

Updated 03/23/2020

Wooster Community Hospital Health System EMS Protocol

EMS Protocols and Procedures Manual

**Approved
2020**



www.responsoft.com

Wooster Community Hospital Health System
Emergency Providers
Protocol and Procedures Manual
Introduction

The following is an adaptation of the National Model EMS Clinical Guidelines. This Pre-Hospital Patient Care Protocol and Procedures Manual establishes the recommended guidelines for patient care that should be provided by all Wooster Community Hospital Health System Emergency Medical providers under the Medical Control Authority of Dr. Jennifer Kline M.D.



The procedures are to be used as guidelines for operations during EMS calls that require medical direction. They are also intended to be guidelines to ensure that personnel are trained in proper patient care. Procedures are not considered rigid rules, but rather established standards against which EMS practice can be measured.

Treatment protocols are specific orders directing the actions pertaining to techniques and/or medications used by EMS personnel who are required to practice under direct supervision of a physician and under Medical Control Authority of Dr. Jennifer Kline M.D. Treatment protocols may and should be initiated without prior direct Medical Control contact, especially when the patient's condition and/or situation is life threatening. As soon as the condition and/or situation permits, direct contact must be established with Medical Control for confirmation of medical care and further medical direction.

General Requirements

Ohio Revised Code, Sections 4765.35, 4765.37 and 4765.39 require that all levels of EMS providers function under the verbal or written orders of a physician EMS Medical Director. Pursuant to Section 4765.40, the State Board of Medical Services shall adopt rules under Section 4765.11 of the ORC establishing written protocols for the triage of adult and pediatric trauma victims.

- Standing orders and protocols shall be signed by the Medical Director and each EMS agency operating under these orders.

In order for an individual to operate at their level of certification, the following individual requirements must be met:

- A passing score (80% or greater) on the level-appropriate Protocol Test.
- Current BLS (CPR) certification.
- Current ACLS certification.
- PHTLS Certification (every 4 years)
- ASLS Certification (every 4 years)
- Annual CE completion according to level of certification (state requirement).

Failure to meet these requirements will result in discipline being taken up to and possibly including the removal of approval to function under these Standing Orders.

Purpose and Notes

These guidelines are intended to help state EMS systems ensure a more standardized approach to the practice of patient care, and to encompass evidence-based guidelines as they are developed.

The long-term goal is to develop a full range of evidence-based prehospital care clinical guidelines. However, until there is a sufficient body of evidence to fully support this goal, there is a need for this interim expert, consensus-based step.

The National Model EMS Clinical Guidelines can fill a significant gap in uniform clinical guidance for EMS patient care, while also providing input to the evidence-based guideline (EBG) development process.

These guidelines will be maintained by the Medical Director Council of the National Association of State EMS Officials (NASEMSO) and will be reviewed and updated periodically. As EBG material is developed, it will be substituted for the consensus-based guidelines now comprising the majority of the content of this document. In the interim, additional consensus-based guidelines will also be added as the need is identified.

Universal Care and Poisoning/Overdose Universal Care guidelines are included to reduce the need for extensive reiteration of basic assessment and other considerations in every guideline.

The appendices contain material such as neurologic status assessment and burn assessment tools to which many guidelines refer to increase consistency in internal standardization and to reduce duplication.

While some specific guidelines have been included for pediatric patients, considerations of patient age and size (pediatric, geriatric and bariatric) have been interwoven in the guidelines throughout the document.

Where IV access and drug routing is specified, it is intended to include IO access and drug routing when IV access and drug routing is not possible.

Generic medication names are utilized throughout the guidelines. A complete list of these, along with respective brand names, may be found in Appendix III "Medications".

NEMSIS - Accurate and quality data collection is crucial to the advancement of EMS and a critical element of EMS research. The National EMS Information System (NEMSIS) has the unique ability to unify EMS data on a national scope to fulfill this need. Each guideline, where possible, is also listed by the closest NEMSIS Version 3 Label and Code corresponding to it, listed in parentheses below the guideline name.

Target Audience

While this material is intended to be integrated into an EMS system's operational guidance materials by its medical director and other leaders, it is written with the intention that it will be consumed by field EMS practitioners.

To the degree possible, it has been assembled in a format useful for guidance and quick reference so that leaders may adopt it in whole or in part, harvesting and integrating as they deem appropriate to the format of their guideline, protocol, or procedure materials.

Acknowledgements

The authors of this document are NASEMSO Medical Director Council members partnered with representatives of seven EMS medical director stakeholder organizations. The stakeholder organizations are the American Academy of Emergency Medicine (AAEM), the American Academy of Pediatrics (AAP), the American College of Emergency Physicians (ACEP), the American College of Osteopathic Emergency Physicians (ACOEP), the American College of Surgeons Committee on Trauma (ACS-COT), the Air Medical Physician Association (AMPA), and the National Association of EMS Physicians (NAEMSP).

General

General Information

EMR**Emergency Medical Responder** Scope of Practice**EMT****Emergency Medical Technician** Scope of Practice**AEMT****Advanced Emergency Medical Technician** Scope of Practice**Paramedic****Paramedic** Scope of Practice

Bold Black Boxes contain important information

All Drugs color coded in **Dark Green**. Example: **Atropine**

Calculated Drugs are **Blue**. Example: **125 mg**

Important Note:

Pharmacology Section: Indications. This links where particular medication will be found in the protocol. This does not mean a specific medication is to be used. Example, Dextrose links to Hypoglycemia/Hyperglycemia page, but does not mean a patient that is Hyperglycemic is to receive Dextrose. Dextrose is found on this page to treat Hypoglycemia.

(Sticky Notes)

Cover		1
Preface		
Introduction	Preface	2
General Requirements	Preface	3
Purpose and Notes	Preface	4
Legend	Preface	5
Notes for Future Protocol Changes	Preface	6
Adult Section		
Adult Assessment		
Adult Universal Care	Adult Assessment	19
Adult Primary Survey	Adult Assessment	20
Adult Secondary Survey	Adult Assessment	21
Adult Secondary Survey-continued	Adult Assessment	22
Treatment and Interventions	Adult Assessment	23
Patient Safety Considerations	Adult Assessment	24
Functional Needs	Adult Assessment	25
Functional Needs-continued	Adult Assessment	26
Functional Needs-Service Animals	Adult Assessment	27
Trauma Triage-Definitions	Adult Assessment	28
Trauma Triage-Determination	Adult Assessment	29
Trauma Triage-Determination-continued	Adult Assessment	30
Patient Assessment Chart	Adult Assessment	31
Adult Behavioral		
Abuse and Maltreatment	Adult Behavioral	33
Abuse and Maltreatment-Notes	Adult Behavioral	34
Agitated/Violent Patient-Part A	Adult Behavioral	35
Agitated/Violent Patient Part B	Adult Behavioral	36
Agitated/Violent Patient-Notes	Adult Behavioral	37
Agitated/Violent Patient-Restraint Reference	Adult Behavioral	38
Excited Delirium	Adult Behavioral	39
Adult Cardiovascular		
Bradycardia	Adult Cardiovascular	41
Bradycardia-Notes	Adult Cardiovascular	42
Cardiac Arrest Part A	Adult Cardiovascular	43
Cardiac Arrest Part B	Adult Cardiovascular	44
Cardiac Arrest Part C	Adult Cardiovascular	45
Cardiac Arrest-Notes Part A	Adult Cardiovascular	46
Cardiac Arrest-Notes Part B	Adult Cardiovascular	47
Cardiac Arrest-Notes Part C	Adult Cardiovascular	48
Cardiac Arrest Process	Adult Cardiovascular	49
Post ROSC	Adult Cardiovascular	50
Chest Pain (ACS/STEMI)	Adult Cardiovascular	51

Chest Pain (ACS/STEMI)-Notes	Adult Cardiovascular	52
Hypotension/Shock (Non-Trauma) Part A	Adult Cardiovascular	53
Hypotension/Shock (Non-Trauma) Part B	Adult Cardiovascular	54
Hypotension/Shock (Non-Trauma)-Notes A	Adult Cardiovascular	55
Hypotension/Shock (Non-Trauma)-Notes B	Adult Cardiovascular	56
Implantable Ventricular Assist Device	Adult Cardiovascular	57
Implantable Ventricular Assist Device-Notes	Adult Cardiovascular	58
Syncope	Adult Cardiovascular	59
Syncope-Notes	Adult Cardiovascular	60
Tachycardia w/Pulse-Narrow Complex	Adult Cardiovascular	61
Tachycardia w/Pulse-Wide Complex	Adult Cardiovascular	62
Tachycardia w/Pulse-Notes	Adult Cardiovascular	63
Adult Endocrine		
Hypoglycemia/Hyperglycemia	Adult Endocrine	65
Hypoglycemia/Hyperglycemia-Notes	Adult Endocrine	66
Adult Environmental		
Bites and Envenomation	Adult Environmental	68
Bites and Envenomation-Notes	Adult Environmental	69
Conducted Electrical Weapon (Taser)	Adult Environmental	70
Conducted Electrical Weapon (Taser)-Notes	Adult Environmental	71
Drowning	Adult Environmental	72
Drowning-Notes	Adult Environmental	73
Electrical Injuries	Adult Environmental	74
Electrical Injuries-Notes A	Adult Environmental	75
Electrical Injuries-Notes B	Adult Environmental	76
Frostbite	Adult Environmental	77
Hyperthermia/Heat Exposure	Adult Environmental	78
Hyperthermia/Heat Exposure-Notes A	Adult Environmental	79
Hyperthermia/Heat Exposure-Notes B	Adult Environmental	80
Hypothermia-Mild/Cold Exposure	Adult Environmental	81
Hypothermia/Cold Exposure-Moderate/Severe	Adult Environmental	82
Hypothermia/Cold Exposure-Notes A	Adult Environmental	83
Hypothermia/Cold Exposure-Notes B	Adult Environmental	84
Lightning Strike Injury	Adult Environmental	85
Lightning Strike Injury-Notes	Adult Environmental	86
SCUBA Injury/Accidents	Adult Environmental	87
SCUBA Injury/Accidents-Notes	Adult Environmental	88
Adult Gastrointestinal		
Abdominal Pain	Adult Gastrointestinal	90
Abdominal Pain-Notes	Adult Gastrointestinal	91
Nausea/Vomiting	Adult Gastrointestinal	92
Nausea/Vomiting-Notes	Adult Gastrointestinal	93

Adult General Medical		
Adult IV/IO	Adult General Medical	95
Altered Mental Status	Adult General Medical	96
Altered Mental Status-Notes	Adult General Medical	97
Epistaxis	Adult General Medical	98
Emerging Infectious Disease	Adult General Medical	99
Adult Pain Control	Adult General Medical	100
Pain Control-Notes	Adult General Medical	101
Renal Patient	Adult General Medical	102
Renal Patient-Notes	Adult General Medical	103
Renal Dialysis	Adult General Medical	104
Sepsis	Adult General Medical	105
Sepsis-Notes	Adult General Medical	106
Sickle Cell Pain Crisis	Adult General Medical	107
Sickle Cell Pain Crisis-Notes	Adult General Medical	108
Adult Neurological		
Seizures	Adult Neurological	110
Seizures-Notes	Adult Neurological	111
Stroke/TIA	Adult Neurological	112
Stroke/TIA-Notes	Adult Neurological	113
Adult OB/GYN		
Abnormal Deliveries	Adult OB/GYN	115
Childbirth/Labor	Adult OB/GYN	116
Gynecological Emergencies	Adult OB/GYN	117
Gynecological Emergencies-Notes	Adult OB/GYN	118
Labor/Delivery	Adult OB/GYN	119
Labor/Delivery-Notes	Adult OB/GYN	120
Obstetric Emergencies-Eclampsia	Adult OB/GYN	121
Obstetric Emergencies-Vaginal Bleeding	Adult OB/GYN	122
Pediatric Neonatal Care	Adult OB/GYN	123
Adult Respiratory		
Adult Airway Management	Adult Respiratory	125
Adult Airway Management-Notes	Adult Respiratory	126
Allergic Reaction/Anaphylaxis Part A	Adult Respiratory	127
Allergic Reaction/Anaphylaxis Part B	Adult Respiratory	128
Allergic Reaction/Anaphylaxis-Notes Part A	Adult Respiratory	129
Allergic Reaction/Anaphylaxis-Notes Pat B	Adult Respiratory	130
Asthma/COPD/Reactive Airway	Adult Respiratory	131
Asthma/COPD/Reactive Airway-Notes Part A	Adult Respiratory	132
Asthma/COPD/Reactive Airway-Notes Part B	Adult Respiratory	133
Drug Assisted Intubation	Adult Respiratory	134
Drug Assisted Intubation Checklist	Adult Respiratory	135

Pre-Intubation Assessment Tips	Adult Respiratory	136
Failed Airway	Adult Respiratory	137
Pulmonary Edema/CHF	Adult Respiratory	138
Pulmonary Edema/CHF-Notes Part A	Adult Respiratory	139
Pulmonary Edema/CHF-Notes Part B	Adult Respiratory	140
Adult Toxicology		
Beta Blocker Poisoning/Overdose	Adult Toxicology	142
Beta Blocker Poisoning/Overdose-Notes	Adult Toxicology	143
Carbon Monoxide/Smoke Inhalation	Adult Toxicology	144
Carbon Monoxide/Smoke Inhalation-Notes	Adult Toxicology	145
Calcium Channel Blocker Poisoning/Overdose	Adult Toxicology	146
Calcium Channel Blocker Poisoning/Overdose-Notes	Adult Toxicology	147
Cyanide Exposure	Adult Toxicology	148
Cyanide Exposure-Notes	Adult Toxicology	149
Cyanide Exposure by Smoke Inhalation	Adult Toxicology	150
Nerve Agents	Adult Toxicology	151
Nerve Agents-Severity Treatments Part A	Adult Toxicology	152
Nerve Agents-Severity Treatments Part B	Adult Toxicology	153
Nerve Agents-Notes A	Adult Toxicology	154
Nerve Agents-Notes B	Adult Toxicology	155
Nerve Agents-Notes C	Adult Toxicology	156
Nerve Agents-Treatment of Seizures	Adult Toxicology	157
Opioid Poisoning/Overdose	Adult Toxicology	158
Opioid Poisoning/Overdose-Notes A	Adult Toxicology	159
Opioid Poisoning/Overdose-Notes B	Adult Toxicology	160
Overdose/Poisoning/Toxic Ingestion	Adult Toxicology	161
Overdose/Poisoning/Toxic Ingestion-Notes A	Adult Toxicology	162
Overdose/Poisoning/Toxic Ingestion-Notes B	Adult Toxicology	163
Radiation Exposure	Adult Toxicology	164
Radiation Exposure-Notes	Adult Toxicology	165
Stimulant Poisoning/Overdose	Adult Toxicology	166
Stimulant Poisoning/Overdose-Notes	Adult Toxicology	167
Topical Chemical Burns	Adult Toxicology	168
Topical Chemical Burns Hydrofluoric Acid	Adult Toxicology	169
Topical Chemical Burns-Notes	Adult Toxicology	170
Riot Control Agents	Adult Toxicology	171
Riot Control Agents-Notes	Adult Toxicology	172
Adult Trauma		
Adult Trauma Management	Adult Trauma	174
Adult Trauma Management-Notes Part A	Adult Trauma	175
Adult Trauma Management-Notes Part B	Adult Trauma	176
Avulsed Teeth	Adult Trauma	177

Blast Injuries	Adult Trauma	178
Blast Injuries-Notes	Adult Trauma	179
Burns	Adult Trauma	180
Burns-Notes	Adult Trauma	181
Crushing Trauma	Adult Trauma	182
Extremity Trauma	Adult Trauma	183
Extremity Trauma-Notes	Adult Trauma	184
Eye Injury	Adult Trauma	185
Eye Injury-continued	Adult Trauma	186
Facial Trauma	Adult Trauma	187
Facial Trauma-Notes	Adult Trauma	188
Head Injury	Adult Trauma	189
Head Injury-continued	Adult Trauma	190
Head Injury-Notes	Adult Trauma	191
High Threat Considerations/Active Shooter	Adult Trauma	192
High Threat Considerations/Active Shooter-Notes	Adult Trauma	193
Spinal Care	Adult Trauma	194
Spinal Care-Notes	Adult Trauma	195
Traumatic Cardiac Arrest	Adult Trauma	196
Pediatric Section		
Pediatric Assessment		
Pediatric Universal Care	Pediatric Assessment	199
Pediatric Vital Signs	Pediatric Assessment	200
Pediatric Assessment Primary/Secondary	Pediatric Assessment	201
Pediatric Assessment Primary/Secondary-Notes	Pediatric Assessment	202
Pediatric Behavioral		
Pediatric Agitated/Violent Patient-Part A	Pediatric Behavioral	204
Pediatric Agitated/Violent Patient-Part B	Pediatric Behavioral	205
Pediatric Cardiovascular		
Pediatric Bradycardia	Pediatric Cardiovascular	207
Pediatric Bradycarida-Notes	Pediatric Cardiovascular	208
Pediatric Cardiac Arrest Part A	Pediatric Cardiovascular	209
Pediatric Cardiac Arrest Part B	Pediatric Cardiovascular	210
Pediatric Cardiac Arrest Part C	Pediatric Cardiovascular	211
Pediatric Syncope	Pediatric Cardiovascular	212
Pediatric Syncope-Notes	Pediatric Cardiovascular	213
Pediatric Tachycardia-SVT	Pediatric Cardiovascular	214
Pediatric Wide Complex Tachycardia	Pediatric Cardiovascular	215
Pediatric Endocrine		
Pediatric Hypoglycemia/Hyperglycemia	Pediatric Endocrine	217
Pediatric Environmental		
Pediatric Hyperthermia/Heat Exposure	Pediatric Environmental	219

Pediatric Gastrointestinal		
Pediatric Abdominal Pain	Pediatric Gastrointestinal	221
Pediatric Nausea/Vomiting	Pediatric Gastrointestinal	222
Pediatric General Medical		
Pediatric Altered Mental Status	Pediatric General Medical	224
Pediatric Brief Resolved Unexplained Event (BRUE)	Pediatric General Medical	225
Pediatric Brief Resolved Unexplained Event (BRUE)-Notes	Pediatric General Medical	226
Pediatric IV/IO	Pediatric General Medical	227
Pediatric Pain Control	Pediatric General Medical	228
Pediatric Neonatal		
Pediatric Newborn/Neonatal Resuscitation	Pediatric Neonatal	230
Pediatric Newborn/Neonatal Resuscitation-Notes	Pediatric Neonatal	231
Pediatric Neurological		
Pediatric Seizure	Pediatric Neurological	233
Pediatric Respiratory		
Pediatric Airway Management	Pediatric Respiratory	235
Pediatric Allergic Reaction/Anaphylaxis Part A	Pediatric Respiratory	236
Pediatric Respiratory Distress (Lower Airway)	Pediatric Respiratory	237
Pediatric Respiratory Distress (Lower Airway)-Notes	Pediatric Respiratory	238
Pediatric Respiratory Distress (Upper Airway)	Pediatric Respiratory	239
Pediatric Respiratory Distress (Upper Airway)-Notes	Pediatric Respiratory	240
Pediatric Toxicology		
Pediatric Beta Blocker Poisoning/Overdose	Pediatric Toxicology	242
Pediatric Calcium Channel Blocker Poisoning/Overdose	Pediatric Toxicology	243
Pediatric Cyanide Exposure	Pediatric Toxicology	244
Pediatric Nerve Agents	Pediatric Toxicology	245
Pediatric Nerve Agents-Severity Treatments Part A	Pediatric Toxicology	246
Pediatric Nerve Agents-Severity Treatments Part B	Pediatric Toxicology	247
Pediatric Nerve Agents-Safety Notes	Pediatric Toxicology	248
Pediatric Opioid Poisoning/Overdose	Pediatric Toxicology	249
Pediatric Overdose/Poisoning/Toxic Ingestion	Pediatric Toxicology	250
Pediatric Trauma		
Pediatric Head Injury	Pediatric Trauma	252
Pediatric Head Injury-continued	Pediatric Trauma	253
Pediatric Spinal Care	Pediatric Trauma	254
Pediatric Trauma Management	Pediatric Trauma	255
Pediatric Trauma Management-Notes Part A	Pediatric Trauma	256
Pediatric Trauma Management-Notes Part B	Pediatric Trauma	257
Pharmacology		
Medication List	Pharmacology	259
Acetaminophen (Tylenol)	Pharmacology	260
Activated Charcoal (Actidose)	Pharmacology	261

Adenosine (Adenocard)	Pharmacology	262
Albuterol (Proventil)	Pharmacology	263
Amiodarone (Cordarone)	Pharmacology	264
Aspirin	Pharmacology	265
Atropine	Pharmacology	266
Brilinta (Ticagrelor)	Pharmacology	267
Calcium Chloride	Pharmacology	268
Dextrose 50%	Pharmacology	269
Dextrose 10%	Pharmacology	270
Dextrose 7.5%	Pharmacology	271
Diphenhydramine (Benadryl)	Pharmacology	272
DuoNeb (Albuterol/Ipratropium)	Pharmacology	273
Epinephrine 1:1,000	Pharmacology	274
Epinephrine 1:10,000	Pharmacology	275
Etomidate (Amidate)	Pharmacology	276
Fentanyl (Sublimaze)	Pharmacology	277
Glucagon	Pharmacology	278
Haloperidol (Haldol)	Pharmacology	279
Heparin	Pharmacology	280
Ketamine (Ketalar)	Pharmacology	281
Ketorlac (Toradol)	Pharmacology	282
Labetalol (Trandate)	Pharmacology	283
Lidocaine (Xylocaine)	Pharmacology	284
Magnesium Sulfate	Pharmacology	285
Methylprednisolone (Solu-Medrol)	Pharmacology	286
Midazolam (Versed)	Pharmacology	287
Morphine	Pharmacology	288
Naloxone (Narcan)	Pharmacology	289
Nitroglycerin	Pharmacology	290
Normal Saline 0.9% (NS)	Pharmacology	291
Ondansetron (Zofran)	Pharmacology	292
Oral Glucose	Pharmacology	293
Oxygen	Pharmacology	294
Oxymetazoline (Afrin)	Pharmacology	295
Promethazine (Phenergan)	Pharmacology	296
Racemic Epinephrine (Vaponefrin)	Pharmacology	297
Sodium Bicarbonate	Pharmacology	298
Tetracaine	Pharmacology	299
Tranexamic Acid (TXA)	Pharmacology	300
Ziprasidone (Geodon)	Pharmacology	301
Pharmacology Review	Pharmacology	302
Pharmacology Review-continued	Pharmacology	303

Guidelines

Aeromedical Transport	Guidelines	305
Concealed Weapon Protocol	Guidelines	306
Dead on Arrival (DOA)	Guidelines	307
Natural Death Form	Guidelines	308
Discontinuation of Resuscitation	Guidelines	309
Do Not Resuscitate/Support Care	Guidelines	310
Do Not Resuscitate/Support Care-continued	Guidelines	311
DNR Identification Form Part A	Guidelines	312
DNR Identification Form Part B	Guidelines	313
EMT Intervener on Scene	Guidelines	314
Heavy Patients	Guidelines	315
Interfacility Patient Transport	Guidelines	316
Interfacility Transfer	Guidelines	317
Non-Hospital Transfer Policy	Guidelines	318
Non-Transports	Guidelines	319
ALS Assist	Guidelines	320
Patient Refusal	Guidelines	321
Patient Refusal-continued	Guidelines	322
Patients with Gastrointestinal Signs/Symptoms and Fever: Part A	Guidelines	323
Patients with Gastrointestinal Signs/Symptoms and Fever: Part B	Guidelines	324
Patients with Gastrointestinal Signs/Symptoms and Fever: Part C	Guidelines	325
Physician at the Scene	Guidelines	326
PPE Guidelines 2014	Guidelines	327
PPE Guideline 2014 continued	Guidelines	328
Public Assist	Guidelines	329
Transport to Free-Standing Urgent Care Clinics	Guidelines	330
Trauma-Exceptions to Mandatory Transport	Guidelines	331
Trauma-Major Trauma Destinations	Guidelines	332
Trauma-Exceptions to Triage to Trauma Center	Guidelines	333

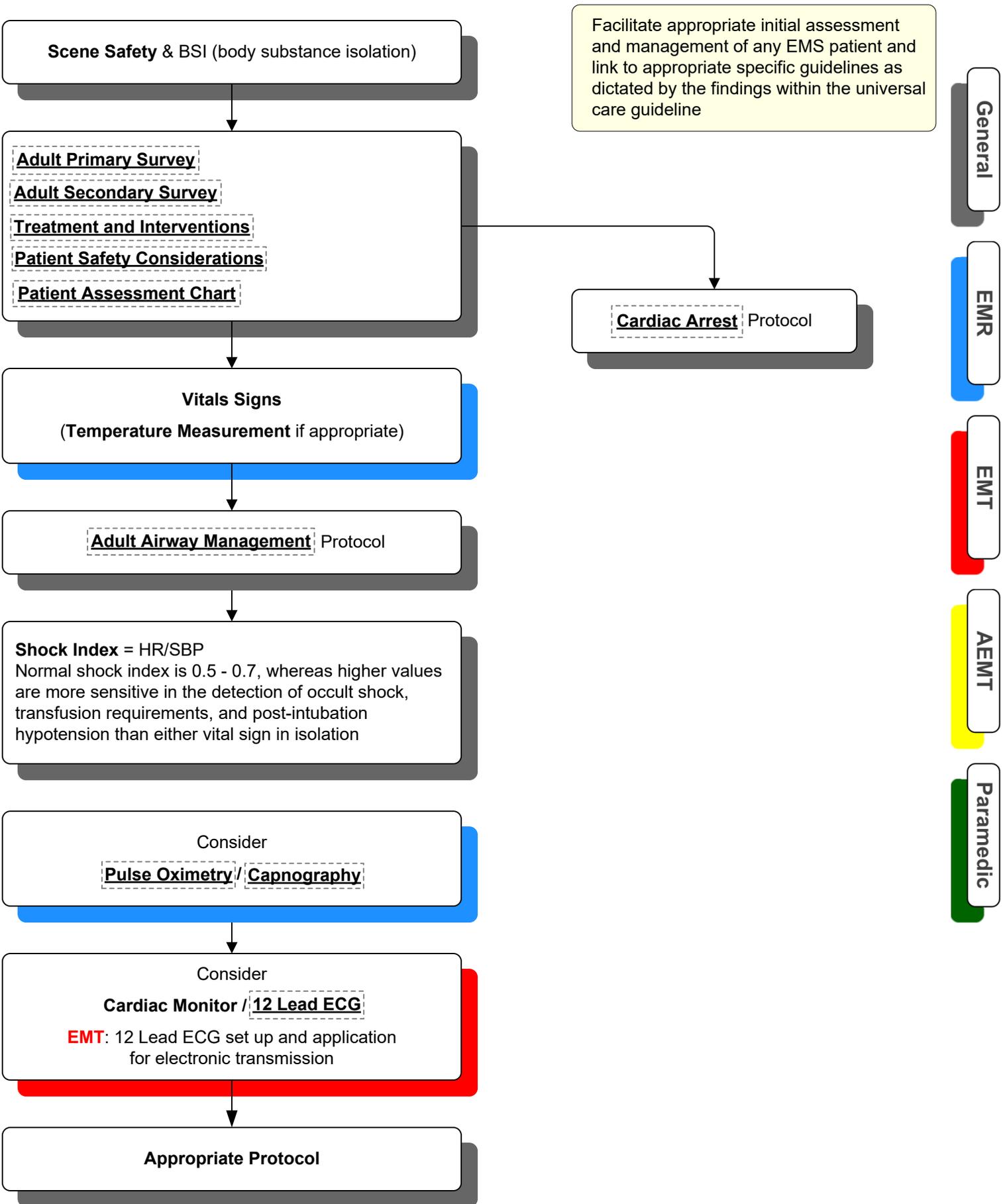
Procedures

12 Lead ECG	Procedures	335
12 Lead ECG-continued	Procedures	336
Cardioversion	Procedures	337
Childbirth	Procedures	338
CCR-Cardiocerebral Resuscitation	Procedures	339
Chest Decompression	Procedures	340
Chest Decompression-Images	Procedures	341
CPAP	Procedures	342
Cricothyrotomy-Surgical	Procedures	343
Defibrillation-Pad Placement	Procedures	344
EMS Blood Draw	Procedures	345

Epistaxis (Nosebleed)	Procedures	346
Endotracheal Intubation	Procedures	347
Endotracheal Intubation-continued	Procedures	348
Endotracheal Intubation-Tube Removal /Sizing	Procedures	349
Endotracheal Medication Administration	Procedures	350
Epinephrine Auto-Injector	Procedures	351
External Jugular IV	Procedures	352
External Pacemaker	Procedures	353
Helmet Removal-Assessment	Procedures	354
Helmet Removal-Process	Procedures	355
I-gel Supraglottic Airway	Procedures	356
I-gel Supraglottic Airway Chart	Procedures	357
Intraosseous Information	Procedures	358
Intraosseous Insertion	Procedures	359
IV Therapy Documentation	Procedures	360
Mass Casualty Incidents	Procedures	361
Mass Casualty Incidents-continued	Procedures	362
Mucosal Atomizer Device (MAD)	Procedures	363
Orthostatic Blood Pressure Measurement	Procedures	364
Pelvic Binder Application	Procedures	365
Peripheral IV	Procedures	366
Pulse Oximetry	Procedures	367
Pulse Oximetry-continued	Procedures	368
Pulse Oximeter Chart	Procedures	369
ResQPOD	Procedures	370
Spinal Motion Restriction (SMR)	Procedures	371
Tasered Patient	Procedures	372
Tasered Patient-Excited Delirium	Procedures	373
Tasered Patient-Barb Removal	Procedures	374
Tourniquet	Procedures	375
Wound Care/Bleeding Control	Procedures	376
Reference		
Protocol Changes Part A	Reference	378
Protocol Changes Part B	Reference	379
Protocol Changes Part C	Reference	380
Protocol Changes Part D	Reference	381
Capnography Basic	Reference	382
Capnography Information	Reference	383
Capnography Waveforms	Reference	384
Drugs Narcan will/will not, have effect on	Reference	385
Medication Infusions	Reference	386
Epinephrine Drip	Reference	387

Mechanical Circulatory Support

Patient Management for VADs	Mechanical Circulatory Support	389
HeartMate II w/Pocket Controllers	Mechanical Circulatory Support	390
Trouble Shooting HeartMate II Pocket	Mechanical Circulatory Support	391
Trouble Shooting HeartMate II	Mechanical Circulatory Support	392
HeartMate II Controller Comparison Part 1	Mechanical Circulatory Support	393
HeartMate II Controller Comparison Part 2	Mechanical Circulatory Support	394



1. Assess scene safety: evaluate for hazards to EMS personnel, patient, bystanders
 - a. Determine number of patients
 - b. Determine mechanism of injury
 - c. Request additional resources if needed. Weigh the benefits of waiting for additional resources against rapid transport to definitive care
 - d. Consider declaration of mass casualty incident if needed
2. Use appropriate personal protective equipment
3. Consider cervical spine stabilization if trauma
4. Primary Survey (**A**irway, **B**reathing, **C**irculation is cited below. There are specific circumstances where **C**irculation, **A**irway, **B**reathing may be recommended by direct medical oversight)
 - a. Airway: assess for patency and open the airway as indicated
 - i. Patient is unable to maintain airway patency—open airway
 1. Head tilt chin lift
 2. Jaw thrust
 3. Suction
 4. Consider use of the appropriate airway management adjuncts and devices: oral airway, nasal airway, blind insertion or supraglottic airway device, laryngeal mask airway, endotracheal tube
 - ii. Obstructed airway: go to **Prehospital Airway Management/ Confirmation/Obstruction/Failed Airway** guideline
 - b. Breathing:
 - i. Evaluate rate, breath sounds, accessory muscle use, retractions, patient positioning
 - ii. Administer oxygen as appropriate with a goal of $\geq 94\%$ oxygen saturation for most acutely ill patients
 - iii. Apnea (not breathing): go to
Prehospital Airway Management/Confirmation/ Obstruction/Failed Airway guideline
 - c. Circulation:
 - i. Assess pulse
 1. If none: go to **Cardiac Arrest (VF/VT/Asystole/PEA)** guideline
 2. Assess rate and quality of carotid and radial pulses
 - Too slow is less than 60
 - Too fast is greater than $220 - \text{age}$
 - ii. Evaluate perfusion by assessing skin color and temperature
 1. Evaluate capillary refill guideline. **Capnography**
 - d. Disability
 - i. Evaluate patient responsiveness: AVPU scale (Alert, Verbal, Pain, Unresponsive; see **6. Obtain baseline vital signs a.**, below)
 - ii. Evaluate gross motor and sensory function in all extremities
 - iii. Evaluate blood glucose in patients with altered mental status
 - iv. If acute stroke suspected, go to **Suspected Stroke/Transient Ischemic Attack** guideline
 - e. Expose patient as appropriate to complaint
 - i. Be considerate of patient modesty
 - ii. Keep patient warm

5. Secondary Survey

The performance of the secondary survey should not delay transport in critical patients. See also secondary survey specific to individual complaints in other protocols. Secondary surveys should be tailored to patient presentation and chief complaint. The following are suggested considerations for secondary survey assessment:

- a. Head:
 - i. Pupils
 - ii. Naso-oropharynx
 - iii. Skull and scalp
- b. Neck
 - i. Jugular venous distension
 - ii. Tracheal position
- c. Chest
 - i. Retractions
 - ii. Breath sounds
 - iii. Chest wall deformity
- d. Abdomen/Back
 - i. Flank/abdominal tenderness or bruising
 - ii. Abdominal distension
- e. Extremities
 - i. Edema
 - ii. Pulses
 - iii. Deformity
- f. Neurologic
 - i. Mental status/orientation
- g. Motor/sensory

6. Obtain baseline vital signs**Critical Patient: Vitals every 5 minutes****Non Critical Patient: Vitals every 10 minutes**

- a. An initial full set of vital signs is required: pulse, blood pressure, respiratory rate, neurologic status assessment. Neurologic status assessment (see **Appendix VI**) involves establishing a baseline and then trending any change in patient neurologic status. Glasgow Coma Score (GCS) is frequently used, but there are often errors in applying and calculating this score. With this in consideration, Glasgow Coma Score may not be more valid than a simpler field approach. Either AVPU (Alert, Verbal, Painful, Unresponsive – see below) or only the motor component of the GCS may more effectively serve in this capacity
- b. Patients with cardiac, weakness, or respiratory complaints
 - i. Pulse oximetry
 - ii. 12-lead EKG should be obtained early in patients with cardiac complaints, weakness
 - iii. Continuous cardiac monitoring, if available
 - iv. Consider waveform capnography
- c. Patient with altered mental status
 - i. Assess blood glucose
 - ii. Consider waveform capnography
- d. A set of vital signs should be performed on each official EMS evaluation run, or documented why unable. Also vital signs should be repeated if grossly abnormal or a significant treatment was administered to the patient.
- e. Critical patients should have pertinent vital signs frequently monitored

7. Obtain OPQRST history:

- a. **O**: onset of symptoms
- b. **P**: provocation – location; any exacerbating or alleviating factors
- c. **Q**: quality of pain
- d. **R**: radiation of pain
- e. **S**: severity of symptoms - pain scale
- f. **T**: time of onset and circumstances around onset

8. Obtain SAMPLE history:

- a. **S**: symptoms
- b. **A**: allergies - medication, environmental, and foods
- c. **M**: medications - both prescription and over-the-counter; bring all containers to hospital if possible
- d. **P**: past medical history
 - i. look for medical alert tags, portable medical records, advance directives
 - ii. look for medical devices/implants: some common ones may be dialysis shunt, insulin pump, pacemaker, central venous access port, gastric tubes, urinary catheter
- e. **L**: last oral intake
- f. **E**: events leading up to the 911 call. In patient with syncope, seizure, altered mental status, or acute stroke, consider bringing witness to the hospital or obtain their contact phone number to provide to ED care team

1. **Oxygen** supplementation if needed to reach target of $\geq 94\%$
2. Place appropriate monitoring equipment as dictated by assessment. These may include
 - a. Continuous pulse oximetry
 - b. Cardiac rhythm monitoring
 - c. Waveform capnography
 - d. Carbon monoxide assessment
3. Establish vascular access if indicated for the purpose of administering medication(s) and/or fluid or in patients who are at risk for clinical deterioration
4. Monitor pain scale if appropriate
5. Reassess patient

1. Routine use of lights and sirens is not warranted
2. Be aware of legal issues and patient rights as they pertain to and impact patient care, e.g. patients with functional needs or children with special healthcare needs
3. Be aware of potential need to adjust management based on patient age and/or comorbidities, including medication dosages
4. The maximum weight-based dose of medication administered to a pediatric patient should not exceed the maximum adult dose except where specifically stated in a patient care guideline
5. Direct medical oversight should be contacted when mandated or as needed

Notes

1. Pediatrics: use a weight-based assessment tool (length-based tape or other system) to estimate patient weight and guide medication therapy and adjunct choice. Although the defined age varies by state, the pediatric population is generally defined by those patients who weigh up to 40 kg or up to 14 years of age, whichever comes first
2. Geriatrics: although the defined age varies by state, the geriatric population is generally defined as those patients who are 70 years old or more. In these patients, as well as all adult patients, reduced medication dosages may apply to patients with renal disease (i.e. on dialysis or a diagnosis of chronic renal insufficiency) or hepatic disease (i.e. severe cirrhosis or end-stage liver disease)
3. Co-morbidities: reduced medication dosages may apply to patients with renal disease (i.e. on dialysis or a diagnosis of chronic renal insufficiency) or hepatic disease (i.e. severe cirrhosis or end-stage liver disease)
4. Vital signs:
 - a. Oxygen
Goal oxygen saturation is $\geq 94\%$. Supplemental oxygen administration is warranted to patients with oxygen saturations below this level and titrated based upon clinical condition, clinical response, and geographic location and altitude
 - b. Normal vital signs—see chart: All patients receive a set of vital signs unless noted otherwise.
 - c. Repeat vital signs if:
 - i. Abnormal
 - ii. Post Intervention
5. Secondary survey may not be completed if patient has critical primary survey problems until those primary problems are addressed.
6. In critical patients, proactive patient management should occur simultaneously with assessment. Ideally, one provider should be assigned to exclusively monitor and facilitate patient-focused care. Treatment and Interventions should be initiated as soon as practicable, but should not impede extrication or delay transport to definitive care
7. Air medical transport of trauma patients should be reserved for higher acuity trauma patients where there is a significant times savings over ground transport, where the appropriate destination is not accessible by ground due to systemic or logistical issues, and for patients who meet the Centers for Disease Control and Prevention's (CDC's) anatomic, physiologic, and situational high-acuity triage criteria

Patient Care Goals

To meet and maintain the additional support required for patients with functional needs during the delivery of prehospital care

Patient Presentation**Inclusion Criteria**

Patients who are identified by the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) that have experienced a decrement in health resulting in some degree of disability. According to the U.S. Department of Health and Human Services, this includes, but is not limited to, individuals with physical, sensory, mental health, and cognitive and/or intellectual disabilities affecting their ability to function independently without assistance

Exclusion Criteria

None

Patient Management**Assessment**

Identify the functional need by means of information from the patient, the patient's family, bystanders, medic alert bracelets or documents, or the patient's adjunct assistance devices

The physical examination should not be intentionally cut short, although the manner in which the exam is performed may need to be modified to accommodate the specific needs of the patient

Treatment and Interventions

Medical care should not intentionally be reduced or abbreviated during the triage, treatment and transport of patients with functional needs, although the manner in which the care is provided may need to be modified to accommodate the specific needs of the patient

Patient Safety Considerations

For patients with communication barriers (language or sensory), it may be desirable to obtain secondary confirmation of pertinent data (e.g. allergies) from the patient's family, interpreters, or written or electronic medical records. The family members can be an excellent source of information and the presence of a family member can have a calming influence on some of these patients

Notes

1. Communication Barriers
 - a. Language Barriers:
 - i. Expressive and/or receptive aphasia
 - ii. Nonverbal
 - iii. Fluency in a different language than that of the EMS professional
 - iv. Examples of tools to overcome language barriers include:
 1. Transport of an individual who is fluent in the patient's language along with the patient to the hospital
 2. Medical translation cards
 3. Telephone-accessible services with live language interpreters
 4. Methods through which the patient augments his/her communication skills (e.g. eye blinking, nodding) should be noted, utilized as able, and communicated to the receiving facility
 - b. Sensory Barriers:
 - i. Visual impairment
 - ii. Auditory impairment
 - iii. Examples of tools to overcome sensory barriers include:
 1. Braille communication card
 2. Sign language
 3. Lip reading
 4. Hearing aids
 5. Written communication
2. Physical Barriers:
 - i. Ambulatory impairment (e.g. limb amputation, bariatric)
 - ii. Neuromuscular impairment
3. Cognitive Barriers:
 - i. Mental illness
 - ii. Developmental challenge or delay

Pertinent assessment findings

1. Assistance Adjuncts

Examples of devices that facilitate the activities of life for the patient with functional needs include, but are not limited to:

- a. Extremity prostheses
- b. Hearing aids
- c. Magnifiers
- d. Tracheostomy speaking valves
- e. White or sensory canes
- f. Wheelchairs or motorized scooters

2. **Service Animals**

As defined by the American Disabilities Act, “any guide dog, signal dog, or other animal individually trained to do work or perform tasks for the benefit of an individual with a disability, including, but not limited to guiding individuals with impaired vision, alerting individuals with impaired hearing to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair, or fetching dropped items”

Services animals are not classified as a pet and should, by law, always be permitted to accompany the patient with the following exceptions:

A public entity may ask an individual with a disability to remove a service animal from the premises if:

- a. The animal is out of control and the animal's handler does not take effective action to control it; or
- b. The animal is not housebroken

Service animals are not required to wear a vest or a leash. It is illegal to make a request for special identification or documentation from the servicer animal's partner. EMS providers may only ask the patient if the service animal is required because of a disability and the form of assistance the animal has been trained to perform

EMS providers are not responsible for the care of service animal. If the patient is incapacitated and cannot personally care for the service animal, a decision can be made whether or not to transport the animal in this situation

Animals that solely provide emotional support, comfort, or companionship do not qualify as service animals

DEFINITIONS

- A. As used in this chapter and section 4765.01 of the Revised Code, "trauma" or "traumatic injury" means severe damage to or destruction of tissue that satisfies both of the following conditions:
1. It creates a significant risk of any of the following:
 - a. Loss of life;
 - b. Loss of a limb;
 - c. Significant, permanent disfigurement;
 - d. Significant, permanent disability; and
 2. It is caused by any of the following:
 - a. Blunt or penetrating injury;
 - b. Exposure to electromagnetic, chemical, or radioactive energy;
 - c. Drowning, suffocation, or strangulation;
 - d. A deficit or excess of heat.
- B. "Evidence of poor perfusion" means physiologic indicators of hemorrhage or decreased cardiovascular function, which may include any of the following symptoms:
1. Weak distal pulse;
 2. Pallor;
 3. Cyanosis;
 4. Delayed capillary refill;
 5. Tachycardia.
- C. "Evidence of respiratory distress or failure" means physiologic indicators of decreased ventilatory function, which may include any of the following symptoms:
1. Strider;
 2. Grunting;
 3. Retractions;
 4. Cyanosis;
 5. Hoarseness;
 6. Difficulty speaking.
- D. "Evidence of hemorrhagic shock" means physiologic indicators of blood loss that may include any of the following symptoms:
1. Delayed capillary refill;
 2. Cool, pale, diaphoretic skin;
 3. Decreased systolic blood pressure with narrowing pulse pressure;
 4. Altered level of consciousness.
- E. "Seatbelt sign" means abdominal or thoracic contusions and abrasions resulting from the use of a seatbelt during a motor vehicle collision.
- F. "Signs or symptoms of spinal cord injury" mean physiologic indicators that the spinal cord is damaged, including, but not limited to, paralysis, weakness, numbness, or tingling of one or more extremities.
- G. "Evidence of neurovascular compromise" means physiologic indicators of injury to blood vessels or nerves including, but not limited to, pallor, loss of palpable pulses, paralysis, paresthesia, or severe pain.

DETERMINATION OF A TRAUMA VICTIM

Emergency medical service personnel shall use the criteria in this rule, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim or pediatric trauma victim, in conjunction with the definition of trauma in section 4765.01 of the Revised Code and this chapter.

- A. An adult trauma victim is a person sixteen years of age or older exhibiting one or more of the following physiologic or anatomic conditions:
1. Physiologic conditions
 - a. Glasgow coma scale less than or equal to thirteen;
 - b. Loss of consciousness greater than five minutes;
 - c. Deterioration in level of consciousness at the scene or during transport;
 - d. Failure to localize to pain;
 - e. Respiratory rate less than ten or greater than twenty-nine;
 - f. Requires endotracheal intubation;
 - g. Requires relief of tension pneumothorax;
 - h. Pulse greater than one hundred twenty in combination with evidence of hemorrhagic shock;
 - i. Systolic blood pressures less than ninety, or absent radial pulse with carotid pulse present;
 2. Anatomic conditions
 - a. Penetrating trauma to the head, neck, or torso;
 - b. Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
 - c. Injuries to the head, neck, or torso where the following physical findings are present:
 - i. Visible crush injury;
 - ii. Abdominal tenderness, distention, or seat belt sign;
 - iii. Pelvic fracture;
 - iv. Flail chest;
 - d. Injuries to the extremities where the following physical findings are present:
 - i. Amputations proximal to the wrist or ankle;
 - ii. Visible crush injury;
 - iii. Fractures of two or more proximal long bones;
 - iv. Signs or symptoms of spinal cord injury;
 - f. Second degree or third degree burns greater than ten percent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.
- B. A pediatric trauma victim is a person under sixteen years of age exhibiting one or more of the following physiologic or anatomic conditions:
1. Physiologic conditions
 - a. Glasgow coma scale less than or equal to thirteen;
 - b. Loss of consciousness greater than five minutes;
 - c. Deterioration in level of consciousness at the scene or during transport;
 - d. Failure to localize to pain;
 - e. Evidence of poor perfusion, or evidence of respiratory distress or failure.
 2. Anatomic conditions
 - a. Penetrating trauma to the head, neck, or torso;
 - b. Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
 - c. Injuries to the head, neck, or torso where the following physical findings are present:
 - i. Visible crush injury;

- i. Abdominal tenderness, distention, or seat belt sign;
- ii. Pelvic fracture;
- iii. Flail chest;
- b. Injuries to the extremities where the following physical findings are present:
 - i. Amputations proximal to the wrist or ankle;
 - ii. Visible crush injury;
 - iii. Fractures of two or more proximal long bones;
 - iv. Evidence of neurovascular compromise.
- c. Signs or symptoms of spinal cord injury;
- d. Second or third degree burns greater than ten percent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.

C. A geriatric trauma victim is a person seventy years of age or older exhibiting one or more of the following causes of injury or physiologic or anatomic conditions:

1. Physiologic conditions:

- a. Glasgow coma scale less than or equal to fourteen in a trauma patient with a known or suspected traumatic brain injury
- b. Glasgow coma score less than or equal to thirteen;
- c. Loss of consciousness greater than five minutes;
- d. Deterioration in level of consciousness at the scene or during transport;
- e. Failure to localize to pain;
- f. Respiratory rate less than ten or greater than twenty-nine;
- g. Requires endotracheal intubation;
- h. Requires relief of tension pneumothorax;
- i. Pulse greater than one hundred twenty in combination with evidence of hemorrhagic shock;
- j. Systolic blood pressure less than one-hundred, or absent radial pulse with carotid pulse present;

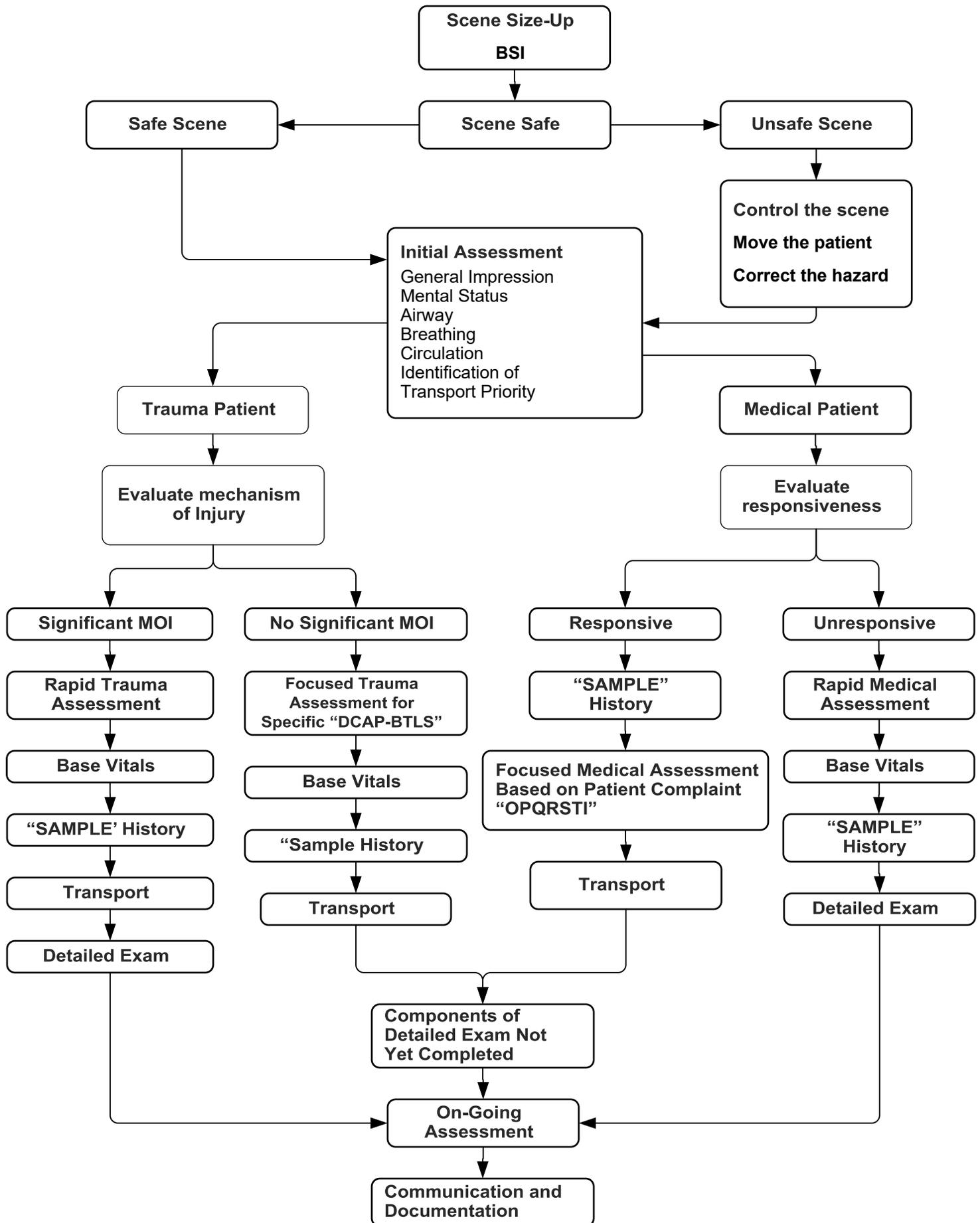
2. Anatomic conditions

- a. Penetrating trauma to the head, neck, or torso;
- b. Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
- c. Loss of consciousness documented for any length of time:
 - i. Visible crush injury;
 - ii. Abdominal tenderness, distention, or seatbelt sign;
 - iii. Pelvic fracture;
 - iv. Flail chest;
- d. Injuries to the extremities where the following physical findings are present:
 - i. Amputations proximal to the wrist or ankle;
 - ii. Visible crush injury;
 - iii. Fracture of one proximal long bone sustained as a result of a motor vehicle crash;
 - iv. Fractures of two or more proximal long bones;
 - v. Evidence of neurovascular compromise.
- e. Signs or symptoms of spinal cord injury;
- f. Second degree or third degree burns greater than ten percent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway;
- g. Injury sustained in two or more body regions.

3. Cause of injuries

- a. Pedestrian struck by a motor vehicle.
- b. Fall from any height, including standing falls, with evidence of a traumatic brain injury. (only geriatrics)
Traumatic brain injury defined as any of the following: documented LOC, amnesic to events, repetitive nausea/vomiting, severe global headache

D. Emergency medical service personnel shall also consider mechanism of injury and special considerations, as taught in the EMT-basic, EMT-intermediate, or EMT-paramedic curriculum, when evaluating whether an injured person qualifies as a trauma victim.



