or Levitra (Vardenafil HCL) within last 24 hours, or with use of Cialis (Tadalafil) with the last 48 hours.
- CPAP/BiPAP should not be removed to administer NTG.

Abdominal Pain

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Pepcid Complete 1 tablet PO for suspected gastric reflux/heartburn. 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. Acetaminophen 1000 mg mixed into 100 ml NS IV/IO infused over 10 minutes. 	A
P	<p>CONSIDER:</p> <ul style="list-style-type: none"> Nausea/Vomiting management per Nausea/Vomiting Guideline (AM30). Treat pain per Pain Management Procedure (PR27) using caution to not totally blunt symptoms required for hospital assessment. Strongly consider obtaining a 12-lead ECG, as underlying etiology may be Acute Coronary Syndrome (AM07). If suspected aortic aneurysm or intra-abdominal hemorrhage, consider permissive hypotension with a goal SBP 90-100 mmHg. 	P

SPECIAL CONSIDERATIONS:

- In females of childbearing age, consider ruptured ectopic pregnancy.
- Traumatic abdominal pain should be managed per the [Multi-System Trauma Guideline \(AT06\)](#).
- If unstable, transport rapidly per [Rapid Transport Policy \(P17\)](#).

Allergic Reaction/Anaphylaxis/Angioedema

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Epinephrine 0.3 mg [1:1,000] IM for anaphylaxis if ≥ 25 kg, in anterolateral thigh. Repeat q 5-10 min. as needed. If in respiratory distress <ul style="list-style-type: none"> Albuterol 2.5 mg via nebulizer attached to Oxygen at 6 LPM, may repeat as needed. Ipratropium 0.5 mg via nebulizer, attached to Oxygen at 6 LPM, may repeat q 30 min. 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. Diphenhydramine 25-50 mg IV/IO/IM (max dose 50 mg). Methylprednisolone 125 mg IV/IO 	A
P	<ul style="list-style-type: none"> If impending cardiorespiratory failure, Epinephrine [1:10,000] 0.1 mg IV/IO over 5 min. in patients who are profoundly hypotensive refractory to volume resuscitation and ≥ 2 IM epinephrine injections. Titrate to MAP > 65 mmHg using Epinephrine infusion 0.05-0.5 mcg/kg/min IV/IO. Use the lowest dose necessary for the shortest duration possible during peripheral line administration. 	P

All drip calculations are using a microdrip (60 gtts/mL)									
Epinephrine Infusion		Drip: 0.05-0.5 mcg/kg/min				Mix: 1mg [1:1000] in 100 mL NS yields			
Titrate by 0.05 mcg/kg/min q 10 min.		10 mcg/mL							
Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

SPECIAL CONSIDERATIONS:

- Epinephrine should be avoided unless critically necessary in patients >40 years of age or with coronary artery disease.

Altered Mental Status of Unknown Etiology

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none">Blood glucose analysisConsider Ammonia Inhalant to stimulate responsiveness.If respiratory depression due to suspected narcotic overdose, Naloxone 0.4-2.0 mg IN, may repeat q 2-5 min (max 10 mg).<ul style="list-style-type: none">Titrate Naloxone to respiratory rate ≥ 12.	B
A	<ul style="list-style-type: none">If respiratory depression due to suspected narcotic overdose, Naloxone 0.4-2.0 mg IV/IO/IN/IM (slow if IV/IO), may repeat q 2-5 min (max 10 mg).<ul style="list-style-type: none">Titrate Naloxone to respiratory rate ≥ 12.	A
P	<ul style="list-style-type: none">Intubate if indicated.Refer to Adult DSI Procedure (PR06) as indicated.Refer to more specific protocols as indicated.	P

SPECIAL CONSIDERATIONS:

- With administration of Naloxone the goal is NOT to bring the patient back to a normal status, but to keep the patient breathing effectively. Patient's may become combative and pose a danger to self and crew if full reversal of the substance is achieved.
- Consider possible etiologies of altered mental status, including AEIOUTIPS mnemonic:
 - Acidosis/Alcohol
 - Endocrine
 - Infection
 - Overdose
 - Uremia
 - Trauma/Toxins
 - Insulin/hyperglycemia/hypoglycemia
 - Psychosis
 - Stroke/Syncope/Seizures/post-ictal

Cyanide Poisoning/Smoke Inhalation

Adult Universal Guideline (AM01)

INDICATIONS:

- Exposure to smoke or fire in an enclosed space.
- Suspected cyanide exposure.

SYMPTOMS MAY INCLUDE:

- Altered mental status
- Chest discomfort
- Dyspnea/tachypnea
- Hypotension
- Seizures
- Cardiac arrest

B

- Remove from toxic environment.
- High flow O₂ via NRB or BVM.
- SpCO monitoring (if available).
- Consider other exposures, including carbon monoxide, and treat per [Toxic Exposure/Poisoning Guideline \(AM36\)](#).
- Initiate rapid transport to a facility with cyanide treatment capabilities.
- If bronchospasm present, refer to [Bronchospasm Guideline \(AM16\)](#).

B

A

- **Fluid bolus LR 250 mL IV/IO** with pressure infusion for hypotension. May repeat up to 2 L if no evidence of pulmonary edema.

A

P

- Consider intubation per [Adult DSI Procedure \(PR06\)](#).
- If seizures, refer to [Seizure Guideline \(AM33\)](#).

P

Emotional/Mental Distress

Adult Universal Guideline (AM01)

INDICATION:

- Emotional/mental distress which impairs care or the physical well-being of the patient.

B

- If possible, remove patient from stressful environment.
- Utilize verbal de-escalation techniques.
- Utilize [Physical Restraint Procedure \(PR29\)](#), if needed.
- Frequent vital signs, including temperature monitoring.
- If hyperthermia, perform immediate cooling measures per [Environmental Emergency: Hyperthermia \(AM23\)](#).

B

A

- Diligent EtCO₂ and SpO₂ monitoring.

A

P

- Consider sedation per [Sedation Guideline \(AM32\)](#).

P

Environmental Emergency - Hyperthermia

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Remove from hot environment. Passive cooling measures as indicated. Remove clothing as needed. If alert and oriented, give small sips of cool liquids. If temp >40°C (104°F) or if with altered mental status, begin active cooling: <ul style="list-style-type: none"> Continually misting exposed skin with tepid water while fanning victim (most effective). Cold packs to axilla, neck, and groin. 	B
A	<ul style="list-style-type: none"> Cool IV Fluids <ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> Refer to Adult DSI Procedure (PR06) as needed. If uncontrolled shivering occurs during cooling, consider mild sedation per Sedation Guideline (AM32). 	P

SPECIAL CONSIDERATION:

- Monitor for dysrhythmia on ECG closely.

DEFINITIONS:

- Heat cramps – minor muscle cramps usually in the legs and abdominal wall. Temperature is normal.
- Heat exhaustion – tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur.
- Heat stroke – temperature overload and/or electrolyte imbalances, often with altered level of consciousness, with or without cessation of sweating. Temperature is usually >40°C (104°F).

Environmental Emergency - Hypothermia

Adult Universal Guideline (AM01)

B

- Passive warming measures:
 - Move to warm environment.
 - Remove wet clothing.
 - Blankets, especially around head.
- For moderate to severe hypothermia, wrapped heat packs to axilla, neck, and groin.

B

A

- Warmed IV Fluids
 - **Fluid bolus LR 250 mL IV/IO.** May repeat up to **2 L** if no evidence of pulmonary edema.

A

SPECIAL CONSIDERATIONS:

- Rectal/Core temperature <30°C (86°F) results in increased risk of ventricular dysrhythmias/VF.
- Handle patient gently, keep horizontal (if able), and limit movement of extremities.
- Bradycardia should be treated with fluids and warming (**not Atropine**).
- Extremes of age and antihypertensive medications may increase risk of hypothermia.
- Medications may not be effective if core temperature <30°C (86°F).

DEFINITIONS:

- Mild – normal body temperature 35-32.1°C (95-89.8°F); conscious, shivering.
- Moderate – 32°-28°C (89.7°-82.5°F); impaired consciousness, not shivering.
- Severe – <28°C (82.4°F); unconscious, not shivering, V/S deteriorating.

Excited Delirium

Adult Universal Guideline (AM01)

INDICATION:

- Highly combative or violent patients suspected to be in hypoxic hypermetabolic state.

SYMPTOMS MAY INCLUDE:

- Agitation
- Aggressive, threatening, or combative behavior
- Amazing feats of strength
- Pressured, loud, incoherent speech
- Sweating (or loss of sweating late)
- Dilated pupils/less reactive to light
- Rapid breathing
- Stripping of clothes

B

- If possible, remove patient from stressful environment.
- Utilize verbal de-escalation techniques.
- Utilize [Physical Restraint Procedure \(PR29\)](#).
- Frequent vital signs, including temperature monitoring.
- If hyperthermia, perform immediate cooling measures per [Environmental Emergency: Hyperthermia \(AM23\)](#).

B

A

- Diligent EtCO₂ monitoring.
- Fluid bolus LR 250 mL IV/IO.** May repeat up to **2 L** if no evidence of pulmonary edema.
- For hyperthermia, **Acetaminophen 1000 mg** mixed into 100 ml NS **IV/IO** infused over 10 minutes.

A

P

- Ketamine 2 mg/kg IV/IO over 1 min** q 15 min PRN or **4 mg/kg IM/IN** q 15 min PRN.
- Consider nausea/vomiting treatment per [Nausea/Vomiting Guideline \(AM30\)](#).
- After initial stabilization, consider:
 - Lorazepam 1-2 mg IV/IO** q 15 min PRN (max total dose 4 mg).
 - OR**
 - Midazolam 2.5 mg IN/IM/IV/IO** q 15 min PRN (max total dose 10 mg).

P

SPECIAL CONSIDERATIONS for the use of Ketamine:

- Must be prepared to bag mask ventilate and/or immediately intubate if vocal cord spasm occurs.**
- May have clinically significant cardiac effect. Use cautiously in patients with significant cardiac history.
- Physical exam must be performed prior to administration of medications. Document findings thoroughly.
- Patients with hepatic or renal insufficiency should initially receive a half dose.

Flank Pain/Renal Colic

Adult Universal Guideline (AM01)

SYMPTOMS:

- Acute flank pain radiating to groin.
- Nausea/vomiting
- Costovertebral Angle (CVA) tenderness
- History of renal calculi.

B

- Consider hot pack/local active warming on lower abdomen and back for pain distraction.

B**A**

- **Fluid bolus LR 250 mL IV/IO.** May repeat up to **2 L** if no evidence of pulmonary edema.
- **Acetaminophen 1000 mg** mixed into 100 ml NS **IV/IO** infused over 10 minutes.

A**P**

- Nausea management per [Nausea/Vomiting Guideline \(AM30\)](#).
- Pain management per [Pain Management Procedure \(PR27\)](#).

P

SPECIAL CONSIDERATIONS:

- Consider abdominal aortic dissection in all patients complaining of flank pain (see [Abdominal Pain \(AM18\)](#)).
- Consider pyelonephritis and sepsis (see [Sepsis Guideline \(AM34\)](#)) in fever and flank pain.

Gastro-Intestinal Hemorrhage

Adult Universal Guideline (AM01)

B

- If upper GI bleed and hemodynamically stable, consider sitting upright with aggressive suction.

B

A

- **Fluid bolus LR 250 mL IV/IO.** May repeat up to **2 L** if no evidence of pulmonary edema.

A

P

- Consider nausea/vomiting treatment per [Nausea/Vomiting Guideline \(AM30\)](#).
- [Adult DSI Procedure \(PR06\)](#) as indicated for upper GI bleed with need for emergent airway protection.

P

MC

- Contact Medical Control for administration of **Tranexamic Acid 2 g IV/IO.** (Captain and above **ONLY**)

MC

SPECIAL CONSIDERATION:

- Rapid transport to closest appropriate facility with blood administration capabilities.

Hypertensive Crisis

Adult Universal Guideline (AM01)

INDICATIONS:

- SBP > 180 mmHg and/or DBP > 120 mmHg **AND** clinical evidence of end-organ dysfunction, including:
 - Chest pain, shortness of breath, or other myocardial ischemia symptoms.
 - Acute altered mental status with no identifiable cause aside from likely hypertensive encephalopathy.
 - Severe headache.

B

- Elevate head of bed to semi-fowler/low-fowler position.

B

P

CONSIDERATIONS:

- **DO NOT** reduce MAP by >20%.

OPTIONS:

- To manage blood pressure:
 - **Nicardipine 5 mg/hr. IV/IO** infusion. May increase by 2.5 mg/hr. q 5 min. to a maximum of 15 mg/hr. with qualifying blood pressure (preferred).
- Consider nausea/vomiting treatment per [Nausea/Vomiting Guideline \(AM30\)](#).

P

Nicardipine Infusion		Mix: 25mg in 250 mL NS yields 0.1 mg/mL
Titrate by 2.5 mg/hr q 5 min.		
Amount to infuse using microdrip set (60 gtts/mL)		
5 mg/hr	50 gtts/min	
7.5 mg/hr	75 gtts/min	
10 mg/hr	100 gtts/min	
12.5 mg/hr	125 gtts/min	
15 mg/hr	150 gtts/min	

SPECIAL CONSIDERATIONS:

- Consider [Pulmonary Edema Guideline \(AM17\)](#) if CHF exacerbation is suspected.
- Consider [Acute Coronary Syndrome \(AM07\)](#) if chest pain.
- Consider [Stroke/CVA/TIA \(AM35\)](#) if neurologic changes.
- Consider [Management of Obstetric Complications: Pre-Eclampsia/Eclampsia Guideline \(OB02\)](#).

Hypoglycemia/Hyperglycemia

Adult Universal Guideline (AM01)

INDICATIONS:

- Hypoglycemia: Glucose < 60 mg/dL or 60-80 mg/dL with related symptoms
- Hyperglycemia: Glucose > 250 mg/dL with related symptoms

B

HYPOGLYCEMIA:

- **Oral Glucose** 15 g PO, may repeat PRN.

B

A

HYPOGLYCEMIA:

- **Dextrose** 12.5-25 g IV/IO, may repeat X1 dose.
 - 125-250 mL of 10% Dextrose solution IV/IO (preferred)
 - OR
 - 25-50 mL of 50% Dextrose solution slow IV/IO.

HYPERGLYCEMIA:

- **Fluid bolus LR 250 mL IV/IO.** May repeat up to 2 L if no evidence of pulmonary edema.

A

SPECIAL CONSIDERATIONS:

- Consider and evaluate for other etiologies of altered mental status, including CVA, intoxication, and infection.
- Strongly encourage patients to be transported to evaluate underlying cause of hypoglycemia should AMS resolve after glucose administration.
- Oral Glucose and Dextrose are temporary fixes for hypoglycemia. The patient should eat prior to transport or before obtaining a patient refusal.

Nausea/Vomiting

Adult Universal Guideline (AM01)

A

- **Fluid bolus LR 250 mL IV/IO.** May repeat up to **2 L** if no evidence of pulmonary edema.

A

P

OPTIONS:

- **Ondansetron 4-8 mg IV/IO/IM.**

P

SPECIAL CONSIDERATION:

- Ondansetron should be avoided in patients with prolonged QTc intervals.
 - Male: > 470 msec.
 - Female: > 480 msec.
- Ondansetron may be administered to prevent motion sickness in air medical evacuation.

Non-Fatal Drowning

Adult Universal Guideline (AM01)

B

- Consider [Spinal Motion Restriction Procedure \(PR32\)](#) as mechanism, history, or physical exam indicates.
- Consider [CPAP/BiPAP \(Non-Invasive\) \(PR05\)](#) if alert and with respiratory distress.

If the patient is unconscious:

- BVM with oral/nasal airway as indicated.
- O₂ if SpO₂ < 94%.
- Consider [Extraglottic Device](#).
- Consider adding PEEP to maximize oxygenation.

B

P

- Treat dysrhythmias per specific guideline.
- [Adult DSI Procedure \(PR06\)](#) if SpO₂ < 94% on oxygen and patient is deteriorating.

P

SPECIAL CONSIDERATION:

- If hypothermic, treat per [Environmental Emergency – Hypothermia \(AM24\)](#) or [Cardiac Arrest Due to Hypothermia \(AM04\)](#) Guideline.

Sedation

Adult Universal Guideline (AM01)

B

- If possible, remove patient from stressful environment.
- Utilize verbal de-escalation techniques.
- Utilize [Physical Restraint Procedure \(PR29\)](#).
- Frequent vital signs including temperature monitoring.
- If hyperthermia, perform immediate cooling measures per [Environmental Emergency: Hyperthermia \(AM23\)](#).

B

P

- Continuous monitoring, including EtCO₂ and SpO₂.
- [Excited Delirium \(AM25\)](#) as needed.
- [Nausea/Vomiting \(AM30\)](#) as needed.

MILD SEDATION:

- **Lorazepam 0.5-1.0 mg IV/IO** q 15 min PRN (preferred) or
- **Midazolam 1 mg IN/IM** q 15 min PRN

MODERATE SEDATION:

- **Lorazepam 1-2 mg IV/IO** q 15 min PRN (preferred) or
- **Midazolam 2.5 mg IN/IM** q 15 min PRN

DEEP SEDATION:

- **Ketamine 2 mg/kg IV/IO** over 1 min q 15 min PRN (preferred) OR **4 mg/kg IM/IN** q 15 min PRN

P

SPECIAL CONSIDERATIONS:

- **Mild Sedation** – Example: anxiety refractory to calming techniques that is impairing care.
- **Moderate Sedation** – Example: painful procedures or potential harm to self or others.
- **Deep Sedation** – Example: severe isolated trauma (field amputation) or uncontrollable patients with potential harm to self or others.
- Medication selection may be based on the applicable sedation level or lower (example: provider may apply mild sedation dosing for moderate sedation procedure). Provider may not utilize higher sedation level medication unless clinically warranted.
- Dose selection in elderly patients should be cautious, usually starting at the low end of the dosing range.
- IN/IM route should be utilized FIRST in combative patients.
- For sedation of patients with behavioral emergencies:
 - Patient must lack capacity and be a danger to self or others (those treated under implied consent).
 - Obtain vascular access as soon as possible when can be done safely.
 - Use minimum dose necessary to resolve danger.
 - **Physical exam must be performed prior to administration of medications. Document findings thoroughly.**

SPECIAL CONSIDERATIONS for the use of Ketamine:

- **Must be prepared to bag mask ventilate and/or immediately intubate if vocal cord spasm occurs.**
- May have clinically significant cardiac effect. Use cautiously in patients with significant cardiac history.
- Patients with hepatic or renal insufficiency should initially receive a half dose.

Seizure

Adult Universal Guideline (AM01)

INDICATION:

- Generalized convulsive seizures **WITH** impaired consciousness.

B

- If signs of airway obstruction and chin-lift, jaw thrust, and/or suction do not alleviate it, place an OPA or NPA.
- If oxygenation/ventilation compromised, apply O₂ via NRB or BVM.
- Blood glucose analysis.

B

P

OPTIONS:

If no IV access,

- Midazolam 5 mg IN/IM**, may repeat X1 q 15 min

If IV access,

- Midazolam 2.5 mg IV/IO**, may repeat X1 q 15 min

OR

- Lorazepam 2 mg IV/IO**, may repeat X1 q 15 min

P

MC

- Contact Medical Control for refractory seizures lasting ≥ 5 min. post second medication administration.
- Ketamine 100 mg mixed into 100 mL NS** administered over 10 min. (Captain and above **ONLY**).

MC

SPECIAL CONSIDERATIONS:

- IO administration should be a last resort.
- If patient received benzodiazepines prior to EMS arrival, consider an alternate benzodiazepine.
- Use caution with repeated dosing of benzodiazepines; closely monitor the airway status and hemodynamics.
- If patient is in the 3rd trimester of pregnancy or post-partum, consider [Management of Obstetric Complications: Pre-Eclampsia/Eclampsia Guideline \(OB02\)](#).

Sepsis

Adult Universal Guideline (AM01)

B	Sepsis Alert: <ul style="list-style-type: none"> The purpose of a Sepsis Alert is to provide pre-arrival Emergency Department notification in order to facilitate rapid assessment and treatment of a suspected severe sepsis patient. A Sepsis Alert will be instituted for patients meeting the following 2 criteria: <ul style="list-style-type: none"> Two or more of the following: <ul style="list-style-type: none"> Temperature > 38° C (100.4° F) OR < 36° C (96.8° F) Respiratory Rate > 22 breaths/min Heart rate > 90 beats/min Blood pressure ≤ 100 mmHg Glasgow coma scale < 15 EtCO₂ ≤ 25 mmHg 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO for hypoperfusion. May repeat up to 2 L if no evidence of pulmonary edema. Acetaminophen IV 1000 mg mixed into 100 mL NS IV/IO infused over 10 min. for fevers > 100° F. 	A
P	<ul style="list-style-type: none"> If MAP < 65 mmHg and evidence of hypoperfusion not responsive to fluid resuscitation, consider one or more of the following vasopressors. OPTIONS (Goal MAP > 65 mmHg): <ul style="list-style-type: none"> Norepinephrine 8 mcg (0.5 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min. IV/IO (preferred) Epinephrine 10 mcg (1 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min IV/IO. 	P

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion		Drip: 0.1-0.5 mcg/kg/min					Mix: 4mg in 250 mL NS yields		
Titrate by 0.02 mcg/kg/min q 5 min.		16 mcg/mL							
Patient kg	40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min	15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min	18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min	21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min	27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min	30	38	45	53	60	68	75	83	90

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion		Drip: 0.05-0.5 mcg/kg/min				Mix: 1mg [1:1000] in 100 mL NS yields			
Titrate by 0.05 mcg/kg/min q 10 min.		10 mcg/mL							
Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

SPECIAL CONSIDERATIONS:

- Early recognition of sepsis and hospital notification is critical to rapid treatment.

Stroke/CVA

Adult Universal Guideline (AM01)

If suspected acute stroke/CVA:
Refer to [Code Stroke Procedure \(PR03\)](#).

B	<ul style="list-style-type: none"> Identify time last known well. Head of bed to semi-fowler/low-fowler position, unless SBP <120 mmHg, then lay flat. Check blood glucose. Transport to an appropriate stroke center. 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO for hypoperfusion. May repeat up to 2 L if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> If SBP > 200 mmHg and/or DBP > 110 mmHg, consider: <ul style="list-style-type: none"> Nicardipine 5 mg/hr. IV/IO infusion, may increase by 2.5 mg/hr. q 5 min. to a maximum of 15 mg/hr., with qualifying blood pressures (preferred) Do not reduce MAP by >20%. 	P

Nicardipine Infusion		Mix: 25mg in 250 mL NS yields 0.1 mg/mL
Titrate by 2.5 mg/hr q 5 min.		
Amount to infuse using microdrip set (60 gtts/mL)		
5 mg/hr		50 gtts/min
7.5 mg/hr		75 gtts/min
10 mg/hr		100 gtts/min
12.5 mg/hr		125 gtts/min
15 mg/hr		150 gtts/min

SPECIAL CONSIDERATIONS:

- Ensure rapid transport; < 10 min scene time or < 5 min air medical evacuation activation is the goal.
- Notify the [designated stroke facility](#) ASAP.

Toxic Exposure/Poisoning

- Scene Safety
- Decontamination as needed
- Consult Emergency Response Guide
- Contact Poison Control (800-222-1222) for guidance in treatment of all toxic exposures/poisonings not listed below.

Adult Universal Guideline (AM01)

Opiates	B	<ul style="list-style-type: none"> • Naloxone 0.4-2 mg IV/IN/IO/IM • May repeat q 2-5 min for respiratory depression, max 10 mg • EMT-B may administer by IN route ONLY. 	B	HBO Therapy INDICATIONS: <ul style="list-style-type: none"> • Syncope • Seizure • AMS • Other neurological symptoms • SpCO >25% • Pregnancy lowers threshold for HBO
Carbon Monoxide	B	<ul style="list-style-type: none"> • Transport to a facility with hyperbaric capability. • Oxygen via NRB or BVM. • Monitor SpCO 	B	
Dystonic Reaction	P	<ul style="list-style-type: none"> • Diphenhydramine 50 mg IV/IO/IM 	P	
Tricyclic Antidepressants If QRS >100 msec, ventricular dysrhythmias, or Brugada	P	<ul style="list-style-type: none"> • Sodium Bicarbonate 1-2 mEq/kg IV/IO 	P	
Anticholinesterase Inhibitors (Carbamate, Nerve Agent, Organophosphate)	P	<ul style="list-style-type: none"> • Atropine Sulfate 2 mg IV/IO, may repeat PRN q 5 min. until resolution of bronchorrhea or bronchospasm. 	P	
Other substances not addressed	B	<ul style="list-style-type: none"> • Contact Poison Control • Consider contacting Medical Control 	B	

SPECIAL CONSIDERATIONS:

- If able to measure carbon monoxide, document levels while providing treatment.
- Do not begin transport until all contaminated clothing has been removed and patient has been decontaminated and cleared by HazMat/Fire Department.
- When contacting Poison Control, document operator name or number in PCR.
- May follow Poison Control guidelines on treatment or contact Medical Control for further orders.



Adult Trauma

Amputation/Hemorrhage

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Control bleeding: <ul style="list-style-type: none"> Direct pressure. Pressure dressing. For junctional or extremity hemorrhage, consider QuickClot Procedure (PR31). For extremity hemorrhage, consider Combat Application Tourniquet Procedure (PR04). Transport to and notify trauma center ASAP. 	B
A	<ul style="list-style-type: none"> For trauma without head injury, administer fluid bolus LR 250 mL IV/IO to target MAP 65 mmHg or adequate perfusion (palpable radial pulse, appropriate mental status). May repeat up to 2 L to meet target. For epistaxis: administer Tranexamic Acid (TXA) 100 mg IN into the affected nares using a MAD device (max total dose 200 mg). 	A
P	<ul style="list-style-type: none"> Pain management per Pain Management Procedure (PR27). If administering TXA, administer Calcium Chloride 10% 1 g mixed into 100 mL NS IV/IO over 10 minutes. Must be administered in separate IV/IO lines or prior to TXA administration. For suspected hemorrhage meeting the below criteria, administer Tranexamic Acid (TXA) 2 gm in 100 mL NS IV infusion given over 10 min.: <ul style="list-style-type: none"> Blunt or penetrating trauma mechanism suffered in the past 3 hours ≥ 16 years of age, and Either show signs of significant hemorrhage (SBP < 90 mmHg, HR > 110 BPM), or are considered in paramedic judgement to be at high risk of significant hemorrhage 	P

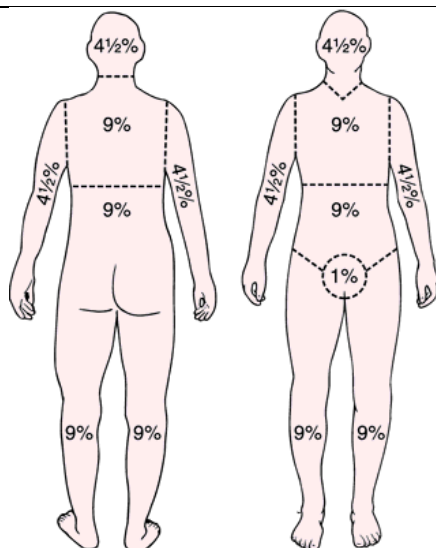
SPECIAL CONSIDERATIONS:

- Transport amputated part wrapped in sterile gauze.
- Keep amputated part cool but dry.
- Do not place amputated part submerged in ice/ice water or unwrapped and directly on chemical cold pack.

Burn

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Remove all burned/burning clothing and any jewelry. If burn is < 10% BSA, cool with sterile saline briefly. Prevent patient from hypothermia. If burn is > 10% BSA, cover with dry, sterile, and loose dressing. 	B
A	<ul style="list-style-type: none"> LR fluid bolus IV/IO per American Burn Association formula: <ul style="list-style-type: none"> Newborn – 4 years old – 125 mL/hr. 5 years old – 18 years old – 250 mL/hr. 18 years old and above – 500 mL/hr. 	A
P	<ul style="list-style-type: none"> Pain management per Pain Management Procedure (PR27). Refer to Adult DSI Procedure (PR06) as needed. 	P



SPECIAL CONSIDERATIONS:

- Advanced airway management, especially in:
 - Full thickness burns to face or perioral region.
 - Circumferential neck burns.
 - Acute respiratory distress.
 - Progressive hoarseness or air hunger.
 - Respiratory depression.
 - Altered mental status.
 - Airway edema.
- For smoke inhalation with signs of toxicity, consider Cyanide Poisoning Guideline (AM21).
- Consider transport to burn center if:
 - Partial thickness > 20% BSA in 10-50 year old.
 - Partial thickness > 10% BSA in < 10 or > 50 year old.
 - Full thickness > 5% BSA in anyone
 - Burns involving face, eyes, ears, genitalia, or joints.
 - Burns complicated by confirmed inhalation injury.
 - High voltage burn.
 - Burns complicated by fracture or other trauma (in which burn is main cause of morbidity).
 - Burns in high-risk patients.

Envenomation

Adult Universal Guideline (AM01)

If allergic reaction, refer to [Allergic Reaction/Angioedema/Anaphylaxis Guideline \(AM19\)](#).

B

- If safe to perform, take a photo of the animal for the hospital.
- If the bite is on an extremity, remove all jewelry and constrictive clothing.
- Keep the patient calm.
- Do **NOT** apply cold packs, constricting bands, or tourniquets.
- If **snake bite**, elevate the extremity at or above the level of the heart, if the patient tolerates.
- If **jellyfish**, scrape off any remaining tentacles or nematocysts, immerse affected body part in hot water (113°F).
- If **lionfish, scorpionfish, or stingray**, immerse affected body part in hot water (113°F).
- If **caterpillar (Asp)**, place duct tape over the sting site. Quickly remove the tape to remove poison hairs or spines that remain in the skin. Wash with warm water.

B

A

- If the patient presents with signs and symptoms of hypoperfusion, administer **fluid bolus LR 250 mL IV/IO**. May repeat up to **2 L** if no evidence of pulmonary edema.

A

P

- Pain management medications per [Pain Management Procedure \(PR27\)](#).

P

SPECIAL CONSIDERATIONS:

- Transport to the closest appropriate hospital.
- Preferred hospital includes Ben Taub General Hospital (adults) and Texas Children's Hospital (pediatrics), due to availability of a medical toxicologist.

Eye Injury

Adult Universal Guideline (AM01)

B

Superficial Injury:

- Patch affected eye.

Chemical Exposure:

- Brush off solid chemical prior to flushing.
- Continual flushing with NS/LR.

Open injury to globe:

- Patch both eyes
- Do not put pressure on or manipulate the eyes.
- Do not administer any medications into eyes.
- Elevate head of bed.
- Do not allow to eat or drink.

B

P

- [Nausea/Vomiting \(AM30\)](#) as needed.
- Pain management medications per [Pain Management Procedure \(PR27\)](#), especially in setting of open globe.

P

SPECIAL CONSIDERATIONS:

- Consider open globe in blunt or penetrating eye trauma (or any puncture or laceration of eyelid or periorbital area).
- Open globe **may** present with the following signs/symptoms:
 - Eye pain
 - Decreased visual acuity
 - Tear-shaped pupil
 - Extrusion of intraocular content
 - Subconjunctival hemorrhage involving entire sclera
 - Hemorrhagic chemosis
 - Hyphemia
 - Lens dislocation

Head Injury

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Consider Spinal Motion Restriction Procedure (PR32). Maintain SpO₂ ≥ 94%. Elevate head of bed 30° for severe head injury with mental status changes, if no contraindications. 	B
A	<ul style="list-style-type: none"> Avoid hypotension, maintain MAP ≥ 75 mmHg. For trauma with head injury, administer fluid bolus LR 250 mL IV/IO to target MAP 75 mmHg. May repeat up to 2 L to meet target. 	A
P	<ul style="list-style-type: none"> Nausea/Vomiting (AM30) as needed. Pain management per Pain Management Procedure (PR27). Consider advanced airway management. <ul style="list-style-type: none"> Oral endotracheal intubation should not delay transport if BVM ventilation is effective in maintaining oxygenation/ventilation and airway is not continually compromised. Refer to Adult DSI Procedure (PR06) as needed. If patient has signs of brain stem herniation, maintain EtCO₂ 30-35 mmHg. 	P
MC	<ul style="list-style-type: none"> If hypotensive refractory to fluid bolus, consider Norepinephrine 8 mcg (0.5 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min. IV/IO to maintain MAP ≥ 75 mmHg. For suspected intracranial hemorrhage consider: Calcium Chloride 10% 1 g IV/IO mixed into 100 mL NS over 10 minutes (Captain and above ONLY). Must be administered in separate IV/IO line from TXA. For suspected intracranial hemorrhage consider: Tranexamic Acid (TXA) 2 g IV/IO mixed into 100 mL NS over 10 minutes (Captain and above ONLY). 	MC

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion		Drip: 0.1-0.5 mcg/kg/min					Mix: 4mg in 250 mL NS yields 16 mcg/mL			
Titrate by 0.02 mcg/kg/min q 5 min.		40	50	60	70	80	90	100	110	120
Patient kg		40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min		15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min		18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min		21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min		24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min		27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min		30	38	45	53	60	68	75	83	90

SPECIAL CONSIDERATIONS:

- Avoid hypoxia (SpO₂ < 94%) and hypotension (MAP < 75 mmHg).**
- Brain stem herniation signs/symptoms:
 - Decreasing mental status, abnormal respiratory pattern, asymmetric/unreactive pupils, decorticate or decerebrate posturing, Cushing's response (bradycardia with hypertension).
- Transport to highest level of care within trauma system for:
 - GCS ≤ 13.
 - Penetrating head trauma.

Multi-System Trauma

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none">Control life-threatening hemorrhage per Amputation/Hemorrhage Guideline (AT01).Consider Spinal Motion Restriction Procedure (PR32).Consider Extraglottic Device if unable to ventilate.Administer supplemental oxygen, maintaining SpO₂ ≥94%.Refer to Head Injury Guideline (AT05) as indicated.Refer to Rapid Transport Policy (P17).Open chest/abdominal wound – refer to Chest Seal Procedure (PR02). Look for exit wounds. Monitor for tension pneumothorax.Rib fractures / flail segment – Immobilize with your hand, a pillow, or binder of some kind.	B
A	<ul style="list-style-type: none">For trauma without head injury, administer fluid bolus LR 250 mL IV/IO to target MAP 65 mmHg or adequate perfusion (palpable radial pulse, appropriate mental status). May repeat up to 2 L to meet target.<ul style="list-style-type: none">If head injury, refer to Head Injury Guideline (AT05).	A
P	<ul style="list-style-type: none">Pain management per Pain Management Procedure (PR27).Refer to Adult DSI Procedure (PR06) as needed.Maintain high index of suspicion for tension pneumothorax; perform needle decompression as needed.Refer to Finger Thoracostomy (PR15) as needed. (Captain and above ONLY)	P

SPECIAL CONSIDERATION:

- Consider pelvic stabilization for suspected pelvic/orthopedic injury with associated hypotension.
- Helmet removal:
 - The helmet should be removed only when enough trained personnel are available to assist.
 - If a helmet is to be removed, maintain manual stabilization of the spine during removal and remove any hardware that could allow a safer removal. Ideally, a helmet and shoulder pads should be removed as one unit.
 - The facemask should be removed on all helmets during transport.

Musculoskeletal/Soft Tissue Injury

Adult Universal Guideline (AM01)

B	<ul style="list-style-type: none"> Control life-threatening hemorrhage per Amputation/Hemorrhage Guideline (AT01). Consider Spinal Motion Restriction Procedure (PR32). Splint to immobilize injury. For Taser response: <ul style="list-style-type: none"> Remove probes unless they are in the face, eyes, genitals, or if paramedic assessment shows that probes should not be removed. Grab probe firmly and quickly (pluck) straight out. Give probes to law enforcement to be kept as evidence. Wipe area with alcohol prep. Control any hemorrhage. Apply Band-Aid and/or gauze. 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 250 mL IV/IO for hypoperfusion. May repeat up to 2 L if no evidence of pulmonary edema. Acetaminophen IV 1000 mg mixed into 100 mL NS IV/IO infused over 10 min. for pain control. 	
P	<ul style="list-style-type: none"> Consider pain management prior to and post splinting, per Pain Management Procedure (PR27). 	P
MC	<ul style="list-style-type: none"> For suspected crush syndrome/prolonged entrapment (> 4 hour) <ul style="list-style-type: none"> Sodium Bicarbonate 1 mEq/kg IV/IO. May repeat 0.5 mEq/kg X 1 q 10 min. Albuterol 2.5 mg via nebulizer single dose (for suspected hyperkalemia). 	MC

Spinal/Neurogenic Shock

Adult Universal Guideline (AM01)

A

- Goal of MAP $\geq$ 90 mmHg to prevent cord ischemia.
- Administer **fluid bolus LR 250 mL IV/IO**. May repeat up to 2 L if no evidence of pulmonary edema.

A

P

- Goal of MAP $\geq$ 90 mmHg to prevent cord ischemia.
- If not responsive to fluid, consider vasopressors.
 - Norepinephrine 8 mcg (0.5 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min. IV/IO.**
 - Epinephrine 10 mcg (1 mL) IVP q 3-5 min. or 0.1-0.5 mcg/kg/min IV/IO.**
- Prevent bradycardia.
 - Atropine 0.5 mg rapid IV/IO q 3-5 min. (max 3 mg total).**
- Consider transcutaneous pacing if patient refractory to pharmacologic treatment with critical hypoperfusion.

P

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Drip: 0.05-0.5 mcg/kg/min

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Drip: 0.1-0.5 mcg/kg/min

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5 min.

16 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min	15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min	18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min	21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min	27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min	30	38	45	53	60	68	75	83	90

SPECIAL CONSIDERATIONS:

- Spinal shock:
 - Loss of neurological function below the level of the spinal cord injury, transient process that can last days to months.
- Neurogenic shock:
 - Hemodynamic instability and autonomic dysfunction that is associated with spinal injury.
 - Classic triad of hypotension, relative bradycardia, and hypothermia.

Traumatic Arrest

Adult Universal Guideline (AM01)

Indication:

- A pulseless patient with suspected traumatic cause.

AT ANY TIME:

Return of pulses go to **Appropriate Guideline**.

B

- [Adult CPR Guideline \(AM02\)](#)
- Consider **withholding resuscitation** if apneic and pulseless with obvious mortal injuries, including:
 - Decapitation
 - Massively deforming head trauma
 - Incineration
 - Massively deforming thorax injury

B

A

- Administer **fluid bolus LR 250 mL IV/IO**. May repeat up to **2 L** if no evidence of pulmonary edema.

A

P

- If **blunt or penetrating thoracoabdominal trauma and no signs of life** (no spontaneous respiration, no pupillary responses, and no spontaneous motor movement) upon EMS arrival, consider **withholding resuscitation**.
- Refer to [Criteria for Death/Withholding Resuscitation Policy \(P05\)](#).
- No ACLS medication administration required.
- Maintain high index of suspicion for tension pneumothorax; perform [needle decompression](#) as needed.
- Refer to [Finger Thoracostomy \(PR15\)](#) as needed prior to discontinuing resuscitative efforts. (Captain and above **ONLY**)

P

MC

- If criteria to withhold resuscitation are **NOT** met and provider desires to discontinue resuscitative efforts, authorization for [Termination of Resuscitation \(PR35\)](#) must be obtained by a MD.

MC

SPECIAL CONSIDERATIONS:

- Do **NOT** apply this algorithm if the suspected cause of cardiac arrest is medical.
- On-scene treatment should consist **ONLY** of (unless waiting for air medical):
 - CABC's (including CPR)
 - Airway management (BLS preferred, unless compromised).
 - Occlusion of open chest injuries.
 - Severe hemorrhage control.



Obstetrics and Gynecology

Management of Uncomplicated Delivery

This guideline applies to patients in labor, with imminent delivery.

A critically important decision point is whether to attempt delivery in the field or transport the patient to the hospital. Factors that affect that decision include:

- Frequent contractions, < 2 min. apart and lasting 30-45 sec.
- Crowning or bulging.
- Mother has the urge to push or move her bowels. Do not allow the patient to utilize the toilet.
- Number of previous deliveries.

B

1. Perform a focused patient assessment.
2. Administer supplemental oxygen to maintain an $\text{SpO}_2 \geq 94\%$.
3. Place the patient supine with knees bent and widely separated. Elevate the patient's buttocks if needed.
4. Have delivery supplies ready (scissors, bulb syringe/suction, clean towels, cord ties).
5. Carefully assist in expulsion of the newborn from the birth canal in its natural progression. Provide gentle pressure using your palm to control delivery of the head. Do not pull the newborn.
6. As the head emerges, encourage the mother not to push so that the delivery process can continue slowly and with minimal trauma to the perineal area.
7. Check for umbilical cord around the neck. If present, slip it off over the head. If it is too tight to remove, quickly clamp cord in two places and cut between clamps.
8. Gently guide the head downward (posterior) until the upper (anterior) shoulder delivers.
9. Gently lift the head upwards (anterior) until the lower (posterior) shoulder delivers.
10. Suction mouth then nose to clear secretions (if obvious airway obstruction or requires positive pressure ventilation, see [Neonatal Resuscitation Guideline \(OB04\)](#)).
 - If the infant does not begin breathing spontaneously after delivery of the body, stimulate it by patting/slapping the feet and drying/cleaning the infant. If normal respirations do not begin within 30 seconds, refer to [Neonatal Resuscitation Guideline \(OB04\)](#).
11. Once delivery is accomplished, position the infant at or slightly below the level of the vagina, clamp the cord at 6" and 8" from the navel, and cut between the clamps.
12. Dry and wrap the newborn in a blanket to preserve body temperature.
 - Alternately, the infant may be placed skin to skin and covered with blankets.
13. Note the delivery time and gender of the newborn.
14. Proceed immediately to [Neonatal Resuscitation Guideline \(OB04\)](#) if resuscitation is necessary.
15. Record APGAR score at 1 min. and at 5 min.
16. If the placenta is delivered (separation usually occurs within 5 min. after delivery), ensure it is transported to the hospital.
17. After delivery, massaging the uterus and allowing the infant to nurse with promote uterine contraction and help control bleeding.

B

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

Management of Obstetric Complications

Pre-Eclampsia/Eclampsia

Pre-Eclampsia/Eclampsia

Pre-Eclampsia – new onset hypertension and either protein in urine or end-organ dysfunction after 20 weeks of gestation in a previously normotensive woman.

Eclampsia – development of grand mal seizures in a woman with pre-eclampsia, in the absence of other neurological conditions that could account for the seizure.

Indications:

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

B	<ul style="list-style-type: none"> • Perform a focused patient assessment. • Administer supplemental oxygen to maintain SpO₂ $\geq 94\%$. • Place patient in the left lateral recumbent position, if possible. • During transport, dim the lights in the transport unit. • Provide immediate transport to the closest appropriate facility. 	B
A	<ul style="list-style-type: none"> • Establish IV of LR KVO or saline lock, as needed • If the patient presents with signs/symptoms of hypoperfusion, administer fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> • If eclampsia is suspected, administer Magnesium Sulfate: <ul style="list-style-type: none"> • Loading dose: 5 g in 100 mL NS IV infusion given over 15 min. • Maintenance dose: 2 g in 100 mL NS IV infusion given over 1 hr. • Monitor for toxicity: sleepiness/drowsiness, decreased respiratory rate, and decreased deep tendon reflexes. <ul style="list-style-type: none"> - If toxicity occurs, discontinue magnesium sulfate. • If the patient continues to seize, contact Medical Control. 	P
MC	<ul style="list-style-type: none"> • If SBP ≥ 160 mmHg or DBP ≥ 110 mmHg, consider: <ul style="list-style-type: none"> • Nicardipine 5 mg/hr. IV/IO infusion, may increase by 2.5 mg/hr. q 5 min. to a maximum of 15 mg/hr. • Goal SBP < 150 mmHg and DBP < 100 mmHg. 	MC

SPECIAL CONSIDERATION:

- Eclampsia may occur up to 30 days post-delivery.

Management of Obstetric Complications

Prolapsed Cord/Limb Presentation

Prolapsed Cord

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

B	<ul style="list-style-type: none"> • Perform a focused patient assessment. • Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$. • Place patient in the knee-chest position. Consider prone knee-chest position. • Palpate the cord for a pulse (excessive palpation may cause vasospasm, potentially leading to a worse outcome). If no pulse is obtained, elevate the presenting fetal part. This is generally performed by placing 2 fingers or an entire hand into the vagina to elevate the fetus off the cord. • Wrap the cord in a saline soaked dressing. Do not attempt to push the cord back in to the vagina. • Notify and provide immediate transport to the closest appropriate facility while maintain elevation of the presenting part. 	B
A	<ul style="list-style-type: none"> • Establish IV of LR KVO or saline lock, as needed • If the patient presents with signs/symptoms of hypoperfusion, administer fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A

Limb Presentation

When faced with a newborn's limb as the presenting part, do not attempt delivery. Transport immediately to the closest appropriate facility.

B	<ul style="list-style-type: none"> • Perform a focused patient assessment. • Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$. • Place patient supine with hips elevated. • Do not attempt to deliver the newborn in the pre-hospital setting. • Keep the patient calm and encourage not to push during contractions. • Notify and provide immediate transport to the closest appropriate facility. 	B
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SPECIAL CONSIDERATION:

- Consider the need for rapid transport over on-scene management.

Management of Obstetric Complications

Breech Presentation/Shoulder Dystocia

Breech (Buttocks) Presentation

When faced with a newborn's buttocks as the presenting part, let the delivery occur naturally and ensure that an open airway is provided until delivery is completed.

B

- Perform a focused patient assessment.
- Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$.
- Place patient supine with knees widely separated. Elevate the patient's buttocks, if needed.
- Allow the delivery to proceed normally while supporting the newborn with the palm of your hand and arm to prevent explosive delivery.
- If the head delivers slowly or becomes trapped in the birth canal, place a gloved hand in the vagina, with the palm towards the newborn's face utilizing a "V" technique with your fingers. Push the vaginal wall away from the newborn's face to create a space until delivery of the head.
- Check the cord to ensure that it is not wrapped around the newborn's neck.
- Notify and provide immediate transport to the closest appropriate facility.

B

Shoulder Dystocia

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

B

- Perform a focused patient assessment.
- Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$.
- Place patient supine with knees widely separated. Elevate the patient's buttocks.
- Hyperflex mother's legs into a knee-chest position (McRoberts maneuver), allowing her pubic symphysis to slide over the infant's anterior shoulder, flattening the maternal sacrum.
- If McRoberts maneuver fails, also apply suprapubic pressure to displace the infant posteriorly. Apply pressure just above the pubic symphysis, not the uterine fundus.
- Notify and provide immediate transport to the closest appropriate facility.

B

Management of Obstetric Complications

Uterine Inversion

Uterine Inversion

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

B	<ul style="list-style-type: none">• Perform a focused patient assessment.• Administer supplemental oxygen to maintain SpO₂ ≥94%.• Place the patient supine.• If the placenta is still attached, do not remove it.• Make one attempt to manually replace the inverted uterus by placing a hand inside the vagina and pushing the fundus along the long axis of the vagina toward the umbilicus.<ul style="list-style-type: none">• If a constriction ring is palpable, pressure should be applied to the part of the fundus nearest the ring to ease it through from bottom to top.• If unsuccessful, cover any protruding tissue lightly with moist sterile dressings.• Notify and provide immediate transport to the closest appropriate facility while maintain elevation of the presenting part.	B
A	<ul style="list-style-type: none">• Establish IV of LR KVO or saline lock, as needed• If the patient presents with signs/symptoms of hypoperfusion, administer fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema.	A

Management of Vaginal Hemorrhage

This guideline applies to females with heavy vaginal bleeding as a result of pregnancy, including abruptio placenta, placenta previa, uterine rupture, miscarriage, or post-partum hemorrhage.

B	<ul style="list-style-type: none"> • Perform a focused patient assessment. • Administer supplemental oxygen to maintain SpO₂ ≥94%. • Positioning: <ul style="list-style-type: none"> • If in 3rd trimester of pregnancy, place the patient in the left lateral recumbent position. • If not in the 3rd trimester and is exhibiting signs/symptoms of hypoperfusion, place patient in Trendelenburg position. • If active post-partum hemorrhage from the vagina, apply a firm uterine massage starting from the pubis toward the umbilicus clockwise. • If miscarriage and the fetus is <20 weeks in gestation: <ul style="list-style-type: none"> • If pulseless and apneic, do not attempt resuscitation measures for the fetus. • If there is any question as to the approximate gestation of the fetus, provide Neonatal Resuscitative Measures (OB04). • If spontaneous respirations and/or pulses, provide Neonatal Resuscitative Measures (OB04) and transport immediately to the closest appropriate facility. • If miscarriage and the fetus is ≥20 weeks in gestation: <ul style="list-style-type: none"> • Provide Neonatal Resuscitative Measures (OB04) and transport to the closest appropriate facility. 	B
A	<ul style="list-style-type: none"> • Establish IV of LR KVO or saline lock, as needed. • If the patient presents with signs/symptoms of hypoperfusion, administer fluid bolus LR 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema. 	A
MC	<ul style="list-style-type: none"> • Consider administering: Calcium Chloride 10% 1 g mixed into 100 mL NS IV/IO over 10 minutes. Must be administered in separate IV/IO lines or prior to TXA administration. (Captain and above ONLY) • Consider administering: Tranexamic Acid (TXA) 2 gm in 100 mL NS IV infusion given over 10 min. (Captain and above ONLY) 	MC

Neonatal Resuscitation

This guideline applies to newborn patients who do not respond to initial stimulation and resuscitation efforts (weak cry, signs of respiratory distress, poor tone). Prompt initiation of resuscitations steps is critical to the successful outcome of a neonatal resuscitation.

B	<ul style="list-style-type: none"> Position the newborn on his/her back, with the airway in the sniffing position. Suction the mouth then nose using bulb suction. Dry the infant, place on a dry blanket, cover the head and keep the infant warm. Provide tactile stimulation, if the newborn is not responding to drying. If heart rate < 100, gasping, or apnea: <ul style="list-style-type: none"> Positive pressure ventilations with <i>room air</i> at 40-60 breaths/min. <ul style="list-style-type: none"> Primary indicator of effective ventilation is heart rate improvement. Use minimum necessary rate/volume to achieve chest rise and heart rate change. If no improvement after 90 sec., ventilate with <i>oxygen</i> until heart rate normalizes, then reassess. If heart rate < 60: <ul style="list-style-type: none"> Positive pressure ventilations with <i>oxygen</i> at 40-60 breaths/min. If no improvement after 30 sec., begin chest compressions at 3:1 ratio (90 compressions and 30 breaths per min.) Record APGAR score at 1 min. and at 5 min. Obtain BGL (< 30 mg/dL is considered hypoglycemia, contact medical control if < 30 mg/dL) 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 10 mL/kg IV/IO over 5-10 min. if ventilation and heart rate are not improved after 3 min. of adequate resuscitation. 	A
P	<ul style="list-style-type: none"> Continuous ECG monitoring and treat life threatening dysrhythmias as indicated. If heart rate <60 bpm and no chest rise during ventilation, intubate. If heart rate remains <60 bpm despite adequate ventilation and chest compressions, consider Epinephrine [1:10,000] 0.01 mg/kg IV. Repeat q 3-5 min. if heart rate remains <60 bpm. 	P

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

Targeted Right Arm (pre-ductal) SpO₂ Post-Delivery

1 min	60-65%
2 min	65-70%
3 min	70-75%
4 min	75-80%
5 min	80-85%
10 min	85-95%

SPECIAL CONSIDERATION:

- For birth defect, consider contacting Medical Control and transporting to an appropriate facility.



Pediatric Medical

Pediatric Universal Guideline

B

- Scene/Crew Safety/PPE.
- Appropriate equipment to patient side.
- Perform focused patient assessment including vital signs.
- Administer supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$, unless otherwise directed.
- Place patient in position of comfort, unless contraindicated.
- Appropriate airway management, procedure, and equipment to credential level. Consider viral/bacterial filter.
- Consider [Spinal Motion Restriction Procedure \(PR32\)](#).
- Consider glucose assessment per [Diagnostic Tools and Procedures \(PR08\)](#).
- Consider pain management per [Pain Management Procedure \(PR27\)](#).

B

A

- Establish IV of LR TKO or saline lock as needed. May utilize IO route if needed.
- If the patient presents with signs and symptoms of hypoperfusion, administer **fluid bolus LR 20 mL/kg IV/IO**. May repeat once if no evidence of pulmonary edema.
- For fever $> 100^\circ\text{F}$ administer **Acetaminophen IV 15 mg/kg** mixed into 100 mL NS **IV/IO** over 10 min.

A

P

- If SBP below lower limit of normal BP for age [Pediatric Vital Signs](#), and evidence of hypoperfusion not responsive to fluid resuscitation, consider vasopressors.
- Cardiac monitoring including 12 Lead ECG as appropriate.
- DSI per [Pediatric Delayed Sequence Intubation Procedure \(PR07\)](#).
- Consider nausea/vomiting treatment per [Nausea/Vomiting Guideline \(PM24\)](#).

P

MC

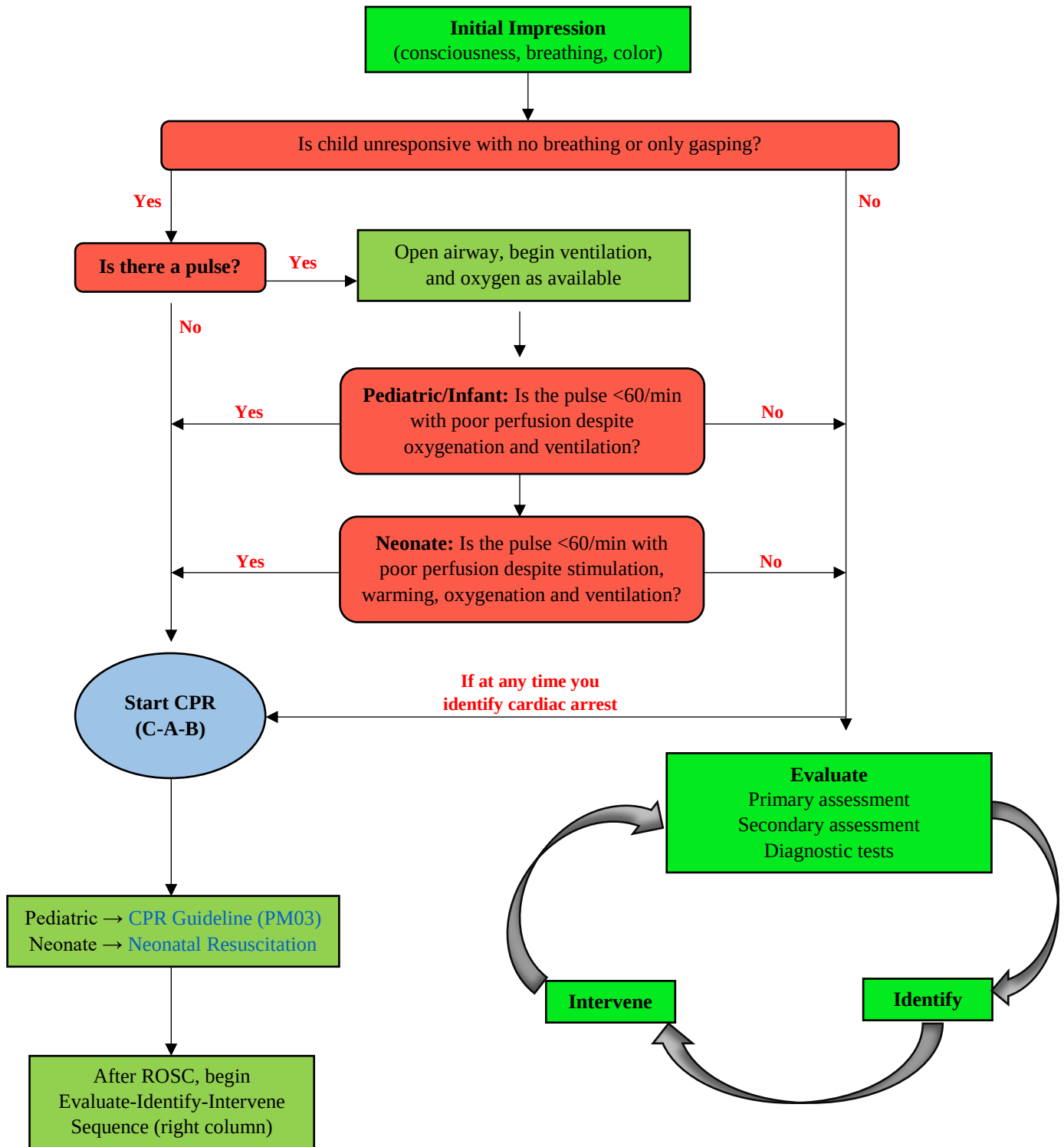
- For deviation from any guideline.
- For any additional orders beyond the guidelines.
- To obtain recommendations.
- Sedation.
- Certain toxic exposures per [Toxic Exposure/Poisoning Guideline \(PM30\)](#).
- Termination of Resuscitation per [Termination of Resuscitation Procedure \(PR35\)](#).
- Suspected acute coronary syndrome
- Acute pulmonary edema with shortness of breath

MC

Pearls:

- If Medical Control is required, the patient is the responsibility of the EMS personnel with the highest certification level on scene.
- All patients with any respiratory compromise, altered mental status, or with medication administration that may have sedative effect should be placed on End Tidal CO_2 (ETCO_2).
- Any patient who a GCS < 15 , who is not in a normal state, should have a blood glucose checked.
- All transported patients should have at least two sets of vital signs.
- Vital signs should be documented at clinically appropriate levels (i.e. patients on vasoactive medications or beta-blockers q 5 min, critical patients q 5-10 min, stable patients q 15-30 min, or shorter based on specific guidelines).
- If Medical Control is unavailable, follow the appropriate guideline and contact Medical Control as soon as possible.
- Oxygen should be titrated to lowest level required to achieve $\text{SpO}_2 \geq 94\%$ to avoid potential oxygen toxicity.

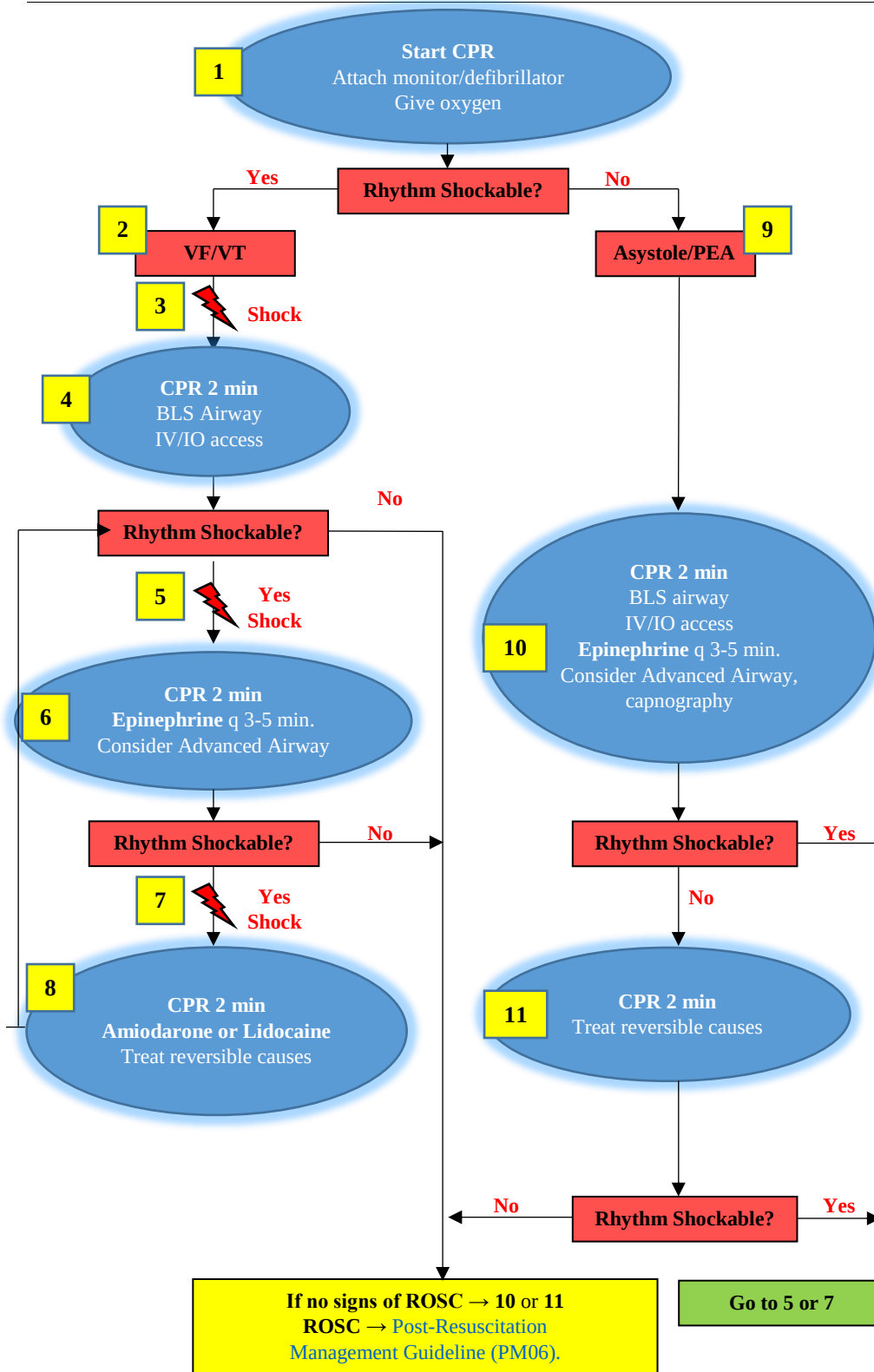
Pediatric Systematic Approach Guideline



SPECIAL CONSIDERATION:

- If at any time you identify a life-threatening problem, immediately begin appropriate interventions.

Pediatric CPR Guideline



CPR Quality

- Mechanical CPR should be implemented as soon as operationally possible to provide high quality CPR.
- Push hard (>1/3 of diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 min.
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths/min w/ continuous chest compressions.
- Quantitative waveform capnography
 - If EtCO₂ <10 mm Hg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in EtCO₂ (typically ≥40 mm Hg)

Shock Energy

- Biphasic: Zoll X Series first shock
 - 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose.

Drug Therapy

- Epinephrine IV/IO dose:
 - 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration). Repeat q 3-5 min.
- Amiodarone IV/IO dose:
 - 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.
- -OR-
 - Lidocaine IV/IO dose:
 - First dose: 1 mg/kg bolus.
 - Maintenance dose: 20-50 mcg/kg/min (repeat bolus dose if infusion initiated <15 minutes after initial bolus therapy)

Advanced Airway

- Extraglottic devices or endotracheal intubation
- ETCO₂ to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath q 6-8 seconds (8-10 breaths/min)

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Hypoglycemia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Asystole/PEA

Consider reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/Hyperkalemia
- Hypothermia

Pediatric Universal Guideline (PM01)

Consider reversible causes:

- Tamponade (cardiac)
- Tension pneumothorax
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

AT ANY TIME:

Return of pulses, go to

[Post-Resuscitation Management Guideline \(PM06\)](#)

AT ANY TIME:

Change in rhythm, go to

Appropriate Guideline

B

- [Pediatric CPR Guideline \(PM03\)](#)

B

OPTIONS:

- **Epinephrine 0.01mg/kg [1:10,000] IV/IO** q 5 min. PRN X 4.
- If hyperkalemia or TCA overdose is suspected, **Sodium Bicarbonate 1 mEq/kg IV/IO (max 50 mEq for child; reduced 4.2% solution recommended for children < 6 months old).** Routine use is NOT recommended.
- If hyperkalemia or calcium channel blocker overdose suspected, **Calcium Chloride 10% 20 mg/kg (0.2 mL/kg) IV/IO** over 10 min. Routine use is NOT recommended.

P

P

No ROSC

ROSC

In atypical circumstances, when termination of resuscitation may be warranted, refer to [Termination of Resuscitation Procedure \(PR35\)](#).

MC

MC

[Post-Resuscitation Management Guideline \(PM06\)](#)

Pearls:

- Always confirm asystole in more than one lead.
- Reversible causes must be identified and addressed by their respective guideline/procedure

Cardiac Arrest Due to Hypothermia

Pediatric Universal Guideline (PM01)

AT ANY TIME:

Return of pulses, go to

Post-Resuscitation Management Guideline (PM06)

AT ANY TIME:

Change in rhythm, go to

Appropriate Guideline

B

- Pediatric CPR Guideline (PM03)
- Treat hypothermia aggressively per Environmental Emergency: Hypothermia Guideline (PM22).

B

P

- If rectal temperature < 30°C (90°F):
 - BLS and aggressive rewarming take priority.
 - Medications should be withheld until temperature >30°C (90°F).
 - If VF and initial defibrillation attempt is unsuccessful, withhold additional defibrillation attempts until patient warmed.
- If rectal temperature > 30°C (90°F), treat per appropriate dysrhythmia guideline.

P

No ROSC

ROSC

Core Temperature 32°-35°C (90°-95°F)

Post-Resuscitation Management Guideline (PM06)

MC

In atypical circumstances, when termination of resuscitation may be warranted, refer to Termination of Resuscitation Procedure (PR35).

MC

SPECIAL CONSIDERATIONS:

- Handle patients gently, as rough handling may induce VF.
- Consider external active and passive rewarming techniques.

Post-Resuscitation Management

Pediatric Universal Guideline (PM01)

B	<p>Optimize oxygenation and ventilation</p> <ul style="list-style-type: none"> Do not hyperventilate Maintain SpO₂ ≥ 94% <p>Obtain frequent vital signs</p>	B
A	<p>Optimize oxygenation and ventilation</p> <ul style="list-style-type: none"> Goal is to maintain EtCO₂ 35-40 mmHg. Other targets may be tolerated for specific patients <ul style="list-style-type: none"> Higher EtCO₂ tolerable for patients with acute lung injury or high airway pressure. Lower EtCO₂ tolerable for treating suspected cerebral edema (avoid hyperventilation which may induce cerebral vasoconstriction). <p>If hypotensive:</p> <ul style="list-style-type: none"> Fluid bolus LR 20 mL/kg IV/IO. May repeat twice if no evidence of pulmonary edema. 	A
P	<p>Optimize oxygenation and ventilation</p> <ul style="list-style-type: none"> Analgesia and sedation per Pediatric DSI guideline (PR07) if intubated. <p>If SBP below lower limit of normal BP for age (Pediatric Vital Signs), and evidence of hypoperfusion not responsive to fluid resuscitation, consider vasopressors.</p> <ul style="list-style-type: none"> Epinephrine 0.1-1.0 mcg/kg/min IV/IO. Norepinephrine 0.1-2 mcg/kg/min. IV/IO <p>Obtain a 12 Lead ECG. If evidence of STEMI, active STEMI Alert (PR33).</p>	P

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.05 mcg/kg/min	0.75	1.5	2.25	3.0	4.5	6.0	7.5	9.0	10.5
0.1 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.15 mcg/kg/min	2.25	4.5	6.75	9.0	13.5	18.0	22.5	27.0	31.5
0.2 mcg/kg/min	3.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0	42.0
0.25 mcg/kg/min	3.75	7.5	11.25	15.0	22.5	30.0	37.5	45.0	52.5
0.3 mcg/kg/min	4.5	9.0	13.5	18.0	27.0	36.0	45.0	54.0	63.0

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5min.

16 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.1 mcg/kg/min	0.9	1.9	2.8	3.8	5.6	7.5	9.4	11.3	13.1
0.12 mcg/kg/min	1.1	2.3	3.4	4.5	6.8	9.0	11.3	13.5	15.8
0.14 mcg/kg/min	1.3	2.6	3.9	5.3	7.9	10.5	13.1	15.8	18.4
0.16 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.18 mcg/kg/min	1.7	3.4	5.1	6.8	10.1	13.5	16.9	20.3	23.6
0.2 mcg/kg/min	1.9	3.8	5.6	7.5	11.3	15.0	18.8	22.5	26.3

PEARLS:

- Over-ventilation is a common cause of hypotension post-arrest.
- Epinephrine infusion is recommended if ROSC is suspected to be reliant on Epinephrine bolus.
- Selection of vasopressor is provider preference. Consider cause of arrest when making selection.

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

Consider reversible causes:

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/Hyperkalemia
- Hypothermia

Pediatric Universal Guideline (PM01)

Consider reversible causes:

- Tamponade (cardiac)
- Tension pneumothorax
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

AT ANY TIME:

Return of pulses, go to

[Post-Resuscitation Management Guideline \(PM06\)](#)

AT ANY TIME:

Change in rhythm, go to

Appropriate Guideline

B

- [Pediatric CPR Guideline \(PM03\)](#)

B

P

- **Defibrillation:**
Biphasic:
 - Initial: 2 J/kg
 - Second: 4 J/kg
 - Subsequent: ≥ 4 J/kg (**max 10 J/kg or adult dose**, whichever is lower)
- **Epinephrine 0.01mg/kg [1:10,000] IV/IO (max single dose 1mg) q 3-5 min. PRN X 4.**

CONSIDER:

- If refractory VF/Pulseless VT,
Amiodarone 5 mg/kg IV/IO. May repeat twice q 5-10 min.
-OR (if Amiodarone unavailable)-
Lidocaine 1.0 mg/kg IV/IO. May repeat **0.5 mg/kg bolus q 5 min. PRN (max total dose 3 mg/kg).**
- If drug-induced prolonged QT interval associated with torsades de pointes suspected,
Magnesium Sulfate 50 mg/kg in 100 mL NS IV/IO over 15 min. (max 2 g).
- If hyperkalemia or TCA overdose is suspected,
Sodium Bicarbonate 1 mEq/kg IV/IO (max 50 mEq for child; reduced 4.2% solution recommended for children <6 months old). Routine use is NOT recommended.
- If hyperkalemia or calcium channel blocker overdose suspected,
Calcium Chloride 10% 20 mg/kg IV/IO (0.2 mL/kg) over 2-5 min. Routine use is NOT recommended.

P

No ROSC

ROSC

MC

In atypical circumstances, when termination of resuscitation may be warranted, refer to [Termination of Resuscitation Procedure \(PR35\)](#).

MC

[Post-Resuscitation Management Guideline \(PM06\)](#)

SPECIAL CONSIDERATION:

- Reversible causes must be identified and addressed by their respective guideline/procedure.

Bradycardia

Pediatric Universal Guideline (PM01)

B

- If HR < 60 with poor perfusion refractory to adequate oxygenation/ventilation, chest compressions per [Pediatric CPR Guideline \(PM03\)](#).

B

P

OPTIONS:

- **Epinephrine 0.01 mg/kg [1:10,000] (0.1 mL/kg) IV/IO** q 3-5 min. PRN.
- For increased vagal tone or primary AV block, consider **Atropine 0.02 mg/kg IV/IO** up to 2 doses (**min 0.1 mg/dose, max 0.5 mg/dose, max total dose 1 mg**)
- If refractory to medications, consider [Transcutaneous Pacing \(PR36\)](#).

CONSIDER:

- **Sedation and/or pain management** while using transcutaneous pacing if not hypotensive.
 - Pain management per [Pain Management Procedure \(PR27\)](#).
 - Sedation per [Sedation Guideline \(PM26\)](#).

P

SPECIAL CONSIDERATIONS:

- Do not delay treatment of bradycardia (HR < 60) with signs of cardiopulmonary compromise, including:
 - Hypotension
 - Acutely altered mental status
 - Shock or poor end-organ perfusion
 - Respiratory distress or failure
- Reversible causes must be identified and addressed by their respective guideline/procedure.
- Consider beta blocker or calcium channel blocker overdose; refer to [Toxic Exposure/Poisoning Guideline \(PM30\)](#).

Narrow Complex Tachycardia

Pediatric Universal Guideline (PM01)

INDICATION:

Non-sinus tachycardia with pulses **and** QRS complex < 0.09 sec.

Hemodynamically unstable, with symptoms including rate-related cardiovascular compromise (AMS, chest pain, dyspnea, acute heart failure, or signs of hypoperfusion).

Symptomatic but no evidence of compromised perfusion.

Obtain 12 lead ECG

- Consider sedation, see below.

Immediate synchronized cardioversion:

- Initial dose: **1.0 J/kg**.
- Subsequent doses: **2 J/kg**

CONSIDER:

- If it will not delay treatment, **Sedation and/or pain management** immediately prior to synchronized cardioversion (do not utilize if hypotensive).

OPTIONS:

- Pain management per [Pain Management Procedure \(PR27\)](#).
- Sedation per [Sedation Guideline \(PM26\)](#).

Sinus tachycardia:

- Vagal Maneuver** (ice to face, Valsalva, carotid sinus massage in older children)
- Search for and treat causes.

Supraventricular tachycardia (SVT):

- Vagal Maneuver** (ice to face, Valsalva, carotid sinus massage in older children)
- Adenosine 0.1 mg/kg rapid IV/IO (max first dose 6 mg)** followed by 20 mL rapid flush. May repeat at **0.2 mg/kg rapid IV/IO (max second dose 12 mg)**.
- If no IV/IO access or Adenosine unsuccessful, consider **synchronized cardioversion**.

SPECIAL CONSIDERATIONS:

- Tachycardia is generally well-tolerated and intervention may only be required in the presence of hypoperfusion.
- Probable sinus tachycardia:
 - Compatible history consistent with known cause (exercise, pain, anxiety, fever, toxins, etc.).
 - Beat-to-beat variability with changes in activity or stress level.
 - Usually < 220/min in infants
 - Usually < 180/min in children
 - P waves present/normal; variable R-R; constant/normal PR interval, QRS narrow (≤ 0.09 seconds).
 - Upper rate of sinus tachycardia is age-related (approximately 220/min – patient age in years).
- Probable SVT:
 - Compatible history (non-specific, CHF symptoms – infant, palpitations – child); history of abrupt rate changes.
 - Different from sinus tachycardia in variability, rate, P waves, R-R, and PR, except QRS is usually narrow.
- All patients receiving medications within this guideline must have defibrillation pads in place.
- Avoid Adenosine use in patient with asthma and COPD.

Wide Complex Tachycardia

Pediatric Universal Guideline (PM01)

INDICATION:

- Non-sinus tachycardia with pulses and QRS complex ≥ 0.09 sec.

Hemodynamically unstable, with symptoms including rate-related cardiovascular compromise (AMS, chest pain, dyspnea, acute heart failure, or signs of hypoperfusion).

Symptomatic but no evidence of compromised perfusion.

Obtain 12 lead ECG

- Consider sedation, see below.

Immediate cardioversion:

- Initial Dose: **1.0 J/kg**
- Subsequent Doses: **2 J/kg**

CONSIDER:

- If it will not delay treatment, **Sedation and/or pain management** immediately prior to synchronized cardioversion (do not utilize if hypotensive).

OPTIONS:

- Pain management per [Pain Management Procedure \(PR27\)](#).
- Sedation per [Sedation Guideline \(PM26\)](#).

OPTIONS:

Ventricular Tachycardia:

- Adenosine 0.1 mg/kg rapid IV/IO** followed by 20 mL rapid flush, *only if regular, monomorphic, and believed to be SVT with aberrancy*. May repeat at **0.2 mg/kg rapid IV/IO X 1** if fails to convert.
- Amiodarone 5 mg/kg in 100 mL NS infusion IV/IO** over 20-60 minutes.

Amiodarone Infusion (over 30 min)					Mix: 300mg in 100 mL NS yields 3.0 mg/mL				
Amount to infuse using microdrip set (60 gtts/mL) in 30 minutes									
Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
5 mg/kg	8	17	25	33	50	67	83	100	117

SPECIAL CONSIDERATIONS:

- All patients receiving medications within this guideline must have defibrillation pads in place.
- Avoid Adenosine use in patient with asthma and COPD.
- Amiodarone is contraindicated in pregnancy.
- Probable ventricular tachycardia:
 - Ventricular rate > 120 /min, regular, wide QRS (> 0.09 seconds).
- P waves often not identifiable; T waves typically opposite in polarity from QRS.

Bronchiolitis

Pediatric Universal Guideline (PM01)

INDICATION:

- Respiratory distress with wheezing or diffuse rhonchi in patients < 2 years of age.

B

- Maintain SpO₂ > 94%. Utilize oxygen via nasal cannula; escalate to face mask as needed.
- Suction the nose and/or mouth if excessive secretions are present.
- BVM for respiratory failure.
 - Consider EGD only if BVM fails.

B

A

If hypotensive:

- Fluid bolus LR 20 mL/kg IV/IO.** May repeat **once** if no evidence of pulmonary edema.

A

P

- If BVM ventilation fails, consider [EGD](#) or [Pediatric DSI Procedure \(PR07\)](#) is:
 - Impending respiratory failure
 - Altered mental status
 - Hypoxia
 - Hypercarbia
- If rapidly deteriorating, [Nebulized Epinephrine 1mg \[1:1,000\] X 1 dose](#) diluted in NS to total 5 mL total volume.

P

SPECIAL CONSIDERATION:

- This guideline excludes anaphylaxis, croup, epiglottitis, foreign body aspiration, and submersion/drowning.

Bronchospasm

Pediatric Universal Guideline (PM01)

INDICATION:

- Respiratory distress with wheezing or decreased air entry in patients ≥ 2 years of age, presumed to be due to bronchospasms from reactive airway disease, asthma, or obstructive lung disease.

B

SpO₂ goal $\geq 94\%$.

MILD OPTIONS:

- Albuterol** 2.5 mg (ideal 0.15 mg/kg) via nebulizer attached to Oxygen at 6 LPM, repeat as needed.

MODERATE OPTIONS:

- Ipratropium** 0.25 mg/dose (<20 kg) or 0.5 mg/dose (>20 kg) via nebulizer q 30 min. (max 2 doses)
- Suction nose and/or mouth if excessive secretions are present.

B

A

MODERATE OPTIONS:

- Fluid bolus** LR 20 mL/kg IV/IO. May repeat **once** if no evidence of pulmonary edema.

A

P

MODERATE OPTIONS:

- Methylprednisolone** 2 mg/kg IV/IO (max dose 125 mg)

SEVERE OPTIONS:

- Magnesium Sulfate** 40 mg/kg IV/IO (max dose 2 g) in 100 mL NS over 15 min.
- For impending respiratory failure secondary to reactive airway disease, **Epinephrine** 0.01 mg/kg (max dose 0.3 mg) [1:1,000] IM, if no clinical signs of improvement.
- Refer to [Pediatric DSI Procedure \(PR07\)](#) as needed.

P

SPECIAL CONSIDERATIONS:

- This guideline excludes bronchiolitis (wheezing <2 years of age), croup, epiglottitis, foreign body aspiration.
- To reduce hyperinflation, hypotension, and risk of tension pneumothorax, consider ventilation with a:
 - Slower respiratory rate.
 - Smaller tidal volume (6-8 mL/kg).
 - Shorter inspiratory time (80-100 mL/min.).
 - Longer expiratory time (I/E 1:4 or 1:5).
- If sudden deterioration, consider DOPE mnemonic:
 - D**isplacement of ETT.
 - O**bstuction of tube.
 - P**neumothorax.
 - E**quipment failure/Evaluate for Auto-PEEP.

Croup/Epiglottitis

Pediatric Universal Guideline (PM01)

INDICATION:

- Suspected croup (usually < 3 yrs old):
 - Slow Onset
 - Generally wants to sit up
 - Barking cough
 - No drooling
 - Fever approx. 100-101 °F
- Suspected Epiglottitis (usually > 3 yrs old):
 - Rapid Onset
 - Prefers to sit up
 - No barking cough
 - Drooling; painful to swallow
 - Fever approx. 102-104 °F
 - Occasional stridor

B	<ul style="list-style-type: none"> • Maintain SpO2 > 90%. Utilize oxygen via nasal cannula; escalate to face mask as needed. • Suction the nose and/or mouth if excessive secretions are present. • BVM for respiratory failure. <ul style="list-style-type: none"> • Consider EGD only if BVM fails. 	B
A	<p>If hypotensive:</p> <ul style="list-style-type: none"> • Fluid bolus LR 20 mL/kg IV/IO. May repeat once if no evidence of pulmonary edema. • Consider for fever > 100°F, Acetaminophen IV 15 mg/kg IV/IO mixed into 100 mL NS administered over 10 min. 	A
P	<ul style="list-style-type: none"> • For stridor at rest with suspected croup, Nebulized Epinephrine 0.5 mg/kg [1:1,000] (max dose 5 mg) diluted in NS to total 5 mL volume. May repeat q 20 min. PRN for continued distress. • If BVM ventilation fails, consider EGD or Pediatric DSI Procedure (PR07) is: <ul style="list-style-type: none"> ○ Impending respiratory failure ○ Altered mental status ○ Hypoxia ○ Hypercarbia 	P

SPECIAL CONSIDERATIONS:

- This guideline excludes anaphylaxis, asthma, bronchiolitis, foreign body aspiration, and submersion/drowning.
- Minimize discomfort/anxiety, as increases in anxiety may worsen airway obstruction.

Pediatric Difficult/Obstructed Airway

Pediatric Universal Guideline (PM01)

B

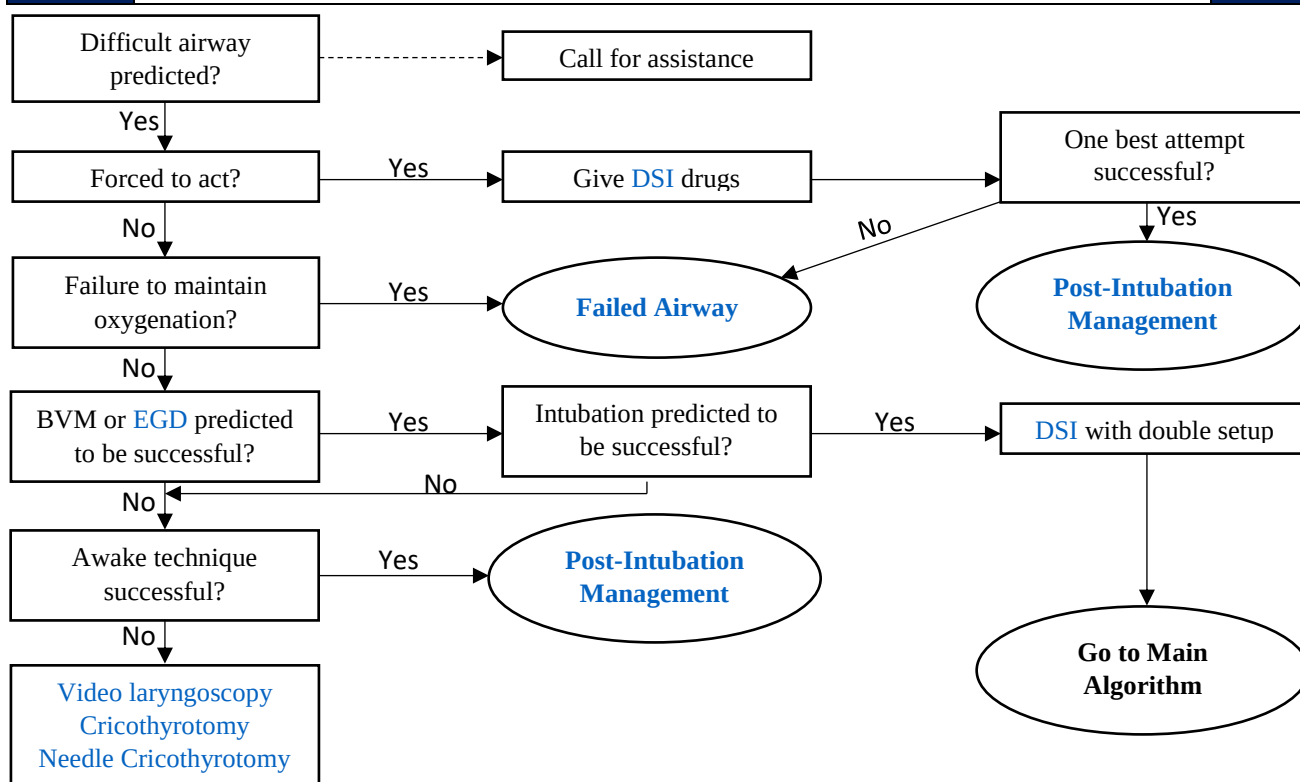
DIFFICULT AIRWAY:

- See flow diagram below (may only perform skills allowed under appropriate protocol for certification level).

OBSTRUCTED AIRWAY:

- Manually open the airway/position the head (if no contraindications).
- Insert OPA if no gag reflex, or NPA.
- Attempt to ventilate, if no spontaneous ventilations.
- Attempt to visualize obstruction; if visible attempt to remove using finger sweep or Magill Forceps.
- If not visible, perform foreign body airway obstruction maneuvers (e.g. subdiaphragmatic abdominal thrusts for child; back blows/chest thrusts for infants).

B



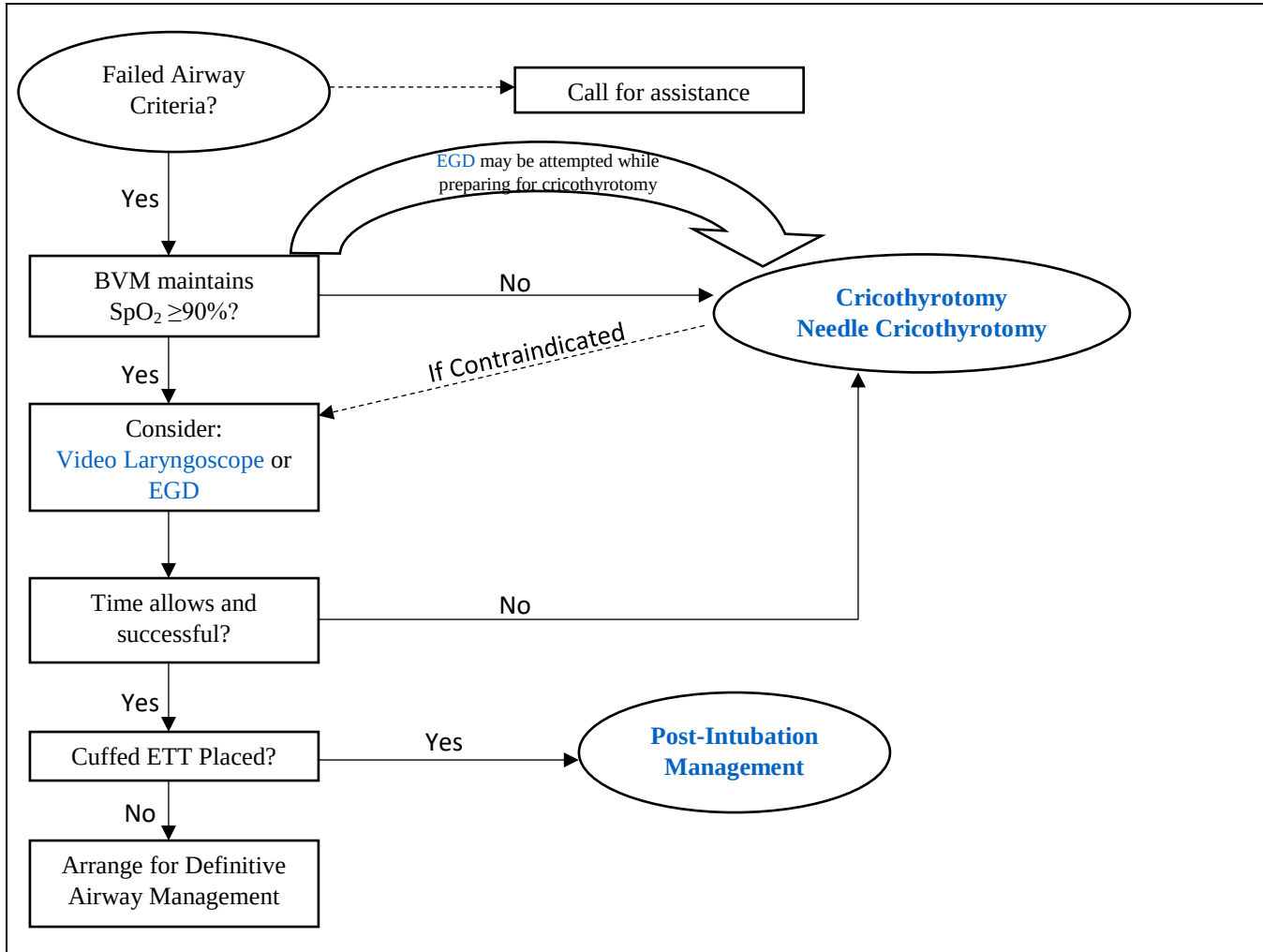
SPECIAL CONSIDERATIONS:

- **MOANS** (Mask Ventilation): **M**ask seal; **O**bstruction/**O**besity; **A**ged; **N**o teeth; **S**tiff (increased ventilator pressures, e.g. asthma, COPD, ARDS, term pregnancy).
- **LEMONS** (Laryngoscopy): **L**ook externally (gestalt); **E**valuate 3-3-2; **M**allampati; **O**bstruction/**O**besity; **N**eck mobility; **S**aturation/**S**ituation.
- **RODS** (Extraglottic Device): **R**estricted mouth opening; **O**bstructed/**O**besity; **D**istorted/**D**isrupted airway; **S**tiff (as for MOANS).
- **SMART** (Surgical Airway): **S**urgery; **M**ass; **A**ccess/**A**natomy; **R**adiation; **T**umor.
- An intubation attempt is defined as anytime the laryngoscope blade passes the plane of the teeth.

Pediatric Failed Airway

Pediatric Universal Guideline (PM01)

Notify receiving hospital ASAP regarding a patient's difficult or failed airway.



SPECIAL CONSIDERATIONS:

- **ELM:** External Laryngeal Manipulation may improve the view of the cords.

Abdominal Pain

Pediatric Universal Guideline (PM01)

A

- **Fluid bolus LR 20 mL/kg IV/IO.** May repeat **once** if no evidence of pulmonary edema.

A

P

CONSIDER:

- Nausea/Vomiting management per [Nausea/Vomiting Guideline \(PM24\)](#).
- Treat pain per [Pain Management Procedure \(PR27\)](#) using caution to not totally blunt symptoms required for hospital assessment. Do not utilize NSAIDS.

P

SPECIAL CONSIDERATIONS:

- In females of childbearing age, consider ruptured ectopic pregnancy.
- Strongly consider obtaining a 12-lead ECG in patients with abdominal pain, as underlying etiology may be [Acute Coronary Syndrome \(AM07\)](#).
- Traumatic abdominal pain should be managed per the [Multi-System Trauma Guideline \(PT06\)](#).
- If unstable, transport rapidly per [Rapid Transport Policy \(P17\)](#).

Allergic Reaction/Anaphylaxis/Angioedema

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Epinephrine 0.01 mg/kg [1:1,000] (0.01 mL/kg) IM (0.3 mg for patients ≥ 25 kg; otherwise max single dose 0.3 mg) for anaphylaxis in anterolateral thigh. May repeat twice q 5-10 min PRN. If in respiratory distress with wheezing, <ul style="list-style-type: none"> Albuterol 2.5 mg (ideal 0.15 mg/kg) via nebulizer, repeat as needed. 	B
A	<ul style="list-style-type: none"> Fluid bolus LR 20 mL/kg IV/IO. May repeat twice if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> If SBP below lower limit of normal BP for age (Pediatric Vital Signs), and evidence of hypoperfusion not responsive to fluid resuscitation, consider vasopressors. Diphenhydramine 1 mg/kg (max 25 mg) IV/IO/IM. Methylprednisolone 2 mg/kg IV/IO (max dose 125 mg). If impending cardiorespiratory failure, Epinephrine infusion 0.05-0.5 mcg/kg/min IV/IO, titrated to effect on BP (to lower limit of normal) in patients who are profoundly hypotensive refractory to volume resuscitation and ≥2 IM epinephrine injections. 	P

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.05 mcg/kg/min	0.75	1.5	2.25	3.0	4.5	6.0	7.5	9.0	10.5
0.1 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.15 mcg/kg/min	2.25	4.5	6.75	9.0	13.5	18.0	22.5	27.0	31.5
0.2 mcg/kg/min	3.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0	42.0
0.25 mcg/kg/min	3.75	7.5	11.25	15.0	22.5	30.0	37.5	45.0	52.5
0.3 mcg/kg/min	4.5	9.0	13.5	18.0	27.0	36.0	45.0	54.0	63.0

Altered Mental Status of Unknown Etiology

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Blood glucose analysis Consider Ammonia Inhalant to stimulate responsiveness. If respiratory depression due to suspected narcotic overdose, Naloxone 0.1 mg/kg (max single dose 2 mg) IN, <ul style="list-style-type: none"> May repeat q 2-5 min, (max 10 mg). Titrate Naloxone to respiratory rate ≥ 12. 	B
A	<ul style="list-style-type: none"> If respiratory depression due to suspected narcotic overdose, Naloxone 0.1 mg/kg (max single dose 2 mg) IV/IO/IN/IM (slow if IV/IO), <ul style="list-style-type: none"> May repeat q 2-5 min, (max 10 mg). Titrate Naloxone to respiratory rate ≥ 12. Administer slow if IV/IO route. 	A
P	<ul style="list-style-type: none"> Intubate if indicated. Refer to Pediatric DSI Procedure (PR07) as indicated. Refer to more specific protocols as indicated. 	P

SPECIAL CONSIDERATIONS:

- With administration of Naloxone the goal is NOT to bring the patient back to a normal status, but to keep the patient breathing effectively. Patient's may become combative and pose a danger to self and crew if full reversal of the substance is achieved.
- Consider possible etiologies of altered mental status, including AEIOUTIPS mnemonic:
 - Acidosis/Alcohol
 - Endocrine
 - Infection
 - Overdose
 - Uremia
 - Trauma/Toxins
 - Insulin/hyperglycemia/hypoglycemia
 - Psychosis
 - Stroke/Syncope/Seizures/post-ictal

Cyanide Poisoning/Smoke Inhalation

Pediatric Universal Guideline (PM01)

INDICATIONS:

- Exposure to smoke or fire in an enclosed space.
- Suspected cyanide exposure.

SYMPTOMS MAY INCLUDE:

- Altered mental status
- Chest discomfort
- Dyspnea/tachypnea
- Hypotension
- Seizures
- Cardiac arrest

B

- Remove from toxic environment.
- High flow O₂ via NRB or BVM.
- SpCO monitoring (if available).
- Consider other exposures, including carbon monoxide, and treat per [Toxic Exposure/Poisoning Guideline \(PM30\)](#).
- Initiate rapid transport to a facility with cyanide treatment capabilities.

B

A

- **Fluid bolus LR 20 mL/kg IV/IO** with pressure infusion for hypotension. May repeat **twice** if no evidence of pulmonary edema.

A

P

- Consider intubation per [Pediatric DSI Procedure \(PR07\)](#).
- If seizures, refer to [Seizure Guideline \(PM27\)](#).

P

Emotional/Mental Distress

Pediatric Universal Guideline (PM01)

INDICATION:

- Emotional/mental distress which impairs care or the physical well-being of the patient.

B

- If possible, remove patient from stressful environment.
- Utilize verbal de-escalation techniques.
- Utilize [Physical Restraint Procedure \(PR29\)](#), if needed.
- Frequent vital signs, including temperature monitoring.
- If hyperthermia, perform immediate cooling measures per [Environmental Emergency: Hyperthermia \(PM21\)](#).

B

A

- Diligent EtCO₂ and SpO₂ monitoring.

A

P

- Consider sedation per [Sedation Guideline \(PM26\)](#).

P

Environmental Emergency - Hyperthermia

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Remove from hot environment. Passive cooling measures as indicated. Remove clothing as needed. If alert and oriented, give small sips of cool liquids. If temp > 40°C (104°F) or if with altered mental status, begin active cooling: <ul style="list-style-type: none"> Continually misting exposed skin with tepid water while fanning victim (most effective). Cold packs to axilla, neck, and groin. 	B
A	<ul style="list-style-type: none"> Cool IV Fluids <ul style="list-style-type: none"> Fluid bolus LR 20 mL/kg IV/IO. May repeat twice if no evidence of pulmonary edema. 	A
P	<ul style="list-style-type: none"> Refer to Pediatric DSI Procedure (PR07) as needed. If uncontrolled shivering occurs during cooling, consider mild sedation per Sedation Guideline (PM26). 	P

SPECIAL CONSIDERATION:

- Monitor for dysrhythmia on ECG closely.

DEFINITIONS:

- Heat cramps – minor muscle cramps usually in the legs and abdominal wall. Temperature is normal.
- Heat exhaustion – tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur.
- Heat stroke – temperature overload and/or electrolyte imbalances, often with altered level of consciousness, with or without cessation of sweating. Temperature is usually >40°C (104°F).

Environmental Emergency - Hypothermia

Pediatric Universal Guideline (PM01)

B

- Passive warming measures:
 - Move to warm environment.
 - Remove wet clothing.
 - Blankets, especially around head.
- For moderate to severe hypothermia, wrapped heat packs to axilla, neck, and groin.