Patient Care Goals

1. Recognize any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential for harm, or threat of harm to a patient
2. These situations may involve safety issues for responding providers, so take appropriate steps to protect the safety of the responders as well as bystanders
3. Get the patient out of immediate danger
4. Assess any patient injuries that may be the result of acute or chronic events
5. Attempt to preserve evidence whenever possible, however the overriding concern should be providing appropriate emergency care to the patient

Patient Assessment

1. Start with a primary survey and identify any potentially life threatening issues
2. Document thorough secondary survey for potential abuse/ maltreatment red flags:
 - a. Inability to communicate due to language and/or cultural barrier
 - b. Multiple bruises in various stages of healing
 - c. Age inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way)
 - d. Pattern burns, bruises, or scars suggestive of specific weaponry used
 - e. Evidence of medical neglect for injuries or infections
 - f. Trauma to genitourinary systems or frequent infections to this system
 - g. Evidence of malnourishment and/or serious dental problems
3. Assess physical issues and avoid extensive investigation of the specifics of abuse or maltreatment, but document any statements made spontaneously by patient

Treatment and Interventions

Adult Universal Care

Phone Numbers:

Wayne County: CPS: 330-345-5340 / APS: 330-287-5800
 Holmes County: APS / CPS: 330-674-1111 (After Hours Contact via Holmes Co. Sheriff- 330-674-1936)
 Ashland County: APS/ CPS: 419-828-5000

1. Address life threatening issues
2. Find way to get patient to a safe place even if no medical indication for transport
3. Report concerns about potential abuse/maltreatment to law enforcement immediately, in accordance with state law, about:
 - a. Caregivers impeding your ability to assess/transport patient
 - b. Caregivers refusing care for the patient
4. For patients transported, report concerns to hospital and/or law enforcement personnel per mandatory reporting laws

Patient Safety Considerations

1. If no medical emergency exists, next priority is safe patient disposition/removal from the potentially abusive situation
2. Do not confront suspected perpetrators of abuse/maltreatment. This can create an unsafe situation for EMS and for the patient

General

EMR

EMT

AEMT

Paramedic

Notes

1. Definitions:

- a. Abuse/maltreatment: Any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential for harm, or threat of harm to a patient
 - b. Child maltreatment/abuse: Child maltreatment includes any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child. An act of commission (child abuse) is the physical, sexual or emotional maltreatment or neglect of a child or children. An act of omission (child neglect) includes failure to provide (e.g. physical, emotional, medical/dental, and educational neglect) and failure to supervise (e.g. inadequate supervision, and exposure to violent environments)
 - c. Human trafficking: when people are abducted or coerced into service and often transported across international borders
2. Clues to abuse or maltreatment can vary depending on the age group of the patient and on the nature of the abuse. Remember that not all abuse or maltreatment involves physical harm. It is important to realize that the job of EMS is to document their concerns, assess the patient for potentially serious injuries, make sure that their concerns are disclosed to the appropriate legal authorities, and work towards getting the patient into a safe situation. EMS personnel should not take it upon themselves to investigate or intervene above and beyond those concepts and should leave further intervention to the appropriate law enforcement personnel
 3. It is very important to have a high index of suspicion for abuse in children presenting with an Pediatric Brief Resolved Unexplained Event (BRUE). Of the very serious causes of BRUE, child abuse has been found in as many as 11% of cases. One retrospective review noted that a call to 911 for BRUE was associated with an almost 5 times greater odds of abusive head trauma being diagnosed as the cause of the BRUE, clearly emphasizing the high index of suspicion EMS providers must have when responding to these calls
 4. Abuse and maltreatment can happen to patients of all ages
 5. Patients may be unwilling or unable to disclose abuse or maltreatment so the responsibility falls on EMS personnel to assess the situation, document appropriately, and take appropriate action to secure a safe place for the patient
 6. Document findings by describing what you see and not ascribing possible causes (e.g. "0.5 inch round burn to back" as opposed to "burn consistent with cigarette burn")

Patient Presentation

1. Clues to abuse or maltreatment can vary with age group of the patient and type of abuse
2. Not all abuse or maltreatment is physical
3. EMS role is to:
 - a. Document concerns
 - b. Assess potentially serious injuries
 - c. Disclose concerns to appropriate authorities
 - d. Initiate help to get the patient into a safe situation
 - e. Not to investigate or intervene beyond the steps above
 - f. Leave further intervention to law enforcement personnel

Inclusion/Exclusion Criteria

Absolute inclusion/exclusion criteria are not possible in this area. Rather, clues consistent with different types of abuse/maltreatment should be sought:

1. Potential clues to abuse/maltreatment from caregivers or general environment:
 - a. Caregiver apathy about patient's current situation
 - b. Caregiver overreaction to questions about situation
 - c. Inconsistent histories from caregivers or bystanders regarding what happened
 - d. Information provided by caregivers or patient that is not consistent with injury patterns
 - e. Injuries not appropriate for patient's age or physical abilities (e.g. infants with injuries usually associated with ambulatory children, elders who have limited mobility with injury mechanisms inconsistent with their capabilities)
 - f. Caregiver not allowing patient to speak for himself/herself, or who appears controlling
 - g. Inadequate facilities where the patient lives and/or evidence of security measures that appear to confine people to the facility
2. Potential clues to abuse or maltreatment that can be obtained from the patient:
 - a. Multiple bruises in various stages of healing
 - b. Age inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way)
 - c. Pattern burns, bruises, or scars suggestive of specific weaponry used
 - d. Evidence of medical neglect for injuries or infections
 - e. Trauma to genitourinary systems or frequent infections to this system
 - f. Evidence of malnourishment and/or serious dental problems
 - g. Inability to communicate due to language and/or cultural barrier
3. Have a high index of suspicion for abuse in children presenting with an Pediatric Brief Resolved Unexplained Event (BRUE)

Patient Care Goals

1. Provision of emergency medical care to the agitated, violent, or uncooperative patient
2. Maximizing and maintaining safety for the patient, EMS personnel, and others

Patient Assessment

1. Note medications/substances on scene that may contribute to the agitation, or may be treatment of relevant medical condition
2. Maintain and support airway
3. Respiratory rate and effort. Ideally, monitor pulse oximetry and/or capnography
4. Circulatory status:
 - a. Blood pressure (if possible)
 - b. Pulse rate
 - c. Capillary refill
5. Mental status
 - a. Obtain blood glucose (if possible)
6. Temperature (if possible)
7. Evidence of traumatic injuries

Treatment and Interventions

Adult Universal Care

Patient Rapport

- a. Attempt verbal reassurance and calm patient prior to use of chemical and/or physical restraints
- b. Engage family members/loved ones to encourage patient cooperation if their presence does not exacerbate the patient's agitation
- c. Continued verbal reassurance and calming of patient following chemical/physical restraints

Chemical Restraints

Notes:

Selection of chemical restraint should be based upon the patient's clinical condition, current medications, and allergies in addition to EMS resources and medical oversight

The numbering of medications below is not intended to indicate a hierarchy/preference of administration

Chemical restraints should be a later consideration for pediatric patients

Consider lower dose (half dose) in geriatric patients.

Antipsychotics

Haloperidol (Haldol) (useful for prior psychiatric/alcohol induced agitation/psychosis)

5 mg IVP, IO 5 - 10 minute onset of action, or 5 - 10 mg IM; 10 - 20 minute onset of action

Ziprasidone (Geodon) (useful for bipolar or schizophrenia induced agitation/psychosis)

10 - 20 mg IM; 10 minute onset of action (Needs constituted with sterile water)

See: **Agitated/Violent Patient Part B**

General

EMR

EMT

AEMT

Paramedic

Chemical Restraints-continued

Benzodiazepines

Midazolam (Versed) (useful for substance abuse/undifferentiated agitation/psychosis)

2.5 mg IVP, IO 3 - 5 minute onset of action, may repeat x1 in 5 minutes

5 mg IM 10 - 15 minute onset of action, may repeat x1 in 10 minutes

2.5 mg IN 3 - 5 minute onset of action, may repeat x1 in 5 minutes

General

Dissociative Agents (Provide Sedation and Anesthesia)

Ketamine (Ketalar) (useful for excited delirium, immediate sedation for imminent threat to self or others)

Mild, Moderate Agitation: 2 mg/kg IM or 1 mg/kg IVP

Profound Agitation/ Excited Delirium: 4 mg/kg IM or 2 mg/kg IVP **Maximum 400 mg for all doses**

Proceed with **Excited Delirium** ketamine algorithm

EMR

EMT

Antihistamines

Diphenhydramine (Benadryl) (useful as adjunct to administration of Haldol)

25 – 50 mg IM, 25 mg IVP, IO

AEMT

Paramedic

Physical Restraints

Body

- Stretcher straps should be applied as the standard procedure for all patients during transport
- Sheets can be used as additional stretcher straps if necessary
- Stretcher straps and sheets should never restrict the patient's chest wall motion
- Placement of stretcher straps or sheets (to prevent flexion/extension of torso, hips, legs) around:
 1. the lower lumbar region, below the buttocks, or
 2. the thighs, knees, and legs

Extremities

- Soft or leather restraint devices should not require a key to release them
- Restrain all four extremities to maximize safety for patient, staff, and others
- iRestrain all extremities to the stationary frame of the stretcher
- Multiple knots should not be used to secure the restraint device

If Chemical Restraint given EMS gives patient report directly to ED Physician

See: **Agitated/Violent Patient-Restraint Reference**

Notes

1. Direct medical oversight should be contacted at any time for advice, especially when patient's level of agitation is such that transport may place all parties at risk
2. Transport by air is not advised
3. Some chemical restraint medications are available in auto-injectors for rapid administration
4. Stretchers with adequate foam padding, particularly around the head, facilitates patient's ability to self-position the head and neck to maintain airway patency
5. For patients with key-locking restraint devices, applied by another agency, consider the following options:
 - a. Remove restraint device and replace it with a restraint device that does not require a key
 - b. Administer chemical restraints then remove and replace restraint device with another non-key-locking device after patient has become more cooperative
 - c. Transport patient, accompanied in patient compartment by person who has key for the device
 - d. Transport patient in vehicle of person with device key if medical condition of patient is deemed stable, direct medical oversight so authorizes, and law allows

Pertinent Assessment Findings

Continuous monitoring of:

1. Airway patency
2. Respiratory status with pulse oximetry and/or capnography
3. Circulatory status with frequent blood pressure measurements
4. Mental status and trends in level of patient cooperation
5. Cardiac status, especially if the patient has received chemical restraints
6. Extremity perfusion with capillary refill in patients in physical restraints

Patient Safety Considerations

1. Don personal protective equipment (PPE)
2. Do not attempt to enter or control a scene where physical violence or weapons are present
3. Dispatch law enforcement immediately to secure and maintain scene safety
4. Urgent de-escalation of patient agitation is imperative in the interest of patient safety as well as for EMS personnel and others on scene
5. Uncontrolled or poorly controlled patient agitation and physical violence can place the patient at risk for sudden cardiopulmonary arrest due to the following etiologies:
 - a. Excited delirium/exhaustive mania: A postmortem diagnosis of exclusion for sudden death thought to result from metabolic acidosis (most likely from lactate) stemming from physical agitation or physical control measures (including TASER@s) and potentially exacerbated by stimulant drugs (e.g. cocaine) or alcohol withdrawal
 - b. Positional asphyxia: Sudden death from restriction of chest wall movement and/or obstruction of the airway secondary to restricted head or neck positioning resulting in hypercarbia and/or hypoxia
6. Apply a cardiac monitor as soon as possible, particularly when chemical restraints have been administered
7. All patients who have received chemical restraints must be monitored closely for the development of oversedation. Utilize capnography if available
8. Patients who have received antipsychotic medication as a chemical restraint must be monitored closely for the potential development of:
 - a. Dystonic reactions (this can easily be treated with diphenhydramine/benzodiazepines)
 - b. Mydriasis (dilated pupils)
 - c. Ataxia
 - d. Cessation of perspiration
 - e. Dry mucous membranes
 - f. Cardiac arrhythmias (particularly QT prolongation)
9. Placement of stretcher in sitting position prevents aspiration and reduces the patient's physical strength by placing the abdominal muscles in the flexed position
10. Patients who are more physically uncooperative should be physically restrained in the lateral decubitus position (one arm above the head and the other arm below the waist), rather than the prone, to avoid airway compromise
11. Patients should never be transported while hobbled, "hog-tied", or restrained in a prone position with hands and feet behind the back
12. Patients should never be transported while "sandwiched" between backboards or mattresses

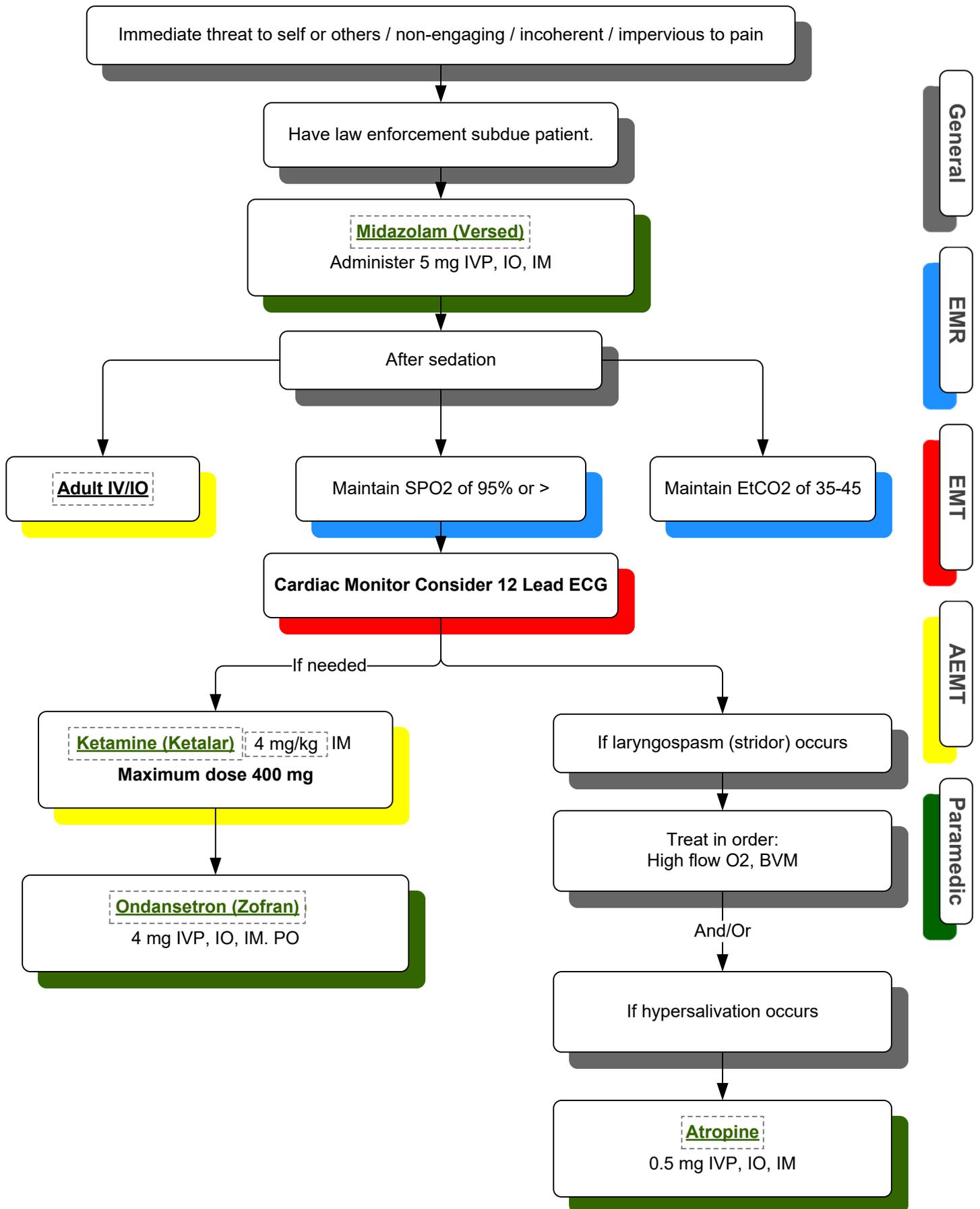
“Quick Look” – A patient may NOT refuse treatment if:

- a. **Unconscious.**
- b. **Confused** (to person, place, time, situation or is unable to make an “informed decision”).
- c. **Intoxicated**, exhibiting S/Sx of **Illness** or **Injury** (not just alcohol on board).
- d. **A minor child**, exhibiting S/Sx of **Illness** or **Injury** (unless determined to be a “mature minor”)
- e. **Developmentally** or **Psychologically Disabled**, exhibiting S/Sx of **Illness** or **Injury**.
- f. **Hostile** or **Threatening** of others (verbally or physically), exhibiting S/Sx of **Illness** or **Injury**
- g. **Suicidal** (either verbally threatening or actively gesturing)

Restraint Documentation Guidelines should include:

- a. That the **patient refused** or was **unable to consent** to treatment (unconscious?).
- b. **Evidence** of the patient’s **incompetence** (or inability) to refuse treatment.
- c. **Assistance of Law Enforcement Officials** with restraint,
 - i. **And/or orders** from **medical control** to restrain
 - ii. **And/or adherence** to **service restraint protocols**
- d. The **type(s)** of **restraints employed** (soft, leather, mechanical).
- e. The **limb(s) restrained** (right wrist, bilateral wrists, “4 point”).
- f. Any **injuries** that **occurred during** or **after restraint**.
- g. **Circulation checks** every 15 (or fewer) minutes.
- h. **Behavior** and/or **mental status** of patient **after** restraint.

Excited Delirium



General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Maintain adequate perfusion
2. Treat underlying cause:
 - a. Hypoxia
 - b. Shock
 - c. Second or third degree AV block
 - d. Toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin)
 - e. Electrolyte disorder
 - f. Increased intracranial pressure (ICP)
 - g. Other

Treatment and Interventions

Adult Universal Care

Manage Airway as necessary

Oxygen as appropriate

Pulse Oximetry measurement
maintain O2 saturation \geq 94%

Cardiac Monitor

12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Obtain **Blood Glucose**

treat per **Hypoglycemia/Hyperglycemia**

guideline as indicated

Adult IV/IO

Fluid bolus if appropriate

Atropine

First dose: 0.5 mg bolus IVP, IO
Repeat every 3 – 5 minutes
Maximum 3 mg

External Pacemaker

If pacing is performed, consider sedation
or **Adult Pain Control**

Chronotropic medication "push dose epinephrine"

Prepare 10 mcg/ml by adding:

Epinephrine 1:10,000 (1 ml) to 9 ml NS;

administer 10 mcg (1ml) every 1 - 2 minutes as needed

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion criteria

1. Heart rate < 60 with either symptoms (Altered Mental Status, CP, CHF, seizure, syncope, shock, pallor, diaphoresis) or evidence of hemodynamic instability
2. The major EKG rhythms classified as bradycardia include:
 - a. Sinus bradycardia
 - b. Second-degree AV block
 - Type I —Wenckenbach/Mobitz I
 - Type II —Mobitz II
 - c. Third-degree AV block complete block
 - d. Ventricular escape rhythms

Exclusion Criteria

No specific recommendations

Notes

1. Patients who have undergone cardiac transplant will not respond to atropine
2. Consider potential culprit medications including beta-blockers, calcium channel blockers, sodium channel blockers/anti-depressants, cocaine, clonidine, and digoxin. If medication overdose is considered, refer to appropriate guideline in the **Toxins and Environmental** section.
3. Consider hyperkalemia in the patient with wide complex bradycardia, dialysis dependent renal failure.
4. Bradycardia should be managed via the least invasive manner possible, escalating care as needed
 - a. Third degree heart block or the denervated heart (as in cardiac transplant) may not respond to atropine and in these cases, proceed quickly to chronotropic agents (such as epinephrine or dopamine), or transcutaneous pacing.
In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing

Patient Safety Considerations

If pacing is performed, consider sedation or pain control

Beta Blocker Table

Brand Name	Generic Name
BETA ADRENERGIC BLOCKERS	
Betapace Betapace AF	Sotalol
Blocadren	Timolol
Brevibloc	Esmolol
Cartrol	Carteolol
Coreg Coreg CR	Carvedilol
Corgard	Nadolol
Inderal Inderal LA Innopran XL	Propranolol
Kerlone	Betaxolol
Levatol	Penbutolol
Lopressor Toprol XL	Metoprolol
Sectral	Acebutolol
Tenormin	Atenolol
Trandate Normodyne	Labetalol
Visken	Pindolol
Zebeta	Bisoprolol
BETA BLOCKERS-COMBINATION PRODUCTS	
Corzide	Nadolol-Bendroflumethiazide
Inderide	Propranolol-HCT
Tenoretic	Atenolol-Chlorthalidone
Ziac	Bisoprolol-HTC

Calcium Channel Blockers

Check if your drug is on this list:

- ♦ amlodipine (Norvasc)
- ♦ amlodipine and atorvastatin (Caduet)
- ♦ amlodipine and benazepril (Lotrel)
- ♦ amlodipine and valsartan (Exforge)
- ♦ amlodipine and telmisartan (Twynta)
- ♦ amlodipine and olmesartan (Azor)
- ♦ amlodipine and perindopril (Prestalia)
- ♦ clevidipine (Cleviprex)
- ♦ diltiazem (Cardizem)
- ♦ nicardipine (Cardene, Cardene SR)
- ♦ nisoldipine (Sular)

Patient Care Goals

1. Return of spontaneous circulation (ROSC)
2. Preservation of neurologic function

Inclusion Criteria

Patients with cardiac arrest

Exclusion Criteria

Include the following:

1. Patients suffering cardiac arrest due to severe hypothermia (see **Hypothermia/Cold Exposure** guideline)
 2. Patients with identifiable Do Not Resuscitate (or equivalent such as POLST) order (see **Terminating or Not Starting Resuscitation Due to DO Not Resuscitate/Advance Directive/Healthcare Power of Attorney (POA)** guideline)
- Patients in arrest due to traumatic etiology (see **General Trauma Management** guideline)

Assessment

The patient in cardiac arrest requires a prompt balance of treatment and assessment. In cases of cardiac arrest, assessments should be focused and limited to obtaining enough information to reveal the patient is pulseless. Once pulselessness is discovered, treatment should be initiated immediately and any further history must be obtained by bystanders while treatment is ongoing

The most important therapies for patients suffering from cardiac arrest are prompt cardiac defibrillation and minimally interrupted effective chest compressions

General

EMR

EMT

AEMT

Paramedic

Initiate chest compressions in cases with no bystander chest compressions, or take over compressions from bystanders while a second rescuer is setting up the AED or defibrillator.

- If adequate, uninterrupted bystander CPR has been performed or if the patient arrests in front of the EMS providers, immediately proceed with rhythm analysis and defibrillation, if appropriate
- If no compressions and the arrest was not witnessed by EMS providers immediately perform chest compressions at a rate of 100-120/minute, followed by rhythm analysis and defibrillation, if indicated. In the unwitnessed arrest, chest compressions are commonly the most rapidly applied therapy and should be instituted immediately in an effort to minimize the “no flow” state of cardiac arrest

All efforts should be instituted to create a “low flow” state (Through effective chest compressions and defibrillation with other treatment)

Defibrillation See: Defibrillation-Pad Placement

Power levels of 200, 300, 360 with subsequent defibrillation remaining at 360, for initial and subsequent defibrillation attempts. Anterior/ Posterior Pad Placement Preferred

CPR

Resume immediately after defibrillation attempts with no pauses for pulse checks for 2 minutes regardless of the rhythm displayed on the cardiac monitor

See: Cardiac Arrest Part B

All attempts should be made to prevent avoidable interruptions in chest compressions, such as pre-charging the defibrillator and hovering over the chest, rather than stepping away during defibrillations

Adult IV/IO

Access should be obtained within the first 2-minute period of chest compressions

ASAP

Epinephrine 1:10,000 1 mg IV, IO
Repeat every 3 – 5 minutes

Continue the cycle of chest compressions for 2 minutes, followed by rhythm analysis and defibrillation of shockable rhythms. During this period of time, the proper strategy of airway management is currently not defined and many options for airway management exist. Regardless of the airway management and ventilation strategy, consider the following principles:

The airway management strategy should not interrupt compressions
Successful resuscitation from cardiac arrest depends primarily on effective, minimally- interrupted chest compressions and prompt defibrillation. Airway management is of secondary importance and should not interfere with compressions and defibrillation. Options for airway management include:

Passive ventilation: High flow oxygen is applied via a non-rebreather mask with an oropharyngeal airway or i-gel. Some oxygen will be entrained with each decompression of the chest. This may be applied for the first 3-4 compression cycles (6-8 minutes), after which one may consider BVM ventilation or placement of an advanced airway (as below) of V-Fib/Pulseless V-Tach, PEA/ Asystole,

BVM ventilation at 10 breaths per minute, applied without interrupting the compressions.

BVM ventilation with 30:2 ventilation to compression ratio: Each 30 compressions, the compressions are paused briefly to allow 2 BVM ventilations, then compressions immediately resumed.

Advanced airway placement: **Preferred Airway** Either a supraglottic airway or an endotracheal tube may be placed without interruption of compressions. Ventilations are provided at 10 breaths/minute. Capnography: With High Quality CPR= Goal >20 mmHg

Consider limited tidal volumes. For neonates and young children, an adult sized BVM may be used as long as a proper mask size and tidal volume are utilized

Consider use of antiarrhythmic for recurrent VF/Pulseless VT

Amiodarone (Cordarone): 300 mg IVP, IO

May be repeated once at a dose of 150 mg

See: **Cardiac Arrest Part C**

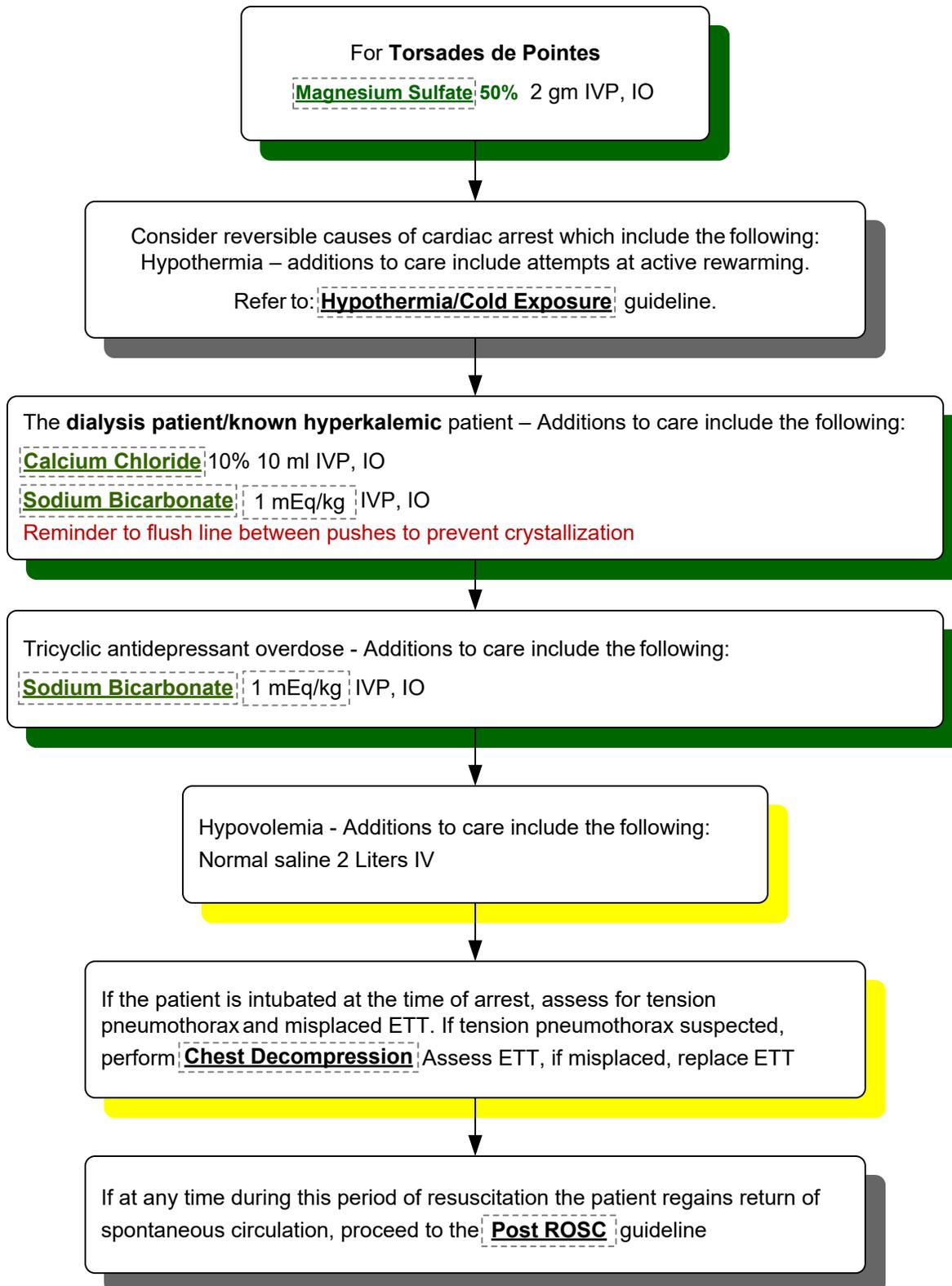
General

EMR

EMT

AEMT

Paramedic



General

EMR

EMT

AEMT

Paramedic

Notes

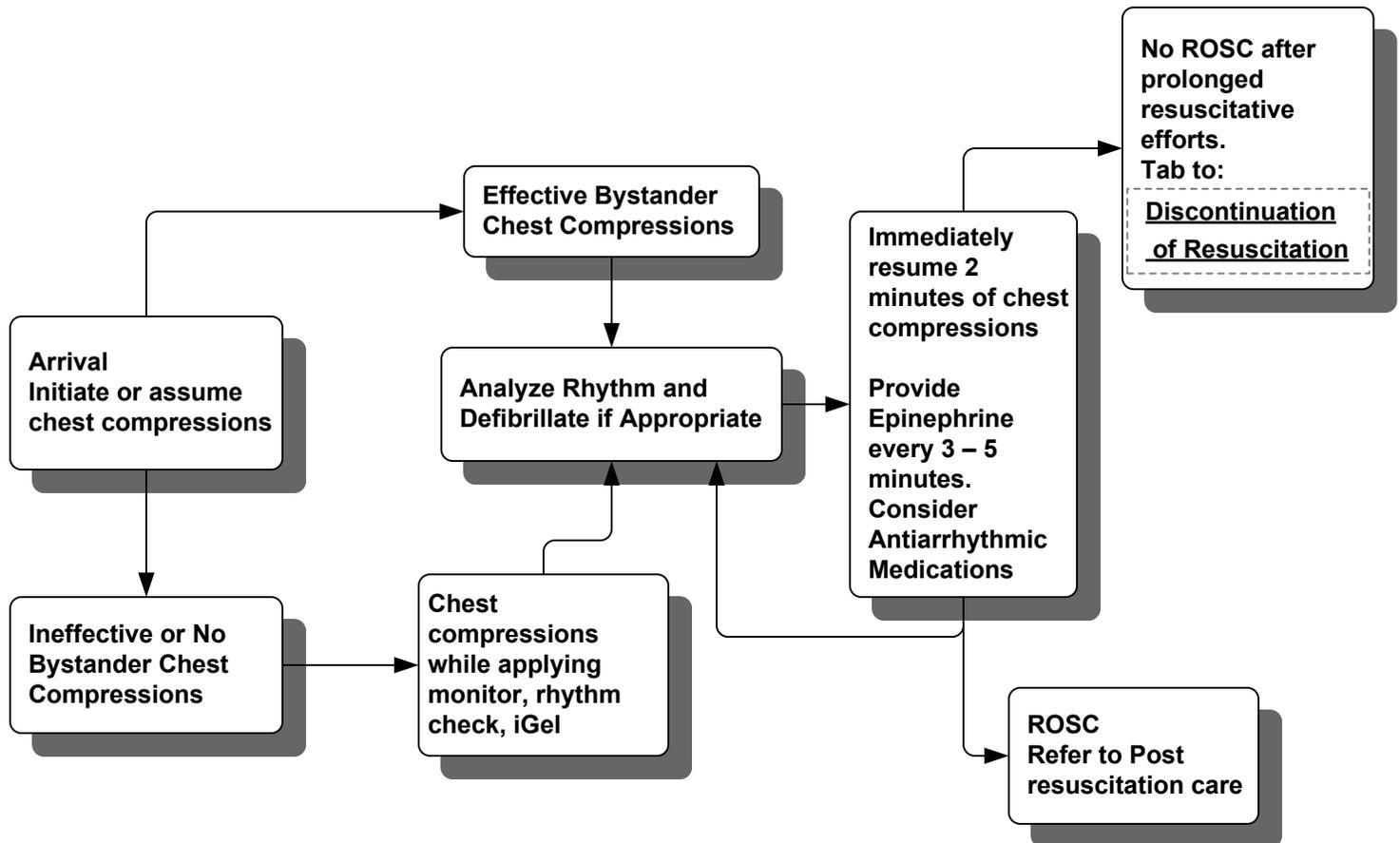
1. Effective chest compressions and defibrillation are the most important therapies to the patient in cardiac arrest. Effective chest compressions are defined as:
 - a. A rate of greater than 100 and less than 120 compressions/minute
 - b. Depth of at least 2 inches (5 cm) and less than 2.4 inches (6cm) for adults and children or 1.5 inches (4 cm) for infants. Adolescents who have entered puberty should receive the same depth of chest compressions as an adult.
 - c. Allow for complete chest recoil (avoid leaning)
 - d. Minimize interruptions in compressions. Reasons to interrupt CPR: ROSC or Pronouncement of Death
 - e. Avoid rescuer fatigue by rotating rescuers every 2 minutes
 - f. Avoid excessive ventilation. Consider delayed airway management. If no advanced airway, consider
 - i. Passive ventilation using an NRB with 3-4 cycles of uninterrupted chest compressions (for arrests of suspected cardiac etiology) Consider BVM ventilation or advanced airway after 3-4 cycles.
 - ii. BVM ventilation every 10-15 compressions with cycles of uninterrupted chest compressions.
 - iii. 30:2 ventilation to compression ratio for adults, and 15:2 for children when 2 rescuers are present.
 - iv. If an advanced airway is placed, ventilations should not exceed 10 breaths/minute (1 breath every 6 seconds) in adults.
 - g. Quantitative end-tidal CO₂ should be used to monitor effectiveness of chest compressions. If ETCO₂ < 10 mmHg during the initial phases of resuscitation, attempt to improve chest compression quality. Consider additional monitoring with biometric feedback which may improve compliance with suggested resuscitation guidelines
 - h. Chest compressions are usually the most rapidly applied therapy for the patient in cardiac arrest and should be applied as soon as the patient is noted to be pulseless. If the patient is being monitored with pads in place at the time of arrest, immediate defibrillation should take precedence over all other therapies, however, if there is any delay in defibrillation (for instance, in order to place pads), chest compressions should be initiated while the defibrillator is being applied. There is no guidance on how long these initial compressions should be applied, however, it is reasonable to either complete between 30 seconds and 2 minutes of chest compressions in cases of no bystander chest compressions OR to perform defibrillation as soon as possible after chest compressions initiated in cases of witnessed arrest
 - i. There is insufficient evidence to recommend the routine use of extracorporeal CPR (ECPR) for patients with cardiac arrest. In settings where it can be rapidly implemented, ECPR may be considered for select cardiac arrest patients for whom the suspected etiology of the cardiac arrest is potentially reversible during a limited period of mechanical cardiorespiratory support
 - a. Chest compressions should be reinitiated immediately after defibrillation as pulses, if present, are often difficult to detect and rhythm and pulse checks interrupt compressions
 - b. Continue chest compressions between completion of AED analysis and AED charging
 - c. **Effectiveness of chest compressions decreases with any movements. Patients should therefore be resuscitated as close to the point at which they are first encountered and should only be moved if the conditions on scene are unsafe or do not operationally allow for resuscitation. Chest compressions are also less effective in a moving vehicle. It is also dangerous to EMS providers, patients, pedestrians and other motorists to perform chest compressions in a moving ambulance. For these reasons and because in most cases the care provided by EMS providers is equivalent to that provided in emergency departments, resuscitation should occur on scene**
 - d. Defibrillation dosing should follow manufacturer's recommendation in the case of biphasic defibrillators. If the manufacturer's recommendation is unknown, use highest setting possible. In the case of monophasic devices, setting should be 360J (or 4 J/kg for children)
2. IV or IO access without interrupting chest compressions
3. Administer epinephrine during the first Humoral IO Placement preferred round of compressions

4. Airway management strategy should be considered early during the case. At present, the most effective mechanism of airway management is uncertain with some systems managing the airway aggressively and others managing the airway with basic measures and both types of systems finding excellent outcomes. Regardless of the airway management style, consider the following principles:
 - a. Airway management should not interrupt chest compressions
 - b. Carefully follow ventilation rate and prevent hyperventilation
 - c. Consider limited tidal volumes
 - d. There is uncertainty regarding the proper goals for oxygenation during resuscitation. Current recommendations suggest using the highest flow rate possible through NRB or BVM. This should not be continued into the post-resuscitation phase in which there becomes more clear guidance on maintaining an oxygenation saturation of $\geq 94\%$
 - e. Special attention should be applied to the pediatric population and airway management/respiratory support. Given that the most likely cause of cardiac arrest is respiratory, airway management may be considered early in the patient's care. However, the order of Circulation-Airway-Breathing is still recommended as the order of priority by the American Heart Association for pediatric resuscitation in order to ensure timely initiation of chest compressions to maintain perfusion, regardless of the underlying cause of the arrest. In addition, conventional CPR is preferred in children, since it is associated with better outcomes when compared to compression-only CPR
5. Special Circumstances in Cardiac Arrest
 - a. Trauma – Refer to **General Trauma Management** guideline
 - b. Pregnancy
 - i. The best hope for fetal survival is maternal survival
 - ii. Position the patient in the supine position with a second rescuer performing manual uterine displacement to the left in an effort to displace the gravid uterus and increase venous return by avoiding aorto-caval compression
 - iii. If manual displacement is unsuccessful, the patient may be placed in the left lateral tilt position at 30° . This position is less desirable than the manual uterine displacement as chest compressions are more difficult to perform in this position
 - iv. Chest compressions should be performed slightly higher on the sternum than in the non-pregnant patient to account for elevation of the diaphragm and abdominal contents in the obviously gravid patient
 - v. Defibrillation should be performed as in non-pregnant patients
 - c. Arrests of respiratory etiology (including drowning) Consider early and aggressive management of the patient's airway as well as the above protocols for cardiac arrest. Passive ventilation with a NRB is NOT indicated for these patients.
6. Application of the "pit crew" model of resuscitation
 - a. Ideally, providers in each EMS agency will use a "pit crew" approach when using this protocol to ensure the most effective and efficient cardiac arrest care. Training should include teamwork simulations integrating first responders, BLS, and ALS crewmembers who regularly work together. High-performance systems should practice teamwork using "pit crew" techniques with predefined roles and crew resource management principles. For example (the Pennsylvania State EMS Model for Pit Crew):
 - i. Rescuer 1 and 2 set up on opposite sides of patient's chest and perform continuous chest compressions, alternating after every 100 compressions to avoid fatigue
 - ii. Use a metronome or CPR feedback device to ensure that compression rate is 100-120/minute
 - iii. Chest compressions are only interrupted during rhythm check (AED analysis or manual) and defibrillation shocks. Continue compressions when AED/ defibrillator is charging
 - iv. Additional rescuer obtains IO (or IV) access and gives epinephrine. For IO access, the proximal humerus is the preferred site for adults
 - v. During the first four cycles of compressions/defibrillation (approximately 10 minutes) avoid advanced airway placement
 - vi. One responding provider assumes code leader position overseeing the entire response
 - vii. Use a CPR checklist to ensure that all best practices are followed during CPR
 - b. For efficient "pit crew" style care, the EMS agency medical director should establish the options that will be used by providers functioning within the EMS agency. Options include establishing:
 - i. The airway/ventilation management, if any, that will be used
 - ii. The initial route of vascular access

- c. The EMS agency must, overseen by the agency medical director, perform a QI review of care and outcome for every patient that receives CPR next to agency medical director and/or EMS Coordinator
- i. The QI should be coordinated with local receiving hospitals to include hospital admission, discharge, and condition information. This EMS agency QI can be accomplished by participation an organized cardiac arrest registry
 - ii. The QI should be coordinated with local PSAP/dispatch centers to review opportunities to assure optimal recognition of possible cardiac arrest cases and provision of dispatch-assisted CPR (including hands-only CPR when appropriate)

Patient Safety Considerations

It is not safe for the patient or providers to perform chest compressions during transport. Chest compressions during patient movement are less effective in regards to hands on time, depth, recoil and rate and providers performing chest compressions in a moving vehicle are at risk for injury. Therefore, patients should be resuscitated as close to the scene as operationally possible.



ROSC-Return of Spontaneous Circulation

Patient Care Goals

Out-of-hospital cardiac arrest in the U.S. has a mortality rate greater than 90% and results in excess of 300,000 deaths per year. Many of those who do survive suffer significant neurologic morbidity. Current research has demonstrated that care of patients with return of spontaneous circulation (ROSC) at specialized centers is associated with both decreased mortality and improved neurologic outcomes. It is believed that hypothermia suppresses the cascade of damaging biochemical events that causes secondary cellular injury and death after an anoxic insult

The goal is therefore to optimize neurologic and other function following a return of spontaneous circulation following resuscitated cardiac arrest

General

EMR

EMT

AEMT

Paramedic

Perform general patient management

Support life-threatening problems associated with airway, breathing, and circulation. Monitor closely for reoccurrence of cardiac arrest

Oxygen as appropriate

Pulse Oximetry measurement

maintain O2 saturation \geq 94% DO NOT hyper-oxygenate

For hypotension (SBP less than 100mmHg) fluid bolus of 10ml/kg max of 1 liter wide open, may repeat x1
Chronotropic medication "push dose epinephrine"

Prepare 10 mcg/ml **Epinephrine 1:10,000** (1 ml) of to 9 ml NS; administer 10 mcg (1 ml) every 1 - 2 minutes as needed

treat per

Hypoglycemia/Hyperglycemia

guideline as indicated

Obtain **Blood Glucose**

If patient seizes, refer to

Seizures guideline

12 Lead ECG

Mild therapeutic hypothermia may be beneficial in unresponsive patients who are intubated with ROSC.
Ice packs: Groin, Axilla and Neck

Post cardiac arrest patients with evidence or interpretation consistent with ST elevation myocardial infarction (STEMI/Acute MI) may be transported to any hospitals which offer percutaneous coronary intervention in their cardiac catheterization laboratory

Consider transport patients to facility which offers specialized post-resuscitative care
Do not allow patient to become hyperthermic

Patient Care Goals

1. Identify STEMI quickly
2. Determine the time of symptom onset
3. Activate hospital-based STEMI system of care per criteria:
 1. EMS crew interprets STEMI
 2. Monitor interprets ***STEMI***
 3. Reciprocal changes
4. Monitor vital signs and cardiac rhythm and be prepared to provide CPR and defibrillation if needed
5. Administer appropriate medications
6. Transport to appropriate facility

The 12-lead EKG is the primary diagnostic tool that identifies a STEMI. It is imperative that EMS providers routinely acquire a 12-lead EKG as soon as possible for all patients exhibiting signs and symptoms of ACS.

- a. The EKG should be transmitted from time of patient contact for remote interpretation by a physician or screened for STEMI by properly trained EMS providers, with or without the assistance of computer-interpretation

STEMI- ONLY for STEMI Patients transported to Wooster Community Hospital

- Contact WCH ED ASAP
- If ED Physician confirms "STEMI" get verbal confirmation from ED Staff
- Provide Pt. Name, DOB and SS# if available
- Place Defibrillation pads on Pt.
- Give **Brilinta** 180 mg PO Crushed/ Chewed by patient (Redose if patient vomits)
- Administer **Heparin** 60 units/kg to a MAX dose of 4,000 Units.
- DO NOT DELAY transport for Medication Administration

Adult Universal Care

If the patient is dyspneic, hypoxemic, or has obvious signs of heart failure, EMS providers should administer oxygen and titrate therapy to oxygen saturation of $\geq 94\%$

Cardiac Monitor 12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Aspirin (4) chewable 81 mg/tab

Adult IV/IO

Fluid bolus if appropriate

Nitroglycerin 0.4 mg SL

Every 3 – 5 minutes as long as SBP 100 mmHg or greater.

Avoid administration with Inferior MI

If BP <100mmHg (<65 mmHg MAP) give 250 mL NS bolus (Use Caution in CHF/ Pulmonary Edema Symptoms)

EMT can assist patient with Nitroglycerin if pt. is prescribed

Consider with hypotension or RV syndrome:

Fentanyl (Sublimaze)

1 mcg/kg IVP, IO every 3 - 5 minutes for pain

100 mcg Maximum per dose, Maximum Total 200 mcg

Transport and destination decisions should be based on local resources and system of care. Transport to nearest, **most appropriate** facility.

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion/Exclusion Criteria**

Chest pain or discomfort in other areas of the body (e.g. arm, jaw, epigastrium) of suspected cardiac origin, shortness of breath, sweating, nausea, vomiting, and dizziness. Atypical or unusual symptoms are more common in women, the elderly and diabetic patients. May also present with CHF, syncope and/or shock

Some patients will present with non-cardiac chest pain, for these patients, defer the administration of aspirin and nitrates and refer to **Pain Management** guideline.

Notes

Acute coronary syndrome may present with atypical pain, vague or only generalized complaints

Pertinent Assessment Findings

A complete medication list should be obtained from each patient. It is especially important for the treating physician to be informed if the patient is taking beta-blockers, calcium channel blockers, clonidine, digoxin, and medications for the treatment of erectile dysfunction

Patient Management Assessment

Signs and symptoms include chest pain, congestive heart failure, syncope, shock, symptoms similar to a patient's previous myocardial infarction (MI)

Patient Safety Considerations

1. Observe for signs of clinical deterioration: dysrhythmias, CP, SOB, decreased LOC/syncope, or other signs of shock/hypotension
2. Perform serial 12-lead EKGs (especially any time clinical changes noted)

Pertinent Assessment Findings

- Evidence of trauma
- Evidence of cardiac dysfunction (e.g. evidence of CHF, arrhythmia)
- Evidence of hemorrhage
- Evidence of neurologic compromise
- Evidence of alternate etiology, including seizure
- Initial and ongoing cardiac rhythm
- 12-lead EKG as indicated

Patient Care Goals

1. Initiate early fluid resuscitation and vasopressors to maintain/restore adequate perfusion to vital organs
2. Differentiate between possible underlying causes of shock in order to promptly initiate additional therapy

Unstable Signs:

Altered mental status, chest pain, hypotension, or other signs of shock. Rate-related symptoms uncommon if heart rate <150/min.

treat per

Hypoglycemia/Hyperglycemia
guideline as indicated

Adult Universal Care

Oxygen as appropriate

Pulse Oximetry measurement

Titrate to oxygen SPO \geq 94%

Consider Capnography

Cardiac Monitor

12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Obtain **Blood Glucose**

Adult IV/IO

20 ml/kg isotonic fluid; Maximum of 1 liter over < 15 minutes, using a push-pull method of drawing up the fluid in a syringe and pushing it through the IV. May repeat one time.

If there is a history of adrenal insufficiency, give:

Methylprednisolone (Solu-Medrol) 2 mg/kg IVP Maximum 125 mg

See: **Hypotension/Shock (Non-Trauma) Part B**

General

EMR

EMT

AEMT

Paramedic

Vasopressors (shock unresponsive to IV fluids) ONLY if symptomatic (Altered LOC, Hypotension, Low EtCO2)

Chronotropic medication "push dose epinephrine"

Prepare 10 mcg/ml **Epinephrine 1:10,000** (1 ml) of to 9 ml NS; administer 10 mcg (1 ml) every 1 - 2 minutes as needed



Provide advanced notification to the hospital

General

EMR

EMT

AEMT

Paramedic

Notes

1. Early, aggressive IV fluid administration is essential in the treatment of suspected shock
2. Patients predisposed to shock:
 - a. Immunocompromised (patients undergoing chemotherapy or with a primary or acquired immunodeficiency)
 - b. Adrenal insufficiency (Addison's disease, congenital adrenal hyperplasia, chronic or recent steroid use)
 - c. History of a solid organ or bone marrow transplant
 - d. Infants
 - e. Elderly
3. Tachycardia is the first sign of compensated shock, and may persist for hours. Hypotension indicates uncompensated shock, which may progress to cardiopulmonary failure within minutes
4. Hydrocortisone succinate, if available, is preferred over methylprednisolone and dexamethasone for the patient with adrenal insufficiency, because of its dual glucocorticoid and mineralocorticoid effects. Patients with no reported history of adrenal axis dysfunction may have adrenal suppression due to their acute illness, and hydrocortisone should be considered for any patient showing signs of treatment-resistant shock. Patients with adrenal insufficiency may have an emergency dose of hydrocortisone available that can be administered IV or IM

Patient Safety Considerations

Recognition of cardiogenic shock: if patient condition deteriorates after fluid administration, rales or hepatomegaly develop, then consider cardiogenic shock and holding further fluid administration

Patient Presentation**Inclusion Criteria**

1. Signs of poor perfusion (due to a medical cause) such as one or more of the following:
 - a. Altered mental status
 - b. Delayed/flash capillary refill
 - c. Hypoxia (pulse oximetry < 94%)
 - d. Decreased urine output
 - e. Respiratory rate > 20 in adults or elevated in children (see normal vital signs table)
 - f. Hypotension for age (lowest acceptable systolic blood pressure in mm Hg):
 - i. < 1 year: 60
 - ii. 1-10 years: (age in years)(2)+70
 - iii. > 10 years: 90
 - g. Tachycardia for age, out of proportion to temperature (see **Normal Vital Signs** table, **Appendix VII**)
 - h. Weak, decreased or bounding pulses
 - i. Cool/mottled or flushed/ruddy skin
2. AND potential etiologies of shock:
 - a. Hypovolemia (poor fluid intake, excessive fluid loss (e.g. bleeding, SIADH, hyperglycemia excessive diuretics, vomiting, diarrhea)
 - b. Sepsis (temperature instability: < 36 C or 96.8 F; > 38.5 C or 101.3 F; and/or tachycardia, warm skin, tachypnea)
 - c. Anaphylaxis (urticaria, nausea/vomiting, facial edema, wheezing)
 - d. Signs of heart failure (hepatomegaly, rales on pulmonary exam, extremity edema, JVD)

Exclusion Criteria

Shock due to suspected trauma (see **Trauma** section guidelines)

Patient Management Assessment

1. History

- a. History of GI bleeding
- b. Cardiac problems
- c. Stroke
- d. Fever
- e. Nausea/vomiting, diarrhea
- f. Frequent or no urination
- g. Syncopal episode
- h. Allergic reaction
- i. Immunocompromise (malignancy, transplant, asplenia)
- j. Adrenal insufficiency
- k. Presence of a central line
- l. Other risk of infection (spina bifida or other genitourinary anatomic abnormality)

2. Exam

- a. Airway/breathing (airway edema, rales, wheezing, pulse oximetry, respiratory rate)
- b. Circulation (heart rate, blood pressure, capillary refill)
- c. Abdomen (hepatomegaly)
- d. Mucous membrane hydration
- e. Skin (turgor, rash)
- f. Neurologic (GCS, sensorimotor deficits)

3. Determination of type of shock

- a. Cardiogenic
- b. Distributive (neurogenic, septic, anaphylactic)
- c. Hypovolemic
- d. Obstructive (e.g. pulmonary embolism, cardiac tamponade, tension pneumothorax)

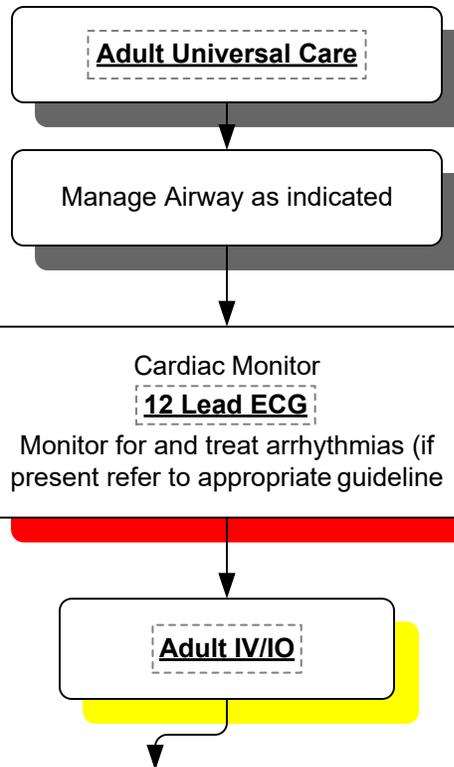
Patient Assessment Findings

Decreased perfusion manifested by altered decreased mental status, decreased urine output (< 1 ml/kg/hr) or abnormalities in capillary refill or pulses:

1. **Cardiogenic, hypovolemic**, obstructive shock: capillary refill >2 seconds, diminished peripheral pulses, mottled cool extremities
2. **Distributive shock**: flash capillary refill, bounding peripheral pulses

Patient Care Goals

1. Rapid identification of, and interventions for, cardiovascular compromise in patients with VADs
2. Rapid identification of, and interventions for VAD-related malfunctions or complications



General

EMR

EMT

AEMT

Paramedic

If patient is experiencing VAD-related complications or cardiovascular problems, expedite transport to the medical facility where VAD was placed if patient's clinical condition and time allows

If patient has a functioning VAD and is experiencing a non-cardiovascular-related problem, transport to a facility that is appropriate for the patient's main presenting problem without manipulating the device

If patient has a functioning VAD and is hypoperfusing:

- a. Administer IV fluids (**Maximum of 1 liter**) over less than 15 minutes, using a push-pull method of drawing up the fluid in a syringe and pushing it through the IV
- b. May repeat based on patient's condition and clinical impression for a total cumulative dose not to exceed 2 liters

7. If patient is in full cardiac arrest:
 - a. **CPR** should not be performed if there is any evidence the pump is still functioning, the decision whether to perform CPR should be made based upon best clinical judgment in consultation with the patient's VAD-trained companion and the VAD coordinator (or direct medical oversight if VAD coordinator unavailable)
 - b. **CPR** may be initiated only where:
 - i. You have confirmed the pump has stopped and troubleshooting efforts to restart it have failed, and
 - ii. The patient is unresponsive and has no detectable signs of life

Mechanical Circulatory Support

Patient Presentation**Inclusion Criteria**

1. Adult patients that have had an implantable ventricular assist device (VAD), including a left ventricular assist device (LVAD), right ventricular assist device (RVAD), or biventricular-assist device (BiVAD), and have symptoms of cardiovascular compromise
2. Patients with VADs that are in cardiac arrest
3. Patients with VADs that are experiencing a medical or injury-related event not involving the cardiovascular system or VAD malfunction

Exclusion Criteria

Adult patients who do not have a VAD in place

Patient Management Assessment

1. Assess for possible pump malfunction
 - a. Assess for alarms
 - b. Auscultate for pump sound "hum"
 - c. Signs of hypoperfusion including pallor, diaphoresis, altered mental status
2. If the VAD pump has malfunctioned:
 - a. Utilize available resources to troubleshoot potential VAD malfunctions and to determine appropriate corrective actions to restore normal VAD function:
 - i. Contact the patient's VAD-trained companion, if available
 - ii. Contact the patient's VAD coordinator, using the phone number on the device
 - iii. Check all the connections to system controller
 - iv. Change VAD batteries, and/or change system controller if indicated
 - v. Have patient stop all activity and assess for patient tolerance
 - vi. Follow appropriate cardiovascular condition-specific protocol(s) as indicated

Notes

1. You do not need to disconnect the controller or batteries in order to:
 - a. Defibrillate or cardiovert
 - b. Acquire a 12-lead EKG
2. Automatic non-invasive cuff blood pressures may be difficult to obtain due to the narrow pulse pressure created by the continuous flow pump
3. Flow through many VAD devices is not pulsatile and patients may not have a palpable pulse or accurate pulse oximetry
4. The blood pressure, if measurable, may not be an accurate measure of perfusion.
5. Ventricular fibrillation, ventricular tachycardia, or asystole/PEA may be the patient's "normal" underlying rhythm. Evaluate clinical condition and provide care in consultation with VAD coordinator
6. The patient's travel bag should accompany them at all times with back-up controller and spare batteries
7. If feasible, bring the patient's power module, cable, and display module to the hospital
8. All patients should carry a spare pump controller with them
9. The most common cause for VAD alarms are low batteries or battery failures
10. Although automatic non-invasive blood pressure cuffs are often ineffective in measuring systolic and diastolic pressure, if they do obtain a measurement, the MAP is usually accurate
11. Other VAD complications:
 - a. Infection
 - b. Stroke/TIA
 - c. Bleeding
 - d. Arrhythmias
 - e. Cardiac tamponade
 - f. CHF
 - g. Aortic insufficiency

Patient Care Goals

1. Stabilize and resuscitate when necessary
2. Initiate monitoring and diagnostic procedures
3. Transfer for further evaluation

Patient Presentation
&
Patient Assessment
See: **Syncope-Notes**

General

EMR

EMT

AEMT

Paramedic

Obtain detailed history

Adult Universal Care

Manage Airway as indicated

Oxygen as appropriate
Pulse Oximetry measurement

Evaluate for hemorrhage and treat for shock if indicated

Patient Safety Considerations:
Patients suffering syncope due to arrhythmia may suffer recurrent arrhythmia and should therefore be placed on a cardiac monitor.
Geriatric patients suffering **falls from standing** may sustain significant injury and should be diligently screened for trauma. Refer to the General Trauma Management guideline

Cardiac Monitor
12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Obtain **Blood Glucose**

treat per
Hypoglycemia/Hyperglycemia
guideline as indicated

Adult IV/IO

Fluid bolus if appropriate

Patient Presentation

Syncope is heralded by **both** the loss of consciousness and the loss of postural tone. Syncope typically is abrupt in onset and resolves equally quickly. EMS providers may find the patient awake and alert on initial evaluation. Presyncope is defined as the prodromal symptoms of syncope. It usually lasts for seconds to minutes and may be described by the patient as “nearly blacking out” or “nearly fainting”

Inclusion criteria

1. Abrupt loss of consciousness with loss of postural tone
2. Prodromal symptoms of syncope

Exclusion criteria

Conditions other than the above, including patients:

1. Patients with alternate and obvious cause of loss of consciousness (such as trauma – see **Head Injury** Guideline)
2. Patients with ongoing mental status changes or coma should be treated per the **Altered Mental Status** guideline

Notes

1. By being most proximate to the scene and to the patient’s presentation, EMS providers are commonly in a unique position to identify the cause of syncope. Consideration of potential causes, ongoing monitoring of vitals and cardiac rhythm as well as detailed exam and history are essential pieces of information to pass onto hospital providers
2. All patients suffering from syncope deserve hospital level evaluation, even if they appear normal with few complaints on scene
 - a. High risk causes of syncope include the following:
 - i. Cardiac causes – such as arrhythmias and massive pulmonary embolism
 - ii. Neurologic - some of the symptoms of seizure may mimic those of syncope with loss of consciousness and collapse. Consider seizure and obtain full history from bystander witnesses
 - b. Consider high risk 12-lead EKG features including:
 - i. Evidence of QT prolongation
 - ii. Delta waves
 - iii. Brugada syndrome (incomplete RBBB pattern in V1/V2 with ST segment elevation)

Patient Management Assessment

1. Pertinent History

- a. Review the patient’s past medical history, including a history of:
 - i. Cardiovascular disease (cardiac disease/stroke/ etc.)
 - ii. Seizure
 - iii. Recent trauma
 - iv. Anticoagulation
 - v. Dysrhythmia
 - vi. Congestive heart failure (CHF)
 - vii. Syncope

- b. History of Present Illness, including:
 - i. Conditions leading to the event
 - ii. Patient complaints before or after the event including prodromal symptoms
 - iii. History from others on scene, including seizures or shaking, presence of pulse/breathing (if noted), duration of the event, events that lead to the resolution of the event

c. Review of Systems:

- i. Occult blood loss (GI/GU)
- ii. Fluid losses (nausea/vomiting/ diarrhea) and fluid intake
- iii. Current Medications

2. Pertinent Physical Exam Including:

- a. Attention to vital signs as well as evaluation for trauma / pulse ox
- b. Detailed neurologic exam (including stroke screening and mental status)
- c. Heart, lung, abdominal and extremity exam
- d. Additional Evaluation:
 - i. Finger stick blood glucose
 - ii. Cardiac monitoring
 - iii. Ongoing vital signs
 - iv. 12-lead EKG

Pertinent Assessment Findings

- Evidence of trauma
- Evidence of cardiac dysfunction (e.g. evidence of CHF, arrhythmia)
- Evidence of hemorrhage
- Evidence of neurologic compromise
- Evidence of alternate etiology, including seizure
- Initial and ongoing cardiac rhythm
- 12-lead EKG as indicated

Patient Care Goals

1. Maintain adequate oxygenation, ventilation and perfusion
2. Restore regular sinus rhythm - correct rhythm disturbance
3. Search for underlying cause:
 - a. Medications (caffeine, diet pills, thyroid, decongestants)
 - b. Drugs (cocaine, amphetamines)
 - c. History of dysrhythmia
 - d. CHF

Treatment and Interventions

Adult Universal Care

Manage Airway as indicated
Provide supplemental **Oxygen** as needed to maintain O2 saturation $\geq 94\%$

Cardiac Monitor
12 Lead ECG
Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Adult IV/IO

Fluid bolus if appropriate

Obtain **Blood Glucose**

treat per **Hypoglycemia/Hyperglycemia** guideline as indicated

Regular Narrow Stable SVT

Perform Vagal Maneuvers
Modified Valsalva Maneuver: Have pt. Blow into empty 10mL syringe for 30 seconds then lay patient flat and elevate legs as close to 90 degrees as possible.