B

A

- Warmed IV Fluids
 - **Fluid bolus LR 20 mL/kg IV/IO.** May repeat **twice** if no evidence of pulmonary edema.

A

SPECIAL CONSIDERATIONS:

- Rectal/Core temperature $<30^{\circ}\text{C}$ (86°F) results in increased risk of ventricular dysrhythmias/VF.
- Handle patient gently, keep horizontal (if able), and limit movement of extremities.
- Bradycardia should be treated with fluids and warming (not Atropine).
- Extremes of age and antihypertensive medications may increase risk of hypothermia.
- Medications may not be effective if core temperature $<30^{\circ}\text{C}$ (86°F).

DEFINITIONS:

- Mild – normal body temperature $35\text{-}32.1^{\circ}\text{C}$ ($95\text{-}89.8^{\circ}\text{F}$); conscious, shivering.
- Moderate – $32^{\circ}\text{-}28^{\circ}\text{C}$ ($89.7^{\circ}\text{-}82.5^{\circ}\text{F}$); impaired consciousness, not shivering.
- Severe – $<28^{\circ}\text{C}$ (82.4°F); unconscious, not shivering, V/S deteriorating.

Hypoglycemia/Hyperglycemia

Pediatric Universal Guideline (PM01)

INDICATIONS:

- Hypoglycemia: Glucose < 60 mg/dL or 60-80 mg/dL with related symptoms
- Hyperglycemia: Glucose > 250 mg/dL with related symptoms

B

HYPOGLYCEMIA:

- **Oral glucose 15 g PO**, may repeat PRN.

B

A

HYPOGLYCEMIA:

- **Dextrose 0.25-0.5 g/kg IV/IO (max 25 g), slow IVP.** May repeat X1 dose.
 - 2.5-5 mL/kg of 10% Dextrose solution in all age groups (preferred).
 - OR
 - 2.5-5 mL/kg of 10% Dextrose solution in infants – 8 years of age.
 - 0.5-1 mL/kg of 50% Dextrose solution slow IV/IO in adolescents and children > 8 years of age.

HYPERGLYCEMIA:

- **Fluid bolus LR 10 mL/kg IV/IO.** May repeat **twice** if no evidence of pulmonary edema or worsening neurological changes indicative of cerebral edema.

A

SPECIAL CONSIDERATIONS:

- Consider and evaluate for other etiologies of altered mental status, including CVA, intoxication, and infection.
- Strongly encourage patients to be transported to evaluate underlying cause of hypoglycemia should AMS resolve after glucose administration.

Nausea/Vomiting

Pediatric Universal Guideline (PM01)

A

- **Fluid bolus LR 20 mL/kg IV/IO.** May repeat **twice** if no evidence of pulmonary edema.

A

P

OPTION:

- **Ondansetron 0.1 mg/kg IV/IO/IM (max 4 mg),** for children > 6 months of age.

P

SPECIAL CONSIDERATION:

- Determine if the patient has any cardiac history, as Ondansetron should be avoided in patients with prolonged QTc intervals.
 - Prepuberty: > 460 msec.
- Ondansetron may be administered to prevent motion sickness in air medical evacuation.

Non-Fatal Drowning

Pediatric Universal Guideline (PM01)

B

- Consider [Spinal Motion Restriction Procedure \(PR32\)](#) as mechanism, history, or physical exam indicates.
- Consider [CPAP](#) if alert and with respiratory distress.

If the patient is unconscious:

- BVM with oral/nasal airway as indicated.
- O₂ if SpO₂ <94%.
- Consider [Extraglottic Device](#).
- Consider PEEP to maximize oxygenation.

B

P

- Treat dysrhythmias per specific guideline.
- [Pediatric DSI Procedure \(PR07\)](#) if SpO₂ < 94% on oxygen and patient is deteriorating.

P

SPECIAL CONSIDERATION:

- If hypothermic, treat per [Environmental Emergency – Hypothermia \(PM22\)](#) or [Cardiac Arrest Due to Hypothermia \(PM05\)](#) Guideline.

Sedation

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> If possible, remove patient from stressful environment. Utilize verbal de-escalation techniques. Utilize Physical Restraint Procedure (PR29). Frequent vital signs including temperature monitoring. If hyperthermia, perform immediate cooling measures per Environmental Emergency: Hyperthermia (PM21). 	B
P	<ul style="list-style-type: none"> Continuous monitoring, including EtCO₂ and SpO₂. Nausea/Vomiting Guideline (PM24), as needed. <p>MILD/MODERATE SEDATION:</p> <ul style="list-style-type: none"> Lorazepam 0.05 mg/kg IV/IO (max single dose 2 mg) q 20 min. PRN (max total dose 4 mg) (preferred) or Midazolam 0.05 mg/kg IN/IM (max single dose 2.5 mg) q 20 min. PRN (max total dose 5 mg) <p>DEEP SEDATION:</p> <ul style="list-style-type: none"> Ketamine 2 mg/kg IV/IO over 1 min. (preferred) OR 4 mg/kg IM/IN q 15 min. X 1. 	P

SPECIAL CONSIDERATIONS:

- Mild Sedation** – Example: anxiety refractory to calming techniques that is impairing care.
- Moderate Sedation** – Example: painful procedures or potential harm to self or others.
- Deep Sedation** – Example: severe isolated trauma (field amputation) or uncontrollable patients with potential harm to self or others.
- Medication selection may be based on the applicable sedation level or lower (example: provider may apply mild sedation dosing for moderate sedation procedure). Provider may not utilize higher sedation level medication unless clinically warranted.
- IN/IM route should be utilized FIRST in combative patients.
- For sedation of patients with behavioral emergencies:
 - Patient must lack capacity and be a danger to self or others (those treated under implied consent).
 - Obtain vascular access as soon as possible when can be done safely.
 - Use minimum dose necessary to resolve danger.

SPECIAL CONSIDERATIONS for the use of Ketamine:

- Must be prepared to bag mask ventilate and/or immediately intubate if vocal cord spasm occurs.**
- May have clinically significant cardiac effect. Use cautiously in patients with significant cardiac history.
- Patient must have physical exam performed prior to medication administration. Document thoroughly.
- Patients with hepatic or renal insufficiency should initially receive a half dose.

Seizure

Pediatric Universal Guideline (PM01)

INDICATIONS:

- Generalized convulsive seizures **WITH** impaired consciousness.

B

- If signs of airway obstruction and chin-lift, jaw thrust, and/or suction does not alleviate it, place an OPA or NPA.
- If oxygenation/ventilation compromised, apply O₂ via NRB or BVM.
- Blood glucose analysis.

B

P

OPTIONS:

If no IV access,

- Midazolam** 0.5 mg/kg IN/IM (max single dose 2.5 mg, may repeat X 1 q 10 min.

If IV access,

- Lorazepam** 0.05-0.1 mg/kg IV/IO (max single dose 2 mg, may repeat X 1 q 10 min.

OR

- Midazolam** 0.05 mg IV/IO (max 2.5 mg/dose), may repeat X 1 q 10 min.

P

MC

- Contact Medical Control for uncontrolled seizures ≥ 5 min. post second dose administration.
- Consider administration: **Ketamine** 1 mg/kg IM, may repeat X 1 q 15 min. (> 3 years old) (Captain and above **ONLY**)

MC

SPECIAL CONSIDERATIONS:

- IO administration should be a last resort.
- If patient received benzodiazepines prior to EMS arrival, consider an alternate benzodiazepine.
- Use caution with repeated dosing of benzodiazepines; closely monitor the airway status and hemodynamics.
- Neonates should receive supportive care and treatment for underlying etiology (e.g. hypoglycemia); only should prolonged seizures receive benzodiazepines.
- If patient is in the 3rd trimester of pregnancy or post-partum, consider [Management of Obstetric Complications: Pre-Eclampsia/Eclampsia Guideline \(OB02\)](#).

Shock & Sepsis

Pediatric Universal Guideline (PM01)

B

- BVM with oral/nasal airway as indicated.
- O₂ if SpO₂ <94%.

B

A

- **Fluid bolus LR 20 mL/kg IV/IO** for hypoperfusion. May repeat **twice** if no evidence of pulmonary edema.
- Fever > 100°F administer **Acetaminophen IV 15 mg/kg** mixed into 100 mL NS over 10 min.

A

P

- If SBP below lower limit of **normal BP for age (RF06)** and evidence of hypoperfusion not responsive to fluid resuscitation, consider vasopressors.

OPTIONS (Goal increase SBP to lower limit of normal for age)

Warm Shock:

- **Norepinephrine 0.05-0.5 mcg/kg/min**, titrated (preferred).

Cold Shock:

- **Epinephrine 0.1-0.3 mcg/kg/min IV/IO infusion**, titrated.

P

MC

- If refractory shock and history of adrenal insufficiency (Addison's disease, congenital adrenal hyperplasia, recent chronic steroid use), **Methylprednisolone 2mg/kg IV/IO (max 125 mg)**.

MC

Table 3. Signs and Symptoms of Shock ⁽⁹⁾

	Cold Shock	Warm Shock	Non-specific
Pulses (central vs peripheral)	Decreased or weak	Bounding	
Capillary refill (central vs peripheral)	≥ 3 sec	Flash (< 1 sec)	
Skin	Mottled, cool	Flushed, ruddy, erythroderma (other than face)	Petechiae below the nipple, any purpura
Mental status			Decreased, irritability, confusion inappropriate crying or drowsiness, poor interaction with parents, lethargy, diminished arousability, obtunded

Table 2. PALS Adjusted Vital Signs for Septic Shock ^(7,8)

Age	Heart Rate	Resp Rate	Systolic BP	Temp (°C)
0d - 1m	> 205	> 60	< 60	<36 or >38
≥ 1m - 3m	> 205	> 60	< 70	<36 or >38
≥ 3m - 1y	> 190	> 60	< 70	<36 or >38.5
≥ 1y - 2y	> 190	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 2y - 4y	> 140	> 40	< 70 + (age in yr × 2)	<36 or >38.5
≥ 4y - 6y	> 140	> 34	< 70 + (age in yr × 2)	<36 or >38.5
≥ 6y - 10y	> 140	> 30	< 70 + (age in yr × 2)	<36 or >38.5
≥ 10y - 13y	> 100	> 30	< 90	<36 or >38.5
> 13y	> 100	> 16	< 90	<36 or >38.5

*† HR followed by ↓ HR with BP changes will be noted as shock becomes uncompensated.

Shock & Sepsis

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.05 mcg/kg/min	0.75	1.5	2.25	3.0	4.5	6.0	7.5	9.0	10.5
0.1 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.15 mcg/kg/min	2.25	4.5	6.75	9.0	13.5	18.0	22.5	27.0	31.5
0.2 mcg/kg/min	3.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0	42.0
0.25 mcg/kg/min	3.75	7.5	11.25	15.0	22.5	30.0	37.5	45.0	52.5
0.3 mcg/kg/min	4.5	9.0	13.5	18.0	27.0	36.0	45.0	54.0	63.0

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5min.

16 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.1 mcg/kg/min	0.9	1.9	2.8	3.8	5.6	7.5	9.4	11.3	13.1
0.12 mcg/kg/min	1.1	2.3	3.4	4.5	6.8	9.0	11.3	13.5	15.8
0.14 mcg/kg/min	1.3	2.6	3.9	5.3	7.9	10.5	13.1	15.8	18.4
0.16 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.18 mcg/kg/min	1.7	3.4	5.1	6.8	10.1	13.5	16.9	20.3	23.6
0.2 mcg/kg/min	1.9	3.8	5.6	7.5	11.3	15.0	18.8	22.5	26.3

Stroke/CVA

Pediatric Universal Guideline (PM01)

If suspected acute stroke/CVA:
Refer to [Code Stroke Procedure \(PR03\)](#).

B

- Identify time last known well.
- Head of bed to semi-fowler/low-fowler position, unless SBP below normal for age, then lay flat.
- Check blood glucose.
- Transport to an [appropriate stroke center](#) (ideal: comprehensive stroke, pediatric specialty center).

B

A

- **Fluid bolus LR 20 mL/kg IV/IO** for hypoperfusion. May repeat **once** if no evidence of pulmonary edema.

A

MC

- If markedly hypertensive, contact Medical Control for possible anti-hypertensive medication administration.

MC

SPECIAL CONSIDERATIONS:

- Ensure rapid transport; < 10 min scene time or < 5 min air medical evacuation activation is the goal.
- Notify the [designated stroke facility](#) ASAP.

Toxic Exposure/Poisoning

- Scene Safety
- Decontamination as needed
- Consult Emergency Response Guide
- Contact Poison Control (800-222-1222) for guidance in treatment of all toxic exposures/poisonings not listed below.

Pediatric Universal Guideline (PM01)

Opiate	B	<ul style="list-style-type: none"> • Naloxone 0.1 mg/kg IV/IN/IO/IM (max 2 mg/dose) • May repeat q 2-5 min for respiratory depression, max 10 mg • EMT-B may administer IN route ONLY 	B	HBO Therapy INDICATIONS: <ul style="list-style-type: none"> • Syncope • Seizure • AMS • Other neurological symptoms • SpCO >25% • Pregnancy lowers threshold for HBO
Carbon Monoxide	B	<ul style="list-style-type: none"> • Transport to a facility with hyperbaric capability. • Oxygen via NRB or BVM. • Monitor SpCO, if available. 	B	
Dystonic Reaction	P	<ul style="list-style-type: none"> • Diphenhydramine 1 mg/kg (max 50 mg) IV/IO/IM 	P	
Tricyclic Antidepressants If QRS > 100 msec., ventricular dysrhythmias, or Brugada	P	<ul style="list-style-type: none"> • Sodium Bicarbonate 1-2 mEq/kg IV/IO 	P	
Anticholinesterase Inhibitors (Carbamate, Nerve Agent, Organophosphate)	P	<ul style="list-style-type: none"> • Atropine Sulfate 0.05 mg/kg IV/IO, may repeat PRN q 5 min. until resolution of bronchorrhea or bronchospasm. 	P	
Other substances not addressed	B	<ul style="list-style-type: none"> • Contact Poison Control • Consider contacting Medical Control 	B	

SPECIAL CONSIDERATIONS:

- If able to measure carbon monoxide, document levels while providing treatment.
- Do not begin transport until all contaminated clothing has been removed and patient has been decontaminated and cleared by HazMat/Fire Department.
- When contacting Poison Control, document operator name or number in PCR.
- May follow Poison Control guidelines on treatment or contact Medical Control for further orders.



Pediatric Trauma

Amputation/Hemorrhage

Pediatric Universal Guideline (PM01)

B

- Control bleeding:
 - Direct pressure.
 - Pressure dressing.
 - For junctional or extremity hemorrhage, consider [QuickClot Procedure \(PR31\)](#).
 - For extremity hemorrhage, consider [Combat Application Tourniquet Procedure \(PR04\)](#).
- Transport to and notify trauma center ASAP.

B

P

- Pain management per [Pain Management Procedure \(PR27\)](#).

P

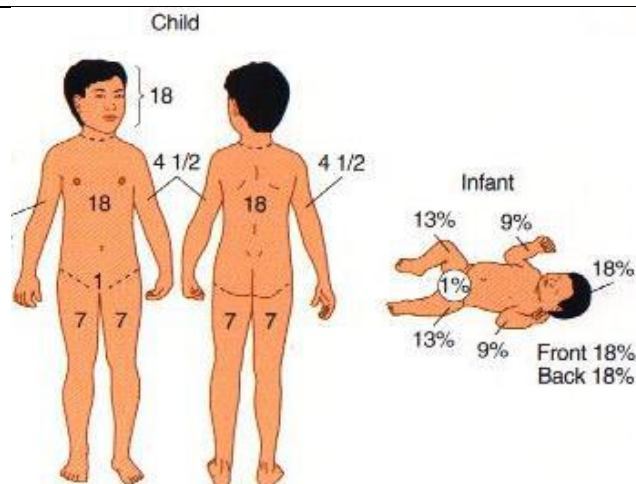
SPECIAL CONSIDERATIONS:

- Transport amputated part wrapped in a moist sterile gauze.
- Keep amputated part cool.
- Do **not** place amputated part submerged in ice/ice water or unwrapped and directly on chemical cold pack.

Burn

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Remove all burned/burning clothing and any jewelry. If burn is < 10% BSA, cool with sterile saline briefly. Prevent hypothermia. If burn is > 10% BSA, cover with dry, sterile, loose dressing. 	B
A	<ul style="list-style-type: none"> LR fluid bolus IV/IO per American Burn Association formula: <ul style="list-style-type: none"> Newborn – 4 years old – 125 mL/hr. 5 years old – 18 years old – 250 mL/hr. 	A
P	<ul style="list-style-type: none"> Pain management per Pain Management Procedure (PR27). Refer to Pediatric DSI Procedure (PR07) as needed. 	P



SPECIAL CONSIDERATIONS:

- Advanced airway management, especially in:
 - Full thickness burns to face or perioral region.
 - Circumferential neck burns.
 - Acute respiratory distress.
 - Progressive hoarseness or air hunger.
 - Respiratory depression.
 - Altered mental status.
 - Airway edema.
- For smoke inhalation with signs of toxicity, consider [Cyanide Poisoning Guideline \(PM19\)](#).
- Consider transport to burn center if:
 - Partial thickness > 20% BSA in 10 years of age or older.
 - Partial thickness > 10% BSA in < 10 years of age.
 - Full thickness > 5% BSA in anyone
 - Burns involving face, eyes, ears, genitalia, or joints.
 - Burns complicated by confirmed inhalation injury.
 - High voltage burn.
 - Burns complicated by fracture or other trauma (in which burn is main cause of morbidity).
 - Burns in high-risk patients.

Envenomation

Pediatric Universal Guideline (PM01)

If allergic reaction, refer to [Allergic Reaction/Angioedema/Anaphylaxis Guideline \(PM17\)](#).

B

- If safe to perform, take a photo of the animal for the hospital.
- If the bite is on an extremity, remove all jewelry and constrictive clothing.
- Keep the patient calm.
- Do **NOT** apply cold packs, constricting bands, or tourniquets.
- If **snake bite**, elevate the extremity at or above the level of the heart, if the patient tolerates.
- If **jellyfish**, scrape off any remaining tentacles or nematocysts, immerse affected body part in hot water (113°F).
- If **lionfish, scorpionfish, or stingray**, immerse affected body part in hot water (113°F).
- If **caterpillar (Asp)**, place duct tape over the sting site. Quickly remove the tape to remove poison hairs or spines that remain in the skin. Wash with warm water.

B

A

- If the patient presents with signs and symptoms of hypoperfusion, administer **fluid bolus LR 20 mL/kg IV/IO**. May repeat **twice** if no evidence of pulmonary edema.

A

P

- Pain management per [Pain Management Procedure \(PR27\)](#).

P

SPECIAL CONSIDERATIONS:

- Transport to the closest appropriate hospital.
- Preferred hospital is Texas Children's Hospital (pediatrics), due to availability of a medical toxicologist.

Eye Injury

Pediatric Universal Guideline (PM01)

B	<p>Superficial Injury:</p> <ul style="list-style-type: none"> • Patch affected eye. <p>Chemical Exposure:</p> <ul style="list-style-type: none"> • Brush off solid chemical prior to flushing. • Continual flushing with LR/NS. <p>Open injury to globe:</p> <ul style="list-style-type: none"> • Patch both eyes • Do not put pressure on or manipulate the eyes. • Do not administer any medications into eyes. • Elevate head of bed. • Do not allow to eat or drink. 	B
P	<ul style="list-style-type: none"> • Nausea/Vomiting Guideline (PM24), as needed. • Pain management per Pain Management Procedure (PR27), especially in setting of open globe. 	P

SPECIAL CONSIDERATIONS:

- Consider open globe in blunt or penetrating eye trauma (or any puncture or laceration of eyelid or periorbital area).
- Open globe **may** present with the following signs/symptoms:
 - Eye pain
 - Decreased visual acuity
 - Tear-shaped pupil
 - Extrusion of intraocular content
 - Subconjunctival hemorrhage involving entire sclera
 - Hemorrhagic chemosis
 - Hyphemia
 - Lens dislocation

Head Injury

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Consider Spinal Motion Restriction Procedure (PR32). Maintain $\text{SpO}_2 \geq 94\%$. Elevate head of bed 30° for severe head injury with mental status changes, if no contraindications. 	B
A	<ul style="list-style-type: none"> Avoid hypotension, maintain SBP with fluid bolus LR 20 mL/kg IV/IO (may repeat twice to meet target) to maintain: <ul style="list-style-type: none"> < 1 month: > 60 mmHg 1-12 months: > 70 mmHg 1-10 years: > 70 + 2X age in years > 10 years: MAP ≥ 75 mmHg 	A
P	<ul style="list-style-type: none"> Nausea/Vomiting Guideline (PM24), as needed. Pain management per Pain Management Procedure (PR27). Consider advanced airway management. <ul style="list-style-type: none"> Oral endotracheal intubation should not delay transport if BVM ventilation is effective in maintaining oxygenation/ventilation and airway is not continually compromised. Refer to Pediatric DSI Procedure (PR07) as needed. If patient has signs of brain stem herniation, maintain EtCO_2 30-35 mmHg. 	P

SPECIAL CONSIDERATIONS:

- Avoid hypoxia ($\text{SpO}_2 < 94\%$) and hypotension (as above).**
- Nasopharyngeal airway and nasal endotracheal intubation shall not be used with significant facial injury or possible basal skull fracture.
- Brain stem herniation signs/symptoms:
 - Decreasing mental status, abnormal respiratory pattern, asymmetric/unreactive pupils, decorticate or decerebrate posturing, Cushing's response (bradycardia with hypertension).
- Transport to highest level of care within the pediatric trauma system for:
 - $\text{GCS} \leq 13$.
 - Penetrating head trauma.
 - Open or depressed skull fracture.

Multi-System Trauma

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none">Control life-threatening hemorrhage per Amputation/Hemorrhage Guideline (PT01).Consider Spinal Motion Restriction Procedure (PR32).Consider Extraglottic Device if unable to ventilate.Administer supplemental oxygen, maintaining SpO₂ ≥94%.Refer to Head Injury Guideline (PT05) as indicated.Refer to Rapid Transport Policy (P17).Open chest/abdominal wound – refer to Chest Seal Procedure (PR02). Look for exit wounds. Monitor for tension pneumothorax.Rib fractures / flail segment – Immobilize with your hand, a pillow, or binder of some kind.	B
A	<ul style="list-style-type: none">For trauma without head injury, if SBP is below normal BP for age (RF06) and signs/symptoms of hypoperfusion, administer fluid bolus LR 20 mL/kg IV/IO to target SBP for age or adequate perfusion (palpable radial pulse, appropriate mental status). May repeat twice to meet target.<ul style="list-style-type: none">If head injury, refer to Head Injury Guideline (PT05).	A
P	<ul style="list-style-type: none">Pain management per Pain Management Procedure (PR27).Refer to Pediatric DSI Procedure (PR07) as needed.Maintain high index of suspicion for tension pneumothorax; perform needle decompression as needed (same adult landmarks, usually 18 or 20 Ga catheter, 2” max).	P

SPECIAL CONSIDERATION:

- Consider pelvic stabilization for suspected pelvic/orthopedic injury with associated hypotension.
- Helmet removal:
 - The helmet should be removed only when enough trained personnel are available to assist.
 - If a helmet is to be removed, maintain manual stabilization of the spine during removal and remove any hardware that could allow a safer removal. Ideally, a helmet and shoulder pads should be removed as one unit.
 - The facemask should be removed on all helmets during transport.

Musculoskeletal/Soft Tissue Injury

Pediatric Universal Guideline (PM01)

B	<ul style="list-style-type: none"> Control life-threatening hemorrhage per Amputation/Hemorrhage Guideline (PT01). Consider Spinal Motion Restriction Procedure (PR32). Splint to immobilize injury. For Taser response: <ul style="list-style-type: none"> Remove probes unless they are in the face, eyes, genitals, or if paramedic assessment shows that probes should not be removed. Grab probe firmly and quickly (pluck) straight out. Give probes to law enforcement to be kept as evidence. Wipe area with alcohol prep. Control any hemorrhage. Apply Band-Aid and/or gauze. 	B
P	<ul style="list-style-type: none"> Consider pain management prior to and post splinting, per Pain Management Procedure (PR27). 	P
MC	<ul style="list-style-type: none"> For suspected crush syndrome/prolonged entrapment (> 4 hour) <ul style="list-style-type: none"> Sodium Bicarbonate 1 mEq/kg IV/IO (max 50 mEq for child; reduced 4.2% solution recommended for children < 6 months). May repeat 0.5 mEq/kg X 1 q 10 min. Albuterol 2.5 mg via nebulizer single dose (for suspected hyperkalemia) 	MC

Spinal/Neurogenic Shock

Pediatric Universal Guideline (PM01)

A

- Goal of **normal BP for age (RF06)**.
- Administer **fluid bolus LR 20 mL/kg IV/IO**. May repeat **twice** if no evidence of pulmonary edema.

A

P

- Prevent hypotension.
- Is SBP below lower limit of normal BP for age (Pediatric Vital Signs), and evidence of hypoperfusion not responsive to fluid resuscitation, consider vasopressors.
 - **Norepinephrine 0.05-0.5 mcg/kg/min. IV/IO.**
 - **Epinephrine 0.05-0.5 mcg/kg/min IV/IO.**
- Prevent bradycardia.
 - Consider transcutaneous pacing if patient refractory to pharmacologic treatment with critical hypoperfusion.

P

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion		Mix: 1mg [1:1000] in 100 mL NS yields 10 mcg/mL							
Titrate by 0.05 mcg/kg/min q 10 min.									
Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.05 mcg/kg/min	0.75	1.5	2.25	3.0	4.5	6.0	7.5	9.0	10.5
0.1 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.15 mcg/kg/min	2.25	4.5	6.75	9.0	13.5	18.0	22.5	27.0	31.5
0.2 mcg/kg/min	3.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0	42.0
0.25 mcg/kg/min	3.75	7.5	11.25	15.0	22.5	30.0	37.5	45.0	52.5
0.3 mcg/kg/min	4.5	9.0	13.5	18.0	27.0	36.0	45.0	54.0	63.0

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion		Mix: 4mg in 250 mL NS yields 16 mcg/mL							
Titrate by 0.02 mcg/kg/min q 5min.									
Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.1 mcg/kg/min	0.9	1.9	2.8	3.8	5.6	7.5	9.4	11.3	13.1
0.12 mcg/kg/min	1.1	2.3	3.4	4.5	6.8	9.0	11.3	13.5	15.8
0.14 mcg/kg/min	1.3	2.6	3.9	5.3	7.9	10.5	13.1	15.8	18.4
0.16 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.18 mcg/kg/min	1.7	3.4	5.1	6.8	10.1	13.5	16.9	20.3	23.6
0.2 mcg/kg/min	1.9	3.8	5.6	7.5	11.3	15.0	18.8	22.5	26.3

SPECIAL CONSIDERATIONS:

- Spinal shock:
 - Loss of neurological function below the level of the spinal cord injury, transient process that can last days to months.
- Neurogenic shock:
 - Hemodynamic instability and autonomic dysfunction that is associated with spinal injury.
 - Classic triad of hypotension, relative bradycardia, and hypothermia.

Traumatic Arrest

Pediatric Universal Guideline (PM01)

Indication:

- A pulseless patient with suspected traumatic cause.

AT ANY TIME:

Return of pulses go to **Appropriate Guideline**.

B

- **Pediatric CPR Guideline (PM03)**
- Consider **withholding resuscitation** if apneic and pulseless with obvious mortal injuries, including:
 - Decapitation
 - Massively deforming head trauma
 - Incineration
 - Massively deforming thorax injury

B

A

- Administer **fluid bolus LR 20 mL/kg IV/IO**. May repeat **twice** if no evidence of pulmonary edema.

A

P

- If **blunt or penetrating thoracoabdominal trauma and no signs of life** (no spontaneous respiration, no pupillary responses, and no spontaneous motor movement) upon EMS arrival, consider **withholding resuscitation**.
- Refer to **Criteria for Death/Withholding Resuscitation Policy (P05)**.
- No ACLS medications required.
- Maintain high index of suspicion for tension pneumothorax; perform **needle decompression** as needed (same adult landmarks, usually 18 or 20 Ga catheter, 2" max).

P

MC

- If criteria to withhold resuscitation are NOT met and provider desires to discontinue resuscitative efforts, authorization for **Termination of Resuscitation (PR35)** must be obtained by a MD.

MC

SPECIAL CONSIDERATIONS:

- Do **NOT** apply this algorithm if the suspected cause of cardiac arrest is medical.
- On-scene treatment should consist **ONLY** of (unless waiting for air medical):
 - CABC's (including CPR)
 - Airway management (BLS preferred, unless compromised).
 - Occlusion of open chest injuries.
 - Severe hemorrhage control.



Clinical Policies

Air Transport

POLICY:

A helicopter may be utilized when any of the following are present:

1. Patient meets criteria for a tertiary care center evaluation, AND
 - a. The patient is a victim of trauma entrapped in a vehicle or machinery and extrication is expected to last > 15 min., OR
 - b. The patient is in urgent need of blood products and transport is delayed, OR
 - c. Ground transport would be markedly delayed, OR
 - d. Any patient identified with a time-sensitive medical or traumatic condition that is unstable or has a high likelihood of becoming unstable and transport by aircraft would be faster than a short scene time and transport by ground to the hospital.
2. An MCI that requires ALS resources beyond capabilities of lead agency command.

The patient should not be in cardiac arrest. By the nature of injury or illness, some patients may be in a peri-arrest state at the time of patient hand-off to the flight crew. Transporting a patient by helicopter in cardiac arrest is not endorsed by the Commission on Accreditation of Medical Transport Systems (CAMTS).

ACTION:

1. The highest ranking medical crew member will determine the need for air transport. An on-scene fire department officer may activate a helicopter prior to arrival of an ambulance to reduce the response window. The ranking medical crew member will decide whether to continue air medical assets upon arrival to the scene and after patient assessment.
2. Any level medical crew member or fire officer may request air medical transport at the direction of the highest ranking medical crew member.
3. The communications center will handle the request and activation of the air medical resource.
4. A safe landing zone should be established by fire department or law enforcement; however, if unavailable, a landing zone may be established by EMS. The pilot has the ultimate liability to ensure safe aircraft operations and may refuse a landing zone if deemed unsafe.
5. Establish a safe landing zone via the T.O.W.W. acronym:
 - A. **T:** Terrain – Establish a landing zone on a flat, hard surface.
 - B. **O:** Obstacles – Ensure a minimum safe landing zone of 60x60 feet in the daytime and 100x100 feet at night.
 - C. **W:** Wind – In addition to 4 landing zone markers, use a 5th to identify the direction of the prevailing wind.
 - D. **W:** Wires – Look up to ensure wires, towers, and/or other obstacles are not close to the landing zone.

Reference:

Commission on Accreditation of Medical Transport Systems – 10th Edition Operations Standards; 5-12-2015. www.camts.org

Child Abuse Recognition and Reporting

PURPOSE:

Children suffer several types of abuse. All are harmful to their physical and emotional development and require intervention. Under the Child Abuse Prevention and Treatment Act (CAPTA), child abuse and neglect means, at a minimum, *“Any recent act or failure to act, on the part of a parent or caregiver, which results in death, serious physical or emotional harm, sexual abuse, or exploitation,”* or *“an act or failure to act which presents an imminent risk of serious harm.”* By Texas State Law, all healthcare providers are obligated to report cases of suspected child abuse or neglect to either the local law enforcement agency or the Texas Department of Family and Protective Services (TDFPS) via the hotline (800-252-5400) or online (www.txabusehotline.org).

POLICY:

1. **Protect** the life of the child from harm, and the EMS team from liability.
2. **Suspect** that the child may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
3. **Respect** the privacy of the child and family.
4. **Collect** as much evidence as possible, especially information.

ACTION:

1. Stabilize and treat all injuries.
2. Immediately request law enforcement assistance. Do not initiate a report to law enforcement or social services in front of the patient, parents, or caregiver, if avoidable.
3. If sexual abuse is suspected, discourage the patient from washing.
4. If patient, parent, or caregivers are hostile, or refuse access/transport, protect your safety and immediately request law enforcement assistance, if not already requested.
5. Do not confront or become hostile to the parent or caregiver.
6. Document:
 - A. In their own words (in quotation marks) all statement by the patient, the parent, or caregiver, including statements made about the manner of the injuries.
 - B. Any abnormal behavior of the patient, parent, or caregiver.
 - C. The condition of the environment and other residents present.
 - D. Who received the report of suspected abuse or neglect.
 - E. If reporting is done after PCR completion, an addendum should be completed with reporting date, time, who reported to, and any other pertinent details.
7. Healthcare providers are required to immediately report any suspicious findings, via one of the following methods:
 - A. To the TDFPS Hotline (800-252-5400). This phone is answered 24 hrs/day. This should occur as soon as reasonably possible at the hospital after patient transfer is completed. Providers may need to request a brief “out of service time” for this process to be completed. Other than the phone interview, there are no other immediate written documentation reporting requirements by the State.
 - B. To the TDFPS website (www.txabusehotline.com).
 - C. To law enforcement directly.
8. When the patient is transported to the hospital, the hospital staff receiving report should be advised of the conditions/situation in which the patient was found. Notification of hospital staff only does **NOT** meet the State reporting requirements.

Consent for Treatment/Transport/Refusal

PURPOSE:

To establish guidelines for providers when addressing issues of consent, or for patients who wish to refuse offered treatment and/or transport.

POLICY:

1. All patients consenting to or refusing treatment and/or transport must:
 - A. Be an adult or an emancipated minor.
 - a. An adult is a person who is 18 years of age or older.
 - b. An emancipated minor is a minor who has obtained a court order of emancipation from a Texas court. Minors may petition the court for emancipation if s/he is:
 - i. A resident of Texas, AND
 - ii. 17 years of age or at least 16 years of age and living separately from his/her parents, managing conservator or guardian, AND
 - iii. Is self-supporting and managing his/her own financial affairs.
 - B. Be able to demonstrate mental capacity. The patient must be able to exhibit:
 - a. An understanding of all the information about the intervention/treatment.
 - b. An appreciation of how that information applies to his/her situation.
 - c. The ability to evaluate the information, comparing risks and benefits.
 - d. The ability to make a rational and consistent choice and communication that choice.
 - C. NOT have been declared legally incompetent by a court of law. If a patient has been declared legally incompetent, his/her court appointed guardian has the right to consent to or refuse evaluation, treatment, and/or transportation for the patient.
 - D. NOT be suicidal or homicidal. A law enforcement officer may arrest a patient who threatens or attempts suicide under Texas Health and Safety Code 573.001. The statute also covers other mentally ill patients and a similar statute allows an arrest for chemical dependency. Only a law enforcement officer can make these arrests.
2. Patients meeting the above criteria who demonstrate mental capacity retain the right to refuse some or all treatment and/or transport. All patients should be encouraged to seek care. Additional tactics may be used to encourage treatment/transport, including, but not limited to, involving the patient's physician, additional providers, a supervisor, or Medical Consult.
3. Under no circumstances will providers deny appropriate treatments or EMS transportation to any patient (or legal patient representative) who requests medical assistance from the provider or agency. The initiation of treatment should not be dependent on the patient's willingness to accept transport (e.g. hypoglycemia, asthma). This does not include the administration of narcotic pain medications and sedative agents.
4. Providers shall not discourage any patient (or legal patient representative) from seeking medical care from a physician or from accepting EMS transport to the hospital.
5. Providers are to follow a patient's advance decisions if they have access to valid advanced directives.
6. When a patient with mental capacity wishes to refuse care, the provider will:
 - A. Identify any patient perceived obstacles to treatment/transport and make reasonable efforts to address those obstacles. This includes, but is not limited to, the offer of transportation without treatment or the offer of transportation to a facility not recommended by guideline. These should be offered only for the purposes of facilitating additional evaluation and/or treatment which would otherwise be refused.
 - B. Inform the patient of the risks of refusal and benefits of treatment/transport in accordance with their presenting complaint. It should be explained that the risks described are not comprehensive due to diagnostic limitations of the pre-hospital environment and that their refusal may result in the worsening of their condition, serious disability, or death.
 - C. Advise the patient that they should seek immediate medical care at an Emergency Department or with their own physician. Further, that they may call 911 again at any time if they wish to be transported to the hospital or if their condition changes or worsens.

Consent for Treatment/Transport/Refusal

DEFINITIONS:

Informed Consent:

In Texas, the general rule of law is that for a person to receive medical treatment, they must give informed consent for that treatment. Without consent, the medical treatment is unlawful. This is true regardless of whether the person receiving the treatment is an adult or minor.

Informed consent is based on an individual's appreciation and understanding of the facts, implications, and future consequences of an action. In order to provide informed consent or refusal, a patient must have capacity, including adequate reasoning faculties (appreciation of risks/benefits) relevant to the decision-making process. They should also be aware of the options available to them if they choose not to accept evaluation and/or treatment.

Implied Consent:

In potentially life-threatening emergency situations where a patient is unable to give informed consent, the law presumes that the patient would give consent if able. In these situations, consent for emergency care is implied if the individual is:

1. Unable to communicate because of an injury, accident, illness, or unconsciousness, and is suffering from what reasonably appears to be a life-threatening injury or illness, OR
2. Suffering from impaired mental capacity, OR
3. A minor who is suffering from what reasonably appears to be a life-threatening injury or illness, and who parents, managing conservator or guardian is not present, OR
4. A court of record orders the treatment of an individual who is in an immediate emergency to prevent the individual's serious bodily injury or loss of life.

Substituted (Surrogate) Consent:

In some circumstances, an individual with legal standing may give consent for a patient when the patient does not have the ability to do so because they are a minor, incarcerated, or have been determined by courts to be legally incompetent. Parents or guardians are entitled to provide consent because they have legal responsibility, and in the absence of abuse or neglect, are assumed to act in the best interests of the child. The best way to think about this is to ask: "Has someone *who is legally competent to do so* given consent to treat this minor?" Without consent, medical treatment cannot begin. The following person(s) may consent to, or refuse, the evaluation, treatment, and/or transportation of a minor:

1. Parent
2. Grandparent
3. Adult (>18) sibling
4. Adult (>18) aunt or uncle
5. Educational institution in which the child is enrolled that has received written authorization to consent/refuse from a person having the right to consent/refuse (i.e. daycare, camp, soccer coach, carpool, etc.)
6. Adult who has actual care, control, and possession of a child under the jurisdiction of a juvenile court
7. A court having jurisdiction over a lawsuit affecting the parent-child relationship of which the child is the subject
8. A peace officer who has lawfully taken custody of the minor, if the peace officer has reasonable grounds to believe the minor is in need of immediate medical treatment
9. A managing or possessory conservator or guardian

In certain situations, a minor may consent to medical treatment without involvement of a parent or legal guardian. A minor may consent to treatment if the minor:

1. Is on active duty with the US armed services.
2. Is 16 years or older residing separately from his/her parents and is managing his/her own financial affairs (regardless of the source of income).
3. Consents to diagnosis and treatment of any infectious/communicable disease with a reporting requirement.
4. Is unmarried and pregnant and consents to care related to the pregnancy, other than abortion.
5. Consents to examination and treatment relating to drug or alcohol dependency.
6. Is unmarried and has custody of his/her biological child, s/he may consent to treatment for the child.

Consent for Treatment/Transport/Refusal

DOCUMENTATION:

1. The provider must document facts sufficient to demonstrate the patient's present mental capacity as well as the patient's understanding of his/her condition and the consequences of refusing treatment and/or transport.
 - A. Describe the intervention offered.
 - B. Identify the reasons the intervention was offered
 - C. Identify the potential benefits and risks of the intervention.
 - D. Note that the patient has been told of the risks – including possible jeopardy to life or health – in not accepting the intervention.
 - E. Clearly document that the patient has unequivocally and without condition refused the intervention.
 - F. Identify why the patient refused, particularly if the patient's decision was rational and one that could not be overcome.
2. If a patient wishes to refuse assessment, treatment, and/or transport, have the patient sign the refusal form relating to the refusal of specific assessment, treatment, or transport, and have a third party witness the signature.
 - A. When possible, the witness should be a law enforcement official or relative of the patient.
 - B. The name of the witness should be documented in the PCR. Contact information should also be documented if the witness is not a law enforcement official, fire department personnel, or relative of the patient.
 - C. EMS personnel should not witness the refusal unless no other witnesses are available.
3. If the patient refuses to sign the refusal form, the provider will document the circumstances under which the patient refused to sign and a substantiating witness signature must be obtained.

Crime Scene Management

PURPOSE:

To establish guidelines for conducting patient care on a potential crime scene.

POLICY:

When pre-hospital care or resuscitation efforts are no longer appropriate, it is every provider's responsibility to assist law enforcement by preserving evidence at a potential crime scene. Any scene involving a patient that is pulseless and apneic is to be considered a crime scene and treated accordingly. In such situations, providers should also maintain a heightened awareness for the presence of weapons.

ACTION:

1. General principles of crime scene management:
 - A. The first arriving provider must make patient access to determine whether resuscitation is indicated. All law enforcement refusal of access to patients by providers will be retrospectively reviewed with law enforcement.
 - B. Weapons should not be handed by a provider unless necessary to ensure a safe patient environment. If weapons must be handled, the provider must wear clean gloves, clearly document the item's original location and new location, and inform on-scene law enforcement.
 - C. Never use anything (phone, sink, bathroom, towels, sheets, blankets, pillows, etc.) from an incident scene.
 - D. Victims of suspected assault should be strongly discouraged against "cleaning up", washing, or showering prior to arrival of law enforcement.
 - E. Providers should not touch anything in a crime scene unless required for patient care activities (including patient wallet). Patient demographic information should be obtained from law enforcement when possible.
 - F. Any ligature(s) involved should be left as intact as possible and should be cut rather than unknotted. All cuts made should be in an area well away from knots, when able.
 - G. Containers of any substance which may have been ingested by the patient should be left in the position found unless needed for on-going patient care. If the container must be touched, use clean gloved hands and limit handling to a minimum in order to preserve any fingerprints that may be present.
 - H. Disposable items used during resuscitation efforts are to be left in place on the body. Sharps used during resuscitation and any extraneous trash should be disposed of by EMS personnel.
 - I. IV/IO lines, airways, and all other disposable equipment used, that are successfully placed, are to remain with the body.
 - J. Pronouncement should be made in accordance with the standards outlined in the [Criteria for Death/Withholding Resuscitation Policy \(P05\)](#) or the [Termination of Resuscitation Procedure \(PR35\)](#). The existence of a possible crime scene should not influence the decision to initiate resuscitation efforts.
 - K. Once a pronouncement time is obtained, the body falls under the jurisdiction of the Justice of the Peace. It may not be touched or altered in any way without authorization from the Justice of the Peace.
 - L. Providers may cover the body with a clean sheet or sterile drape, if requested to do so by law enforcement. All efforts should be made to protect the dignity of the patient and block the public's view of the body.
 - M. It is acceptable to share patient care information with appropriate on-scene law enforcement if the patient has been pronounced dead.
2. Crime scene management where no resuscitation is initiated:
 - A. When pronouncement of death is required only one credentialed provider should remain with the patient. All others should immediately leave the area (via the path of entry) without disturbing the crime scene.
3. Crime scene management with unsuccessful resuscitation:
 - A. Once resuscitation efforts have ceased and a death pronouncement has been made, providers should immediately vacate the area (via the path of entry).
 - B. The Justice of the Peace / Medical Examiner must be able to differentiate between punctures originating from resuscitation efforts and those present prior to arrival. All unsuccessful IV/IO or pleural decompression attempts should be marked on the body by circling with a marker or pen.
4. Crime scene management with patient transport:
 - A. Clothing, jewelry, or other objects removed from the patient should be left on-scene. Clearly document any items left and inform on-scene law enforcement of the items original and current locations.
 - B. When cutting clothing for the purpose of assessment and/or treatment, avoid cutting through existing defects in the clothing (tears, entry or exit points) whenever possible.
 - C. If law enforcement is not on-scene prior to transport, efforts not delaying patient care/transport should be made to preserve the crime scene until arrival of law enforcement.

Criteria for Death/Withholding Resuscitation

POLICY:

For non-traumatic arrest, resuscitation efforts are to be withheld only if a patient is obviously dead per criteria below or a valid Out of Hospital Do Not Resuscitate form or ID device is present (see [Out of Hospital Do Not Resuscitate Policy \(P14\)](#)).

ACTION:

- No pulse, no respirations, and one or more of the following is present:
 - Rigor mortis.
 - Dependent lividity.
 - Decomposition.
 - Patient submerged > 20 min. from arrival of first public safety entity until the patient is in a position for effective resuscitation efforts to begin.
 - Death of fetus < 20 weeks by best age determination available at scene. These are considered products of conception and do not require time of death.
 - The body is frozen so completely that chest compressions are impossible or the nose and mouth are blocked with ice.
- If arrest is traumatic in origin, go to the respective Traumatic Arrest Guideline ([Adult \(AT09\)](#) or [Pediatric \(PT09\)](#)).
- If resuscitation efforts have been initiated or continued by a provider, authorization for [Termination of Resuscitation Procedure \(PR35\)](#) must be obtained from Medical Control.
- Document, in the PCR, the specific indications for withholding resuscitation. Fetal death < 20 weeks gestation may be documented on the mother's PCR; if fetus is ≥ 20 weeks gestation, create a separate PCR.
- Notify law enforcement and the Justice of the Peace of the patient's death. EMS shall release the body to either the Justice of the Peace or law enforcement. While it is not required, it is recommended that the EMS crew stay on scene until the arrival of the Justice of the Peace to provide information which could be helpful in the Justice of the Peace's inquest (e.g. medical history, treatment provided, etc.).
- Refer to [Tissue Referral Procedure \(PR36\)](#).

If you are unsure whether the patient meets the above criteria, perform CPR and contact Medical Control.

Definition of a Patient

PURPOSE:

To establish guidelines for who meets the criteria to be considered a patient under these guidelines.

POLICY:

The definition of a patient is any human that meets one or more of the following:

1. Has a complaint suggestive of potential illness or injury.
2. Requests evaluation for potential illness or injury.
3. Has obvious evidence of illness or injury.
4. Has experienced an acute event that could reasonably lead to illness or injury.
5. Is in a circumstance or situation that could reasonably lead to illness or injury.

These criteria are intended to be considered in the broadest sense. The determination of an individual's status as a patient requires the input of both the individual and the provider, as well as an assessment of the circumstances that led to the request for emergency services. If there are any questions of doubts, the individual should be considered a patient.

Within the guidelines, **pediatric patients** are considered:

1. For the purpose of determining transport destination, anyone < 18 years of age, unless expressly stated in another guideline, standard, or procedure.
2. For the purpose of selecting the appropriate treatment guideline, any patient ≤ 60 kg or who can be measured using the Broselow or Handtevy tape.

ACTION:

1. Anyone that fits the definition of a patient must be properly evaluated by a provider and appropriate treatment and transportation offered. If a patient wishes to refuse offered treatment and/or transport, refer to the [Consent for Treatment/Transport/Refusal Policy \(P03\)](#).
2. Anyone that does not fit the definition of a patient as defined above does not require an evaluation but still requires completion of a PCR (i.e. false alarm). However, documentation of on scene discussions and the demographics of those involved should be attempted. If there is any doubt, an individual should be deemed a patient and appropriate evaluation should be provided and documented in the PCR.

Destination Determination

POLICY:

This guideline shall serve as the basis for the provider's transport destination decision. The patient shall always be transported to a facility in which appropriate definitive therapy can be administered; avoid facilities which are medically inappropriate with respect to capabilities or distance.

Patients shall be transported to a facility that is on the *Approved Destination Facility* list. When performing transfers, patients may be transported to hospitals not on the *Approved Destination Facility* list.

Transport shall be limited to El Campo Memorial Hospital or OakBend Wharton (if the patient refuses El Campo Memorial Hospital), unless the patient meets specialty criteria or have an established relationship with a physician who has facility privileges at another approved facility (documentation of reasoning required). If appropriate per the [Air Transport Policy \(P01\)](#), air transport may be utilized in lieu of transporting to the closest appropriate facility.

If the patient has an established relationship with a physician who has facility privileges AND the patient's current condition is related to a previously treated condition, you may transport the patient to that facility.

In situations where personnel are not able to manage the patient's airway, being unable to intubate or unable to ventilate, the patient shall be transported to the closest facility. If that facility is on divert, the provider may divert to the next closest appropriate emergency department. When performing transfers, if the patient's status deteriorates to a level where the crew is concerned of the patient's ability to make it to the receiving facility, the patient shall be transported to the closest facility.

If a facility is on "Internal Disaster", no patients will be transported to this facility. Personnel shall bypass a facility on "ED Saturation" status if transport to a similar facility does not increase transport time by more than 10 minutes.

If the patient insists of transport to an inappropriate facility for their condition, personnel will explain the benefit of transport to the recommended facility and risks of transport to another facility. Personnel shall obtain an informed refusal signature for the recommended destination. Should the patient or the patient's representative request a facility which is in conflict with this guideline, consult the on-duty supervisor.

Specialty Criteria:

Trauma:

El Campo EMS has adopted the SETRAC Pre-Hospital Trauma Transport Guidelines for destination determination on all trauma patients and the SETRAC Pre-Hospital Pediatric Transport Guidelines for pediatric patients (see following pages).

Cardiac:

Cardiac patients with a STEMI should be transported to a facility with a cardiac catheterization lab.

CPR:

Cardiac arrest with on-going CPR shall be transported to the closest appropriate emergency department.

Stroke:

Stroke patients shall be transported to a stroke receiving facility. Patients who do not meet tPA administration time criteria (last known normal of < 3.5 hrs) but are within the endovascular treatment window of 6-8 hrs should be preferentially transported to a comprehensive stroke center. If hospital destinations are equidistant, comprehensive stroke centers are preferred.

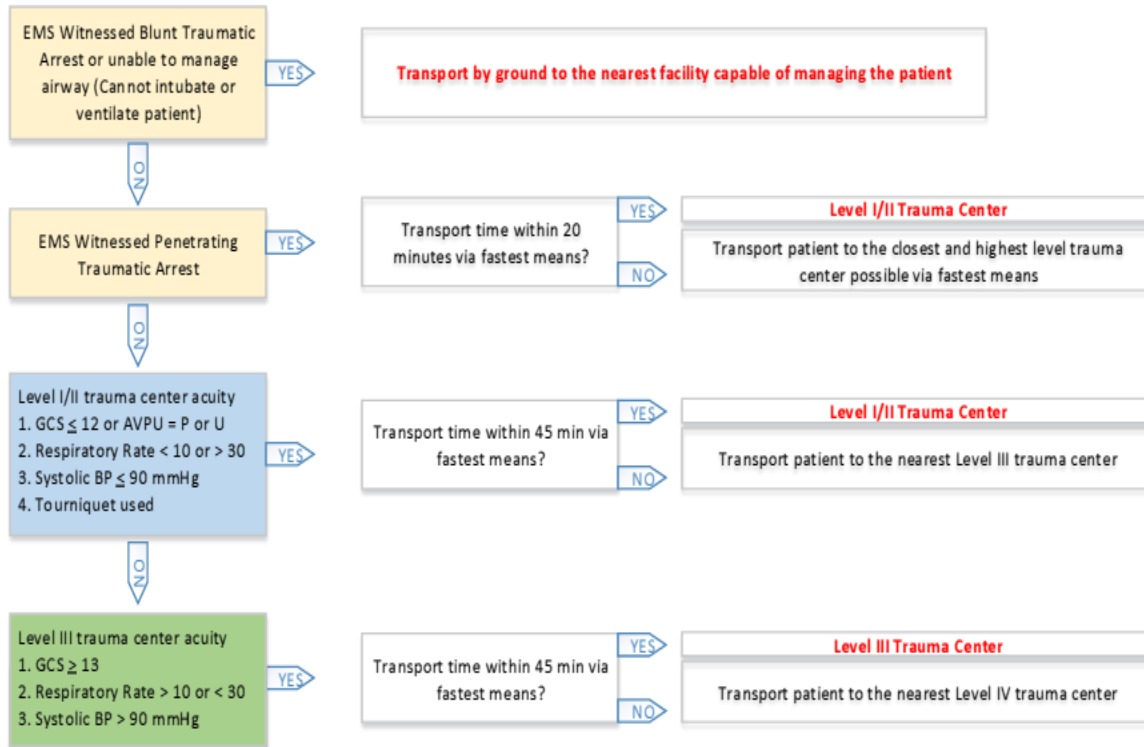
Pre-arrival notification for all patient transports should be attempted and documented.

Destination Determination



SETRAC Pre-Hospital Adult Trauma Transport Guidelines

This is a guide to assist in appropriate trauma transport. Like all protocols, it cannot cover all situations. Good clinical assessment in conjunction with patient stability, MOI, and special patient consideration should guide you to the correct trauma facility. All times indicated are considered from EMS Contact time.



Utilize the Special Patient Consideration Factors by MOI and consider Level III transport

Special Patient Consideration Factors

1. Age $>$ 55 have increased risk of death due to injury $<$ 18 utilize Pediatric Guidelines
2. Anticoagulation and bleeding disorders
3. Burns with no trauma to burn-specific center
4. Time sensitive extremity injuries
5. Pregnancy $>$ 20 weeks

MOI Factors with injury

1. Falls $>$ 20 feet (1 story is 10 feet)
2. High-risk MVI
 - Ejection, partial or complete
 - Death in same passenger compartment
 - Extended extrication time due to vehicle damage
3. Auto vs. Pedestrian or bike
4. Motorcycle crash $>$ 20 mph

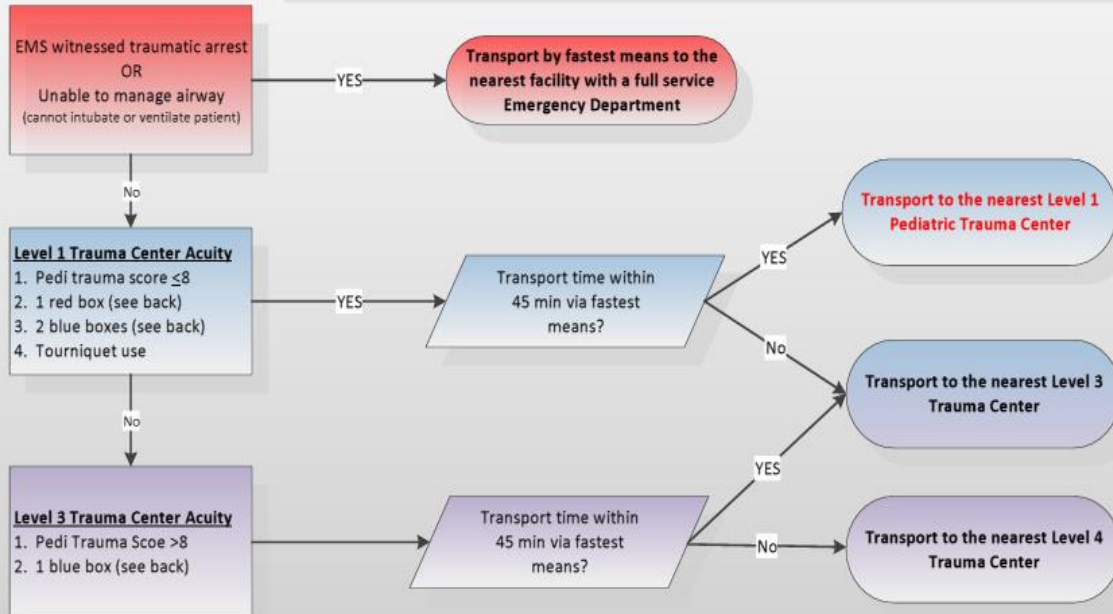
Destination Determination



SETRAC Pre-Hospital Pediatric Transport Guidelines

(A pediatric patient is defined as less than 16 years old)

This is a guide to assist in appropriate trauma transport. Like all protocols it cannot cover all situations. Good clinical assessment in conjunction with patient stability, MOI and special patient considerations should guide you to the correct trauma facility. Times are based on EMS patients contact time.



Utilize the special patient consideration factors followed by MOI and consider Level 1 Pediatric Trauma Center

Special Patient Consideration Factors

1. Bleeding disorders or hemophilia
2. Burns without trauma to Burn Specific Center
3. Submersion injury
4. Special needs patient with suspected injury
5. Unexplained/inconsistent injury

MOI Factors with Injury

1. Fall $\geq 3\times$ patient height
2. High risk MVC
 - Ejection, partial or complete, including child safety seat
 - Death in same passenger compartment
 - Extended extracaitontime due to vehicle damage with injury
 - Front seat air bag deployment
3. Auto vs. pedestrian or bike
4. Motorcycle crash > 20 mph

Last revised: 4/2013

Destination Determination

PEDIATRIC TRAUMA SCORE			
Severity	+2	+1	-1
Size	>20kg	11-20kg	<11kg or <33 inches on pedi tape
Airway	Normal	Supplemental Oxygen	Assisted or intubated
Consciousness	Awake	Amnesia or + LOC	Altered mental status, coma, presence of paralysis, or suspicion of spinal cord injury, or loss of sensation
Circulation	Good peripheral pulses SBP > 90	Carotid or femoral pulses palpable, BUT radial or pedal pulses not palpable, or SBP < 90	Faint or non-palpable carotid or femoral pulses, or SBP < 50
Fracture	None seen or suspected	Single closed long bone fracture	Open long bone fracture, or multiple fracture sites, or multiple dislocations
Cutaneous	No visible injury	Contusion or abrasion	Major soft tissue disruption, or major flap avulsion, or 2nd or 3rd degree burns to > 10% TBSA, or amputation, or any penetrating injury to the head, neck or torso

Last revised: 4/2013

Destination Determination

Facility	Trauma - Level 1	Trauma - Level 3	Pedi Trauma - Level 1	Comprehensive Stroke	Primary Stroke	Interventional Cath Lab	Diagnostic Cath Lab	Burn Center	Hyperbaric	No L&D
Ben Taub General Hospital	X			X		X				
Citizen's Medical Center		X			X	X				
Detar Navarro		X			X	X				
El Campo Memorial Hospital							X			X
Matagorda Regional Medical Center							X			
MD Anderson Cancer Center										X
Memorial Hermann - Southwest				X	X	X				
Memorial Hermann - Sugarland					X	X				
Memorial Hermann - TMC	X		X	X		X		X	X	
Methodist Hospital - TMC				X		X				
Methodist Hospital - Sugarland					X	X				
Oakbend - Jackson Street					X	X				X
Oakbend - Wharton										X
Oakbend - Williams Way					X					
St. Luke's - Sugarland						X				
St. Luke's - TMC				X		X				
Texas Children's - TMC			X							
The Women's Hospital of Texas										
VA Hospital					X	X				X

Domestic Violence and Elder Abuse Recognition and Reporting

PURPOSE:

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elderly abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens.

POLICY:

1. **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
2. **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
3. **Respect** the privacy of the patient and the family.
4. **Collect** as much information and evidence as possible and preserve physical evidence.

ACTION:

1. Assess the patient for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior disorders, excessive aggression, substance abuse, medical non-compliance, or repeated EMS request. This is typically best done in private with patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to the posterior forearms) and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess the patient for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Family and Protective Services (800-252-5400) as soon as practical.
5. If a domestic violence is suspected, provide the patient with information regarding the nearest family violence shelter center, document both that the patient has received the information and the reasons for the provider's belief that the patient's injuries were caused by family violence. Further, provide the patient with a written notice compliant with Texas Family Code Sec. 71.0021.

EMS Screening

PURPOSE:

EMS personnel transport patients with actual or potential emergency medical conditions. EMS personnel shall not be required to transport patients who, after a screening exam, are found to not have evidence of an emergency medical condition.

DEFINITIONS:

- **Emergency Medical Condition-** a condition manifesting itself by acute symptoms of sufficient severity (including severe pain) such that the absence of immediate medical attention could reasonably be expected to result in placing the individual's health [or the health of an unborn child] in serious jeopardy, serious impairment to bodily functions, or serious dysfunction of bodily organs

CRITERIA:

Patients eligible for EMS Screening, in the absence of an emergency medical condition:

- 1) Under age 65
- 2) Not known to be pregnant
- 3) Patient has no condition that would qualify for treatment under the El Campo EMS clinical operating guidelines (other than first aid such as wound dressing).
- 4) Normal vital signs
 - a. Systolic BP 100-180
 - b. Diastolic BP 60-110
 - c. Pulse 60-110 (HR of 50-59 is acceptable if ECG shows sinus bradycardia)
 - d. Temperature > 96.8°F and < 100.4°F
 - e. Oxygen saturation > 94% on room air
 - f. GCS of 15 or normal baseline mental status

ACTION:

- 1) In order to evaluate for evidence of emergency medical conditions, EMS personnel must evaluate and record all the following:
 - a. Blood pressure
 - b. Pulse
 - c. Temperature
 - d. Oxygen Saturation
 - e. GCS
- 2) If EMS personnel determine that there is no evidence of an emergency medical condition in an eligible patient, the crew may (but is not required to) decline to provide transport.
- 3) Attempt to have the patient sign the EMS SCREENING signature form on the ePCR. If the patient refuses to sign, follow the same procedure as if the patient refused to sign any other form.

SPECIAL CONSIDERATIONS:

- If a patient wishes to go to an emergency department and does not have other means of transport (ie. Friends or Family), give the patient a list of alternative means of transport, county health resources, and private ambulance services that the patient can call, AND
- Advise the patient to contact a primary care provider as soon as possible.
- If a language barrier is present, an interpreter or language line must be used. EMS personnel must ensure that the patient understands the directions given via interpreters.

Fire Stand-By Events

PURPOSE:

To have EMS personnel ready for a rapid response to any injured or ill patient on fire-related events.

POLICY:

EMS providers will evaluate and treat personnel operating on the fire ground or at training functions with injuries and/or illness.

ACTION:

1. Responding providers should report to the incident commander and identify the rehabilitation area.
2. Providers should respond to the rehabilitation area with all equipment (bags, stretcher, monitor, oxygen) and stand-by in that safe area.
3. Providers should be ready to respond at all times in case an injured or ill patient is identified.
4. Transport immediately to an appropriate facility if a patient has been identified with significant smoke inhalation or with signs and symptoms of cyanide poisoning (AMS, hypotension, signs of shock, etc). See respective Cyanide Poisoning Guideline ([Adult \(AM21\)](#) and [Pediatric \(PM19\)](#)).

Hospital Diversion

PURPOSE:

To provide guidance to crew members when notified of hospital diversion by receiving facility.

POLICY:

1. The Administrator or Director of Nurses will, by their policies and procedures, issue personally the order, if possible.
2. The name, position, and reason for the diversion should be obtained. This information should be documented in the PCR.
3. The facility being diverted to should immediately notified of the diversion and the clearance received.
4. The dispatcher should be notified as soon as possible.
5. The patient's family or responsible party should be notified as soon as possible, if appropriate.
6. If the EMS personnel's assessment deems the patient to be unstable for transport to another facility other than the hospital issuing the diversion order, the attendant should follow the following guidelines:
 - a. Advise the official at the facility diverting from that the patient needs to be transported to the closest facility (the facility issuing the diversion order) and the reason and assessment information relayed as soon as possible (e.g. cardiac arrest, severe hemorrhagic shock, etc).
 - b. Document all communication with the facility requesting diversion and the outcome of those communications.

Infant Abandonment

PURPOSE:

To provide:

1. Protection to unwanted infants that are placed into custody of EMS under this law.
2. Protection to EMS systems and personnel when confronted with this issue.

POLICY:

The Texas Safe Haven Act (TX Family Code §262.301) provides a mechanism for unwanted infants to be taken under temporary custody by an emergency infant care provider (including Emergency Medical Services providers) if the infant who is presented by the parent is ≤60 days old. The emergency infant care provider will accept and protect infants who are presented to the emergency infant care provider in this manner, until custody is released to the receiving hospital. The designated emergency infant care provider is not liable for damages related to the provider's taking possession of, examining, or treating the child, except for damages related to the provider's negligence.

An emergency infant care provider shall, without a court order, take possession of a child who appears to be ≤60 days old if the child is voluntarily delivered to the provider by the child's parent, and the parent did not express intent to return for the child. An emergency infant care provider who takes possession of a child under this section shall perform any act necessary to protect the physical health or safety of the child. An emergency infant care provider who takes possession of a child has no legal duty to detain or pursue the parent and may not do so unless the child appears to have been abused or neglected. The emergency infant care provider has no legal duty to ascertain the parent's identity, and the parent may remain anonymous. However, the parent may be given a form for voluntary disclosure of the child's medical facts and history.

ACTION:

1. Perform a pediatric assessment using the [Pediatric Systematic Approach Algorithm \(PM02\)](#).
2. Treat as indicated per the appropriate guidelines.
3. Keep the child warm.
4. Notify the Department of Protective and Regulatory Services (800-252-5400) and law enforcement.
5. Transport the child to an appropriate medical facility as per the [Destination Determination Policy \(P07\)](#).
6. Assure the child is secured in an appropriate child restraint device for transport.
7. Document guidelines, procedures, and agency notifications in the PCR.

Interfacility Transports

PURPOSE:

To provide guidance on the treatment of patients being transferred from a hospital to another hospital.

POLICY:

1. Refer to Interfacility Transport Matrix
2. Obtain patient's medical records and transfer paperwork which may include a memorandum of transfer, physician certification statement, and transferring documents.
3. If patient or paperwork is not ready within 15 minutes of arrival at the hospital, the crew may return in service and advise the hospital to call dispatch when the patient and paperwork are ready.
4. If the patient is intubated, confirm airway and placement. Obtain ventilator settings from the facility.
5. If the patient condition changes en route refer to the El Campo EMS Clinical Operating Guidelines.
6. Give a report to the receiving facility, including the report you received from the transferring facility, the patient's condition and treatment during the transport, and all paperwork related to the transport. Copies should be obtained to attach to the PCR.

SPECIAL CONSIDERATIONS:

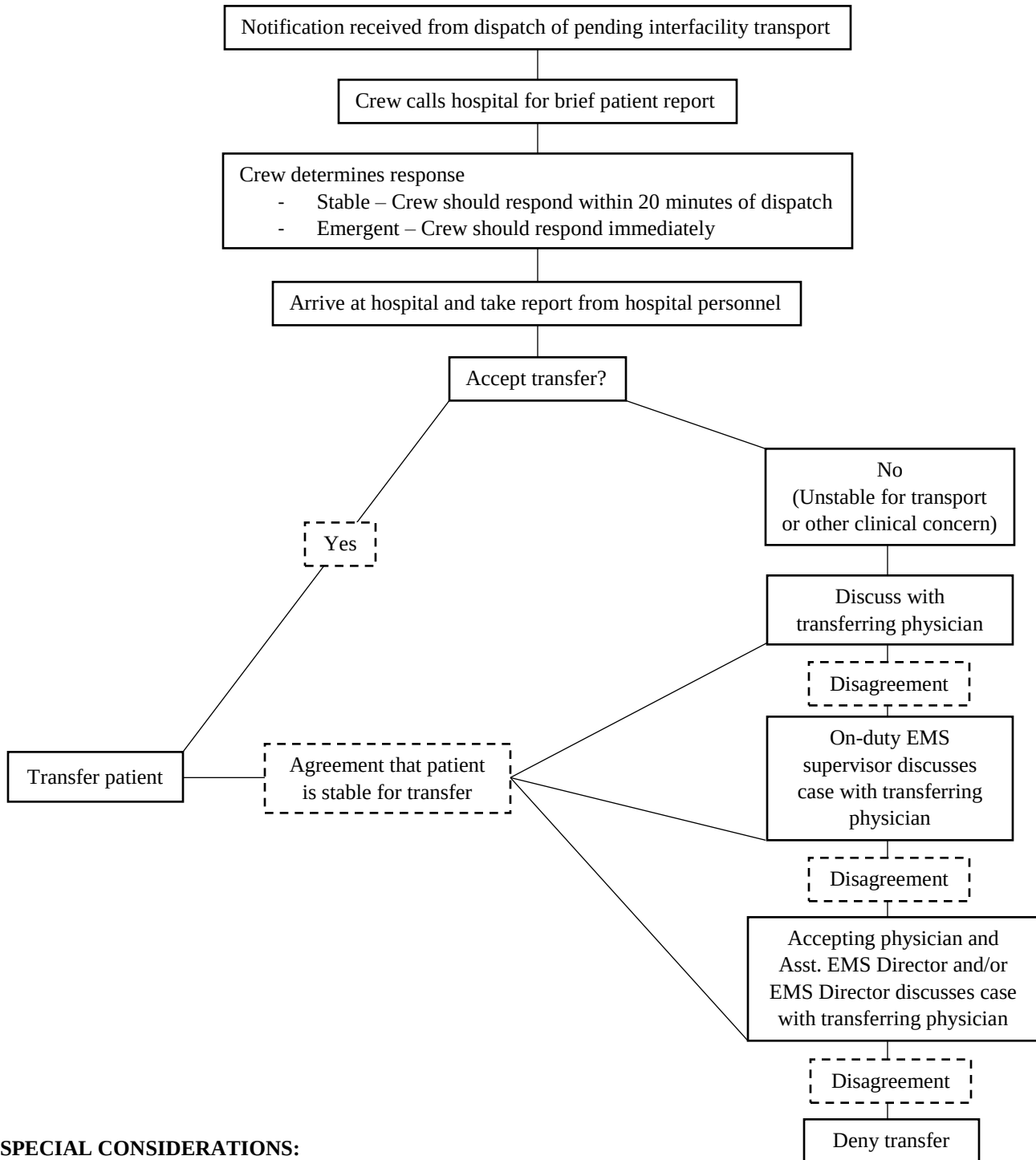
- If, at any time, the patient deteriorates and/or has significant clinical changes, El Campo EMS Clinical Operating Guidelines are to be used and the patient should be taken to the closest appropriate facility.
- If the patient requires treatment(s) outside of the EMS personnel's scope of practice as defined by the El Campo EMS Clinical Operating Guidelines; a nurse, physician, respiratory therapist, or other personnel should accompany the El Campo EMS crew during transport. The transferring physician must provide written orders for the transferring hospital personnel to follow during transport. Examples of such situations include, but are not limited to, a patient on a balloon pump, patient's remaining on the hospital ventilator, or if the patient is in active labor.
- Prior to transport, if the El Campo EMS crew is concerned that the patient is not stabilized to the best extent possible, the El Campo EMS crew will review the patient's condition with the transferring physician and address any clinical concern prior to transport. In the instance where the transferring physician and the El Campo EMS crew do not agree on the stability of the patient, the on-duty EMS supervisor should be contacted immediately. If further problems arise with disagreement of the stability of the patient, the accepting physician and EMS Director and/or Asst. EMS Director should be contacted.

ADDITIONAL:

- IV infusion medications from sending facility
 - In addition to those medications outlined in the El Campo EMS Clinical Operating Guidelines, other medications may be monitored en route without hospital personnel by the El Campo EMS crew when ordered by the transferring physician and provided by the transferring facility.
 - All hospital-initiated medications should be administered on infusion pumps at all times.
 - If changes to the medication administration are necessary due to patient deterioration and/or significant clinical changes, the El Campo EMS crew should contact the transferring physician. If the transferring physician is not available, contact on-line medical control. The crew may also obtain written orders from the transferring physician with parameters for infusion titration before leaving the sending facility.
 - **tPA, Thrombolytics, & Fibrinolytics**
 - Patients who are receiving these infusions are not stable for interfacility transport and may not be transported by El Campo EMS while the infusion is running unless accompanied by a physician who will direct medical care during transport or a nurse operating under delegated practice of such physician.
 - These patients may be transported after the infusion is complete.
- Equipment/Devices
 - When paramedics have received training on the appropriate item, they may:
 - Maintain and utilize additional routes of administration including central lines.
 - Maintain and monitor active chest tubes, continuous bladder irrigation, transvenous pacers, etc.

Interfacility Transports

Interfacility Transport Matrix



SPECIAL CONSIDERATIONS:

- A patient who the hospital has tried to transport via air ambulance but was denied for weather shall be treated as an emergent response.
- When responding to an interfacility transport would leave the service area without a 911 response ready ambulance, the interfacility transport may be delayed.
- The on-duty EMS supervisor, Asst. EMS Director, or EMS Director may choose to notify the hospital that the hospital can contact another EMS service to transport the patient if there may be a significant delay.

Out of Hospital Do Not Resuscitate (OOH-DNR)

POLICY:

Providers will follow Do Not Resuscitate guidelines set forth by the Texas Department of State Health Services. This order does not affect the provision of other emergent care, including comfort care.

A valid Out Of Hospital Do Not Resuscitate (OOH-DNR) directive must be executed by one of the following mechanisms:

- The original or a copy of a fully and properly completed OOH-DNR order ([see example \(P14\)](#)).
- The presence of an OOH-DNR device on a person.

The Texas Department of State Health Services standardized DNR form specifically lists designated treatments that shall be withheld. Those treatments include:

- Cardiopulmonary resuscitation (CPR)
- Advanced airway management (intubation, DSI, cricothyrotomy)
- Artificial ventilation (assisted ventilations, BVM, mechanical ventilation)
- Defibrillation/Cardioversion
- Transcutaneous cardiac pacing

Treatments not prohibited under a DNR include oxygen via non-invasive routes (NRB, nasal cannula, CPAP/BiPAP), NPA/OPA, vasoactive medications, analgesic medications, and IV/IO access.

Should resuscitative actions have been initiated, and a valid OOH-DNR is subsequently produced, unwanted resuscitative efforts outlined in the OOH-DNR may be discontinued without contacting the Medical Director.

A patient with valid OOH-DNR who dies in the ambulance while en route to the hospital should continue to be transported (non-emergency). Medical Control should be contacted at the first available opportunity.

Should a dispute arise regarding an OOH-DNR, Medical Consult must be notified immediately.

The only expiration of the OOH-DNR is if:

- The patient is pronounced dead.
- The OOH-DNR has been revoked.

An OOH-DNR order may be revoked at any time by the person, person's representative, or physician who executed the order. This may be done by:

- Verbal communication to responding healthcare professionals.
- Destruction of the OOH-DNR.
- Removal of all the OOH-DNR identification devices from the patient.

An OOH-DNR order is automatically revoked for a person known to be pregnant, in the case of unnatural or suspicious circumstances, or if the form is filled out incorrectly or not signed twice by all required individuals.

Out of Hospital Do Not Resuscitate (OOH-DNR)

Figure: 25 TAC §157.25 (h)(2)



OUT-OF-HOSPITAL DO-NOT-RESUSCITATE (OOH-DNR) ORDER TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Print Form

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. Comfort care will be given as needed.

Person's full legal name _____

Date of birth _____

☐ Male
☐ Female

A. Declaration of the adult person: I am competent and at least 18 years of age. I direct that none of the following resuscitation measures be initiated or continued for me: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

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 none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

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 none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

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 none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

Attending physician's
signature _____

Date _____

Printed
name _____

Lic# _____

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 none of the following resuscitation measures be initiated or continued for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

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 _____

Notary in the State of Texas and County of _____. The above noted person personally appeared before me and signed the above noted declaration on this date: _____

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 for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

Physician's signature _____

Date _____

Printed name _____

License # _____

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 for the person: cardiopulmonary resuscitation (CPR), transcutaneous cardiac pacing, defibrillation, advanced airway management, artificial ventilation.

Attending physician's signature _____

Date _____

Printed
name _____

Lic# _____

Signature of second physician _____

Date _____

Printed
name _____

Lic# _____

Physician's electronic or digital signature must meet criteria listed in Health and Safety Code §166.082(c).

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's signature _____

Witness 1 signature _____

Witness 2 signature _____

Notary's
signature _____

This document or a copy thereof must accompany the person during his/her medical transport.

Patients with Special Healthcare Needs

PURPOSE:

1. To reinforce the importance of providing quality care and EMS services to adults and children with special needs.
2. To understand the need to communicate with the parents, family, and caregivers regarding healthcare needs and devices with which EMS may not have experience.

POLICY:

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to adults and children with special health care needs.

ACTION:

1. Emergencies involving special needs patients may involve equipment (e.g. left ventricular assist device or vagus nerve stimulation device) or conditions that are unfamiliar to the provider. Providers may utilize the following resources for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport needs specific to the patient's condition:
 - A. The family, caregiver, or patient.
 - B. Any device documentation or condition literature.
 - C. Training aids/information from reputable sources.
 - D. The patient's primary physician or Medical Control.
 - E. The device manufacturer's support team.
2. Transportation will be to the facility appropriate for the specific condition of the patient. In some cases this may involve bypassing the closest facility for a more medically appropriate destination.

Poison Control Center

PURPOSE:

1. To improve the care of patients with poisonings, envenomation, and environmental/biochemical terrorism exposures in the pre-hospital setting.
2. To provide for the timeliest and appropriate level of care to the patient, including the decision to transport or treat on scene.
3. To integrate the Poison Control Center into the pre-hospital response for hazardous materials and biochemical terrorism responses.

POLICY:

The Poison Control Center may be utilized by EMS providers to obtain assistance with the pre-hospital triage and treatment of patients who have a potential or actual toxic exposure.

ACTION:

1. EMS providers should call the Poison Control Center (800-222-1222) to obtain recommendations and advise the center of the patient hospital destination. EMS may contact Medical Control for further guidance or to discuss transport options.
2. If the patient refuses transport, the Poison Control Center will be contacted and given the following information:
 - A. Name and age of patient
 - B. Time of exposure
 - C. Signs and symptoms
 - D. Substance(s) involved
 - E. Any treatment provided.

Rapid Transport

POLICY:

Any patient whose malady can only be treated definitively with time-sensitive, hospital-based treatment, shall have limited, on-scene basic interventions and transport prioritized. These patients may include:

- Hemodynamically unstable patients with multi-system trauma
- Head injury or CVA with evidence of increasing ICP
- Suspected aortic aneurysm
- Suspected ectopic pregnancy, placental abruption, or uterine rupture (vaginal bleeding in pregnant patients who are ≥ 20 weeks gestation)
- All abdominal pain patients with unstable vital signs (tachycardia with normotension or hypotension)
- Obstetrical emergencies with unstable vital signs (tachycardia with normotension or hypotension)
- Suspected STEMI

ACTION:

1. The EMS provider shall institute the indicated interventions on scene noted below and transport to an appropriate facility per [Destination Determination \(P07\)](#):
 - A. Freeing patient from entrapment
 - B. Initiating management of life-threatening external hemorrhage
 - C. BLS airway and ventilation procedures
 - D. Surgical airway
 - E. Intubation
 - F. Occlusion of open chest wounds
 - G. Spinal motion restriction (may be modified for patient's condition)
 - H. Limited vital signs
 - I. Emergent interventions within the skillset of the provider required for patient survival.
2. All other interventions are to be done while patient is being transported, unless a safety risk can be identified that deems the intervention necessary on scene.

Triage

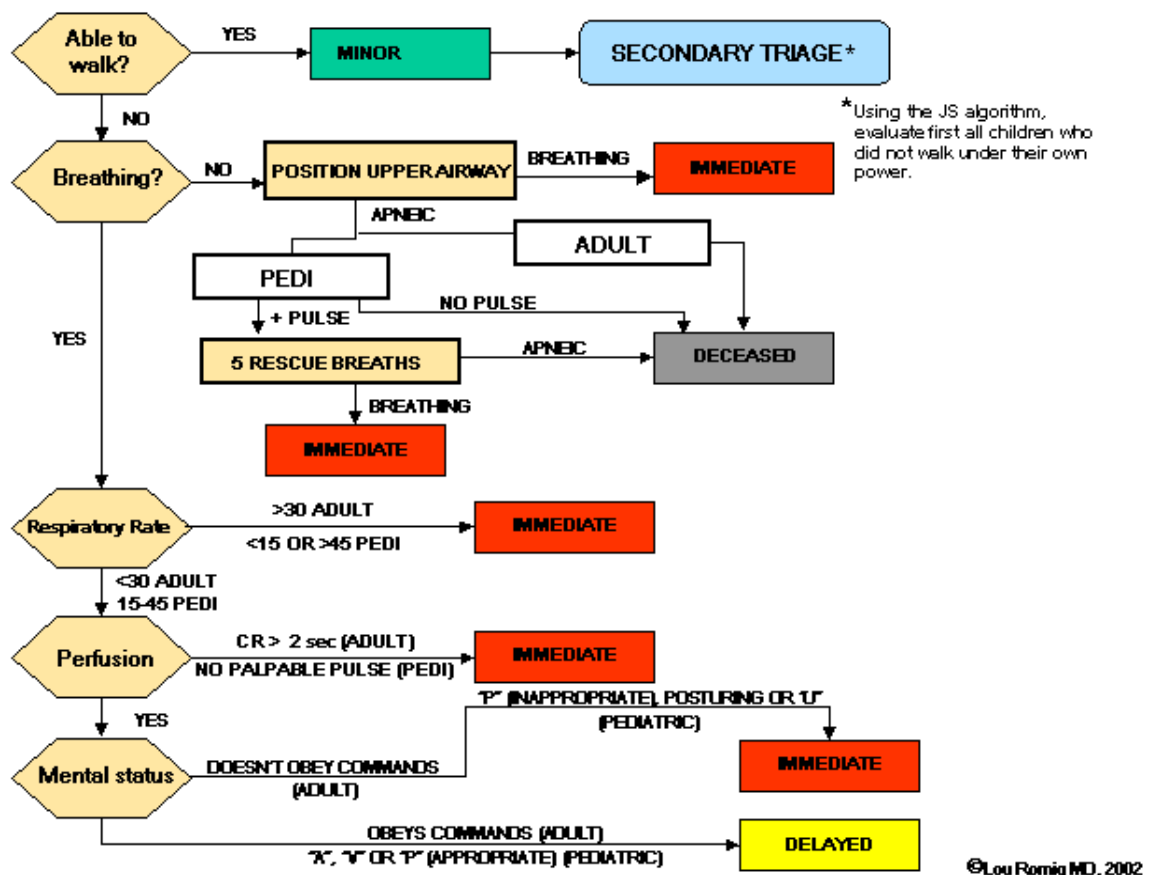
PURPOSE:

To have a standardized process for triage of multiple patients.

PROCEDURE:

- 1) On arrival on scene, if it determined that the number of patients will overwhelm available resources, then triage should be implemented.
- 2) Additional resources should be requested.
- 3) Notify dispatch the number of patients on scene, if known, and if mutual aid will be needed.
- 4) Follow **START/JumpSTART** triage guidelines, see flowchart.
- 5) Usually the first arriving, highest credentialed attendant will serve as the triage officer.

Combined START/JumpSTART Triage Algorithm





Procedures

Central Line Access

INDICATIONS:

- Patient with a central line (PICC/Central Venous Catheter) in place and requires fluid and/or medication administration.

CONTRAINDICATIONS:

- Infection at line of insertion site.
- Combative patient

PROCEDURE:

1. Perform proper hand hygiene and apply clean gloves.
2. Select a hub for access.
 - a. Central lines may have 1-4 hubs. For EMS access, the hub selected isn't critical. If possible, the "power hub" (hub with 10 ml/sec flow) should be reserved for hospital use.
3. Vigorously scrub the hub with an alcohol prep for 15 seconds. Allow 15 seconds for the hub to dry. This step must be repeated each time a syringe/drip set is attached to the hub.
4. Attach syringe (10cc or larger) to hub. Withdraw 10cc of fluid/blood into syringe. Dispose of contents of syringe or entire syringe.
5. Attach flush and flush central line.
6. IF line fails or has difficulty withdrawing or flushing, stop and select another hub to use.
7. Attach syringe with medication or IV tubing to hub and push medication or fluid.
8. When finished using central line, perform a 10cc flush of the line and clamp.

SPECIAL CONSIDERATIONS:

- Avoid obtaining a blood pressure in an extremity with a PICC line.
- Always keep clamps closed when not administering fluid and/or medications.
- Never let the central line go dry.
- Avoid introduction of air into the central line.
- A 10cc syringe is the smallest size syringe to be used with a central line.
- Port-a-cath central lines are not to be accessed, as they require a special needle.

MEDICAL CONTROL:

- Dialysis catheters should only be used in very rare extenuating circumstances. Medical control must be contacted prior to accessing a dialysis catheter.

Chest Seal

CRITERIA:

- Open chest wounds
- Sucking or hissing sounds from chest wound
- Open abdominal wounds with labored respirations

CONTRAINDICATIONS:

- Closed chest injuries

EQUIPMENT:

- Chest seal
- Gauze

PROCEDURE:

1. All open and sucking chest wounds should be treated by immediately applying a vented chest seal.
2. Clean wound with gauze removing dirt and fluid from the skin.
3. Have the patient exhale.
4. Before the patient inhales, place dressing on patient, adhesive side down centering seal over the wound.
5. Firmly press dressing to skin making a good seal.
6. Evaluate for multiple wounds and cover all openings.
7. Monitor respirations after dressing is applied. If respirations worsen, consider [needle decompression](#).

Code Stroke

CRITERIA:

- Positive result from the Cincinnati Prehospital Stroke Scale (CPSS)
- Negative result from CPSS, yet still experiencing stroke symptoms (e.g. unilateral decreased grip strength or ataxia).

CAUTION:

- The patient may still be experiencing a stroke even if CPSS criteria are not met.
- Patients with unstable airways should be transported to the closest emergency department.

PROCEDURE:

- Minimize scene time to <10 min. (unless utilizing air transport).
- Transport emergency traffic to a STROKE appropriate facility (Refer to [Destination Determination \(P07\)](#)).
 - Comprehensive stroke centers are preferred, especially if the transportation difference is not >15 min. and in:
 - Patients who do not meet tPA administration time criteria (last known normal of ≥ 4.5 hrs), but are within the endovascular treatment window of 24 hrs
 - Patients with symptoms concerning for Large Vessel Occlusion (LVO) (RACE ≥ 5).
- Contact receiving facility with Stroke Alert ASAP. Provide requested sensitive patient information via phone.

REFERENCE:

[Cincinnati Prehospital Stroke Scale](#) (≥ 1 abnormal test considered positive)

- Facial droop
 - Normal: both sides of face move equally
 - Abnormal: one side of face does not move at all
- Arm drift
 - Normal: both arms move equally or not at all
 - Abnormal: one arm drifts compared to the other
- Speech
 - Normal: patient uses correct words with no slurring
 - Abnormal: slurred or inappropriate words or mute

[Rapid Arterial occlusion Evaluation \(RACE\) Scale](#) (≥ 5 high likelihood of LVO)

EMS RACE Stroke Scale - Rapid Arterial occlusion Evaluation Scale, used to predict large cerebral arterial occlusions.*			
ITEM	INSTRUCTION		RACE Score
FACIAL PALSY	Ask the patient to show their teeth	ABSENT (symmetrical movement) MILD (slightly asymmetrical) MODERATE TO SEVERE (completely asymmetrical)	0 1 2
ARM MOTOR FUNCTION	Extending the arm of the patient 90 degrees (if sitting) or 45 degrees (if supine)	NORMAL TO MILD (limb upheld more than 10 seconds) MODERATE (limb upheld less than 10 seconds) SEVERE (patient unable to raise arm against gravity)	0 1 2
LEG MOTOR FUNCTION	Extending the leg of the patient 30 degrees (if supine)	NORMAL TO MILD (limb upheld more than 5 seconds) MODERATE (limb upheld less than 5 seconds) SEVERE (patient unable to raise the leg against gravity)	0 1 2
HEAD AND GAZE DEVIATION	Observe eyes and cephalic deviation to one side	ABSENT (eye movements to both sides were possible and no cephalic deviation was observed) PRESENT (eyes and cephalic deviation to one side was observed)	0 1
APHASIA If right hemiparesis	Ask the patient two verbal orders: - "close your eyes" - "make a fist"	NORMAL (performs both tasks correctly) MODERATE (performs one task correctly) SEVERE (performs neither task)	0 1 2
AGNOSIA If left hemiparesis	Asking: - "Who's arm is this?" while showing him/her the paretic arm (asomatognosia) - "Can you move your arm?" (anosognosia)	NORMAL (no asomatognosia nor anosognosia) MODERATE (asomatognosia or anosognosia) SEVERE (both of them)	0 1 2
<small>* Chart adapted from Perez de la Ossa N, Carrera D, Gorcha M, et al. Design and validation of a prehospital stroke scale to predict large arterial occlusion: the rapid arterial occlusion evaluation scale. Stroke; a journal of cerebral circulation. Jan 2014;45(1):87-91.</small>			RACE SCALE TOTAL: Any score above a "0" is a "Stroke Alert"

Combat Application Tourniquet

INDICATIONS:

- Extremity bleeding uncontrolled by direct pressure.

CONTRAINDICATIONS:

- None

EQUIPMENT:

- Combat Application Tourniquet (CAT)

PROCEDURE:

1. Route the band around the effected extremity.
2. Pass the band through the outside buckle (route the band through the friction adapter if using CAT on a lower extremity).
3. Pull the band tight and secure it back on itself using the Velcro surface.
4. Twist the windlass rod until bright red bleeding has stopped.
5. Lock the rod in place with the windlass clip.
6. Secure the rod with the strap by adhering it tightly to the windlass clip.
7. Document the time of application.

SPECIAL CONSIDERATIONS:

- Tighten CAT until bleeding is controlled.
 - Generally, until loss of the distal pulse.
 - No more than 3 turns.
- Hemorrhage control may require 2nd tourniquet ABOVE the first.
- Don't place the CAT directly over a major joint (knee, elbow, etc.).
- Don't place the CAT directly over a full cargo pocket (it may not compress).
- If using CAT on the upper extremity, place it very proximally on the upper arm.

CPAP/BiPAP (Non-Invasive)

INDICATIONS:

Any patient who is in respiratory distress with signs and symptoms consistent with COPD, pulmonary edema, CHF, asthma, emphysema, or pneumonia, and who meets the following criteria:

- Awake and able to follow commands.
- Able to fit the Non-Invasive Ventilation (NIV) mask.
- Has the ability to maintain a patent airway.
- Exhibits two or more of the following:
 - A respiratory rate greater than 25 breaths per min.
 - SpO₂ < 94% at any time.
 - Use of accessory muscles during respirations.
 - Lung exam could have wheezing, rales, or diminished breath sounds depending on etiology of the distress.
- This procedure may be used on DNR patients.

CONTRAINDICATIONS:

- Patient is in respiratory arrest (apneic).
- Patient is suspected of having a pneumothorax or has suffered trauma to the chest.
- Facial lacerations
- Laryngeal trauma
- Recent tracheal or esophageal anastomosis
- Gastrointestinal bleeding or ileus
- Recent gastric surgery
- Basilar skull fracture
- Emphysematous Bulla – when an area of the lung may be brittle and present a risk of bursting
- Patient has a tracheotomy.
- Patient is actively vomiting.
- Caution in hypotensive patients, as the associated increased intrathoracic pressures may reduce venous return and diminish cardiac output.

EQUIPMENT:

- Oxygen source
- Non-Invasive Ventilation mask and tubing
- Ventilator with filter

PROCEDURE:

1. Determine the primary problem:
 - Poor oxygenation (classically CHF and pneumonia) – consider CPAP.
 - Hypercapnia (± hypoxia) – consider BL (BiPAP)
2. Select a mode: Ventilator – CPAP or BL (BiPAP)

Continued on next page

CPAP/BiPAP (Non-Invasive)

PROCEDURE:

Ventilator – CPAP

1. Ensure adequate oxygen supply to the ventilator or circuit.
2. Set to CPAP Mode
3. Set PEEP: 5 cmH₂O (PS: 0 cmH₂O)
4. Set FiO₂: 100%
5. Explain the procedure to the patient and place the delivery device over the mouth and nose.
6. Secure the mask with the provided straps or other provided devices, if the patient allows. If the patient does not tolerate, consider allowing the patient to cover their face securely with mask.
7. Consider increasing PEEP by 2 cmH₂O up to 10 cmH₂O.
8. See “All modes” below for continued instructions.

Ventilator –BL (BiPAP)

1. Ensure adequate oxygen supply to the ventilator or circuit.
2. Set to BL Mode
3. Set EPAP (PEEP): 5 cmH₂O
4. Set IPAP: 10 cmH₂O
5. Set FiO₂: 100%
6. Explain the procedure to the patient and place the delivery device over the mouth and nose.
7. Secure the mask with the provided straps or other provided devices, if the patient allows. If the patient does not tolerate, consider allowing the patient to cover their face securely with mask.
8. If no improvement, titrate EPAP and IPAP.
 - a. Increase EPAP by increments of 2 cmH₂O (Max EPAP = 10 cmH₂O)
 - Increases oxygenation (SpO₂)
 - Decreases air trapping
 - Airway stented open
 - b. Increase IPAP by increments of 2 cmH₂O (Max IPAP = 20 cmH₂O)
 - Decreases EtCO₂ & work of breathing
 - Increases Vt and ventilation
 - c. An increase in EPAP (PEEP) will decrease the pressure support level, therefore IPAP must also be changed to the complimentary level to maintain Vt.
9. See “All modes” below for continued instructions.

All modes

1. Consider inline nebulized medication if indicated.
2. Check for air leaks.
3. Monitor and document the patient’s respiratory response to treatment.
4. Place the patient on the cardiac monitor.
5. Check and document vital signs every 5 min.
6. Continue to coach the patient to keep mask in place and readjust as needed.
7. Call in a report to the accepting hospital ASAP, advising them that your patient is on CPAP/BiPAP.

Continued on next page

CPAP/BiPAP (Non-Invasive)

REMOVAL INDICATIONS:

- CPAP/BiPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask, become lethargic, begins to vomit, becomes hypotensive, or experiences respiratory arrest.
- If respiratory status deteriorates, intermittent positive pressure ventilation with BVM and/or advanced airway management is indicated.

SPECIAL CONSIDERATIONS:

- In BiPAP mode, always attempt to maintain at least 4 cmH₂O between IPAP and EPAP(PEEP) to ensure an adequate gradient to allow for proper ventilation.
- If hypoxia improves (SpO₂ > 95%, patient is alert, and improved work of breathing), you may reduce FiO₂ in 5% increments to a minimum of 60%. Pay careful attention to vital signs and mental status.
- NIV does not involve a respiratory rate. Careful attention to V/S monitoring is imperative. If the ventilator senses apnea, it will shift into the A/C mode and alarm.
- Contact medical control at any time to assist with titrating settings.
- Determinates of success in CPAP/BiPAP
 - a. Decreased work of breathing (RR < 25)
 - b. Absence of:
 - Accessory muscle usage
 - Retractions
 - Nasal flaring
 - Diaphoresis
 - Tachycardia

Delayed Sequence Intubation - Adult

DESCRIPTION:

Delayed Sequence Intubation (DSI) is a form of procedural sedation in advanced airway management with an emphasis on rapid behavioral control of the patient with targeted efforts to oxygenate and subsequently secure the airway. Medical Consult is encouraged if alteration from this guideline is necessary based on the patient's condition.

CONTRAINDICATIONS:

- Known hypersensitivity to DSI medications.

POTENTIAL COMPLICATIONS:

- Increased intra-gastric pressure resulting in emesis.
- Bradycardia/asystole
- Malignant hyperthermia
- Prolonged apnea
- Inability to intubate or ventilate.
- Hypotension
- Aspiration
- Increased ocular pressure.

EQUIPMENT:

- All indicated medications (in labeled syringes, when possible)
- Suction (fully connected, turned on, and with the rigid catheter to the right of the patient's head)
- BVM connected to high flow oxygen
- Intubation equipment including [video laryngoscope](#), when available
- Continuous NIBP, ECG, SpO2, and EtCO2 monitoring
- [Endotracheal introducer \(Bougie\)](#)
- [EGD](#) (e.g. iGel)
- [Surgical airway](#) kit
- Nasal cannula for apneic oxygenation
- Soft restraints

PROCEDURE:

Preparation:

- Difficult airway assessment (MOANS, LEMON, RODS, SMART).
- Identify primary airway strategy and back-up plans.
- Cardiac monitoring, BP monitoring, pulse oximetry, and capnography applied.
- Vascular access obtained.
- Medications identified and prepared.
- Rescue devices immediately available.
- ETT prepared of appropriate size – if difficulty anticipated, also prepare half size smaller ETT.
- Patient positioning so that the tragus of the ear is above the sternum with HOB elevated >15°, unless contraindicated by c-spine injury risk. Consider padding underneath the shoulders if a large occiput exists.

Continued on next page

Delayed Sequence Intubation - Adult

Pre-Oxygenation:

- **Normal oxygen saturation**
 - Nasal cannula at 6 lpm in addition to either oxygen-connected BVM with adequate mask seal and patient-initiated ventilation (no positive pressure ventilation) or high flow oxygen via NRB if limited resources.
- **Obvious hypoxia and/or hypercapnia**
 - Nasal cannula at 6 lpm for apneic oxygenation in addition to BVM ventilation with 100% oxygen if desaturation occurs. Be mindful of gastric distention and aspiration risk.
 - In the alert patient, effective **CPAP/BiPAP** is an appropriate form of pre-oxygenation if already in place.