Adenosine 6 mg rapid IVP, IO followed by 10 ml fluid bolus. If tachycardia continues, give
Adenosine 12 mg rapid IVP, IO A third dose of
Adenosine 12 mg IVP, IO can be given

Irregular Narrow Complex Tachycardia – Stable

- Transport
- Ongoing assessment of stability and perfusion

Regular Narrow Unstable SVT

Synchronized Cardioversion
50, 100, 120, 150, 200, 300, 360 joules

For responsive patients, consider sedation

Irregular Narrow Complex Tachycardia – Unstable

Synchronized Cardioversion
50,100, 120, 150, 200, 300, 360 joules

For responsive patients, consider sedation

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Maintain adequate oxygenation, ventilation and perfusion
2. Restore regular sinus rhythm - correct rhythm disturbance
3. Search for underlying cause:
 - a. Medications (caffeine, diet pills, thyroid, decongestants)
 - b. Drugs (cocaine, amphetamines)
 - c. History of dysrhythmia
 - d. CHF

Treatment and Interventions

Adult Universal Care

Manage Airway as indicated
Provide supplemental **Oxygen** as needed to maintain O2 saturation $\geq 94\%$

Cardiac Monitor 12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Adult IV/IO

Fluid bolus if appropriate

Unstable Signs:

Altered mental status, chest pain, hypotension, or other signs of shock. Rate-related symptoms uncommon if heart rate $<150/\text{min}$.

treat per

Hypoglycemia/Hyperglycemia

guideline as indicated

Obtain **Blood Glucose**

Regular Wide Complex Tachycardia-Stable

Ventricular tachycardia - VT, supraventricular tachycardia - SVT, atrial fibrillation/flutter with aberrancy, accelerated idioventricular rhythms, pre-excited tachycardias with accessory pathways

If non-monomorphic or indeterminate

Amiodarone (Cordarone) 150 mg IVP, IO over 10 minutes; may repeat x 1; dilute per policy.

Synchronized **Cardioversion**

50, 100, 120, 150, 200, 300, 360 joules

Irregular Wide Complex Tachycardia

Stable (atrial fibrillation with aberrancy, pre-excited atrial fibrillation (i.e. atrial fibrillation using an accessory pathway), MAT or polymorphic VT/torsades de pointes.

If non-monomorphic or indeterminate

Amiodarone (Cordarone) 150 mg IVP, IO over 10 minutes; may repeat if needed

If torsades, give

Magnesium Sulfate 2 grams IVP, IO over 15 minutes, dilute per policy

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Patients will manifest elevated heart rate for age and may or may not also present with associated symptoms such as palpitations, dyspnea, chest pain, syncope/near-syncope, hemodynamic compromise, altered mental status or other signs of end organ malperfusion

Inclusion Criteria

Heart Rate > 100 in adults or relative tachycardia in pediatric patients (greater than 220-age is most likely SVT)

Exclusion Criteria

Sinus tachycardia (often difficult to distinguish base on clinical findings)

Pertinent Assessment Findings

No specific recommendations

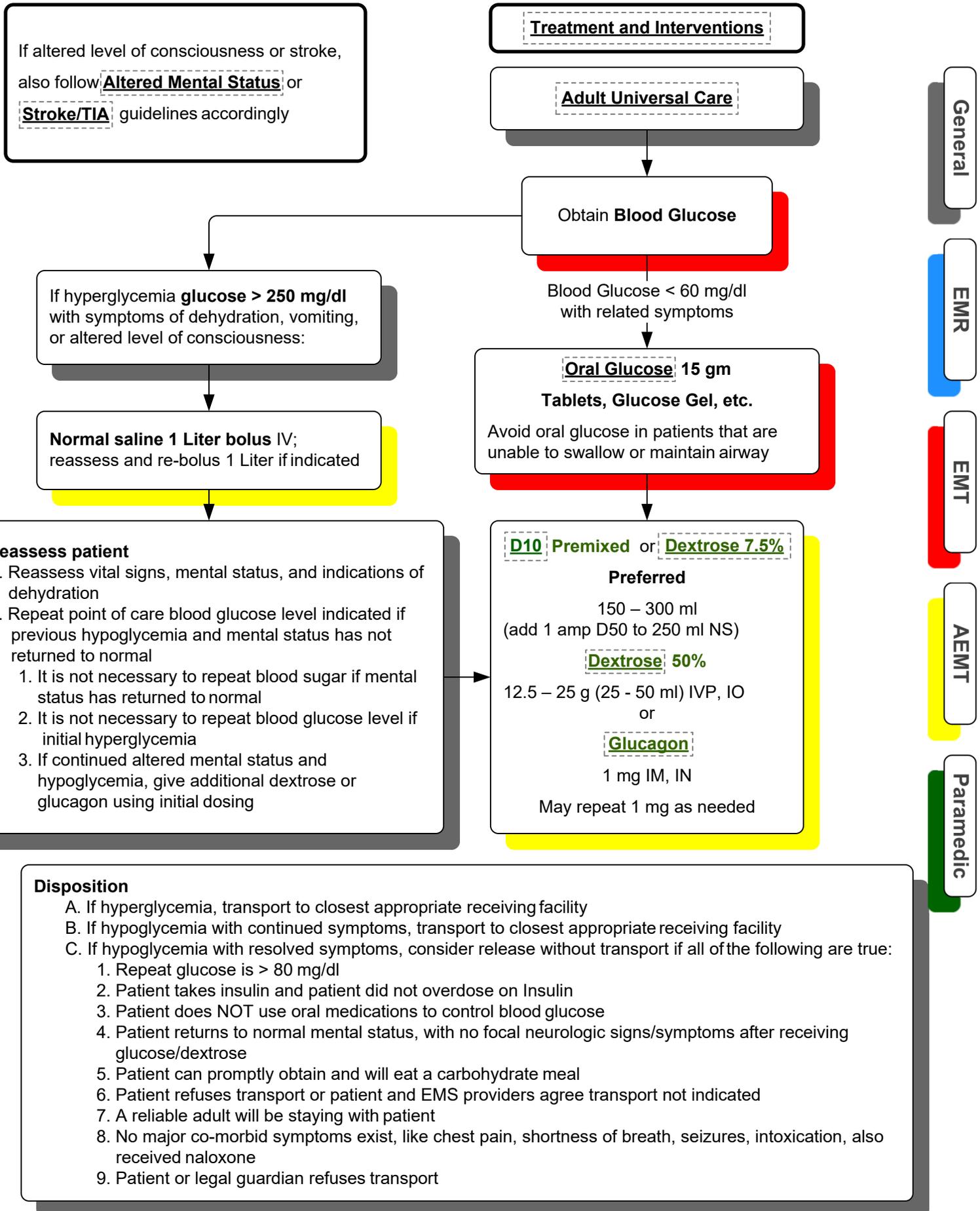
Patient Safety Considerations

1. Only use one antidysrhythmic at a time
2. If using cardioversion, consider sedation or pain control

With irregular wide complex tachycardia (atrial fibrillation with aberrancy, Wolff- Parkinson-White and Lown-Ganong Levine), avoid use of calcium channel blockers, beta blockers and adenosine. Amiodarone preferred medication for treatment.

Notes

1. Causes:
 - a. Hypovolemia
 - b. Hypoxia
 - c. Hydrogen (acidosis)
 - d. Myocardial Infarction
 - e. Hypokalemia/hyperkalemia
 - f. Hypoglycemia
 - g. Hypothermia
 - h. Toxins/Overdose
 - i. Tamponade
 - j. Tension pneumothorax
 - k. Thrombus – central or peripheral
 - l. Trauma
 - m. Hyperthyroidism
2. Atrial fibrillation rarely requires cardioversion in the field. As it is difficult to ascertain onset, risk of stroke needs to be addressed (prior clot formation)
3. A **wide-complex irregular rhythm** should be considered pre-excited atrial fibrillation; extreme care must be taken in these patients. Characteristic EKG findings include a short PR interval and in some cases, a delta wave. **Avoid AV nodal blocking agents such as adenosine**, calcium channel blockers, digoxin, and possibly beta-blockers in patients with pre-excitation atrial fibrillation because these drugs may cause a paradoxical increase in the ventricular response. Blocking the AV node in some of these patients may lead to impulses that are transmitted exclusively down the accessory pathway, which can result in ventricular fibrillation. **Amiodarone can be used instead**
4. Amiodarone can be used as a rate-controlling agent for patients who are intolerant of or unresponsive to other agents, such as patients with CHF who may not otherwise tolerate diltiazem or metoprolol. Caution should be exercised in those who are not receiving anticoagulation, as amiodarone can promote cardioversion
5. Biphasic waveforms have been proven to convert atrial fibrillation at lower energies and higher rates of success than monophasic waveforms. Strategies include dose escalation (50/100/120/150/200/300/360) versus beginning with single high energy/highest success rate for single shock delivered
6. Studies in infants and children have demonstrated the effectiveness of adenosine for the treatment of hemodynamically stable or unstable SVT
7. Adenosine should be considered the preferred medication for stable SVT.
When dosing medications for pediatric patients, dose should be weight based in non-obese patients and based on ideal body weight for obese patients



Patient Presentation**Inclusion Criteria**

1. Adult or pediatric patient with blood glucose < 60 mg/dl with symptoms of hypoglycemia
2. Adult or pediatric patient with altered level of consciousness (also see **Altered Mental Status** guideline)
3. Adult or pediatric patient with stroke symptoms (e.g. hemiparesis, dysarthria; also see **Suspected Stroke/Transient Ischemic Attack** guideline)
4. Adult or pediatric patient with seizure [Also see **Seizures** guideline]
5. Adult or pediatric patient with symptoms of hyperglycemia (e.g. polyuria, polydipsia, weakness, dizziness)
6. Adult or pediatric patient with history of diabetes and other medical symptoms
7. Pediatric patient with suspected alcohol ingestion

Patient Care Goals

Limit morbidity from hypoglycemia and hyperglycemia by:

1. Describing appropriate use of glucose monitoring
2. Treating symptomatic hypoglycemia
3. Appropriate hydration for hyperglycemia

Patient Management Assessment

1. Monitoring:
 - Obtain point of care blood glucose level
2. Secondary survey pertinent to altered blood glucose level:
 - a. Constitutional: assess for tachycardia and hypotension
 - b. Eyes: assess for sunken eyes from dehydration
 - c. Nose /mouth/ears: assess for dry mucus membranes or tongue bite from seizure
 - d. Neurologic:
 - i. Assess GCS and mental status
 - ii. Assess for focal neurologic deficit: motor and sensory

Patient Safety Considerations

1. Dextrose 50% can cause local tissue damage if it extravasates from vein.
2. For children < 8 years of age, dextrose 10% should be used.

Key Considerations

1. Consider contribution of oral diabetic medications to hypoglycemia
2. If possible, have family/patient turn off insulin pumps
3. Consider potential for intentional overdose of hypoglycemic agents

Pertinent Assessment Findings

1. Concomitant trauma
2. Diaphoresis or hypothermia may be associated with hypoglycemia

Patient Care Goals

Bites, stings, and envenomations can come from a variety of insects, marine and terrestrial animals. There is a spectrum of toxins or envenomations with very limited EMS interventions.

1. Assure adequate ventilation, oxygenation and correction of hypoperfusion
2. Pain control which also includes limited external interventions to reduce pain

Adult Universal Care

Adult IV/IO

Consider an IV fluid bolus (normal saline)

20 ml/kg up to 2 liters

Consider vasopressors after adequate fluid resuscitation for the hypotensive patient

"push dose epinephrine"

Prepare 10 mcg/ml **Epinephrine 1:10,000** (1 ml) of to 9 ml NS; administer 10 mcg (1 ml) every 1 - 2 minutes as needed

If seizure, see **Seizures** guideline

Specific therapy for select bites, stings, or envenomation

- Envenomations that are known to have antivenin or antitoxin: e.g. black widow spider, certain scorpions, octopi, fanged snakes and lizards. For these envenomations, consider transport to hospital that has access to antivenin if feasible
- Jellyfish (Cnidarians): Scrape off any remaining tentacles or nematocysts, then immerse affected body part in hot water (113 °F/45 °C) or, for non-USA jellyfish, use vinegar (acetic acid) to reduce pain due to deactivation of the nematocysts
- Lionfish, scorpionfish, stingray: Immerse affected body part in hot water to reduce the pain associated with the toxin

Snakes and Spiders known to be in Northeast Ohio:

Eastern Massauga Rattlesnake, Timber Rattlesnake, Northern Copperhead, Brown Recluse Spider, Black Widow Spider

- WCH has Crofab- Antivenom for Snake Bites

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Bites, stings, and envenomations can come from a variety of marine and terrestrial animals and insects causing local or systemic effects. Patients may present with toxin specific reactions which may include:

1. Site pain
2. Swelling
3. Erythema
4. Discoloration
5. Bleeding
6. Nausea
7. Abdominal pain
8. Hypotension
9. Tachycardia
10. Tachypnea
11. Muscle incoordination
12. Confusion
13. Anaphylaxis/allergic reactions

There is a spectrum of toxins or envenomations and limited EMS interventions that will have any mitigating effect on the patient in the field. The critical intervention is to get the patient to a hospital that has access to the antivenin if applicable.

Patient Management**Assessment**

1. Assess ABCDs and if indicated expose and then cover to assure retention of body heat
2. Vital signs which include temperature
3. Apply a cardiac monitor, examine rhythm strip for arrhythmias, and consider obtaining a 12-lead EKG
4. Check blood glucose Level
5. Monitor pulse oximetry and ETCO₂ for respiratory decompensation
6. Patient pertinent history

Notes

Vinegar (acetic acid) has potential to increase pain associated jelly fish as it can increase nematocysts discharge. Use of vinegar should be avoided within the United States

Pertinent Assessment Findings

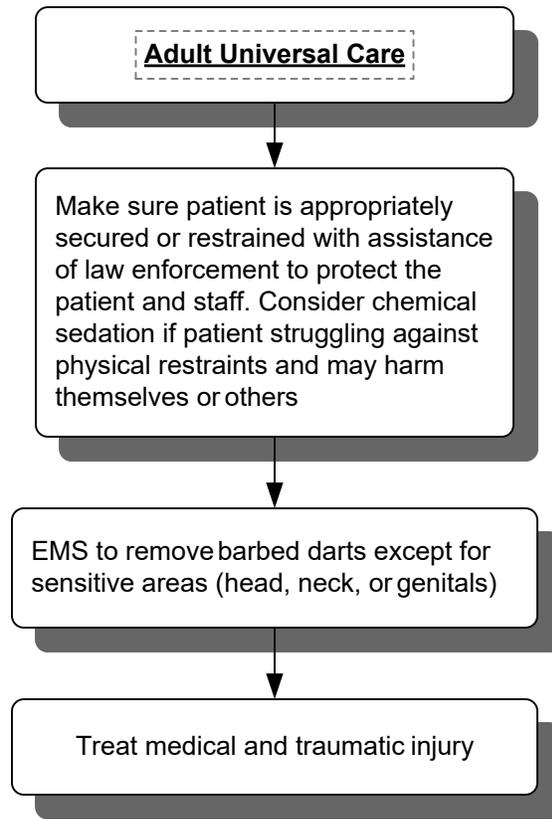
1. Assess for signs and symptoms of local and systematic impact of the suspected toxin
Patient may still have an imbedded stinger, tooth, nematocysts or barb which may continue to deliver toxin if left imbedded

Patient Safety Considerations

1. Do not perform any of the following:
 - a. Tourniquets, tight Ace/crepe bandage, or constricting bands above or below the site of the envenomation
 - b. Incision and/or suction
 - c. Application of cold packs (cryotherapy)
2. EMS providers should not try to capture the offending marine or terrestrial animal or insect
3. If the offending organism has been killed, beware that many dead insect, marine or fanged animals can continue to bite or sting with venom and should be safely placed in a hard sided and closed container for future identification
4. Patient may still have an imbedded stinger, tooth, nematocyst or barb which may continue to deliver toxin if left imbedded. Consider safe removal without squeezing the toxin delivery apparatus

Patient Care Goals

1. Manage the condition that triggered the application of the conducted electrical weapon with special attention to patients meeting criterion for excited delirium
2. Make sure patient is appropriately secured or restrained with assistance of law enforcement to protect the patient and staff
3. Perform comprehensive trauma and medical assessment as patients who have received conducted electrical weapon may have already been involved in physical confrontation
4. If discharged from a distance, two single barbed darts (13mm length) should be located. Do not remove barbed dart from sensitive areas (head, neck, hands, feet or genitals)



General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

1. Patient received either the direct contact discharge or the distance two barbed dart discharge of the conducted electrical weapon
2. Patient may have sustained fall or physical confrontation trauma
3. Patient may be under the influence of toxic substances and or may have underlying medical or psychiatric disorder

Patient Management

Assessment

1. Once patient has been appropriately secured or restrained with assistance of law enforcement, perform primary and secondary assessment including 3-lead EKG, pulse oximeter, and consider 12-lead EKG
2. Evaluate patient for evidence of excited delirium manifested by varied combination of agitation, reduced pain sensitivity, elevated temperature, persistent struggling, or hallucinosis

Pertinent Assessment Findings

Thoroughly assess the tased patient for trauma as the patient may have fallen from standing or higher. Ascertain if more than one TASER® cartridge was used (by one or more officers, in effort to identify total number of possible darts and contacts)

Patient Safety Considerations

1. Before removal of the barbed dart, make sure the cartridge has been removed from the conducted electrical weapon
2. Patient should not be restrained in the prone, face down or hog tied position as respiratory compromise is a significant risk
3. Conducted electrical weapon patient may have underlying pathology before being tased (refer to other guidelines for managing the underlying medical/traumatic pathology)
4. Perform a comprehensive assessment with special attention looking for to signs and symptoms that may indicate agitated delirium
5. Transport the patient to the hospital if they have concerning signs or symptoms
6. EMS providers who respond for a conducted electrical weapon patient should not perform a “medical clearance” for law enforcement

Notes

Conducted electrical weapon can be discharged in three fashions: direct contact without the use of the darts, a single dart with addition contact by direct contact of weapon or from a distance up to 35 feet with two darts. The device delivers 19 pulses per second with an average current per pulse of 2.1 milliamps which in combination with toxins/drugs, patient’s underlying diseases, excessive physical exertion, and trauma may precipitate arrhythmias, thus consider EKG monitoring and 12-lead EKG assessment

Drive Stun is a direct weapon two-point contact which is designed to generate pain and not incapacitate the subject. Only local muscle groups are stimulated with the Drive Stun technique

Drowning

Patient Care Goals

1. Rapid assessment and management of life-threatening injuries
2. Rescue from the water-based environment
3. Transport all patients suffering from drowning for hospital evaluation

Provide supplemental oxygen to maintain saturation $\geq 94\%$. Consider **positive pressure ventilation** in patients with signs or symptoms of respiratory difficulty

Adult Universal Care

Ensure scene safety for patient and rescuers. Remove patient from water as soon as possible. Practice the safest water rescue technique possible, given circumstances on scene. Evacuate to land or a water craft as soon as possible. If there is a delay to accessing shore or a rescue boat, initiate in-water basic life support consisting of ventilation only

Adult Airway Management

Follow cardiac arrest guideline as indicated with consideration of ABC strategy for drowning victims in cardiac arrest. Initiate 5 rescue breaths followed by 30 chest compressions. After the initial 5 breaths, use a 2 breaths to 30 compression ratio

If mechanism or history suggest cervical spine injury, manage c-spine

Consider hypothermia and treat per **Hypothermia/Cold Exposure** guideline

If the victim was involved in underwater diving with diving equipment and uncertainty exists regarding the most appropriate therapy, consider contacting direct medical oversight and discussing need for hyperbaric treatment. Include discussion regarding:

- a. Submersion time
- b. Greatest depth achieved
- c. Ascent rate

Adult Airway Management
Consider **CPAP**

Adult IV/IO
Fluid bolus as indicated

Cardiac Monitor

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Patients suffering from drowning or drowning events independent of presence or absence of symptoms.

Exclusion Criteria

Patients without history of drowning.

Patient Management**Assessment**

1. Follow general patient care guideline
2. History should include circumstances leading to the submersion, details of mechanism of injury, time under water, and water temperature (if available)
3. Primary survey should include aggressive airway management and restoration of adequate oxygenation and ventilation. Unlike the CAB strategy used in standard cardiac arrest, patients suffering cardiac arrest from drowning require an ABC approach with prompt airway management and supplemental breathing
4. History, mechanism of injury and exam should include consideration of possible c-spine injury. If evaluation suggests injury to the cervical spine, manage c-spine
5. Assess for other associated injury such as injury to the head or dive-related emergency

Patient Safety Considerations

1. Avoidance of hyperoxygenation of the drowning victim
2. Rescuer safety considerations

Notes

1. The World Health Organization definition of drowning is “the process of experiencing respiratory impairment from submersion/immersion in liquid”
2. Drowning is further defined in the following categories:
 - a. Non-fatal drowning – patients rescued from drowning
 - b. Fatal drowning – any death, acutely or subacutely, resultant from drowning
3. Submersion refers to situations in which the patient’s airway is underwater. Immersion refers to situations in which the patient’s body is in water but the patient’s airway remains out of the water
4. Drowning is a common cause of death in children. Risk factors for drowning include male gender, age less than 14 years old, alcohol use, lack of supervision, and risk behavior
5. Rescue efforts should be coordinated between all responding agencies to ensure patient is rapidly accessed and removed from the water
6. Initiation of in-water ventilations may increase survival. In-water chest compressions are futile
7. The European Resuscitation Council recommends 5 initial breaths be provided to the drowning victim. The initial ventilations may be more difficult to achieve as water in the airways may impede alveolar expansion. After the initial 5 breaths and 30 compressions, the standard ratio of 2 breaths to 30 compressions may be resumed
8. Active efforts to expel water from the airway (by abdominal thrusts or other means) should be avoided as they delay resuscitative efforts and increase the potential for vomiting and aspiration
9. Longstanding teaching has suggested that rescuers should always assume c-spine injury in victims of drowning. The 2010 American Heart Association update on special circumstances in cardiac arrest notes that routine c-spine precautions in all victims of drowning is likely unnecessary **unless** the mechanism or injury, history or physical exam suggests a cervical spine injury. Mechanisms of injury highly suggestive of cervical spine injury include diving, water skiing, surfing or watercraft accidents
10. Uncertainty exists regarding survival in cold water drowning, however, recent literature suggests the following:
 - a. If water temperature is less than 43° F (6° C) and the patient is submerged with evidence of cardiac arrest:
 - i. Survival is possible for submersion time less than 90 minutes and resuscitative efforts should be initiated
 - ii. Survival is not likely for submersion time greater than 90 minutes and providers may consider not initiating resuscitation or termination of resuscitation on scene
 - b. If water temperature is greater than 43° F (6° C) and the patient is submerged with evidence of cardiac arrest:
 - i. Survival is possible for submersion time less than 30 minutes and resuscitative efforts should be initiated
 - ii. Survival is not likely for submersion time greater than 30 minutes and providers may consider not initiating resuscitation or termination of resuscitation on scene
11. Patients may develop subacute respiratory difficulty after drowning and therefore all victims of drowning should be transported for observation

Patient Care Goals

1. Prevent additional harm to patient
2. Identify life threatening issues such as dysrhythmias and cardiac arrest
3. Identify characteristics of electrical source to communicate to receiving facility (voltage, amperage, alternating current (AC) versus direct current (DC))
4. Understand that deep tissue injury can be far greater than external appearance
5. Have high index of suspicion for associated trauma due to patient being thrown
6. Determine most appropriate disposition for the patient as many will require burn center care and some may require trauma center care

Adult Universal Care

Apply monitor to Identify dysrhythmias or cardiac arrest – even patients who appear dead (particularly dilated pupils) may have good outcomes with prompt intervention – see appropriate protocol for additional information

Immobilize if associated trauma suspected. See **Trauma** section guidelines
Apply dry dressing to any wounds

Remove constricting clothing and jewelry since additional swelling is possible

Adult IV/IO

Administer fluid resuscitation per burn protocol
Remember that external appearance will underestimate the degree of tissue injury

When there is significant associated trauma this takes priority, if local trauma resources and burn resources are not in the same facility

Electrical injury patients should be taken to a burn center whenever possible since these injuries can involve considerable tissue damage

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Exposure to electrical current (AC or DC)

Patient Management**Assessment**

1. Verify scene is secure. The electrical source must be disabled prior to assessment
2. Assess primary survey with specific focus on dysrhythmias or cardiac arrest. Apply a cardiac monitor
3. Identify all sites of burn injury. If the patient became part of the circuit, there will be an additional site near the contact with ground
 - a. Electrical burns are often full thickness and involve significant deep tissue damage
4. Assess for potential associated trauma and note if the patient was thrown from contact point
 - a. If patient has altered mental status, assume trauma was involved and treat accordingly
5. Assess for potential compartment syndrome from significant extremity tissue damage
6. Determine characteristics of source if possible – AC or DC, voltage, amperage and also time of injury

Pertinent Assessment Findings

1. Identification of potential trauma concomitant with electrical injury
2. Presence of cardiac dysrhythmias

Patient Safety Considerations

1. Verify no additional threat to patient
2. Shut off electrical power
3. Move patient to shelter if electrical storm activity still in area

Notes

1. Electrical current causes injury through three main mechanisms:
 - a. Direct tissue damage, altering cell membrane resting potential, and eliciting tetany in skeletal and/or cardiac muscles
 - b. Conversion of electrical energy into thermal energy, causing massive tissue destruction and coagulative necrosis
 - c. Mechanical injury with direct trauma resulting from falls or violent muscle contraction
2. Anticipate atrial and/or ventricular dysrhythmias as well as cardiac arrest
3. The mortality related to electrical injuries is impacted by several factors:
 - a. Route current takes through the body – current traversing the heart has higher mortality
 - b. Type of current: AC vs. DC
 - i. AC is more likely to cause cardiac dysrhythmias while DC is more likely to cause deep tissue burns however either type of current can cause any injury
 - ii. DC typically causes one muscle contraction while AC can cause repeated contractions
 - iii. Both types of current can cause involuntary muscle contractions that do not allow the victim to let go of the electrical source
 - iv. AC is more likely to cause ventricular fibrillation while DC is more likely to cause asystole
 - c. The amount of current impacts mortality more than the voltage

Current Level (Milliamperes)	Probable Effect on Human Body of 120 V, 60 Hz AC for 1 second
1 mA	Perception level, slight tingling sensation. Still dangerous if wet conditions.
5 mA	Slight shock felt; not painful but disturbing. Average individual can let go. However, strong involuntary reactions to shocks in this range may lead to injuries.
6 mA – 16 mA	Painful shock, begin to lose muscular control. Commonly referred to as the freezing current or "let-go" range.
17 mA – 99 mA	Extreme pain, respiratory arrest, severe muscular contractions. Individual cannot let go. Death is possible.
100 mA – 2,000 mA	Ventricular fibrillation (uneven, uncoordinated pumping of the heart.) Muscular contraction and nerve damage begins to occur. Death is likely.
> 2,000 mA	Cardiac arrest, internal organ damage, and severe burns. Death is probable.

Source: https://www.osha.gov/SLTC/etools/construction/electrical_incidents/eleccurrent.html

Frostbite

Patient Care Goals

1. Maintain hemodynamic stability
2. Prevent further heat loss
3. Aggressive management of cardiac arrest
4. Prevent loss of limbs

Adult Universal Care

If the patient has evidence of frostbite, and ambulation/travel is necessary for evacuation or safety, avoid rewarming of extremities until definitive treatment is possible. Additive injury occurs when the area of frostbite is rewarmed then inadvertently refrozen. Only initiate rewarming if refreezing is absolutely preventable

If rewarming is feasible and refreezing can be prevented use circulating warm water (98.6 - 102° F/37 - 39° C) to rewarm effected body part, thawing injury completely. If warm water is not available, rewarm frostbitten parts by contact with non-affected body surfaces. Do not rub or cause physical trauma

After rewarming, cover injured parts with loose sterile dressing. If blisters are causing significant pain, and the provider is so trained, these may be aspirated, however, should not be de-roofed. Do not allow injury to refreeze.
Follow the **Adult Pain Control** guideline

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Cooling and rehydration
2. Mitigate high risk for decompensation
3. Mitigate high risk for agitation and uncooperative behavior

Adult Universal Care

- Move victim to a cool area and shield from the sun or any external heat source
- Remove as much clothing as is practical and loosen any restrictive garments
- If alert and oriented, give small sips of cool liquids

If altered mental status, check **Blood Glucose** level

Maintain airway vigilance for emesis, seizure

Place on **Cardiac Monitor** and record ongoing vital signs and level of consciousness

If temperature is > 104 degrees F (40 degrees C) or if altered mental status is present, begin active cooling by:

- Continually misting the exposed skin with tepid water while fanning the victim (most effective)
- Truncal ice packs may be used, but are less effective than evaporation
- Shivering should be treated as soon as possible
- Ice bath immersion provides the most rapid cooling mechanism but may not be available to EMS

Adult IV/IO

- Establish IV access for heat stroke
- Give cool fluids at **20 ml/kg** boluses and reduce to 10 ml/kg/hr boluses when vitals are stable
- Monitor for shivering and seizures; treat as below

Consider 500 ml normal saline IV fluid bolus for dehydration even if vital signs are normal If uncontrolled shivering occurs during cooling:

Midazolam (Versed): 2.5 mg IVP, IN may repeat once in 5 minutes or; 5 mg IM may repeat once in 10 minutes

General

EMR

EMT

AEMT

Paramedic

Definitions:

1. **Heat cramps** are minor muscle cramps usually in the legs and abdominal wall. Temperature is normal
2. **Heat exhaustion** has both salt and water depletion usually of a gradual onset. As it progresses tachycardia, hypotension, elevated temperature, and very painful cramps occur. Symptoms of headache, nausea and vomiting occur. Heat exhaustion can progress to heat stroke
3. **Heat stroke** occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and/or electrolyte imbalances. Temperature is usually > 104 F. When no thermometer is available, it is distinguished from heat exhaustion by altered level of consciousness

Patient Presentation

Inclusion Criteria

1. Heat cramps
2. Heat exhaustion
3. Heat stroke
4. Stimulant drug abuse
5. Excited delirium (see also **Agitated or Violent Patient/Behavioral Emergency** guideline)

Exclusion Criteria

1. Fever from infectious or inflammatory conditions
2. Malignant hyperthermia
3. Neuroleptic malignant syndrome

Patient Management Assessment

1. Patient assessment:
 - a. Age
 - b. Oral intake
 - c. Medications
 - d. Alcohol
 - e. Illicit drugs
 - f. Overdose
 - g. Withdrawal risk
2. Environmental assessment:
 - a. Ambient temperature and humidity
 - b. Exertion level
 - c. Length of time at risk
 - d. Attire (clothing worn)
 - e. Children left in cars with evidence of altered mental status and elevated body temperature are likely suffering from hyperthermia
3. Associated symptoms:
 - a. Cramps
 - b. Headache
 - c. Orthostatic symptoms
 - d. Nausea
 - e. Weakness
4. Vital signs:

Temperature: usually 104 degrees Fahrenheit or greater (if thermometer available)
5. Mental status:
 - a. Confusion
 - b. Coma
 - c. Seizures
 - d. Psychosis
6. Skin:
 - a. Flushed and hot
 - b. Dry or sweaty
 - c. Signs of first or second degree burns from sun exposure
7. Other signs of poor perfusion/shock

Notes

1. Patients at risk for heat emergencies include neonates, infants, geriatric patients, and patients with mental illness
2. Contributory risk factors may come from:
 - a. Prescription and over-the-counter herbal supplements
 - b. Cold medications
 - c. Heart medications
 - d. Diuretics
 - e. Psychiatric medications
 - f. Drug abuse
 - g. Accidental or intentional drug overdose
3. Heat exposure can occur either due to increased environmental temperatures or prolonged exercise or a combination of both. Environments with temperature > 90° F and humidity > 60% present the most risk
4. Heat stroke is associated with cardiac arrhythmias independent of drug ingestion/overdose. Heat stroke has also been associated with cerebral edema
5. Do not forget to look for other causes of altered mental status such as low blood glucose level
6. Controversy: shivering is thought to worsen outcomes in treating heat stroke. It is controversial about whether to stop active cooling if shivering occurs and ALS care with IV access and anti-shivering drugs are not available. Risk of shivering versus risk of stopping active cooling must be weighed by the team. Research does not demonstrate the value of one benzodiazepine over another in shivering patients
7. Hyperthermia not from environmental factors has a differential that includes the following:
 - a. Fever and delirium
 - b. Hyperthyroid storm
 - c. Delirium tremens (DTs)
 - d. CNS lesion or tumor
 - e. Adverse drug event: neuroleptic malignant syndrome, malignant hyperthermia
8. There is no evidence supporting EMS utilizing orthostatic vital signs

Pertinent Assessment Findings

1. Warning signs: fever, altered mental status
2. Blood glucose level for AMS

- Patient Care Goals**
1. Maintain hemodynamic stability
 2. Prevent further heat loss
 3. Aggressive management of cardiac arrest
 4. Prevent loss of limbs

Adult Universal Care

Maintain patient and rescuer safety. The patient has fallen victim of cold injury and rescuers have likely had to enter the same environment. Maintain rescuer safety by preventing cold injury to rescuers

Adult Airway Management

Mild Hypothermia

In Mild Hypothermia: Core Temperature of 92-96 degree F

- a. Remove the patient from the environment and prevent further heat loss by removing wet clothes and drying skin, insulate from the ground, shelter the patient from wind and wet conditions and insulate the patient with dry clothing or a hypothermia wrap/blankets, cover the patient with a vapor barrier and, if available, move the patient to a warm environment
- b. Hypothermic patients have decreased oxygen needs and may not require supplemental oxygen. If oxygen is deemed necessary, it should be warmed, to a maximum temperature between 104-108° F (40-42° C) and humidified if possible
- c. Provide beverages or foods containing glucose if feasible and patient is awake and able to manage airway independently.
- d. Vigorous shivering can substantially increase heat production. Shivering should be fueled by caloric replacement
- e. Consider field-rewarming methods such as placement of large heat packs or heat blankets (chemical or electric if feasible) to the anterior chest or wrapped around the patient's thorax if large enough. Forced air warming blankets (e.g. Bair Hugger®) can be an effective field rewarming method if available
- f. Monitor frequently. If temperature or level of consciousness decreases, refer to severe hypothermia, below

- g. Consider **IV access**. Indications for IV access and IV fluids in the mildly hypothermic patient are similar to those of the non-hypothermic patient. IV fluids, if administered, should be warmed, ideally to 42° C. Bolus therapy is preferable to continuous drip. The recommended fluid for volume replacement in the hypothermic patient is normal saline
- h. If alterations in mental status, consider measuring finger stick blood glucose and treat as indicated (follow **Hypoglycemia/Hyperglycemia** guideline) and assess for other causes of alterations of mentation

Transport to a hospital capable of rewarming the patient

General

EMR

EMT

AEMT

Paramedic

- Patient Care Goals**
1. Maintain hemodynamic stability
 2. Prevent further heat loss
 3. Aggressive management of cardiac arrest
 4. Prevent loss of limbs

Adult Universal Care

Maintain patient and rescuer safety. The patient has fallen victim of cold injury and rescuers have likely had to enter the same environment. Maintain rescuer safety by preventing cold injury to rescuers

Adult Airway Management

Moderate/Severe Hypothermia

In Moderate or Severe Hypothermia: Moderate: 88-92 degrees F Severe: < 88 degrees F

- a. Perform ABCs. Pulse checks for patients suffering hypothermia should be performed for 60 seconds. Obtain core temperature if possible for patients exhibiting signs or symptoms of moderate/severe hypothermia. Core temperatures are best measured by esophageal probe, if one is available and the provider has been trained in its insertion and use. If esophageal temperature monitoring is not available or appropriate, epitympanic or rectal temperatures should be used. Of note, rectal temperatures are not reliable or suitable for taking temperatures in the field and should only be done in a warm environment (such as a heated ambulance)
- b. Manage airway as needed. Care must be taken not to hyperventilate the patient as hypocarbia may reduce the threshold for ventricular fibrillation in the cold patient. Indications and contraindications for advanced airway devices are similar in the hypothermic patient as in the normothermic patient
- c. Prevent further heat loss using the above methods
- d. Initiate field-rewarming methods such as placement of large heat packs or heat blankets (chemical or electric if feasible) to the anterior chest or wrapped around the patient's thorax if large enough. Forced air warming blankets (e.g. Bair Hugger®) can be an effective field rewarming method if available
- e. Handle the patient gently. Attempt to keep the patient in the horizontal position, especially limiting motion of the extremities to avoid increasing return of cold blood to the heart. Once in a warm environment, clothing should be cut off (rather than removed by manipulating the extremities). Move the patient only when necessary such as to remove the patient from the elements

Apply **Cardiac Monitor** or **AED** if available

Establish IV and provide warmed NS bolus. Repeat as necessary
 If alterations in mental status, consider measuring finger stick blood glucose and treat as indicated (follow **Hypoglycemia/Hyperglycemia** guideline) and assess for other causes of alterations of mentation

Transport as soon as possible to a hospital capable of aggressive resuscitation. If cardiac arrest develops consider transport to a center capable of extracorporeal circulation (if feasible)

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Patients may suffer from hypothermia from exposure to a cold environment (increased heat loss) or may suffer from a primary illness or injury that, in combination with cold exposure (heat loss in combination with decreased heat production), leads to hypothermia. Patients may suffer systemic effects from cold (hypothermia) or localized effects, such as in frostbite. Patients with mild hypothermia will have normal mental status, shivering and may have normal vital signs while patients with moderate to severe hypothermia will manifest mental status changes, eventual loss of shivering and progressive bradycardia, hypotension, and decreased respiratory status. Patients with frostbite will develop numbness involving the affected body part along with a “clumsy” feeling along with areas of blanched skin. Later findings include a “woody” sensation, decreased or loss of sensation, bruising or blister formation, or a white and waxy appearance to affected tissue

Inclusion Criteria

Patients suffering systemic or localized cold injuries

Exclusion Criteria

Patients without cold exposure, or patients with cold exposure but no symptoms referable to hypothermia or frostbite

Patient Safety Considerations

1. Given the additive effects of additional cold stress, the patient should be removed from the cold environment as soon as operationally feasible.
2. In patients suffering from moderate to severe hypothermia, it is critical to not allow these patients to stand or exercise as this may cause circulatory collapse.

Patient Management

Assessment

1. Patient assessment should begin with attention to the primary survey, looking for evidence of circulatory collapse and ensuring effective respirations. The patient suffering from moderate or severe hypothermia may have severe alterations in vital signs including weak and extremely slow pulses, profound hypotension and decreased respirations. The rescuer may need to evaluate the hypothermic patient for longer than the normothermic patient (up to 60 seconds)
2. History – Along with standard SAMPLE-type history, additional patient history should include attention to any associated injury or illness, duration of cold exposure, ambient temperature, and treatments initiated before EMS arrival
3. There are several means to categorize the severity of hypothermia based on either core body temperature readings or clinical evaluation. If possible and reliable, EMS providers should perform core body temperature measurements and categorize patients into one of the three follow levels of hypothermia:
 - a. Mild – temperature ranges on previous pages
 - b. Moderate - temperature ranges on previous pages
 - c. Severe - temperature ranges on previous pages
4. Equally important is the patient’s clinical presentation and the signs or symptoms the patient is experiencing.

The above temperature based categorization should be balanced against these clinical findings

- a. Mild - vital signs not depressed normal mental status, shivering is preserved. Body maintains ability to control temperature
- b. Moderate/Severe – progressive bradycardia, hypotension and decreased respirations, alterations in mental status with eventual coma, shivering will be lost in moderate hypothermia (generally between 31-30° C), and general slowing of bodily functions. The body loses ability to thermo-regulate

Notes

Considerations in cardiac arrest

1. The mainstay of therapy in severe hypothermia and cardiac arrest should be effective chest compressions and attempts at rewarming
2. The temperature at which defibrillation should first be attempted in the severely hypothermic cardiac arrest victim and the number of defibrillation attempts is unclear. There are different approaches regarding resuscitation of the hypothermic arrest patient. Per the American Heart Association, if the patient has a shockable rhythm (VF/VT), defibrillation should be attempted. It is reasonable to continue defibrillation attempts per AHA protocols concurrently with rewarming strategies. The state of Alaska's 2014 guidance on management of hypothermic patients in cardiac arrest advises that defibrillation should be attempted once, followed by 2 minutes of chest compressions, then rhythm and pulse checks. If defibrillation is unsuccessful and the patient's core temperature is $< 30^{\circ}\text{C}$ (86°F), do not make further attempts at defibrillation until the core temperature has increased to $> 30^{\circ}\text{C}$ (86°F). Continue CPR and attempt to rewarm the patient. If defibrillation is unsuccessful and the patient's core temperature is $> 30^{\circ}\text{C}$, (86°F), follow guidelines for normothermic patients. It is noted that the likelihood of successful defibrillation increases with every one-degree increase in temperature. If available monitors reveal asystole, CPR alone is the mainstay of therapy. If monitoring reveals an organized rhythm (other than VF or VT), but no pulses are detected, do not start CPR, but continue to monitor. While this may represent Pulseless Electrical Activity (PEA), this may also represent situations in which the patient's pulses are not detectable, but remain effective due to decreased metabolic needs. In the case of PEA, the rhythm will deteriorate rapidly to asystole, in which case, CPR should be initiated. Given the potential to cause VF with chest compressions, the AK guidance offers that it is better to maintain effective cardiac activity than to start CPR and cause VF
3. Manage the airway per standard care in cardiac arrest victims. (see cardiac arrest guideline)
4. There is little evidence to guide use of medications in severe hypothermia with cardiac arrest, however 2010 AHA updates to advanced cardiac life support recommend use of vasopressors according to standard ACLS protocols while the Alaska 2014 guidelines for the management of hypothermic patients advises medications should be withheld until the patient's core temperature is $> 30^{\circ}\text{C}$ (86°F). Above 30°C , intervals between medication provision should be doubled until the patient reaches 35°C , at which time, normal medication intervals may be adopted
5. Upon ROSC, follow the **Adult Post-ROSC** guideline
6. Patients with severe hypothermia and arrest may benefit from resuscitation even after prolonged downtime, and survival with intact neurologic function has been observed even after prolonged resuscitation. Patients should not be considered deceased until aggressive rewarming has been attempted
7. If a hypothermic patient clearly suffered cardiac arrest and subsequently became hypothermic afterward with prolonged down time between arrest and rescue, there is no rationale for initiating resuscitation and warming the patient
8. The following are contraindications for initiation of resuscitation in the hypothermic patient:
 - a. Submersion for greater than one hour
 - b. Core temperature less than 50°F
 - c. Obvious fatal injuries (such as decapitation)
 - d. The patient exhibits signs of being frozen (such as ice formation in the airway)
 - e. Chest wall rigidity such that compressions are impossible
 - f. Danger to rescuers or rescuer exhaustion

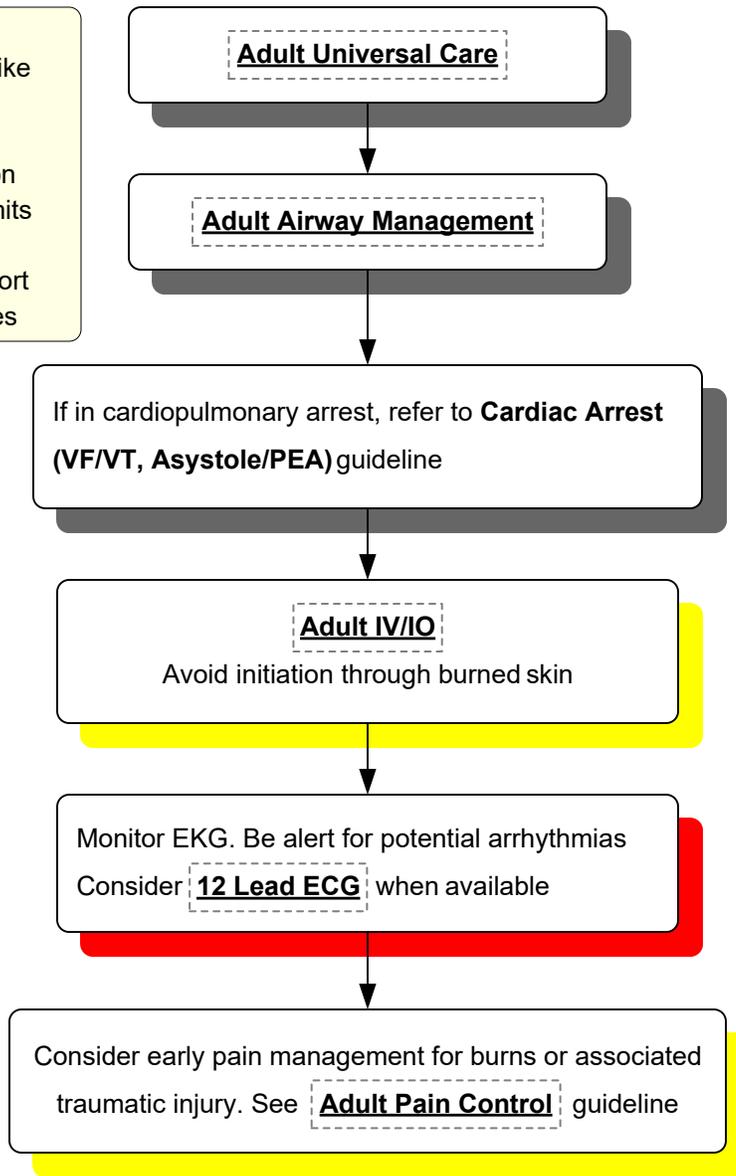
Pertinent Assessment Findings

1. Identification of associated traumatic injuries (when present)
 2. Identification of localized freezing injuries
- Patient core temperature (when available)

Lightning Strike Injury

Patient Care Goals

1. Identify patient(s) as lightning strike victim(s)
2. Move to safe area
3. Initiate immediate resuscitation on cardiac arrest victim(s), within limits of mass casualty care
4. Cardiac monitoring during transport
5. Treat associated traumatic injuries



General

EMR

EMT

AEMT

Paramedic

Patient Presentation

1. Lightning strikes may happen in a variety of environmental conditions. Most commonly they occur in outdoor or wilderness circumstances. Golf courses, exposed mountains or ledges and farms/fields all present conditions that increase risk of lightning strike, when hazardous meteorological conditions exist
2. Lacking bystander observations or history, it is not always immediately apparent that patient has been the victim of a lightning strike. Subtle findings such as injury patterns might suggest lightning injury

Inclusion Criteria

Patients of all ages who have been the victim of lightning strike injury

Patient Management**Assessment**

1. Cardiovascular
 - a. Dysrhythmias
 - b. Transient hypertension
2. Respiratory
 - a. Apnea
 - b. Agonal respirations
 - c. Respiratory paralysis
3. Neurologic
 - a. Seizures
 - b. Confusion
 - c. Paralysis
 - d. Paraplegia
 - e. Vertigo/dizziness
 - f. Parasthesias
 - g. Amnesia
 - h. Memory deficits
 - i. Anxiety
4. EENT

Fixed/dilated pupils possible (autonomic dysfunction)
5. Skin
 - a. Ferning or fern-like superficial skin burn ("Lichtenberg figures")
 - b. Vascular instability may result in cool, mottled extremities
 - c. Frequent first and/or second degree burns
 - d. Third degree burns less common
6. Patient may be in full cardiopulmonary arrest or have only respiratory arrest, as injury is a result of DC current
7. May have stroke-like findings as a result of neurologic insult
8. May have secondary traumatic injury as a result of overpressurization, blast or missile injury.
9. Fixed/dilated pupils may be a sign of neurologic insult, rather than a sign of death/impending death. Should not be used as a solitary, independent sign of death for the purpose of discontinuing resuscitation in this patient population

Patient Safety Considerations

1. Recognize that repeat strike is a risk. Patient **and** rescuer safety is paramount
2. Victims do **not** carry or discharge a current, so the patient is safe to touch and treat

Notes

1. Lightning strike cardiopulmonary arrest patients have a high rate of successful resuscitation, if initiated early, in contrast to general cardiac arrest statistics
2. There may be multiple victims
3. If multiple victims, cardiac arrest patients whose injury was witnessed or thought to be recent should be treated first and aggressively (reverse triage)
4. It may not be immediately apparent that the patient is a lightning strike victim
5. Injury pattern and secondary physical exam findings may be key in identifying patient as a victim of lightning strike
6. Lightning strike is a result of very high voltage, very short duration DC current exposure

Pertinent Assessment Findings

1. Presence of thermal or non-thermal burns
2. Evidence of trauma
3. Evidence of focal neurologic deficits

Patient Care Goals

1. Rapid assessment and management of life-threatening injuries
2. Rescue from the water-based environment
3. Transport patients suffering from SCUBA diving injury/illness for hospital evaluation and consideration of repressurization/hyperbaric oxygen therapy (HBOT)

Adult Universal Care

If SCUBA accident includes associated drowning/near-drowning, see: **Drowning** guideline

Adult Airway Management

1. If air embolism suspected, place in left lateral recumbent position
2. Monitor **vital signs** including oxygen saturations
3. If O2 saturations are less than 92%, provide supplemental oxygen to maintain saturations $\geq 94\%$. Use positive pressure ventilation (e.g. **CPAP**) carefully in patients for whom pulmonary barotrauma is a consideration

Patients with symptoms suspicious for decompression illness (DCI), should be placed on supplemental oxygen regardless of saturations to enhance washout of inert gasses

Consider contacting direct medical oversight and discussing need for hyperbaric treatment and primary transport to facility with HBOT capability. Include discussion regarding factors such as submersion time, greatest depth achieved, ascent rate

Adult IV/IO

Fluid bolus as indicated

Cardiac Monitor

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

Patients with recent history of SCUBA diving exhibiting potential signs and/or symptoms of dive related illness/injury, regardless of dive table compliance

Exclusion Criteria

Patients without history of recent SCUBA diving exposure

Patient Management

Assessment

1. Follow **Universal Care** guideline
2. History should include circumstances leading to the complaint, details of mechanism of injury, time under water, and water temperature (if available)
3. Be alert for signs of pulmonary injury (e.g. unequal or abnormal lung sounds, subcutaneous emphysema)
4. Assess for other associated injury such as injury to the head or spine, if mechanism and symptoms suggest

Patient Safety Considerations

1. If patient still in the water, seek safest and most rapid means of removal (within your scope of training)
2. Seek assistance early for special rescue/extrication needs
3. Check for multiple patients (e.g. group dive table calculation error(s) or contaminated dive gases)

Pertinent Assessment Findings

1. Vital signs findings
2. Neurologic status assessment findings
3. Respiratory assessment findings (e.g. oxygen saturation, respiratory rate)
4. Subcutaneous emphysema

Notes

1. Rescue efforts should be coordinated between all responding agencies to ensure patient is rapidly accessed and removed from the water if diver unable to do so himself/herself
2. If air medical transport necessary, patient should be transported in cabin pressurized to lowest possible altitude. If transported in unpressurized aircraft (e.g. most helicopter (HEMS) services), patient should be flown at the lowest safe altitude possible
3. Decompression illness may have a variety of presentations depending on system affected (e.g. skin, joint(s), pulmonary, neurologic)
4. SCUBA accidents/incidents can result in a variety of issues, including barotrauma, air embolism and decompression illness (DCI)

General

EMR

EMT

AEMT

Paramedic

Adult Universal Care

Secure Airway

Oxygen

as needed to treat shock and/or respiratory distress

Apply **Pulse Oximetry**

Evaluate patient's general appearance, relevant history of condition and determine:

Onset	Allergies
Provokes	Medication
Quality	Past Medical History – especially, recent surgery, any abnormal ingestion, previous trauma, related medical diseases
Radiates	
Severity	
Time	Last Meal
Interventions	Events leading to present illness

Assess additional associated signs and symptoms:

1. Nausea / vomiting blood or coffee grounds
2. Constipation / diarrhea - black, tarry or bloody bowel movements
3. Problems with urination
4. Menstrual abnormality
5. Fever
6. Tenderness, rigidity, and presence or absence of bowel sounds
7. Cardiac associated symptoms: Dyspnea, Diaphoresis, SOB

Transport in position of comfort, preferable supine with knees flexed, unless there is respiratory distress.
Give nothing by mouth.