Pre-Intubation Optimization – ONLY IF TIME/RESOURCES PERMITS:

- **Fentanyl:** Indicated if sympathetic responses should be blunted (increased ICP, aortic dissection, intracranial hemorrhage, and ischemic heart disease) – **Give 3 mcg/kg SLOW IV/IO over 90 sec., approximately 3 min. prior to intubation.** Do not use in hypotensive patients or in patients dependent on sympathetic drive (i.e. patients in shock).
- **Resuscitate Before Intubation**
 - Fluids: Hypotension from bleeding, dehydration, sepsis, etc.
 - Vasopressors: **Epinephrine** or **Norepinephrine** hypotension refractory to fluid challenge.
 - **CPAP** for hypoxia refractory to face mask oxygen in spontaneously breathing patients.
 - **Needle Chest Decompression** for identified or suspected tension pneumothorax.

Sedation, Pre-Oxygenation, and Induction

- **Give an induction agent (ALWAYS BEFORE PARALYSIS)**
 - **Etomidate 0.2-0.3 mg/kg slow IV/IO X 1 dose only** – Recommended dose is 0.2 mg/kg for hemodynamically unstable patients and for obese patients.
 - **-OR-**
 - **Ketamine 2.0 mg/kg slow IV/IO (Preferred)** – Preferred in patients with reactive airway disease and hypotensive patients. In patients that are catecholamine depleted (i.e. sepsis and patients in severe shock), doses > 1.5 mg/kg may cause myocardial depression and exacerbate hypotension. Contraindicated in hypertensive patients, status epilepticus, and in pregnancy.
- **Pre-Oxygenate**
 - Increase oxygen by NC to max flow.
 - Form two handed, thumbs-down seal on BVM, allow spontaneous respirations with maximal oxygen flow.
 - Increase PEEP as needed to achieve maximal SPO2.
 - Upon reaching SpO2 > 93%, begin 3-minute countdown to allow complete de-nitrogenation.
- **Give a paralytic agent**
 - **Rocuronium 1 mg/kg IV/IO** – Contraindicated in Myasthenia Gravis or with known medication allergy.

Continued on next page

Delayed Sequence Intubation - Adult

Placement with Proof:

- 90 seconds after the administration of the neuromuscular blocker, test the patient's jaw for flaccidity, and if flaccid, attempt intubation. Leave the nasal cannula in place at maximal flow during the intubation attempt.
- Verify tube placement with EtCO₂ monitoring and visualization of the ETT passing through the vocal cord.
- Ideal tube depth can be estimated by multiplying the internal diameter of the ETT by 3. Ensure proper tube depth by checking for bilateral breath sounds. Secure the tube after verifying position.
- If unable to intubate and/or ventilate, attempt to place rescue device, and go to [Adult Failed Airway Guideline \(AM15\)](#).

Post-Intubation Management:

- Apply mechanical ventilator whenever possible and ensure optimal and patient specific ventilation.
- Re-assess vital signs q 5 min.; continually assess ETT and overall patient condition. If hypotensive (and not in obvious left-sided heart failure) give NS bolus. Also consider the use of [Epinephrine](#) and [Norepinephrine](#) for persistent hypotension.
- Continue sedation and pain management as needed.
 - Pain Management:
 - [Fentanyl](#) 1 mcg/kg for pain control q 20 min. PRN (max single dose of 200 mcg)
 - Sedation:
 - [Midazolam](#) 0.05 mg/kg slow IV/IO for continued sedation q 20 min. PRN (max total dose 10 mg).
- -OR-
 - [Lorazepam](#) 1-2 mg slow IV/IO q 20 min. PRN (max total dose of 4 mg).
 - Pain Management and Sedation:
 - [Ketamine](#) 1 mg/kg slow IV/IO q 20 min. PRN for continued pain relief and sedation.
- Continue paralysis only when absolutely necessary (unable to tolerate ventilation or a threat to patient or crew safety). **Ensure adequate sedation BEFORE and DURING duration of long-term paralytic administration.**
 - [Rocuronium](#) 1 mg/kg IV/IO q 25-30 min PRN

Special Considerations:

- All medications in this guideline are safe to give IV or IO.
- All medications should be administered slow IV/IO, unless otherwise indicated.
- In hemodynamically unstable patients, it may not be possible to safely administer full doses of opiates, sedatives, neuromuscular blocking agents, etc. Consider early Medical Consult for assistance with dose adjustments.
- All intubated patients should be restrained with soft restraints.

Delayed Sequence Intubation - Pediatric

DESCRIPTION:

Delayed Sequence Intubation (DSI) is a form of procedural sedation in advanced airway management with an emphasis on rapid behavioral control of the patient with targeted efforts to oxygenate and subsequently secure the airway. Medical Consult is encouraged if alteration from this guideline is necessary based on the patient's condition. Pediatric airways should be managed in the *least invasive way possible*.

CONTRAINDICATIONS:

- Known hypersensitivity to DSI medications.

POTENTIAL COMPLICATIONS:

- Increased intra-gastric pressure resulting in emesis.
- Bradycardia/asystole
- Malignant hyperthermia
- Prolonged apnea
- Inability to intubate or ventilate
- Hypotension
- Aspiration
- Increased ocular pressure

EQUIPMENT:

- All indicated medications (in labeled syringes, when possible)
- Suction (fully connected, turned on, and with the rigid catheter to the right of the patient's head)
- BVM connected to high flow oxygen
- Intubation equipment including [video laryngoscope](#), when available
- Continuous NIBP, ECG, SpO₂, and EtCO₂ monitoring
- [Endotracheal introducer \(Bougie\)](#)
- [EGD](#) (e.g., iGel)
- [Needle cricothyroidotomy](#) kit or [Surgical airway](#) kit, depending on patient size/age
- Nasal cannula for apneic oxygenation
- Soft restraints

PROCEDURE:

Preparation:

- Difficult airway assessment (MOANS, LEMON, RODS, SMART).
- Identify primary airway strategy and back-up plans.
- Cardiac monitoring, BP monitoring, pulse oximetry, and capnography applied.
- Vascular access obtained.
- Medications identified and prepared.
- Rescue devices immediately available.
- ETT prepared of appropriate size – if difficulty anticipated, also prepare half size smaller ETT.
- Patient positioning so that the tragus of the ear is above the sternum with HOB elevated >15°, unless contraindicated by c-spine injury risk. Consider padding underneath the shoulders if a large occiput exists.

Continued on next page

Delayed Sequence Intubation - Pediatric

Pre-Oxygenation:

- **Normal oxygen saturation**
 - Nasal cannula at 6 lpm in addition to either oxygen-connected BVM with adequate mask seal and patient-initiated ventilation (no positive pressure ventilation) or high flow oxygen via NRB if limited resources.
- **Obvious hypoxia and/or hypercapnia**
 - Nasal cannula at 6 lpm for apneic oxygenation in addition to BVM ventilation with 100% oxygen if desaturation occurs. Be mindful of gastric distention and aspiration risk.
 - In the alert patient, effective **CPAP** is an appropriate form of pre-oxygenation if already in place.

Pre-Treatment – ONLY IF TIME/RESOURCES PERMITS:

- **Atropine** – 0.02 mg/kg IV/IO X 1 dose – for children < 1-year-old
- **Resuscitate Before Intubation**
 - Fluids: Hypotension from bleeding, dehydration, sepsis, etc.
 - Vasopressors: **Epinephrine** or **Norepinephrine** hypotension refractory to fluid challenge.
 - **CPAP** for hypoxia refractory to face mask oxygen in spontaneously breathing patients.
 - **Needle Chest Decompression** for identified or suspected tension pneumothorax.

Sedation, Pre-Oxygenation, and Induction

- **Give an induction agent (ALWAYS BEFORE PARALYSIS)**
 - **Etomidate** 0.2-0.3 mg/kg slow IV/IO X 1 dose only – Recommended dose is 0.2 mg/kg for hemodynamically unstable patients and for obese patients.
- **-OR-**
 - **Ketamine** 2 mg/kg slow IV/IO (**Preferred**) – Preferred in patients with reactive airway disease and hypotensive patients. In patients that are catecholamine depleted (i.e. sepsis and patients in severe shock), doses > 1.5 mg/kg may cause myocardial depression and exacerbate hypotension. Contraindicated in hypertensive patients, status epilepticus, and in pregnancy.
- **Pre-Oxygenate**
 - Increase oxygen by NC to max flow.
 - Form two handed, thumbs-down seal on BVM, allow spontaneous respirations with maximal oxygen flow.
 - Increase PEEP as needed to achieve maximal SPO2.
 - Upon reaching SpO2 >93%, begin 3-minute countdown to allow complete de-nitrogenation.
- **Give a paralytic agent**
 - **Rocuronium** 1 mg/kg IV/IO – Contraindicated in Myasthenia Gravis or with known medication allergy.

Placement with Proof:

- 90 seconds after the administration of the neuromuscular blocker, test the patient's jaw for flaccidity, and if flaccid, attempt intubation. Leave the nasal cannula in place at maximal flow during the intubation attempt.
- Verify tube placement with EtCO2 monitoring and visualization of the ETT passing through the vocal cord.
- Ideal tube depth can be estimated by multiplying the internal diameter of the ETT by 3. Ensure proper tube depth by checking for bilateral breath sounds. Secure the tube after verifying position.
- If unable to intubate and/or ventilate, attempt to place rescue device and go to **Pediatric Failed Airway Guideline (PM15)**.

Continued on next page

Delayed Sequence Intubation - Pediatric

Post-Intubation Management:

- Apply mechanical ventilator whenever possible and ensure optimal and patient specific ventilation.
- Re-assess vital signs q 5 min.; continually assess ETT and overall patient condition. If hypotensive (and not in obvious left-sided heart failure) give NS bolus. Also consider the use of [Epinephrine](#) and [Norepinephrine](#) for persistent hypotension.
- Continue sedation and pain management as needed.
 - Pain Management:
 - [Fentanyl](#) 0.5-1.0 mcg/kg for pain control q 20 min. PRN (max single dose of 50 mcg)
 - Sedation:
 - [Midazolam](#) 0.05 mg/kg slow IV/IO for continued sedation q 20 min. PRN (max single dose 2.5 mg) (max total dose 10 mg).
 - OR-
 - [Lorazepam](#) 0.05-0.1 mg slow IV/IO q 20 min. PRN (max total dose of 4 mg).
 - Pain Management and Sedation:
 - [Ketamine](#) 1 mg/kg slow IV/IO q 20 min. PRN for continued pain relief and sedation.
- Continue paralysis only when absolutely necessary (unable to tolerate ventilation or a threat to patient or crew safety). **Ensure adequate sedation BEFORE and DURING duration of long-term paralytic administration.**
 - [Rocuronium](#) 1 mg/kg IV/IO q 25-30 min PRN

Special Considerations:

- All medications in this guideline are safe to give IV or IO.
- All medications should be administered slow IV/IO, unless otherwise specified.
- The Broselow Tape or Handtevy app are excellent resources for determining a patient's weight/age. Providers are to be familiar with common doses and are responsible for the ultimate dose administered.
- The Pre-Treatment step can be completely omitted at the Paramedic's discretion if time or crew resources do not easily allow.
- In hemodynamically unstable patients, it may not be possible to safely administer full doses of opiates, sedatives, neuromuscular blocking agents, and etc. Consider early Medical Consult for assistance with dose adjustments.
- All intubated patients should be restrained with soft restraints.
- Routine sedation after intubation is discouraged in pediatrics – administer sedation/analgesia as indicated to maintain proper oxygenation, ventilation, hemodynamics, and patient comfort.

Diagnostic Tools and Procedures

Diagnostic tools and procedures are defined as vital signs, blood glucose determination, temperature, ECG evaluation, pulse oximetry, Doppler, capnography, and any other component not discussed that can help identify a diagnosis related to a patient's illness/injury.

VITAL SIGNS (V/S):

- Complete V/S are defined as respiratory rate, pulse or heart rate (indicate which), capillary refill, temperature, pulse oximetry, and blood pressure (auscultated if any question as to accuracy of automated measurements).
- A respiratory rate, blood pressure, pulse oximetry, and pulse rate are to be obtained on all patients. A palpated blood pressure is acceptable when unable to obtain an auscultated or automated blood pressure, or with a critical patient.
- When possible, an initial complete set of V/S is to be obtained within 5 min. of patient contact.
- Stable patients with non-life- or limb-threatening problems should have V/S repeated every 15 min. (minimum of respiratory rate, pulse/heart rate, pulse oximetry, and blood pressure).
- Urgent or critical patients should have V/S taken every 5 min. (minimum of respiratory rate, pulse/heart rate, pulse oximetry, and blood pressure). Certain medications require constant V/S monitoring as indicated.
- Patients refusing treatment/transport should have, at a minimum, one set of V/S to include blood pressure, pulse/heart rate, pulse oximetry, and respirations.

BLOOD PRESSURE:

Blood pressure accuracy is influenced by many factors, including the cuff size. A cuff that is too small for the arm will yield a falsely elevated blood pressure, while one too large will result in a falsely low reading. The cuff should easily go around the patient's upper arm, but the air bladder should not overlap itself. The width of the cuff should be 2/3 the length of the patient's upper arm.

$$MAP = \frac{(DBP \times 2) + SBP}{3}$$

HEART RATE/PULSE:

Heart rate is the rate of electrical depolarization (usually ventricular) noted on the ECG monitor. Pulse rate is the palpable rate of perfusion noted at the pulse point. Generally, these are identical values; however, this is not always the case. When reporting the rate on the ECG monitor, use the term heart rate. When reporting the rate derived by feeling the radial, brachial, or carotid pulse, use the term pulse rate. Confirm the pulse rate matches the heart rate.

For a *critical* patient for whom time is a factor, the location of palpable pulses may be used to estimate the blood pressure. Do not document the number, rather the presence of a palpable “_____” pulse. Caution that medication administration decisions should be based upon measured blood pressures. The following are generalizations and may not be applicable to all patients:

- Palpable radial pulse: $SBP \geq 80 \text{ mmHg}$
- Palpable axillary or brachial pulse: $SBP \geq 70 \text{ mmHg}$
- Palpable femoral pulse: $SBP \geq 60 \text{ mmHg}$
- Palpable carotid pulse: $SBP \geq 50 \text{ mmHg}$

BLOOD GLUCOSE LEVEL (BGL):

- BGL may be obtained on any patient at the provider's discretion.
- BGL must be assessed on all patients with altered mental status or stroke-like symptoms.
- BGL must also be assessed on all patients with a history of diabetes mellitus or glucose problems, regardless of complaint.
- After administering dextrose, the BGL value may remain falsely elevated. Repeat BGL assessment may not be useful in determining accurate levels. Wait at least 10 min. after dextrose administration before repeating BGL. The patient's clinical status should be used to determine whether or not to administer additional dextrose.

Diagnostic Tools and Procedures

TEMPERATURE:

Temperature monitoring should be obtained when possible on all patients. Typically, oral and rectal temperatures are sufficient. Axillary temperatures are less accurate and should be avoided. When reporting or documenting a temperature value indicate the source (oral, rectal, or axillary).

Accurate temperature measurement is especially important for patients presenting with:

- Seizures
- Sepsis
- Environmental emergencies with extremes in temperature
- CPR secondary to drowning
- Altered mental status

ECG MONITORING (ECG):

- 12 Lead ECG must be obtained in patients with the following complaints:
 - Ischemic chest pain
 - Referred pain to shoulder, neck, or jaw
 - Referred pain to abdomen
 - Shortness of breath
 - Altered mental status
 - Suspected overdose
 - Suspected cardiac involvement
 - Electrical injuries
 - Syncope
- ECG should be assessed within 5 min. of patient contact, when possible.
- Occasionally situations may arise where a 12 Lead ECG isn't possible/practical. Reasonable judgement should guide this decision and thorough documentation to that effect is required. This should be a rare occasion.

PULSE OXIMETRY (SpO2):

- SpO2 should be used to evaluate the oxygen saturation status of all patients, especially in whom hypoxia or ischemia is suspected.
- Oxygen therapy must not be withheld to establish baseline saturation in cases of respiratory distress.
- SpO2 readings are accurate only if:
 - The probe is firmly attached to a clean finger, toe, or ear. Remove nail polish if able.
 - The patient is reasonably well perfused peripherally. Hypotensive, CO poisoned, or peripherally vasoconstricted patients may not present with accurate SpO2 values.
 - The heart rate shown on the pulse oximeter matches the patient's palpable pulse rate and the pulse oximeter exhibits a pleth waveform that is evenly spaced with equally wide waves of equal amplitude.

DOPPLER (if available):

Doppler can be used to evaluate the fetal heart rate of pregnant patients. It may also be used to determine the presence of a peripheral pulse or to obtain an SBP in patients when it cannot be auscultated or otherwise palpated.

Diagnostic Tools and Procedures

CONTINUOUS WAVEFORM CAPNOGRAPHY (EtCO₂):

- EtCO₂ must be monitored on all intubated patients and the results must be recorded.
- Side stream EtCO₂ must be monitored on all sedated patients that are not intubated.
- Side stream EtCO₂ should be utilized on all patients with dyspnea that are not intubated.

CARBON MONOXIDE MONITORING (SpCO):

- SpCO should be monitored on patients near fire operations or when CO exposure is suspected.
- Ideal placement is the fourth digit (ring finger).
- Values > 5% should raise concern for CO exposure in the appropriate clinical context.
- Chronic smokers may have elevated baseline SpCO levels ($\approx$ 10%).

ECG Monitoring

CRITERIA:

- Continuous ECG monitoring should be considered on patients provided with paramedic level medication.
- 12 Lead ECG must be obtained in patients with the following complaints:
 - Ischemic chest pain
 - Referred pain to shoulder, neck, or jaw
 - Referred pain to abdomen
 - Shortness of breath
 - Altered mental status
 - Suspected overdose
 - Suspected cardiac involvement
 - Electrical injuries
 - Syncope
- While understanding that 12-lead ECG is a Paramedic level skill, if the Captain, or higher ranking employee, determines the patient does not require additional ALS monitoring or interventions after the initial 12-lead ECG, patient care may be transferred to the appropriate level provider.
- ECG should be assessed within 5 min. of patient contact, when possible.
- Occasionally situations may arise where a 12 Lead ECG isn't possible/practical. Reasonable judgement should guide this decision and thorough documentation is required.
- A 12-lead ECG must be obtained and transmitted by any AEMT administering NTG SL without a Paramedic present.

CONTRAINDICATIONS:

- None

EQUIPMENT:

- ECG monitor
- Monitor cables
- Electrodes and/or multifunction pads

PROCEDURE:

1. Turn on monitor.
2. Perform skin preparation with alcohol or chlorhexidine solution and shave hair.
3. Apply monitor cables with electrodes to patient. Electrodes are to be placed on the limbs. To reduce artifact, place the leads on the proximal extremity and avoid bony prominences.

STANDARD ECG MONITORING

- Record a strip of the desired lead ECG of at least 6 sec. duration. Record again after any changes in rhythm or any significant changes in rate. Also record "pre" and "post" ECG strips before and after any interventions that will affect the cardiac rhythm or rate (medications, electrical therapy, etc.)

12 LEAD ECG

- Input the patient's age and name. Record a 12 Lead ECG. Record again after any changes in any identified abnormality. Also record "pre" and "post" ECGs before and after any intervention that will affect the cardiac rhythm or rate (medications, electrical therapy, etc.)

NOTE:

- If using a device that provides a computerized interpretation, that interpretation may be used to assist the paramedic in clinical decision-making.
- When possible, and as early as possible, transmit all ECGs concerning for myocardial ischemia or infarct to the receiving hospital.
- Serial 12 Lead ECGs should be obtained on patients with dynamic ECG changes.
- Upload all ECG tracings to the ePCR.

Endotracheal Introducer (Bougie)

CRITERIA:

- Any patient requiring placement of an endotracheal tube.

CONTRAINDICATIONS:

- None

TREATMENT:

- Use the endotracheal introducer (bougie) to assist in oral intubation.

EQUIPMENT:

- Endotracheal introducer (bougie)
- KY jelly
- All intubation equipment

PROCEDURE:

- Using a laryngoscope, insert the endotracheal introducer into mouth and turn until it passes through the vocal cords. You may feel vibrations while the introducer passes over the rings of the trachea.
- While continuing to observe the vocal cords, place the endotracheal tube over the introducer and advance until the tube is in the trachea. Counter-clockwise 90° rotation may be needed to pass the tip of the endotracheal tube through the cords.
- Remove the introducer while securing the tube so it is not displaced.
- Attach the BVM to the endotracheal tube, ventilate and confirm placement, monitor for tube migration, and reassess tube position frequently per intubation guideline.

Endotracheal Tube Suctioning

CRITERIA:

- Intubated patients with symptoms due to increased secretions (e.g. tachycardia, increased resistance during ventilation, decreased lung compliance, decreasing pulse oximetry).

CONTRAINDICATIONS:

- None

EQUIPMENT:

- Standard sterile suction catheter and gloves
- Intubated patient with EtCO₂ monitoring
- BVM or ventilator circuit

PROCEDURE:

1. Pre-oxygenate the patient.
2. Select the appropriately sized catheter (the catheter should be less than half the ETT diameter).
3. Prepare suction set-up. Maintain sterile technique with catheter curled in clean hand.
4. Adjust vacuum to 80-120 mmHg, using the lower values for pediatric patients and higher for adults.
5. Insert catheter to the appropriate depth (≈1 cm beyond the tip of the ETT).
6. Depress and hold the thumb control valve while gently withdrawing the catheter.
7. Release thumb control valve.
8. Reconfirm appropriate EtCO₂ values.

CONSIDERATIONS

- The entire suction procedure should last < 10-15 sec. and actual suctioning < 5-8 sec. per episode.

External Jugular IV

CRITERIA:

- Initial, primary venous access or secondary access in any critical patient.
- In any urgent patient in whom access with an EJ IV is preferred over IO access.

CONTRAINDICATIONS:

- This procedure is contraindicated in anti-coagulated patients.

CAUTION:

- DO NOT compromise c-spine immobilization while establishing EJ IV.

EQUIPMENT:

- IV catheter
- Alcohol or Chlorhexidine wipes
- Tape or commercial securing device
- IV fluid
- Administration set
- Extension set

PROCEDURE:

1. Prepare IV tubing and fluids.
2. When possible, place the patient in Trendelenburg position.
3. Identify external jugular vein and prepare site with alcohol or Chlorhexidine.
4. Stabilize vein at site with distal (cephalad) pressure.
5. Direct needle point proximally (caudally – towards the chest). Pierce skin just to the side of the vein.
6. Advance the catheter until the needle enters the lumen of the vein (recognized by change in resistance and return of blood into catheter hub).
7. Once the needle has entered the lumen, advanced the catheter/needle assembly very slightly farther into the lumen. This ensures that the catheter has entered the vessel.
8. Stop advancing the needle. Advance the catheter off the needle and into the vein.
9. Withdraw the needle from the catheter. If needed, apply gentle pressure proximal to the catheter to stop bleeding from the catheter.
10. Attach the IV tubing to the catheter hub.
11. Confirm fluid flow and lack of extravasation.
12. If the IV is patent, secure the catheter/tubing with tape or a commercial device.
13. Set IV flow to the desired rate.

Extraglottic Device (EGD)

CRITERIA:

- Unconscious patient with respiratory compromise and absent gag reflex.
- EGD should be considered prior to endotracheal tube placement in cardiac arrest.

CONTRAINDICATIONS:

- Responsive patient with intact gag reflex.
- Patients with known esophageal disease.
- Caustic ingestions.

EQUIPMENT:

- iGel of the appropriate size (see below)
- Airway securing device
- Water-based lubricant
- 12 Fr. sump tube

PROCEDURE:

Adult sizes

1. Select correct size iGel Resus pack.
2. Open iGel package, and on a flat surface, take out the protective cradle containing the device.
3. Remove the iGel and transfer it to the palm of the same hand that is holding the protective cradle, supporting the device between the thumb and index finger.
4. Place a small bolus of a water-based lubricant onto the middle of the smooth surface of the protective cradle in preparation for lubrication.
5. Grasp the iGel with the opposite (free) hand along the integral bite block and lubricate the back, sides, and front of the cuff with a thin layer of lubricant.
6. Inspect the device carefully, confirm there are no foreign bodies or a bolus of lubricant obstructing the distal opening. Place the iGel back into the protective cradle in preparation for insertion.
7. Remove the iGel from the protective cradle or cage pack. Grasp the lubricated iGel firmly along the integral bite block. Position the device so that the iGel cuff outlet is facing towards the chin of the patient. The patient should be in the sniffing position with head extended and neck flexed. The chin should be gently pressed down before proceeding. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
8. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt. 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.
9. The iGel should be secured by either: using the included strap, using a commercial tube holder, or by taping down from maxilla to maxilla.
10. You may use the passive O₂ outlet and/or insert a 12 French sump tube in the suction port for gastric content removal.

Pediatric sizes

1. Select the correct size iGel.
2. Open the iGel package, and on a flat surface, take out the cage pack containing the device.
3. Open the cage pack and transfer the iGel into the lid of the cage.
4. Place a small bolus of a water-based lubricant onto the middle of the smooth surface of the cage pack ready for use.
5. Grasp the iGel with the opposite (free) hand along the integral bite block and lubricate the back, sides, and front of the cuff with a thin layer of lubricant.
6. Inspect the device carefully, confirm there are no foreign bodies or a bolus of lubricant obstructing the distal opening. Place the iGel back into the cage pack in preparation for insertion.

Extraglottic Device (EGD)

SIZING:

	Patient Size	i-gel [®] Size	Patient Weight Guidance
	Neonate	1	2-5kg (5-11lbs)
	Infant	1.5	5-12kg (11-25lbs)
	Small pediatric	2	10-25kg (22-55lbs)
	Large pediatric	2.5	25-35kg (55-77lbs)
	Small adult	3	30-60kg (65-130lbs)
	Medium adult	4	50-90kg (110-200lbs)
	Large adult	5	90+kg (200 +lbs)

NOTES:

1. Sometimes a feel of “give-way” is felt before the end-point resistance is met. This is due to the passage of the bowl of the iGel through the faucial pillars. It is important to continue to insert the device until a definitive resistance is felt.
2. Once definitive resistance is met and the teeth are located on the integral bite block, do not repeatedly push the iGel down or apply excessive force during insertion.
3. It is not necessary to insert fingers or thumbs into the patient’s mouth during the process of inserting the device.

EZ IO

CRITERIA:

- EZ-IO 25mm (≥ 3 kg) & EZ-IO 45mm (≥ 40 kg or excessive tissue depth)
 - Immediate vascular access in critical patients.
 - Intravenous fluids or medications are emergently needed and a peripheral IV cannot be established in a timely manner AND the patient's condition is emergent.
- EZ-IO should be considered PRIOR to peripheral IV attempts in the following situations:
 - Cardiac arrest (medical or trauma)
 - Profound hypovolemia with alteration of mental status.
 - Patient in extremis with immediate need for delivery of medications and/or fluids

CONTRAINDICATIONS:

- Fracture of the bone selected for IO infusion.
- Excessive tissue at insertion site with the absence of anatomical landmarks.
- Past history of significant orthopedic procedures (IO in target bone within 48 hrs. or known prosthesis).
- Infection at the selected site of infection.

EQUIPMENT:

- EZ-IO Driver
- EZ-IO 25mm or 45mm set
- Alcohol or Chlorhexidine wipes
- EZ-Connect or standard extension set
- 10 mL syringe
- NS
- Pressure bag or infusion pump
- [2% Lidocaine](#)
- EZ-IO wristband

PROCEDURE:

1. If the patient is conscious, advise EMERGENT NEED for this procedure and obtain informed consent.
2. Determine indications and rule out contraindications.
3. Locate appropriate approved insertion site:
 - a. Adult: proximal tibia and proximal humerus.
 - b. Pediatric: proximal tibia, proximal humerus, and distal femur
4. Prepare insertion site using aseptic technique.
5. Prepare the EZ-IO driver and appropriate needle set (needle selection should be based on patient weight, anatomy, and tissue depth).
6. Stabilize site and insert appropriate needle set.
7. Remove EZ-IO driver from needle set while stabilizing catheter hub.
8. Remove stylet from catheter. Place stylet in sharps container.
9. Connect primed EZ-Connect or standard extension set.
10. For pain management in conscious patients, slowly administer appropriate dose (noted on next pages) of [Lidocaine 2% IO](#).
11. Syringe bolus (flush) the EZ-IO catheter with the appropriate amount of NS to confirm placement.
12. Begin infusion. Utilize pressure (syringe bolus, pressure bag, or infusion pump) for continuous infusions.
13. Dress site, secure tubing, and apply wristband.
14. Frequently monitor EZ-IO site and patient condition.

Continued on next 2 pages

CONSIDERATIONS:

Site Identification Reference:

Proximal Humerus Insertion Site Identification – Adult & Infant/Child

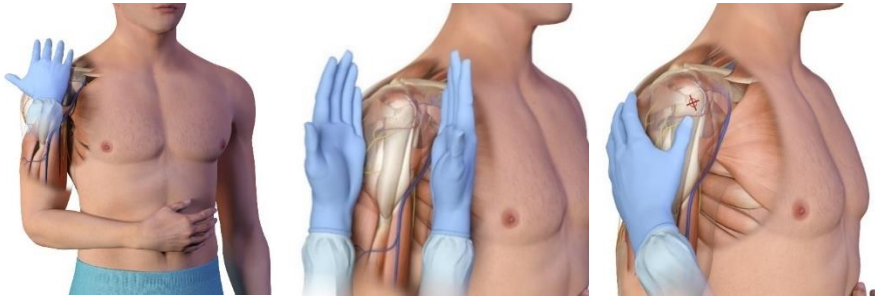
1. Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated)
2. Place your palm on the patient's shoulder anteriorly
The area that feels like a "ball" under your palm is the general target area
You should be able to feel this ball, even on obese patients, by pushing deeply
3. Place the ulnar aspect of your hand vertically over the axilla and the ulnar aspect of your other hand along the midline of the upper arm laterally
4. Place your thumbs together over the arm

This identifies the vertical line of insertion on the proximal humerus

5. Palpate deeply up the humerus to the surgical neck

This may feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck

The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle



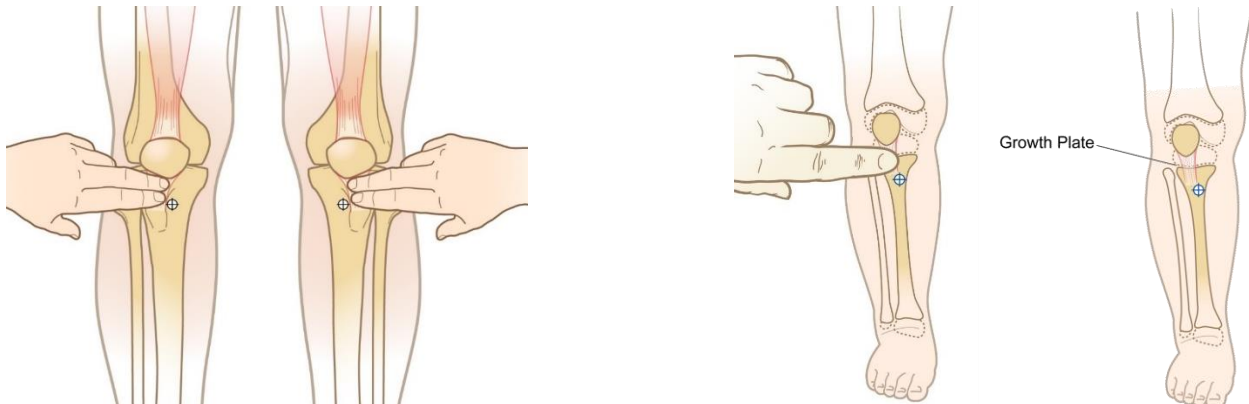
Proximal Tibia Insertion Site Identification – Adult

Extend the leg. Insertion site is approximately 2 cm **medial** to the tibial tuberosity, or approximately 3 cm below the patella and approximately 2 cm **medial**, along the flat aspect of the tibia.

Proximal Tibia Insertion Site Identification – Infant/Child

Extend the leg. Pinch the tibia between your fingers to identify the medial and lateral borders of the tibia.

Insertion site is approximately 1 cm **medial** to the tibial tuberosity, or just below the patella (approximately 1 cm or one finger width) and slightly **medial** (approximately 1 cm), along the flat aspect of the tibia.



Distal Femur Insertion Site Identification – Infant/Child

Extend the leg. Insertion site is approximately 1-2 cm **proximal** to the superior border of the patella and approximately 1 cm **medial** to the mid-line (depending on patient anatomy). Aim the needle set tip at a 90-degree angle to the bone for insertion.



Pain Management:

- **Adult responsive to pain** – Slowly administer **Lidocaine 2% 40 mg IO** over 2 minutes. Allow to dwell in IO space for 1 minute. Flush with 5-10 mL NS. Slowly administer an additional **Lidocaine 2% 20 mg IO** over 1 minute. May repeat PRN. Consider systemic pain control for patients not responding to IO Lidocaine.
- **Pediatric responsive to pain** – Slowly administer **Lidocaine 2% 0.5 mg/kg (not to exceed 40 mg) IO** over 2 minutes. Allow to dwell in IO space for 1 minute. Flush with 2-5 mL NS. Slowly administer an additional **Lidocaine 2% 0.25 mg/kg IO** over 1 minute. May repeat PRN. Consider systemic pain control for patients not responding to IO Lidocaine.

Flow rate:

- Due to the anatomy of the IO space flow rates may appear to be slower than those achieved with an IV catheter.
- Ensure the administration of an appropriate rapid syringe bolus (flush) prior to infusion (**NO FLUSH = NO FLOW**):
 - Rapid syringe bolus (flush) the adult patient with 10 mL of normal saline.
 - Rapid syringe bolus (flush) the pediatric patient with 5 mL of normal saline.

Finger Thoracostomy

CRITERIA:

- Traumatic cardiac arrest with known or suspected injury to chest and/or abdomen.
- Patients in cardiac arrest with suspected tension pneumothorax and/or history and symptoms suggestive of acute bronchospasm exacerbation.

CONTRAINDICATIONS:

- Any patient that has spontaneous cardiac output, including hypotensive patients.

EQUIPMENT:

- Alcohol prep pads or Provodine/Iodine applicator
- Scalpel
- Curved forceps
- Chest seal

PROCEDURE:

1. Ensure patient is in the supine position.
2. IV access, intubation and ventilation should be performed by other crew members and not delay the thoracostomy.
3. Cleanse the site with alcohol or Provodine/Iodine applicators.
4. Stop CPR to reduce the risk of bloodborne pathogen exposure to the provider.
5. Using the scalpel, make a 1-2 inch incision along the line of the ribs in the 4th or 5th intercostal space at the mid-axillary line. It is important not to extend or make incisions in or through penetrating wounds when at all possible.
6. Use the scalpel for skin only, there after use blunt dissection to pass through the intercostal muscles.
7. Utilizing curved forceps, make a hole sufficient to push 1 finger into the pleural cavity. Be careful when you push, as there may be fractured ribs or impaled objects that are sharp.
8. Insert a finger into the pleural space.
9. Ensure the lung is palpated and, if possible, feel caudally for the diaphragm. Use finger to sweep around incision to ensure any trapped air is able to freely vent outside the chest cavity.
10. Place chest seal to skin surface with vented opening over incision site.
11. Check for pulse and resume CPR if indicated.
12. In the event a massive hemothorax is discovered contact Medical Control and consider termination of resuscitation efforts.

CONSIDERATIONS

- This procedure shall be performed only by Paramedics at the Captain level or above.

Firefighter Assessment

CRITERIA:

This procedure applies to all emergency operations and training exercises where strenuous physical activity or exposure to heat or cold exists. Patients should be sent to the assessment area for:

- Any complaint, including the following signs and symptoms:
 - Weakness, dizziness, or syncope
 - Chest pain or shortness of breath
 - Altered mental status
 - Nausea/Vomiting
 - Muscle cramps
- At the discretion of the incident commander

PROCEDURE:

1. Initial evaluation of individual, including all [Diagnostic Tools and Procedures \(PR08\)](#). Transportation should not be delayed in patients with urgent signs/symptoms.
2. Individuals shall be continually reassessed while in assessment area.
3. Apply the [Adult Universal Guideline \(AM01\)](#).
4. Consider cooling measures:
 - Remove from the environment and place in a shaded area or an area with air conditioning.
 - Remove the majority of the protective gear.
 - Submerge patient's forearms in cool water.
 - Rinse and fan the patient with cool water.
 - Refer to [Environmental Emergency – Hyperthermia \(AM23\)](#) guideline as needed.
5. Consider oral rehydration:
 - Water.
 - Electrolyte solution (Gatorade or PowerAde).
 - NO alcohol, caffeine, or carbonated beverages.
6. Refer to a more specific guideline as indicated.
7. If the minimum return criteria are not met after 40 min. of rest, the patient should be transported to the closest appropriate facility.
8. Any patient treated under this guideline should have PCR documentation.

MINIMUM RETURN CRITERIA:

- GCS = 15, alert, and fully oriented
- Temperature < 38°C (100.4°F)
- Heart rate < 120 bpm
- SpO₂ ≥ 94% without oxygen supplementation
- SpCO < 5% for non-smokers, < 10% for smokers (if available)
- SBP 100-160 mmHg
- No medical complaints or signs/symptoms

Intranasal Medication

CRITERIA:

- Medication administration when IV access is not obtainable or undesirable.
- To provide an alternative method for needleless medication delivery.

CONTRAINDICATIONS:

- Facial trauma
- Epistaxis
- Nasal congestion or discharge
- Recent insufflated cocaine use
- Increased mucous production
- NG or NT tube in place
- Any other recognized nasal mucosal abnormality

PROCEDURE:

1. Patient should be in a recumbent or supine position.
2. Draw up medication into a 1 mL or 3 mL syringe with Luer-lock tip.
3. Expel any air within the syringe.
4. Attach the MAD to the syringe and confirm that it is secured firmly to the syringe.
5. Visually inspect nares and choose the largest nostril or the one with the least obstruction.
6. Insert syringe with MAD attached into the nostril until resistance is met (approximately 1.5 cm).
7. Timing the respirations, depress plunger rapidly upon patient exhalation but before inhalation.
8. If the patient is sitting, compress the nares with a gloved finger for 1-2 min. after administration.
9. The MAD is reusable on the same patient but must be disposed after each patient.

CAUTIONS:

- Adult: no more than 1 mL per nostril.
- Pediatric (> 10 years of age): no more than 1 mL per nostril.
- Pediatric (< 10 years of age): no more than 0.5 mL per nostril.
- May repeat administration as frequently as q 5 min. depending on medication.

SPECIAL CONSIDERATION:

- Medication administered must be a medication with an “IN” route outlined in these guidelines. Current medications are:
 - Fentanyl
 - Ketamine
 - Midazolam
 - Narcan
 - Tranexamic Acid (TXA)

Intravenous Access

CRITERIA:

- Any patient requiring immediate or anticipated IV access for medication or fluid administration.
- As directed by specific guideline.
- At the discretion of provider.

CONTRAINDICATIONS:

- None

EQUIPMENT:

- IV catheter
- Alcohol or Provodine/Iodine applicator
- Tape or commercial securing device
- IV fluid
- Administration set (if applicable)
- Extension set
- Tourniquet

PROCEDURE:

1. Prepare IV tubing and fluids
2. Apply constricting band, select site, and prepare with alcohol or Provodine/Iodine applicator.
3. Inspect catheter/needle assembly for defects.
4. Stabilize vein at site and, with bevel up, pierce skin with needle/catheter.
5. Enter lumen of vein with needle, evidenced by blood return into catheter hub.
6. Slightly advance the assembly to ensure that catheter tip has entered lumen.
7. Stabilize needle and advance catheter into lumen.
8. Withdraw needle from catheter. To control bleeding, gentle pressure may be applied proximal to catheter.
9. Attach the administration and/or extension set to catheter, aspirate, and confirm good flow of NS and lack of extravasation.
10. If patent, secure catheter/tubing with tape or commercial securing device.
11. Set IV flow to desired rate (if applicable).

SPECIAL CONSIDERATION:

- An approved EMT-Basic may perform this skill to the level of NS lock (without continuous infusion) with the following qualifications:
 - Qualified to perform this skill in another profession (ex. RN, MD)
 - Monitored and tested according to NREMT standards
 - Clinical Captain or designee will administer the test.
 - Test evaluation will be filed with employee records.
- The approved EMT-Basic is permitted to perform this skill in all protocols where this skill is allowed by EMS personnel with higher credentials.

Intravenous Infusion Pump

CRITERIA:

- Any patient requiring precise regulation of medications and/or IV/IO fluids.

CONTRAINDICATIONS:

- Unable to secure patent vascular access.

EQUIPMENT:

- Infusion pump
- Manufacturer-specific IV pump administration set
- Medication and/or IV fluid

PROCEDURE:

1. Calculate the hourly infusion rate.
2. Verify the rate of infusion with another advanced provider, when available.
3. Open the administration set from the package and close the administration set clamp.
4. Prime the tubing set by removing the spike cover and piercing the inverted IV fluid container. Slowly expel all the air from the IV bag and pump tubing.
5. Hang the IV solution above the level of the infusion pump.
6. Power on the pump and load the tubing set according to the manufacturer's instructions.
7. Program the pump with the prescribed infusion rate (hourly rate) and the volume to be infused.
8. Connect the administration set to vascular access device (IV or IO) using aseptic technique.
9. Unclamp all tubing clamps and press the start button.
10. Ensure proper infusion by observing the status screen on the pump, IV/IO site, vital signs, and patient condition.
11. Verify alarm volume is audible.

SPECIAL CONSIDERATIONS:

- Medical Control to verify medication doses as needed.
- Contact hospital RN to assist with troubleshooting hospital acquired infusion pump.
- The infusion pump may not be appropriate for very small volume infusions and/or neonatal populations.

Law Enforcement/Medical Blood Draw

CRITERIA:

- Law Enforcement - Blood draw requested by law enforcement.
- Medical – Blood draw to facilitate expedited care for patients with urgent medical conditions at the receiving facility.

CONTRAINDICATIONS:

- Law Enforcement – None
- Medical – Blood draw would result in a delay of critical measures.

EQUIPMENT:

- Betadine or alcohol wipes (alcohol wipes are **not** permitted for law enforcement blood draws).
- Blood draw equipment of choice of provider (IV, vacutainer, etc.)
- Law enforcement blood tubes
-OR-
- Medical blood tubes (Blue, Red, Green, Purple)

PROCEDURE:

Law Enforcement Blood Draw

1. Confirm validity of warrant/order.
2. Assemble and prepare equipment.
3. Apply tourniquet and prepare with Betadine prep in a small circular motion from inside to out. If patient is allergic to Betadine, soap and water may be used.
4. Perform venipuncture and obtain blood sample, placing blood in law enforcement provided blood tubes.
5. Apply a protective covering or band-aid over the blood draw site. Note and treat any complications.
6. Slowly mix the anticoagulant powder and blood by inverting the blood tubes several times (do not shake tubes).
7. Blood tubes will be turned over to law enforcement officer executing warrant.
8. Document chain of custody.
9. Complete PCR and attach applicable copies of the search warrant/order.

Medical Blood Draw

1. Assemble and prepare equipment.
2. Perform [Intravenous Access Procedure \(PR17\)](#). The tourniquet should be positioned 7.5cm to 10cm above the puncture site. The tourniquet must be loosened after no more than one minute. If applied for longer, pressure from the tourniquet may cause elevated potassium levels.
3. During venipuncture, the blood sample may be obtained from an unflushed saline lock. The following order is recommended to preserve any additives in the blood tubes.
 - a. Blue – Citrate (must collect enough blood to reach the fill line)
 - b. Red – Serum
 - c. Green – Heparin
 - d. Purple – EDTA
4. Once the blood sample has been obtained, the saline lock shall be flushed with NS.
5. The filled blood tubes shall be inverted 6-8 times (do not shake tubes).
6. Upon arrival to the emergency room, label the blood tubes with El Campo Memorial Hospital patient labels. Write the collection time, initials of EMS personnel who drew blood, and “EMS” on each label for each blood tube.
7. Provide labeled blood tubes to receiving nurse.

Left Ventricular Assist Device (LVAD)

INDICATIONS:

- Patient with a Left Ventricular Assist Device (LVAD)

ASSESSMENT:

- Start with **ABCs**
 - You may or may not feel a palpable pulse as the VAD produces a continuous flow (not a pulsatile flow)
 - Assess mental status, skin condition, and lip color as this may give you the best indicator of perfusion status (circulation)
- **Obtain Vital Signs**
 - Auscultating a manual blood pressure will not be possible; use a non-invasive blood pressure device (Zoll); **a NORMAL Mean Arterial Pressure (MAP) will range from 70-90 mm Hg with a narrow pulse pressure**
 - Pulse Oximetry may not be accurate due to weak or absent pulses
- **Obtain a History and Physical Exam**
- **ECG monitoring and 12 Lead ECG** appropriate to patient condition (ECG will NOT be affected by the VAD pump)
- **Assess whether the pump is functioning by listening with a stethoscope over the pump pocket at the lower left rib margin on the anterior chest.** A distinct hum, or whirling sound, will be heard if the pump is running.
- **Assess the device for any alarms;** intervene appropriately based on alarm type, EMS Guide (device) instructions, and/or per VAD Coordinator instructions.

PROCEDURE:

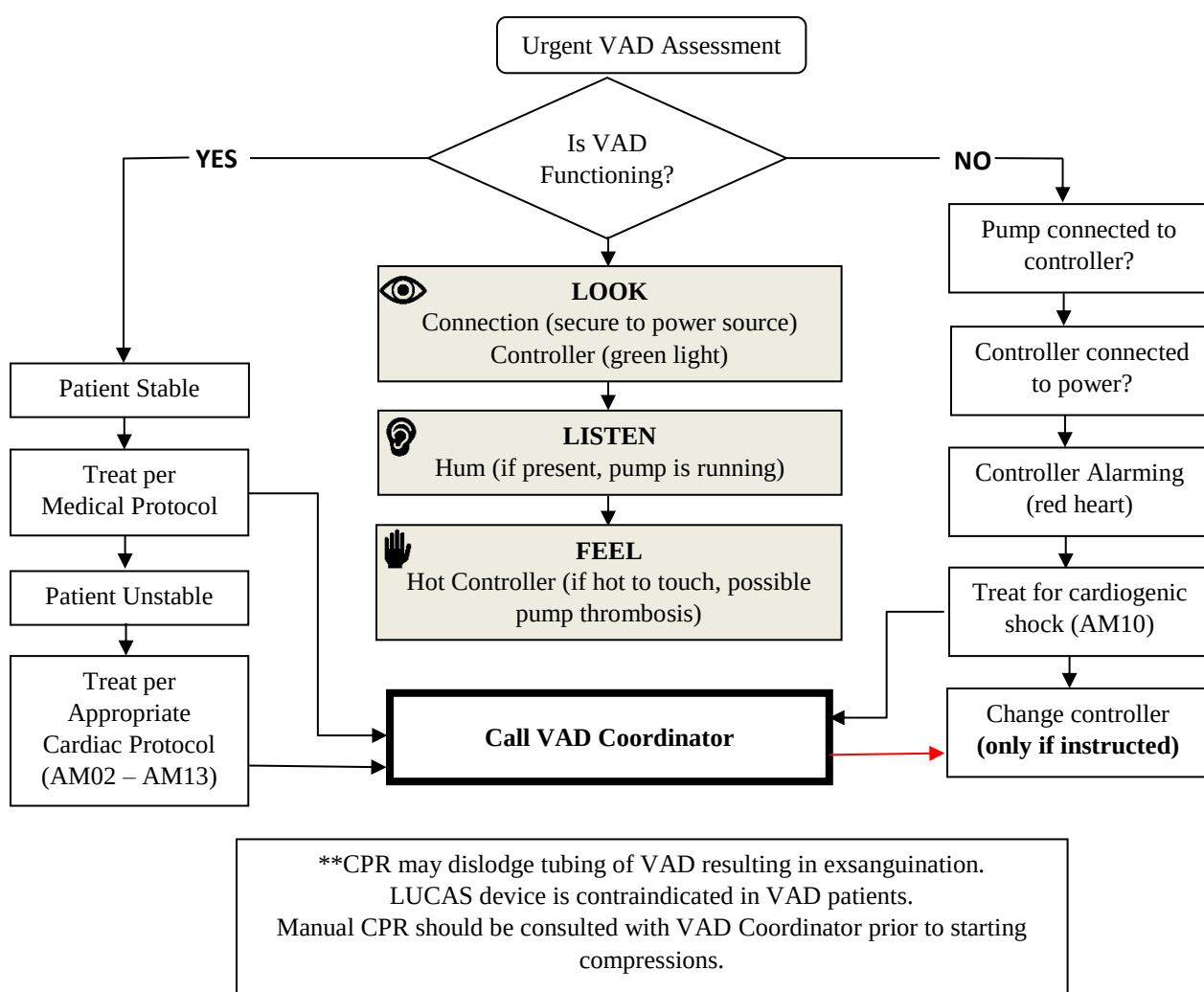
- **Contact the VAD Coordinator** if the patient/family has not already done so. They will be able to provide valuable information regarding treatment and transport decisions.
- **Initiate the applicable treatment protocol for the patient's chief complaint** (i.e. Stroke, Acute Coronary Syndrome, etc.) Medication and other treatments should be followed according to the appropriate guideline. In many cases, the **VAD coordinator may give direction or request something that does not align with El Campo EMS guidelines.** For example, to give a Beta Blocker or Calcium Channel Blocker for a patient with a low BP or unobtainable BP. It is acceptable to follow the advice the VAD coordinator as this is based on patient specific conditions and/or information from the VAD control unit such as drawing too much power because the pressure is too high.
- Prior to transport, **be careful when putting the patient on the stretcher.** Be sure that the driveline doesn't get pulled or become kinked, and that the controller and battery packs are close to the patient and aren't dangling off the side of the stretcher.
- **Transport to hospital where the VAD was placed** or per the VAD Coordinator instructions. **Bring all of the patient's equipment (including the patient's emergency travel pack with them which contains extra batteries and a back-up controller) and a family member that can answer questions,** in case the patient becomes unresponsive.
- **CPR:** It's important that your patient is assessed in complete cardiac arrest before CPR is started. This would include poor perfusion of their skin, complete lack of responsiveness and some indication that their pump isn't functioning. It's especially important to use the guidance of the VAD coordinator before initiating CPR. LUCAS device is contraindicated.

Continued on next page

Left Ventricular Assist Device (LVAD)

SPECIAL CONSIDERATIONS:

- Patients with a VAD are typically on anti-coagulant therapy to prevent clotting within the VAD and the bloodstream. Complications from VADs usually result from anticoagulation (excessive bleeding) or pump thrombosis (clot).
- A patient may be in **Ventricular Fibrillation** or **Ventricular Tachycardia** and remain awake and alert if the pump is working properly. If the patient requires defibrillation or cardioversion, these can be performed as normal, however, **do not place defibrillation pads over the pump**.
- In the event of a pump failure, contact the VAD coordinator for guidance and instruction. Restarting a pump that has been stopped isn't recommended because it will increase the patient's risk of stroke or thromboembolism. This is due to the stagnant blood that may have developed in the system while the pump was off.
- All ACLS drugs may be given to a patient with a VAD.
- VAD Coordinator phone number for Methodist TMC is 281-520-0574. Consult patient's paperwork if the VAD was placed at another hospital.



LUCAS Chest Compression System

CRITERIA:

- Cardiopulmonary arrest

CONTRAINDICATIONS:

- The Lucas does not fit patient (too small or too large)
- Pediatric patient
- Thoracoabdominal traumatic arrest
- Pregnant patients

PROCEDURE:

1. Open Bag
 - A. Open cover so that entire bag unfolds.
 - B. Push ON/OFF for 1 second until green ADJUST key illuminates.
2. Apply to patient
 - A. Pause manual CPR.
 - B. Lay backplane under body, below armpits.
 - C. Resume manual CPR.
3. Remove and attach compressor
 - A. Extend leg; claw locks open.
 - B. Connect to backboard; listen for click.
 - C. Pull up once to ensure attachment.
4. Position suction cup
 - A. Lower edge of suction cup should immediately be above the end of the sternum.
 - B. Suction cut should be centered over the sternum.
5. Lower suction cup
 - A. Pressure pad inside suction cup should touch patient's chest.
 - B. If pad does not touch or fit properly, continue manual compressions.
 - C. Push PAUSE to lock the start position.
6. Start compressions
 - A. Push ACTIVE to begin compressions
 - a. ACTIVE (30:2) – no advanced airway, OR
 - b. ACTIVE (continuous) – advanced airway
 - B. Check for proper position.
 - C. Do not leave patient or device unattended while LUCAS is active.
7. Attach stabilization strap
 - A. Place support cushion under patient's neck.
 - B. Fasten cushion straps to device straps.
 - C. Tighten the straps.
 - D. Delay use, or do not use stabilization strap when it might impair treatment.
8. Push PAUSE to temporarily stop compression for:
 - A. Ventilations – no advanced airway.
 - B. ECG analysis.

CAUTION:

- Keep interruptions to a minimum.

Nasogastric Tube Insertion

CRITERIA:

- Patients who require drainage of gastric contents or decompression of gastric distension.

CONTRAINDICATIONS:

- Severe maxillofacial trauma (cribriform plate disruption).
- Altered mental status without a secured airway.

EQUIPMENT:

- Nasogastric tube of correct size
 - Infant to child – size 6-10 fr.
 - Adolescents to adult – size 10-18 fr.
- 60 mL syringe, catheter-tip type
- Water soluble lubricant
- Cloth tape
- Suction equipment and supplies
- Stethoscope

PROCEDURE:

1. Assemble and prepare the equipment.
2. Inspect the nares for any deformity or obstruction to determine the best side for insertion.
3. Measure, using NG tube, the distance from the bridge of nose to earlobe, then to the point halfway between the end of the sternum and the navel. Mark or note the length.
4. Place the tip of lubricated NG tube into the most dilated nare.
5. Position the head in a neutral or flexed position (unless cervical spine precautions contraindicate) and advance the tube posteriorly, into the pharynx and esophagus. In the conscious patient, ask the patient to swallow as the NG tube is advanced.
6. If the tube coils in the mouth or if the patient develops stridor or dyspnea, **stop**. Remove the tube, oxygenate patient, and attempt NG placement again.
7. Once the tube is advanced to the distance mark, stop and manually stabilize the tube.
8. Attach a syringe and aspirate for gastric contents.
9. After aspirating, auscultate over the epigastrium while re-injecting aspirate.
10. Tube placement is confirmed by auscultating air or aspirate entering the stomach. The presence of gastric contents on aspiration helps confirm placement, but its absence does not necessarily indicate improper placement.
11. Once placement is confirmed, secure the tube with tape.
12. Attach the tube to low intermittent suction.

SPECIAL CONSIDERATIONS:

- May insert NG tube through the mouth as an alternate method in the unconscious patient, if not contraindicated. To measure OG insertion, measure from the corner of the mouth to earlobe, then to the point halfway between the end of the sternum and the navel.

COMPLICATIONS/PRECAUTIONS:

- Nasal and gastrointestinal hemorrhage
- Passage of tube into trachea
- Perforation of the esophagus
- Coiling of tube in posterior pharynx
- Passage of the tube intracranially (with cribriform plate fractures)

Nebulized Medication

CRITERIA:

- Any patient requiring a nebulized medication per guideline with adequate tidal volume.

CONTRAINDICATIONS:

- Contraindication to the medication.

EQUIPMENT:

- Medications for nebulization; reference specific guideline
- Nebulizer device; small volume nebulizer or in-line nebulizer
- [Oxygen](#)

PROCEDURE:

1. Prepare equipment and medication.
2. Explain procedure to patient.
3. Place the mask on the patient, the mouthpiece in the patient's mouth, attach to vent circuit if intubated, or attach in-line with CPAP/BiPAP.
4. Is using a small volume nebulizer, coach the patient to inhale deeply and, if possible, to hold each breath for 1-2 seconds, and then exhale.
5. Monitor and discontinue if adverse side effects (e.g. excessive tachycardia, tachydysrhythmias) develop.

Needle Chest Decompression

CRITERIA:

- Signs and symptoms of a tension pneumothorax

CONTRAINDICATIONS:

- None

EQUIPMENT:

- Appropriate needle set
 - Adult – 8, 10, or 14 ga. X 3.25 inch IV catheter or premanufactured decompression needle
 - Pediatric – 18 or 20 ga. X 1.25 inch IV catheter
- Alcohol prep pads or Provodine/Iodine applicator
- 10 mL syringe
- Stethoscope
- Tape
- Gauze

PROCEDURE:

1. Prepare equipment.
2. Locate appropriate insertion site.
 - A. Anterior – Between 2nd and 3rd intercostal space midclavicular.
 - B. Lateral – Between 4th and 5th intercostal space midaxillary.
3. Prepare area with Alcohol or Provodine/Iodine applicator.
4. With the dominant hand, insert the needle catheter assembly perpendicular to the skin and just above the superior border of the rib inferior to the insertion site.
5. Once the pleural space is entered (recognized by a change in resistance and/or air entry into the syringe), advance catheter into space until the hub is flush with the skin.
6. Remove needle and syringe while manually stabilizing catheter.
7. Cover the catheter with a chest seal, with one way valve directly over catheter opening.
8. Auscultate chest for improvement in breath sounds.
9. Monitor catheter and valve to ensure continued correct functioning and monitor patient for need for additional decompression.

Needle Cricothyrotomy

CRITERIA:

- Life-threatening airway compromise
- Children < 10 years of age
- Cannot ventilate or oxygenate via OPA/NPA, BVM, EGD, or intubation due to an obstruction proximal to the glottic opening.
- As directed by the [Pediatric Failed Airway Guideline \(PM15\)](#).

CONTRAINDICATIONS:

- Patients who have aspirated a foreign body that cannot be visualized by direct laryngoscopy.

EQUIPMENT:

- 14 ga over-the-needle catheter
- Syringe
- 3.0 mm pediatric ETT adapter
- Tape

PROCEDURE:

1. Place the child in the supine position with the head extended over a towel under the shoulder, it not otherwise contraindicated.
2. Carefully palpate the cricothyroid membrane, if possible.
3. Cannulate the trachea with the over-the-needle catheter directed caudally at a 30° angle.
4. Aspirate air using the syringe to ensure tracheal entry.
5. Slide the catheter gently off the needle, removing the needle.
6. Attach the ETT adapter to the hub of the catheter and commence bag ventilation.
7. Auscultate chest for adequate ventilation and apply ET capnography.
8. Secure the catheter with tape

SPECIAL CONSIDERATIONS:

- The provider will note an exaggerated resistance to BVM ventilation. This is normal and is related to the small diameter of the catheter and the turbulence created by ventilation through it.
- The required pressures are well above the limits of the BVM pop-off valve; therefore, it must be disabled in order to permit gas flow through the catheter.

Orotracheal Intubation

CRITERIA:

- A patient with failure of oxygenation or ventilation, failure of airway protection, or anticipated clinical course suggests the need for intubation.
- As directed in the specific guidelines.

CONTRAINDICATIONS:

- Patient suspected of narcotic overdose prior to the administration of Narcan.
- Patient suspected of hypoglycemia prior to the administration of Dextrose.

EQUIPMENT:

- Endotracheal tube(s) of appropriate size
- Endotracheal Introducer (Bougie) or stylet for ET tubes
- Laryngoscope handle and batteries
- Laryngoscope blades of the appropriate sizes and desired type
- BVM
- 10 mL syringe
- Water-soluble lubricant
- Tape or commercial tube securing device
- Oral airway of the appropriate size
- Stethoscope
- EtCO₂ waveform equipment
- Suction equipment and supplies
- [Oxygen](#)

PROCEDURE:

1. Pre-oxygenate patient.
2. Prepare equipment.
3. Position patient's head and torso as appropriate (neutral if cervical spine precautions indicated, "sniffing" position otherwise, ramp if required to place the earlobe at the level of the sternal notch).
4. Remove mask and oral airway (if utilized).
5. Insert laryngoscope blade, moving tongue to the left and lifting epiglottis. **Do not** apply pressure to teeth.
6. Visualize epiglottis, posterior cartilages, and vocal cords.
7. Pass ET tube through pharynx and into glottis. Confirm direct visualization of passage of tube through cords. See [Endotracheal Introducer \(Bougie\) Procedure \(PR10\)](#), as required.
8. Advance tube until cuff is just past the cords (typically $\approx$ 3x tube internal diameter).
9. Manually stabilize/secure tube.
10. Inflate cuff until no air leakage; do not over-inflate (typically $\approx$ 4-6 mL air). Utilize [Tru-Cuff](#) manometer if available.
11. Attach BVM, ventilate, and confirm placement with negative epigastric sounds, the presence of breath sounds in all four lobes, condensation in ET tube, and appropriate EtCO₂ waveform.
12. Reposition tube or re-intubate patient as needed. Each attempt must be preceded by appropriate pre-oxygenation.
13. Reassess tube placement. If still in correct position, secure tube with a commercial device or tape.
14. Frequently reconfirm tube placement, especially after moving patient or manipulating ET tube.
15. Confirm placement after transfer at hospital by ED staff signature in PCR.

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Orotracheal Intubation

SPECIAL CONSIDERATIONS:

- Consider Delayed Sequence Intubation ([Adult \(PR06\)](#) or [Pediatric \(PR07\)](#)) for a patient with intact gag reflex.
- Consider video laryngoscopy for a patient with suspected spinal injury or difficult airway.
- In patients with a preexisting tracheostomy, intubation may be performed through the stoma using an appropriately sized ET tube. Depth modification is required as ET cuff should be just inside the stoma.

POTENTIAL COMPLICATIONS:

- Esophageal intubation
- Right main stem intubation
- Vomiting
- Pneumothorax or tension pneumothorax from high-pressure ventilation
- Inadvertent tube displacement during movement/transport
- Increased intracranial pressure
- Fractured teeth
- Pharyngeal/tracheal trauma

Pain Management

CRITERIA:

- Patient report of pain
- Suspicion of pain in the unresponsive patient, based upon clinical indications.

CONTRAINDICATIONS:

- Allergy to specific pain medication.

PROCEDURE:

A complete neurological exam must be completed **prior** to administering any pain medications, and results of the exam must be fully documented in the PCR.

The reduction and control of pain may be accomplished by psychological, physical, and pharmacological means. These may include:

- Emotional support and distraction techniques
- Positioning and splinting
- Ice pack
- Pharmacological interventions including:
 - **Adult** (SBP >100)
 - **Acetaminophen IV 1000 mg IV/IO** mixed in 100 mL NS infused over 10 min.
 - **Fentanyl 0.5-2 mcg/kg IV/IO/IM/IN** (over 1 minute if IV/IO) (max single dose 200 mcg). May repeat q 15 minutes if SBP parameters met.
 - For acute lower back pain, non-traumatic, may administer **Lorazepam 1mg IV/IO** q 10 min(max 4 mg).
 - Severe pain: **Ketamine 20 mg IV/IO** mixed into 100 mL NS administered over 10 min., or **50 mg IM**. May repeat q 15 min. X 2.
 - **Pediatric (3-12 years)** with SBP > (70 mmHg + (age in yrs X 2)).
 - **Acetaminophen IV 15 mg/kg IV/IO** mixed in 100 mL NS infused over 10 min.
 - **Fentanyl 1-2 mcg/kg IV/IO/IM/IN** (over 1 minute if IV/IO). May repeat q 10 minutes if SBP parameters met.
 - Severe pain: **Ketamine 0.2 mg/kg IV/IO** mixed into 100 mL NS administered over 10 min., or **0.4 mg/kg IM**. May repeat q 15 min. X 2.
 - **Pediatric (1-3 years)** with SBP > (70 mmHg + (age in yrs X 2)).
 - **Fentanyl 2-3 mcg/kg IV/IO/IM/IN** (over 1 minute if IV/IO). May repeat q 10 minutes if SBP parameters met.
 - Severe pain: Ketamine 0.2 mg/kg IV/IO mixed into 100 mL NS administered over 10 min., or 0.4 mg/kg IM. May repeat q 15 min. X 2.
 - Consider:
 - Caution with dosing of opioids in older patients, obese patients, those with comorbid conditions, intoxicated patients, or those with hypotension.
 - Starting at a lower dose and re-dosing to effect is preferable to overdosing with a large, single administrations.
 - All patients require diligent monitoring of their hemodynamic and respiratory status.
 - Nausea management as needed per Nausea/Vomiting guideline (**Adult (AM30)** or **Pediatric (PM25)**).
 - If respiratory depression occurs, ventilate the patient with a BVM until depression resolves. If it is a lasting effect, the patient may be treated per Toxic Exposure/Poisoning guideline (**Adult (AM36)** or **Pediatric (PM30)**).
 - Pharmacological interventions are to be administered by paramedic credentialed providers ONLY.

Pediatric Emergency Tape: Broselow or Handtevy

CRITERIA:

The pediatric length/age-based emergency tape is designed to be used as a quick reference for drug dosages and equipment sizing for pediatric patients. The tape is calibrated in different zones according to different lengths/ages. The zone that corresponds to the patient's length/age is used. If the pediatric length/age-based emergency bag is also used, the zone on the tape can be matched with the zone on the pouch that contains the appropriately sized equipment.

EQUIPMENT:

- Broselow or Handtevy Tape
- Handtevy computer/phone application, if utilizing Handtevy

PROCEDURE:

- 1) Place the patient in a supine position.
- 2) Remove the tape and unfold it.
- 3) Place the tape next to the patient, ensuring that the multicolored side faces up.
- 4) Place the red end of the tape even with the top of the patient's head.
- 5) Place the edge of one hand on the red end of the tape.
- 6) Starting from the patient's head, run the edge of your free hand down the tape.
- 7) Stop your hand even with the heel of the patient's foot. If the patient is larger than the tape, stop here and use the appropriate adult technique.
- 8) Verbalize the zone on the tape (color and/or age) where your free hand has stopped. If the patient falls on the line, go to the next higher section.
- 9) Use the medication doses which correspond to the zone selected.
- 10) Use the corresponding zone (color and/or age) to determine appropriate equipment sizes.

SPECIAL CONSIDERATIONS:

- If child's age is known, you may bypass utilizing the tape and go straight to the Handtevy computer/phone application.
- The Broselow or Handtevy tape are excellent resources for determining a patient's weight/age. Providers are to be familiar with common doses and are responsible for the ultimate dose administered.

Physical Restraints

CRITERIA:

- Any patient who is an imminent risk of harm to self or others who would benefit from gentle restraint to prevent injury to the patient or crew.
- Other means to prevent injury to the patient or crew, including reality orientation, distraction techniques, or less restrictive, therapeutic means must be attempted first. Physical restraint may only be used as a last resort.
- The patient must lack capacity.

CONTRAINDICATIONS:

- Application prior to attempts at less invasive methods of control.

EQUIPMENT:

Any or all the following may be required:

- Soft restraints
- Spit hood (system-approved or law enforcement provided full-face visibility hood) or face mask
- Adequate personnel should be available prior to initiating physical restraint

PROCEDURE:

1. Attempt less restrictive means of managing the patient.
2. Ensure adequate personnel to safely effect restraint (law enforcement preferred).
3. Have assisting team members take control of the patient's extremities.
4. Apply restraints to the upper and lower extremities as necessary, taking care to preserve distal circulation, motor function, and sensation.
5. Restrain the patient in a lateral or supine position. Anatomical positioning is preferred.
6. No devices such as backboards or splints should be placed on top of the patient.
7. The patient should **never** be restrained in the prone position.
8. Recheck circulation in restrained extremities every 15 min., beginning as soon as possible after restraints are applied.
9. A spit hood or face mask may be applied when the patient presents an exposure risk due to spitting.
10. Diligent monitoring of the airway and respiratory status **must** be performed.
11. Thoroughly document the following:
 - A. Efforts prior to restraint
 - B. Reason for use of restraint
 - C. Type of restraint used
 - D. Time restraint applied
 - E. Verification of distal circulation, motor function, and sensation
12. If the patient is restrained by law enforcement personnel with handcuffs or other devices that EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.
 - A. Do not handcuff the patient to the stretcher.
 - B. Substitute soft restraints for the handcuffs if the handcuffs must be removed for patient care activities.
 - C. Do not let the handcuffs jeopardize patient care.

Push Dose Vasopressors

CRITERIA:

- Adult patients requiring rapid vasopressor support in the setting of hypotension.

CONTRAINDICATIONS:

- MAP > 75 mmHg (relative contraindication)
- SBP > 130 mmHg (relative contraindication)
- Unsure patency of vascular access. While preferred site is via central line, antecubital fossa IV or IO are appropriate for short term use.

EQUIPMENT:

- 10 mL syringe with needle
- Alcohol prep
- Tape or medication label
- Vasopressor of choice (*select one*)
 - [Epinephrine](#) – Preferred in patients with lower heart rates and no suspected cardiac ischemia.
 - OR-
 - [Norepinephrine](#) – Preferred in patients with suspected sepsis, cardiac ischemia, or HR >130.

PROCEDURE:

1. Verify patency of vascular access.
2. Clean site with alcohol prep.
3. Mix preparation and deliver the selected drug:
 - A. **Epinephrine:**
 - a. Mix 1 mL (1 mg) of Epinephrine [1:1,000] in a bag of 100 mL of NS, for a final concentration of Epinephrine [1:100,000], or 910 mcg/mL).
 - b. Draw this mixture into a 10 mL syringe.
 - c. Affix “Epi 10 mcg/mL” label to syringe.
 - d. Give 10 mcg (1 mL) IVP q 3-5 min. PRN.
 - B. **Norepinephrine:**
 - a. Mix 4 mL (4 mg) of Norepinephrine in a bag of 250 mL of NS, for a final concentration of Norepinephrine 16 mcg/mL.
 - b. Draw the mixture into a 10 mL syringe.
 - c. Affix “Norepi 16 mcg/mL” label to syringe.
 - d. Give 8 mcg (0.5 mL) IVP q 3-5 min. PRN
4. Re-assess blood pressure and heart rate frequently.
5. If patient condition requires and resources permit, consider transition to vasopressor infusion.

SPECIAL CONSIDERATIONS:

- Shock Index (SI) Calculation: $HR/SBP = SI$. $SI \geq 0.8$ is highly sensitive for the diagnosis of occult shock. Utilization of SI may help guide resuscitation, including the use of IV fluids and/or push dose vasopressors.

QuickClot Gauze

CRITERIA:

- Extremity or junctional hemorrhage uncontrolled by direct pressure.

CONTRAINDICATIONS:

- Thoracoabdominal trauma, including internal wounds, sucking chest wounds, and exposed bowel.
- Eye injuries

EQUIPMENT:

- Sterile 4x4s (non-sterile, if unavailable)
- Rolled gauze
- QuickClot Gauze

PROCEDURE:

1. Remove excess pooled blood from the wound cavity using 4x4s.
2. Determine the source of significant hemorrhage.
3. Pack the QuickClot Gauze directly onto the bleeding source, maintaining constant pressure at the hemorrhage source.
4. Use 4x4s to wipe the remainder of the wound cavity to ensure no other sources of bleeding.
5. Continue constant pressure application at the hemorrhage sources for an additional 3-5 min.
6. Once hemorrhage is controlled, pack the remainder of the QuickClot Gauze into the wound cavity.
7. Pack 4x4s or rolled gauze into the remainder of the wound cavity if space allows.
8. Apply a pressure dressing.
9. Frequently re-evaluate the patient and the wound for re-bleed. Do not remove the bandage unless bleeding continues. If needed, repeat the process to obtain hemorrhage control.

SPECIAL CONSIDERATIONS:

- Placing QuickClot Gauze into a wound cavity full of blood will not allow for the hemostatic chemical to be directed at the source of bleeding. Adequate wound bowl clean-out is imperative.
- A fully saturated bandage may not provide adequate hemostasis. Consider replacing if significantly saturated and hemorrhage control not obtained.

Spinal Motion Restriction

CRITERIA:

- Suspected spinal injury.

CONTRAINDICATIONS:

- Placement of c-collar would interfere with airway management.
- Application of c-collar causes more discomfort than suspected injury.
- C-collar does not properly fit patient.

PROCEDURE:

1. Utilize Spinal Motion Restriction (SMR) Algorithm to determine need for SMR.
2. IF SMR is indicated and:
 - A. Patient is ambulatory on scene or the patient can safely self-extricate:
 - i. Place c-collar on patient.
 - ii. Allow the patient to move themselves to the stretcher.
 - iii. Transport the patient in a supine position or position of comfort.
 - iv. Upon arrival at the hospital, allow the patient to move themselves to the hospital stretcher, wheelchair, or other appropriate chair.
 - B. If the patient is not ambulatory or if extrication (movement/removal by EMS personnel) is required:
 - i. Place c-collar on patient.
 - ii. Use a CombiCarrier or scoop stretcher as needed to move the patient to the stretcher.
 - iii. Remove the CombiCarrier or scoop stretcher once the patient is on the stretcher. Patient may be left on the CombiCarrier or scoop stretcher if the patient requires rapid transport and the device will assist in rapid patient movement or the removal of the device will delay critical interventions/emergency transport.
 - iv. If multiple patients are being transported and the patient will be placed on the bench seat, the patient may remain on the CombiCarrier or scoop stretcher with ample padding in place.
3. Upon arrival at the hospital, move patient to the hospital stretcher while maintaining inline spinal alignment.

SPECIAL CONSIDERATIONS:

- All patients with a suspected spinal injury should be instructed to avoid moving their head and neck as much as possible.
- In cases where a c-collar is contraindicated or not tolerated, care should be taken to keep the cervical spine as in-line and stabilized as possible through positioning, towel placement, or manual stabilization.
- All patient movements should be done to limit motion of the spine.
- A long spine board may be substituted for the CombiCarrier or scoop stretcher if needed.

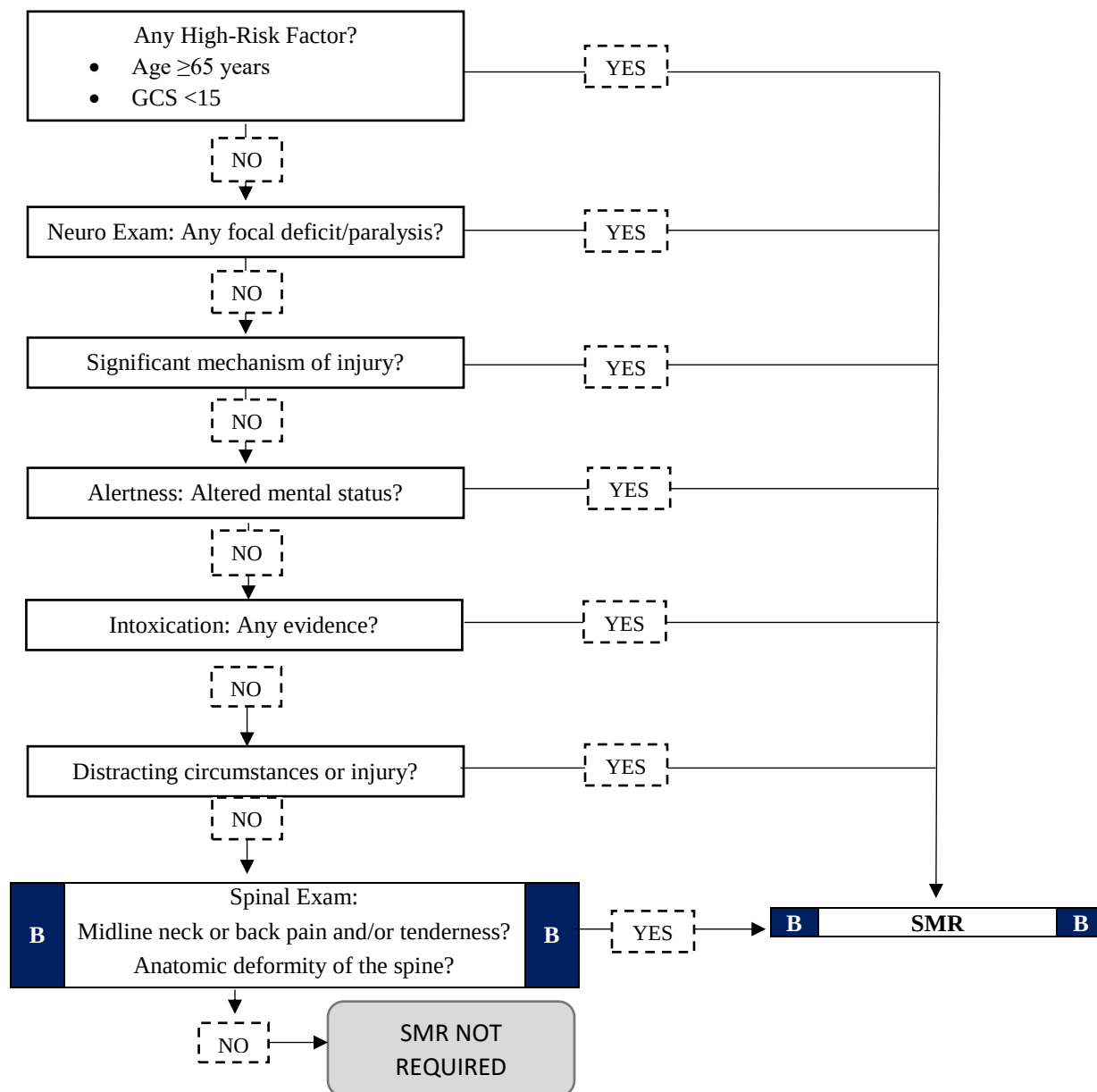
CAUTIONS:

- Be aware of potential airway compromise or aspiration in immobilizes patients with nausea/vomiting or with facial/oral bleeding.
- Prolonged immobilization on a spine board can be very uncomfortable and lead to ischemic skin pressure injuries.
- Excessively tight immobilization straps can limit chest excursion and cause hypoventilation.
- Children are abdominal breathers; immobilization straps should go across the chest and pelvis, not across the abdomen, when possible.
- Children have disproportionately larger heads than adults. When securing pediatric patients to a spine board, the body should be elevated to accommodate the larger head size and avoid neck flexion when immobilized.
- Age alone should not be a factor in decision-making for prehospital spine care, yet the patient's ability to reliably be assessed at the extremes of age should be considered. Communication barriers with infants/toddlers ($\approx$ 3 years of age) or elderly patients with dementia may prevent the provider from accurately assessing the patient.
- If in doubt, apply motion restriction.

Continued on next page

Spinal Motion Restriction

Spinal Motion Restriction (SMR) Algorithm



SPECIAL CONSIDERATIONS:

- A patient's spine cannot be "cleared" without radiographic imaging. This algorithm identifies those patients who are unlikely of having a spinal injury.
- Patients over age 65 are more prone to skeletal injury with even slight traumatic insult.
- **Significant mechanism of injury:** Fall from elevation ≥ 3 fts / 5 stairs, axial load to head, MVC (high speed, rollover, ejection), ATV accidents, bicycle collisions.
- **Distracting circumstances or injury:** Other traumatic injuries causing pain, emotional distress, communication barrier, or any similar injury that impairs the patient's ability to contribute to a reliable patient exam.
- Range of motion of the patient's neck does not need to be assessed as part of the decision for SMR.
- Patients with penetrating injury to the head, neck, or torso **and** no evidence of spinal injury should **not** receive spinal motion restriction.

Page 191

Surgical Airway

CRITERIA:

- Life-threatening airway compromise.
- Inability to oxygenate or ventilate via OPA/NPA, BVM, EGD, or intubation.
- As directed by the Failed Airway Guideline ([Adult \(AM15\)](#) and [Pediatric \(PM15\)](#)).

CONTRAINDICATIONS:

- Patient <10 years old.
- Airway obtained by any other means.

EQUIPMENT:

- Chlorhexidine or other skin cleanser
- ETT securing device (i.e. shoe string)
- Cricothyroidotomy commercial tube, or appropriately sized cuffed ET tube
- Syringe
- Number 10 scalpel
- Bougie
- Tracheal hook, if available
- Hemostat
- Suction equipment and supplies
- Sterile 4x4s
- BVM with Oxygen

PROCEDURE:

1. Prepare and assemble the equipment.
2. If at all possible, pre-oxygenate the patient.
3. Prepare the anterior neck with Chlorhexidine or other skin cleanser.
4. Locate the cricothyroid membrane. Place a finger on the thyroid cartilage (“Adam’s apple”) and move the finger down into the soft depression between the thyroid cartilage and cricoid cartilage (next firm “bump”).
5. Leave a finger on the membrane.
6. Stabilize the tissue by applying finger pressure bilaterally to membrane with the hand that has identified the membrane.
7. Place the tip of the scalpel on the skin just superior to the membrane.
8. Make a vertical incision ($\approx$ 4-5 cm) through the epidermis and adipose tissue over the membrane, exposing the membrane.
9. Stabilize the cricoid cartilage with thumb and forefinger while identifying and exposing the cricoid membrane.
10. Make a horizontal incision ($\approx$ 2 cm) across the membrane.
11. If available, insert the tracheal hook into the membrane and rotate so the hook is oriented in a cephalad direction. Apply gentle upward and cephalad traction.
12. If tracheal hook not available, insert a hemostat into the incision to open the hole and widen.
13. Insert an endotracheal introducer (bougie) caudally into the membrane via the incision. Confirm location.
14. Introduce an appropriately sized ET tube ($\leq$ 6.0 mm) caudally and medially over the bougie, through the incision. Inflate the cuff and remove the bougie and syringe.
15. Inflate cuff until no air leakage; do not over-inflate (typically $\approx$ 4-6 mL air). Utilize Tru-Cuff manometer if available.
16. Ventilate and confirm placement with ease of ventilation, auscultation, observation of chest wall movement, condensation in the ET tube, and appropriate EtCO₂ waveform.
17. Secure airway with securing device and apply dressing to site (if bleeding).
18. Contact receiving hospital of surgical airway.

Termination of Resuscitation

CRITERIA:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advance life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital in **non-traumatic cardiac arrest** when this procedure is followed. This policy complies with Texas Health & Safety Code, Sec 773.016.

PROCEDURE:

- If a **person's personal physician is present** and assume responsibility for the care of the person (after satisfactorily identifying him/herself as a licensed physician) while the person is receiving emergency prehospital care, the **physician may order the termination of cardiopulmonary resuscitation** only if, based on the physician's professional medical judgement, the physician determines that resuscitation should be discontinued.
- **Termination of cardiopulmonary resuscitation** may occur **with the approval of Medical Control, if ALL** the following criteria have been met:
 - Patient must be 18 years of age or older.
 - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, EGD placement, or cricothyrotomy.
 - IV or IO access has been achieved.
 - Adequate CPR with rhythm appropriate medication and defibrillation have been administered per the [Adult CPR Guideline \(AM02\)](#) or [Pediatric CPR Guideline \(PM03\)](#).
 - Persistent asystole or agonal rhythm is present and no reversible causes are identified after a minimum of 20 min. of resuscitation *after ALS interventions have begun*.
 - *Failure to establish* the following: a spontaneous palpable pulse (even if transient), a persistent/recurring ventricular fibrillation/tachycardia, or any continued neurological activity such as eye opening or motor responses.
 - All credentialed providers involved in the patient's care agree that discontinuation of the resuscitation is appropriate.
 - Family members or responsible parties have indicated no objection to the concept of field termination of resuscitative efforts after education.
- If obvious death criteria are identified after the initiation of layperson or other first responder CPR, refer to [Criteria for Death/Withholding Resuscitation Policy \(P05\)](#).
- Refer to [Out of Hospital Do Not Resuscitate Policy \(P14\)](#) as needed.
- Document ED physician and hospital name in the report.
- If a field termination does occur, clamp off IV lines and leave the ET tube in place. Do not remove any invasive lines or tubes until directed to by JP.
- Notify law enforcement and the Justice of the Peace of the patient's death. EMS shall release the body to either the Justice of the Peace or law enforcement. While it is not required, it is recommended that the EMS crew stay on scene until the arrival of the Justice of the Peace to provide information which could be helpful in the Justice of the Peace's inquest (e.g. medical history, treatment provided, etc.).
- Thoroughly document the resuscitation events and time efforts were stopped in the PCR.

Tissue Referral

PURPOSE:

The purpose is to have a phone referral system with Life Gift™ (or other regional tissue donation centers) for potential tissue donors. Statistics show that the earlier a referral is made, the higher the recovery rate. When deaths occur in the field, EMS agencies have proven to be one of the most reliable referral sources and facilitate the process by providing valuable clinical information about the decedent. Disqualification for donation will be determined by the Life Gift™ coordinator and not the provider on scene.

CRITERIA:

- Any death not transported regardless of down time, age, or disease.

PROCEDURE:

Life Gift™ will determine suitability of the donor and will approach family for donor consent. Do NOT approach the family about potential donation as Life Gift™ is the best source of information to family members and will entertain any questions the family may have.

1. Contact Life Gift™ (from scene, if possible) at 800-633-6562 and document in report.
2. Inform call taker that you would like to report a death. Be prepared to provide the following:
 - A. Location of the deceased
 - B. Next of kin or contact person with phone number, when possible
 - C. Name, age, sex, height/weight, and race of deceased
 - D. Cause of death (mechanism of injury)
 - E. Last known time alive
 - F. Brief medical history, if available
 - G. EMS agency and unit number
 - H. Name of referring medic
 - I. Agency telephone number (If El Campo EMS, 979-543-3335)
 - J. Funeral home being transported to

Life Gift™ will provide follow-up information directly to the crew regardless of outcome. This will be done either by phone or letter within thirty business days.

Transcutaneous Pacing

CRITERIA:

- Bradycardia that does not respond to drug therapy or that results in insufficient perfusion.

EQUIPMENT:

- Cardiac monitor/defibrillator with pacing capability
- ECG monitoring equipment, including electrodes
- Multifunction pads
- Clippers and/or razor

PROCEDURE:

1. Ensure patient is on ECG monitor with electrodes.
2. Place multifunction pads on clean, dry skin. If necessary, trim hair.
 - A. Anterior/Posterior placement (preferred)
 - i. Apply anterior multifunction pad to mid-sternum.
 - ii. Apply posterior multifunction pad just below left scapula.
 - B. Anterior/Anterior placement (if anterior/posterior is not feasible)
 - i. Apply one multifunction pad to the right of the sternum, below the clavicle.
 - ii. Apply the second multifunction pad to the 5th ICS, left midaxillary.
3. Attach multifunction pad to the monitor.
4. Turn the pacer on. **DO NOT** start the current flow.
5. Set the pacer rate at 80 bpm.
6. Start the pacer current.
7. Increase the milliamp setting by 20's until a capture is obtained or up to the max energy available from the device.
NOTE: Electrical capture is usually evident by a wide QRS and tall, broad T-waves. In some patients, it may be less obvious and noted only by a change in QRS morphology.
8. Once electrical capture is obtained, begin decreasing milliamps by 5's until capture is lost.
9. Then increase milliamps by 5's until electrical capture is regained. This will be the electrical or stimulation threshold (the minimum level of electrical energy needed to consistently depolarize the heart muscle).
10. Check for a pulse to determine the presence of mechanical capture. *NOTE: Mechanical capture* must be confirmed by a palpable pulse, rise in blood pressure, and/or evidence of improved perfusion.
11. If there is electrical capture but not mechanical capture, increase the *rate* only, up to a max of 120 bpm. **DO NOT** increase the energy if electrical capture is achieved.
12. If no response is obtained from max pacing output at a rate from 80-120 bpm, interrupt pacing and continue with the appropriate cardiac guideline. Intermittently check for possible capture using max pacer setting.
13. Documentation should include:
 - A. Date and time pacing initiated
 - B. Baseline and pacing rhythm strips
 - C. Current required to obtain capture
 - D. Pacing rate
 - E. Evaluation of patient's response to pacing, in terms of electrical and/or mechanical response, if applicable
 - F. Date and time pacing terminated

SPECIAL CONSIDERATION:

- Multifunction pad placement location should be utilized in the same locations, as described above, for defibrillation and cardioversion.

Tru-Cuff

CRITERIA:

- Any intubated patient

CONTRAINDICATIONS:

- None

EQUIPMENT:

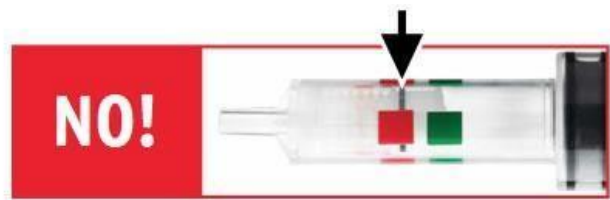
- Tru-Cuff endotracheal tube (ETT) cuff manometer.

PROCEDURE:

1. Place ETT per applicable procedure.
2. Attach the Tru-Cuff syringe to the ETT.
3. Inflate until the black line is in the green pressure zone.

SPECIAL CONSIDERATIONS:

- Tru-Cuff should be utilized to verify cuff pressure of any ETT being managed under these guidelines.
- The device will allow accurate measurement of ETT cuff pressures and allow appropriate cuff inflation for all ages of patients requiring an ETT.



Ventilator

CRITERIA:

- Respiratory failure, OR
- Need of mechanical ventilation.

CONTRAINDICATIONS:

- Patient without confirmed ET tube or EGD via waveform capnography.

EQUIPMENT:

- Secured airway
- Pre-checked ventilator
- Vent circuit with filter
- Suction unit with tubing

PROCEDURE:

1. Assure patency and placement of airway by confirmation methods listed in airway guideline. Suction, adjust, or re-intubate as needed. Assure the tube is secured in place and cuff is functioning correctly.
2. Set Tidal Volume (TV) to $\approx 6\text{-}10$ mL/kg of ideal body weight.
3. Set Breaths per Minute (BPM) to desired rate.
4. Check the following parameters immediately after connecting patient to ventilator:
 - a. TV – Observe the patient for adequate chest excursion (rise and fall). Auscultate breath sounds and assess air exchange. If the chest does not rise, check the airway and evaluate for other injuries to the thoracic area. Recheck the tidal volume.
 - b. BPM – Assess delivery of proper respiratory rate. Increase or decrease BPM as needed, checking the rate once again after adjustment is made.
5. Positive End Expiratory Pressure (PEEP):
 - a. Establish PEEP is SBP >90 mmHg and hypoxia is suspected. PEEP should be discontinued if SBP <90 mmHg.
 - b. The PEEP should be added to achieve SpO₂ of $>90\%$, and should be added in increments of 5 cmH₂O, with max. of 15 cmH₂O.

SPECIAL CONSIDERATION:

- FiO₂ should be reduced to lowest amount necessary to maintain SpO₂ $\geq 94\%$.
- Ideal Body Weight (IBW)
 - Males: IBW (kg) = $50 + 2.3$ (height (in)-60)
 - Females: IBW (kg) = $45.5 + 2.3$ (height (in)-60)

Vt- Adult	
5'0"-5'1"	280-500 mL
5'2"-5'3"	300-570 mL
5'4"-5'5"	330-620 mL
5'6"-5'7"	350-660 mL
5'8"-5'9"	380-710 mL
5'10"-5'11"	410-750 mL
6'0"-6'1"	440-800 mL
6'2"-6'3"	470-850 mL
>6'3"	480-1000 mL

VT- Pedi	
GREY	12-40 mL
PINK	36-60 mL
RED	48-80 mL
PURPLE	60-100 mL
YELLOW	72-120 mL
WHITE	90-170 mL
BLUE	120-220 mL
ORANGE	150-270 mL
GREEN	Handtevy

Video Laryngoscopy

CRITERIA:

- Any patient meeting the requirements for intubation
- Anticipated difficult airway/anatomy
- Failed intubation attempt

CONTRAINDICATIONS:

- None

EQUIPMENT:

- Video Laryngoscope (King Vision or McGrath) and batteries
- Video laryngoscope blades of the appropriate sizes and desired type
- Endotracheal tube of appropriate size
- [Endotracheal Introducer \(Bougie\)](#) or stylet for ET tubes
- BVM
- 10 mL syringe
- Water-soluble lubricant
- Tape or commercial tube securing device
- Oral airway of the appropriate size
- Stethoscope
- EtCO₂ waveform equipment
- Suction equipment and supplies
- [Oxygen](#)

PROCEDURE:

1. Connect the video laryngoscope display to the appropriate blade.
2. Power on the video laryngoscope.
3. Insert the video laryngoscope into the mouth.
4. Looking directly into the patient's mouth and with the video laryngoscope in the left hand, introduce the video laryngoscope into the *midline* of the oral pharynx.
5. With the laryngoscope inserted, look at the monitor to identify the epiglottis, and then manipulate the scope to obtain the best glottis view. Optimal conditions are achieved when the glottis opening and vocal cords are in the middle to upper third of the screen.
6. Looking directly into the patient's mouth, not at the screen, carefully guide the distal tip of the tube into position near the tip of the laryngoscope.

NOTE: It is important to look into the mouth at this step to avoid injuring the tonsils or soft palate.

7. Look at the monitor to complete the intubation; gently rotate or angle the tube to redirect as needed.
8. Continue post-intubation management per intubation guideline ([Adult \(PR06\)](#) or [Pediatric \(PR07\)](#)).

SPECIAL CONSIDERATIONS:

- If the vocal cords cannot be seen or the endotracheal tube cannot be passed, then lift straight up with the video laryngoscope. Do not rock the video laryngoscope backwards.



References

The Drug Reference is only a guide and reference for providers and in no way supersedes the guideline dosages. It is only to be used as reference material to further educate and familiarize the provider. While numerous side effects may be possible, only the most frequently observed are listed. All IV/IO medications should be pushed slowly unless otherwise indicated.

Drug Reference

Acetaminophen IV	pg. 201
Adenosine (Adenocard)	pg. 202
Albuterol Sulfate (Proventil)	pg. 203
Amiodarone (Cordarone)	pg. 204
Ammonia Inhalant	pg. 205
Aspirin	pg. 206
Atropine Sulfate	pg. 207
Calcium Chloride	pg. 208
Clopidogrel (Plavix)	pg. 209
Dextrose	pg. 210
Diltiazem (Cardizem)	pg. 211
Diphenhydramine (Benadryl)	pg. 212
Epinephrine (Adrenalin)	pg. 213
Esmolol (Breviblock)	pg. 215
Etomidate (Amidate)	pg. 216
Fentanyl (Sublimaze)	pg. 217
Glucose Paste/Gel	pg. 218
Heparin	pg. 219
Ipratropium Bromide (Atrovent)	pg. 220
Ketamine	pg. 221
Lactated Ringers	pg. 223
Lidocaine	pg. 224
Lorazepam (Ativan)	pg. 225
Magnesium Sulfate	pg. 226
Methylprednisolone (Solu-Medrol)	pg. 227
Midazolam (Versed)	pg. 228
Naloxone (Narcan)	pg. 229
Nicardipine	pg. 230
Nitroglycerin	pg. 231
Norepinephrine (Levophed)	pg. 232
Ondansetron (Zofran)	pg. 233
Oxygen	pg. 234
Pepcid Complete	pg. 235
Rocuronium Bromide	pg. 236
Sodium Bicarbonate	pg. 237
Sodium Chloride (Normal Saline)	pg. 238
Tranexamic Acid (TXA)	pg. 239

Acetaminophen (Ofirmev)

CLASS

- Antipyretic, Analgesic

MECHANISM OF ACTION

- Decreases fever by working on the hypothalamus heat reducing center producing peripheral vasodilation. Unclear in pain control.

PHARMACOKINETICS

- 1) Onset: 5-10 minutes for analgesia / 30 minutes for fever reduction
- 2) $\frac{1}{2}$ -life: 2-4 hours
- 3) Duration: 4-6 hours

INDICATIONS

- Fever > 100°F and unable to tolerate PO
- SIRS Criteria
- Mild Pain Control

CONTRAINDICATIONS

- 1) Known allergy
- 2) Hypersensitivity to sulfonamides
- 3) Acetaminophen intake in past 4 hours
- 4) Severe renal insufficiency
- 5) Adrenal insufficiency
- 6) Age < 1 year
- 7) Hepatic Insufficiency

PREGNANCY RISK FACTOR

- B: No risk in animal studies

SIDE EFFECTS

- 1) Rare in normal doses.
- 2) Liver problems in large doses or overdoses.

DOSING & ADMINISTRATION

Adult

- 1000 mg mixed into 100cc NS administered IV/IO over 10 minutes.

Pediatric

- 15 mg/kg mixed into 100cc NS administered IV/IO over 10 minutes.

SPECIAL CONSIDERATION:

- May be given in addition to prior doses of Ibuprofen.
- May be used in conjunction with Fentanyl.
- Transport is required if Acetaminophen is administered.
- Utilize Handtevy system for pediatric doses.

Adenosine (Adenocard)

CLASS

- Antidysrhythmic

MECHANISM OF ACTION

- Slows conduction time through the AV node, interrupting the re-entry pathway through the AV node, restoring normal sinus rhythm.

PHARMACOKINETICS

- 1) Onset: 5-10 sec.
- 2) $\frac{1}{2}$ -life: <10 sec.
- 3) Duration: 30-40 sec.