Adult IV/IO

Fluid bolus to maintain a systolic blood pressure ≥ 100 .
MAP > 65 mmHg

Monitor ECG during transport.

12 Lead ECG

for Upper Abdominal Pain

For nausea, consider administration of **Ondansetron (Zofran)** 4 mg IV, IM, PO
May repeat in 10 min. x 1 additional dose

For a patient with a history of kidney stones, flank pain, and the source of the pain is strongly suspected to be recurrent kidney stones, consider **Ketorlac (Toradol)** 30 mg IVP or 60 mg IM
(Do not use Toradol if the patient has an allergy to aspirin).
NSAIDS or has a history of renal failure

General Considerations

A. It is important to remember that abdominal pain can be caused by a large number of different disease processes. The organ systems that may be involved in abdominal pain include, esophagus, stomach, intestinal tract, liver, pancreas, spleen, kidneys, male and female genital organs, bladder, as well as referred pain from the chest that can involve the heart, lungs or pleura. Abdominal pain may also be caused by muscular and skeletal problems.

B. There are a limited number of problems that present with abdominal pain that are life threatening or may become life threatening.

1. Myocardial Infarction
2. Perforated stomach, gallbladder, or bowel
3. Gastrointestinal bleeding with pain - usually due to an ulcer
4. Hemorrhagic pancreatitis
5. Appendicitis
6. Diabetic ketoacidosis
7. Ruptured esophagus (this usually presents with chest pain)
8. Dissecting or ruptured abdominal aortic aneurysm
9. Certain toxic mushrooms ingestion and other toxic ingestion
10. Ectopic pregnancy

C. Abdominal pain emergencies are likely to lead to death due to blood or fluid loss with resultant shock. There may also be severe electrolyte abnormalities that can cause arrhythmias.

Myocardial Infarction may present as abdominal pain especially in the diabetic and elderly.

Nausea/Vomiting

Patient Care Goals

Decrease discomfort secondary to nausea and vomiting

Adult Universal Care

History and physical examination focused on potential causes of nausea and vomiting (e.g. gastrointestinal, cardiovascular, gynecologic)

Isopropyl Alcohol (Alcohol Prep) 2 - 3 breathes in nose and out mouth every 15 minutes

Ondansetron (Zofran)

4 mg IV, IM or 4 mg PO
May repeat x 1 in 10 minutes

Promethazine (Phenergan)

12.5 - 25 mg IV, IM MAX Dose 50 mg

Adult IV/IO

Consider Normal Saline bolus of 500 ml unless contraindicated (e.g. h/o CHF, renal failure)

- May repeat as indicated
- Consider 10 - 20 ml/kg IV fluid unless contraindicated

General

EMR

EMT

AEMT

Paramedic

Notes

1. Ondansetron is preferred in children for the treatment of nausea and vomiting.
2. Prochlorperazine and metoclopramide have an increased risk of dystonic reactions. Some phenothiazines also have an increased risk of respiratory depression when used with other medications that cause respiratory depression, and some phenothiazines can cause neuroleptic malignant syndrome
3. IV form of ondansetron may be given PO in same dose
4. For dystonia/akathisia induced by an anti-emetic administer diphenhydramine:
 - a. Adult: 25 IVP 50 mg IM
 - b. Pediatric: 1-2 mg/kg IV/IM/PO (maximum 25 mg IV, 50 mg IM)
5. Nausea and vomiting are symptoms of illness – in addition to treating the patient's nausea and vomiting a thorough history and physical are key to identifying what may be a disease in need of emergent treatment (e.g. bowel obstruction, myocardial infarction, pregnancy)

Pertinent Assessment Findings

1. Vital signs
2. Risk factors for heart disease/EKG if applicable
3. Pregnancy status
4. Abdominal exam

Patient Presentation

Inclusion criteria

Currently nauseated and/or vomiting

Exclusion Criteria

No specific recommendations

Patient Safety Consideration

Although less common than with other anti-emetics, dystonic and extrapyramidal symptoms are possible in response to ondansetron administration

IV Therapy

- administer fluids
 - administer medications
- To minimize the risk of complications use:
- Proper choice of equipment
 - careful choice of IV site
 - good insertion technique
 - aseptic preparation of infusions

Venipuncture Technique

- Inform patient of IV insertion.
- Use aseptic technique
- Assessment of patient and equipment
- Venipuncture technique
- Dressings and maintenance of safety
- Instructions to patient
- Documentation

Adult Universal Care

Assess need for IV

Emergent or potentially emergent medical or trauma condition

Peripheral IV

No more than 2 - 3 attempts

All IV infusions should be TKO unless addressed by specific algorithm

Normal Saline 0.9%

Unsuccessful & Critical

Intraosseous Information

Intraosseous Insertion

for life-threatening event

Successful

Monitor infusion, see:

IV Therapy Documentation

Non-Traumatic Hypotension?

See:

Hypotension/Shock (Non-Trauma) Part A

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

- 1. Identify treatable causes
- 2. Protect patient from harm

Adult Universal Care

Stroke Tool

Oxygen as appropriate
Pulse Oximetry measurement
 maintain O2 saturation \geq 94%

Obtain **Blood Glucose**
 See: **Hypoglycemia/Hyperglycemia** guideline for treatments

Naloxone (Narcan)
 See: **Opioid Poisoning/Overdose** guideline for treatments if suspected

Restraint: physical and chemical see:
Agitated/Violent Patient guideline for treatments if suspected

Anti-dysrhythmic medication see: **Cardiovascular Section** guidelines for specific dysrhythmia guidelines for treatments

Active cooling or warming see:
Hypothermia/Cold Exposure or **Hyperthermia/Heat Exposure** guidelines for treatments

Adult IV/IO
 See: fluid administration doses in **Shock** and **Hypoglycemia/Hyperglycemia** guidelines

General

EMR

EMT

AEMT

Paramedic

Notes

1. History from bystanders
2. Age of the patient
3. Environment where patient found
4. Recent complaints (e.g. headache, chest pain, difficulty breathing, vomiting, fever)
5. Pill bottles/medications: anti-coagulants, anti-depressants, narcotic pain relievers, benzodiazepines
6. Medical alert tags and accessory medical devices
7. Toddlers should be evaluated for reduced PO intake and/or vomiting and/or diarrhea as a cause of AMS

Pertinent Assessment Findings

1. Track marks
2. Breath odor
3. Skin temperature
4. Location

Patient Presentation**Inclusion criteria**

Impaired decision-making capacity

Exclusion criteria

Traumatic brain injury

Patient Safety Considerations

With depressed mental status, initial focus is on airway protection, oxygenation, ventilation, and perfusion. The violent patient may need chemical and/or physical restraint to insure proper assessment and treatment. Hypoglycemic and hypoxic patients can be irritable and violent (see **Agitated or Violent Patient/Behavioral Emergency** guideline)

Patient Assessment

Look for treatable causes of altered mental status:

1. Airway: make sure airway can remain patent; reposition patient as needed
2. Breathing: look for respiratory depression; check SPO₂, ETCO₂, and CO detector readings
3. Circulation: look for signs of shock
4. Glasgow Coma Score and/or AVPU
5. Pupils
6. Neck rigidity or pain with range of motion
7. Stroke tool
8. Blood glucose level
9. EKG: arrhythmia limiting perfusion
10. Breath odor: possible unusual odors include alcohol, acidosis, ammonia
11. Chest/Abdominal: intra-thoracic hardware, assist devices, abdominal pain or distention
12. Extremities/skin: track marks, hydration, edema, dialysis shunt, temperature to touch (or if able, use a thermometer)
13. Environment: survey for pills, paraphernalia, ambient temperature

Patient Care Goals
 To stop or slow nasal source hemorrhage.

Adult Universal Care

Definition
 Nasal source hemorrhage, both anterior and posterior.

Patient Presentation

1. If significant traumatic cause, refer to Trauma section.
2. Spontaneous/minor trauma: picking or blowing of the nares.

Patient Management

1. History: Age, PMHX, meds, previous episodes, duration and quantity of blood (estimate).
2. Physical: vital signs (BP may be cause or effect), side bleeding (or if both sides, which side started) and any nausea and/or vomiting.

Oxymetazoline (Afrin)

1 - 2 sprays in effected nostril
 Leave Bottle with patient after use.

See: **Epistaxis (Nosebleed)** Procedure

General

EMR

EMT

AEMT

Paramedic

Emerging Infectious Disease (suspected COVID-19)

Non-Transport guidance to reduce exposure and spread

History

- Flu-like illness

Signs and Symptoms

- Fever greater than 100.4°F
- Rhinorrhea/nasal congestion
- Productive cough
- Chills
- Weakness and/or flu-like symptoms
- Body aches

Differential

- Cancer / tumors / lymphomas
- Medication or drug reaction
- Hyperthyroidism
- Heat-related emergency
- Meningitis
- Bacterial infection

Communications Center indicates positive CoVID-19
Or
High suspicion of CoVID-19

Exit to the appropriate protocol

Yes

No

PPE must protect from droplet/fluid contamination

Universal precautions with proper PPE required.

- N95 mask, Impermeable gown, gloves, eye protection
- Limit patient contact to one provider only if at all possible.
- All providers should attempt to maintain a distance of 6 feet or more from the patient when feasible and does not interfere with indicated patient care

Perform assessment:

- Age less than 50 years old
- Respiratory rate between 8 and 20 bpm
- Pulse oximetry greater than 94% on room air
- Heart rate less than 100 bpm
- Systolic BP greater than 100 mmHg
- Fever greater than 100.4°F
- One or more viral symptoms present (cough, fever, nasal/chest congestion, sore throat, body aches)

B

No

Do ALL criteria above apply?

Yes

Does the patient report:

- Chest pain, or
- Shortness of breath, or
- Syncope

No

Yes

Exit to the appropriate protocol

Destination Guidelines

If the patient is transported to the hospital

- **Radio report:** The driver should contact the hospital's EC before leaving the scene. Call **Wooster Community Hospital ED** at **(330) 263-8442**. Provide a basic report to the hospital with suspected illness, vital signs, treatments..
- **At destination:** The driver will make contact with the hospital staff while the patient/primary provider remains in the unit.
- Once patient has been cleared from the ambulance, carefully remove PPE and discard in the waste container in the patient's room by the door.
- **Ambulance cleaning:** Carefully clean/disinfect the ambulance and any surfaces contacted by the patient or provider before returning to service.

If patient consents to non-transport:

- Highest EMT certification must assume care.
- Hand COVID-19 packet to patient.
- Discuss non-transport, self quarantine, and when to seek care following checklist (see PEARLs).
- Patient must make this decision on own, appears to be competent to make this decision, and has a appropriate support system in place in case EMS needs to be called on patient's behalf (see PEARLs).

Transport or contact Medical Control if patient does not meet criteria.

Patient Care Goals

The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. One of the most essential missions for all healthcare providers should be the relief and/or prevention of pain and suffering. Approaches to pain relief must be designed to be safe and effective in the organized chaos of the prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the rapidity of care

Adult Universal Care

Oxygen as appropriate

Pulse Oximetry measurement
maintain O2 saturation \geq 94%

Determine patient's pain score assessment using standard pain scale.
Self-report scale (**Numeric Rating Scale (NRS)**)

Cardiac Monitor
per patient assessment

1. If available, consider use of non-pharmaceutical pain management techniques
 - a. Placement of the patient in a position of comfort
 - b. Application of ice packs and/or splints for pain secondary to trauma Verbal reassurance to control anxiety

Adult IV/IO

Fluid bolus if appropriate

Non-Narcotic Option:

Acetaminophen (Tylenol)
650 mg **Maximum** PO

If not improved, consider use of analgesics

Fentanyl (Sublimaze) 1 mcg/kg IVP, IN or IM **Maximum 100 mcg**

Ketorlac (Toradol) 30 mg IVP or 60 mg IM **Medic only medication**

Morphine 0.05 mg/kg IVP, IM **Maximum dose 10 mg**

Ketamine (Ketalar) 0.1 - 0.3 mg/kg IVP, IO or IN

Consider administration of oral, sublingual, or IV antiemetics to prevent nausea.

See **Nausea/Vomiting** guideline

If indicated based on pain assessment, repeat pain medication administration after 10 minutes of the previous dose

Transport in position of comfort and reassess as indicated

General

EMR

EMT

AEMT

Paramedic

Notes

1. Pain severity (0 - 10) should be recorded before and after analgesic medication administration and upon arrival at destination
2. Narcotic analgesia was historically contraindicated in the prehospital setting for abdominal pain of unknown etiology. It was thought that analgesia would hinder the emergency physician's or surgeon's evaluation. Recent studies have demonstrated that opiate administration may alter the physical examination findings, but these changes result in no significant increase in management errors
3. Opiates may cause a rise in intracranial pressure

Patient Presentation**Inclusion Criteria**

Patients who are experiencing pain

Exclusion Criteria

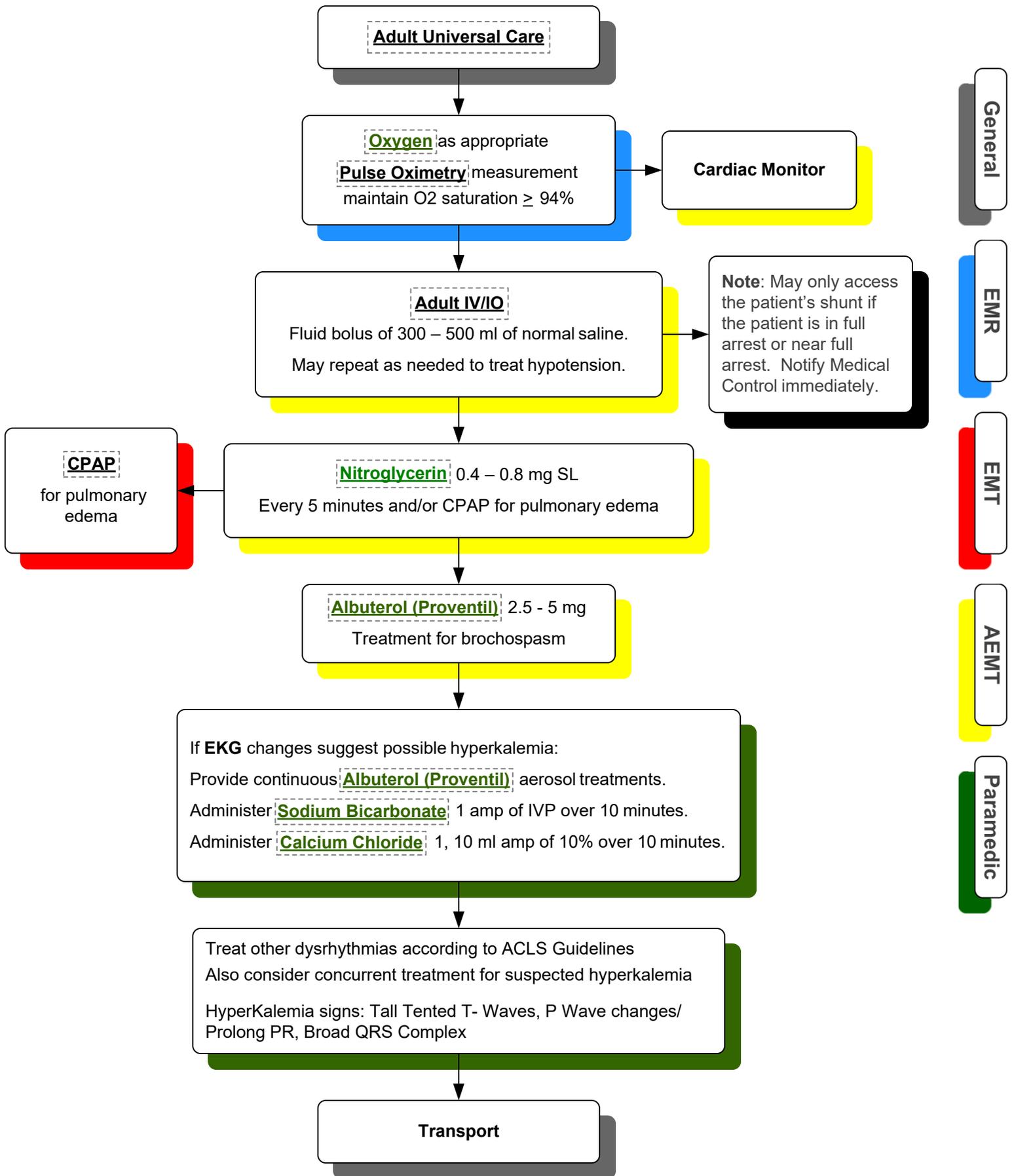
1. Patients who are allergic to narcotic medications
2. Patients who have altered mentation (GCS < 15 or mentation not appropriate for age)

Pertinent Assessment Findings

1. Mental status (GCS and pain level)
2. Respiratory system (tidal volume, chest rigidity)
3. Gastrointestinal (assess for tenderness, rebound, guarding, and nausea)

Patient Safety Considerations

1. All patients should have drug allergies identified prior to administration of pain medication
2. Administer narcotics with caution to patients with GCS < 15, hypotension, identified medication allergy, hypoxia (oxygen saturation < 90%) after maximal supplemental oxygen therapy, or signs of hypoventilation
3. Fentanyl is contraindicated for patients who have taken monoamine oxidase inhibitors (MAOI) during the previous 14 days
4. Non-steroidal anti-inflammatory medications should not be administered to pregnant patients
5. Avoid Ketorolac in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, or known peptic ulcer disease



General

EMR

EMT

AEMT

Paramedic

Possible Complications

A. The dialysis procedure may cause:

1. Hypotension (15-30%)
 - i. May result in angina, MI, dysrhythmia, altered mental status, and seizure.
2. Removal of therapeutic medications.
 - i. Example: Tegretol
3. Disequilibrium syndrome.
 - i. Cause: shift of urea and / or electrolytes
 - ii. Signs and symptoms: Nausea and / or vomiting, altered mentation, or seizure.
4. Bleeding.
 - i. These patients are often treated with heparin and they may have a low platelet count.
 - ii. Bleeding may be at the catheter site, retroperitoneal, gastrointestinal, or subdural.
5. Equipment malfunctions.
 - i. Possible air embolus.
 - ii. Possible fever or endotoxin.

B. The renal failure disease process (uremia) may cause:

1. Congestive heart failure.
2. Electrolyte (i.e. potassium) imbalance.
3. Anemia.
4. Bleeding.
5. Pericarditis.

Assessment

A. Establish and document the pertinent patient history.

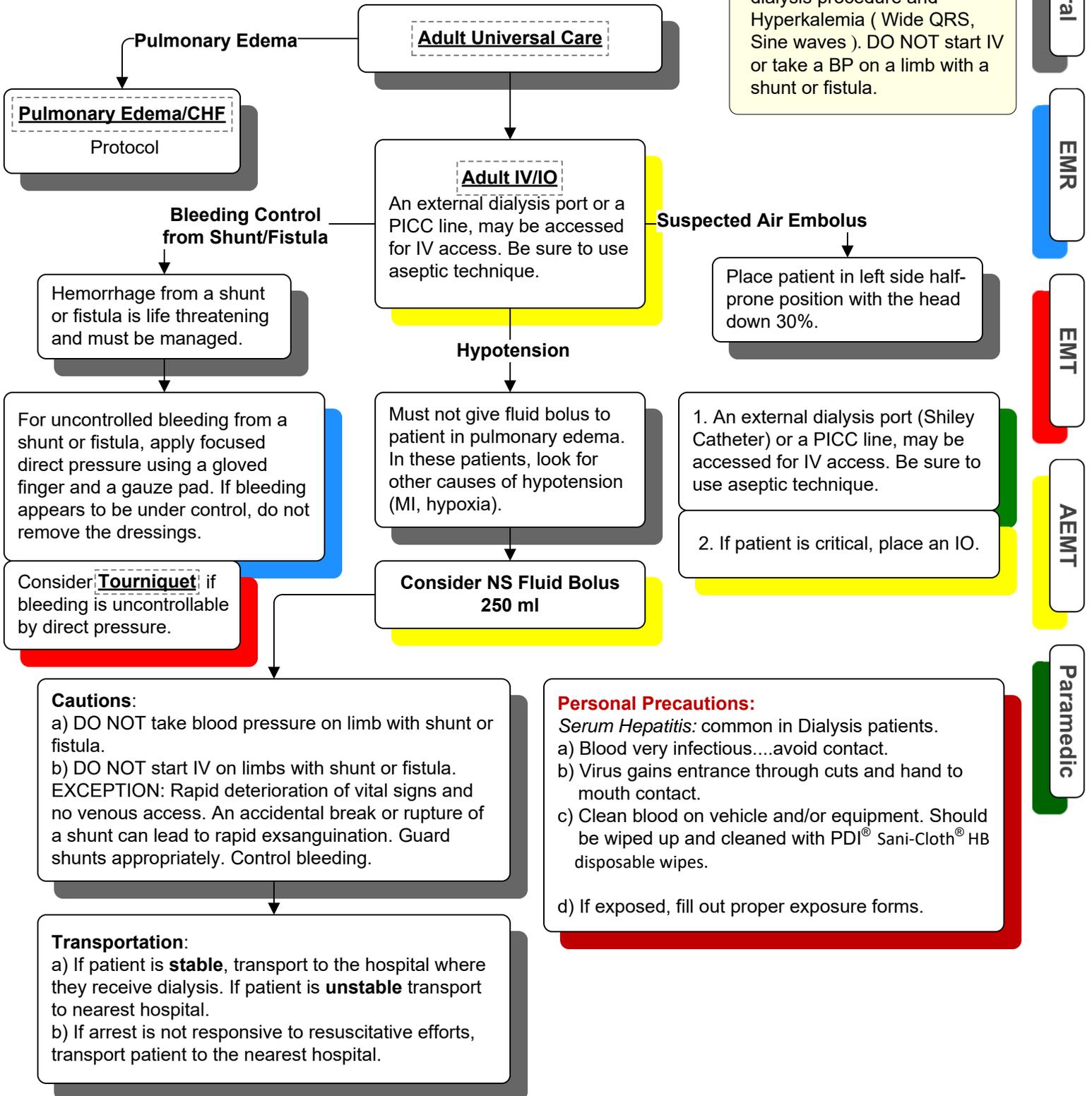
1. The cause of the chronic renal failure.
2. The patient's dialysis history.
 - i. Number of years on dialysis.
 - ii. Current dialysis schedule (Mon / Wed / Fri).
 - iii. Previous complications from dialysis.
3. The current dialysis procedure.
 - i. Amount of fluid removed.
 - ii. Amount of fluid scheduled to be removed.
 - iii. Current signs / symptoms.
 - iv. Any interventions made by dialysis center staff.

B. Components of the physical exam.

1. The patient's fluid status.
 - i. Hypovolemia (tachycardia, hypotension, cool clammy skin)
 - ii. Hypervolemia (congestive heart failure, dependent edema, hypertension)
2. The patient's mental status.
 - i. Altered.
 - ii. Seizure.
 - iii. Oxygen saturation (SpO₂).
 - iv. Blood sugar.
3. The patient's EKG.
 - i. "T" wave changes.
 1. Peaked – hyperkalemia
 2. Flat – hypokalemia
 - ii. Dysrhythmia.
 1. Wide QRS – hyperkalemia
 - iii. Myocardial infarction.
 1. Look for ST segment changes in the 12-lead EKG.
4. The patient's shunt.
 - i. Bleeding.
 - ii. Do not use the arm with the shunt for blood pressure or IV access.

Dialysis: The process of filtering the blood, the way kidneys normally do, using a machine. Dialysis machine filters the blood to rid it of waste products. The filtered blood then returns to the patient through the venous catheter.

Medical concerns for the Renal Dialysis patient are: Pulmonary edema most common, Arrhythmia, Hypertensive crisis, Air embolus, Can occur during the dialysis procedure and Hyperkalemia (Wide QRS, Sine waves). DO NOT start IV or take a BP on a limb with a shunt or fistula.



General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Early recognition/notification.
2. I.V. access.
3. Obtain/maintain hemodynamic stability by fluid resuscitation and if needed, pressor support.

Adult Universal Care

Definition

A cascade of inappropriate immune responses to the presence of an infection.

Adult IV/IO

Fluid resuscitation boluses of **500 ml NS** every 5 to 10 minutes up to 2 liters to maintain SBP greater than or equal to 100. MAP > 65 mmHg
(Be judicious in patients at risk for fluid overload/pulmonary edema)

Cardiac Monitor

12 Lead ECG

Oxygen as needed

Pulse Oximetry measurement

maintain O2 saturation \geq 94%

Consider **Capnography**

IF SIRS criteria (Systemic Inflammatory Response Syndrome) and obvious/suspected infection, notify receiving facility of "suspected sepsis" patient.

Suspected Sepsis:

- HR > 90
- Temp. < 96.8 or > 100.9
- Resp > 20
- SBP < 90 or MAP < 65 mmHg

Also consider:

- Mental Status Change
- ETCO2 < 25 mmHg

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Obvious/Suspected infection **AND** Systemic Inflammatory Response Syndrome (SIRS) signs:

Suspected Sepsis:

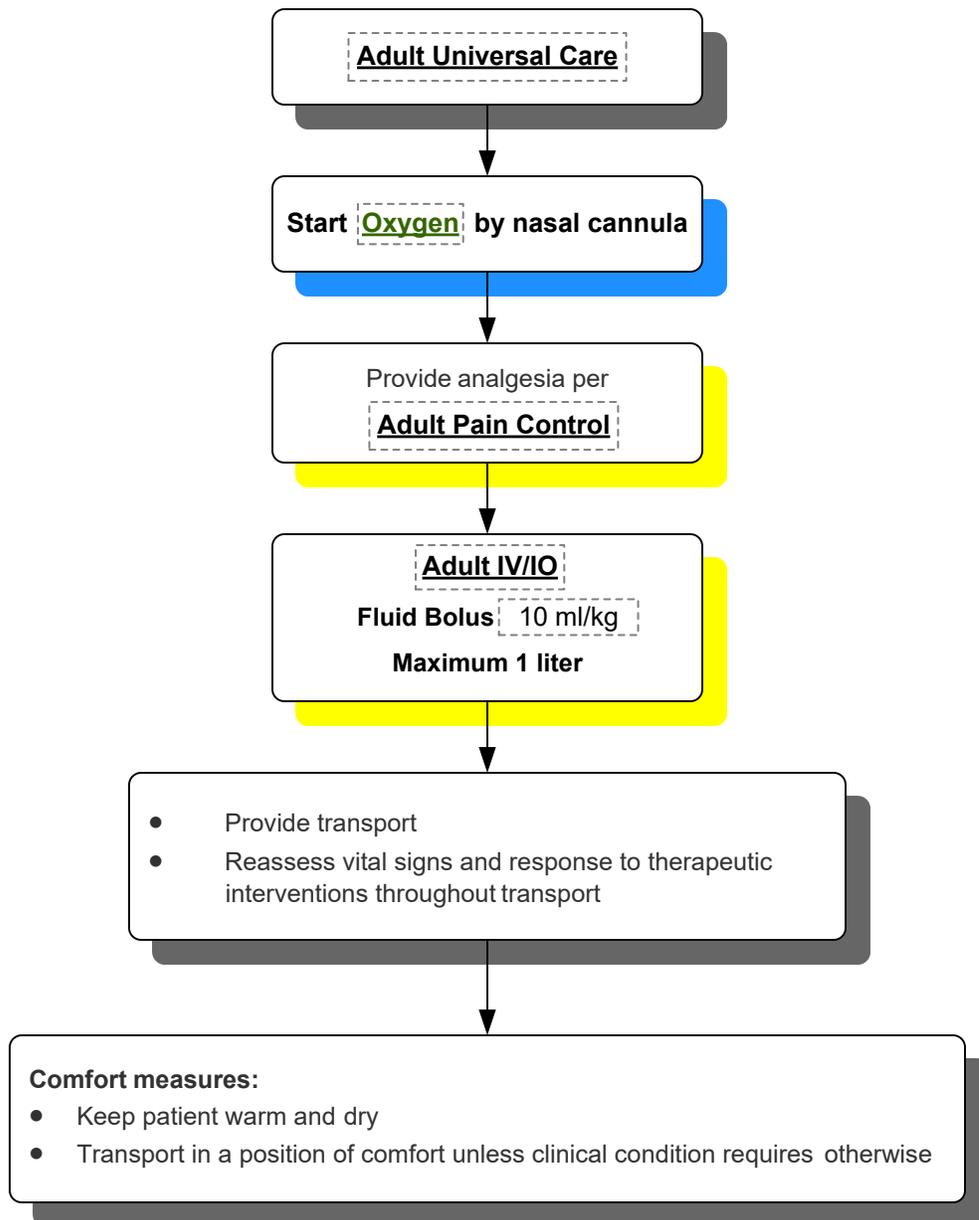
- HR > 90
- Temp. < 96.8 or > 100.9
- Resp > 20
- SBP < 90 or MAP < 65 mmHg

Also consider:

- Mental Status Change
- ETCO₂ < 25 mmHg

Notes

1. Early recognition, decreases hospital delays and improves outcome.
2. Hemodynamic instability can have initial resuscitation commenced in the pre-hospital setting, decreasing morbidity and mortality.
3. If CPAP is used for respiratory support, limit the airway pressure setting to 5 cm/H₂O or less.
4. ETCO₂ of 25 or less correlates to an elevated serum lactate level.



General

EMR

EMT

AEMT

Paramedic

Inclusion Criteria

1. Patient with known sickle cell disease experiencing a pain crisis

Exclusion Criteria

1. Pain due to acute traumatic injury [see Trauma section guidelines]
2. Abdominal pain due to or related to pregnancy [see OB/GYN section guidelines]
3. Patients with sickle cell trait

Patient Management**Assessment**

1. Perform airway assessment and management per the Airway Management guideline
2. Obtain vital signs including pulse, respiratory rate, pulse oximetry, and blood pressure
3. Provide evaluation and management of altered mental status per the Altered Mental Status guideline
4. Provide evaluation and management of pain per the Pain Management guideline
5. Obtain vascular access as necessary to provide analgesia and/or fluid resuscitation
6. Assess for potentially serious complications other than pain crisis which may include:
 - a. Acute chest syndrome
 - i. Hypoxia
 - ii. Chest pain
 - iii. Fever
 - b. Stroke [see Suspected Stroke/Transient Ischemic Attack guideline]
 - i. Focal neurologic deficits
 - c. Meningitis
 - i. Headache
 - ii. Altered mental status
 - iii. Fever
 - d. Septic arthritis
 - i. Severe pain in a single joint
 - ii. Fever
 - e. Splenic sequestration crisis (usually young pediatric patients)
 - i. Abdominal pain, LUQ
 - ii. Splenic enlargement (examine with care)
 - iii. Hypotension, tachycardia
7. Assess for signs of shock- If shock is present, treat per Shock guideline

Notes**Key Considerations**

1. Assess for life-threatening complications of sickle cell disease - these patients have significantly higher risk of numerous complications in addition to pain crises
2. Provide appropriate treatment for pain, respiratory distress, and shock
3. These patients may have a higher tolerance to narcotic pain medications if they are taking them on a regular basis
4. These patients will tolerate acute blood loss poorly due to baseline anemia
5. Patients with sickle cell trait can have acute pain crises in extreme conditions (e.g. heat exhaustion, dehydration) and a number of college athlete deaths have been linked to sickle cell trait

Pertinent Assessment Findings

1. Lung exam and assessment of respiratory distress
2. Altered mental status
3. Focal neurologic deficits
4. Inability to move a joint

Patient Care Goals

1. Cessation of seizures in the prehospital setting
2. Minimizing adverse events in the treatment of seizures in the prehospital setting
3. Minimizing seizure recurrence during transport

Adult Universal Care

If signs of airway obstruction are present and a chin-lift, jaw thrust, and/or suctioning does not alleviate it, place oropharyngeal airway (if gag reflex is absent) or nasopharyngeal airway. Place pulse oximeter and waveform capnography to monitor oxygenation/ventilation

Apply **Oxygen** via face mask or non-rebreather mask. Administer bag-valve mask ventilation if oxygenation/ventilation are compromised

Assess signs of perfusion
Assess neurologic status

Routes for Treatment

Intranasal, or intramuscular routes for benzodiazepines are preferred as first line for administration of anticonvulsants. Intravenous (IV) placement is not necessary for treatment of seizures, but could be obtained if needed for other reasons

Midazolam (Versed) 0.1 mg/kg IM, IN **Maximum dose 10 mg**

Midazolam (Versed) 0.1 mg/kg IVP **Maximum dose 5 mg**

Recent evidence supports the use of IM midazolam as an intervention that is at least as safe and effective as intravenous lorazepam for prehospital seizure cessation

Obtain **Blood Glucose** if below 60 mg/dl
See: **Hypoglycemia/Hyperglycemia** guideline for treatments

Consider **Magnesium Sulfate** 4 grams IVP over 5 minutes in the presence of seizure in the third trimester of pregnancy or post-partum

General

EMR

EMT

AEMT

Paramedic

Notes

1. Many airway/breathing issues in seizing patients can be managed without intubation or placement of an advanced airway. Reserve these measures for patients that fail less invasive maneuvers as noted above
2. For children with convulsive status epilepticus requiring medication management in the prehospital setting, trained EMS personnel should be allowed to administer medication without direct medical oversight
3. For new onset seizures or seizures that are refractory to treatment, consider other potential causes including trauma, stroke, electrolyte abnormality, toxic ingestion, pregnancy, hyperthermia
4. A variety of safe and efficacious doses for benzodiazepines have been noted in the literature for seizures. The doses for anticonvulsant treatment noted above are those that are common to the forms and routes of benzodiazepines noted in this guideline. One dose, rather than a range, has been suggested in order to standardize a common dose in situations when an EMS agency may need to switch from one type of benzodiazepine to another due to cost or resource limitations

Patient Assessment

1. History
 - a. Duration of current seizure
 - b. Prior history of seizures, diabetes, or hypoglycemia
 - c. Typical appearance of seizures
 - d. Baseline seizure frequency and duration
 - e. Concurrent symptoms of apnea, cyanosis, vomiting, bowel/bladder incontinence, or fever
 - f. Bystander administration of medications to stop the seizure
 - g. Current medications, including anticonvulsants
 - h. Recent dose changes or non-compliance with anticonvulsants
 - i. History of trauma, pregnancy, heat exposure, or toxin exposure
2. Exam
 - a. Air entry/airway patent?
 - b. Breath sounds, respiratory rate and effectiveness of ventilation
 - c. Signs of perfusion (pulses, capillary refill, color)
 - d. Neurologic status (GCS, nystagmus, pupil size)

Patient Safety Consideration

1. Trained personnel should be able to give medication without contacting direct medical oversight. However, more than two doses of benzodiazepines are associated with high risk of airway compromise. Use caution, weigh risks/benefits of deferring treatment until hospital, and/or consider consultation with direct medical oversight if patient has received two doses of benzodiazepines by bystanders and/or prehospital providers
2. Hypoglycemic patients who are treated in the field for seizure should be transported to hospital, regardless of whether or not they return to baseline mental status after treatment

Patient Presentation**Inclusion Criteria**

Seizure activity upon arrival of prehospital personnel or new/recurrent seizure activity lasting > 5 minutes

Exclusion Criteria

Seizures due to trauma, pregnancy, hyperthermia, or toxic exposure should be managed according to those condition-specific guidelines first.

Pertinent Assessment Findings

The presence of fever with seizure in children < 6 months old and > 6 years old is **not** consistent with a simple febrile seizure, and should be concerning for meningitis or encephalitis

Patient Care Goals

1. Detect neurological deficits
2. Determine eligibility for transport to a stroke center

MEND Exam Pre-Hospital Stroke Assessment En-Route

Mental Status	
Level of Consciousness	Awake & alert
Speech	Repeats You can't teach an old dog new tricks using correct words and no slurring
Questions	Says the month and own age correctly
Commands	Closes & opens eyes to command
Cranial Nerves	
Facial Droop	Both sides move equally well on smile/grimace
Visual Fields	Sees fingers in all 4 quadrants
Horizontal Gaze	Moves eyes completely side to side
Cranial Nerves	
Motor—Arm Drift (eyes closed)	Raised arms do not drift down (both together)
Motor—Leg Drift (eyes open)	Each raised leg does not drift down (1 at a time)
Sensory—Arm (eyes closed)	Feels touch on each arm normally
Sensory—Leg (eyes closed)	Feels touch on each leg normally
Coordination—Arm	Finger-to-nose accurate & smooth
Coordination—Leg	Heel-to-shin accurate & smooth

Provide ED patient info:

- First Name
- Last Name
- DOB
- LKW (Last Known Well) Time
- Pt. Weight (If able)
- Reason for Call
- Initial Set of Vitals (BP, HR, RR, Temp. and O2 Sat.)

Adult Universal Care

CPSS- On Scene
- Facial Droop
- Arm Drift
- Slurred Speech

Determine Time "last seen normal"
Notify Hospital of "Stroke Alert" if patient Last Known Well (LKW)/ Last Seen Normal is < 24hrs.

Provide **Oxygen**
Only if O2 saturation < 94%. Titrate to ≥ 94%

If seizure activity present, refer to **Seizures** guideline

Obtain **Blood Glucose** level. Treat only if glucose < 60 mg/dl

Monitor
12 Lead ECG

Adult IV/IO

Severe Hypertension with Neurological Symptoms-

Labetalol (Trandate): 10 - 20 mg Slow IVP

* **With Medical Control Approval***

Contact Med. Control if BP > 220/120

General

EMR

EMT

AEMT

Paramedic

Notes

1. Patients presenting with signs/symptoms of stroke should be transported to the nearest stroke center or, if not available, a stroke ready facility
2. Do not treat hypertension
3. Cardiac monitor
4. Have suction readily available

Pediatrics: Treatment principles remain the same. Although rare, pediatric patients can have strokes. Stroke scales are not validated for pediatric patients. Transport to Akron Children's Hospital.

Patient Safety Consideration

1. Prevent aspiration – elevate head of stretcher 15-30 degrees if systolic BP >100 mm Hg; maintain head and neck in neutral alignment, without flexing the neck
2. Protect paralyzed limbs from injury
3. Avoid multiple IV attempts (allowing for hospital access)

Notes

Anti- Coagulants: Include dose and time of last administration

- None
- Pradaxa (Dabigatran)
- Eliquis (Apixaban)
- Lovenox (Enoxaparin)
- Bevyxxa (Betrixaban)
- Arixtra (Fondaparinux)
- Coumadin (Warfarin)
- Xarelto (Rivaroxaban)
- Heparin
- Fragmin (Dalteparin)
- Savaysa (Edoxaban)

Anti-Platelets: Include dose and time of administration

- None
- Aspirin 81 mg
- Aspirin 325 mg
- Plavix (Clopidogrel)
- Aggrenox (Aspirin/ Dipyridamole)
- Effient (Prasugrel)
- Brilinta (Ticagrelor)

Patient Presentation

1. Neurologic deficit such as **facial droop**, **localized weakness**, gait disturbance, **slurred speech**, altered mentation
2. Hemiparesis or hemiplegia
3. Dysconjugate gaze, forced or crossed gaze (if patient is unable to voluntarily respond to exam, makes no discernible effort to respond, or LOC is such as there is no response)
4. Severe headache, neck pain/stiffness, **difficulty seeing**

Inclusion Criteria

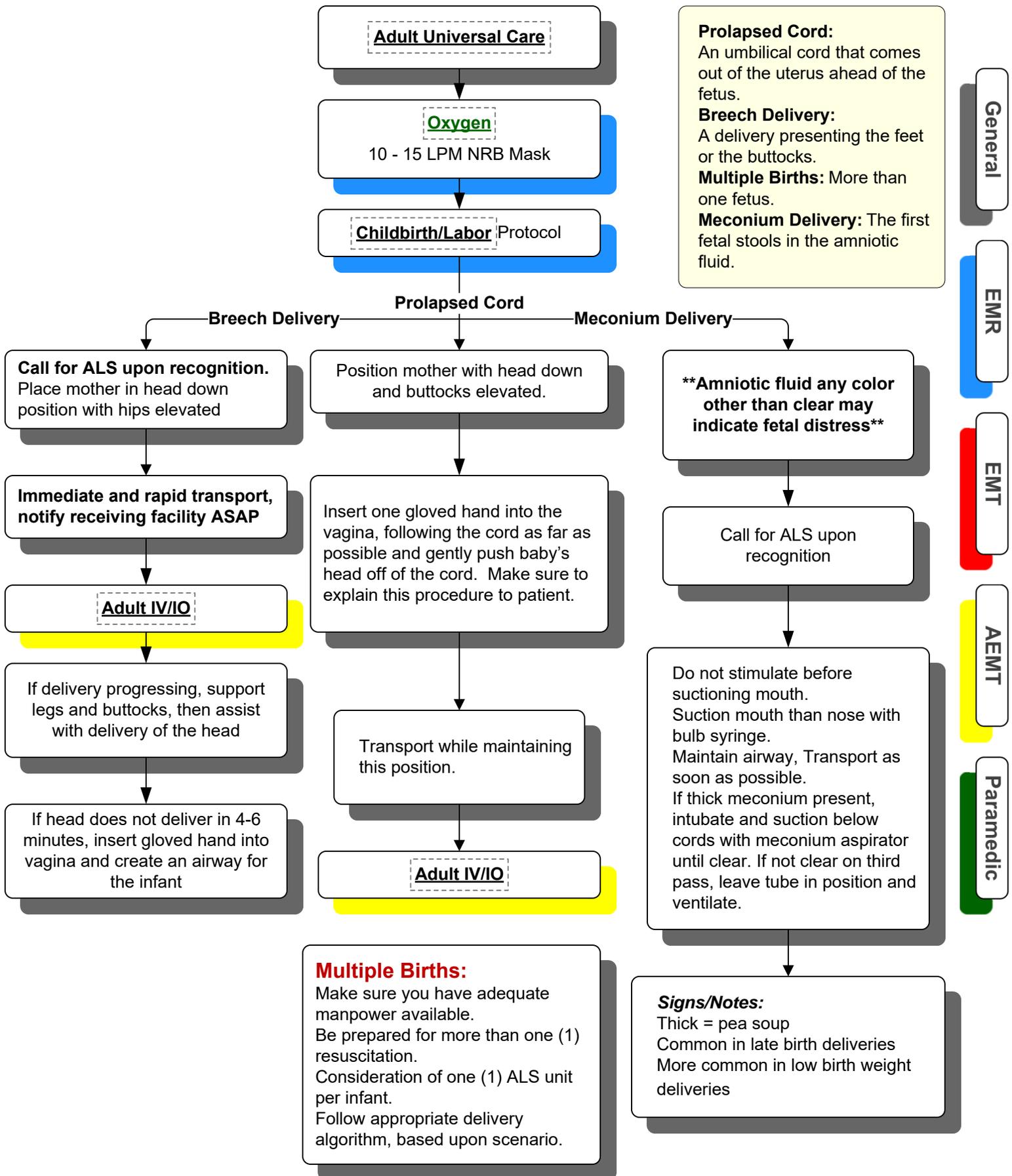
Patient has signs and symptoms consistent with stroke or transient ischemic attack (TIA)

Exclusion Criteria

1. If glucose < 60 refer to **Hypoglycemia/Hyperglycemia** guideline

If trauma and GCS \leq 13, refer to **Head Injury** and **General Trauma Management** guidelines

Abnormal Deliveries



Three stages of labor:

First Stage: Onset of contractions with progressive changes in cervix.
Second Stage: Labor begins and fully dilated. Ends with birth.
Third Stage: Separation and delivery of placenta.

How far along in the pregnancy is the patient? Time contractions. Was there prenatal care? Has the patient's water broken? Is there any blood? Has crowning began yet? Is there any other presentation of the fetus?
Note: Up to 500 ml blood loss during delivery is normal and well tolerated by the mother.

Adult Universal Care

Have mother lie in preferred birthing position.

**Obstetric Emergencies-
Vaginal Bleeding**

Abnormal vaginal bleeding?

No

Inspect perineum
(No digital vaginal exam)

No crowning

Monitor and reassess
Document frequency and duration
of contractions

Crowning

Adult IV/IO

Priority symptoms
Crowning, patient needs to push.
See **Abnormal Deliveries**

Rapid Transport

Vaginal Bleeding after Delivery

If brisk bleeding continues, massage "knead" the uterus over the lower abdomen above the pubis with firm pressure.

Oxygen
10-15 LPM via NRB Mask

If bleeding continues, evaluate massage technique, position for shock.

Cardiac Monitor
if hemodynamically unstable

General

EMR

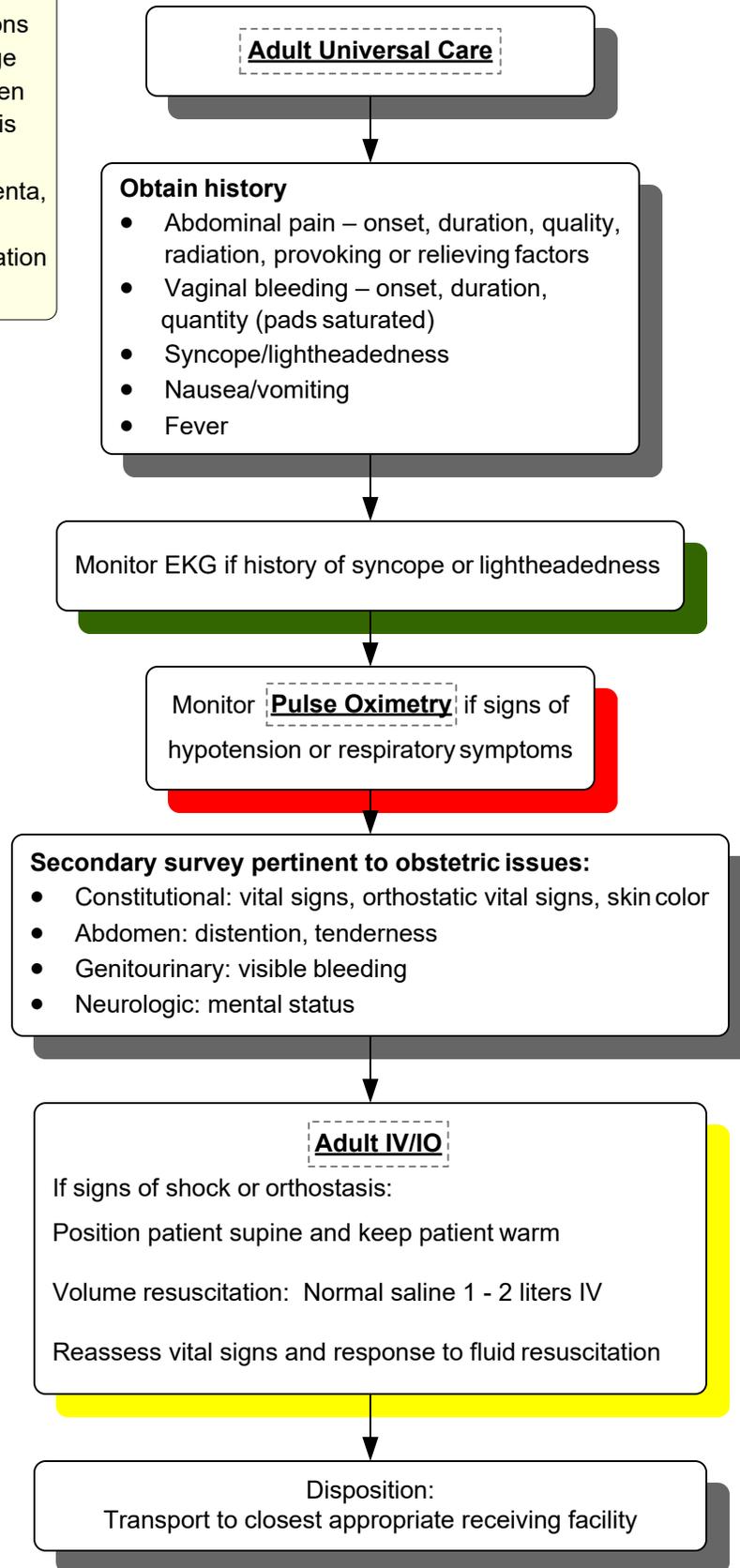
EMT

AEMT

Paramedic

Patient Care Goals

1. Recognize serious conditions associated with hemorrhage during pregnancy even when hemorrhage or pregnancy is not apparent (e.g. ectopic pregnancy, abruption placenta, placenta previa)
2. Provide adequate resuscitation for hypovolemia



General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

1. Female patient with vaginal bleeding in any trimester
2. Female patient with pelvic pain or possible ectopic pregnancy
3. Maternal age at pregnancy may range from 10 to 60 years of age

Exclusion Criteria

1. Childbirth and active labor (see **Childbirth** guideline)
2. Seizure related to pregnancy/eclampsia (see **Seizures** guideline)
Post-partum hemorrhage (see **Childbirth** guideline)

Notes

Syncope can be a presenting symptom of hemorrhage from ectopic pregnancy or causes of vaginal bleeding

Pertinent Assessment Findings

1. Vital signs to assess for signs of shock (e.g. tachycardia, hypotension)
2. Abdominal exam (e.g. distension, rigidity, guarding)
If pregnant, evaluate fundal height

Patient Safety Considerations

1. Patients in third trimester of pregnancy should be transported on left side or with uterus manually displaced to left if hypotensive
2. Do not place hand/fingers into vagina of bleeding patient except in cases of prolapsed cord or breech birth that is not progressing

Patient Management**Assessment**

1. Obtain history
 - a. Abdominal pain – onset, duration, quality, radiation, provoking or relieving factors
 - b. Vaginal bleeding – onset, duration, quantity (pads saturated)
 - c. Syncope/lightheadedness
 - d. Nausea/vomiting
 - e. Fever
2. Monitoring
 - a. Monitor EKG if history of syncope or lightheadedness
 - b. Monitor pulse oximetry if signs of hypotension or respiratory symptoms
3. Secondary survey pertinent to obstetric issues:
 - a. Constitutional: vital signs, orthostatic vital signs, skin color
 - b. Abdomen: distention, tenderness
 - c. Genitourinary: visible bleeding
 - d. Neurologic: mental status

Patient Care Goals

1. Recognize imminent birth
2. Assist with uncomplicated delivery of term newborn
3. Recognize complicated delivery situations
4. Apply appropriate techniques when delivery complication exists

Signs of imminent delivery:

Contractions, crowning, urge to push, urge to move bowels, membrane rupture or bloody show

Adult Universal Care

If patient in labor but no signs of impending delivery, transport to appropriate receiving facility

If impending delivery, go to: **Childbirth**
If complications, see below.