INDICATIONS

- Narrow, Regular PSVT (AVNRT or AVRT)
- Wide, Regular (only if monomorphic, regular and suspected SVT with aberrancy)

CONTRAINDICATIONS

- 1) 2nd degree or 3rd degree AV block, except those on pacemakers
- 2) Sick Sinus Syndrome
- 3) Symptomatic bradycardia
- 4) Asthma or bronchospastic lung disease
- 5) Known hypersensitivity

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) May produce short lasting heart blocks.
- 2) May produce facial flushing, headache, shortness of breath/dyspnea, dizziness.
- 3) May produce bronchoconstriction in COPD patients.

DOSING & ADMINISTRATION

- Adenosine should be given as a rapid bolus intravenous injection. It should be given as proximal as possible and followed by a 20 mL NS flush and elevating the arm.

Adult

- 12 mg rapid IV/IO followed by 20 mL rapid flush. May repeat 12 mg X1.

Pediatric

- 0.1 mg/kg rapid IV/IO (max first dose 12 mg). May repeat at 0.2 mg/kg rapid IV/IO X1 (max second dose 12 mg).

SPECIAL CONSIDERATION:

- Smaller doses of Adenosine may be effective in the presence of dipyridamole & carbamazepine.
- A 12-lead EKG is required prior to administration of this medication.

Albuterol Sulfate (Proventil)

CLASS

- Beta-2 agonist

MECHANISM OF ACTION

- Bronchial smooth muscle relaxation by action on beta-2 receptors.

PHARMACOKINETICS

- 1) Onset: 5 min.
- 2) $\frac{1}{2}$ -life: 2 hrs.
- 3) Duration: 2-4 hrs.

INDICATIONS

- Bronchospasm (COPD)
- Allergic reaction with associated bronchospasm
- Suspected Hypokalemia with crush injury

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) CHF / Cardiac Asthma

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Tremors
- 2) Tachycardia
- 3) Hypertension
- 4) Dizziness
- 5) Hyperactivity

DOSING & ADMINISTRATION

Adult

- 2.5 mg via nebulizer on oxygen at 6 LPM. Repeat as needed. May require escalation to continuous.
- Crush syndrome (medical control): 2.5 mg via nebulizer once.

Pediatric

- 2.5-5.0 mg (ideal 0.15 mg/kg) via nebulizer. Repeat as needed. May require escalation to continuous.
- Crush syndrome (medical control): 2.5 mg via nebulizer once.

SPECIAL CONSIDERATION:

- ETCO₂ monitoring is required following administration of this medication, including patients that refuse transport to the ER.

Amiodarone (Cordarone)

CLASS

- Antidysrhythmic, Potassium Channel Blocker

MECHANISM OF ACTION

- Class III antiarrhythmic agent which inhibits adrenergic stimulation (alpha- and beta-blocking properties), affects sodium, potassium, and calcium channels, and prolongs the action potential and refractory period in myocardial tissue; decreases AV conduction and sinus node function.

PHARMACOKINETICS

- 1) Onset: Rapid onset
- 2) $\frac{1}{2}$ -life: 58 days
- 3) Duration: Approximately 30-45 min.

INDICATIONS

- Refractory VF
- Refractory pulseless VT
- Symptomatic ventricular ectopy with R-on-T phenomenon, multifocal PVCs >6/min, runs of ≥ 5 PVCs.
- Wide, regular dysrhythmia (VT or SVT w/ aberrancy)
- Ventricular arrhythmia or wide complex tachycardia

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Bradycardia
- 3) Second/Third degree heart block
- 4) Cardiogenic shock
- 5) Severe sinus node dysfunction
- 6) Pregnancy
- 7) QTc > 500ms on 12-lead EKG

PREGNANCY RISK FACTOR

- D: Positive evidence of risk. Avoid during breastfeeding.

SIDE EFFECTS

- 1) Hypotension
- 2) Complete AV block
- 3) Increased QT interval
- 4) Nausea and vomiting
- 5) CHF

DOSING & ADMINISTRATION

Adult

- **Refractory VF/pulseless VT:** 300 mg IV/IO. May give second dose of 150 mg after 5-10 min. (max total 3 mg/kg).
- **Ventricular ectopy/Wide, regular dysrhythmia/Wide, irregular dysrhythmia:** Infuse 150 mg/100 mL NS IV/IO over 10 min. Maintenance 1 mg/min for 1st 6 hrs.

Pediatric

- **Refractory VF/pulseless VT:** 5 mg/kg (max 300 mg) IV/IO. May repeat q 5-10 min twice.
- **Wide, regular dysrhythmia:** Infuse 5 mg/kg over 20-60 min.

Ammonia Inhalant

CLASS

- Respiratory stimulant

MECHANISM OF ACTION

- Prevents or awakens a person from fainting

PHARMACOKINETICS

- 1) Onset: Immediate

INDICATIONS

- Fainting
- Unresponsiveness

CONTRAINDICATIONS

- 1) Known hypersensitivity

SIDE EFFECTS

- 1) EENT irritation

DOSING & ADMINISTRATION

Adult

- 1-2 inhalants

Pediatric

- 1-2 inhalants

SPECIAL CONSIDERATION:

- ETCO₂ monitoring is required following administration of this medication, including patients that may refuse transport to the ER.

Aspirin

CLASS

- Antiplatelet agent, antipyretic, analgesic, and nonsteroidal anti-inflammatory drug (NSAID)

MECHANISM OF ACTION

- Irreversibly inhibits cyclooxygenase-1 and -2 (COX-1 and -2) enzymes, via acetylation, which results in decreased formation of prostaglandin precursors; irreversibly inhibits formation of prostaglandin derivative, thromboxane A₂, via acetylation of platelet cyclooxygenase, thus inhibiting platelet aggregation.

PHARMACOKINETICS

- 1) Onset: 1-3 min.
- 2) $\frac{1}{2}$ -life: 1-6 hrs.
- 3) Duration: 30-60 min.

INDICATIONS

- Cardiac chest pain
- Suspected acute coronary syndrome

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Bleeding GI ulcers
- 3) Hemophilia
- 4) Pediatric patients

PREGNANCY RISK FACTOR

- D: Positive evidence of risk if full dose is used in the third trimester

SIDE EFFECTS

- 1) Prolonged bleeding time
- 2) Gastric irritation
- 3) Abdominal pain
- 4) Nausea

DOSING & ADMINISTRATION

Adult

- 324 mg PO total dose (low-dose aspirin preferred).

Atropine Sulfate

CLASS

- Anticholinergic

MECHANISM OF ACTION

- Blocks the action of acetylcholine at parasympathetic sites in smooth muscle, secretory glands, and the CNS; increases cardiac output, dries secretions. Atropine reverses the muscarinic effects of cholinergic poisoning due to agents with acetylcholinesterase inhibitor activity by acting as a competitive antagonist of acetylcholine at muscarinic receptors.

PHARMACOKINETICS

- 1) Onset: Rapid
- 2) $\frac{1}{2}$ -life: 2-3 hrs.
- 3) Duration: 2-6 hrs. (Longer in children and elderly)

INDICATIONS

- Bradycardia (symptomatic HR <50 bpm)
- Anticholinesterase inhibitor exposure (Organophosphate Poisoning)
- Calcium channel blocker ingestion (Medical Control or Poison Control recommendation)
- Beta blocker ingestion (Medical Control or Poison Control recommendation)
- Neurogenic shock with bradycardia
- Intubation pre-treatment in children <8 years old

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Suspected traumatic brain injury or intracranial hemorrhage

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Tachycardia
- 2) Dilated pupils
- 3) Headache
- 4) Dry mucous membranes

DOSING & ADMINISTRATION

Adult

- **Bradycardia:** 0.5 mg IV/IO. May repeat q 3-5 min. (max total 3 mg) if beneficial response.
- **Anticholinesterase inhibitor exposure:** 2 mg IV/IO. May repeat PRN q 5 min. until resolution of bronchorrhea or bronchospasm.
- **CCB/BB ingestion** (medical/poison control) & neurogenic shock with bradycardia: 0.5-1.0 mg IV/IO q 3-5 min. (max total 3 mg).

Pediatric

- **Bradycardia:** 0.02 mg/kg IV/IO up to 2 doses (min 0.1 mg/dose; max 0.5 mg/dose; max total dose 1 mg).
- **Anticholinesterase inhibitor exposure:** 0.05 mg/kg IV/IO. May repeat PRN q 5 min. until resolution of bronchorrhea or bronchospasm.
- **CCB/BB ingestion** (medical/poison control): 0.02 mg/kg IV/IO q 3-5 min. (max 0.5 mg/dose) X2 doses.
- **Intubation pre-treatment:** 0.02 mg/kg IV/IO X1 dose in infants <1 year old.

SPECIAL CONSIDERATION:

- Caution in the setting of a suspected AMI.

Calcium Chloride

CLASS

- Electrolyte

MECHANISM OF ACTION

- Moderates nerve and muscle performance via action potential excitation threshold regulation. Improves myocardial activity and stabilizes cardiac membranes.

PHARMACOKINETICS

- 1) Onset: Immediate
- 2) $\frac{1}{2}$ -life: Unknown
- 3) Duration: 30 min. – 2 hrs.

INDICATIONS

- Cardiac arrest with suspected hyperkalemia or calcium channel blocker overdose
- Calcium channel blocker overdose (Medical Control or Poison Control recommendation)
- Hydrofluoric acid exposure (Medical Control or Poison Control recommendation)
- Traumatic hemorrhage prior to administration of Tranexamic Acid (TXA)

CONTRAINDICATIONS

- 1) Hypercalcemia
- 2) Known hypersensitivity
- 3) Hypokalemia
- 4) Known/suspected digoxin toxicity

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) May increase irritability in the presence of digoxin.
- 2) Flushing
- 3) Warm feeling
- 4) Hypotension

DOSING & ADMINISTRATION

Adult

- **Cardiac Arrest:** 1 g mixed into 100cc NS IV/IO infused over 10 min.
- **CCB ingestion** (medical/poison control): 1 g mixed into 100cc NS IV/IO infused over 10 min.
- **Traumatic Hemorrhage:** 1g mixed into 100cc NS IV/IO infused over 10 min.

Pediatric

- **Cardiac Arrest:** 20 mg/kg IV/IO of 10% solution mixed into 100cc NS IV/IO infused over 10 min.
- **CCB ingestion** (medical/poison control): 20 mg/kg IV/IO (max 1 g) infused over 10 min. of 10% solution.

SPECIAL CONSIDERATIONS

- DO NOT mix with Sodium Bicarbonate, it will create precipitate.
- Causes tissue irritation and necrosis if infiltrated.
- Reduce dosage in patients taking digoxin.
- EKG and ETCO₂ monitoring required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Clopidogrel (Plavix)

CLASS

- Anti-platelet

MECHANISM OF ACTION

- Plavix has an anti-platelet effect that inhibits the ability of platelets to clump together as part of a blood clot. It is an inhibitor of adenosine diphosphate (ADP) induced platelet aggregation acting by direct inhibition of ADP binding to its receptor and of the subsequent ADP-mediated activation of glycoprotein GPIIb/IIIa complex.

PHARMACOKINETICS

- 1) Onset: 1 hrs.
- 2) $\frac{1}{2}$ -life: 6 hrs.
- 3) Duration: up to 5 days

INDICATIONS

- STEMI

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Active bleeding, peptic ulcer
- 3) Intracranial hemorrhage
- 4) Pediatric patient

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) Hypersensitivity reactions
- 2) Thrombotic thrombocytopenic purpura
- 3) Bleeding
- 4) Epistaxis
- 5) Hematuria
- 6) Bruising
- 7) Ulcers
- 8) Rash

DOSING & ADMINISTRATION

Adult

- **STEMI:** 600 mg PO (as directed by receiving MD/Cardiologist **ONLY**)
 - 600 mg = 8 of the 75 mg tablets

Dextrose

CLASS

- Carbohydrate, Simple Sugar

MECHANISM OF ACTION

- Dextrose, a monosaccharide, is a source of calories and fluid for patients unable to obtain an adequate oral intake; may decrease body protein and nitrogen losses; promotes glycogen deposition in the liver. When used in the treatment of hyperkalemia (combined with insulin), dextrose stimulates the transient uptake of potassium by cells, especially in muscle tissue, lowering serum potassium.

PHARMACOKINETICS

- 1) Onset: Rapid
- 2) $\frac{1}{2}$ -life: Varies, dependent on the level of hypoglycemia.
- 3) Duration: Varies, dependent on the level of hypoglycemia.

INDICATIONS

- Hypoglycemia

CONTRAINDICATIONS

- 1) Hyperglycemia
- 2) Intracranial or intraspinal hemorrhage

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Must be administered through a patent IV line to prevent tissue necrosis due to infiltration.

DOSING & ADMINISTRATION

Adult

- 12.5-25 g IV/IO; may repeat X1 dose.
 - 125-250 mL of 10% Dextrose solution IV/IO (preferred).
 - OR
 - 25-50 mL of 50% Dextrose solution slow IV/IO.

Pediatric

- 0.25-0.5 g/kg (max 25 g) IV/IO.
 - 2.5-5 mL/kg of 10% Dextrose solution IV/IO in all age groups (preferred).
 - OR
 - 2.5-5 mL/kg of 10% Dextrose solution IV/IO in infants - 8 years of age.
 - 0.5-1 mL/kg of 50% Dextrose solution slow IV/IO in adolescents and children >8 years of age.

SPECIAL CONSIDERATIONS

- 10% Dextrose solutions are preferred over higher concentrations in all patients.
- 50% Dextrose is a relatively thick solution and is more easily administered through a large bore IV catheter.
- Dextrose in CVA patients may worsen outcome.
- Dextrose is a temporary fix; the patient should eat to maintain normal blood glucose levels prior to transport or before obtaining an informed patient refusal.

Diltiazem (Cardizem)

CLASS

- Calcium Channel Blocker, Antidysrhythmic

MECHANISM OF ACTION

- Nondihydropyridine calcium channel blocker which inhibits calcium ion from entering the “slow channels” or select voltage-sensitive areas of vascular smooth muscle and myocardium during depolarization, producing a relaxation of coronary vascular smooth muscle and coronary vasodilation; increases myocardial oxygen delivery in patients with vasospastic angina. Slows SA / AV node conduction time.

PHARMACOKINETICS

- 1) Onset: 3 min.
- 2) Duration: 1-3 hrs.
- 3) $\frac{1}{2}$ -life: 3-4 hrs.

INDICATIONS

- Narrow, regular PSVT (AVNRT or AVRT)
- Narrow, irregular rhythms (A-fib/A-flutter with RVR, MAT)

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) 2nd or 3rd degree heart block
- 3) Wolff-Parkinson-White syndrome or other pre-excitation syndromes
- 4) Hypotension
- 5) Sick sinus syndrome
- 6) Cardiogenic shock
- 7) Ventricular tachycardia

PREGNANCY RISK FACTOR

- C (1st Trimester): Risk cannot be ruled out
- D (2nd or 3rd Trimester): Documented evidence of risk

SIDE EFFECTS

- 1) Flushing
- 2) Hypotension
- 3) Heart block
- 4) Bradycardia
- 5) Palpitations

DOSING & ADMINISTRATION

Adult

- 0.25 mg/kg IV/IO (max single dose 25 mg) over 3-5 min. Lower doses with age >65 or hepatic/renal disease. May repeat X 1 q 10 minutes 0.35 mg/kg IV/IO (max single dose 25mg) over 3-5 min.

SPECIAL CONSIDERATION

- Do not use concurrently with IV Beta Blockers.
- A 12-lead EKG must be obtained prior to administering this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Diphenhydramine (Benadryl)

CLASS

- Histamine H₁ antagonist

MECHANISM OF ACTION

- Competes with histamine for H₁-receptor sites on effector cells in the gastrointestinal tract, blood vessels, and respiratory tract; anticholinergic and sedative effects are also seen.

PHARMACOKINETICS

- 1) Onset: 15 min.
- 2) ½-life: 2-6 hrs.
- 3) Duration: 4-8 hrs.

INDICATIONS

- Allergic reaction
- Anaphylaxis
- Dystonic reaction (Phenothiazine Overdose)

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Blood pressure < 90 mmHg systolic
- 3) Patient takes MAOI Inhibitors
- 4) Neonates or premature infants

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) Drowsiness
- 2) Dry mouth
- 3) Hypotension
- 4) Dizziness
- 5) Thickened mucous secretions

DOSING & ADMINISTRATION

Adult

- **Allergic reaction:** 25-50 mg IV/IO/IM (max dose 50 mg).
- **Dystonic reaction:** 50mg IV/IO/IM.

Pediatric

- **Allergic reaction:** 1 mg/kg IV/IO/IM (max dose 25 mg).
- **Dystonic reaction:** 1 mg/kg IV/IO/IM (max dose 50 mg).

SPECIAL CONSIDERATION

- Patient may get extremely drowsy, capnography monitoring required prior to and after administration.
- ETCO₂ monitoring is required prior to and following administration of this medication, including patients who may refuse transport to the ER.

Epinephrine (Adrenalin)

CLASS

- Sympathomimetic, Alpha/Beta adrenergic agonist

MECHANISM OF ACTION

- Stimulates alpha-, beta1-, and beta2-adrenergic receptors resulting in relaxation of smooth muscle of the bronchial tree, cardiac stimulation (increasing myocardial oxygen consumption), and dilation of skeletal muscle vasculature; small doses can cause vasodilation via beta2-vascular receptors; large doses may produce constriction of skeletal and vascular smooth muscle.

PHARMACOKINETICS

- 1) Onset: Rapid
- 2) $\frac{1}{2}$ -life: Unknown
- 3) Duration: 20-30 min.

INDICATIONS

- Cardiac arrest
- Post-resuscitation hypotension
- Bradycardia
- Cardiogenic shock
- Bronchospasm – severe
- Anaphylaxis
- Sepsis
- Neurogenic shock with refractory hypotension
- Bronchiolitis via nebulizer in children <2 years of age
- Croup in children

CONTRAINDICATIONS

- 1) No absolute contraindications.

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out.

SIDE EFFECTS

- 1) Tachycardia
- 2) Anxiety
- 3) Palpitations
- 4) Nausea and vomiting

DOSING & ADMINISTRATION

Adult

- **Cardiac Arrest:** 1 mg [1:10,000] IV/IO q 5 min (max 2 mg)
- **Post-resuscitation:** 0.1-0.5 mcg/kg/min IV/IO to goal MAP 75-90 mmHg.
- **Bradycardia:** 0.1-0.5 mcg/kg/min IV/IO to patient response.
- **Cardiogenic Shock & Sepsis:** 0.05-0.5 mcg/kg/min IV/IO to MAP >65 mmHg.
- **Bronchospasm:** 0.01 mg/kg (max dose 0.3 mg) [1:1,000] IM.
- **Anaphylaxis:** 0.3 mg [1:1,000] IM if ≥ 25 kg. Repeat q 3-5 min. PRN.
- **Anaphylaxis with impending cardiorespiratory failure:** 0.1 mg [1:10,000] IV/IO over 5 min.
- **Neurogenic shock with refractory hypotension:** 0.05-0.5 mcg/kg/min IV/IO to MAP ≥ 90 mmHg.

Epinephrine (Adrenalin)

Pediatric

- **Cardiac Arrest:** 0.01 mg/kg [1:10,000] IV/IO q 5 min. PRN X 4 (max single dose 1 mg).
- **Post-resuscitation:** 0.1-1 mcg/kg/min IV/IO to goal lower limit normal BP.
- **Bradycardia:** 0.01 mg/kg [1:10,000] IV/IO q 3-5 min. to patient response.
- **Shock & Sepsis:** 0.1-0.3 mcg/kg/min IV/IO to lower limit normal BP.
- **Bronchospasm:** 0.01 mg/kg (max dose 0.3 mg) [1:1,000] IM.
- **Bronchiolitis:** 1 mg [1:1,000] X1 dose diluted in NS to total 5 mL total volume, nebulized.
- **Croup:** 0.5 mg/kg [1:1,000] (max dose 5 mg) diluted in NS to total 5 mL volume, nebulized. May repeat q 20 min. PRN continued distress.
- **Anaphylaxis:** 0.01 mg/kg [1:1,000] IM (max dose 0.3 mg).
- **Anaphylaxis with impending cardiorespiratory failure:** 0.1-1 mcg/kg/min. infusion to lower limit normal BP.
- **Neurogenic shock with refractory hypotension:** 0.05-0.5 mcg/kg/min IV/IO to goal normal BP.

SPECIAL CONSIDERATION

- Avoid in patients >40 years of age or with CAD unless critically necessary.
- Push dose Epinephrine is a temporary fix, work to correct the underlying problem.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication for any patient with a spontaneous pulse.

Esmolol (Brevibloc)

CLASS

- Antidysrhythmic, Beta Blocker

MECHANISM OF ACTION

- Selectively antagonizes beta-1 adrenergic receptors (class II antiarrhythmic).

PHARMACOKINETICS

- 1) Onset: 2-10 minutes
- 2) $\frac{1}{2}$ -life: 9 minutes
- 3) Duration: 10-30 minutes

INDICATIONS

- Refractory Ventricular Fibrillation / Pulseless Ventricular Tachycardia cardiac arrest

CONTRAINDICATIONS

- 1) None in the emergency setting

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) CHF
- 2) Severe bradycardia
- 3) Heart block
- 4) Hypotension
- 5) Bronchospasm

DOSING & ADMINISTRATION

Adult

- 50 mg slow IV/IO administered over 1 min. followed by 50 mg mixed into 100cc NS IV/IO administered over 10 min.

SPECIAL CONSIDERATION:

- Refractory VF/VT is defined as a shockable rhythm with ETCO₂ > 20 mmHg that has not converted after:
 - 3 Defibrillations
 - 2 mg of Epinephrine
 - 300 mg of Amiodarone or 1.5 mg/kg of Lidocaine
- Extravasation may cause tissue damage or necrosis.
- Do not give Sodium Bicarbonate through the same line without thoroughly flushing the IV tubing.
- ETCO₂ monitoring is required prior to and following administration of this medication.

Etomidate (Amidate)

CLASS

- General Anesthetic

MECHANISM OF ACTION

- Acts centrally on GABA receptors in the brain delaying postsynaptic inhibition, thus reducing the frequency in which the neuron responds with an action potential.

PHARMACOKINETICS

- 1) Onset: 30-60 sec.
- 2) $\frac{1}{2}$ -life: 2-3 min.
- 3) Duration: 3-5 min.

INDICATIONS

- Sedation for intubation where Ketamine is contraindicated.
- Pediatric sedation for:
 - Transcutaneous pacing
 - Cardioversion
 - Airway management < 3 years old

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Hypotension
- 3) Known pregnancy

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Suppresses endogenous cortisol production with prolonged use.
- 2) Apnea
- 3) Transient myoclonic movements

DOSING & ADMINISTRATION

Adult

- **Delayed Sequence Intubation:** 0.2-0.3 mg/kg slow IV/IO administered over 1 min.

Pediatric

- **TCP / Synchronized Cardioversion:** 0.1 mg/kg slow IV/IO over 1 min. Max total dose 6 mg.
- **Delayed Sequence Intubation:** 0.2-0.3 mg/kg slow IV/IO administered over 1 min.

SPECIAL CONSIDERATION

- Etomidate has no analgesic effects. Remember pain control may be necessary in addition to this medication.
- Etomidate is secondary to Ketamine for DSI.
- Consider dose of 0.2 mg/kg for hemodynamically unstable patients and for obese patient.
- ETCO₂ and EKG monitoring are required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Fentanyl (Sublimaze)

CLASS

- Opioid and Analgesic (Schedule II)

MECHANISM OF ACTION

- Binds with various opioid receptors at many sites within the CNS, increases pain threshold, alters pain reception, inhibits ascending pain pathways.

PHARMACOKINETICS

- 1) Onset: Immediate
- 2) $\frac{1}{2}$ -life: 3-12 hrs.
- 3) Duration: 30-60 min.

INDICATIONS

- Moderate to severe pain and pre-procedure pain management
- Intubation pre-treatment for sympathetic response blunting (brain and cardiac)
- Post-intubation pain management

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Hemodynamic instability

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Respiratory depression
- 2) Dizziness
- 3) Drowsiness
- 4) Nausea and vomiting
- 5) Bronchoconstriction
- 6) Laryngospasm

DOSING & ADMINISTRATION

Adult

- **Pain management:** 0.5-2.0 mcg/kg IV/IO/IN/IM (max single dose 200 mcg) q 15 min PRN if SBP >100 mmHg.
- **Intubation pre-treatment:** 3 mcg/kg slowly over > 90 sec., 3 min. prior to intubation.
- **Post-intubation pain management :** 1 mcg/kg q 20 min. (max single dose 200 mcg).

Pediatric

- **Pain management:**
 - 1-3 y/o: 2-3 mcg/kg IV/IO/IN q 15 min. if SBP parameters met.
 - 3-12 y/o: 1-2 mcg/kg IV/IO/IN q 15 min. if SBP parameters met.
- **Post-intubation pain management :** 0.5-1.0 mcg/kg q 20 min. (max single dose 50 mcg).

SPECIAL CONSIDERATION

- Fentanyl should be pushed slow IV/IO over 1-2 min to prevent side effects.
- Caution with dosing of opioids in older patients, obese patients, and those with comorbid conditions.
- ETCO₂ and EKG monitoring required prior to and following administration of this medication.

Glucose Paste/Gel

CLASS

- Carbohydrate, Simple Sugar

MECHANISM OF ACTION

- After absorption from GI tract, glucose is distributed in the tissues and provides a prompt increase in circulating blood sugar.

PHARMACOKINETICS

- 1) Onset: Rapid
- 2) ½-life: Varies dependent on the level of hypoglycemia.
- 3) Duration: Varies dependent on the level of hypoglycemia.

INDICATIONS

- Hypoglycemia

CONTRAINDICATIONS

- 1) Hyperglycemia
- 2) Patient with altered mental status, not able to speak or swallow

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Nausea

DOSING & ADMINISTRATION

Adult

- 15 g PO, may repeat PRN

Pediatric

- 15 g PO, may repeat PRN

SPECIAL CONSIDERATIONS

- Oral glucose is a temporary fix; the patient should eat to maintain normal blood glucose levels prior to transport or before obtaining an informed patient refusal.

Heparin

CLASS

- Anticoagulant

MECHANISM OF ACTION

- Heparin inhibits the clotting cascade by activating specific plasma proteins. The drug is used in the prevention and treatment of all types of thromboses and emboli, disseminated intravascular coagulation, arterial occlusion, and thrombophlebitis and is used prophylactically to prevent clotting before surgery.

PHARMACOKINETICS

- 1) Onset: immediately.
- 2) $\frac{1}{2}$ -life: 1-6 hrs.
- 3) Duration: 2-4 hrs.

INDICATIONS

- STEMI

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Active bleeding
- 3) Recent intracranial, intraspinal, or eye surgery
- 4) Severe hypertension
- 5) Bleeding tendencies
- 6) Severe thrombocytopenia

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Allergic reaction (chills, fever, back pain)
- 2) Thrombocytopenia
- 3) Hemorrhage
- 4) Bruising
- 5) Rash

DOSING & ADMINISTRATION

Adult

- **STEMI:** 5000 units IVP (as directed by receiving MD/Cardiologist **ONLY**)

Ipratropium Bromide (Atrovent)

CLASS

- Anticholinergic

MECHANISM OF ACTION

- Blocks the action of acetylcholine at parasympathetic sites in bronchial smooth muscle causing bronchodilation; local application to nasal mucosa inhibits serous and seromucous gland secretions.

PHARMACOKINETICS

- 1) Onset: 1-3 min.
- 2) $\frac{1}{2}$ -life: 2 hrs.
- 3) Duration: 4-6 hrs.

INDICATIONS

- Bronchospasm

CONTRAINDICATIONS

- 1) Known hypersensitivity to Ipratropium Bromide, Atropine, soybeans, or peanuts

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) Cough
- 2) Dizziness
- 3) Dry mucous membranes
- 4) Headache

DOSING & ADMINISTRATION

Adult

- 0.5 mg via nebulizer on oxygen at 6 LPM, may repeat X 1 q 30 min. (Max total dose 1mg)

Pediatric

- 0.25 mg (<20 kg) or 0.5 mg (>20 kg) via nebulizer on oxygen at 6 LPM, may repeat X 1 q 30 min. (Max total dose 0.5-1.0 mg)

SPECIAL CONSIDERATION

- Use cautiously in patients with glaucoma, prostatic hyperplasia, or bladder-neck obstruction.
- Transport is required if patient is treated with this medication.
- Not a stand-alone medication, to be used with Albuterol only.
- ETCO₂ monitoring required following administration of this medication, including patients who may refuse transport to the ER.

Ketamine

CLASS

- Dissociative Anesthetic

MECHANISM OF ACTION

- Produces a cataleptic-like state in which the patient is dissociated from the surrounding environment by direct action on the cortex and limbic system. Ketamine is a noncompetitive NMDA receptor antagonist that blocks glutamate. Low (subanesthetic) doses produce analgesia, and modulate central sensitization, hyperalgesia, and opioid tolerance.

PHARMACOKINETICS

- 1) Onset: 30 sec.
- 2) $\frac{1}{2}$ -life: 2-3 hrs.
- 3) Duration: 5-25 min.

INDICATIONS

- Sedation of highly combative or violent patients, suspected to be in Excited Delirium
- Delayed sequence intubation or post-intubation sedation
- Pain management
- Severe bronchospasm
- Refractory seizures

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Conditions in which an increase in blood pressure would be hazardous.

PREGNANCY RISK FACTOR

- Ketamine has not been formally assigned to a pregnancy category by the FDA, therefore use is not recommended.

SIDE EFFECTS

- 1) Cardiovascular: Mild increase in blood pressure and heart rate.
- 2) Respiratory: May produce severe depression of respiration, apnea, or laryngospasm following rapid intravenous administration.
- 3) Neurological: Decreased level of consciousness and hallucinations or emergence reactions.

DOSING & ADMINISTRATION

Adult

- **Excited Delirium or deep sedation:** 2 mg/kg slow IV/IO, may repeat q 15 min. PRN (preferred) or 4 mg/kg IM, may repeat q 15 min PRN.
- **DSI:** 2 mg/kg IV/IO administered over 1 min.
- **Post-intubation sedation:** 1.0 mg/kg IV/IO administered over 1 min., may repeat q 20 min. PRN.
- **Refractory seizures:** 100 mg mixed into 100cc NS administered over 10 min. Medical Control authorization required.
- **Management of severe pain:** 20 mg mixed into 100cc NS IV/IO administered over 10 min., may repeat q 15 min. X 2 or 50 mg IM, may repeat q 15 min. X 2.
- **Asthma:** 0.3 mg/kg IV/IO administered over 1 min. for severe asthmatic bronchospasm., may repeat q 15 min. X 1

Pediatric

- **Deep Sedation:** 2 mg/kg slow IV/IO, may repeat q 15 min. PRN (preferred) or 4 mg/kg IM, may repeat q 15 min. PRN.
- **DSI:** 2 mg/kg IV/IO administered over 1 min.
- **Post-intubation sedation:** 1.0 mg/kg IV/IO administered over 1 min., may repeat q 20 min. PRN.
- **Refractory seizures:** 1 mg/kg IM, may repeat q 15 min. X 1 (> 3 years old). Medical Control authorization required.
- **Management of severe pain:** 0.2 mg/kg mixed into 100cc NS IV/IO administered over 10 min., may repeat q 15

Ketamine

min. X 2 or 0.4 mg IM (max dose 50 mg), may repeat q 15 X 2.

SPECIAL CONSIDERATIONS

- Must be prepared to bag mask ventilate and/or immediately intubate if vocal cord spasm occurs.
- May have clinically significant cardiac effect. Use cautiously in patients with significant cardiac history.
- Dose selection in elderly patients should be cautious, usually starting at the low end of the dosing range.
- Patients with hepatic or renal insufficiency should initially receive a half dose.
- Use Handtevy system for pediatric dosages.
- ETCO₂ and EKG monitoring are required following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Lactated Ringers

CLASS

- Electrolyte / IV fluid

MECHANISM OF ACTION

- Replaces fluid and isotonic electrolyte balance in patients with hypovolemia. Provides lactate for the correction of mild acidosis.

PHARMACOKINETICS

- 1) Distribution: Immediate

INDICATIONS

- Fluid and electrolyte replacement
- Hypovolemia

CONTRAINDICATIONS/PRECAUTIONS

- 1) Known hypersensitivity to sodium lactate
- 2) Pulmonary edema
- 3) Cirrhosis of liver
- 4) Postoperative patients, heart failure, circulatory insufficiency, renal dysfunction, hypoproteinemia.

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Pulmonary edema
- 2) Hypervolemia
- 3) Thrombophlebitis

DOSING & ADMINISTRATION

Adult

- **Volume replacement:** 250 mL IV/IO. May repeat up to 2 L if no evidence of pulmonary edema.
- **Other:** TKO

Pediatric

- **Volume replacement:** 20 mL/kg IV/IO. May repeat X 3 if no evidence of pulmonary edema.
- **Other:** TKO

SPECIAL CONSIDERATIONS

- Use caution when administering to avoid pulmonary edema.
- Use caution in geriatric patients.
- Use judiciously in traumatic hemorrhage patients, Lactated Ringers is an acidic solution that can worsen to post-traumatic coagulopathy.

Lidocaine

CLASS

- Antidysrhythmic agent (Class Ib) and Local Anesthetic

MECHANISM OF ACTION

- Class Ib antiarrhythmic; suppresses automaticity of conduction tissue by increasing electrical stimulation threshold of the ventricle, His-Purkinje system, and spontaneous depolarization of the ventricles during diastole by a direct action on the tissues; blocks both the initiation and conduction of nerve impulses by decreasing the neuronal membrane's permeability to sodium ions, which results in inhibition of depolarization with resultant blockade of conduction.

PHARMACOKINETICS

- 1) Onset: 45-90 sec.
- 2) $\frac{1}{2}$ -life: 2-8 hrs.
- 3) Duration: 10-20 min.

INDICATIONS

- Secondary to Amiodarone for refractory VF
- Second to Amiodarone for refractory pulseless VT
- Symptomatic ventricular ectopy with R-on-T phenomenon, multifocal PVCs >6/min., runs of ≥ 5 PVCs
- EZ-IO infusion pain management

CONTRAINDICATIONS

- 1) Known hypersensitivity or hypersensitivity to another amide type local anesthetic.
- 2) Wolff-Parkinson-White Syndrome
- 3) 2nd or 3rd degree heart block (if no pacemaker present)
- 4) AV or intraventricular heart block (except with artificial pacemaker)

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) May cause a decrease in cardiac output and hypotension in high doses, especially in the elderly or patients in heart failure.

DOSING & ADMINISTRATION

Adult

- **Refractory VF/Pulseless VT:** 1.5 mg/kg IV/IO, may repeat 0.75 mg/kg bolus q 5 min. (max total 3 mg/kg).
- **Ventricular ectopy:** 1.5 mg/kg IV/IO, may repeat 0.75 mg/kg q 5 min. (max total of 3 mg/kg).
- **EZ-IO pain management:** 40 mg over 2 min. into IO site. Flush with 5-10 mL NS. Then, 20 mg over 1 min. into IO site.

Pediatric

- **Refractory VF/Pulseless VT:** 1 mg/kg IV/IO, may repeat 0.5 mg/kg bolus q 5 min. (max total 3 mg/kg).
- **EZ-IO pain management:** 0.5 mg/kg over 2 min. into IO site. Flush with 2-5 mL NS. Then, 0.25 mg/kg over 1 min. into IO site.

Lorazepam (Ativan)

CLASS

- Benzodiazepine

MECHANISM OF ACTION

- Binds to stereospecific benzodiazepine receptors on the postsynaptic GABA neuron at several sites within the central nervous system, including the limbic system, reticular formation. Enhancement of the inhibitory effect of GABA on neuronal excitability results by increased neuronal membrane permeability to chloride ions. This shift in chloride ions results in hyperpolarization (a less excitable state) and stabilization. Benzodiazepine receptors and effects appear to be linked to the GABA-A receptors. Benzodiazepines do not bind to GABA-B receptors.

PHARMACOKINETICS

- 1) Onset: 1 min.
- 2) $\frac{1}{2}$ -life: 12 hrs.
- 3) Duration: 6-8 hrs.

INDICATIONS

- Sedation
- Seizures
- Post-intubation sedation
- Non-traumatic back pain

CONTRAINDICATIONS

- 1) Known hypersensitivity

PREGNANCY RISK FACTOR

- D: Positive evidence of risk

SIDE EFFECTS

- 1) Drowsiness, confusion
- 2) Hypotension
- 3) Decreased respiratory drive
- 4) Hepatic or renal impairment

DOSING & ADMINISTRATION

Adult

- **Sedation**
 - Mild: 0.5-1.0 mg slow IV/IO push, may repeat q 15 min. (max total dose 3 mg).
 - Moderate: 1-2 mg slow IV/IO push, may repeat q 15 min. (max total dose 4 mg).
- **Seizures:** 2 mg slow IV/IO push, may repeat X 1 q 15 min. (max total dose 4 mg).
- **Post-intubation sedation:** 1-2 mg slow IV/IO push, may repeat q 15 min. PRN (max total dose 4 mg).
- **Excited Delirium (post stabilization):** 1-2 mg slow IV/IO push, may repeat q 15 min PRN (max total dose 4 mg).

Pediatric

- **Sedation:** 0.05 mg/kg slow IV/IO push, may repeat q 15 min. PRN (max dose 2 mg) (max total dose 4 mg).
- **Seizures:** 0.05-0.1 mg/kg slow IV/IO push, may repeat q 15 min. PRN (max dose 2 mg) (max total dose 4mg).
- **Post-intubation sedation:** 0.05-0.1 mg/kg slow IV push, may repeat q 15 min. PRN (max dose 4 mg).

SPECIAL CONSIDERATIONS

- Starting at a lower dose and re-dosing to effect is preferable to overdosing with a large, single administration.
- Caution with hypotension or when used with other respiratory depressants or alcohol.
- ETCO₂ monitoring is required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Magnesium Sulfate

CLASS

- Electrolyte

MECHANISM OF ACTION

- Parenterally, magnesium decreases acetylcholine in motor nerve terminals and acts on myocardium by slowing rate of SA node impulse formation and prolonging conduction time. Magnesium is necessary for the movement of calcium, sodium, and potassium in and out of cells, as well as stabilizing excitable membranes.

PHARMACOKINETICS

- 1) Onset: Immediate
- 2) $\frac{1}{2}$ -life: 4 hrs.
- 3) Duration: 30 min.

INDICATIONS

- Torsade-de-Pointes/polymorphic VT
- Bronchospasm – severe
- Refractory V-fib or V-Tach
- Eclampsia

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) High degree heart blocks
- 3) Myocardial damage

PREGNANCY RISK FACTOR

- D: Positive evidence of risk

SIDE EFFECTS

- 1) Flushing
- 2) Hypotension
- 3) Respiratory depression
- 4) Decreased reflexes

DOSING & ADMINISTRATION

Adult

- **Torsade-de-Pointes:** 2 g mixed in 100 mL NS IV/IO infusion over 15 min.
- **Bronchospasm:** 40 mg/kg mixed in 100 mL NS IV/IO infusion over 15 min. (max 2 g).
- **Eclampsia:** Load: 5 g/100 mL NS IV/IO infusion over 15 min. Maintenance 2 g/100 mL NS IV/IO infusion over 1 hr. Discontinue if toxicity occurs.

Pediatric

- **Torsade-de-Pointes:** 50 mg/kg mixed in 100 mL NS IV/IO infusion over 15 min. (max 2 g).
- **Bronchospasm:** 40 mg/kg mixed in 100 mL NS IV/IO infusion over 15 min. (max 2 g).

SPECIAL CONSIDERTATION

- Side effects are usually from too rapid administration.
- Monitor deep tendon reflexes, mental status, and respiratory sufficiency as these can be signs of toxicity from administration too rapidly.
- ETCO₂ and EKG monitoring are required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Methylprednisolone (Solu-Medrol)

CLASS

- Corticosteroid

MECHANISM OF ACTION

- In a tissue-specific manner, corticosteroids regulate gene expression subsequent to binding specific intracellular receptors and translocation into the nucleus. Corticosteroids exert a wide array of physiologic effects including modulation of carbohydrate, protein, and lipid metabolism and maintenance of fluid and electrolyte homeostasis. Moreover, cardiovascular, immunologic, musculoskeletal, endocrine, and neurologic physiology are influenced by corticosteroids. Decreases inflammation by suppression of migration of polymorphonuclear leukocytes and reversal of increased capillary permeability.

PHARMACOKINETICS

- 1) Onset: >30 min.
- 2) $\frac{1}{2}$ -life: 18-36 hrs.
- 3) Duration: 7 days

INDICATIONS

- Bronchospasm
- Allergic reaction
- Anaphylaxis
- Refractory shock and history of adrenal insufficiency

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Untreated serious infections

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Insomnia
- 2) Frequent urination
- 3) Hyperglycemia
- 4) Risk of infection
- 5) Nausea and vomiting

DOSING & ADMINISTRATION

Adult

- 125 mg slow IV/IO push.

Pediatric

- **Bronchospasm:** 2 mg/kg slow IV/IO push (max dose 125 mg).
- **Refractory shock with adrenal insufficiency:** 2 mg/kg slow IV/IO push (max 125 mg) (**Medical Control Authorization ONLY**).

Midazolam (Versed)

CLASS

- Benzodiazepine

MECHANISM OF ACTION

- Bind to stereospecific benzodiazepine receptors on the postsynaptic GABA neuron at several sites within the central nervous system, including the limbic system, reticular formation. Enhancement of the inhibitory effect of GAB on neuronal excitability results by increased neuronal membrane permeability to chloride ions. This shift in chloride ions results in hyperpolarization (a less excitable state) and stabilization. Benzodiazepine receptors and effects appear to be linked to the GABA-A receptors. Benzodiazepines do not bind to GABA-B receptors.

PHARMACOKINETICS

- 1) Onset: 1-3 min.
- 2) $\frac{1}{2}$ -Life: 1-2 hrs.
- 3) Duration: 30-60 min.

INDICATIONS

- Pre-procedure sedation (e.g., cardioversion)
- Sedation
- Seizures

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Hypotension

PREGNANCY RISK FACTOR

- D: Positive evidence of risk

SIDE EFFECTS

- 1) Respiratory depression
- 2) Hypotension
- 3) Altered mental status

DOSING & ADMINISTRATION

Adult

- **Sedation:**
 - Mild: 1 mg IN/IM q 15 min PRN (max total dose 5 mg)
 - Moderate: 2.5 mg IN/IM q 15 min PRN (max total dose 7.5 mg)
- **Seizures:** 2.5 mg IV/IO or 5 mg IN/IM q 15 min. PRN (max total dose 10 mg).
- **Post-intubation sedation:** 0.05 mg/kg slow IV/IO q 15 min. PRN (max total dose 10 mg)
- **Excited Delirium (post stabilization):** 2.5 mg IN/IM/IV/IO q 15 min PRN (max total dose 10 mg)

Pediatric

- **Sedation:** 0.05 mg/kg IN/IM q 15 min. PRN (max single dose 2.5 mg) (max total dose 5 mg).
- **Seizures:** 0.05 mg/kg IV/IO or 0.1 mg/kg IN/IM q 15 min PRN (max single dose 2.5 mg) (max total dose 5 mg).
- **Post-intubation sedation:** 0.05 mg/kg slow IV/IO q 15 min. PRN (max single dose 2.5 mg) (max total dose 10 mg).

SPECIAL CONSIDERATIONS

- Resuscitative equipment must be available prior to administration.
- The dose required to achieve sedation varies from individual to individual.
- ETCO₂ and EKG monitoring are required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Naloxone (Narcan)

CLASS

- Opioid antagonist

MECHANISM OF ACTION

- Pure opioid antagonist that competes and displaces opioids at opioid receptor sites.

PHARMACOKINETICS

- 1) Onset: 2 min.
- 2) $\frac{1}{2}$ -life: 60-90 min.
- 3) Duration: 15-30 min.

INDICATIONS

- Respiratory depression due to suspected narcotic overdose

CONTRAINDICATIONS

- 1) Known hypersensitivity

PREGNANCY RISK FACTOR

- B/C: No evidence of risk in studies/Risk cannot be ruled out

SIDE EFFECTS

- 1) Vomiting, agitation, tachycardia, and seizures (in neonates)

DOSING & ADMINISTRATION

Adult

- 0.4-2.0 mg IV/IO/IN/IM. May repeat q 2-5 min to respiratory rate ≥ 12 (max total dose 10 mg).

Pediatric

- 0.1 mg/kg IV/IO/IN/IM (max single dose 2 mg). May repeat q 2-5 min to respiratory rate ≥ 12 (max total dose 10 mg).

SPECIAL CONSIDERATIONS:

- The lowest dose required to reverse respiratory depression should be utilized.
- Darvon and other synthetic opiate narcotics may require larger doses of naloxone.
- Avoid acute opiate withdrawal by using smaller doses.
- EMT-B may administer by IN route ONLY.
- Initial care should be focused on respiratory support especially BVM ventilations.
- ETCO₂ monitoring is required prior to and following administration of this medication. (May be removed during IN medication administration)

Nicardipine

CLASS

- Dihydropyridine calcium-channel blocker

MECHANISM OF ACTION

- Calcium ion influx inhibitor (calcium channel blocker) that inhibits calcium ions from entering cardiac and vascular smooth muscle cells. The contractile processes of cardiac muscle and vascular smooth muscle depend upon the movement of extracellular calcium ions into these cells through specific ion channels. Nicardipine, which is more selective to vascular smooth muscle than cardiac muscle, causes arteries to dilate, decreasing blood pressure.

PHARMACOKINETICS

- 1) Onset: 1-2 min.
- 2) $\frac{1}{2}$ -life: 2-4 hrs.
- 3) Duration: 6-12 hrs.

INDICATIONS

- Hypertensive crisis
- Stroke (Systolic B/P > 200 mmHg and/or Diastolic B/P > 110 mmHg)
- Pregnancy induced hypertension

CONTRAINDICATIONS

- 1) Hypotension
- 2) Advanced aortic stenosis

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Hypotension
- 2) Headache
- 3) Nausea/vomiting
- 4) Tachycardia
- 5) May exacerbate heart failure in patients taking beta-blockers

DOSING & ADMINISTRATION

Adult

- **Hypertensive crisis / Stroke:** 5 mg/hr. IV/IO infusion, may increase by 2.5 mg/hr. q 10 min. to a maximum of 15 mg/hr. with qualifying blood pressure.
- **Pre-eclampsia/Eclampsia (Medical Control ONLY):** 5 mg/hr. IV/IO infusion, may increase by 2.5 mg/hr. q 10 min. to a maximum of 15 mg/hr. with qualifying blood pressure

SPECIAL CONSIDERATIONS:

- Use cautiously in patients with impaired renal or hepatic function, taking beta-blocker in CHF, left ventricular dysfunction, and in patients with portal hypertension.
- Should be administered by slow continuous infusion at a concentration of 0.1 mg/mL. Each vial of 25mg should be diluted with 250 mL of NS.
- EKG monitoring is required prior to and following administration of this medication.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Nitroglycerin

CLASS

- Nitrate and vasodilator

MECHANISM OF ACTION

- Nitroglycerin forms free radical nitric oxide. In smooth muscle, nitric oxide activates guanylate cyclase which produces a vasodilator effect on the peripheral veins and arteries with more prominent effects on the veins. Primarily reduces cardiac oxygen demand by decreasing preload (left ventricular end-diastolic pressure); may modestly reduce afterload; dilates coronary arteries and improves collateral flow to ischemic regions.

PHARMACOKINETICS

- 1) Onset: 1 min.
- 2) ½-life: 1-4 min.
- 3) Duration: 3-5 min.

INDICATIONS

- Suspected acute coronary syndrome (ACS)
- Pulmonary edema

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Aortic stenosis
- 3) Sexual performance enhancing drugs (phosphodiesterase-5 (PDE-5) inhibitors)
 - a. Viagra (Sildenafil citrate) in last 24 hrs.
 - b. Levitra (Vardenafil HCl) in last 24 hrs.
 - c. Cialis (Tadalafil) in last 48 hrs.
- 4) Hypotension (SBP <100 mmHg)
- 5) Right ventricular infarction
- 6) Stroke signs and symptoms

PREGNANCY RISK FACTOR

- B/C: No evidence of risk in studies/Risk cannot be ruled out

SIDE EFFECTS

- 1) Headache
- 2) Hypotension

DOSING & ADMINISTRATION

Adult

- **ACS:** 0.4 mg SL q 3-5 min. PRN pain relief, patient must maintain SBP >100 mmHg for additional doses.
- **Pulmonary edema** (Captain and above for ACS):
 - 0.4-1.2 mg SL q 3-5 min. PRN, patient must maintain SBP > 100 mmHg for additional doses.
 - Mix 50mg/250 mL NS then administer 200 mcg (1 mL) slow IV/IO push for symptomatic CHF, may repeat q 5 min. PRN (max total dose 600 mcg). Followed by 50 mcg/min. (15 mL/hr.) IV/IO infusion, may increase by 50 mcg/min. q 10 min. (max total dose 200 mcg/min.)