General

EMR

EMT

AEMT

Paramedic

Shoulder Dystocia

If delivery fails to progress after head delivers, quickly attempt the following

Hyperflex mother's hips to severe supine knee-chest position

Apply firm suprapubic pressure to attempt to dislodge shoulder

Apply high-flow oxygen to mother

Contact direct medical oversight and/or closest appropriate receiving facility for direct medical oversight and to prepare team

Transport as soon as possible

Prolapsed Umbilical Cord

Placed gloved fingers between infant and uterus to avoid compression of cord

Consider placing mother in prone knee-chest position

Apply high-flow oxygen to mother

Transport as soon as possible

Contact and/or closest appropriate receiving facility for direct medical oversight and to prepare team

Maternal Cardiac Arrest

Apply manual pressure to displace uterus from right to left

See **Cardiac Arrest (VF/VT/Asystole/PEA)** guideline for resuscitation care (defibrillation and medications should be given for same indications and doses as if non-pregnant patient)

Transport as soon as possible if infant is estimated to be over 24 weeks gestation (perimortem Cesarean section at receiving facility is most successful if done within 5 minutes of maternal cardiac arrest)

Contact direct medical oversight and/or closest appropriate receiving facility for direct medical oversight and to prepare team

Breech Birth

Abnormal Deliveries:
If head fails to deliver, place gloved hand into vagina with fingers between infant's face and uterine wall to create an open airway

Apply high-flow oxygen to mother

Transport as soon as possible

Contact direct medical oversight and/or closest appropriate receiving facility for direct medical oversight and to prepare team

Notes

1. OB assessment:
 - a. Length of pregnancy
 - b. Number of pregnancies
 - c. Number of viable births
 - d. Number of non-viable births
 - e. Last menstrual period
 - f. Due date
 - g. Prenatal care
 - h. Number of expected babies
 - i. Drug use
2. Notify direct medical oversight if:
 - a. Prepartum hemorrhage
 - b. Postpartum hemorrhage
 - c. Breech presentation
 - d. Limb presentation
 - e. Nuchal cord
 - f. Prolapsed cord
3. Some bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal

Patient Presentation**Inclusion Criteria**

Imminent delivery with crowning

Exclusion Criteria

1. Vaginal bleeding in any stage of pregnancy (see **Obstetrical/Gynecological Conditions** guideline)
2. Emergencies in first or second trimester of pregnancy (see **Obstetrical/Gynecological Conditions** guideline) Seizure from eclampsia (see **Seizure** guideline)

Eclampsia: New onset of grand Mal seizure or unexplained coma during pregnancy.

ECLAMPSIA/TOXEMIA

Definition:

Toxemia: is the presence of any combination of the following after the 20th week of pregnancy. Can occur for up to 2 weeks post delivery.

- A. Total body edema
- B. Hypertension: BP systolic > 140 mmHg, BP diastolic > 90 mmHg or a change in the diastolic pressure > 15 mmHg from antenatal pressure.
- C. Seizures after the 6th month of pregnancy

Eclampsia: is the presence of toxemia plus seizures.

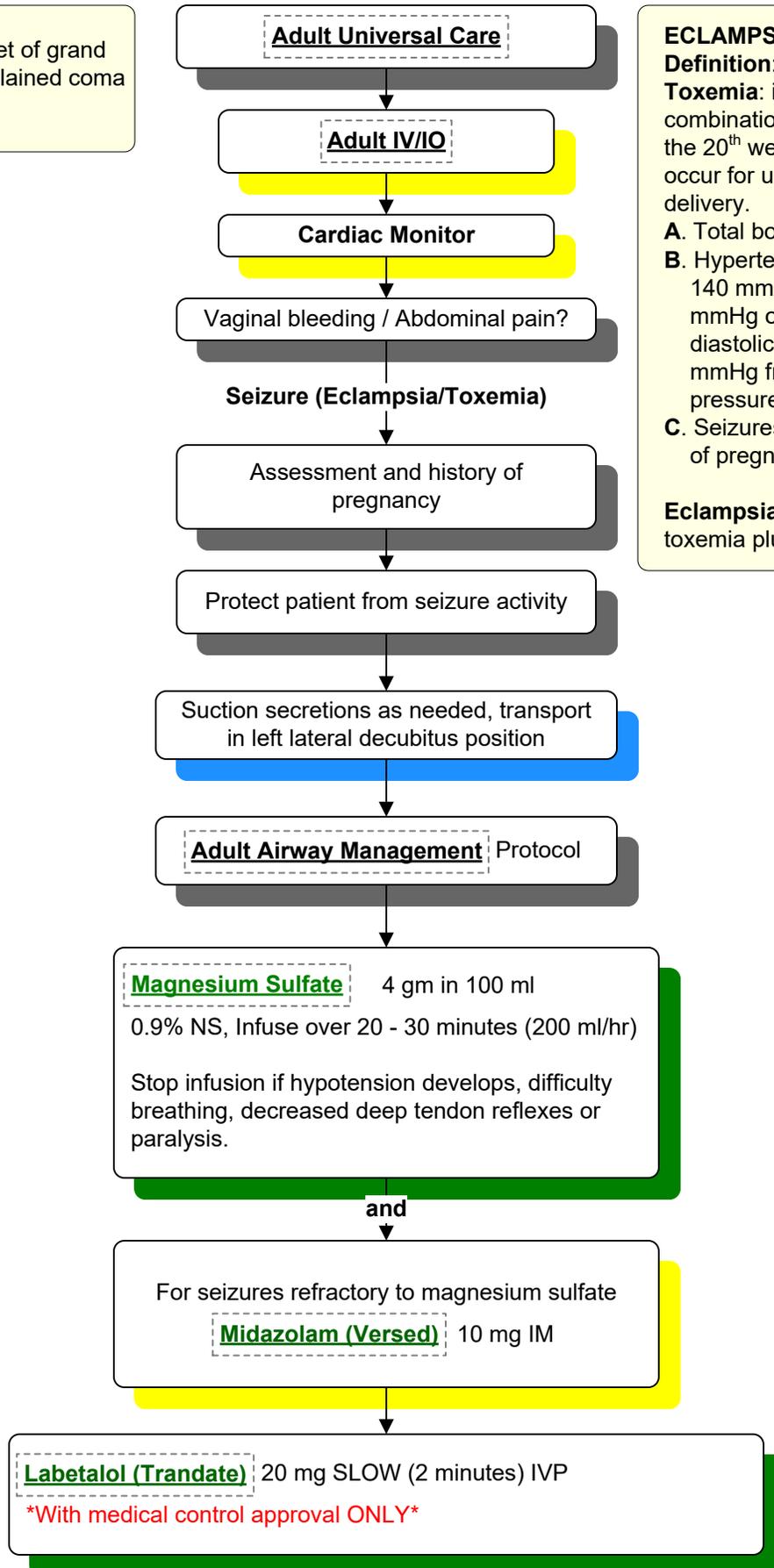
General

EMR

EMT

AEMT

Paramedic



Pregnancy complications can occur for several reasons, including; trauma, and pre-existing health problems, ex. diabetes, hypertension, and heart disease to name a few.

Adult Universal Care

Adult IV/IO

Large bore IV Titrate to keep BP > 90 systolic

Cardiac Monitor

if hemodynamically unstable

Oxygen

10-15 LPM via NRB Mask

Obtain history of pregnancy and estimate amount of bleeding

Vaginal Bleeding during Pregnancy:

< 20 Weeks (Miscarriage)

Miscarriage – Termination of pregnancy before fetus is viable.

> 20 Weeks (abruption or Placenta Previa)

Abruption- Premature separation of the placenta from the wall of the uterus

Placenta Previa- Attachment of the placenta very low in the uterus that completely or part covers the internal cervical opening.

General

EMR

EMT

AEMT

Paramedic

Miscarriage < 20 weeks

Abruption or Placenta Previa > 20 weeks

Apply external vaginal pads

Bring any fetal tissues to hospital.

Do not remove anything from the vaginal area.

Transport to appropriate facility, on left side.

Consider second IV enroute if patient unstable

Control bleeding
Do not insert packing into vagina

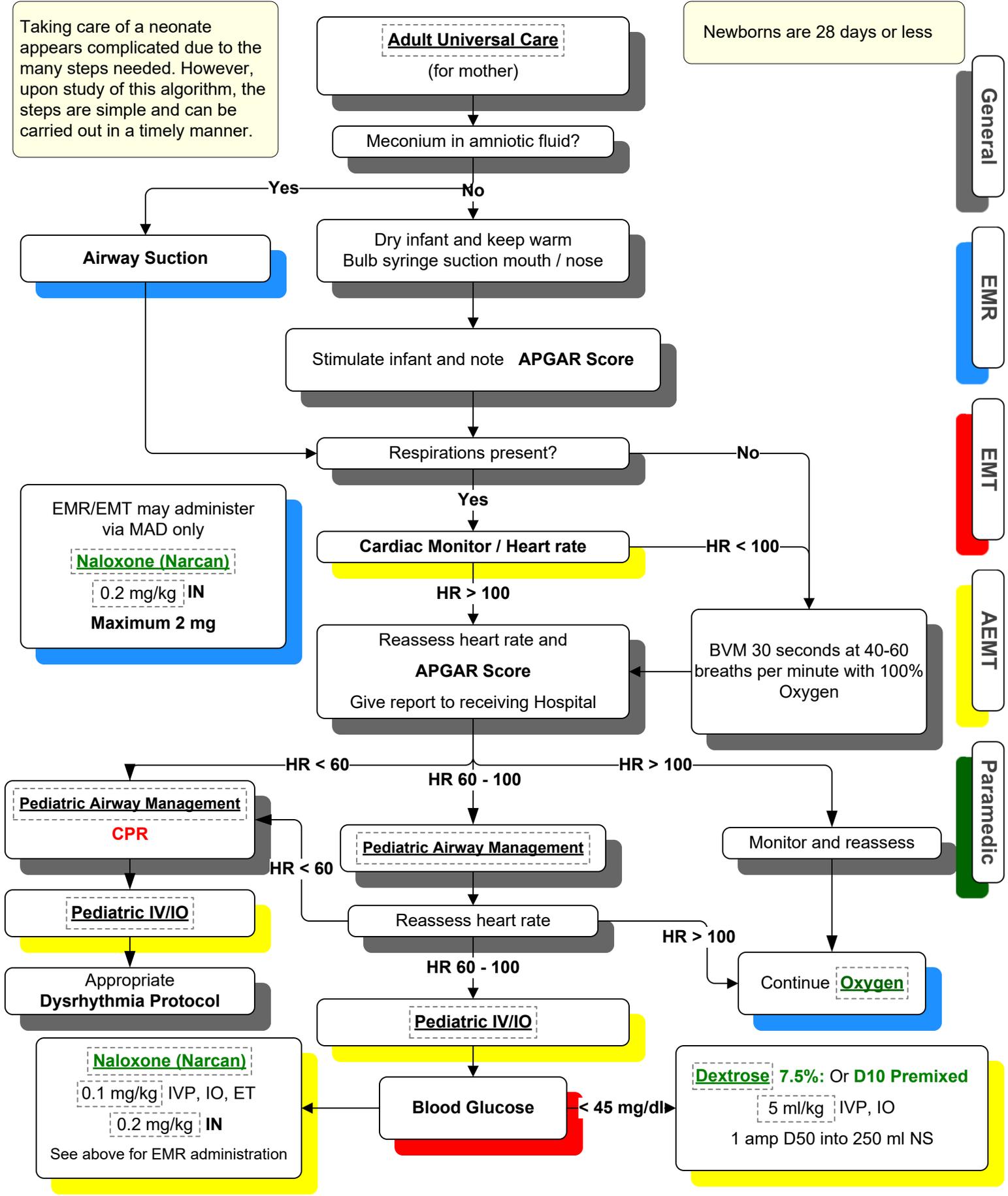
Elevate hips of patient

Transport immediately to OB hospital

Taking care of a neonate appears complicated due to the many steps needed. However, upon study of this algorithm, the steps are simple and can be carried out in a timely manner.

Newborns are 28 days or less

- General
- EMR
- EMT
- AEMT
- Paramedic



Patient Care Goals

1. Provide effective oxygenation and ventilation
2. Recognize and alleviate respiratory distress
3. Provide necessary interventions quickly and safely to patients with the need for respiratory support
4. Identify a potentially difficult airway in a timely fashion

Non-Invasive Ventilation Techniques

Use **Continuous Positive Airway Pressure - CPAP**

bilevel positive airway pressure (BiPAP), intermittent positive pressure breathing (IPPB), humidified high-flow nasal cannula (HFNC), and/or bilevel nasal CPAP for severe respiratory distress or *impending* respiratory failure

Use bag-valve mask (BVM) ventilation in the setting of respiratory failure or arrest

Oropharyngeal Airways (OPA) and Nasopharyngeal Airways (NPA)

Consider the addition of an OPA and/or NPA to make BVM more effective, especially in patients with altered mental status

I-gel Supraglottic Airway

Consider the use of a SGA or EGD if BVM is not effective in maintaining oxygenation and/or ventilation. Examples include, but are not limited to, the laryngeal mask airway (LMA) or King® laryngeal tube (KLT). This is especially important in children, since endotracheal intubation is an infrequently performed skill in this age group, and has not been shown to improve outcomes

Endotracheal Intubation

- A. When less-invasive methods (BVM, SGA/EGD placement) are ineffective, however, use endotracheal intubation to maintain oxygenation and/or ventilation
- B. Other indications may include potential airway obstructions, severe burns, multiple traumatic injuries, altered mental status or loss of normal protective airway reflexes
- C. Monitor clinical signs, pulse oximetry, and capnography for the intubated patient
- D. Video laryngoscopy enhances intubation success rates, and should be used when available. Fiberoptic-assisted endotracheal intubation may be needed if the vocal cords cannot be visualized by other means

When patients cannot be oxygenated/ventilated effectively by previously mentioned interventions, the provider should consider **Cricothyroidotomy** if the risk of death for not escalating airway management seems to outweigh the risk of a procedural complication

Transport to the closest appropriate hospital for airway stabilization should occur when respiratory failure cannot be successfully managed in the prehospital setting

General

EMR

EMT

AEMT

Paramedic

Notes

1. When compared to the management of adults with cardiac arrest, paramedics are less likely to attempt endotracheal intubation in children with cardiac arrest. Further, paramedics are more likely to be unsuccessful when intubating children in cardiac arrest and complications such as malposition of the ET tube or aspiration can be nearly three times as common in children as compared to adults
2. Use continuous waveform capnography to detect end-tidal carbon dioxide (ETCO₂). This is an important adjunct in the monitoring of patients with respiratory distress, respiratory failure, and those treated with positive pressure ventilation. It should be used as the standard to confirm extraglottic device and endotracheal tube placement
3. CPAP, BiPAP, IBPP, HFNC
Contraindications to these non-invasive ventilator techniques include intolerance of the device, increased secretions inhibiting a proper seal, or recent gastrointestinal and/or airway surgery
4. Bag-Valve Mask:
 - a. Appropriately-sized masks should completely cover the nose and mouth and maintain an effective seal around the cheeks and chin
 - b. Ventilation should be delivered with only sufficient volume to achieve chest rise
 - c. Ventilating breaths should be delivered over one second, with a two second pause between breaths (20 breaths/minute)
5. Orotracheal intubation
 - a. Approximate depth of insertion = (3) x (endotracheal tube size)
 - b. Confirm successful placement with waveform capnography. Less optimal methods of confirmation include bilateral chest rise, bilateral breath sounds, maintenance of adequate oxygenation, and color change on end-tidal CO₂ colorimetric device. Misting observed in the tube is not a reliable method of confirmation

Patient Presentation

Inclusion Criteria

1. Children and adults with signs of severe respiratory distress/respiratory failure
2. Patients with evidence of hypoxemia or hypoventilation

Exclusion Criteria

1. Patients with tracheostomies
2. Chronically ventilated patients
3. Newborn patients
4. Patients in whom oxygenation and ventilation is adequate with supplemental oxygen alone, via simple nasal cannula or face mask

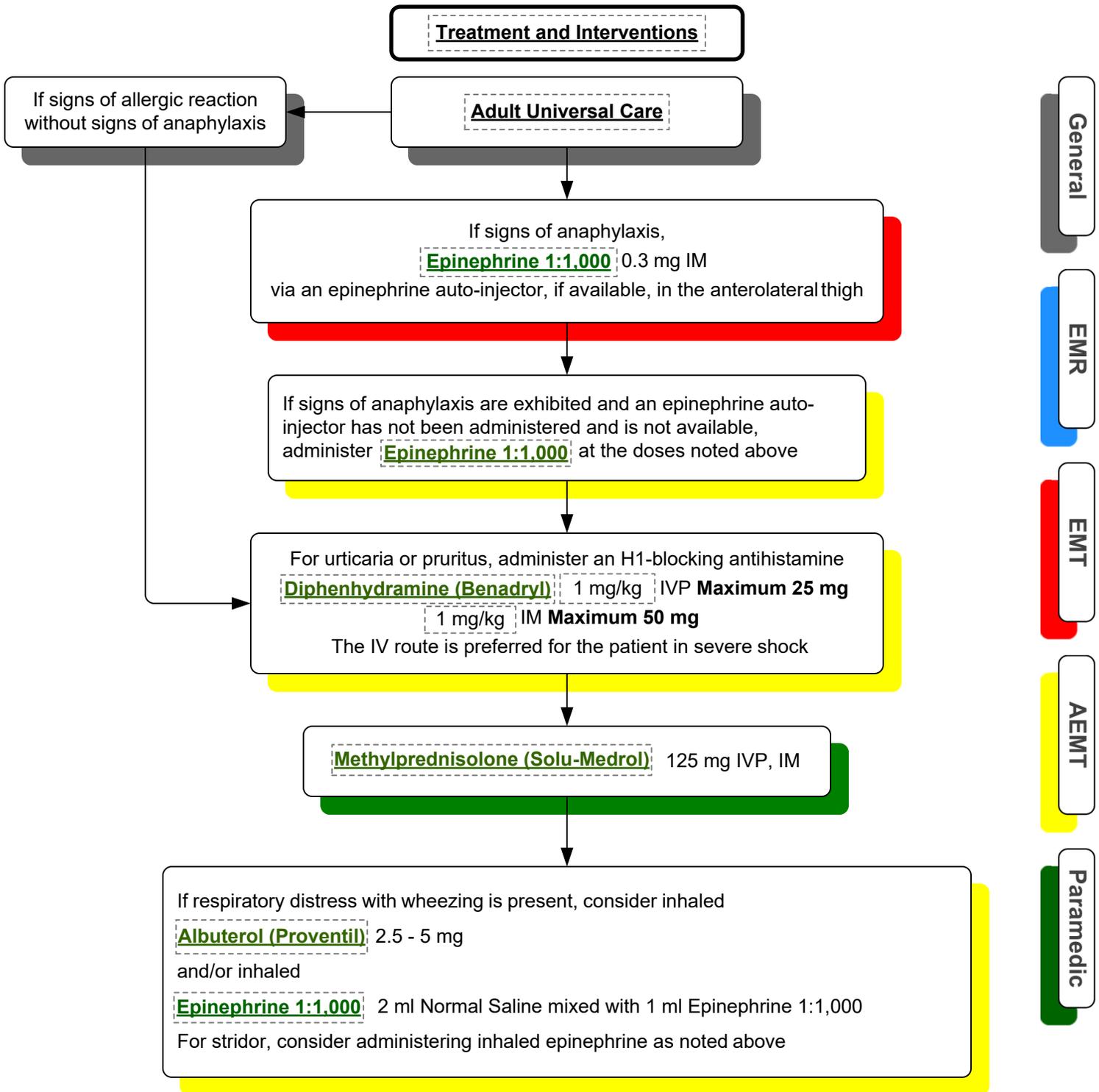
Patient safety considerations

1. Avoid excessive pressures or volumes during BVM
 2. Avoid endotracheal intubation, unless less invasive methods fail, since it can be associated with aspiration, oral trauma, worsening of cervical spine injury, malposition of the ET tube (mainstem intubation, esophageal intubation), or adverse effects of sedation, especially in children
 3. Once a successful SGA/EGD placement or intubation has been performed, obstruction or displacement of the tube can have further deleterious effects on patient outcome. Tubes should be secured with either a commercial tube holder or tape
- RSI for providers operating within a comprehensive program with ongoing training and quality assurance measures

Patient Management Assessment

1. History: Assess for
 - a. Time of onset of symptoms
 - b. Associated symptoms
 - c. History of asthma or other breathing disorders
 - d. Choking or other evidence of upper airway obstruction
 - e. History of trauma
2. Physical Examination: Assess for
 - a. Shortness of breath
 - b. Abnormal respiratory rate and/or effort
 - c. Use of accessory muscles
 - d. Quality of air exchange, including depth and equality of breath sounds
 - e. Wheezing, rhonchi, rales, or stridor
 - f. Cough
 - g. Abnormal color (cyanosis or pallor)
 - h. Abnormal mental status

Signs of a difficult airway (short jaw or limited jaw thrust, small thyromental space, upper airway obstruction, large tongue, obesity, large tonsils, large neck, craniofacial abnormalities, excessive facial hair)



See: **Allergic Reaction/Anaphylaxis Part B**

If signs of anaphylaxis and hypoperfusion persist following the first dose of epinephrine, additional **Epinephrine 1:1,000** 0.3 mg IM can be repeated every 5 - 15 minutes at the doses noted above

For signs of hypoperfusion, also administer **Normal Saline 20 ml/kg** isotonic fluid rapidly (over 15 minutes) via IV or IO, and repeat as needed for ongoing hypoperfusion

Consider "push dose epi"
Prepare 10 mcg/ml by adding 1 ml of **Epinephrine 1:10,000** to 9 ml NS; administer 10 mcg (1ml) every 1 - 2 minutes as needed

When cardiovascular collapse (hypotension with altered mental status, pallor, diaphoresis and/or delayed capillary refill) is present despite repeated IM doses of epinephrine in conjunction with at least **60 ml/kg** isotonic fluid boluses

Transport as soon as possible, and perform ongoing assessment as indicated. Cardiac monitoring is not required, but should be considered for those with known heart problems or who received multiple doses of epinephrine

General

EMR

EMT

AEMT

Paramedic

Notes

1. Allergic reactions and anaphylaxis are serious and potentially life-threatening medical emergencies. It is the body's adverse reaction to a foreign protein (i.e. food, medicine, pollen, insect sting or any ingested, inhaled, or injected substance). A localized allergic reaction (i.e. urticaria or angioedema that does not compromise the airway) may be treated with antihistamine therapy. When anaphylaxis is suspected, EMS personnel should always consider epinephrine as first-line treatment. Cardiovascular collapse may occur abruptly, without the prior development of skin or respiratory symptoms. Constant monitoring of the patient's airway and breathing is essential.
2. A thorough assessment and a high index of suspicion are required for all potential allergic reaction patients. Consider:
 - a. History of Present Illness:
 - i. Onset and location
 - ii. Insect sting or bite
 - iii. Food allergy/exposure
 - iv. New clothing, soap, detergent
 - v. Past history of reactions
 - vi. Medication history
 - b. Signs and Symptoms
 - i. Itching or urticaria
 - ii. Coughing, wheezing, or respiratory distress
 - iii. Chest tightness or throat constriction
 - iv. Hypotension or shock
 - v. Persistent gastrointestinal symptoms (nausea, vomiting, and diarrhea)
 - vi. Altered mental status
 - c. Other Considerations
 - i. Angioedema (drug-induced)
 - ii. Aspiration/airway obstruction
 - iii. Vasovagal event
 - iv. Asthma or COPD
 - v. Heart failure
3. Gastrointestinal symptoms occur most commonly in food-induced anaphylaxis, but can occur with other causes. Oral pruritus is often the first symptom observed in patients experiencing food-induced anaphylaxis. Abdominal cramping is also common, but nausea, vomiting, and diarrhea are frequently observed as well
4. Contrary to common belief that all cases of anaphylaxis present with cutaneous manifestations, such as urticaria or mucocutaneous swelling, a significant portion of anaphylactic episodes may not involve these signs and symptoms on initial presentation. Moreover, most fatal reactions to food-induced anaphylaxis in children were not associated with cutaneous manifestations
5. Patients with asthma are at high risk for a severe allergic reaction
6. There is controversy among experts with very low quality evidence to guide management for the use of empiric IM epinephrine after exposure to a known allergen in asymptomatic patients with a history of prior anaphylaxis

Patient Presentation

Inclusion Criteria

Patients of all ages with suspected allergic reaction

Exclusion Criteria

No specific recommendations

Patient Safety Considerations

1. Time to epinephrine delivery
2. Concentration of epinephrine in relation to route
3. Use of epinephrine auto-injectors to reduce dosing errors
4. Weight-based dosing of medications

Patient Assessment

1. Evaluate for patent airway and presence of oropharyngeal edema
2. Auscultate for wheezing and assess level of respiratory effort
3. Assess for adequacy of perfusion
4. Assess for presence of signs of anaphylaxis
5. Determine:
 - a. Non-anaphylactic Allergic Reaction
 - Symptoms involving only **one** organ system (i.e. localized angioedema that does not compromise the airway, or not associated with vomiting)
 - b. Anaphylaxis - More severe and is characterized by an acute onset involving:
 - i. The skin (urticaria) and/or mucosa with either respiratory compromise or decreased BP or signs of end-organ dysfunction,
OR
 - ii. Hypotension for that patient (systolic BP < 90 for adults; see Normal Vital Signs table, **Appendix VII**, for pediatric cut-offs) after exposure to a known allergen **OR**
 - iii. Two or more of the following occurring rapidly after exposure to a likely allergen:
 1. Skin and/or mucosal involvement (urticaria, itchy, swollen tongue/lips)
 2. Respiratory compromise (dyspnea, wheeze, stridor, hypoxemia)
 3. Persistent gastrointestinal symptoms (vomiting, abdominal pain)
Hypotension or associated symptoms (syncope, hypotonia, incontinence)

Patient Care Goals

1. Alleviate respiratory distress due to bronchospasm
2. Promptly identify and intervene for patients who require escalation of therapy
3. Deliver appropriate therapy by differentiating other causes of respiratory distress

Adult Universal Care

Pulse Oximetry and end-tidal CO₂ (ETCO₂) should be routinely used as an adjunct to other forms of respiratory monitoring

Adult Airway Management

General

Check an **12 Lead ECG** if suspected cardiac origin of the respiratory distress

EMR

Airway

Give supplemental **Oxygen**. Escalate from a Nasal Cannula to a simple face mask to a Non- Rebreather Mask as needed, in order to maintain greater than or equal to 94% oxygenation

Suction the nose and/or mouth (via bulb, Yankauer, suction catheter) if excessive secretions are present

EMT

Inhaled Medications

DuoNeb aerosol for age greater than or equal to 2, may repeat x1, if further aerosols needed or age less than 2, then use **Albuterol** may repeat as needed

AEMT

Adult IV/IO (fluid bolus of **20 ml/kg** up to 1 liter)

IVs should be placed when there are clinical concerns of dehydration in order to administer fluids, or when administering IV medications

Paramedic

CPAP

Steroids: **Methylprednisolone (Solu-Medrol)**
125 mg IM, IVP

Magnesium Sulfate 40 mg/kg IVP

Maximum 2 grams over 15 - 30 minutes should be administered for severe bronchoconstriction and concern for impending respiratory failure

If suspected Asthmatic: **Epinephrine 1:1,000** 0.3 mg IM,
Should only be administered for impending respiratory failure as adjunctive therapy when there are no clinical signs of improvement

Notes

1. COPD patients **not** in respiratory distress should be given oxygen to maintain adequate oxygen saturation above 90%
2. Nebulizer droplets can carry viral particles, so additional personal protective equipment should be considered, including placement of a surgical mask over the nebulizer to limit droplet spread

Pertinent Assessment Findings

In the setting of severe bronchoconstriction, wheezing might not be heard. Patients with known asthma who complain of chest pain or shortness of breath should be empirically treated, even if wheezing is absent.

Patient safety considerations

1. Routine use of lights and sirens is not recommended during transport
2. Giving positive pressure in the setting of bronchoconstriction, either via a supraglottic airway or intubation, increases the risk of air trapping, which can lead to pneumothorax and cardiovascular collapse. So, these interventions should be reserved for situations of respiratory failure

Patient Presentation

Inclusion Criteria

Respiratory distress with wheezing or decreased air entry in, presumed to be due to bronchospasm from reactive airway disease, asthma, or obstructive lung disease. These patients may have a history of recurrent wheezing that improves with beta- agonist inhalers/nebulizers such as albuterol or levalbuterol

1. Symptoms/signs may include:
 - a. Wheezing - will have expiratory / inspiratory wheezing unless they are unable to move adequate air to generate wheezes
 - b. May have signs of respiratory infection (e.g. fever, nasal congestion, cough, sore throat)
 - c. May have acute onset after inhaling irritant
2. This includes:
 - a. Asthma exacerbation
 - b. Chronic obstructive pulmonary disease (COPD) exacerbation
 - c. Wheezing from suspected pulmonary infection (e.g. pneumonia, acute bronchitis)

Exclusion Criteria

Respiratory distress due to a presumed underlying cause that includes one of the following:

1. Anaphylaxis
2. Epiglottitis
3. Foreign body aspiration
4. Submersion/drowning
5. Congestive heart failure
6. Trauma

Patient Management Assessment

1. History

- a. Onset of symptoms
- b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
- c. Usual triggers of symptoms (cigarette smoke, change in weather, upper respiratory infections)
- d. Sick contacts
- e. Treatments given to self
- f. Previously intubated
- g. Number of emergency department visits in the past year
- h. Number of admissions in the past year
- i. Number of ICU admissions
- j. Family history of asthma, eczema, or allergies

2. Exam

- a. Full set of vital signs (T-if prior illness, BP, RR, P, O₂ sat); waveform capnography is a useful adjunct and will show a "sharkfin" waveform in the setting of obstructive physiology
- b. Air entry (normal vs. diminished; prolonged expiratory phase)
- c. Breath sounds (wheezes, crackles, rhonchi, diminished, clear, absent)
- d. Signs of distress (accessory muscle use, retracting, stridor)
- e. Inability to speak full sentences (sign of shortness of breath)
- f. Color (pallor, cyanosis, normal)
- g. Mental status (alert, tired, lethargic, unresponsive)
- h. Signs of distress include:
 - i. Apprehension, anxiety, combativeness, lethargy
 - ii. Hypoxia
 - Adult <90% oxygen saturation
 - Pediatric <95% oxygen saturation
 - iii. Intercostal/subcostal/supraclavicular retractions
 - iv. Nasal flaring
 - v. Cyanosis

	YES	NO	
1. SpO2 and ETCO2 evaluation before and after airway intervention; confirm patient IV/IO; ECG monitor	<input type="checkbox"/>	<input type="checkbox"/>	General
2. Prepare patient: <ul style="list-style-type: none"> Position in sniffing position (earlobe horizontal w/ xiphoid) if not contraindicated, head of cot at 15 to 30 degrees if possible. Assess for signs suggesting a difficult intubation 	<input type="checkbox"/>	<input type="checkbox"/>	
3. Preoxygenate for 2 - 3 minutes: 10 lpm with regular NC and 15 lpm via BVM at 10 BPM	<input type="checkbox"/>	<input type="checkbox"/>	EMR
4. Prepare equipment: BSI, suction source (attach rigid tip catheter); drugs and airway equipment (bougie), alternative airway (iGel)	<input type="checkbox"/>	<input type="checkbox"/>	
5. Sedation: <ul style="list-style-type: none"> Etomidate (Amidate): 0.3 mg/kg IVP up to Maximum dose 30 mg or Ketamine (Ketalar): (preferred for asthma) 2 mg/kg slow IVP (Maximum 200 mg , must be diluted) over one minute or 4 mg/kg IM (Maximum 500 mg, need not diluted) Allow for clinical response before intubating (if possible) 	<input type="checkbox"/>	<input type="checkbox"/>	EMT
6. Intubate per procedure: Maintain O2 10 lpm via NC <ul style="list-style-type: none"> Apply lip retraction, external laryngeal pressure; in-line stabilization if indicated Monitor VS, level of consciousness, skin color, ETCO2, SPO2 every 5 minutes during procedure 	<input type="checkbox"/>	<input type="checkbox"/>	AEMT
7. Confirm tube placement: <ul style="list-style-type: none"> Monitor ETCO2 to confirm placement Ventilate and observe chest rise; auscultate over epigastrium, bilateral anterior chest and midaxillary lines 	<input type="checkbox"/>	<input type="checkbox"/>	
8. If successful: <ul style="list-style-type: none"> O2 15 lpm via BVM may now d/c NC Inflate cuff (avoid over inflation); note diamond number on ETT with teeth or gums Secure ETT with commercial device. Reassess ETCO2 & lung sounds Post-intubation sedation: if SBP is greater or equal to 90: Midazolam (Versed) 2.5 mg slow IVP every 3 - 5 minutes to Maximum total of 10 mg or Fentanyl (Sublimaze) 50 – 100 mcg every 5 – 10 minutes to Maximum total 200 mcg Continue to monitor ETCO2 or capnography to confirm tracheal placement 	<input type="checkbox"/>	<input type="checkbox"/>	Paramedic
9. If unsuccessful: <ul style="list-style-type: none"> Re-oxygenate x 30 seconds; repeat steps 6 & 7 If unsuccessful (Maximum 2 attempts) or ETI attempts not advised: insert alternative airway; ventilate with O2 15 lpm via BVM 	<input type="checkbox"/>	<input type="checkbox"/>	
10. If unable to adequately ventilate: Needle or surgical cricothyrotomy per procedure	<input type="checkbox"/>	<input type="checkbox"/>	

Ready
Consider HEAVEN Criteria

Oxygen/Delivery Supplies

- Spare O2 tank available
- True nasal cannula on/ready
- BVM with PEEP valve ready
- Suction checked, working, and ON. Back up suction ready

IV Medications

- IV connected to fluid and running
- NIBP on, hemodynamics assessed/addressed
- Second IV line ready
- Sedation agent drawn up; Dose confirmed
- PUSH-DOSE PRESSOR drawn up; Dose confirmed
- POST-INTUBATION medications drawn up; dose confirmed

INTUBATION EQUIPMENT

- NPA AND OPA available
- Direct Laryngoscopy handle/blade chosen, tested
- Video Laryngoscopy blade chosen, cuff tested
- ETT size chosen, cuff tested
- +/- 1 size ETT ready
- 10 ml syringe ready
- ETT on bougie (Kiwi grip/alt)
- In-line EtCO2 plugged into monitor, attached to BVM
- Tube securing device ready
- Supraglottic Airway ready
- Surgical Airway kit ready

HEAVEN CRITERIA

- Hypoxemia
- Extremes Of Size
- Anatomic Challenges
- Vomit/Blood/Fluid
- Exsanguination/Anemia
- Neck Mobility Issues

SET

Sedation and Pre-Oxygenation

- Administer SEDATION AGENT
- Position the patient to align tragus to sternal notch with head of bed elevated to > 30 degrees
- Increase oxygen flow to flush through nasal cannula
- Form two handed, thumbs down seal on BVM, allow spontaneous respirations with maximum oxygen flow
- Increase PEEP as needed to achieve maximal SpO2
- SpO2 > 93%, begin 3 minute countdown
- NIBP, SpO2, EtCO2 VISIBLE
- Crew briefed
- Post-DSI care briefed
- Begin 90 second countdown

GO

PERFORM INTUBATION

- MOANS**
- M-mask seal**
- O-obesity / obstruction**
- A-age (greater than age 55)**
- N-no teeth**
- S-stiff lungs / snoring**

Mallampati

The amount of the posterior pharynx you can visualize



- Assessing the difficult Airway**
- LEMONS**

- L-Look visual inspection** such as small jaw, large tongue, short neck, facial trauma, or congenital abnormalities.
- E-Evaluate apply 3:3:2 rule** Three fingers in the fully opened mouth, three from the apex of the jaw to hyoid bone and two fingers from the hyoid to the tracheal cartilage is predictive of good visualization.
- M-Mallampati (see above)**
- O-Obstruction Upper airway obstruction**
- N-Neck mobility**

Difficult Airway: something one anticipates.
Failed Airway: Something one experiences.
Walls, 2002

Assistive techniques that are also of great value are the Sellick's maneuver. It is important to remember: As unsuccessful attempts at intubation increase, the likelihood of tracheal swelling, soft tissue trauma, and aspiration can occur.

Unsuccessful attempts at intubation by most proficient technician on scene

SPO₂ > 92% with BVM ventilation & 100% O₂

Continue BVM w/100% O₂
 Consider securing airway, despite SPO₂ reading if airway needs controlled

Yes

No

I-gel Airway
 (Pulseless & Apneic)

No
 Unable to establish airway

BVM w/100% O₂

SPO₂ > 92%?

Continue ventilation with BVM

I-gel Airway
 (Apneic)

Unsuccessful, or

Facial Trauma or swelling?
 (Avoid cricothyrotomy if possible, with most medical patients)

Yes

(only if checked off on surgical cric)
Cricothyrotomy-Surgical

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Decrease respiratory distress and work of breathing
2. Maintaining adequate oxygenation and perfusion
3. Direct supportive efforts towards decreasing afterload and increasing preload

Adult Universal Care

Manage airway as necessary
 Provide supplemental **Oxygen** as needed to maintain O2 saturation $\geq 94\%$

Initiate monitoring and perform **12 Lead ECG**

Adult IV/IO

Nitroglycerin 0.4 – 0.8 mg SL
 Every 3 – 5 minutes as long as SBP > 100 mmHg

CPAP Consider advanced airway for severe distress or if not improving with less invasive support

General

EMR

EMT

AEMT

Paramedic

Patient Management Assessment

1. History
 - a. Use of diuretics and compliance
 - b. Weight gain
 - c. Leg swelling
 - d. Orthopnea
2. Exam
 - a. Breath sounds – crackles/rales
 - b. Lower extremity edema
 - c. JVD
 - d. Cough and/or productive cough with pink/frothy sputum
 - e. Diaphoresis
 - f. Chest discomfort
 - g. Hypotension
 - h. Shock
 - i. Respiratory distress, assess:
 - i. Patient's ability to speak in full sentences
 - ii. Respiratory accessory muscle use

Patient Presentation

Inclusion Criteria

1. Respiratory distress with presence of rales
2. Clinical impression consistent with congestive heart failure

Exclusion Criteria

1. Clinical impression consistent with infection (e.g. fever)
2. Clinical impression consistent with asthma/COPD

Notes

1. Differential:
 - a. MI
 - b. CHF
 - c. Asthma
 - d. Anaphylaxis
 - e. Aspiration
 - f. COPD
 - g. Pleural effusion
 - h. Pneumonia
 - i. PE
 - j. Pericardial tamponade
 - k. Toxin exposure
2. Non-Invasive Positive Pressure Ventilation:
 - a. Contraindications:
 - i. Hypoventilation
 - ii. Altered level of consciousness
 - iii. Airway compromise
 - iv. Aspiration risk
 - v. Pneumothorax
 - vi. Facial trauma/burns
 - vii. Systolic BP < 90 mmHg
 - viii. Recent oropharyngeal/tracheal/bronchial surgery
 - b. Benefits:
 - i. Increased oxygenation and perfusion by reducing work of breathing
 - ii. Maintaining inflation of atelectatic alveoli
 - iii. Improving pulmonary compliance
 - iv. Decreases respiratory rate and the work of breathing, HR, and SBP
 - v. Improves delivery of bronchodilators
 - vi. Reduces preload and afterload, improving cardiac output
 - c. Complications:
 - i. Most common is anxiety
 - ii. Theoretical risk of hypotension and pneumothorax as NIPPV increases intrathoracic pressure which decreases venous return and cardiac output
 - iii. Sinusitis
 - iv. Skin abrasions
 - v. Conjunctivitis – minimized with proper size mask
 - vi. Potential for barotrauma - pneumothorax or pneumomediastinum (rare)

Notes-continued

3. Allow patient to remain in position of comfort. Patients may decompensate if forced to lie down.
4. CHF is a common cause of pulmonary edema. Other causes include:
 - a. Medications
 - b. High altitude exposure
 - c. Kidney failure
 - d. Lung damage caused by gases or severe infection
 - e. Major injury
5. Avoid nitroglycerin in patients who have taken sildenafil in the last 24 hours, or tadalafil or vardenafil in the last 48 hours. Nitroglycerin reduces left ventricular (LV) filling pressure primarily via venous dilation. At higher doses the drug variably lowers systemic afterload and increases stroke volume and cardiac output. Although some have advocated early use of ACE inhibitor in patients with acute decompensated heart failure, we do not recommend this approach. There are limited data on the safety and efficacy of initiating new ACE inhibitor or angiotensin receptor blockers (ARB) therapy in the early phase of therapy of acute decompensated heart failure (i.e. the first 12 to 24 hours)
6. There is controversy regarding the use of Lasix in acute pulmonary edema in the prehospital setting, and use is not recommended at this time. Lasix has been widely used in the treatment of CHF and acute pulmonary edema despite limited studies on its effectiveness. Since pulmonary edema is more commonly a problem of volume distribution than overload, administration of furosemide provides no immediate benefit for most patients. There are potential risks of hypokalemia, arrhythmias and increased systemic vascular resistance through enhancement of the Renin Angiotensin System, all of which may be deleterious to the acute CHF patient. Misdiagnosis of CHF and subsequent inducement of inappropriate diuresis can lead to increased morbidity and mortality in patients
7. Nitrates provide both subjective and objective improvement, and might decrease intubation rates, incidence of MIs, and mortality. High-dose nitrates can reduce both preload and afterload and potentially increase cardiac output. Because many CHF patients present with very elevated arterial and venous pressure, frequent doses of nitrates may be required to control blood pressure and afterload. High dose nitrate therapy, nitroglycerin SL, 0.8–2 mg q 3–5 minutes has been used in patients in severe distress such as hypoxia, altered mentation, diaphoresis, or speaking in one word sentences. A concern with high doses of nitrates is that some patients are very sensitive to even normal doses and may experience marked hypotension; it is therefore critical to monitor blood pressure during high-dose nitrate therapy

Patient Care Goals

1. Reduce GI absorption of oral agents with some form of binding
2. Assure adequate ventilation, oxygenation and correction of hypoperfusion

Adult Universal Care

Consider **Activated Charcoal** without sorbitol **1 gm/kg** PO.
 If risk of rapid decreasing mental status, do not administer oral agent without adequately protecting the airway

Poison Control: (800) 222-1222

Blood Glucose

Consider **Atropine** for symptomatic bradycardia
 1 mg IVP, IO every 5 minutes to **Maximum of 3 mg**

Adult IV/IO
 Consider fluid challenge **20 ml/kg** for hypotension with associated bradycardia

Consider **Glucagon** for symptomatic patient
 1 mg every 5 minutes IVP, IO
 (may require 6 mg to see clinical effects)

Consider vasopressor after adequate fluid resuscitation for the hypotensive patient
 "push dose epinephrine"
 prepare 10 mcg/ml by adding 1ml of **Epinephrine 1:10,000** to 9 ml NS; administer 10 mcg (1 ml) every 1 - 2 minutes as needed

Consider **External Pacemaker** if refractory to initial pharmacologic interventions

If seizure, consider **Midazolam (Versed)** 0.1 mg/kg in 2 mg increments slow IVP, IO over one to two minutes per increment with **Maximum single dose 5 mg** (Reduce by 50% for patients 69 years or older)

- General
- EMR
- EMT
- AEMT
- Paramedic

Patient Presentation

Beta blocker or beta adrenergic antagonist medication to reduce the effects of epinephrine/ adrenaline

Inclusion Criteria

Patients present with:

1. Bradycardia
2. Hypotension
3. Lethargy
4. Weakness
5. Shortness of breath
6. Possible seizures

Patient Management

Assessment

1. Assess ABCDs and if indicated expose and then cover to assure retention of body heat
2. Vital signs which include temperature
3. Apply a cardiac monitor, examine rhythm strip for arrhythmias, and consider obtaining a 12- lead EKG
4. Check blood glucose level
5. Monitor pulse oximetry and ETCO2 for respiratory decompensation
6. Identify specific medication taken (noting immediate release vs. sustained release formulations), time of ingestion, and quantity
7. Pertinent cardiovascular history or other prescribed medications for underlying disease
8. Patient pertinent history
9. Patient physical

Notes

1. Pediatric patient may develop hypoglycemia from beta blocker overdose therefore it is important to perform glucose evaluation
2. Glucagon has a side effect of increased vomiting
3. Atropine may have little or no effect (likely to be more helpful in mild overdoses)

Pertinent Assessment Findings

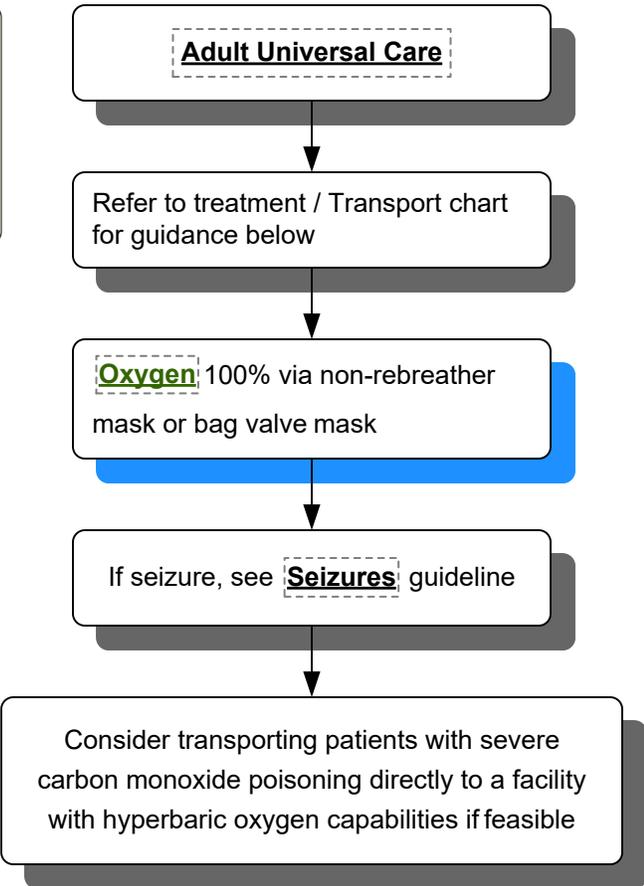
1. Certain beta blockers, such as acebutolol and propranolol may increase QRS duration
2. Certain beta blockers such as acebutolol and pindolol may produce tachycardia and hypertension
3. Sotalol can produce increase in QTc interval and ventricular dysrhythmia
4. Frequent reassessment is essential as patient deterioration can be rapid and catastrophic

Patient Safety Considerations

1. Ipecac is contraindicated
2. Transcutaneous pacing may not always capture nor correct hypotension when capture is successful

Patient Care Goals

1. Remove patient from toxic environment
2. Assure adequate ventilation, oxygenation and correction of hypoperfusion



General

EMR

EMT

AEMT

Paramedic

Interview to find symptomatic patients.

A. Be aware of those patients in the category of having an increased sensitivity to CO:

- Pregnant females
- Infants and children
- Geriatrics

B. If patient meets one of the three criteria above, then move one level higher for treatment

Complete a formal EMS evaluation for all symptomatic patients.

- Symptomatic patients are those with headache, nausea, dyspnea, dizziness, or changes in level of consciousness.

Obtain a Caboxyhemoglobin level on all patients with signs or symptoms. Follow the table for EMS treatment.

EMS Treatment for Carboxyhemoglobin		
COHb Level %	Signs & Symptoms	Treatment
0 – 4%	None - Normal	None Necessary (smoker 3-5% higher)
5 – 9%	Minor Headache	100% O2 via NRB Mask Reassess after 10-15 min.
10 – 19%	Headache / SOB	100% O ₂ via NRB Mask And transport to closest hospital
20 – 29%	Headache, Nausea, Dizziness, Fatigue	ABC's, 100% Oxygen, And transport to closest hospital Unless unconscious
30 – 39%	Severe Headache, Vomiting, Vertigo, ALOC	ABC's, 100% Oxygen, Transport HBO
40 – 49%	Confusion, Syncope, Tachycardia	ABC's, 100% Oxygen, Transport HBO
50 – 59%	Seizures, Shock, Apnea	ABC's, 100% Oxygen, Transport HBO
60% - up	Cardiac Arrhythmias, Coma, Death	ABC's, 100% Oxygen, Transport HBO

Patient Presentation

Carbon monoxide is a colorless, odorless gas which has a high affinity for binding to red cell hemoglobin thus preventing the binding of oxygen to the hemoglobin leading to hypoxia. A significant reduction in oxygen delivery to tissues and organs occurs with carbon monoxide poisoning. With any form of combustion [fire/ smoke (e.g. propane or charcoal stoves or heaters), combustion engines (e.g. generators, lawn mowers, motor vehicles, home heating systems)], carbon monoxide will be generated

Inclusion Criteria

Patients exposed to carbon monoxide source may present with a spectrum of symptoms:

1. Mild intoxication:
 - a. Nausea
 - b. Fatigue
 - c. Headache
 - d. Vertigo
 - e. Lightheadedness
2. Moderate to severe:
 - a. Altered mental status
 - b. Tachypnea
 - c. Tachycardia
 - d. Convulsion
 - e. Cardiopulmonary arrest

Patient Management

Assessment

1. Remove patient from toxic environment
2. Assess ABCDs and, if indicated, expose and then cover to assure retention of body heat
3. Vital signs which include temperature
4. Apply a cardiac monitor, examine rhythm strip for arrhythmias, and consider obtaining a 12- lead EKG
5. Check blood glucose level
6. Monitor pulse oximetry and ETCO₂ for respiratory decompensation
7. Patient pertinent history
8. Patient physical

Notes

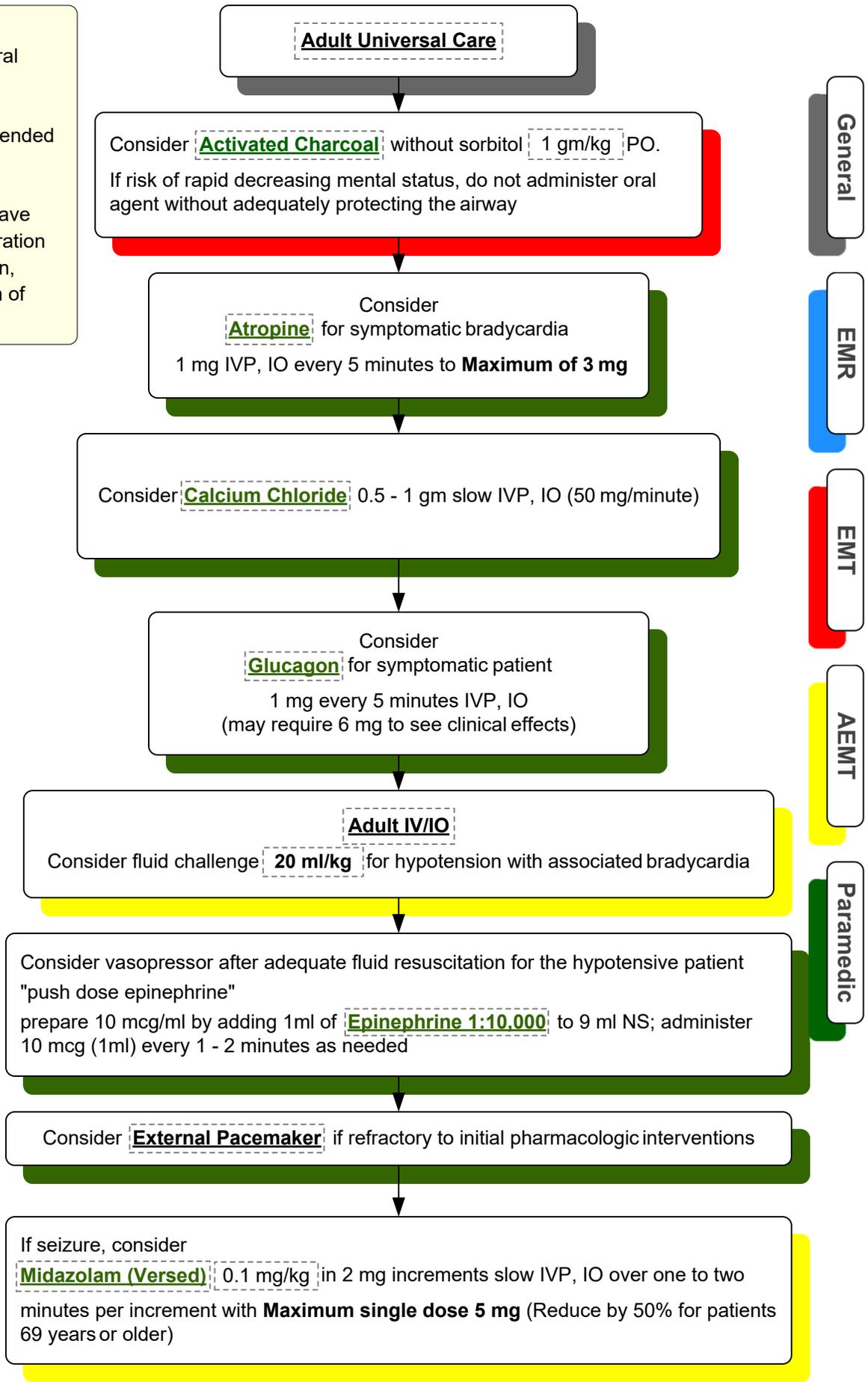
1. Pulse oximetry is inaccurate due to the carbon monoxide binding with hemoglobin
2. As maternal carboxyhemoglobin levels do not accurately reflect fetal carboxyhemoglobin levels, pregnant patients are more likely to be treated with hyperbaric oxygen
3. A patient light wavelength analysis device to detect carboxyhemoglobin is useful to indicate if there is a carbon monoxide exposure in a non-arrested patient
 - . Do not anticipate an immediate change in readings with oxygen administration

Patient Safety Considerations

1. Consider affixing a carbon monoxide detector to an equipment bag that is routinely taken into scene (if it signals alarm, don appropriate respiratory protection)
2. Remove patient and response personnel from potentially hazardous environment as soon as possible
3. Provide instruction to the patient, the patient's family, and other appropriate bystanders to not enter the environment (e.g. building, car) where the carbon monoxide exposure occurred until the source of the poisoning has been eliminated
4. Do not look for cherry red skin coloration as an indication of carbon monoxide poisoning as this is usually a morgue finding
5. CO oximeter devices may yield inaccurate low/normal results for patients with CO poisoning. All patients with probable or suspected CO poisoning should be transported to the nearest appropriate hospital, based on their presenting signs and symptoms

Patient Care Goals

1. Reduce GI absorption of oral agents with some form of binding agent (activated charcoal) especially for extended release
2. Early airway protection is required as patients may have rapid mental status deterioration
3. Assure adequate ventilation, oxygenation and correction of hypoperfusion



General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Calcium channel blocker medication interrupts the movement of calcium across cell membranes. Calcium channel blockers are used to manage hypertension, certain rate-related arrhythmias, prevent cerebral vasospasm, and angina pectoris

Inclusion Criteria

Patients present with:

1. Bradycardia
2. Hypotension
3. Decreased AV Nodal conduction
4. Cardiogenic shock

Notes

1. Certain calcium channel blockers generate a variety of dysrhythmias. Especially concerning are:
 - a. Bradycardia
 - b. Torsade de pointes
2. The avoidance of administering calcium chloride or calcium gluconate to a patient on cardiac glycosides (e.g. digoxin) as this may precipitate toxicity and associate fatal arrhythmias is felt to be a historical belief and not supported
3. Glucagon has a side effect of increased vomiting

Patient Management**Assessment**

1. Assess ABCDs and, if indicated, expose and then cover to assure retention of body heat
2. Vital signs including temperature
3. Apply a cardiac monitor, examine rhythm strip for arrhythmias, and consider obtaining a 12-lead EKG
4. Check blood glucose Level
5. Monitor pulse oximetry and ETCO₂ for respiratory decompensation
6. Identify specific medication taken (noting immediate release vs. sustained release formulations), time of ingestion, and quantity
7. Pertinent cardiovascular history or other prescribed medications for underlying disease
8. Patient pertinent history
9. Patient physical

Poison Control: (800) 222-1222

Patient Care Goals

1. Remove patient from toxic environment
2. Assure adequate ventilation, oxygenation and correction of hypoperfusion

Adult Universal Care

There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication and levels detected in the environment. For the patient with an appropriate history and manifesting one or more of high concentrations of cyanide signs or symptoms, treat as per algorithm:

Oxygen 100% via non-rebreather mask or bag valve mask
Supportive Airway Management

If **seizure**, consider **Midazolam (Versed)** (benzodiazepine of choice)
Adult : **0.1 mg/kg** in 2 mg increments slow IV push over one to two minutes per increment with **Maximum single dose 5 mg** (Reduce by 50% for patients 69 years or older)

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Cyanide is a colorless, "bitter almond smell" (genetically only 40% of population can smell) gas or white crystal which attaches to tissues at the cellular mitochondria (cytochrome oxidase) level, thus preventing the use of oxygen, leading to cellular hypoxia

Inclusion Criteria

Depending on its form, cyanide can enter the body through inhalation, ingestion, or absorption through the skin. Cyanide should be suspected in occupational or smoke exposures (i.e. firefighting), industrial accidents, natural catastrophes, suicide and murder attempts, chemical warfare and terrorism (whenever there are multiple casualties of an unclear etiology). Non-specific and early signs of cyanide exposure (inhalation, ingestion, or absorption) include the following signs and symptoms: anxiety, vertigo, weakness, headache, tachypnea, nausea, dyspnea, vomiting, and tachycardia

High concentrations of cyanide will produce:

1. Markedly altered level of consciousness
2. Seizure
3. Respiratory depression or respiratory arrest
4. Cardiac dysrhythmia (other than sinus tachycardia)

The rapidity of onset is related to the severity of exposure (inhalation or ingestion) and may have dramatic, immediate effects causing early hypertension with subsequent hypotension, sudden cardiovascular collapse or seizure/coma

Notes

1. Pulse oximetry accurately reflects serum levels of oxygen but does not accurately reflect tissue oxygen levels therefore should not be relied upon
2. After hydroxocobalamin has been administered, pulse oximetry levels are no longer accurate
3. If the patient has taken an oral ingestion of cyanide salt, the cyanide salt will react to the acids in the stomach generating hydrogen cyanide. Be sure to maximize air circulation in closed space (back compartment of ambulance) as the patient's gastric contents may contain hydrogen cyanide gases when released with vomiting or belching

Pertinent Assessment Findings

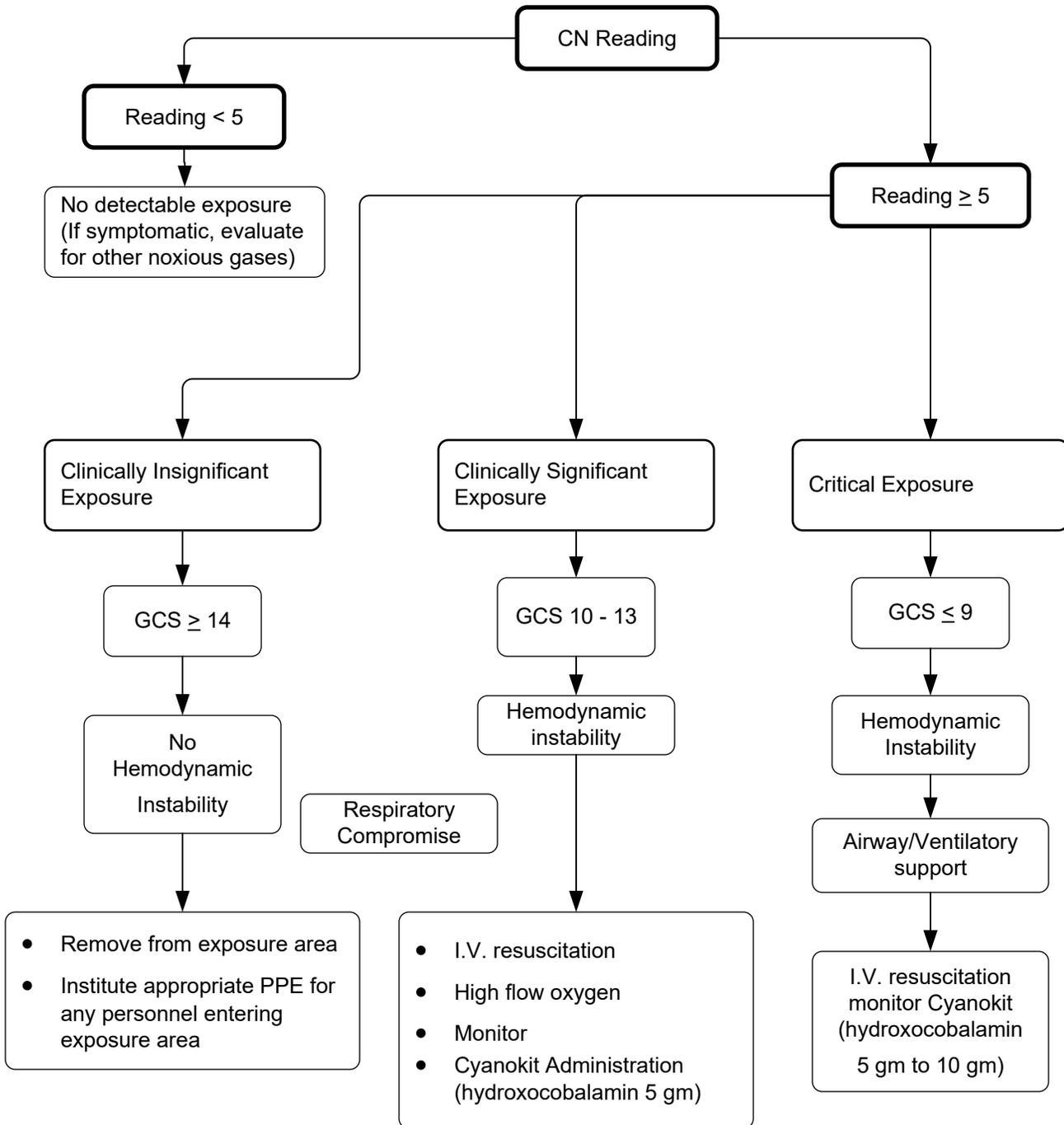
Early and repeated assessment is essential

Patient Safety Considerations

1. In the event of multiple casualties, be sure to wear appropriate PPE during rescue evacuation from the toxic environment
2. If patient has ingested cyanide liquid or crystals, the cyanide will react with the stomach acids to generate hydrogen cyanide gas which may be released into provider breathing air with belching, vomiting or gastric lavage
3. Do not use nitrites in conjunction with suspected carbon monoxide poisoning as it worsens the hemoglobin oxygen carrying capacity even more than CO)
4. Hydroxocobalamin is only agent safe for treatment of cyanide poison in pregnant patient

Patient Management

1. Remove patient from toxic environment
2. Assess ABCDs and, if indicated, expose and then cover the patient to assure retention of body heat
3. Vital signs which include temperature
4. Put on cardiac monitor and examine rhythm strip for arrhythmia potentials (consider 12-lead EKG)
5. Check blood glucose Level
6. Monitor pulse oximetry and ETCO₂ for respiratory decompensation.
7. Identify specific agent taken, time of ingestion/ inhalation, and quantity
8. Pertinent cardiovascular history or other prescribed medications for underlying disease
9. Patient pertinent history
10. Patient physical exam



Patient Care Goals

Rapid recognition of the signs and symptoms of confirmed or suspected acetylcholinesterase inhibitor (AChEI) agents such as carbamates, nerve agents, or organophosphates exposure followed by expeditious and repeated administration of atropine, the primary antidote.

Adult Universal Care

Poison Control: (800) 222-1222

General

EMR

EMT

AEMT

Paramedic

Atropine

Atropine is the primary antidote for organophosphate, carbamate, or nerve agent exposures, and repeated doses should be administered liberally to patients who exhibit signs and symptoms of exposure or toxicity

- a. Atropine may be provided in multi-dose vials, pre-filled syringes, or auto-injectors
- b. Commercially available atropine auto-injectors include:
 - i. Atro-Pen® 1 mg of atropine (dark red container)
 - ii. Atro-Pen® 2 mg of atropine (green container)

Pralidoxime Chloride (2-PAM)

Pralidoxime chloride is a secondary treatment and should be given concurrently in an effort to reactivate the acetylcholinesterase

- a. Pralidoxime chloride may be provided in a single dose vial, pre-filled syringes, or auto-injectors
- b. Auto-injectors contain 600 mg of pralidoxime chloride
- c. In order to be beneficial to the victim, a dose of pralidoxime chloride should be administered shortly after the nerve agent or organophosphate poisoning as it has minimal clinical effect if administration is delayed

Benzodiazepines

Benzodiazepines are administered as an anticonvulsant for those patients who exhibit seizure activity (see the **Seizures** guideline for doses and routes of administration)

- a. Lorazepam, diazepam, and midazolam are the most frequently used benzodiazepines in the prehospital setting
- b. In the scenario of an AChEI agent exposure, the administration of diazepam or midazolam is preferable due to their more rapid onset of action
- c. Benzodiazepines may be provided in multi-dose or single-dose vials, pre-filled syringes, or auto-injectors
Cana® is a commercially available auto-injector of diazepam

Mark I Kits

- a. A commercially available kit of nerve agent/organophosphate antidote auto-injectors
- b. A Mark I® kit consists of one auto-injector containing 2 milligrams of atropine and a second auto-injector containing 600 milligrams of pralidoxime chloride

Duodote

- a. A commercially available auto-injector of nerve agent/organophosphate antidote
Duodote® is one auto-injector that contains 2.1 milligrams of atropine and 600 milligrams of pralidoxime chloride

Mild AChEI Agent Exposure	
Patient Weight	Atropine Dose IM or via Auto-Injector
Infant: 0 - 2 years	0.05 mg/kg IM or via auto injector
Child: 3 – 7 years (13 – 25 kg)	1 mg IM or via auto-injector (e.g. 0.25 mg and or 0.5 mg auto-injector)
Child: 8 – 14 years (26 – 50 kg)	2 mg IM or via auto-injector (e.g. 2 mg and or two 1 mg auto-injector)
Adolescent/Adult	2 mg IM or via auto-injector
Pregnant Women	2 mg IM or via auto-injector
Geriatric or Frail	1 mg IM or via auto-injector

Mild to Moderate AChEI Agent Exposure		
Patient Weight	Atropine Dose IM or via Auto-Injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0 - 2 years	0.05 mg/kg IM or via auto injector	15 mg/kg IM
Child: 3 – 7 years (13 – 25 kg)	1 mg IM or via auto-injector (e.g. 0.25 mg and or 0.5 mg auto-injector)	15 mg/kg IM or One auto-injector (600 mg)
Child: 8 – 14 years (26 – 50 kg)	2 mg IM or via auto-injector (e.g. 2 mg and or two 1 mg auto-injector)	15 mg/kg IM or One auto-injector (600 mg)
Adolescent/Adult	2 mg IM or via auto-injector	600 mg IM or One auto-injector (600 mg)
Pregnant Women	2 mg IM or via auto-injector	600 mg IM or One auto-injector (600 mg)
Geriatric or Frail	1 mg IM or via auto-injector	10 mg/kg IM or One auto-injector (600 mg)

Severe AChEI Agent Exposure

Patient Weight	Atropine Dose IM or via Auto-Injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0 - 2 years	0.1 mg/kg IM or via auto-injector (e.g. 0.25 mg and/or 0.5 mg auto-injector)	45 mg/kg IM
Child: 3 – 7 years (13 – 25 kg)	0.1 mg/kg IM or 2 mg via auto-injector (e.g. one 2 mg auto-injectors or four 0.5 mg auto-injectors)	45 mg/kg IM or One auto-injector (600mg)
Child: 8 – 14 years (26 – 50 kg)	4 mg IM or via auto-injector (e.g. two 2 mg auto-injectors or four 1 mg auto-injectors)	45 mg/kg IM or Two auto-injectors (1200 mg)
Adolescent > 14 years	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto-injectors)	Three auto-injectors (1800 mg)
Adult	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto-injectors)	Three auto-injectors (1800 mg)
Pregnant Women	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto-injectors)	Three auto-injectors (1800 mg)
Geriatric or Frail	2-4 mg IM or 2-4 mg via auto-injector (e.g. one to two 2 mg auto-injectors)	25 mg/kg IM or Two to three auto-injectors (1200 mg-1800 mg)

Patient Presentation**Inclusion Criteria**

DUMBELS is a mnemonic used to describe the signs and symptoms of AChEI agent poisoning. All patient age groups are included where the signs and symptoms exhibited are consistent with the toxidrome of DUMBELS.

- D** Diarrhea
- U** Urination
- M** Miosis/Muscle weakness
- B** Bronchospasm/Bronchorrhea
- E** Emesis

- L** Lacrimation
- S** Salivation/Sweating

Patient Management Assessment

1. Don the appropriate personal protective equipment (PPE)
2. Remove the patient's clothing and wash the skin with soap and water
 - a. AChEI agents can be absorbed through the skin
 - b. Contaminated clothing can provide a source of continued exposure to the toxin
3. Rapidly assess the patient's respiratory status, mental status, and pupillary status
4. Administer oxygen
5. Establish intravenous access (if possible)
6. Apply a cardiac monitor (if available)
7. The heart rate may be normal, bradycardic, or tachycardic
8. Clinical improvement should be based upon the drying of secretions and easing of respiratory effort rather than heart rate or pupillary response
9. Continuous and ongoing patient reassessment is critical

Assessment

1. AChEI agents are highly toxic chemical agents and can rapidly be fatal
2. Antidotes (atropine and pralidoxime) are effective if administered before circulation fails
3. The patient may develop:
 - a. Miosis (pinpoint pupils)
 - b. Bronchospasm
 - c. Vomiting
 - d. Excessive secretions in the form of:
 - i. Tearing
 - ii. Salivation
 - iii. Rhinorrhea
 - iv. Diarrhea
 - v. Urination

Assessment-continued

4. Penetration of an AChEI agent into the central nervous system (CNS) will cause:
 - a. Headache
 - b. Confusion
 - c. Generalized muscle weakness
 - d. Seizures
 - e. Lethargy or unresponsiveness
5. Estimated level of exposure based upon signs and symptoms
 - a. Mild
 - i. Miosis alone
 - ii. Miosis and severe rhinorrhea
 - b. Mild to moderate (in addition to symptoms of mild exposure)
 - i. Localized swelling
 - ii. Muscle fasciculations
 - iii. Nausea and vomiting
 - iv. Weakness
 - v. Shortness of breath
 - c. Severe (in addition to symptoms of mild to moderate exposure)
 - i. Unconsciousness
 - ii. Convulsions
 - iii. Apnea or severe respiratory distress requiring assisted ventilation
 - iv. Flaccid paralysis
6. Onset of symptoms can be immediate with an exposure to a large amount of the AChEI
7. Signs and symptoms with large AChEI agent exposures (regardless of route)
 - a. Sudden loss of consciousness
 - b. Seizures
 - c. Copious secretions
 - d. Apnea
 - e. Death
 - i. There is usually an asymptomatic interval of minutes after liquid exposure before these symptoms occur
 - ii. Effects from vapor exposure occur almost immediately
8. Patients with low-dose chronic exposures may have a more delayed presentation of symptoms
9. Identify:
 - a. Specific agent taken (if possible)
 - b. Time of exposure
 - c. Quantity
 - d. Pertinent cardiovascular history or other prescribed medications for underlying disease
10. The patient can manifest any or all of the signs and symptoms of the toxidrome based on the route of exposure, agent involved, and concentration of the agent:
 - a. Vapor exposures will have a direct effect on the eyes and pupils causing miosis
 - b. Patients with isolated skin exposures will have normally reactive pupils
 - c. Certain AChEI agents can place the patient at risk for both a vapor and skin exposure

Medication Administration:

1. Atropine in extremely large, and potentially multiple, doses is the antidote for an AChEI agent poisoning
2. Atropine should be administered immediately followed by repeated doses until the patient's secretions resolve
3. Pralidoxime chloride (2-PAM) is a secondary treatment and, when possible, should be administered concurrently with atropine
4. The stock of atropine and pralidoxime chloride available to EMS providers is usually not sufficient to fully treat the victim of an AChEI agent exposure; however, EMS providers should initiate the administration of atropine and, if available, pralidoxime chloride
5. Seizures should be treated with benzodiazepines
There is some emerging evidence that, for midazolam, the intranasal route of administration may be preferable to the intramuscular route
6. The patient should be emergently transported to the closest appropriate medical facility as directed by direct medical oversight

Recommended Doses

The medication dosing tables that are provided below are based upon the severity of the clinical signs and symptoms exhibited by the patient. There are several imperative factors to note:

1. For organophosphate or severe AChEI agent exposure, the required dose of atropine necessary to dry secretions and improve the respiratory status is likely to exceed 20 mg. Atropine should be administered rapidly and repeatedly until the patient's clinical symptoms diminish
2. Since the antidotes in the Mark I® kit are in two separate vials, the atropine auto-injector in the kit can be administered to the patient in the event that Atro-Pen® or generic atropine auto-injectors are not available and/or intravenous atropine is not an immediate option
3. Due to the fact that Duodote® auto-injectors contain pralidoxime chloride, they should not be used for additional dosing of atropine beyond the recommended administered dose of pralidoxime chloride
4. All of the medications below can be administered intravenously in the same doses cited for the intramuscular route. However, due to the rapidity of onset of signs, symptoms, and potential death from AChEI agents, intramuscular administration is highly recommended to eliminate the inherent delay associated with establishing intravenous access
5. Atropine and diazepam can be administered via the intraosseous route. However, due to the rapidity of onset of signs, symptoms, and potential death from AChEI agents, intramuscular administration remains the preferable due to the inherent delay associated with establishing intraosseous access and the limited use of this route of administration for other medications

Patient safety considerations

1. Continuous and ongoing patient reassessment is critical
2. Clinical response to treatment is demonstrated by the drying of secretion and the easing of respiratory effort
3. Initiation of and ongoing treatment should **not** be based upon heart rate or pupillary response
4. Precautions for pralidoxime chloride administration: Although Duodote® contains atropine, the primary antidote for an AChEI agent poisoning, the inclusion of pralidoxime chloride in the auto-injector can present challenges if additional doses of atropine are warranted by the patient condition and other formulations of atropine are unavailable:
 - a. In the pediatric population, an overdose of pralidoxime chloride may cause profound neuromuscular weakness and subsequent respiratory depression
 - b. In the adult population, especially for the geriatric victim, excessive doses of pralidoxime chloride may cause severe systolic and diastolic hypertension, neuromuscular weakness, headache, tachycardia, and visual impairment
 - c. For the geriatric victim who may have underlying medical conditions, particularly impaired kidney function or hypertension, the EMS provider should consider administering the lower recommended adult dose of intravenous pralidoxime chloride
5. Considerations during the use of auto-injectors
 - a. If an auto-injector is administered, a dose calculation prior to administration is not necessary
 - b. For atropine, additional auto-injectors should be administered until secretions diminish
 - c. Mark I® kits and Duodote® have not been approved for pediatric use by the Food and Drug Administration (FDA), but they can be considered for the initial treatment for children of any age with severe symptoms of an AChEI agent poisoning especially if other formulations of atropine are unavailable
 - d. Pediatric Atro-Pen® auto-injectors are commercially available in a 0.25 mg auto-injector (yellow) and a 0.5 mg auto-injector (red). Atro-Pen® auto-injectors are commercially available in a 1 mg auto-injector (blue) and a 2 mg auto-injector (green)
 - e. A pralidoxime chloride 600 mg auto-injector may be administered to an infant that weighs greater than 12 kg

Notes

1. Clinical Effects of AChEI Agents
 - a. The clinical effects are caused by the inhibition of the enzyme acetylcholinesterase which allows excess acetylcholine to accumulate in the nervous system
 - b. The excess accumulated acetylcholine causes hyperactivity in muscles, glands, and nerves
2. Organophosphates
 - a. Can be legally purchased by the general public
 - b. Toxic chemicals that are readily available for purchase by the general public as pesticides penetrate tissues and bind to the patient's body fat producing a prolonged period of illness and ongoing toxicity even during aggressive treatment
3. Nerve agents
 - a. Traditionally classified as weapons of mass destruction (WMD)
 - b. Not readily accessible to the general public
 - c. Extremely toxic and rapidly fatal with any route of exposure
 - d. GA (tabun), GB (sarin), GD (soman), GF, and VX are types of nerve agents and are WMDs

Pertinent Assessment Findings

The signs and symptoms exhibited with the toxidrome of DUMBELS. (See Patient Presentation Inclusion Criteria listed above)

Guideline for the Treatment of Seizures Secondary to AChEI Agent Exposure		
Patient Weight	Atropine Dose IM or via Auto-Injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0 - 2 years	0.2 - 0.5 mg/kg IM, repeat every 2-5 minutes	0.15 mg/kg IM, repeat prn in 10 minutes
	0.2 - 0.5 mg/kg IV every 15-30 minutes; may repeat twice as needed	May repeat dose once
	Total maximum dose: 5 mg	Total maximum dose: 0.3 mg/kg
Child: 3 – 13 years	0.2 - 0.5 mg/kg IM repeat every 2-5 minutes	0.15 mg/kg IM, repeat prn in 10 minutes
	0.2 - 0.5 mg/kg IV every 15-30 minutes; may repeat dose twice if needed	May repeat dose once
	Total maximum dose: 5 mg if < 5 years	Total maximum dose: 0.3 mg/kg; not to exceed 20 mg
	Total maximum dose: 10 mg if age ≥5 years 1 CANA auto-injector	
Adolescent > 14 years	2-3 CANA auto-injectors	0.15 mg/kg IM to a maximum dose of 10 mg, repeat prn in 10 minutes
	5-10 mg IV every 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Adult	2-3 CANA auto-injectors	10 mg IM, repeat prn in 10 minutes
	5-10 mg IV every 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Pregnant Women	2-3 CANA auto-injectors	10 mg IM, repeat prn in 10 minutes
	5-10 mg IV every 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg
Geriatric or Frail	2-3 CANA auto-injectors	10 mg IM, repeat prn in 10 minutes
	5-10 mg IV every 15 minutes	May repeat dose once
	Total maximum dose: 30 mg	Total maximum dose: 20 mg

Patient Care Goals

1. Rapid recognition and intervention of a clinically significant opioid poisoning or overdose
2. Prevention of respiratory and/or cardiac arrest

Poison Control: (800) 222-1222

Adult Universal Care

Critical resuscitation (opening and/or maintaining the airway, provision of oxygen, ensuring adequate circulation) should be performed prior to naloxone administration

If the patient is symptomatic from a confirmed or suspected opioid overdose, consider

Naloxone (Narcan) administration.

The administration of the initial dose or subsequent doses can be incrementally titrated until respiratory depression is reversed

Naloxone (Narcan) can be administered via the IVP, IM, IN, or ETT routes with the typical initial adult dose ranging between 0.4 - 2 mg

- For the intranasal route, divide administration of the dose equally between the nostrils to a **Maximum of 1 ml** per nostril
- The intranasal administration can also be titrated until adequate respiratory effort is achieved.
- For patient refusal, administer **Naloxone (Narcan)** 2 mg IM before leaving scene if patient permits.

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

Patients of all age groups with access to opioids and known or suspected opioid use or abuse

Exclusion Criteria:

Patients with altered mental status exclusively from other causes (e.g. head injury, hypoxia, or hypoglycemia)

Patient Management

1. Don the appropriate personal protective equipment (PPE)
2. Therapeutic interventions to support the patient's airway, breathing, and circulation should be initiated prior to the administration of naloxone
3. Identify specific medication taken (including immediate release vs sustained release) if possible, time of ingestion, and quantity
4. Obtain and document pertinent cardiovascular history or other prescribed medications for underlying disease
5. Be aware that unsecured hypodermic needles may be on scene if the intravenous route may have been used by the patient, and that there is a higher risk of needle sticks during the management of this patient population which may also have an increased incidence of blood-borne pathogens
6. Naloxone, an opioid antagonist, should be considered for administration to patients with a confirmed or suspected opioid overdose, **especially those that are exhibiting respiratory depression**
7. Naloxone administration via the intranasal or intramuscular routes or as a nebulized solution provide additional options of medication delivery
 - Suboxone® is a combination of buprenorphine and naloxone. The IN route has the benefit of no risk of needle stick to the provider

Assessment

1. Assess the patient's airway, breathing, circulation, and mental status
2. Support the patient's airway by positioning, oxygen administration, and ventilator assistance with a bag valve mask if necessary
3. Assess the patient for other etiologies of altered mental status including hypoxia, hypoglycemia, hypotension, and traumatic head injury

Notes

1. The essential feature of opioid overdose requiring EMS intervention is respiratory depression or apnea
2. Overuse and abuse of prescribed and illegal opioids has led to an increase in accidental and intentional opioid overdoses
3. DEA and opioids:
 - a. Opioids, most of which are controlled under the Drug Enforcement Administration (DEA), have a high potential for abuse, but have an accepted medical use in patient treatment and can be prescribed by a physician
 - b. Frequent legally prescribed opioids include codeine, fentanyl, hydrocodone, morphine, hydromorphone, methadone, morphine, oxycodone, and oxymorphone
 - c. Opioid derivatives, such as heroin, are illegal in the United States
4. Opioid combinations:
 - a. Some opioids are manufactured as a combination of analgesics with acetaminophen, acetylsalicylic acid (aspirin), or other substances
 - b. In the scenario of an overdose, there is a potential for multiple drug toxicities
 - c. Examples of opioid combination analgesics:
 - i. Vicodin® is a combination of acetaminophen and hydrocodone
 - ii. Percocet® is a combination of acetaminophen and oxycodone
 - iii. Percodan® is a combination of aspirin and oxycodone

Patient Safety Considerations

1. Clinical duration of naloxone
 - a. The clinical opioid reversal effect of naloxone is limited and may end within an hour whereas opioids often have a duration of 4 hours or longer
 - b. Monitor the patient for recurrent respiratory depression and decreased mental status
2. Opioid withdrawal
 - a. Patients with altered mental status secondary to an opioid overdose may become agitated or violent following naloxone administration due to opioid withdrawal
 - b. Be prepared for this potential scenario and take the appropriate measures in advance to ensure and maintain scene safety
3. EMS providers should be prepared to initiate airway management before, during, and after naloxone administration and to provide appropriate airway support until the patient has adequate respiratory effort

Pertinent Assessment Findings

1. The primary clinical indication for the use of opioid medications is analgesia
2. In the opioid overdose scenario, signs and symptoms include:
 - a. Miosis (pinpoint pupils)
 - b. Decreased intestinal motility
 - c. Respiratory depression
 - d. Decreased mental status
3. Additional assessment precautions:
 - a. The risk of respiratory arrest with subsequent cardiac arrest from an opioid overdose as well as hypoxia, hypercarbia, and aspiration may be increased when other substances such as alcohol, benzodiazepines, or other medications have also been taken by the patient
 - b. The signs and symptoms of an opioid overdose may also be seen in newborns who have been delivered from a mother with recent or chronic opioid use. Neonates who have been administered naloxone for respiratory depression due to presumed intrauterine opioid exposure should be monitored closely for seizures

Go to:

Drugs Narcan will/will not, have effect on

Patient Care Goals

1. Remove patient from hazardous material environment decontaminate to remove continued sources of absorption, ingestion, inhalation, or injection
2. Identify intoxicating agent by toxidrome or appropriate environmental testing
3. Assess risk for organ impairments (heart, brain, kidney)
4. Identify antidote or mitigating agent
Treat signs and symptoms in effort to stabilize patient

Adult Universal Care

Adult Airway Management

Administer oxygen and if hypoventilation, toxic inhalation or desaturation noted, support breathing

Adult IV/IO

infusion of lactated ringers or normal saline
Fluid Bolus 20 ml/kg
if evidence of hypotension

Obtain **Blood Glucose**

Drugs Narcan will/will not, have effect on

Acetaminophen overdose:

- Consider **Activated Charcoal** without sorbitol **1 gm/kg** PO
- If risk of rapidly decreasing mental status, do not administer oral agents

Aspirin overdose:

- Consider **Activated Charcoal** without sorbitol **1 gm/kg** PO
- If risk of rapid decreasing mental status, do not administer oral agents
- As aspirin is erratically absorbed, charcoal is highly recommended to be administered early

Ingestion of caustic substances (acids and alkali)

- In the few minutes immediately after ingestion, consider administration of water or milk if available (maximum of 250 ml) **Medical Control Approval.**
- Symptomatic dystonia, extrapyramidal signs or symptoms, or mild allergic reactions Consider **Diphenhydramine (Benadryl):** 25 mg IV or IM

Symptomatic monoamine oxidase inhibitor overdose (MAOI; examples: Isocarboxazid (Marplan), Phenelzine (Nardil), Selegiline (Emsam), Tranylcypromine (Parnate))

- Consider administration of **Midazolam (Versed):** for temperature control **0.1 mg/kg** in 2 mg increments slow IV push over one to two minutes per increment with **Maximum single dose 5 mg** (Reduce by 50% for patients 69 years or older)

Oral ingestion poisoning:

- Consider administration of **Activated Charcoal** without sorbitol **1 gm/kg** PO particularly if it is within the first 2 hour after ingestion (including acetaminophen)
- Patients who have ingested medications with extended release or delayed absorption should also be administered activated charcoal If there is a risk of rapidly decreasing mental status or for petroleum-based ingestions, do not administer oral agents

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

Presentation may vary depending on the concentration and duration of exposure. Signs and symptoms may include, but are not limited to, the following:

1. Absorption:

- a. Nausea
- b. Vomiting
- c. Diarrhea
- d. Altered mental status
- e. Abdominal pain
- f. Rapid heart rate
- g. Dyspnea
- h. Seizures
- i. Arrhythmias
- j. Respiratory depression
- k. Sweating
- l. Tearing
- m. Defecation
- n. Constricted/dilated pupils
- o. Rash
- p. Burns to the skin

2. Ingestion:

- a. Nausea
- b. Vomiting
- c. Diarrhea
- d. Altered mental status
- e. Abdominal pain
- f. Rapid or slow heart rate
- g. Dyspnea
- h. Seizures
- i. Arrhythmias
- j. Respiratory depression
- k. Chemical burns around or inside the mouth
- l. Abnormal breath odors

3. Inhalation:

- a. Nausea
- b. Vomiting
- c. Diarrhea
- d. Altered mental status
- e. Abnormal skin color
- f. Dyspnea
- g. Seizures
- h. Burns to the respiratory tract
- i. Stridor
- j. Sooty sputum
- k. Known exposure to toxic or irritating gas
- l. Respiratory depression
- m. Sweating
- n. Tearing
- o. Constricted/dilated pupils
- p. Dizziness

4. Injection:

- a. Local pain
- b. Puncture wounds
- c. Reddening skin
- d. Local edema
- e. Numbness
- f. Tingling
- g. Nausea
- h. Vomiting
- i. Diarrhea
- j. Altered mental status
- k. Abdominal pain
- l. Seizures
- m. Muscle twitching
- n. Hypoperfusion
- o. Respiratory depression
- p. Metallic or rubbery taste

Patient Management Assessment

1. Make sure the scene is safe
2. Consider Body Substance Isolation (BSI) or appropriate personal protective equipment (PPE)
3. Assess ABCD and if indicated expose and then cover to assure retention of body heat
4. Vital signs which include temperature
5. Place cardiac monitor and examine rhythm strip for arrhythmia potentials (consider 12-lead EKG)
6. Check blood glucose level
7. Monitor pulse oximetry and ETCO₂ for respiratory decompensation
8. Identify specific medication taken (including immediate release vs sustain release) time of ingestion, dose, and quantity
9. Pertinent cardiovascular history or other prescribed medications for underlying disease
10. Check for needle marks, paraphernalia, bites, bottles or evidence of agent involved, self-inflicted injury, or trauma
11. Law enforcement should have checked for weapons and drugs but you may decide to re-check
12. Patient pertinent history
13. Patient physical examination

Patient Safety Considerations

1. Scene/environmental safety patient and provider
2. Monitor patient airway, breathing, pulse oximetry, ETCO₂ for adequate ventilation as they will change over time
3. Repeat vital signs
4. Monitor level of consciousness
5. Monitor EKG with special attention to rate, rhythm, QRS and QT duration
6. Maintain or normalize patient temperature
7. Accurate ingestion history (as patient may become unconscious before arrival at ED):
 - a. Time of ingestion
 - b. Route of exposure
 - c. Quantity of medication or toxin taken (safely collect all possible medications or agents)
 - d. Alcohol or other intoxicant taken
8. Poison center should be engaged as early as reasonably possible to add in appropriate therapy and to track patient outcomes to improve knowledge of toxic effects. The national 24-hour toll-free telephone number to poison control centers is (800) 222-1222, and it is a resource for free, confidential expert advice from anywhere in the United States

Notes

1. Each toxin or overdose has unique characteristics which must be considered in individual protocol
2. Activated charcoal is still a useful adjunct in the serious agent, enterohepatic, or extended release agent poisoning as long as the patient does not have the potential for rapid alteration of mental status or airway/ aspiration risk
3. Ipecac is no longer recommended for **any** poisoning or toxic ingestion. The manufacturer has stopped production of this medication

Pertinent Assessment Findings

1. Each toxin or overdose has unique characteristics which must be considered in individual guideline
2. Frequent reassessment is essential as patient deterioration can be rapid and catastrophic

Radiation Exposure

Patient Care Goals

1. Identify the patient with a confirmed or suspected radiation exposure or radioactive contamination
2. Minimize the resultant mortality and morbidity
3. Prevent ongoing or additional contamination

Adult Universal Care

Confirmed or suspected skin exposures

Wash all exposed areas repeatedly with soap and water

Continue irrigation of the skin until dosimetry readings decrease to an acceptable level

Confirmed or suspected inhalation contamination

- Administer **Oxygen**
- Maintain the airway and, if necessary, perform intubation

Support respirations and consider administration of **Albuterol (Proventil)** aerosols if necessary

Inform personnel at the receiving facility of a confirmed or suspected radioactive inhalation and/or ingestion as bronchopulmonary lavage and/or urgent administration of chelating or blocking agents may be indicated to minimize tissue damage

Potassium iodide (KI) may protect the thyroid in the rare event where radioactive iodine is released. If deemed necessary, the public health agency with jurisdictional authority will direct the distribution and administration of potassium iodide to the appropriate patient and emergency responder populations

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion criteria**

1. Patients exposed to a known or suspected source of radiation
2. All ages are included particularly patients exhibiting the signs and symptoms of acute radiation toxicity:
 - a. Nausea
 - b. Vomiting
 - c. Petechiae
 - d. External bleeding
 - e. Suspected internal bleeding
 - f. Dizziness
 - g. Headache
 - h. Altered mental status

Patient Management

1. Don personal protective equipment (PPE)
2. Exercise universal precautions at all times
3. Place contaminated towels, waste water, and body fluids in secured containers denoted for radioactive waste materials
4. Place all body fluids released from vomiting, urination, salivation, and defecation in plastic bags and secure them in containers denoted for radioactive waste materials

Assessment

Radiation does not produce any immediate symptoms unless the exposure is severe. Most patients with radiation will be asymptomatic initially.

Pertinent Assessment Findings

1. Earliest symptoms
 - a. Tissues with rapid cell growth produce initial signs and symptoms
 - b. Gastrointestinal tract elicited as nausea and vomiting
2. Delayed symptoms (days to weeks after exposure or contamination)
 - a. Skin burns with direct contact with radioactive source
 - b. Skin burns or erythema from ionizing rays
 - c. Fever
 - d. Bone marrow suppression presenting as:
 - i. Immunosuppression
 - ii. Petechiae
 - iii. Spontaneous internal and external bleeding

Patient Safety Considerations

1. Monitor patient dosimetry readings frequently
2. Monitor EMS provider dosimetry readings frequently
3. For persons with high levels of radiation or an increasing trend in dosimetry readings:
 - a. Remove from the scene
 - b. Perform decontamination
 - c. Move to a cold zone

Notes

1. Sources of radiation
 - a. Legal
 - i. Industrial plants
 - ii. Healthcare facilities that provide radiologic services
 - iii. Nuclear power plants
 - iv. Mobile engineering sources (e.g. construction sites that are installing cement)
 - b. Illegal
 - i. Weapons of mass destruction
 - ii. "Dirty bomb" design to contaminate widespread areas
2. Physiology of Radiation Poisoning
 - a. Contamination – Poisoning from direct exposure to a radioactive source, contaminated debris, liquids, or clothing where radiation continues to be emitted from particles on surface
 - b. Exposure – Poisoning from radioactivity, in the form of ionizing rays, penetrating through the bodily tissues of the patient
3. Common types of radioactivity that cause poisoning
 - a. Gamma rays
 - i. Highest frequency of ionizing rays
 - ii. Penetrates the skin deeply
 - iii. Causes the most severe radiation toxicity
 - b. Beta rays

Can penetrate up to 1 cm of the skin's thickness
 - c. Alpha rays
 - i. Lowest frequency of ionizing rays
 - ii. Short range of absorption
 - iii. Dangerous only if ingested or inhaled
 - d. Radioactive daughters
 - i. Products of decay of the original radioactive substance
 - ii. Can produce gamma and beta rays (e.g. uranium decays into a series of radon daughters)
4. In general, trauma patients who have been exposed to or contaminated by radiation should be triaged and treated on the basis of the severity of their conventional injuries
5. A patient who is contaminated with radioactive material (e.g. flecks of radioactive material embedded in their clothing and skin) generally poses a minimal exposure risk to medical personnel.

Patient Care Goals

1. Identify intoxicating agent
2. Protect organs at risk for injury such as heart, brain, liver, kidney
3. Determine if there is an antidote
Treat the symptoms which may include anxiety, hallucinations, chest pain, seizure, arrhythmia, excited delirium

Adult Universal Care

Adult IV/IO

Give fluids for poor perfusion; cool fluids for hyperthermia, see:
Shock and Hyperthermia/Heat Exposure

Consider treating shortness of breath as atypical ACS
maintain oxygen saturation $\geq 94\%$

Consider soft restraints especially if law enforcement has been involved in getting patient to cooperate see:
Agitated or Violent Patient/Behavioral Emergency

Consider medications to reduce stimulation and anxiety, and to improve behavior and compliance. See: **Agitated/Violent Patient** If haloperidol is used, monitor 12-lead for QT-interval if feasible

Consider prophylactic use of anti-emetic: **Ondansetron (Zofran)**
Do not use promethazine if haloperidol has been given

As a last resort consider
Diphenhydramine (Benadryl) to induce drowsiness 25 mg IVP, 50 mg IM

If hyperthermia suspected, begin external cooling

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

1. Cocaine
2. Amphetamines
3. Phencyclidine (PCP)
4. Derivatives
 - a. Ecstasy
 - b. Methamphetamine
 - c. Bath salts

Patient Management

Begin with the ABCDs:

1. Airway is patent
2. Breathing is oxygenating
3. Circulation is perfusing
4. Mental status is coherent
5. Treat any compromise of these parameters
6. Ask about chest pain and difficulty breathing

Assessment

1. Vital signs including temperature
2. Apply a cardiac monitor and examine rhythm strip for arrhythmias
3. Check blood glucose level
4. Monitor ETCO₂ for respiratory decompensation
5. Check for trauma, self-inflicted injury
Law enforcement should have checked for weapons and drugs, but you may decide to repeat the inspection

Patient Safety Considerations

1. Apply soft restraints if necessary
2. Explain to the patient that his/her safety and the safety of all of the ambulance occupants is a priority during transport
3. Administer medications for chemical restraint when violence or threatening behavior is present or imminent

Notes

1. If law enforcement has placed the patient in handcuffs, this patient needs ongoing physical restraint for safe transport. Have law enforcement in back of ambulance for the handcuffed patient or make sure proper physical restraints are in place before law enforcement leaves and ambulance departs from scene
2. If patient has signs and symptoms of ACS, strive to give nitroglycerin SL q 3-5 minutes as long as SBP > 100 and until pain resolves (if range not desired, use q 3 minutes). Vasospasm is often the problem in this case as opposed to a fixed coronary artery lesion
3. Maintaining IV access, cardiac monitor, and SPO₂/ETCO₂ monitors are key to being able to catch and intervene decompensations in a timely manner. Restrain the patient to facilitate patient assessment and lessen likelihood of vascular access or monitor displacements

Pertinent Assessment Findings

1. History is as important as the physical examination
2. If the patient is on psychiatric medication, but has failed to be compliant, this fact alone puts the patient at higher risk for excited delirium
3. If the patient is found naked, this may elevate the suspicion for stimulant use or abuse and increase the risk for excited delirium
4. If polypharmacy is suspected, hypertension and tachycardia are expected hemodynamic findings secondary to increased dopamine release. Stimulus reduction from benzodiazepines, anti-psychotics, and ketamine will improve patient's vital signs and behavior
5. Be prepared for the potential of cardiovascular collapse as well as respiratory arrest
If a vasopressor is needed, epinephrine or norepinephrine is recommended over dopamine

Topical Chemical Burns

Patient Care Goals

1. Rapid recognition of a topical chemical burn
2. Initiation of emergent and appropriate intervention and patient transport

Adult Universal Care

Carefully brush off solid chemical prior to flushing the site as the irrigating solution may activate a chemical reaction

Flush the patient's skin (and eyes, if involved) with copious amounts of water or normal saline

Provide adequate analgesia via the **Adult Pain Control** protocol provided by EMS direct medical oversight

Consider the use of topical anesthetic eye drops **Tetracaine** two (2) drops of topical ophthalmic for chemical burns of the eye

Continuous flushing of chemical burns of the eye
Take measures to minimize hypothermia

Adult IV/IO

Initiate intravenous fluid resuscitation if necessary to obtain hemodynamic stability

Hydroflouric Acid exposure protocol if indicated

General

EMR

EMT

AEMT

Paramedic

Hydrofluoric acid (HF) is a highly corrosive substance that is primarily used for automotive cleaning products, rust removal, porcelain cleaners, etching glass, cleaning cement or brick, or as a pickling agent to remove impurities from various forms of steel. Patients who are initially exposed to low concentration of HF are pain-free. However, as HF penetrates and binds to the proteins in the skin, significant tissue damage and necrosis results hours after the initial exposure

For all patients in whom a hydrofluoric acid exposure is confirmed or suspected:

1. Vigorously irrigate all affected areas with water or normal saline
2. Apply a **cardiac monitor** for significant HF exposures as hypocalcemia may occur
3. Apply calcium preparation:
 - a. Calcium prevents tissue damage from hydrofluoric acid
 - b. Calcium gluconate is preferred over calcium chloride as it is less irritating
 - c. Topical calcium preparations:
 - i. Commercially manufactured calcium gluconate gel
 - ii. If commercially manufactured calcium gluconate gel is not available, a topical calcium gluconate gel preparation can be made by combining 25 ml of calcium gluconate 10% solution in 75-150 ml of a sterile water soluble gel (e.g. Surgilube® or KY® jelly)
 - iii. If calcium gluconate is not available, 10 ml of calcium chloride 10% solution in 75- 150 ml in sterile water soluble gel (e.g. Surgilube® or KY® jelly)
 - iv. Apply generous amounts of calcium gluconate gel to the exposed skin sites to neutralize the cutaneous effects of the hydrofluoric acid and to prevent tissue damage and necrosis
 - v. If fingers are involved, apply the calcium gel to the hand, squirt additional calcium gel into a surgical glove, and then insert the affected hand into the glove.
 - vi. For patients who have sustained a significant exposure to hydrofluoric acid and are exhibiting clinically significant signs and symptoms of hypocalcemia, calcium chloride 10% solution should be administered intravenously

Patient Presentation**Inclusion criteria**

Patients of all ages who have sustained exposure to a chemical that can cause a topical burn in a delayed clinical presentation

Patient Management

1. Don the appropriate protective personal equipment (PPE)
2. Remove the patient's clothing, if necessary
3. Contaminated clothing should preferably be placed in bags
4. If deemed necessary and manpower resources permit, the patient should be transported by EMS providers who did not participate in the decontamination process, and in an emergency response vehicle that has not been exposed to the chemical
5. Information regarding the chemical should be gathered while on scene
6. Communicate all data regarding the chemical to the receiving facility

Assessment

1. Clinical effects and severity of a topical chemical burn is dependent upon:
 - a. Type of burn
 - b. Concentration of the chemical
 - c. pH of the chemical
 - d. Onset of burn
 - i. Immediate
 - ii. Delayed (e.g. hydrofluoric acid)
2. Calculate the estimated total body surface area that is involved
3. Prevent further contamination

Patient safety considerations

1. Don PPE
2. Take measures to prevent the patient from further contamination through decontamination
3. Take measures to protect the EMS provider and others from contamination
4. Do not attempt to neutralize an acid with an alkali or an alkali with an acid as a serious exothermic reaction will occur and cause serious harm to the patient
5. Expeditious transport or transfer to a designated burn center should be considered for burns that involve a significant percentage of total body surface area or burns that involve the eyes, face, hands, feet or genitals

Key Considerations

1. IV fluid resuscitation should be guided by patient age, percentage of body surface area involved in burn, body habitus and calculated by the Parkland Formula (see Appendix V)
2. Since the severity of topical chemical burns is largely dependent upon the type, concentration, and pH of the chemical involved as well as the body site and surface area involved, it is imperative to obtain as much information as possible while on scene about the chemical substance by which the patient was exposed. The information gathering process will often include:
 - a. Transport of the container of the chemical to the receiving facility
 - b. Transport of the original or a copy of the Material Safety Data Sheet (MSDS) of the substance to the receiving facility
 - c. Contacting the reference agency to identify the chemical agent and assist in management (e.g. CHEMTREC®)
3. Decontamination from chemicals with a low pH (acids) is more easily accomplished than chemicals with a high pH (alkalis) because alkalis tend to penetrate and bind to deeper tissues
4. Some chemicals will also manifest local and systemic signs, symptoms, and bodily damage

Pertinent Assessment Findings

1. An estimate of the total body surface area that is involved
2. Patient response to therapeutic interventions
3. Patient response to fluid resuscitation
4. Patient response to analgesia

Patient Care Goals

1. Address side effects of exposed individuals
2. Decontamination of affected individuals
3. Minimize effect to provider

- Move affected individuals from contaminated environment into fresh air if possible
- Remove contaminated clothing as able
- Have patient remove contact lenses if appropriate

Adult Universal Care

Irrigation with water or saline may facilitate resolution of symptoms and is recommended for decontamination of dermal and ocular exposure

If patient is in respiratory distress, go to Respiratory section
 If patient is wheezing, go to Bronchospasm
 For persistent pain of the eye or skin, go to **Topical Chemical Burns**

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

1. Exposure to identifiable agents that are not intended to cause significant injury or fatality

Exclusion Criteria

1. Exposure to chlorine, phosgene, ammonia or other agents that are intended to cause significant injury or fatality
2. Exposure to an unknown agent

Patient Management Assessment

1. Assess scene safety: evaluate for hazards to EMS personnel, patient, bystanders
 - a. Determine riot control agent being used
 - b. Don appropriate PPE
 - c. Determine number of patients
2. Note symptoms exhibited by the exposed individual
3. Examine as appropriate to complaints

Notes Key Considerations

1. Pepper Spray is the most commonly encountered riot control agent.
2. Pepper Spray has a high safety ratio. All three have a high median lethal concentration (LCt50) and a low median effective concentration (ECt50).
3. Toxicity is related to time of exposure and concentration of agent used (exposure in nonventilated space).
4. Symptoms that may be experienced after exposure:
 - a. Eyes: tearing, pain, conjunctivitis, blurred vision
 - b. Nose/mouth/throat: rhinorrhea, burning/pain, trouble swallowing, drooling
 - c. Lungs: chest tightness, coughing, choking sensation, wheezing, dyspnea
 - d. Skin: burning, redness, dermatitis
 - e. GI: nausea and vomiting are rare and may be posttussive
5. Symptoms begin within seconds of exposure, are self-limited and are best treated by removing patient from ongoing exposure. Symptoms frequently decrease over time (15-45 minutes) after exposure ends.

Patient Safety Considerations

1. Toxicity is related to duration of exposure and concentration of agent used (exposure in non-ventilated space)
2. Patients with pre-existing pulmonary conditions (e.g. asthma, COPD) may be prone to more severe respiratory effects
3. Traumatic injury may result when exposed individuals are in proximity to the device used to disperse the riot control agent (e.g. hose/stream under pressure, riot control agent projectile, grenade)

Pertinent Assessment Findings

1. Riot control agent used
2. Symptoms of exposed
3. Lung sounds
4. Evidence of other traumatic injuries

Patient Care Goals

1. Rapid assessment and management of life-threatening injuries
2. Safe movement of patient to prevent worsening injury severity
3. Rapid and safe transport to the appropriate level of trauma care
4. Rapid and safe transport to the Closest/ Most Appropriate level trauma care

Airway

- Establish patent airway with cervical spine precautions per **Adult Airway Management** guideline and **Spinal Care** guideline
- If respiratory efforts inadequate, assist with bag-mask ventilation, consider airway adjuncts
- If impending airway obstruction or altered mental status resulting in inability to maintain airway patency, secure definitive airway

Breathing

- If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax, perform needle decompression
- For open chest wound, place semi-occlusive dressing
Monitor oxygen saturation, provide supplemental oxygen

Circulation

- Control external hemorrhage per **Extremity Trauma** / **External Hemorrhage Management** guideline
- If pelvis unstable and patient is hypotensive, place pelvic binder or sheet to stabilize pelvis

Adult IV/IO

Fluid Resuscitation

1. If SBP < 90 mmHg or HR > 120, Permissive Hypotension: 250-500 mL NS bolus and reassess
2. For adult patients with penetrating trauma target SBP 90 mmHg (or palpable radial pulse) MAP > 65 mmHg
3. For adult patients with head injury, target SBP 110-120. Hypotension should be avoided to maintain cerebral perfusion

Disability

If clinical signs of traumatic brain injury, see **Head Injury** guideline.
Consider **Tranexamic Acid (TXA)**: 1 gram mixed in 100 ml NS connected to 10 gtt/ml tubing infused over 10 minutes (app 1½ drop/sec)

Exposure

Avoid hypothermia. Remove wet clothing. Cover patient to prevent further heat loss

Note that patients with major hemorrhage, hemodynamic instability, penetrating torso trauma, or signs of traumatic brain injury often require rapid surgical intervention. Minimize scene time (goal 10 minutes or less) and initiate rapid transport to a trauma center

Decisions regarding transport destination should be based on the CDC Field Triage Guidelines for Trauma Patients

General

EMR

EMT

AEMT

Paramedic

Patient Management**Assessment**

1. Assess scene safety: evaluate for hazards to EMS personnel, patient, bystanders
 - a. Determine number of patients
 - b. Determine mechanism of injury
 - c. Request additional resources if needed. Weigh the benefits of waiting for additional resources against rapid transport to definitive care
 - d. Consider declaration of mass casualty incident if needed
2. Use appropriate personal protective equipment
3. **Primary survey**
 - a. Hemorrhage control

Assess for and stop severe hemorrhage (see **Extremity Trauma/External Hemorrhage Management** guideline)
 - b. Airway
 - i. Assess airway patency, ask patient to talk to assess stridor and ease of air movement
 - ii. Look for injuries that may lead to airway obstruction including unstable facial fractures, expanding neck hematoma, blood or vomitus in the airway, facial burns/ inhalation injury
 - iii. Evaluate mental status for ability to protect airway (GCS < 8 likely to require airway protection)
 - c. Breathing
 - i. Assess respiratory rate and pattern
 - ii. Assess symmetry of chest wall movement
 - iii. Listen bilaterally on lateral chest wall for breath sounds
 - d. Circulation
 - i. Assess blood pressure and heart rate
 - ii. Signs of hemorrhagic shock include: tachycardia, pale, cool clammy skin, capillary refill > 2 seconds
 - e. Disability
 - i. Perform neurologic status assessment (see **Appendix VI**)
 - ii. Assess gross motor movement of extremities
 - iii. Evaluate for clinical signs of traumatic brain injury with herniation including: unequal pupils, lateralizing motor signs or posturing
 - f. Exposure
 - i. Rapid evaluation of entire body to identify sites of penetrating wounds or other blunt injuries. Be sure to roll patient and view back. Prevent hypothermia

Secondary Assessment, Treatment and Interventions

1. Assessment

- a. Obtain medical history from patient or family including:
 - i. Allergies
 - ii. Medications
 - iii. Past medical and surgical history
 - iv. Events leading up to the injury
- b. **Secondary Survey**: Head to toe physical exam
 - i. Head
 1. Palpate head and scalp and face and evaluate for soft tissue injury or bony crepitus
 2. Assess pupils
 - ii. Neck
 1. Check for:
 - a. Contusions
 - b. Abrasions
 - c. Hematomas
 - d. JVD
 2. Palpate for crepitus
 3. Evaluate for spinal tenderness
 - iii. Chest
 1. Palpate for instability/ crepitus
 2. Listen to breath sounds
 3. Inspect for penetrating or soft tissue injuries
 - iv. Abdomen
 1. Palpate for tenderness
 2. Inspect for penetrating or soft tissue injuries
 - v. Pelvis
 1. Inspect for penetrating or soft tissue injuries
 2. Palpate once for instability by gentle AP pressure with the heels of the hands on the symphysis pubis and then medial pressure at the iliac crests bilaterally
 - vi. Back
 1. Log roll patient to maintain spinal alignment
 2. Inspect for penetrating or soft tissue injuries
 3. Palpate for spinal tenderness
 - vii. Neurologic status assessment (see **Appendix VI**)
 1. Serial assessment of mental status
 2. Gross exam of motor strength all four extremities
 - viii. Extremities
 1. Assess for fracture/deformity
 2. Assess peripheral pulses/ capillary refill
- c. Additional treatment considerations
 - i. Maintain spine precautions per **Spinal Care** guideline
 - ii. Splint obvious extremity fractures per **Extremity Trauma/External Hemorrhage Management** guideline
 - iii. Provide pain medication per **Pain Management** guideline

Notes

1. Optimal trauma care requires a structured approach to the patient, emphasizing ABCDE
2. Target scene time < 10 minutes for unstable patients or those likely to need surgical intervention
3. Provider training should include the CDC Guidelines for Field Triage
4. Frequent reassessment of the patient is important
 - a. If patient develops difficulty with ventilation, reassess breath sounds for development of tension pneumothorax
 - b. If extremity hemorrhage is controlled with pressure dressing or tourniquet, reassess for evidence of continued hemorrhage
 - c. If mental status declines, reassess ABCs
5. Withholding and termination of resuscitative efforts
 - a. Resuscitative efforts should be withheld for trauma patients with the following:
 - i. Decapitation
 - ii. Hemicorpectomy
 - iii. Signs of rigor mortis or dependent lividity
 - iv. Blunt trauma: apneic, pulseless, no organized activity on cardiac monitor
 - b. Resuscitative efforts may be terminated in patients with traumatic arrest who have no return to spontaneous circulation after 15-30 minutes of resuscitative efforts, including minimally interrupted CPR

Patient Presentation**Inclusion Criteria**

Patients of all ages who have sustained an injury as a result of mechanical trauma. This includes both blunt and penetrating injury as well as burns

Exclusion Criteria

No specific recommendations

Patient Safety Considerations

1. Life threatening injuries identified on primary survey should be managed immediately and rapidly transported to a trauma center. Secondary survey should be performed while en route
2. Monitor patient for deterioration over time with serial vital signs and repeat neurologic status assessment
 - a. Patients with compensated shock may not manifest hypotension until severe blood loss has occurred
 - b. Patients with traumatic brain injury may deteriorate as intracranial swelling and hemorrhage increase
3. Anticipate potential for progressive airway compromise in patients with trauma to head and neck

Adult Trauma Management

Application.