SPECIAL CONSIDERATION

- IV should be established prior to administration of Nitroglycerin SL if possible.
- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Norepinephrine (Levophed)

CLASS

- Alpha and beta agonist

MECHANISM OF ACTION

- Stimulates beta1-adrenergic receptors and alpha-adrenergic receptors causing increased contractility and heart rate as well as vasoconstriction, thereby increasing systemic blood pressure and coronary blood flow; clinically, alpha effects (vasoconstriction) are greater than beta effects (inotropic and chronotropic effects).

PHARMACOKINETICS

- 1) Onset: very rapid
- 2) ½-life: Unknown
- 3) Duration: 1-2 min.

INDICATIONS

- Post-resuscitation hypotension
- Cardiogenic shock
- Sepsis (preferred vasopressor)
- Calcium channel blocker ingestion
- Beta blocker ingestion
- Neurogenic shock with hypotension

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Hypotension due to blood volume depletion
- 3) Peripheral vascular thrombosis (except for lifesaving procedures)

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Dysrhythmias
- 2) Bradycardia

DOSING & ADMINISTRATION

Adult

- **Post-resuscitation:** 0.1-0.5 mcg/kg/min. IV/IO to goal MAP 75-90 mmHg.
- **Cardiogenic shock & Sepsis & CCB/BB Ingestion:** 0.05-0.5 mcg/kg/min. IV/IO to goal MAP >65 mmHg.
- **Neurogenic shock:** 0.05-0.5 mcg/kg/min. IV/IO to goal MAP ≥90 mmHg

Pediatric

- **Post-resuscitation:** 0.1-2.0 mcg/kg/min. IV/IO to goal lower limit normal BP.
- **Shock & Sepsis:** 0.05-0.5 mcg/kg/min. IV/IO to goal lower limit normal BP.
- **Neurogenic shock:** 0.05-0.5 mcg/kg/min. IV/IO to goal lower limit normal BP.

SPECIAL CONSIDERATIONS

- Blood pressures must be documented at a minimum of every 5 minutes following administration of this medication.

Ondansetron (Zofran)

CLASS

- Antiemetic

MECHANISM OF ACTION

- Selective 5-HT₃ receptor antagonist, blocking serotonin, both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone.

PHARMACOKINETICS

- 1) Onset: Rapid
- 2) $\frac{1}{2}$ -life: 3-6 hrs.
- 3) Duration: 4-8 hrs.

INDICATIONS

- Nausea and/or vomiting

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Prolonged QT interval
- 3) Known Serotonin Syndrome

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) QT prolongation and serotonin syndrome
- 2) Anxiety
- 3) Dizziness
- 4) Drowsiness and fatigue

DOSING & ADMINISTRATION

Adult

- 4-8 mg slow IV/IO push or IM.

Pediatric

- 0.1 mg/kg slow IV/IO push or IM (max total dose 4 mg) for children > 6 months of age.

SPECIAL CONSIDERATIONS

- EKG must be obtained prior to and following administration of this medication.
- Do not administer if QTc interval is > 470 ms. in males or > 480 ms. in females.

Oxygen

CLASS

- Naturally occurring element

MECHANISM OF ACTION

- Binds to hemoglobin providing fuel for many biological processes.

PHARMACOKINETICS

- 1) N/A

INDICATIONS

- $\text{SpO}_2 \leq 94\%$
- Decreased perfusion states
- Respiratory distress

CONTRAINDICATIONS

- 1) None

SIDE EFFECTS

- 1) None

DOSING & ADMINISTRATION

- Dependent on delivery system

SPECIAL CONSIDERATIONS

- Titrate SpO_2 to $\geq 94\%$.
- Rarely is a nasal cannula the appropriate first line oxygen delivery device. The goal of oxygen administration is to quickly increase the partial pressure of oxygen present in the lung to facilitate faster diffusion of oxygen into the pulmonary capillaries.

Pepcid Complete

CLASS

- Antacid, Histamine 2 (H2) Blocker

MECHANISM OF ACTION

- Famotidine complete (Pepcid Complete) is a combination of two different kinds of medications, so it works in two ways. Famotidine (10 mg) is a histamine H2 antagonist, which means it blocks histamine from working, so less acid is released in the stomach. Calcium Carbonate (800 mg) and Magnesium Hydroxide (165 mg) neutralize stomach acids.

PHARMACOKINETICS

- 1) Onset: 15-30 min.
- 2) $\frac{1}{2}$ -life: 2-3 hrs.
- 3) Duration: 10-12 hrs.

INDICATIONS

- Suspected gastric upset.
- Allergic reaction including anaphylaxis.

CONTRAINDICATIONS

- 1) Known hypersensitivity

PREGNANCY RISK FACTOR

- A: No risk in human studies.

SIDE EFFECTS

- 1) Constipation
- 2) Diarrhea

DOSING & ADMINISTRATION

Adult

- 1 Tablet PO. Medication should be chewed and swallowed completely.

Pediatric

- 1/2 Tablet PO. Medication should be chewed and swallowed completely.

Rocuronium Bromide

CLASS

- Neuromuscular blocking agent, non-depolarizing

MECHANISM OF ACTION

- Blocks acetylcholine from binding to receptors on motor endplate inhibiting depolarization thus producing complete muscle paralysis.

PHARMACOKINETICS

- 1) Onset: 1 min.
- 2) ½-life: 60-90 min.
- 3) Duration: 30 min.

INDICATIONS

- DSI paralytic
- Post-intubation paralysis

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Myasthenia gravis
- 3) Inability to successfully perform endotracheal intubation or cricothyroidotomy.

PREGNANCY RISK FACTOR

- C: Risk cannot be ruled out

SIDE EFFECTS

- 1) Hypertension
- 2) Tachycardia
- 3) Transient hypotension

DOSING & ADMINISTRATION

Adult

- **DSI paralytic:** 1 mg/kg IV/IO.
- **Post-intubation paralysis :** 1 mg/kg IV/IO q 25-30 min. PRN.

Pediatric

- **DSI paralytic:** 1 mg/kg IV/IO.
- **Post-intubation paralysis :** 1 mg/kg IV/IO q 25-30 min. PRN.

SPECIAL CONSIDERATION

- ETCO2 monitoring is required prior to and following administration of this medication.
- EKG monitoring is required prior to and following administration of this medication.
- SPO2 monitoring is required prior to and following administration of this medication.
- Ensure equipment and backup plan are prepared and communicated prior to administration of this medication.

Sodium Bicarbonate

CLASS

- Electrolyte

MECHANISM OF ACTION

- Dissociates to provide bicarbonate ions which neutralizes hydrogen ion concentration and raises blood and urinary pH.

PHARMACOKINETICS

- 1) Onset: Immediate
- 2) ½-life: Unknown
- 3) Duration: 8-10 min.

INDICATIONS

- Hyperkalemia
- Tricyclic antidepressant ingestion
 - Seizures
 - Ventricular dysrhythmias
 - Altered mental status
- Chlorine and related compound exposure (Medical Control or Poison Control recommendation)
- Prolonged entrapment (>4 hr.)/Rhabdomyolysis (Medical Control)

CONTRAINDICATIONS

- 1) None in emergency setting

SIDE EFFECTS

- 1) Hypokalemia

DOSING & ADMINISTRATION

Adult

- **Cardiac Arrest/Hyperkalemia:** 1 mEq/kg IV/IO.
- **TCA ingestion:** 1-2 mEq/kg IV/IO.
- **Crush Syndrome:** (Medical Control authorization **ONLY**): 1 mEq/kg IV/IO just before crush extrication > 4 hrs. May repeat 0.5 mEq/kg IV/IO X1 q 10 min.

Pediatric

- **Cardiac Arrest/Hyperkalemia:** 1 mEq/kg IV/IO (max 50 mEq); dilute to 4.2% solution for children <6 months.
- **TCA ingestion:** 1-2 mEq/kg IV/IO.
- **Crush Syndrome** (Medical Control authorization **ONLY**): 1 mEq/kg IV/IO just before crush extrication > 4 hrs. (max 50 mEq); dilute to 4.2% solution for children <6 months. May repeat 0.5 mEq/kg IV/IO X1 q 10 min.

SPECIAL CONSIDERATION

- Flush IV/IO lines thoroughly before administering secondary medications through same line Sodium Bicarbonate was administered.

Sodium Chloride (Normal Saline)

CLASS

- Electrolyte

MECHANISM OF ACTION

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

PHARMACOKINETICS

- 1) Distribution: Immediate

INDICATIONS

- Dilution solution for medication infusions

CONTRAINDICATIONS/PRECAUTIONS

- 1) Patients with conditions in which sodium and chloride administration is detrimental.
- 2) Postoperative patients, heart failure, circulatory insufficiency, renal dysfunction, hypoproteinemia.

PREGNANCY RISK FACTOR

- A: Contains no components known to have adverse effects

SIDE EFFECTS

- 1) Pulmonary edema
- 2) Hypernatremia
- 3) Aggravation of metabolic acidosis
- 4) Thrombophlebitis

DOSING & ADMINISTRATION

Adult

- Rate and volume determined by medication added

Pediatric

- Rate and volume determined by medication added

SPECIAL CONSIDERATION

- Use caution when administering to avoid pulmonary edema.
- Sodium Chloride is an isotonic crystalloid solution that is slightly acidic. Use caution when administering to patients in shock, metabolic acidosis, or respiratory acidosis as it may worsen the underlying acidosis.

Tranexamic Acid (TXA)

CLASS

- Anti-fibrinolytic

MECHANISM OF ACTION

- Forms a reversible complex that displaces plasminogen from fibrin resulting in inhibition of fibrinolysis; it also inhibits the proteolytic activity of plasmin.

PHARMACOKINETICS

- 1) Onset: 5-15 min.
- 2) $\frac{1}{2}$ -life: 2-11 hrs.
- 3) Duration: 3 hr.

INDICATIONS

- Hypovolemic Shock with suspected traumatic hemorrhage < 3 hours since time of injury
- Traumatic Brain Injury
- Epistaxis
- OB Complication - Postpartum Hemorrhage (Medical Control authorization **ONLY**)

CONTRAINDICATIONS

- 1) Known hypersensitivity
- 2) Suspected stroke, myocardial infarction, or pulmonary embolus
- 3) <16 years old
- 4) Isolated head injury
- 5) >3 hours from traumatic injury

PREGNANCY RISK FACTOR

- B: No evidence of risk in studies

SIDE EFFECTS

- 1) Hypotension (with rapid administration)
- 2) Giddiness
- 3) Allergic dermatitis
- 4) Diarrhea
- 5) Nausea/vomiting
- 6) Blurred vision

DOSING & ADMINISTRATION

Adult

- **Traumatic Hemorrhage/Traumatic Brain Injury/OB Complication**
 - Infuse 2 g mixed into 100 mL NS IV/IO over 5 min.
- **Epistaxis:**
 - 100 mg IN administered via MAD device into the effected nostril(s) (max total dose 200 mg).

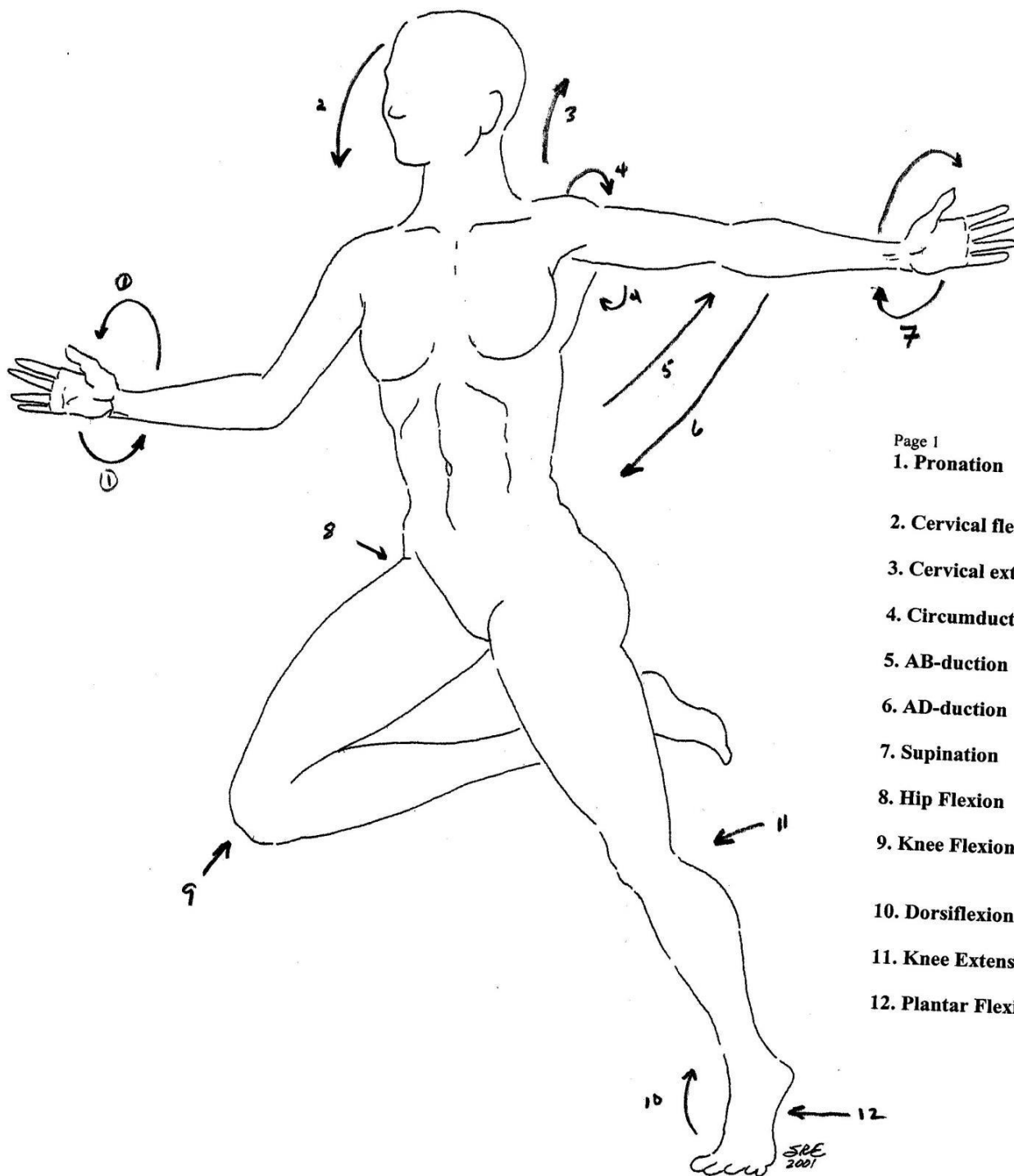
SPECIAL CONSIDERATION

- Patients with traumatic hemorrhage should have Calcium Chloride administered prior to administration of TXA.
- Hypotension may be seen when TXA is administered rapidly, ensure that it is being administered at the proper rate.



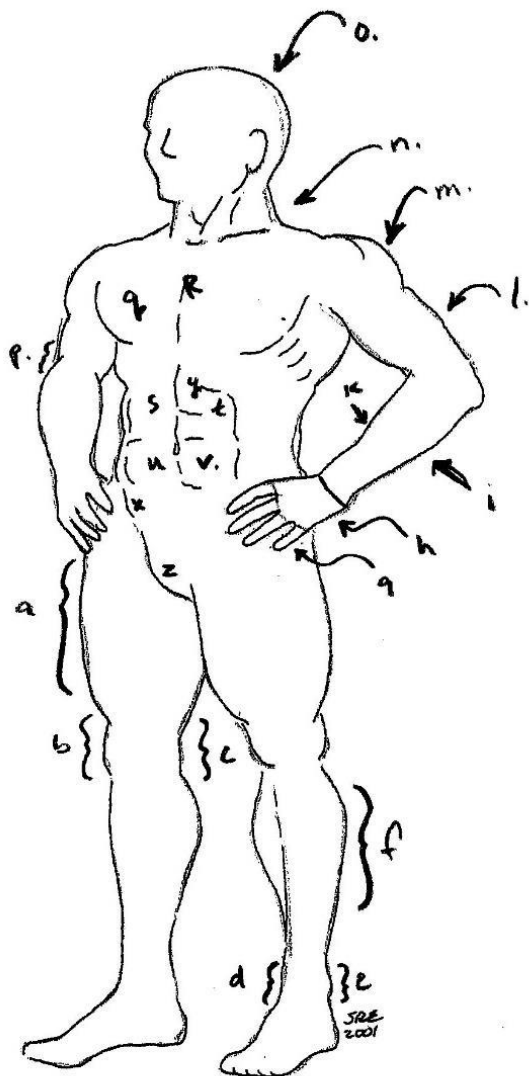
Reference Material

Anatomical Reference



Anatomical Reference

Page 2. REGIONS



- a. Femoral or Ant. Femoral
- b. Patellar
- c. Popliteal
- d. Medial Malleolus
- e. Lateral Malleolus
- f. Gastrocnemius
- g. Digit, digital by number
- h. Carpal
- i. Ulnar
- j. None
- k. Radial
- l. Humeral, post/ant.
- m. Deltoid, ant./post.
- n. Cervical, post./ant.
- o. Cranial, see specific regions on page 3.
- p. Antecubital
- q. Pectoral, lat./med.
- r. Sternal
- s. Abdominal- Right Upper Quadrant
- t. Abd.- Left Upper Quadrant
- u. Abd.- Right Lower Quadrant
- v. Abd.- Left Lower Quadrant
- w. Right Inguinal
- x. Costal Margin
- y. Perineal or Genital
- z. Perineal or Genital

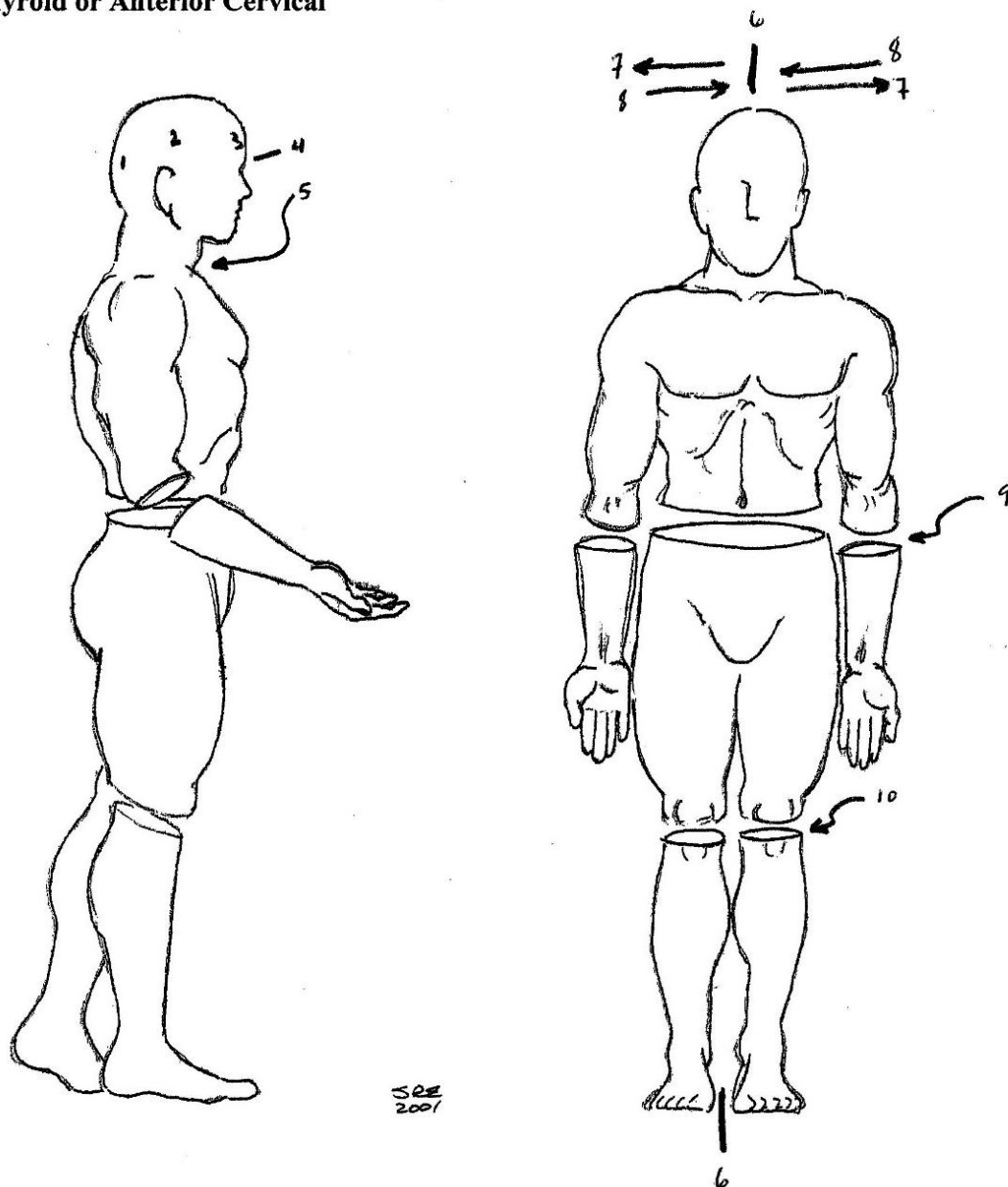
Anatomical Reference

Page 3. Anatomical Relationship

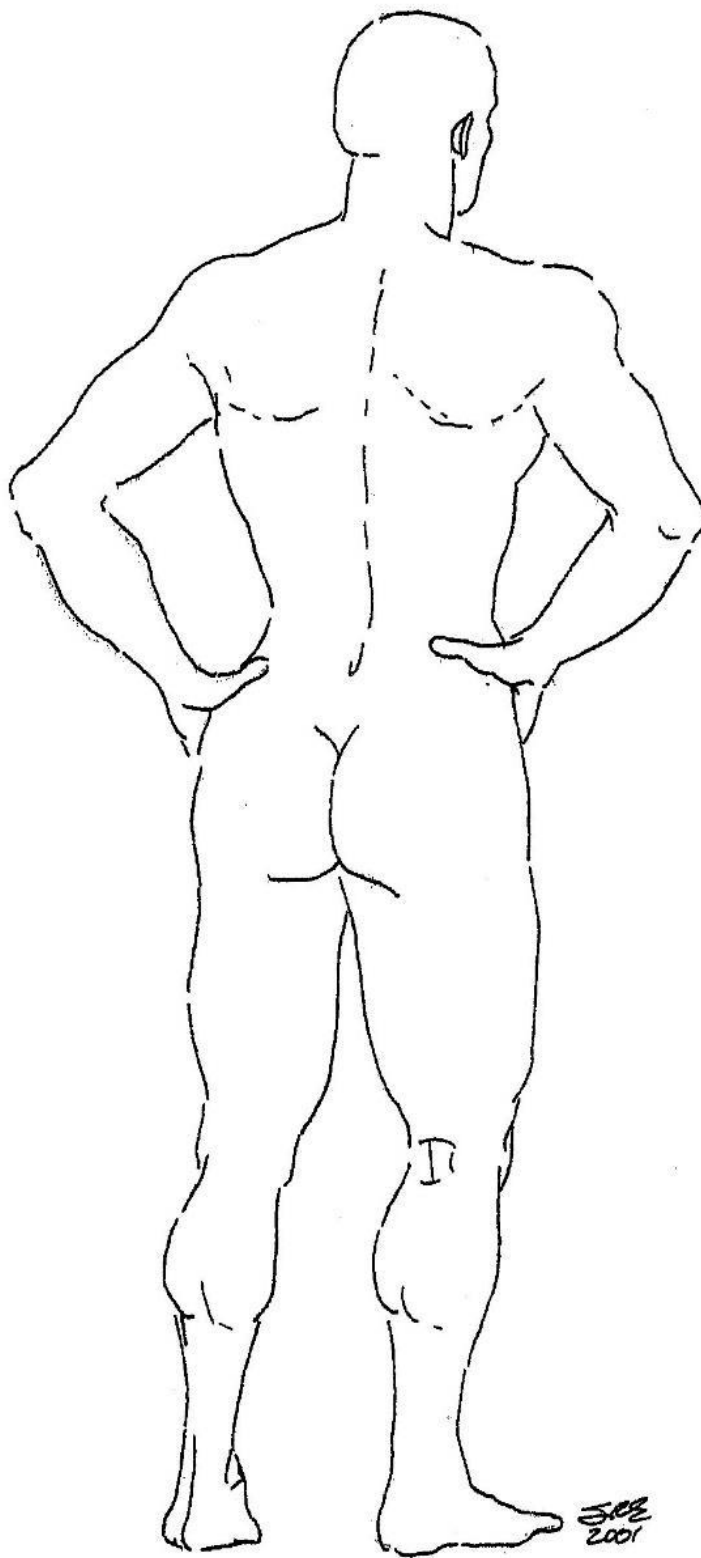
1. Occiput
2. Temporal
3. Frontal
4. Supraorbital
5. Thyroid or Anterior Cervical

6. Midline (Sagittal)

7. Lateral
8. Medial
9. Coronal
10. Coronal or Patellar coronal



Anatomical Reference



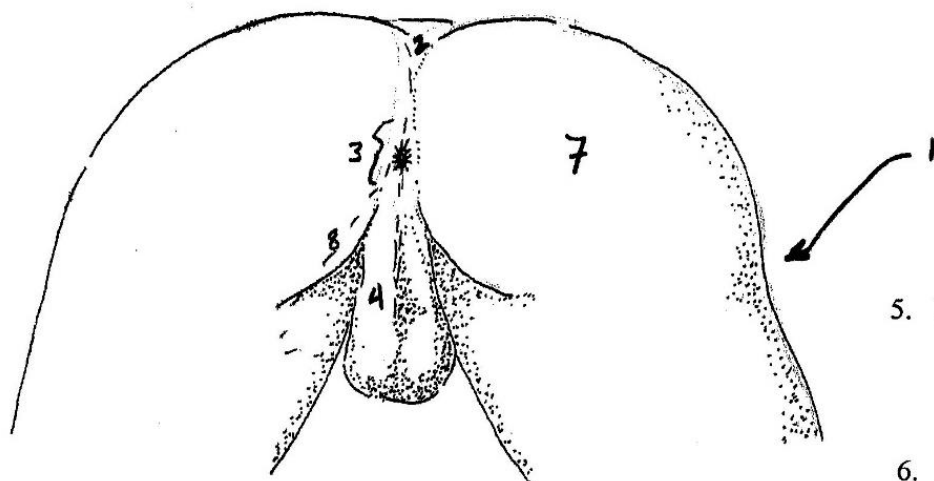
DORSAL SURFACE

502
2001

Anatomical Reference

Perineal Regions

1. Gluteal Fold
2. Coccygeal
3. Anal or Perianal
4. Scrotal

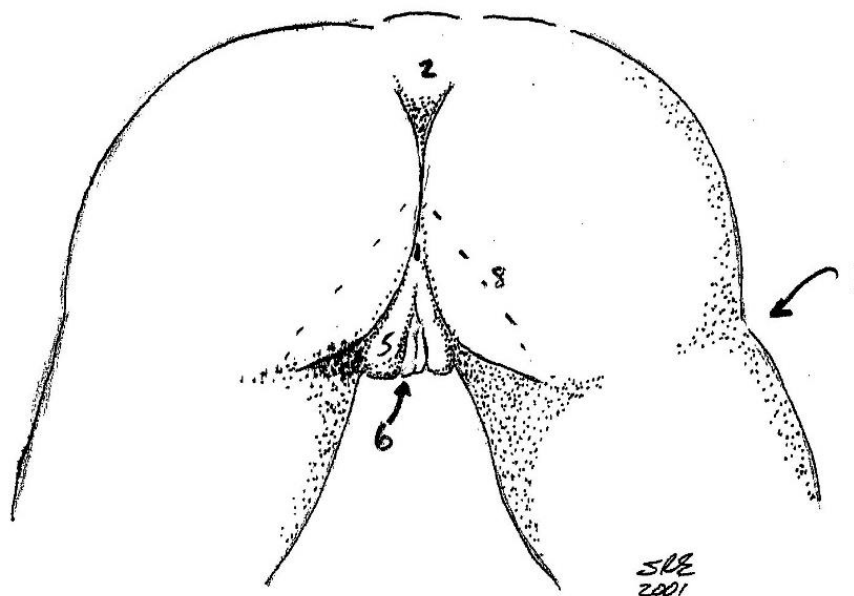


5. Labium Majus, Labia Majora

6. Labium Minus, Labia Minora

7. Gluteal

8. Urogenital Triangle



Approved Abbreviation List

Abbreviations

A-fib or A.F.

ABC

abd

AC

Ad lib

ALS

A.M.

AMA

amp

ant.

A&Ox1-2-3 or 4

AOSTF

Approx.

ASA

ASAP

AV

BBB

b.i.d.

bicarb

BLS

BGL

BP

BPM

brady

BS

BVM

°C

cc

CA

CABG

CaCl₂

CAD

C/C

CCU

CHF

cm

CNS

c/o

CO

CO₂

cont

COPD

CPR

CSF

C-spine

CV

CVA

Definitions

atrial fibrillation

airway, breathing, circulation

abdomen, abdominal

antecubital

as much as needed, as desired

advanced life support

morning

against medical advice

ampule

anterior

alert and oriented times 1-2-3 or 4

arrived on scene to find

approximately

aspirin

as soon as possible

atrioventricular

bundle branch block

twice daily

sodium bicarbonate

basic life support

blood glucose level

blood pressure

beats per minute

bradycardia

breath sounds

bag-valve-mask

Celsius

cubic centimeter

cancer

coronary artery bypass graft surgery

calcium chloride

coronary artery disease

chief complaint

coronary care unit

congestive heart failure

centimeter

central nervous system

complains of

carbon monoxide

carbon dioxide

continuous

chronic obstructive pulmonary disease

cardiopulmonary resuscitation

cerebrospinal fluid

cervical spine

cardiovascular

cerebral vascular accident

Approved Abbreviation List

Abbreviations

D&C	dilatation and curettage
defib	defibrillation
DKA	diabetic ketoacidosis
DNR	do not resuscitate
d/o	days old
DOA	dead on arrival
DOE	dyspnea on exertion
DOS	dead on scene
D50	dextrose 50%
Dr.	doctor
d/t	due to
DT's	delirium tremens
DVT	deep vein thrombosis
D5W	5% dextrose in water
Dx	diagnosis
dz	disease
EBL	estimated blood loss
ECG or EKG	electrocardiogram
EDC	estimated date of confinement
EEG	electroencephalogram
e.g.	for example
EGD	extraglottic device
EMT	emergency medical technician
ENT	ear, nose, and throat
EOM	extra ocular movements
Epi	epinephrine
E.R. or E.D.	emergency room or emergency department
ET	endotracheal
ETA	estimated time of arrival
Etc	etcetera
EtCO ₂	end-tidal capnography
ETOH	alcohol/ethanol
ETT	endotracheal tube
Exp	expiratory
°F	Fahrenheit
Fr	French
fx	fracture
ga	gauge
GCS	Glasgow Coma Scale
G.I.	gastrointestinal
g	gram
gtt or gtts	drops
GU	genitourinary
hr	hour
H ₂ O	water
HCTZ	hydrochlorothiazide
HEENT	head, eyes, ears, nose, and throat

Definitions

Approved Abbreviation List

Abbreviations

Hg

HTN

Hx

HPI

HR

hs

ICU

i.e.

IM

Inj

IO

Irreg

IV

IVP

j

JVD

K⁺

KCl

kg

KVO

L

L (circled)

lac

lat

lb

LLL

LLQ

LMP

LOC

LPM

LR

L/S-spine

L-spine

LUL

LUQ

LVN

MCI

mcg

MD

med

mEq

mg

MI

mL

mm

mod.

MOI

Definitions

mercury

hypertension

history

history of present illness/injury

heart rate

bedtime

intensive care unit

in other words

intramuscular

injection/inject

intraosseous

irregular

intravenous

IV push

joule

jugular venous distention

Potassium

potassium chloride

kilogram

keep vein open

liter

left

laceration

lateral

pound

left lower lobe

left lower quadrant

last menstrual period

loss of consciousness

liters per minute

lactated ringers

lumbar sacral spine

lumbar spine

left upper lobe

left upper quadrant

licensed vocational nurse

mass casualty incident

microgram

medical doctor

medication or medicated

milliequivalent

milligram

myocardial infarction

milliliter

millimeter

moderate

mechanism of injury

Approved Abbreviation List

Abbreviations

m/o

MVA

MVC

Na⁺

N/A

NaCl

NaHCO₃

NAD

NCAT

neg (-)

neuro

NG

Nitro, NTG

NKA

NKDA

nl

NPA

NPO

NS

NSR

N/V

NRB

O₂

OB

OD

OK

OPA

OR

oz.

PAC

Palp.

PCN

PD

PE

PEA

PERRLA

PID

P.M.

PO

P-R

PRN

PT

PTA

PUD

PVC

PE

Pos (+)

Definitions

months old

motor vehicle accident

motor vehicle collision

sodium

not applicable

sodium chloride

sodium bicarbonate

no apparent distress

normocephalic atraumatic

negative

neurologic

nasogastric

nitroglycerin

no known allergy

no known drug allergy

normal

nasal pharyngeal airway

nothing by mouth

normal saline

normal sinus rhythm

nausea/vomiting

nonrebreather

oxygen

obstetrical

overdose

okay

oral pharyngeal airway

operating room

ounce

premature atrial complex

palpation

penicillin

police department

physical exam

pulseless electrical activity

pupils equal, round, reactive to light and accommodation

pelvic inflammatory disease

afternoon

by mouth

P-R interval

as needed

patient

prior to arrival

peptic ulcer disease

premature ventricular contraction

physical exam

positive

Approved Abbreviation List

Abbreviations

post.
PVD
q
q.d.
q.h.
q2h
q.i.d.
q.o.d.
R (circled)
RR
reg.
RLL
RLQ
RN
R/O
ROSC
resp/min
RRR
RUL
RUQ
Rx
SC or SQ
sec.
SIDS
SL
S.O.
SOB
S/P
S/S
stat
STD
STI
SVT
Sx.
tach, tachy
TCA
°T, temp
TIA
tib-fib
t.i.d.
TKO
T/L-spine
TMJ
TPN
T-spine
TV

Definitions

posterior
peripheral vascular disease
every
every day
every hour
every 2 hours
four times a day
every other day
right
respiratory rate
regular
right lower lobe
right lower quadrant
registered nurse
rule out
return of spontaneous circulation
respirations per minute
regular rate rhythm
right upper lobe
right upper quadrant
prescription
subcutaneous
second
sudden infant death syndrome
sublingual
sheriff's office
shortness of breath
status post
signs and symptoms
at once
sexually transmitted disease
sexually transmitted infection
supraventricular tachycardia
symptoms
tachycardia
tricyclic antidepressant
temperature
transient ischemic attack
tibia/fibula
three times a day
to keep open
thoraco-lumbar spine
temporo-mandibular joint
total parenteral nutrition
thoracic spine
tidal volume

Approved Abbreviation List

Abbreviations

URI
UTI
UNK
V-fib or VF
via
vs
V/S
VT
WNL
WPW
x
XR
y or yrs
y/o

Definitions

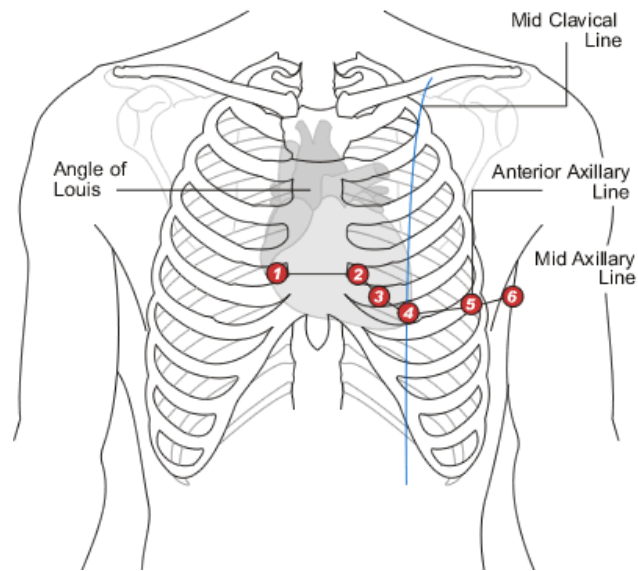
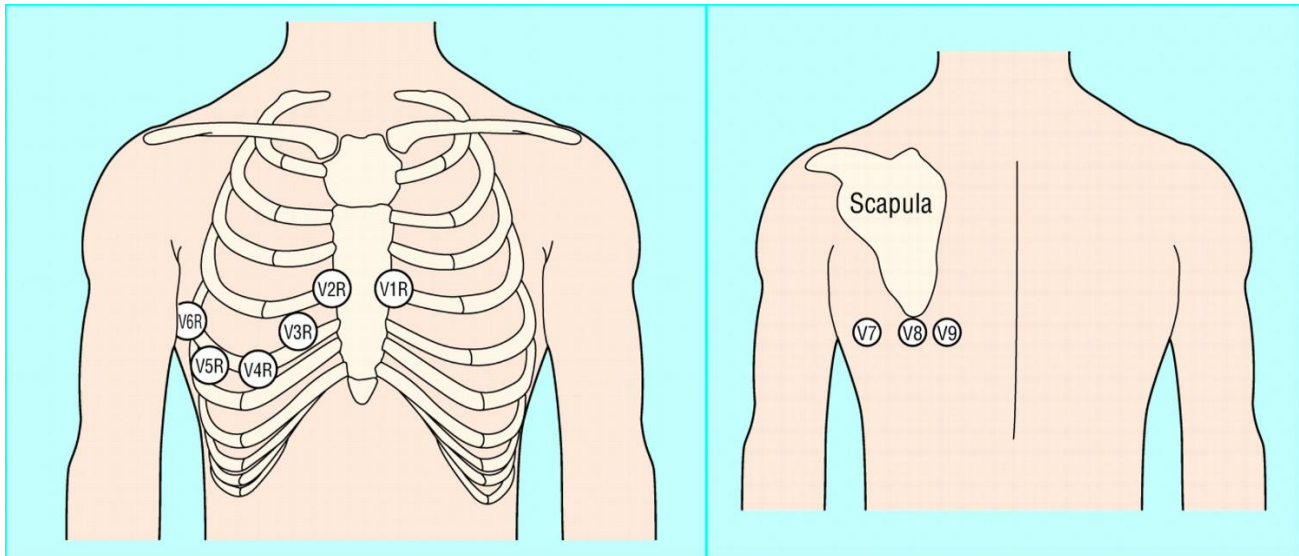
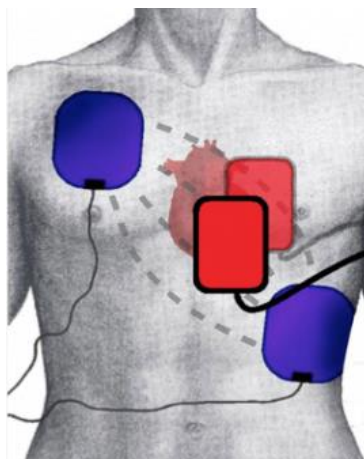
upper respiratory infection
urinary tract infection
unknown
ventricular fibrillation
by the way
versus
vital signs
ventricular tachycardia
within normal limits
Wolff Parkinson White Syndrome
times
x-ray
year
years old

Cincinnati Prehospital Stroke Scale (CPSS)

Cincinnati Prehospital Stroke Scale (≥ 1 abnormal test considered positive)

- Facial droop
 - Normal: both sides of face move equally
 - Abnormal: one side of face does not move at all
- Arm drift
 - Normal: both arms move equally or not at all
 - Abnormal: one arm drifts compared to the other
- Speech
 - Normal: patient uses correct words with no slurring
 - Abnormal: slurred or inappropriate words or mute

ECG Placement



Glasgow Coma Scale (GCS)

Adult			Pediatric	
Spontaneously	4	Best Eye Opening	Spontaneously	4
To verbal stimuli	3		To verbal stimuli	3
To painful stimuli	2		To painful stimuli	2
No eye opening	1		No eye opening	1
Oriented	5	Best Verbal Response	Appropriate coo & cry	5
Confused	4		Irritable cry	4
Inappropriate words	3		Inconsolable crying	3
Incomprehensible	2		Grunts	2
No verbal response	1		No verbal response	1
Obeys commands	6	Best Motor Response	Normal spontaneous	6
Localizes pain	5		Withdraws to touch	5
Withdraws to pain	4		Withdraws to pain	4
Flexion to pain	3		Flexion to pain	3
Extension to pain	2		Extension to pain	2
No motor response	1		No motor response	1

Pediatric Vital Signs

Age	Pulse	Respiratory Rate	Systolic BP
Preterm <1 kg	120-160	30-60	36-58
Preterm 1 kg	120-160	30-60	42-66
Preterm 2 kg	120-160	30-60	50-72
Newborn	126-160	30-60	60-70
<1 year	100-140	30-60	70-80
1-3 years	100-140	20-40	76-90
4-6 years	80-120	20-30	80-100
7-9 years	80-120	16-24	84-110
10-12 years	60-100	16-20	90-120
13-14 years	60-90	16-20	90-120
>15 years	60-90	14-20	90-130

Adult Vasopressor Drip Chart

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Drip: 0.05-0.5 mcg/kg/min

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.05 mcg/kg/min	12	15	18	21	24	27	30	33	36
0.1 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.15 mcg/kg/min	36	45	54	63	72	81	90	99	108
0.2 mcg/kg/min	48	60	72	84	96	108	120	132	144
0.25 mcg/kg/min	60	75	90	105	120	135	150	165	180
0.3 mcg/kg/min	72	90	108	126	144	162	180	198	216

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Drip: 0.1-0.5 mcg/kg/min

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5 min.

16 mcg/mL

Patient kg	40	50	60	70	80	90	100	110	120
0.1 mcg/kg/min	15	19	23	26	30	34	38	41	45
0.12 mcg/kg/min	18	23	27	32	36	41	45	50	54
0.14 mcg/kg/min	21	26	32	37	42	47	53	58	63
0.16 mcg/kg/min	24	30	36	42	48	54	60	66	72
0.18 mcg/kg/min	27	34	41	47	54	61	68	74	81
0.2 mcg/kg/min	30	38	45	53	60	68	75	83	90

Pediatric Vasopressor Drip Chart

All drip calculations are using a microdrip (60 gtts/mL)

Epinephrine Infusion

Mix: 1mg [1:1000] in 100 mL NS yields

Titrate by 0.05 mcg/kg/min q 10 min.

10 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.05 mcg/kg/min	0.75	1.5	2.25	3.0	4.5	6.0	7.5	9.0	10.5
0.1 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.15 mcg/kg/min	2.25	4.5	6.75	9.0	13.5	18.0	22.5	27.0	31.5
0.2 mcg/kg/min	3.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0	42.0
0.25 mcg/kg/min	3.75	7.5	11.25	15.0	22.5	30.0	37.5	45.0	52.5
0.3 mcg/kg/min	4.5	9.0	13.5	18.0	27.0	36.0	45.0	54.0	63.0

All drip calculations are using a microdrip (60 gtts/mL)

Norepinephrine (Levophed) Infusion

Mix: 4mg in 250 mL NS yields

Titrate by 0.02 mcg/kg/min q 5min.

16 mcg/mL

Patient kg	2.5	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0
0.1 mcg/kg/min	0.9	1.9	2.8	3.8	5.6	7.5	9.4	11.3	13.1
0.12 mcg/kg/min	1.1	2.3	3.4	4.5	6.8	9.0	11.3	13.5	15.8
0.14 mcg/kg/min	1.3	2.6	3.9	5.3	7.9	10.5	13.1	15.8	18.4
0.16 mcg/kg/min	1.5	3.0	4.5	6.0	9.0	12.0	15.0	18.0	21.0
0.18 mcg/kg/min	1.7	3.4	5.1	6.8	10.1	13.5	16.9	20.3	23.6
0.2 mcg/kg/min	1.9	3.8	5.6	7.5	11.3	15.0	18.8	22.5	26.3

Rapid Arterial Occlusion Evaluation Score (RACE)

EMS RACE Stroke Scale - Rapid Arterial Occlusion Evaluation Scale, used to predict large cerebral arterial occlusions. *			
ITEM	INSTRUCTION		RACE Score
FACIAL PALSY	Ask the patient to show their teeth	ABSENT (symmetrical movement) MILD (slightly asymmetrical) MODERATE TO SEVERE (completely asymmetrical)	0 1 2
ARM MOTOR FUNCTION	Extending the arm of the patient 90 degrees (if sitting) or 45 degrees (if supine)	NORMAL TO MILD (limb upheld more than 10 seconds) MODERATE (limb upheld less than 10 seconds) SEVERE (patient unable to raise arm against gravity)	0 1 2
LEG MOTOR FUNCTION	Extending the leg of the patient 30 degrees (if supine)	NORMAL TO MILD (limb upheld more than 5 seconds) MODERATE (limb upheld less than 5 seconds) SEVERE (patient unable to raise the leg against gravity)	0 1 2
HEAD AND GAZE DEVIATION	Observe eyes and cephalic deviation to one side	ABSENT (eye movements to both sides were possible and no cephalic deviation was observed) PRESENT (eyes and cephalic deviation to one side was observed)	0 1
APHASIA If right hemiparesis	Ask the patient two verbal orders: - "close your eyes" - "make a fist"	NORMAL (performs both tasks correctly) MODERATE (performs one task correctly) SEVERE (performs neither task)	0 1 2
AGNOSIA If left hemiparesis	Asking: - "Who's arm is this?" while showing him/her the paretic arm (asomatognosia) - "Can you move your arm?" (anosognosia)	NORMAL (no asomatognosia nor anosognosia) MODERATE (asomatognosia or anosognosia) SEVERE (both of them)	0 1 2
<small>* Chart adapted from Perez de la Ossa N, Carrera D, Gorcha M, et al. Design and validation of a prehospital stroke scale to predict large arterial occlusion: the rapid arterial occlusion evaluation scale. Stroke; a journal of cerebral circulation. Jan 2014;45(1):87-91.</small>			RACE SCALE TOTAL: Any score above a "0" is a "Stroke Alert"

- Scores ≥ 5 have a high likelihood of a large vessel occlusion (LVO)
- RACE is based on an abbreviated version of the NIHSS, the "gold standard" for evaluating stroke victims.
- The maximum score is 9 (not 11) because the evaluation is done on the left or right side, not both simultaneously.
- RACE is a 5 of 6 item scale. The last item is based on which side the patient has deficits on previous scale items.
- RACE is a universal quantitative tool to help determine the severity of a stroke and to identify strokes with large vessel occlusions (LVO) which would benefit going to a comprehensive stroke center.
- The Cincinnati (CPSS) offers a high degree of sensitivity for strokes but is qualitative scores (positive or negative) and not quantitative (severity).
- The cut-score of ≥ 5 is based on the significant global accuracy of RACE predicting LVO and its close correlation to the NIHSS.



Addendums

Addendum Tracking

PURPOSE:

To track Clinical Operating Guideline (COG) changes, updates, and addendums and record that COG are appropriately updated.

PROCEDURE:

- 1) When COG addendums & updates are issued, EMS personnel will add them to ambulance and personal copies of the COG as soon as possible.
- 2) Updates that modify or replace existing portions of the COG will be placed in the appropriate portion of the COG binder and the portion being replaced will be removed.
- 3) Addendums that are completely new will be placed in the addendum section at the end of the COG unless other specific instructions are given when the addendum is released.
- 4) The crew member updating the COG will document the number and name of the protocol, procedure, or addendum: the date they updated the book; whether the release replaced an existing document or is new; and whether it was placed in order in the COG binder or in the addendum section on the log below. The crew member will initial the line or lines they completed.
 - a. Documents in the addendum section will proceed from oldest to newest (place new addendums in the back) unless they are replacing an old addendum, in which case the old addendum shall be removed and the new one put in its place.
- 5) An electronic version with the above changes will be sent out to crew members and updated in the PCR software, if applicable.

Number & Name	Date Added	Update/New (underline)	Placed (underline)	Initials
XX## Example	03/02/2023	<u>Updated Existing</u> / New	<u>In Order</u> / Addendums	AS
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	
		Updated Existing / New	In Order / Addendums	

Addendum Tracking

[illegible]

Addendum Tracking

[illegible]

Addendum #1

Brooke Radley Dorotik, MD, Medical Director

Date