Teeth that have been knocked out through trauma can be successfully re-implanted if re-implantation is accomplished soon enough and if the root material has not been damaged.

In any case of facial or oral trauma, inspect the mouth for missing teeth. If teeth are missing and it appears that they have been avulsed (e.g. blood in the empty socket), then search both the patient's mouth and the scene for these teeth.

Handling of avulsed teeth.

Minimize the handling and manipulation of any avulsed teeth. Do not attempt to wash or clean the teeth. Doing so will only jeopardize the remaining root material.

Place the avulsed teeth in Hanks Balanced Salt Solution.

- a. Use only a new, unopened bottle of Hanks Solution. Inspect the bottle. If the bottle has already been opened, do not use it. If there is particulate matter or cloudiness in the Solution, do not use it.
- b. If there are avulsed teeth from more than one patient, place enough of the Hanks Solution from one bottle into as many other containers as are needed so that the teeth from each patient are in separate containers. The additional containers need not be sterile, but they should be clean and small enough so that the teeth are completely immersed in the Hanks Solution. Label each container with the patient's name. Once the bottle of Hanks Solution has been opened and used, it cannot be reused.
- c. If the patient is transported, transport the teeth with the patient and turn the container over to Emergency Department personnel. If the patient is not transported, turn the container over to the patient and advise him/her to seek immediate dental treatment for re-implantation.

If Hanks Solution is not available, the following solutions are acceptable alternatives, in decreasing order of preference. Note that regardless of the solution used, the teeth should not be handled any more than absolutely necessary to get them into a container and should in no case be cleaned or otherwise traumatized. Make no attempt to wrap the teeth in gauze or any similar substance before placing them in whatever liquid is used.

- a. **Milk:** Use cold milk in a small container.
- b. **Saline.**
- c. **Saliva:** Saliva is a poor but acceptable transport media. Nevertheless, using it presents several problems, which make it less desirable than the other alternatives above.
 1. In order to use saliva, the tooth, or teeth, ordinarily must be transported in the patient's mouth. This always creates the risk of aspiration and therefore must never be considered in any patient who has any kind of decrease sensorium or any kind of airway problem.
 2. Saliva is heavily contaminated with bacteria and will thus quickly contaminate the root material of the teeth.

Re-implantation

As a general rule, re-implantation should not be attempted in the field because:

- It is likely to be painful and will be difficult to accomplish successfully without anesthesia.
- Without some means of stabilizing the re-implanted tooth, it is likely to come out again with the attendant risks of aspiration or further damage.

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Maintain patient and provider safety by identifying ongoing threats at the scene of an explosion
 2. Identify multi-system injuries which may result from a blast, including possible toxic contamination
- Prioritize treatment of multi-system injuries to minimize patient morbidity

Adult Trauma Management**Adult Airway Management****Breathing**

- Provide supplemental oxygen to maintain O₂ saturation $\geq 94\%$
- Assist respirations as needed
- Cover any open chest wounds with semi-occlusive dressing
- If patient has evidence of tension pneumothorax (decreased or absent breath sounds and signs of shock), perform needle decompression

Circulation

Control any external hemorrhage see: **Extremity Trauma** / **External Hemorrhage Management**

Establish IV access with two large bore IVs or IOs

- Administer NS or LR as per **General Trauma** guideline
- If patient is burned, administer NS or LR as per **Burn** guideline

Disability:

- If evidence of head injury, treat as per Head Injury guideline
- Apply spinal precautions as per **Spinal Care** guideline
- Monitor GCS during transport to assess for changes

Exposure: Keep patient warm to prevent hypothermia

General

EMR

EMT

AEMT

Paramedic

Notes

1. Scene safety is of paramount importance when responding to an explosion or blast injury
2. Patients sustaining blast injury may sustain complex, multi-system injuries including: blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure
3. Consideration of airway injury, particularly airway burns, should prompt early and aggressive airway management
4. Minimize IV fluid resuscitation in patients without signs of shock
5. Consider injuries due to barotrauma
 - a. Tension pneumothorax
 - b. Tympanic membrane perforation resulting in deafness. This may complicate the evaluation of their mental status and their ability to follow commands

Pertinent Assessment Findings

Evidence of multi-system trauma, especially airway injury/burn, barotrauma to lungs, and toxic chemical contamination

Patient Safety Considerations

1. Ensuring scene safety is especially important at the scene of an explosion. Consider possibility of subsequent explosions, structural safety, possible toxic chemical contamination, the presence of noxious gasses, and the like. In a possible terrorist event, consider the possibility of secondary explosive devices
2. Remove patient from the scene as soon as is practical and safe
3. If the patient has sustained burns (thermal, chemical, or airway), consider transport to specialized burn center

Patient Presentation**Inclusion Criteria**

Patients exposed to explosive force (injuries may include any or all of the following: blunt and/or penetrating trauma, burns, pressure-related injuries (barotrauma), and toxic chemical contamination)

Patient Management Assessment

1. Hemorrhage Control: Assess for and stop severe hemorrhage (see **Extremity Trauma/ External Hemorrhage Management** guideline) Airway: Assess airway patency. Consider possible thermal or chemical burns to airway
2. Breathing: Evaluate adequacy of respiratory effort, oxygenation, quality of lung sounds, and chest wall integrity. Consider possible pneumothorax or tension pneumothorax (as a result of penetrating/blunt trauma or barotrauma)
3. Circulation: Look for evidence of external hemorrhage. Assess BP, pulse, skin color/character, and distal capillary refill for signs of shock
4. Disability: Assess patient responsiveness (AVPU) and level of consciousness (GCS). Assess pupils. Assess gross motor movement of extremities
5. Exposure: Rapid evaluation of entire skin surface, including back (log roll), to identify blunt or penetrating injuries

Patient Care Goals

Minimize tissue damage and patient morbidity from burns

Adult Trauma Management

Stop the burning:

- Soak clothing and skin with water if burning or smoldering, then remove clothing if not stuck to the patient
- Remove jewelry. It may be hot
- Leave blisters intact

Minimize burn wound contamination. Cover burns with dry dressing or clean sheet. May place cooled compress to isolated burn, but do NOT apply direct ice packs.

Vital signs including SPO2, consider SPCO and ETCO2 if available
ETCO2 monitoring may be particularly useful to monitor respiratory status in patients receiving significant doses of narcotic pain medication

12 Lead ECG (monitor rhythm)

Supplement **Oxygen** titrated to SPO2, if available. Give to all burn patients rescued from a confined space

Adult IV/IO

Evaluate distal circulation in circumferentially burned extremities

Consider early management of pain and nausea/vomiting. See:

Adult Pain Control

Nausea/Vomiting

Initiate fluid resuscitation: Use lactated ringers or normal saline

If patient in shock, give fluid per shock protocol
If patient not in shock: Begin fluids based on estimated TBSA (see Initial Fluid Rate Chart for Burns in **Appendix V**). For children, use length-based tape for weight estimate
Initial fluid rate can also be calculated as: $4 \times \text{Pt. Weight (kg)} \times \% \text{BSA}$
Give Half of calculated fluid over 1st 8 hours.

Prevent systemic heat loss – keep patient warm

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Observe and document:

1. Airway – stridor, hoarse voice
2. Mouth and nares – redness, blisters, soot, singed hairs
3. Breathing – rapid, shallow, wheezes, rales
4. Skin – Estimate Body Surface Area (BSA) and depth (partial v. full thickness)
5. Associated trauma – blast, fall, assault

Inclusion Criteria

Patients sustaining thermal burns

Exclusion Criteria

Electrical, chemical, and radiation burns (see **Toxins and Environmental** section)

Special transport considerations:

1. Transport to most appropriate trauma center when there is airway or respiratory involvement, or when multi-trauma or blast injury is suspected
2. Consider transport directly to burn center if BSA > 20% partial thickness, BSA > 10% full thickness involvement of hands/feet, genitalia, face; circumferential burns
3. Consider air ambulance transportation for long transport times, pain control requiring deep sedation, and airway concerns that might necessitate advanced airway management

Scene Management:

Assure crew safety: power off, electrical lines secure, gas off, no secondary devices, hazmat determinations made, proper protective attire including breathing apparatus may be required

Patient Management Assessment

1. Circumstances of event-- consider:
 - a. related trauma in addition to the burns
 - b. inhalation exposures such as CO and cyanide
 - c. pediatric or elder abuse
2. Follow ABCs of resuscitation
3. If evidence of possible airway burn, consider aggressive airway management.
4. Consider spinal immobilization (See **Spinal Care** guideline)
5. Estimate BSA burned and depth of burn (See burn related tables in **Appendix V**)
6. Document pain scale

Special treatment considerations

1. If blast mechanism, see **Blast Injury** guideline
2. Airway burns can rapidly lead to upper airway obstruction and respiratory failure
3. Have a high index of suspicion for cyanide poisoning in a patient with depressed GCS, respiratory difficulty and cardiovascular collapse in the setting of an enclosed-space fire. Give antidote (hydroxocobalamin), if available, in this circumstance
4. Particularly in closed space fires, carbon monoxide toxicity is a consideration; pulse oximetry may not be accurate; see Carbon Monoxide Poisoning guideline
5. For specific chemical exposures (cyanide, hydrofluoric acid, other acids and alkali) see Chemical Burn guideline
6. Consider contamination and notification of receiving facility of potentially contaminated patient (e.g. meth lab incident)

Notes

1. Onset of stridor and change in voice are sentinel signs of potentially significant airway burns, which may rapidly lead to airway obstruction or respiratory failure
2. If the patient is not in shock, the fluid rates recommended above will adequately maintain patient's fluid volume per the Parkland Formula
3. Pain management is critical in acute burns

Adult Trauma Management

Follow the **Multiple Trauma** Protocol as indicated.

Institute the crush protocol if one major extremity is trapped for two or more hours or if two major extremities are trapped for one or more hours.

Prior to extrication:

COORDINATE TIME OF RELEASE WITH RESCUE PERSONNEL

Adult IV/IO

Establish at least one (1) large bore IV of 0.9% normal saline and administer a 1000 ml bolus.

Administer a bolus of

Sodium Bicarbonate 1 mEq/kg IVP
(Minimum dose 50 mEq - 1 amp)

Add **Sodium Bicarbonate** one (1) amp to each liter (1,000 ml NS) of IV solution infused. Maintain a continuous infusion at a rate of 1000 ml per hour.

Apply the **cardiac monitor**. Obtain monitor tracing prior to and sequentially during further treatment.

Contact receiving Emergency Department and notify them of the patient's crushing injury.

Anticipate Crushing Syndrome and possible cardiac arrest upon extrication of patient.

Just before extrication:

Administer a bolus of

Sodium Bicarbonate 1 mEq/kg IVP
(Minimum dose 50 mEq - 1 amp)

Adult IV/IO

Open the IV to run at a wide open rate and run in the remainder of the 1000 ml bag.

Upon extrication:

Return to the maintenance infusion of 1 amp of **Sodium Bicarbonate** in each 1000 ml bag of normal saline administered at the rate of 1000 ml per hour.

Monitor ECG closely. Watch for:

- A. Widened QRS complexes - 0.12 seconds or greater.
- B. Tall, "peaked" T-waves

If treating suspected hyperkalemia:

- Flush out the **Sodium Bicarbonate** in the IV line or use a separate IV.
- Administer **Calcium Chloride** 1 amp (10 ml) of slow IVP over 10 minutes.
- **Albuterol** 2.5 mg/3 ml NS via nebulizer @ 6 L/M O₂

Anticipate Crushing Syndrome and possible cardiac arrest upon extrication of patient.

Pain Management

Morphine IVP, IO 0.1 mg/kg

Maximum dose of 10 mg. Repeat doses every 10 minutes
0.05 mg/kg to a **Maximum dose of 5 mg.**

Total Maximum dose is 20 mg.

Morphine 0.1 mg/kg IM to a **Maximum one time dose of 10 mg.** (only if no IV or IO is available) **OR**

Ketamine (Ketalar) 0.1 - 0.3 mg/kg IVP, IO or IN **OR**

Fentanyl (Sublimaze) 1 mcg/kg IV, IO, IM, or IN to a

Maximum dose of 100 mcg. Repeat q 10 minutes at
0.5 mcg/kg to a

Maximum dose of 50 mcg.

Total Maximum dose is 200 mcg.

(note: dilute with 5 ml NS IV or 10 and given over 1 - 2 minutes)

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Minimize blood loss from extremity hemorrhage
2. Avoid hemorrhagic shock as a result of extremity hemorrhage
3. Minimize pain in potential fractures or dislocations

Adult Trauma Management**Manage Bleeding**

- A. Apply direct pressure to bleeding site, followed by pressure dressing, followed by hemostatic agent.
- B. Direct pressure/pressure dressing or **Hemostatic agent** is ineffective or impractical:
 - If the bleeding site is amenable to tourniquet placement, apply **Tourniquet** to extremity
 - If the bleeding site is not amenable to tourniquet placement (i.e. junctional injury), apply a topical hemostatic agent with direct pressure
 - Tourniquet should be placed 2-3 cm proximal to wound, not over a joint, and tightened until bleeding stops. If bleeding continues, place a second tourniquet proximal to the first
 - For thigh wounds, consider placement of two tourniquets, side-by-side, and tighten sequentially to eliminate distal pulse

Groin/axillary injury

- Apply direct pressure to wound
- If still bleeding, pack wound tightly with gauze and continue direct pressure
- Consider hemostatic adjuncts

Manage pain: See **Adult Pain Control** guideline

- Pain management should be strongly considered for patients with suspected fractures
- If tourniquet placed, an alert patient will likely require pain medication to manage tourniquet pain

Stabilize suspected fractures/dislocations

- A. If distal vascular function is compromised, gently attempt to restore normal anatomic position. Strongly consider pain management before attempting to move a suspected fracture
- B. Use splints as appropriate to limit movement of suspected fracture
 - Reassess distal neurovascular status after any manipulation or splinting of fractures/dislocations
- C. Elevate extremity fractures above heart level whenever possible to limit swelling
- D. Apply ice/cool packs to limit swelling in suspected fractures or soft tissue injury. Do not apply ice directly to skin

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

1. Traumatic extremity hemorrhage (external hemorrhage)
2. Potential extremity fractures or dislocations

Patient Management Assessment

1. Evaluate for obvious deformity, shortening, rotation, or instability
2. Neuro status of extremity
 - a. Sensation to light touch
 - b. Distal movement of extremity
3. Vascular status of extremity
 - a. Pallor
 - b. Pulse
 - c. Capillary refill
 - d. Degree of bleeding/blood loss with assessment of the color of the blood (venous or arterial); if it is pulsatile or not

Patient Safety Considerations

1. If tourniquet used, ensure that it is sufficiently tight to occlude the distal pulse, in order to avoid compartment syndrome
2. Tourniquet used, ensure that it is well marked and visible and that all subsequent providers are aware of the presence of the tourniquet. Do not cover with clothing or dressings
3. Time of tourniquet placement should be prominently marked on the patient
4. If pressure dressing or tourniquet used, frequently re-check to determine if bleeding has restarted. Check for blood soaking through the dressing or continued bleeding distal to the tourniquet. Do NOT remove tourniquet or dressing in order to assess bleeding

Notes

1. Tourniquet may be placed initially to stop obvious severe hemorrhage, then replaced later with pressure dressing after stabilization of ABCs and packaging of patient
Tourniquet should NOT be removed if:
 - a. Transport time short (less than 30 minutes)
 - b. Amputation or near-amputation
 - c. Unstable or complex multiple-trauma patient
 - d. Unstable clinical or tactical situation
2. If tourniquet replaced with pressure dressing, leave loose tourniquet in place so it may be retightened if bleeding resumes. Survival markedly improved when tourniquet placed *before* shock ensues
3. Commercial/properly tested tourniquets are preferred over improvised tourniquets
4. Arterial pressure points are not effective in controlling hemorrhage
5. Amputated body parts should be transported with patient for possible re-implantation
 - a. It should remain cool but dry
 - b. Place the amputated part in a plastic bag
 - c. Place the bag with the amputated part on ice in a second bag
 - d. Do not let the amputated part come in direct contact with the ice

Patient Care Goals

Minimize tissue damage and patient morbidity from burns

Adult Trauma Management

General

EMR

EMT

AEMT

Paramedic

TRAUMA

- A. Do not allow eye injury to distract you from the basics of trauma care.
- B. Do not remove any foreign body imbedded in the eye or orbit. Stabilize any large protruding foreign bodies.
- C. With blunt trauma to the eye, if time permits, examine the globe briefly for gross laceration as the lid may be swollen tightly shut later. Scleral rupture may lie beneath an intact conjunctiva.
 1. Exert no pressure on the globe when doing the exam or when covering for transport.
 2. A light sterile wet dressing may be used to cover the eye for transport - avoid pressure directly to the eye by covering with a protective shield, (metal patch, drinking cup).
 3. Do not delay transport by covering the eye if the patient has other life-threatening injuries.
- D. Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye, but in some cases the patient is too anxious to tolerate this.
- E. Transport patient at 45° unless other life threats prohibit this from being done.
- F. Do **NOT** administer Tetracaine if a penetrating injury is suspected.

CHEMICAL BURNS

- A. When possible determine type of chemical involved first. The **eye should be irrigated with copious amounts of water or saline** using IV tubing wide open for a **minimum of 15 minutes** started as soon as possible. Any delay may result in serious damage to the eye.
- B. A topical ophthalmic anesthetic should be placed in the eye prior to irrigation. Always check to determine if the patient has any allergy to anesthetic agents.
- C. Always obtain name and, if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible.

CONTACT LENSES

- A. If possible, contact lenses should be removed from the eye; be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.
- B. If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses.

See: **Eye Injury-continued**

ACUTE, UNILATERAL VISION LOSS

- A. When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion. Urgent transport and treatment is necessary.
- B. Patient should be transported at 45°.
- C. Keep patient calm, unless otherwise indicated.
- D. Obtain history of injury: Type, Where, When, How.
- E. Establish communications with Medical Control and advise them of the patient's condition. Transport immediately.
- F. In cases where eyes may need irrigation, administer two (2) drops of topical ophthalmic anesthetic (i.e.-Tetracaine) in eyes.
- G. Eye irrigation may be conducted with Normal Saline or Sterile Water

In cases where eyes may need irrigation, administer Tetracaine two (2) drops of topical ophthalmic anesthetic in eyes.

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Preservation of vision
 2. Preservation of dentition
- Preservation of a patent airway

Adult Trauma Management

Oxygen supplementation based on hypoxia to maintain O₂ saturation $\geq 94\%$; use ETCO₂ to help monitor for hypoventilation and apnea

Adult IV/IO

As needed for fluid or pain and anti-emetic medication (more likely) administration

Pain medication as per

Adult Pain Control**Avulsed tooth:**

- Avoid touching the root of the avulsed tooth. Do not wipe off tooth
- Pick up at crown end.
- Place in milk or saline as the storage medium. Alternatively patient can hold tooth in mouth using own saliva as storage medium

Eye trauma: See: **Eye Injury** Protocol

Mandible unstable:

- Expect patient cannot spit/swallow effectively. Have suction readily available.
- If spine cleared (see **Spinal Care** guideline), transport sitting up with spit/emesis basin

Epistaxis:

- Squeeze nose (or have patient do so) for 10 – 15 minutes continuously.
- If this does not stop the bleeding then refer to the **Epistaxis** Protocol

Nose/ear avulsion:

- Recover tissue if it does not waste scene time
- Transport with tissue wrapped in sterile gauze moistened with sterile saline
- Severe ear and nose lacerations can be addressed with a protective sterile dressing

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Isolated facial injury, including trauma to the eyes, nose, ears, midface, mandible, dentition

Exclusion Criteria

1. General Trauma (see **General Trauma Management** guideline)
2. Burn trauma (see **Burns** guideline)

Patient Management Assessment

1. Patient medications with focus on blood thinners/anti-platelet agents
2. ABCs with particular focus on ability to keep airway patent
 - a. Stable midface
 - b. Stable mandible
 - c. Stable dentition: poorly anchored teeth require vigilance for possible complete avulsion
3. Bleeding (which may be severe: epistaxis, oral trauma, facial lacerations)
4. Cervical spine pain or tenderness (see **Spinal Care** guideline)
5. Mental status assessment for possible traumatic brain injury (see **Head Injury** guideline)
6. Gross vision assessment
7. Dental avulsions
8. Any tissue or teeth avulsed should be collected. Lost teeth not recovered on scene may be in the airway
9. Overall trauma assessment based on the mechanism of injury
10. Specific re-examination geared toward airway and ability to ventilate adequately

Notes

1. Airway may be compromised because of fractures or bleeding
2. After nasal fractures, epistaxis may be posterior and may not respond to direct pressure over the nares. This may result in bleeding running down posterior pharynx, potentially compromising airway
3. Protect avulsed tissue and teeth. Avulsed teeth may be successfully re-implanted if done so in a very short period after injury. Use sterile dressing for ear and nose cartilage

Pertinent Assessment Findings

1. Unstable facial fractures that can abruptly compromise airway
2. Loose teeth and retro-pharynx bleeding

Head Injury

Adult Trauma Management

Adult Airway Management

Oxygen: prevent any desaturation < 90%; use supplemental O2 as needed to maintain O2 saturation ≥ 94%

If patient unable to maintain airway, consider oral airway (nasal airway should not be used with significant facial injury or possible basal skull fracture)
 Oral endotracheal intubation: use only if BVM ventilation ineffective in maintaining oxygenation or if airway is continually compromised. Nasal intubation should not be used in patients with head injury

Patient Care Goals

- Limit disability and mortality from head injury by:
1. Promoting adequate oxygenation
 2. Promoting adequate cerebral perfusion
 3. Limiting development of increased intracranial pressure
 4. Limiting secondary brain injury

Moderate / severe head injury:
 Continuous waveform capnography and EtCO2 measurement if available
Supraglottic airway / endotracheal intubation only if BVM ventilation inadequate to maintain adequate oxygenation. Target EtCO2 35-40 mmHg
Severe head injury with signs of herniation: Hyperventilation to target EtCO2 30-35 mmHg. This is a short-term option, and is ONLY for severe head injury (GCS ≤ 8 or U (unresponsive) on AVPU scale) with signs of herniation

Wound care:

- A. Control bleeding with direct pressure if no suspected open skull injury
- B. Moist sterile dressing to any potential open skull wound

Moderate / severe closed head injury:

- A. Blood pressure: avoid hypotension
 1. Adult (age > 10 years): maintain SBP ≥ 110 mmHg if isolated head injury

Adult IV/IO

Closed head injury: Consider administering NS/LR fluid bolus to maintain blood pressure to above numbers and maintain cerebral perfusion
 Do not delay transport to initiate IV access

See: **Head Injury-continued**

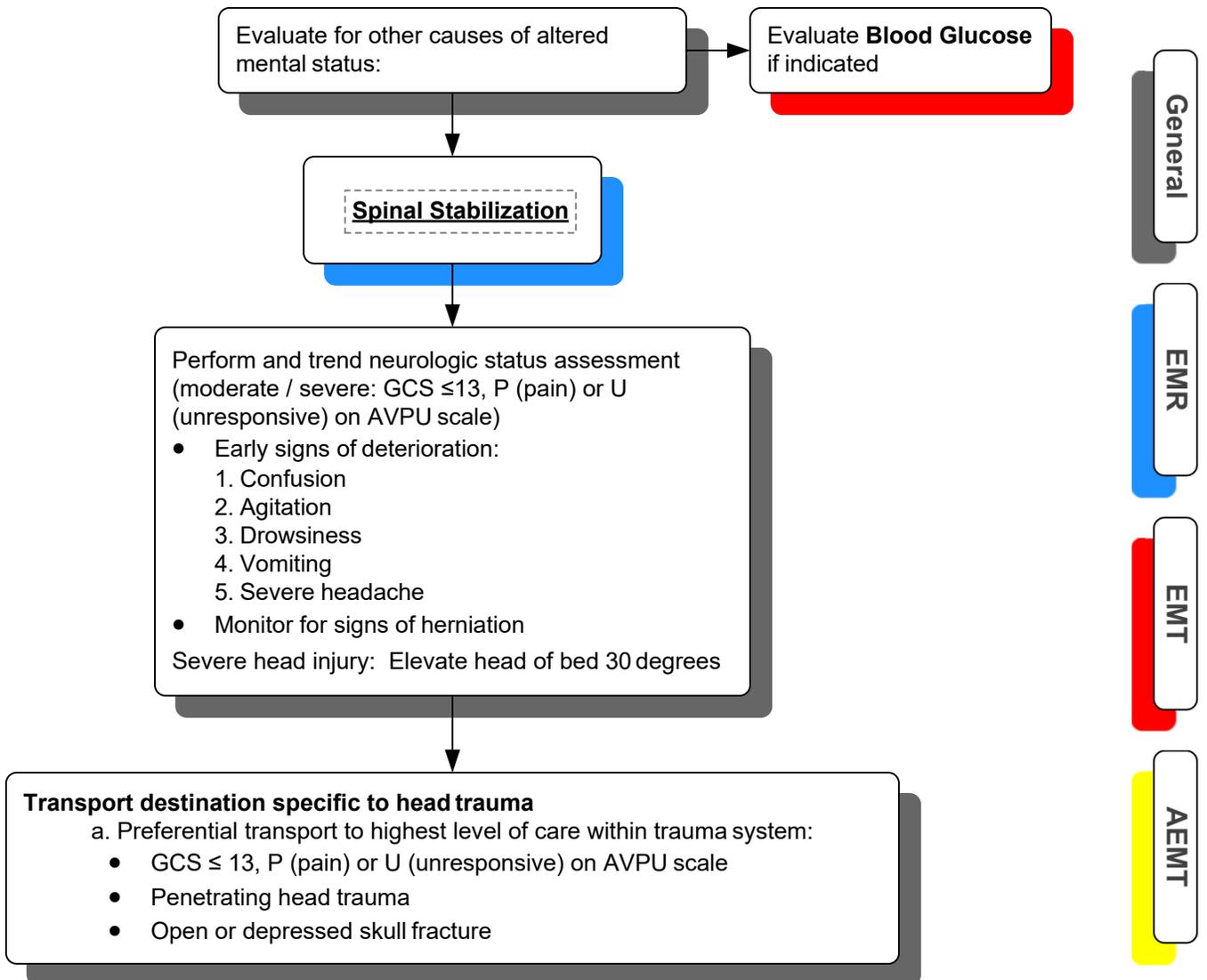
General

EMR

EMT

AEMT

Paramedic



General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Adult or pediatric patient with blunt or penetrating head injury (LOC or amnesia not required)

Patient Management Assessment

1. Maintain cervical stabilization (see **Spinal Care** guideline)
2. Primary survey: Use "Approach to Injured Patient"
3. Monitoring:
 - a. Continuous pulse oximetry
 - b. Frequent systolic and diastolic blood pressure measurement
 - c. Initial neurologic status assessment (see Neurologic Status Assessment in Appendix VI), and reassessment with any change in mentation
 - d. Moderate/severe head injury : apply continuous waveform ETCO₂ if available
4. Secondary survey pertinent to isolated head injury:
 - a. Head:
 - Gently palpate skull to evaluate for depressed or open skull fracture
 - b. Eyes:
 - i. Evaluate pupil size and reaction to light to establish baseline
 - ii. Reassess if decrease in mentation
 - c. Nose/mouth/ears:
 - Evaluate for blood/fluid drainage
 - d. Face:
 - Evaluate for bony stability
 - e. Neck:
 - Palpate for cervical spine step-off
 - f. Neurologic:
 - i. Perform neurologic status assessment (as above)
 - ii. Evaluate for focal neurologic deficit: motor and sensory

Patient Assessment Findings

1. Neurologic status assessment findings
2. Pupils
3. Trauma findings on physical exam

Notes

1. Important that providers be specifically trained in accurate neurologic status assessment
2. If endotracheal intubation or invasive airways are used, continuous waveform capnography is required to document proper tube placement and assure proper ventilation rate
3. Signs of herniation
 - a. Decreasing mental status
 - b. Abnormal respiratory pattern
 - c. Asymmetric/unreactive pupils
 - d. Decorticate posturing
 - e. Cushing's response (bradycardia and hypertension)
4. Be alert for deterioration in patients with risk factors for potentially significant head injury:
 - a. GCS < 15 at 2 hours post-injury, anything below A (alert) on AVPU scale
 - b. Age > 55 years
 - c. Deterioration in neurologic status assessment
 - d. Post-traumatic seizure
 - e. Focal neurological deficit
 - f. LOC > 5 min
 - g. Clinical suspicion of skull fracture
 - h. Recurrent vomiting
 - i. Known coagulopathy/bleeding disorder/ anticoagulant therapy
 - j. Persistent severe headache
 - k. Persistent post-traumatic amnesia
 - l. Large scalp hematoma/abrasion
 - n. Dangerous mechanism:
 - i. Fall > 20 feet (adult)
 - ii. Fall > 10 feet (pediatric)
 - iii. High risk auto crash
 - iv. Motor vehicle vs. pedestrian or bicyclist
 - v. Age
5. Do not delay transport for IV access placement
6. A "continually compromised" airway is one where basic airway maneuvers and suction do not protect the patient from significant aspiration
 Note that in circulation section, "adult" designation was used at age ≥ 10 because at 10, the formula for pediatric SBP target = SBP 90 which is the same target as adult. These numbers are taken from 2010 AHA Guidelines, Part 14 (PALS) - Kleinman citation in References

Patient Care Goals

1. Assess scene
2. Mitigating further harm
3. Accomplish goal with minimal additional injuries

Adult Trauma Management

Hot Zone/Direct Threat care considerations:

- a. Defer in depth medical interventions if engaged in ongoing direct threat (e.g. active shooter, unstable building collapse, improvised explosive device, hazardous material threat)
- b. Threat mitigation techniques will minimize risk to patients and providers
- c. Triage should be deferred to a later phase of care
- d. Prioritization for extraction is based on resources available and the situation
- e. Minimal interventions are warranted
- f. Encourage patients to provide self-first aid or instruct aid from uninjured bystander

Hot Zone/Direct Threat Zone: an area within the inner perimeter where active threat and active hazard exists.

Warm Zone/Indirect Threat Zone: an area within the inner perimeter where security and safety measures are in place. This zone may have potential hazards, but no active danger exists.

a. Consider hemorrhage control:

- i. **Tourniquet application** is the primary "medical" intervention to be considered in Hot Zone/Direct Threat
- ii. Consider instructing patient to apply direct pressure to the wound if no tourniquet available (or application is not feasible)
- iii. Consider quickly placing or directing patient to be placed in position to protect airway, if not immediately moving patient

Warm Zone/Indirect Threat care considerations:

- a. Maintain situational awareness
- b. Ensure safety of both responders and patients by rendering equipment and environment safe (firearms, vehicle ignition)

c. Conduct primary survey, per the General Trauma Management guideline, and initiate appropriate life-saving interventions

- i. Hemorrhage control
 1. **Tourniquet**
 2. **Wound packing if feasible**
- ii. Maintain airway and support ventilation [see Airway Management guideline)

- d. **Do not delay** patient extraction and evacuation for non-life-saving interventions
- e. Consider establishing a casualty collection point if multiple patients are encountered
- f. Unless in a fixed casualty collection point, triage in this phase of care should be limited to the following categories:
 - i. Uninjured and/or capable of self-extraction
 - ii. Deceased/expectant
 - iii. All others

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

High threat environment - when greater than normal conditions exist that are likely to cause damage or danger to provider or patient

Exclusion Criteria

No significant threat exists to provider and patient allowing for the performance of routine care

Patient Safety Considerations

1. Anticipate unique threats based on situation
2. During high threat situations, provider safety should be considered in balancing the risks and benefits of patient treatment

Notes**Key Considerations**

1. In high threat situations, novel risk assessment should be considered. Provider and patient safety will need to be simultaneously considered
2. During high threat situations, an integrated response with other public safety entities may be warranted
3. Depending on the situation, a little risk may reap significant benefits to patient safety and outcome
4. During these situations, maintaining communications and incident management concepts may be crucial to maximizing efficiency and mitigating dangers

Patient Care Goals

1. Select patients for whom spinal immobilization is indicated
2. Minimize secondary injury to spine in patients who have, or may have, an unstable spinal injury
Minimize patient morbidity from immobilization procedures

Adult Trauma Management**Immobilize patient with cervical collar if there is any of the following:**

- a. Patient complains of midline neck or spine pain
- b. Any midline neck or spinal tenderness with palpation
- c. Any abnormal mental status (including extreme agitation) or neurologic deficit
- d. Any evidence of alcohol or drug **intoxication**
- e. Another severe or painful distracting injury is present
- f. Torticollis in children
- g. A communication barrier that prevents accurate assessment
- h. Age greater or equal to 65 with external signs of trauma consistent with neck involvement.

If none of the above apply, patients should not have a cervical collar placed

Patients with penetrating injury to the neck / spine should receive spinal immobilization, only if they are exhibiting neurologic symptoms.

If extrication may be required

- A. **From a vehicle:** After placing a cervical collar, if indicated, children in a booster seat and adults should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat
- B. **Other situations requiring extrication:** A padded long board may be used for extrication, using the lift and slide (rather than a logroll) technique

Helmet Removal

If a football helmet needs to be removed, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet while keeping the neck immobilized. Occipital padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning

Patients should not routinely be transported on long boards, unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these rare situations, long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient

Patients should be transported to the nearest appropriate facility, in accordance with the Centers for Disease Control "Guidelines for Field Triage of Injured Patients" (see **General Trauma Management** guideline)

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Traumatic mechanism of injury consistent with spinal (cervical, thoracic, lumbar) involvement.

Patient Management Assessment

1. Assess the **scene**, to determine the risk of injury. Mechanism alone should not determine if a patient requires cervical spine immobilization. However, mechanisms that have been associated with higher risk of injury are the following:
 - a. All-terrain vehicles, snowmobiles, ejection from automobile, sports, hanging, multiple roll-over.
 - b. Axial loading injuries to the spine / diving.
 - c. Associated, substantial torso injuries
 - d. Falls >10 feet, greater or equal to 3X patient's height.
2. Assess the patient in the position he/she was found. Initial assessment should focus on determining whether or not a cervical collar needs to be applied (spinal injury assessment).
3. Assess for mental status, neurologic deficits, spinal pain or tenderness, any evidence of intoxication, or other severe injuries

Patient Safety Considerations

1. Be aware of potential airway compromise or aspiration in immobilized patient with nausea/vomiting, or with facial/oral bleeding
2. Excessively tight immobilization straps can limit chest excursion and cause hypoventilation
3. Prolonged immobilization on spine board can lead to ischemic pressure injuries to skin
4. Prolonged immobilization on spine board can be very uncomfortable for patient
5. Children are abdominal breathers, so immobilization straps should go across chest and pelvis and not across the abdomen, when possible
6. Children have disproportionately larger heads. When securing pediatric patients to a spine board, the board should have a recess for the head, or the body should be elevated approximately 1-2 cm to accommodate the larger head size and avoid neck flexion when immobilized

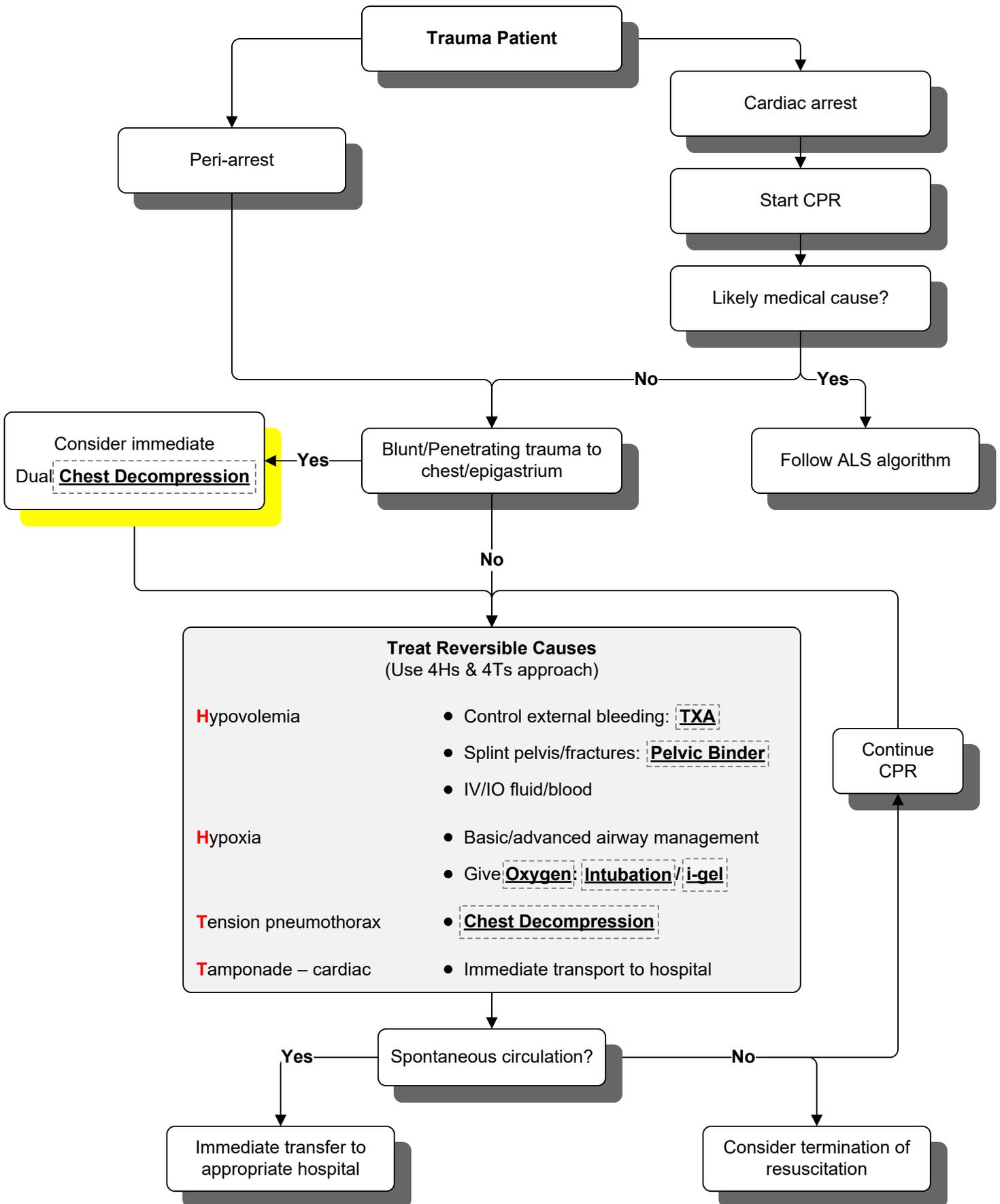
Notes

1. Evidence is lacking to support or refute the use of manual stabilization prior to spinal assessment in the setting of a possible traumatic injury, when the patient is alert with spontaneous head/neck movement. Providers should not manually stabilize these alert and spontaneously moving patients, since patients with pain will self-limit movement, and forcing immobilization on children with this clinical appearance may unnecessarily increase discomfort and anxiety
2. Certain populations with musculoskeletal instability may be predisposed to cervical spine injury. However, evidence does not support or refute that these patients should be treated differently than those who do not have these conditions. These patients should be treated according to the spinal care guideline like other patients without these conditions
3. 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 or elderly patients with dementia may prevent the provider from accurately assessing the patient
4. Spinal immobilization should be considered a treatment or preventive therapy
5. Patients who are likely to benefit from immobilization should undergo this treatment
6. Patients who are not likely to benefit from immobilization, who have a low likelihood of spinal injury, should not be immobilized
7. Ambulatory patients may be safely immobilized on gurney with cervical collar and straps and will not generally require a spine board
8. Long spine board should be reserved for patient movement in non-ambulatory patients who meet immobilization criteria and should be removed as soon as is practical

Patient Assessment Findings

1. Mental status
2. Normal neurologic examination
3. Evidence of intoxication
4. Evidence of multiple trauma with other severely painful injuries

Traumatic Cardiac Arrest



Scene Safety & BSI (body substance isolation)

Pediatric Assessment Primary/Secondary
Pediatric Assessment Primary/Secondary-Notes

Pediatric Airway Management

Pediatric Vital Signs per guideline
(Temperature Measurement if appropriate)

Pediatric Spinal Care

Consider
Pulse Oximetry

Consider
Cardiac Monitor

Appropriate Protocol

The Universal Patient Care Protocol should be used as primary guide to all patient assessment.

General

EMR

EMT

AEMT

Paramedic

Pediatric Normal Vital Signs

Age Range	Pulse	Respiratory Rate	Systolic BP	Weight
Preterm < 1 kg	120 - 160	30 - 60	36-58	< 1 kg
Preterm 1 kg	120-160	30 - 60	42-66	1 kg
Preterm 2 kg	120-160	30 - 60	50-72	2 kg
Newborn	120-160	30 - 60	60-70	3-5 kg
Up to 1 Year	100-140	30 - 60	70-80	6-9 kg
1 - 3 Years	100-140	20-40	76-90	10-15 kg
4 - 6 Years	80-120	20-30	80-100	15-20 kg
7 - 9 Years	80-120	16-24	84-110	20-30 kg
10 - 12 Years	60-100	16-20	90-120	30-40 kg
13 - 14 Years	60-90	16-20	90-120	40-50 kg
15 Years and Older	60-90	14-20	90-130	> 50 kg

Scene Size Up

- a. Review the dispatch information
- b. As you approach the scene, be sure to consider safety for yourself and your patient
- c. Observe universal precautions
- d. After determining the number and location of patients, consider the need for additional resources
- e. Determine mechanism of injury and/or nature of illness
- f. Reassess the situation

Primary Survey

- a. Obtain general impression of patient, chief complaint, and priority problems
- b. Determine responsiveness
- c. Assess airway
- d. Assess breathing
- e. Assess circulation
- f. Maintain cervical stabilization/immobilization if indicated
- g. Utilize length/weight based tape to determine appropriate medications and equipment

Initial Interventions

- a. Treat **Airway/Breathing** problems
- b. Treat **Circulation** problems
- c. Establish **Pediatric IV/IO** access if indicated
- d. Apply **Cardiac Monitor**
- e. Maintain normal patient temperature

Secondary Survey

- a. Perform secondary assessment after initial interventions are completed
- b. Address problems identified in the secondary survey utilizing the appropriate protocol(s)
- c. Obtain vital signs, including blood glucose if available and indicated
- d. Assess pain

Ongoing Assessment

- a. Repeated evaluation of patient/vital signs
 - i. More than one set of vital signs for patient with grossly abnormal or significant treatment administered

Transport/Contact Medical Control

- a. Patients should be transported as soon as feasible to an appropriate medical facility. Immediate transport with treatment enroute is recommended for patients with significant trauma or unstable airways
- b. Contact medical direction as soon as feasible if online medical direction is needed
- c. For seriously injured or critically ill patients, give a brief initial report from the scene when possible, with a more detailed report given to medical direction while enroute

Key Considerations

Pediatrics: use a weight based assessment tool (length based tape, protocol calculator or other system) to estimate patient weight and guide medication therapy and adjunct choice

- a. Although the defined age varies by state, the pediatric population is generally defined by those patients who weigh up to 40 kg or up to 14 years of age, whichever comes first
- b. Consider using the pediatric assessment triangle (appearance, work of breathing, circulation) when first approaching a child to help with assessment

Patient Care Goals

1. Provision of emergency medical care to the agitated, violent, or uncooperative patient
2. Maximizing and maintaining safety for the patient, EMS personnel, and others

Patient Assessment

1. Note medications/substances on scene that may contribute to the agitation, or may be treatment of relevant medical condition
2. Maintain and support airway
3. Respiratory rate and effort. Ideally, monitor pulse oximetry and/or capnography
4. Circulatory status:
 - a. Blood pressure (if possible)
 - b. Pulse rate
 - c. Capillary refill
5. Mental status
 - a. Obtain blood glucose (if possible)
6. Temperature (if possible)
7. Evidence of traumatic injuries

Treatment and Interventions

Pediatric Universal Care

Patient Rapport

- a. Attempt verbal reassurance and calm patient prior to use of chemical and/or physical restraints
- b. Engage family members/loved ones to encourage patient cooperation if their presence does not exacerbate the patient's agitation
- c. Continued verbal reassurance and calming of patient following chemical/physical restraints

Chemical Restraints

Notes:

Selection of chemical restraint should be based upon the patient's clinical condition, current medications, and allergies in addition to EMS resources and medical oversight
 The numbering of medications below is not intended to indicate a hierarchy/preference of administration
 Chemical restraints should be a later consideration for pediatric patients

Antipsychotics

WITH MED CONTROL APPROVAL ONLY

Haloperidol (Haldol)

Age 6-14 years: 0.05 mg/kg IM to a Maximum of 3 mg

See: **Pediatric Agitated/Violent Patient-Part B**

General

EMR

EMT

AEMT

Paramedic

Chemical Restraints-continued

Benzodiazepines

Midazolam (Versed) (useful for substance abuse/undifferentiated agitation/psychosis)

WITH MED CONTROL APPROVAL ONLY

0.05 mg/kg IV to **Maximum dose of 3 mg**, or

0.1 mg/kg IM to **Maximum dose of 3 mg**, or 0.2 mg/kg IN to a **Maximum dose of 5 mg**

Dissociative Agents (Provide Sedation and Anesthesia)

Ketamine (Ketalar) (useful for excited delirium, immediate sedation for imminent threat to self or others)

Age 14 or greater **(WITH MED CONTROL APPROVAL ONLY)**

1 mg/kg IVP to **Maximum dose of 300 mg**, or 2 - 3 mg/kg IM to **Maximum dose of 300 mg**

Antihistamines

Diphenhydramine (Benadryl) (useful as adjunct to administration of Haldol)

0.5 mg/kg IM, IVP, IO **Maximum dose 25 mg**

Physical Restraints

Body

- Stretcher straps should be applied as the standard procedure for all patients during transport
- Sheets can be used as additional stretcher straps if necessary
- Stretcher straps and sheets should never restrict the patient's chest wall motion
- Placement of stretcher straps or sheets (to prevent flexion/extension of torso, hips, legs) around:
 1. the lower lumbar region, below the buttocks, or
 2. the thighs, knees, and legs

Extremities

- Soft or leather restraint devices should not require a key to release them
- Restrain all four extremities to maximize safety for patient, staff, and others
- iRestrain all extremities to the stationary frame of the stretcher
- Multiple knots should not be used to secure the restraint device

See: **Agitated/Violent Patient-Restraint Reference**

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Maintain adequate perfusion
2. Treat underlying cause:
 - a. Hypoxia
 - b. Shock
 - c. Second or third degree AV block
 - d. Toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin)
 - e. Electrolyte disorder
 - f. Increased intracranial pressure (ICP)
 - g. Other

Treatment and Interventions

Pediatric Universal Care

Manage Airway as necessary

Oxygen as appropriate

Pulse Oximetry measurement
maintain O2 saturation \geq 94%

Cardiac Monitor

12 Lead ECG

Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Obtain **Blood Glucose**

treat per
Pediatric Hypoglycemia/Hyperglycemia
guideline as indicated

Pediatric IV/IO

Fluid bolus if appropriate

Consider the following additional therapies if bradycardia and symptoms or hemodynamic instability continue:

Epinephrine 1:10,000 0.01 mg/kg IVP, IO every 3 - 5 minutes

Also consider **Atropine** 0.01 - 0.02 mg/kg IVP, IO

with Minimum dose of 0.1 mg if increased vagal tone or cholinergic drug toxicity is suspected.

Epinephrine may be used for bradycardia and poor perfusion unresponsive to ventilation and oxygenation. It is reasonable to administer atropine for bradycardia caused by increased vagal tone or cholinergic drug toxicity

External Pacemaker

If pacing is performed, consider sedation
or **Pediatric Pain Control**

General

EMR

EMT

AEMT

Paramedic

1. Patients who have undergone cardiac transplant will not respond to atropine
2. Consider potential culprit medications including beta-blockers, calcium channel blockers, sodium channel blockers/anti-depressants, cocaine, digoxin, and clonidine. If medication overdose is considered, refer to appropriate guideline in the **Toxins and Environmental** section.
3. Consider hyperkalemia in the patient with wide complex bradycardia, dialysis dependent renal failure.
4. Bradycardia should be managed via the least invasive manner possible, escalating care as needed
 - a. Third degree heart block or the denervated heart (as in cardiac transplant) may not respond to atropine and in these cases, proceed quickly to chronotropic agents (such as epinephrine or dopamine), or transcutaneous pacing.
 - b. In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing

Patient Care Goals

1. Return of spontaneous circulation (ROSC)
2. Preservation of neurologic function

Inclusion Criteria

Patients with cardiac arrest

Exclusion Criteria

Include the following:

1. Patients suffering cardiac arrest due to severe hypothermia (see **Hypothermia/Cold Exposure** guideline)
 2. Patients with identifiable Do Not Resuscitate (or equivalent such as POLST) order (see **Terminating or Not Starting Resuscitation Due to DO Not Resuscitate/Advance Directive/Healthcare Power of Attorney (POA)** guideline)
- Patients in arrest due to traumatic etiology (see **General Trauma Management** guideline)

Assessment

The patient in cardiac arrest requires a prompt balance of treatment and assessment. In cases of cardiac arrest, assessments should be focused and limited to obtaining enough information to reveal the patient is pulseless. Once pulselessness is discovered, treatment should be initiated immediately and any further history must be obtained by bystanders while treatment is ongoing

The most important therapies for patients suffering from cardiac arrest are prompt cardiac defibrillation and minimally interrupted effective chest compressions

General

EMR

EMT

AEMT

Paramedic

Initiate chest compressions in cases with no bystander chest compressions, or take over compressions from bystanders while a second rescuer is setting up the AED or defibrillator.

- If adequate, uninterrupted bystander CPR has been performed or if the patient arrests in front of the EMS providers, immediately proceed with rhythm analysis and defibrillation, if appropriate
- If no compressions and the arrest was not witnessed by EMS providers, perform chest compressions at a rate of 100-120/minute for 2 minutes, followed by rhythm analysis and defibrillation, if appropriate. In the unwitnessed arrest, chest compressions are commonly the most rapidly applied therapy and should be instituted immediately in an effort to minimize the "no flow" state of cardiac arrest

All efforts should be instituted to create a "low flow" state through effective chest compressions, OPA, Defibrillation and other treatment

Defibrillation

Initial 2 J/kg
subsequent attempts 4 J/kg

Effectiveness of chest compressions decreases with any movements. Patients should therefore be resuscitated as close to the point at which they are first encountered and should only be moved if the conditions on scene are unsafe or do not operationally allow for resuscitation. Chest compressions are also less effective in a moving vehicle. It is also dangerous to EMS providers, patients, pedestrians and other motorists to perform chest compressions in a moving ambulance. For these reasons and because in most cases the care provided by EMS providers is equivalent to that provided in emergency departments, resuscitation should occur on scene

CPR

Resume immediately after defibrillation attempts with no pauses for pulse checks for 2 minutes regardless of the rhythm displayed on the cardiac monitor

See: **Pediatric Cardiac Arrest Part B**

All attempts should be made to prevent avoidable interruptions in chest compressions, such as pre-charging the defibrillator and hovering over the chest, rather than stepping away during defibrillations

Pediatric IV/IO

Access should be obtained within the first 2-minute period of chest compressions

Epinephrine 1:10,000 0.01 mg/kg (0.1 ml/kg) IVP, IO
Repeat every 3 - 5 minutes **Maximum 1 mg / 10 ml**

Continue the cycle of chest compressions for 2 minutes, followed by rhythm analysis and defibrillation of shockable rhythms. During this period of time, the proper strategy of airway management is currently not defined and many options for airway management exist. Regardless of the airway management and ventilation strategy, consider the following principles:

The airway management strategy should not interrupt compressions
Successful resuscitation from cardiac arrest depends primarily on effective, minimally-interrupted chest compressions and prompt defibrillation. Airway management is of secondary importance and should not interfere with compressions and defibrillation. Options for airway management include:

BVM ventilation at 10 breaths per minute, applied without interrupting the compressions.

BVM ventilation with 30:2 ventilation to compression ratio: Each 30 compressions, the compressions are paused briefly to allow 2 BVM ventilations, then compressions immediately resumed.

Advanced airway placement: Either a supraglottic airway or an endotracheal tube may be placed without interruption of compressions. Ventilations are provided at 10 breaths/minute.

Consider limited tidal volumes. For neonates and young children, an adult sized BVM may be used as long as a proper mask size and tidal volume are utilized

Consider use of antiarrhythmic for recurrent VF/Pulseless VT

Amiodarone (Cordarone) 5 mg/kg IVP, IO **Maximum 300 mg**
May be repeated once total **Maximum dose 150 mg**

See: **Pediatric Cardiac Arrest Part C**

General

EMR

EMT

AEMT

Paramedic

For Torsades de Pointes

Magnesium Sulfate 50% 25 - 50 mg/kg IVP, IO

Dilute to 10% Solution

(take 2 ml's of a 50% solution, then add 8 ml's NS which results in a 10 ml volume 10% dilution of a 1G) 100 mg/ml

Consider reversible causes of cardiac arrest which include the following:
Hypothermia – additions to care include attempts at active rewarming.

The dialysis patient/known hyperkalemic patient – Additions to care include the following:

Calcium Chloride 10% 20 mg/kg (0.2 ml/kg) IVP, IO **Maximum 10 ml (5 gm / 5,000 mg)**

Sodium Bicarbonate 1 mEq/kg IVP, IO

Tricyclic antidepressant overdose - Additions to care include the following:

Sodium Bicarbonate 1 mEq/kg IVP, IO

Hypovolemia - Additions to care include the following:

Normal saline 20 ml/kg IV

If the patient is intubated at the time of arrest, assess for tension pneumothorax and misplaced ETT. If tension pneumothorax suspected, perform **Chest Decompression**. Assess ETT, if misplaced, replace ETT

If at any time during this period of resuscitation the patient regains return of spontaneous circulation.

If resuscitation remains ineffective, consider termination of resuscitation

See: **Discontinuation of Resuscitation** guideline

List of Tricyclic Antidepressants:

- Amitriptyline,
- Amoxapine,
- Desipramine (Norpramin),
- Doxepin,
- Imipramine (Tofranil),
- Nortriptyline (Pamelor),
- Protriptyline (Vivactil),
- Trimipramine (Sarmontil)

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Stabilize and resuscitate when necessary
2. Initiate monitoring and diagnostic procedures
3. Transfer for further evaluation

Patient Presentation & Patient Assessment

See: **Pediatric Syncope-Notes**

General

EMR

EMT

AEMT

Paramedic

Obtain detailed history

Pediatric Universal Care

Manage Airway as indicated

Oxygen as appropriate
Pulse Oximetry measurement

Evaluate for hemorrhage and treat for shock if indicated

Obtain **Blood Glucose**

Patient Safety Considerations:
Patients suffering syncope due to arrhythmia may suffer recurrent arrhythmia and should therefore be placed on a cardiac monitor.

treat per

Pediatric Hypoglycemia/Hyperglycemia
guideline as indicated

Pediatric IV/IO

Fluid bolus if appropriate

If necessary Cardiac Monitor

12 Lead ECG
Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Patient Presentation

Syncope is heralded by **both** the loss of consciousness and the loss of postural tone. Syncope typically is abrupt in onset and resolves equally quickly. EMS providers may find the patient awake and alert on initial evaluation. Presyncope is defined as the prodromal symptoms of syncope. It usually lasts for seconds to minutes and may be described by the patient as “nearly blacking out” or “nearly fainting”

Inclusion criteria

1. Abrupt loss of consciousness with loss of postural tone
2. Prodromal symptoms of syncope

Exclusion criteria

Conditions other than the above, including patients:

1. Patients with alternate and obvious cause of loss of consciousness (such as trauma – see **Pediatric Head Injury** Guideline)
2. Patients with ongoing mental status changes or coma should be treated per the **Pediatric Altered Mental Status** guideline

Notes

1. By being most proximate to the scene and to the patient’s presentation, EMS providers are commonly in a unique position to identify the cause of syncope. Consideration of potential causes, ongoing monitoring of vitals and cardiac rhythm as well as detailed exam and history are essential pieces of information to pass onto hospital providers
2. All patients suffering from syncope deserve hospital level evaluation, even if they appear normal with few complaints on scene
 - a. High risk causes of syncope include the following:
 - i. Cardiac causes – such as arrhythmias and massive pulmonary embolism
 - ii. Neurologic - some of the symptoms of seizure may mimic those of syncope with loss of consciousness and collapse. Consider seizure and obtain full history from bystander witnesses
 - b. Consider high risk 12-lead EKG features including:
 - i. Evidence of QT prolongation
 - ii. Delta waves
 - iii. Brugada syndrome (incomplete RBBB pattern in V1/V2 with ST segment elevation)

Patient Management Assessment

1. Pertinent History

- a. Review the patient’s past medical history, including a history of:
 - i. Cardiovascular disease (cardiac disease/stroke/ etc.)
 - ii. Seizure
 - iii. Recent trauma
 - iv. Anticoagulation
 - v. Dysrhythmia
 - vi. Congestive heart failure (CHF)
 - vii. Syncope
- b. History of Present Illness, including:
 - i. Conditions leading to the event
 - ii. Patient complaints before or after the event including prodromal symptoms
 - iii. History from others on scene, including seizures or shaking, presence of pulse/breathing (if noted), duration of the event, events that lead to the resolution of the event
- c. Review of Systems:
 - i. Occult blood loss (GI/GU)
 - ii. Fluid losses (nausea/vomiting/diarrhea) and fluid intake
 - iii. Current Medications

2. Pertinent Physical Exam Including:

- a. Attention to vital signs as well as evaluation for trauma / pulse ox
- b. Detailed neurologic exam (including stroke screening and mental status)
- c. Heart, lung, abdominal and extremity exam
- d. Additional Evaluation:
 - i. Finger stick blood glucose
 - ii. Cardiac monitoring
 - iii. Ongoing vital signs
 - iv. 12-lead EKG

Pertinent Assessment Findings

- Evidence of trauma
- Evidence of cardiac dysfunction (e.g. evidence of CHF, arrhythmia)
- Evidence of hemorrhage
- Evidence of neurologic compromise
- Evidence of alternate etiology, including seizure
- Initial and ongoing cardiac rhythm
- 12-lead EKG as indicated

Patient Care Goals

1. Maintain adequate oxygenation, ventilation and perfusion
2. Restore regular sinus rhythm - correct rhythm disturbance
3. Search for underlying cause:
 - a. Medications (caffeine, diet pills, thyroid, decongestants)
 - b. Drugs (cocaine, amphetamines)
 - c. History of dysrhythmia
 - d. CHF

Treatment and Interventions

Pediatric Universal Care

Manage Airway as indicated
Provide supplemental **Oxygen** as needed to maintain O2 saturation $\geq 94\%$

Cardiac Monitor
12 Lead ECG
Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Pediatric IV/IO: Fluid bolus if appropriate
20 ml/kg Maximum 1 liter

Obtain **Blood Glucose**

treat per
Pediatric Hypoglycemia/Hyperglycemia
guideline as indicated

Stable SVT

Perform vagal maneuvers

Adenosine (Adenocard): 0.1 mg/kg IVP, IO
Maximum 6 mg
If unsuccessful, may repeat with
Adenosine (Adenocard): 0.2 mg/kg IVP, IO
Maximum 12 mg x 2

Unstable SVT

Synchronized Cardioversion

Deliver a synchronized shock; **2 J/kg**
for the first dose
Repeat doses should be **3 J/kg**

For responsive patients, consider sedation

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Maintain adequate oxygenation, ventilation and perfusion
2. Restore regular sinus rhythm - correct rhythm disturbance
3. Search for underlying cause:
 - a. Medications (caffeine, diet pills, thyroid, decongestants)
 - b. Drugs (cocaine, amphetamines)
 - c. History of dysrhythmia
 - d. CHF

Treatment and Interventions

Pediatric Universal Care

Manage Airway as indicated
Provide supplemental **Oxygen** as needed to maintain O2 saturation $\geq 94\%$

Cardiac Monitor
12 Lead ECG
Monitor for and treat arrhythmias (if present refer to appropriate guideline)

Pediatric IV/IO Fluid bolus if appropriate
20 ml/kg Maximum 1 liter

Obtain **Blood Glucose**

treat per
Pediatric Hypoglycemia/Hyperglycemia
guideline as indicated

Regular Wide Complex Tachycardia-Stable

Regular Wide Complex Tachycardia-Unstable

(ventricular tachycardia - VT, supraventricular tachycardia - SVT, atrial fibrillation/flutter with aberrancy, accelerated idioventricular rhythms, pre-excited tachycardias with accessory pathways, torsades de pointes)

Synchronized Cardioversion
0.5 - 1 J/kg

Consider

Adenosine (Adenocard) 0.1 mg/kg for SVT aberrancy
IVP, IO Otherwise,
Amiodarone (Cordarone) 5 mg/kg IVP, IO
Maximum 150 mg over 10 minutes

If non-monomorphic or indeterminate

Amiodarone 5 mg/kg IV, IO over 10 minutes; may repeat x 1; dilute per policy.
Maximum 150 mg

General

EMR

EMT

AEMT

Paramedic

If altered level of consciousness

also follow: **Pediatric Altered Mental Status**

Pediatric Universal Care

Obtain **Blood Glucose**

Blood Glucose < 60 mg/dl
with related symptoms

Oral Glucose: 0.5 gm/kg

Maximum 15 gm, may repeat x 1

Tablets, Glucose Gel, etc.

Avoid oral glucose in patients that are
unable to swallow or maintain airway

If hyperglycemia **glucose > 250 mg/dl**
with symptoms of dehydration, vomiting,
or altered level of consciousness:

Normal saline **20 ml/kg** bolus IV,
reassess and repeat up to **40 ml/kg** total

Reassess patient

- A. Reassess vital signs, mental status, and indications of dehydration
- B. Repeat point of care blood glucose level indicated if previous hypoglycemia and mental status has not returned to normal
 - 1. It is not necessary to repeat blood sugar if mental status has returned to normal
 - 2. It is not necessary to repeat blood glucose level if initial hyperglycemia
 - 3. If continued altered mental status and hypoglycemia, give additional dextrose or glucagon using initial dosing

Dextrose 7.5%: Or **D10 Premixed**

5 ml/kg of a 7.5% dextrose IVP, IO

(1 amp D50 into a 250 ml NS)

(Age >8 follow adult)

Glucagon

1 mg IM, IN if ≥ 20 kg (or ≥ 5 yo)

0.5 mg IM, IN if < 20 kg (or < 5 yo)

Disposition

- A. If hyperglycemia, transport to closest appropriate receiving facility
- B. If hypoglycemia with continued symptoms, transport to closest appropriate receiving facility
- C. If hypoglycemia with resolved symptoms, consider release without transport if all of the following are true:
 - 1. Repeat glucose is > 80 mg/dl
 - 2. Patient takes insulin
 - 3. Patient does NOT use oral medications to control blood glucose
 - 4. Patient returns to normal mental status, with no focal neurologic signs/symptoms after receiving glucose/dextrose
 - 5. Patient can promptly obtain and will eat a carbohydrate meal
 - 6. Gaurdian refuses transport or patient and EMS providers agree transport not indicated
 - 7. A reliable adult will be staying with patient
 - 8. No major co-morbid symptoms exist, like chest pain, shortness of breath, seizures, intoxication, also received naloxone
 - 9. Patient or legal guardian refuses transport

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Cooling and rehydration
2. Mitigate high risk for decompensation
3. Mitigate high risk for agitation and uncooperative behavior

Pediatric Universal Care

- Move victim to a cool area and shield from the sun or any external heat source
- Remove as much clothing as is practical and loosen any restrictive garments
- If alert and oriented, give small sips of cool liquids

If altered mental status, check **Blood Glucose** level

Maintain airway vigilance for emesis, seizure

Place on **Cardiac Monitor** and record ongoing vital signs and level of consciousness

If temperature is > 104 degrees F (40 degrees C) or if altered mental status is present, begin active cooling by:

- Continually misting the exposed skin with tepid water while fanning the victim (most effective)
- Truncal ice packs may be used, but are less effective than evaporation
- Shivering should be treated as soon as possible
- Ice bath immersion provides the most rapid cooling mechanism but may not be available to EMS

Pediatric IV/IO

- Establish IV access for heat stroke
- Give cool fluids at **20 ml/kg** boluses and reduce to 10 ml/kg/hr boluses when vitals are stable
- Monitor for shivering and seizures; treat as below

Consider **10 - 20 ml/kg** normal saline IV fluid bolus for dehydration even if vital signs are normal

Midazolam (Versed): 0.1 mg/kg IV or 0.2 mg/kg IN, IM **Maximum single dose 1 mg**; Note: a 5 mg/ml concentration is recommended for IN, IM administration)

General

EMR

EMT

AEMT

Paramedic

Pediatric Universal Care

Secure Airway

Oxygen

as needed to treat shock and/or respiratory distress

Apply **Pulse Oximetry**

Evaluate patient's general appearance, relevant history of condition and determine:

Onset	Allergies
Provokes	Medication
Quality	Past Medical History – especially, recent surgery, any abnormal ingestion, previous trauma, related medical diseases
Radiates	
Severity	
Time	Last Meal
Interventions	Events leading to present illness

Assess additional associated signs and symptoms:

1. Nausea / vomiting blood or coffee grounds
2. Constipation / diarrhea - black, tarry or bloody bowel movements
3. Problems with urination
4. Menstrual abnormality
5. Fever
6. Tenderness, rigidity, and presence or absence of bowel sounds
7. Cardiac associated symptoms: Dyspnea, Diaphoresis, SOB

Transport in position of comfort, preferable supine with knees flexed, unless there is respiratory distress.
Give nothing by mouth.

Pediatric IV/IO

Pediatric Vital Signs

Fluid bolus to maintain appropriate BP for age.

Monitor ECG during transport.

For nausea, consider administration of

Ondansetron (Zofran)

- > 30 kg (66 lbs.) – 4 mg IV or 4 mg, PO Can repeat dose x 1 in 10 minutes
- < 30 kg (66 lbs.) but > 15 kg – 4 mg IV or 4 mg (one 4 mg ODT) PO
- < 15 kg (33 lbs.) but > 8 kg – 2 mg IV or 2 mg (1/2 a 4 mg ODT) PO
- < 8 kg (17.6 lbs.) – N/A

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

Decrease discomfort secondary to nausea and vomiting

Pediatric Universal Care

History and physical examination focused on potential causes of nausea and vomiting (e.g. gastrointestinal, cardiovascular, gynecologic)

Ondansetron (Zofran)

> 30 kg – 4 mg IV or 4 mg, PO Can repeat dose x 1 in 10 minutes
 < 30 kg but >15 kg – 4 mg IV or 4 mg (one 4 mg ODT) PO
 < 15 kg but >8 kg – 2 mg IV or 2 mg (1/2 a 4 mg ODT) PO
 < 8 kg – N/A

Pediatric IV/IO

Consider Normal Saline bolus unless contraindicated (e.g. h/o CHF, renal failure)

- May repeat as indicated
- Consider 10 - 20 ml/kg IV fluid unless contraindicated

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

- 1. Identify treatable causes
- 2. Protect patient from harm

Pediatric Universal Care

Oxygen as appropriate
Pulse Oximetry measurement
 maintain O2 saturation \geq 94%

Obtain **Blood Glucose**
 See: **Pediatric Hypoglycemia/Hyperglycemia** guideline for treatments

Naloxone (Narcan)
 See: **Pediatric Opioid Poisoning/Overdose** guideline for treatments

Restraint: physical and chemical see:
Pediatric Agitated/Violent Patient-Part A guideline for treatments

Anti-dysrhythmic medication see: **Cardiovascular Section** guidelines for specific dysrhythmia guidelines for treatments

Active cooling or warming see:
Hypothermia/Cold Exposure or **Pediatric Hyperthermia/Heat Exposure** guidelines for treatments)

Pediatric IV/IO
 See: fluid administration doses in **Shock** and **Pediatric Hypoglycemia/Hyperglycemia** guidelines

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Recognize patient characteristics and symptoms consistent with an BRUE
2. Promptly identify and intervene for patients who require escalation of care
3. Choose proper destination for patient transport

Pediatric Universal Care

Cardiac Monitor

Pulse Oximetry

Should be routinely used as an adjunct to other monitoring

Blood Glucose

Repeat glucose assessments on prolonged transports

Airway

Give supplemental oxygen for signs of respiratory distress or hypoxemia. Escalate from a nasal cannula to a simple face mask to a non-rebreather mask as needed, in order to maintain normal oxygenation

Suction the nose and/or mouth (via bulb, suction catheter) if excessive secretions are present

Pediatric IV/IO

IVs should only be placed in children for clinical concerns of shock, or when administering IV medications

Advanced Airway Management

If apnea persists, initiate bag-valve-mask ventilation
Supraglottic devices and intubation should be utilized only if bag-valve-mask ventilation fails in setting of respiratory failure or apnea. The airway should be managed in the least invasive way possible

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Suspected BRUE: A patient with an episode that is frightening to the observer with some combination of the following:

1. Apnea (central or obstructive)
2. Color change (usually cyanosis or pallor)
3. Marked change in muscle tone (flaccid or rigid)

Exclusion Criteria

1. Age > 12 months
2. Presumed underlying cause that includes one of the following (refer to appropriate guidelines):
 - a. Seizure
 - b. Respiratory distress
 - c. Cardiopulmonary arrest
 - d. Trauma with known mechanism of injury

Notes

1. BRUE is a group of symptoms, not a disease process
2. As many as 10% of patients will require ED or hospital intervention
3. Determine severity, duration, and nature of event
4. All patients should be transported
5. Contact direct medical oversight if parent/guardian is refusing medical care and/or transport

Pertinent Assessment Findings

1. Assess for irritability (cries with minimal provocation)
2. Look for external signs of trauma

Patient Assessment

1. History

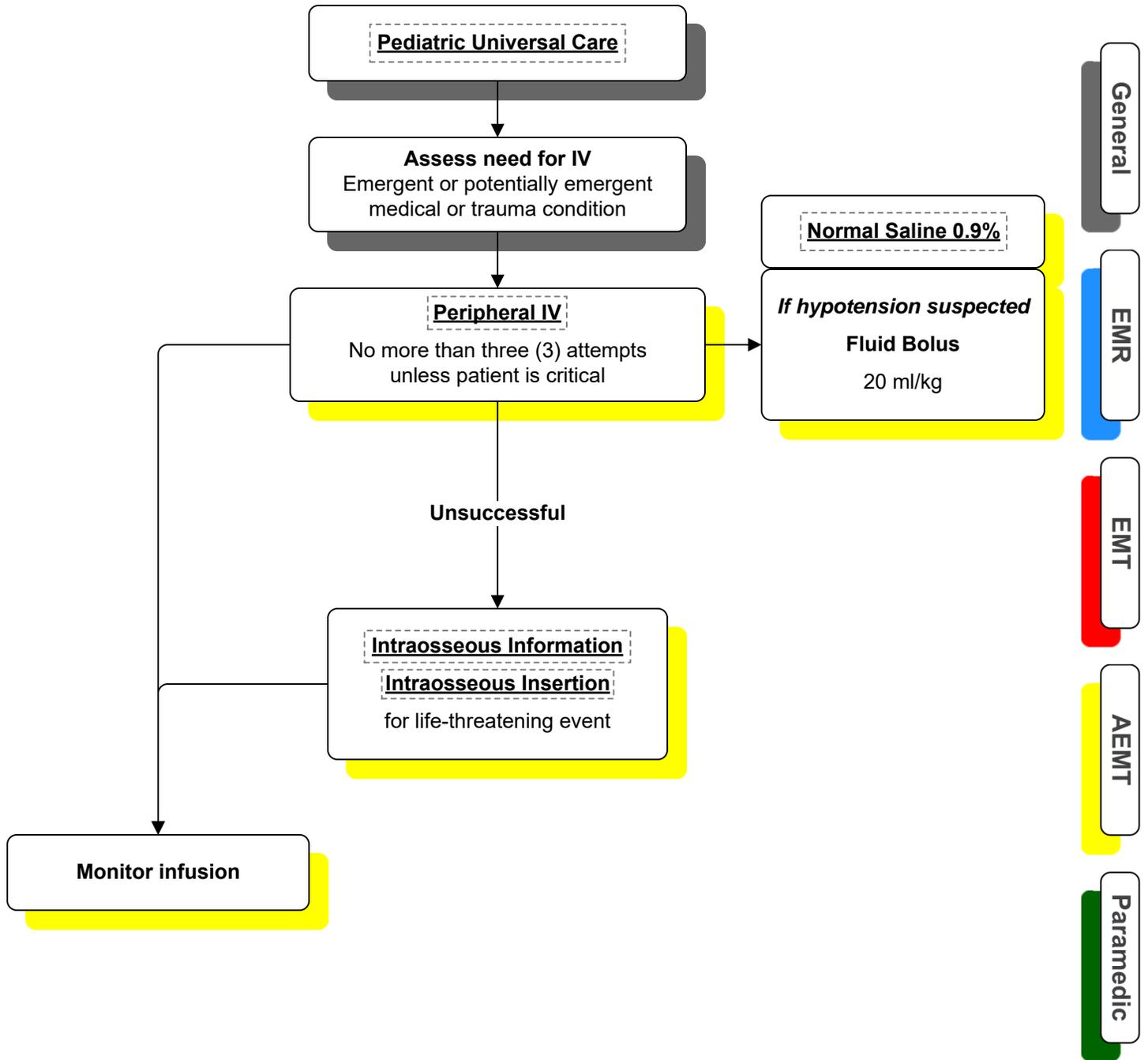
- a. History and circumstances associated with event of symptoms
- b. History of color change (including cyanosis and/or pallor), irregular breathing or change in muscle tone
- c. Concurrent symptoms (fever, cough, rhinorrhea, vomiting, diarrhea, rash, labored breathing)
- d. Prior history of BRUE, prior BRUE event in last 24 hours
- e. Family history of SIDS
- f. Treatment and Interventions performed (resuscitation attempts at home)
- g. History of premature birth before 37 weeks gestation
- h. Past medical history (cardiac, neurologic, respiratory, or chromosomal anomalies)
- i. History of gastroesophageal reflux

2. Exam

- a. Full set of vital signs (per **Universal Care** guideline)
- b. Signs of respiratory distress (grunting, nasal flaring, retracting)
- c. Color (pallor, cyanosis, normal)
- d. Mental status (alert, tired, lethargic, unresponsive, irritability) Physical exam for external signs of trauma

Patient Safety Considerations

1. Regardless of patient appearance, all patients with a history of signs or symptoms of BRUE should be transported for further evaluation
2. Destination Considerations
 - a. Consider transport to a facility with pediatric critical care capability for patients with history of cyanosis, significant past medical history (e.g. cardiac, respiratory) or past medical history of BRUE, resuscitation attempt by caregiver, or more than one BRUE in 24 hours Given possible need for intervention, all patients should be transported to facilities with baseline readiness to care for children



Patient Care Goals

The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. One of the most essential missions for all healthcare providers should be the relief and/or prevention of pain and suffering. Approaches to pain relief must be designed to be safe and effective in the organized chaos of the prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the rapidity of care

Pediatric Universal Care

Oxygen as appropriate
Pulse Oximetry measurement
 maintain O2 saturation \geq 94%

Determine patient's pain score assessment using standard pain scale.
 Self-report scale **Numeric Rating Scale (NRS)**

Cardiac Monitor
 per patient assessment

1. If available, consider use of non-pharmaceutical pain management techniques
 - a. Placement of the patient in a position of comfort
 - b. Application of ice packs and/or splints for pain secondary to trauma Verbal reassurance to control anxiety

Pediatric IV/IO: Fluid bolus if appropriate
20 ml/kg **Maximum 1 liter**

If not improved, consider use of analgesics as available and as permitted by direct medical oversight

Morphine 0.05 mg/kg IVP **Maximum dose 10 mg** IM per **Med Control** Order Only

Fentanyl (Sublimaze) (age greater than or equal to 2 years old) 1 mcg/kg IN, IM, IVP **Maximum 100 mcg**

For a patient with a history of kidney stones, flank pain, and the source of the pain is strongly suspected to be recurrent kidney stones, consider

Ketorlac (Toradol) 0.5 mg/kg IV **Maximum dose IV: 15 mg** 0.5 mg/kg or IM **Maximum dose IM: 30 mg**

Administered by Paramedic Only

(Do not use Toradol if the patient has an allergy to aspirin).
 NSAIDS or has a history of renal failure

Consider administration of oral, sublingual, or IV antiemetics to prevent nausea in high risk patients. See **Pediatric Nausea/Vomiting** guideline

If indicated based on pain assessment, repeat pain medication administration after 10 minutes of the previous dose

Transport in position of comfort and reassess as indicated

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Provide routine care to the newly born infant
2. Perform a neonatal assessment
3. Rapidly identify newly born infants requiring resuscitative efforts
4. Provide appropriate interventions to minimize distress in the newly born infant
5. Recognize the need for additional resources based on patient condition and/or environmental factors

Pediatric Universal Care

Clamp cord in two places and cut cord between the clamps if still attached to mother

Warm, Dry, and Stimulate

Wrap infant in dry towel or thermal blanket to keep infant as warm as possible during resuscitation; keep head covered if possible

If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen

If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and clear airway as needed

If thick meconium or secretions present **and** signs of respiratory distress, suction mouth then nose

If heart rate > 100 beats per minute

- Monitor for central cyanosis Provide blow-by oxygen as needed
- Monitor for signs of respiratory distress. If apneic or in significant respiratory distress:
 - A. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
 - B. Consider endotracheal intubation as per NRP guidelines

If heart rate < 100 beats per minute

- Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
 - A. Primary indicator of effective ventilation is improvement in heart rate
 - B. Rates and volumes of ventilation required can be variable, only use the minimum necessary rate and volume to achieve chest rise and a change in heart rate
- If no improvement after 90 seconds, change oxygen delivery to 30% FiO2 if blender available, otherwise 100% FiO2 until heart rate normalizes

Consider **Endotracheal Intubation** per NRP guidelines if bag-valve-mask ventilation is ineffective

See: **Pediatric Neonatal Care**

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

Newly born infants

Exclusion Criteria

Documented gestational age < 20 weeks (usually calculated by date of last menstrual period). If any doubt about accuracy of gestational age, initiate resuscitation

Patient Assessment

1. History

- a. Date and time of birth
- b. Onset of symptoms
- c. Prenatal history (prenatal care, substance abuse, multiple gestation, maternal illness)
- d. Birth history (maternal fever, presence of meconium, prolapsed or nuchal cord, maternal bleeding)
- e. Estimated gestational age (may be based on last menstrual period)

2. Exam

- a. Respiratory rate and effort (strong, weak, or absent; regular or irregular)
- b. Signs of respiratory distress (grunting, nasal flaring, retractions, gasping, apnea)
- c. Heart rate (fast, slow, or absent)
 - i. Precordium, umbilical stump or brachial pulse may be used
 - ii. Auscultation of chest is preferred since palpation of umbilical stump is less accurate
- d. Muscle tone (poor or strong)
- e. Color/Appearance (central cyanosis, acrocyanosis, pallor, normal)
- f. APGAR score (appearance, pulse, grimace, activity, respiratory effort) necessary to guide resuscitative efforts
- g. Estimated gestational age (term, late)
- h. Pulse oximetry should be considered if prolonged resuscitative efforts or if supplemental oxygen is administered
Goal: oxygen saturation at 10 minutes is 85-95%

Notes

1. Approximately 10% of newly born infants require some assistance to begin breathing
2. Deliveries complicated by maternal bleeding (placenta previa, vas previa, or placental abruption) place the infant at risk for hypovolemia secondary to blood loss
3. Low birth weight infants are at high risk for hypothermia due to heat loss
4. If pulse oximetry is used as an adjunct, the preferred placement place of the probe is the right arm, preferably wrist or medial surface of the palm. Normalization of blood oxygen levels (SaO2 85-95%) will not be achieved until approximately 10 minutes following birth
5. Both hypoxia and excess oxygen administration can result in harm to the infant. If prolonged oxygen use is required, titrate to maintain an oxygen saturation of 85-95%
6. While not ideal, a larger facemask than indicated for patient size may be used to provide bag- valve-mask ventilation if an appropriately sized mask is not available. Avoid pressure over the eyes as this may result in bradycardia
7. Increase in heart rate is the most reliable indicator of effective resuscitative efforts
8. A multiple gestation delivery may require additional resources and/or providers

Pertinent Assessment Findings

1. It is difficult to determine gestational age in the field. If there is any doubt as to viability, resuscitation efforts should be initiated
2. Acrocyanosis, a blue discoloration of the distal extremities, is a common finding in the newly born infant transitioning to extrauterine life. This must be differentiated from central cyanosis

Patient Safety Considerations

Hypothermia is common in newborns and worsens outcomes of nearly all post-natal complications. Ensure heat retention by drying the infant thoroughly, covering the head, and wrapping the baby in dry cloth. When it does not encumber necessary assessment or required interventions, “kangaroo care” (i.e. placing the infant skin-to-skin directly against mother’s chest and wrapping them together) is an effective warming technique

Patient Care Goals

1. Cessation of seizures in the prehospital setting
2. Minimizing adverse events in the treatment of seizures in the prehospital setting
3. Minimizing seizure recurrence during transport

Pediatric Universal Care

If signs of airway obstruction are present and a chin-lift, jaw thrust, and/or suctioning does not alleviate it, place oropharyngeal airway (if gag reflex is absent) or nasopharyngeal airway. Place pulse oximeter and waveform capnography to monitor oxygenation/ventilation

Apply **Oxygen** via face mask or non-rebreather mask. Administer bag-valve mask ventilation if oxygenation/ventilation are compromised

Assess signs of perfusion
Assess neurologic status

Routes for Treatment

Intranasal, or intramuscular routes for benzodiazepines are preferred as first line for administration of anticonvulsants. Intravenous (IV) placement is not necessary for treatment of seizures, but could be obtained if needed for other reasons

Midazolam (Versed): 0.1 mg/kg slow IVP, IM **Maximum dose 2 mg**
Midazolam (Versed): 0.2 mg/kg IN **Maximum dose 2 mg**

Recent evidence supports the use of IM midazolam as an intervention that is at least as safe and effective as intravenous lorazepam for prehospital seizure cessation

Obtain **Blood Glucose** if below 60 mg/dl
See: **Pediatric Hypoglycemia/Hyperglycemia** guideline for treatments

General

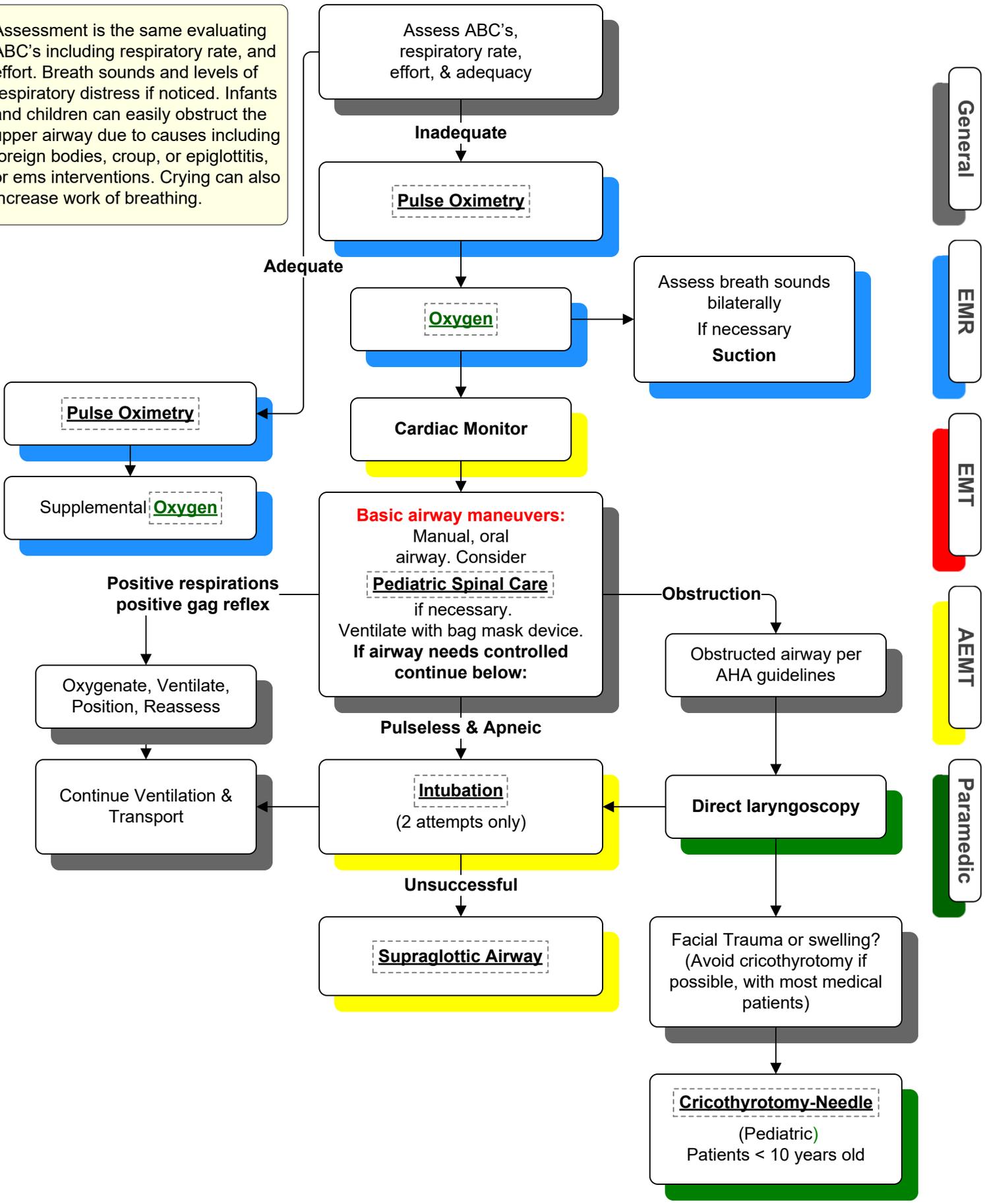
EMR

EMT

AEMT

Paramedic

Assessment is the same evaluating ABC's including respiratory rate, and effort. Breath sounds and levels of respiratory distress if noticed. Infants and children can easily obstruct the upper airway due to causes including foreign bodies, croup, or epiglottitis, or ems interventions. Crying can also increase work of breathing.



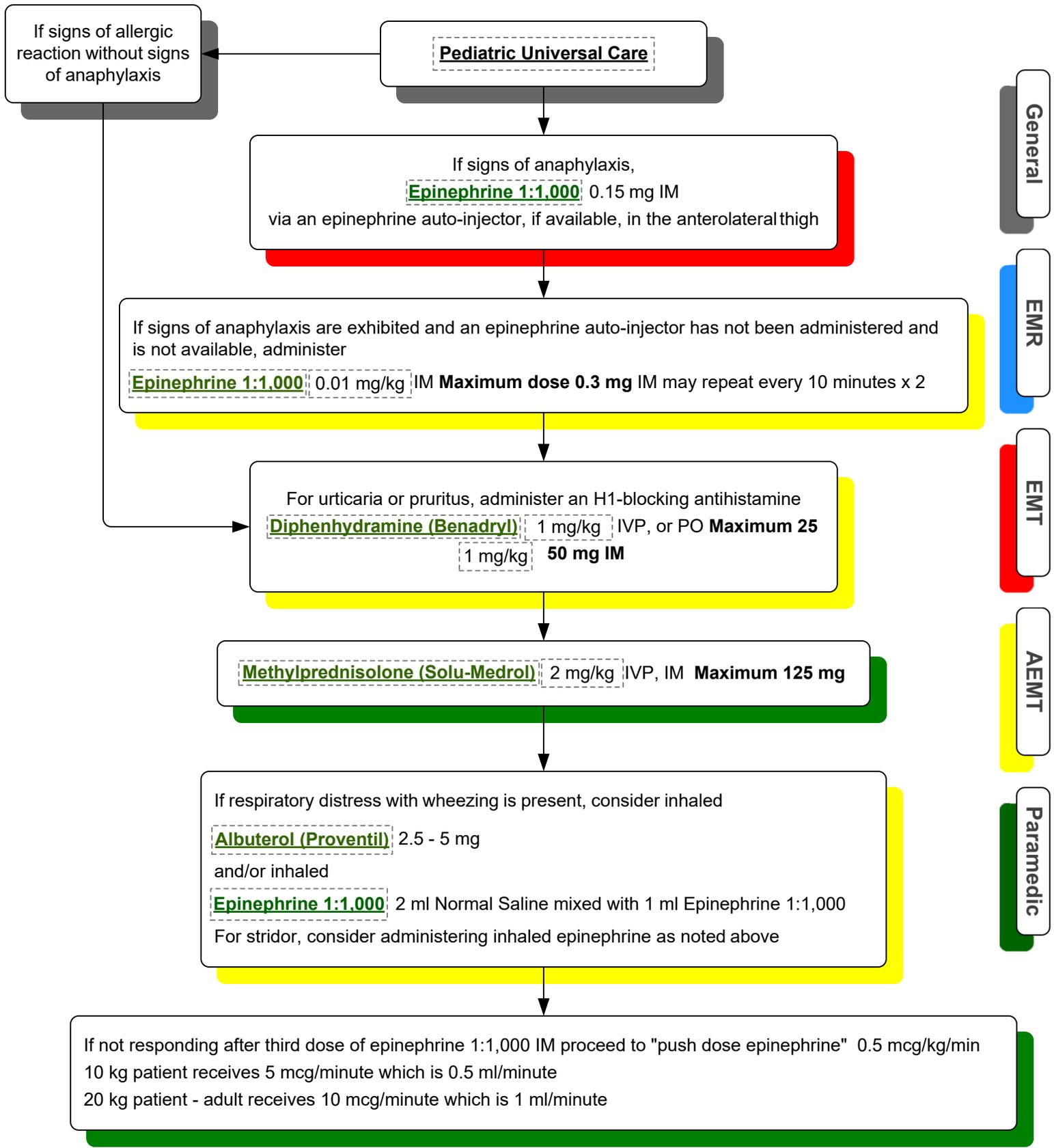
General

EMR

EMT

AEMT

Paramedic



General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Alleviate respiratory distress
2. Promptly identify respiratory distress, failure, and/or arrest, and intervene for patients who require escalation of therapy
3. Deliver appropriate therapy by differentiating other causes of pediatric respiratory distress
4. Lower Airway includes the trachea below the vocal cords, lungs and bronchioles. Lower Airway problems include: Asthma and Bronchiolitis

Pediatric Universal Care

Pulse Oximetry and end-tidal CO₂ (ETCO₂) should be routinely used as an adjunct to other forms of respiratory monitoring

Perform monitor only if there are no signs of clinical improvement after treating respiratory distress

Airway

- Give supplemental oxygen. Escalate from a nasal cannula to a simple face mask to a non-breather mask as needed, in order to maintain normal oxygenation
- Suction the nose and/or mouth (via bulb, Yankauer®, or suction catheter) if excessive secretions are present

DuoNeb

2.5 mg & 0.5 mg in 3 mL. May repeat in 10 min.

Inhaled Medications

Nebulized **Epinephrine 1:1,000** should be administered to children in severe respiratory distress with bronchiolitis (e.g. coarse breath sounds) in the prehospital setting if other treatments (e.g., suctioning, oxygen) fail to result in clinical improvement

Epinephrine 1:1,000 nebulized 2 ml Normal Saline mixed with 1 ml Epinephrine 1:1,000

Pediatric IV/IO

IVs should only be placed in children for clinical concerns of shock, or when administering IV medications

Steroids

Methylprednisolone (Solu-Medrol) 2 mg/kg IVP, IO, IM to **Maximum dose of 125 mg**

Improvement of Oxygenation and/or Respiratory Distress with Non-invasive Airway Adjuncts

- Continuous positive airway pressure (**CPAP**) or high flow nasal cannula (HFNC) should be administered, when available, for severe respiratory distress
- Bag-Valve-Mask Ventilation should be utilized in children with respiratory failure

Supraglottic Devices and Intubation

- **Supraglottic** devices and **Intubation** should be utilized only if bag-valve-mask ventilation fails
- The airway should be managed in the least invasive way possible

General

EMR

EMT

AEMT

Paramedic

Patient Presentation**Inclusion Criteria**

Child < age 2 with wheezing or diffuse rhonchi

Exclusion Criteria

1. Anaphylaxis
2. Croup
3. Epiglottitis
4. Foreign body aspiration
5. Submersion/drowning

Patient Assessment

1. History

- a. Onset of symptoms
- b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
- c. Sick contacts
- d. History of wheezing
- e. Treatments given
- f. Number of emergency department visits in the past year
- g. Number of admissions in the past year
- h. Number of ICU admissions ever
- i. History of prematurity
- j. Family history of asthma, eczema, or allergies

2. Exam

- a. Full set of vital signs (T, BP, RR, P, O₂ saturation)
- b. Air entry (normal vs. diminished)
- c. Breath sounds (wheezes, crackles, rales, rhonchi, diminished, clear)
- d. Signs of distress (grunting, nasal flaring, retracting, stridor)
- e. Weak cry or inability to speak full sentences (sign of shortness of breath)
- f. Color (pallor, cyanosis, normal)
- g. Mental status (alert, tired, lethargic, unresponsive) Hydration status (+/- sunken eyes, delayed capillary refill, mucus membranes moist vs. tacky, fontanel flat vs. sunken)

Notes

1. Suctioning can be a very effective intervention to alleviate distress, since infants are obligate nose breathers
2. Heliox should not be routinely administered to children with respiratory distress
3. Insufficient data exist to recommend the use of inhaled steam or nebulized saline
4. Though albuterol has previously been a consideration, the most recent evidence does not demonstrate a benefit in using it for bronchiolitis
5. Ipratropium and other anticholinergic agents should not be given to children with bronchiolitis in the prehospital setting
6. Though nebulized hypertonic saline has been shown to decrease hospital length of stay when used for bronchiolitis, it does not provide immediate relief of distress and should not be administered to children in respiratory distress in the prehospital setting

Patient Safety Considerations

Routine use of lights and sirens is not recommended during transport

Patient Care Goals

1. Alleviate respiratory distress
2. Promptly identify respiratory distress, failure, and/or arrest, and intervene for patients who require escalation of therapy
3. Deliver appropriate therapy by differentiating other causes of pediatric respiratory distress

An accurate history is by far the most important tool for establishing a diagnosis in pediatric patients with upper airway obstruction. Always inquire about possible foreign bodies such as peanuts, hot dogs, marbles, toys, etc.

Pediatric Universal Care

Pulse Oximetry and end-tidal CO₂ (ETCO₂) should be routinely used as an adjunct to other forms of respiratory monitoring

Cardiac monitor only if there are no signs of clinical improvement after treating respiratory distress

Observe for signs and symptoms of respiratory distress (wheezing, stridor, retractions, agitation, pale or dusky skin color, cyanosis, diaphoresis, tachypnea, etc.). If patient is ventilating adequately, obtain complete history prior to medical intervention

Airway

- Give supplemental oxygen. Escalate from a nasal cannula to a simple face mask to a non-breather mask as needed, in order to maintain normal oxygenation
- Suction the nose and/or mouth (via bulb, Yankauer®, or suction catheter) if excessive secretions are present

Inhaled Medications

Epinephrine 1:1,000 2 ml Normal Saline mixed with 1 ml Epinephrine 1:1,000, nebulized, should be administered by advanced life support (ALS) providers to all children in respiratory distress with signs of stridor at rest. Humidified oxygen or mist therapy is **not** indicated

Pediatric IV/IO

IVs should only be placed in children with respiratory distress for clinical concerns of dehydration, or when administering IV medications

Improvement of Oxygenation and/or Respiratory Distress with Non-invasive Airway Adjuncts

- Bag-valve-mask ventilation should be utilized in children with respiratory failure

Supraglottic Devices and Intubation

- **Supraglottic** devices and **Intubation** should be utilized only if bag-valve-mask ventilation fails
- The airway should be managed in the least invasive way possible

General

EMR

EMT

AEMT

Paramedic

Patient Presentation

Inclusion Criteria

Suspected Croup (history of stridor or history of barky cough)

Exclusion Criteria

Presumed underlying cause that includes one of the following:

1. Anaphylaxis
2. Asthma
3. Bronchiolitis (wheezing < 2 years of age)
4. Foreign body aspiration Submersion/drowning

Patient Assessment

1. History

- a. Onset of symptoms (history of choking)
- b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
- c. Sick contacts
- d. Treatments given
- e. Personal history of asthma, wheezing, or croup in past

2. Exam

- a. Full set of vital signs (T, BP, RR, P, O2 sat)
- b. Presence of stridor at rest or when agitated
- c. Description of cough
- d. Other signs of distress (grunting, nasal flaring, retracting,)
- e. Color (pallor, cyanosis, normal)
- f. Mental status (alert, tired, lethargic, unresponsive)

Notes

1. Upper airway obstruction can have inspiratory, expiratory, or biphasic stridor
2. Foreign bodies can mimic croup, it is important to ask about a possible choking event
3. Impending respiratory failure is indicated by:
 - a. Change in mental status such as fatigue and listlessness
 - b. Pallor
 - c. Dusky appearance
 - d. Decreased retractions
 - e. Decreased breath sounds with decreasing stridor
4. Without stridor at rest or other evidence of respiratory distress, inhaled medications may not be necessary

Pertinent Assessment Findings

1. Respiratory distress (retractions, wheezing, stridor)
2. Decreased oxygen saturation
3. Skin color
4. Neurologic status assessment
5. Reduction in work of breathing after treatment
Improved oxygenation after breathing

Isolate

	Epiglottitis	Croup	Foreign Body
Site of Obstruction	Above vocal cords	Below vocal cords	Varies
Cause	Bacterial Infection	Viral infection	Varies
Age range	Generally older child (>2 yrs) but can occur at any age	Younger child (6 months-3 years)	Any (usually under 5 years and in adult years)
Onset	Sudden (6-24 hours), fever may be first sign	24-72 hours	Sudden if upper airway
Toxicity	Child appears very ill; often has high fever	Mild to moderate, low-grade fever	Not ill appearing, no fever
Drooling	Common	Infrequent	May be present
Cough		Rare "barky" or "seal-like"	Common, distinctive, choking, gagging

Patient Care Goals

1. Reduce GI absorption of oral agents with some form of binding
2. Assure adequate ventilation, oxygenation and correction of hypoperfusion

Pediatric Universal Care

Consider **Activated Charcoal** without sorbitol **1 gm/kg** PO.
 If risk of rapid decreasing mental status, do not administer oral agent without adequately protecting the airway

Poison Control: (800) 222-1222

Blood Glucose

Consider **Atropine** for symptomatic bradycardia
0.02 mg/kg **Maximum 0.5 mg** every 5 minutes,
Maximum total dose 1 mg

Pediatric IV/IO
 Consider fluid challenge: **20 ml/kg** for hypotension with associated bradycardia

Consider **Glucagon** for symptomatic patient
1 mg IVP (25-40 kg); every 5 minutes as necessary
0.5 mg IVP (less than 25 kg); every 5 minutes as necessary

Consider **External Pacemaker** if refractory to initial pharmacologic interventions

If seizure, consider
Midazolam (Versed) **0.1 mg/kg** in 2 mg increments slow IVP over one to two minutes per increment with **Maximum single dose 5 mg** or **0.2 mg/kg** IN to **Maximum dose of 2 mg**

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Reduce GI absorption of oral agents with some form of binding agent (activated charcoal) especially for extended release
2. Early airway protection is required as patients may have rapid mental status deterioration
3. Assure adequate ventilation, oxygenation and correction of hypoperfusion

Poison Control: (800) 222-1222

Beta Blockers end in: "olol"
Calcium Channel Blockers end in: "ipine"

Pediatric Universal Care

Consider **Activated Charcoal** without sorbitol **1 gm/kg** PO.
If risk of rapid decreasing mental status, do not administer oral agent without adequately protecting the airway

Consider **Atropine** for symptomatic bradycardia
0.02 mg/kg **Maximum 0.5 mg** every 5 minutes,
Maximum total dose 1 mg

Consider **Calcium Chloride** **20 mg/kg** (**0.2 ml/kg**) slow IVP, IO
Maximum dose 1 gm or 10 ml

Consider **Glucagon** for symptomatic patient
1 mg IVP (25 - 40 kg); every 5 minutes as necessary
0.5 mg IVP (less than 25 kg); every 5 minutes as necessary

Pediatric IV/IO
Consider fluid challenge: **20 ml/kg** for hypotension with associated bradycardia

Consider **External Pacemaker** if refractory to initial pharmacologic interventions

If seizure, consider
Midazolam (Versed) **0.1 mg/kg** in 2 mg increments slow IVP over one to two minutes per increment with **Maximum single dose 5 mg** or **0.2 mg/kg** IN to **Maximum dose of 2 mg**

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Remove patient from toxic environment
2. Assure adequate ventilation, oxygenation and correction of hypoperfusion

Pediatric Universal Care

There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication and levels detected in the environment. For the patient with an appropriate history and manifesting one or more of high concentrations of cyanide signs or symptoms, treat as per algorithm:

Oxygen 100% via non-rebreather mask or bag valve mask

Supportive Airway Management

Cyanide Symptoms: Headache, Dizzy, Confusion, Anxiety, or restlessness, N/V, SOB or Tachypnea, Chest pain or Tachycardia, Loss of Consciousness, Seizures

If **seizure**, consider **Midazolam (Versed)** (benzodiazepine of choice)
 Pediatric: **0.1 mg/kg** in 2 mg increments slow IVP over one to two minutes per increment with **Maximum single dose 5 mg** or **0.2 mg/kg** **IN** to **Maximum dose of 2 mg**

General

EMR

EMT

AEMT

Paramedic

Pediatric Universal Care**Patient Care Goals**

Rapid recognition of the signs and symptoms of confirmed or suspected acetylcholinesterase inhibitor (AChEI) agents such as carbamates, nerve agents, or organophosphates exposure followed by expeditious and repeated administration of atropine, the primary antidote.

General

EMR

EMT

AEMT

Paramedic

Atropine

Atropine is the primary antidote for organophosphate, carbamate, or nerve agent exposures, and repeated doses should be administered liberally to patients who exhibit signs and symptoms of exposure or toxicity

- a. Atropine may be provided in multi-dose vials, pre-filled syringes, or auto-injectors
- b. Commercially available atropine auto-injectors include:
 - i. Pediatric Atro-Pen® 0.25 mg of atropine (yellow container)
 - ii. Pediatric Atro-Pen® 0.5 mg of atropine (blue container)

Pralidoxime Chloride (2-PAM)

Pralidoxime chloride is a secondary treatment and should be given concurrently in an effort to reactivate the acetylcholinesterase

- a. Pralidoxime chloride may be provided in a single dose vial, pre-filled syringes, or auto-injectors
- b. Auto-injectors contain 600 mg of pralidoxime chloride
- c. In order to be beneficial to the victim, a dose of pralidoxime chloride should be administered shortly after the nerve agent or organophosphate poisoning as it has minimal clinical effect if administration is delayed

Benzodiazepines

Benzodiazepines are administered as an anticonvulsant for those patients who exhibit seizure activity (see the

Pediatric Seizure guideline for doses and routes of administration)

- a. Lorazepam, diazepam, and midazolam are the most frequently used benzodiazepines in the prehospital setting
- b. In the scenario of an AChEI agent exposure, the administration of diazepam or midazolam is preferable due to their more rapid onset of action
- c. Benzodiazepines may be provided in multi-dose or single-dose vials, pre-filled syringes, or auto-injectors
Cana® is a commercially available auto-injector of diazepam

Mark I® Kits

- a. A commercially available kit of nerve agent/organophosphate antidote auto-injectors
- b. A Mark I® kit consists of one auto-injector containing 2 milligrams of atropine and a second auto-injector containing 600 milligrams of pralidoxime chloride

DuoDote (2-PAMCI/Atropine)

- a. A commercially available auto-injector of nerve agent/organophosphate antidote
Duodote® is one auto-injector that contains 2.1 milligrams of atropine and 600 milligrams of pralidoxime chloride

Mild AChEI Agent Exposure	
Patient Weight	Atropine Dose IM or via Auto-Injector
Infant: 0 - 2 years	0.05 mg/kg IM or via auto injector
Child: 3 – 7 years (13 – 25 kg)	1 mg IM or via auto-injector (e.g. 0.25 mg and or 0.5 mg auto-injector)
Child: 8 – 14 years (26 – 50 kg)	2 mg IM or via auto-injector (e.g. 2 mg and or two 1 mg auto-injector)
Adolescent/Adult	2 mg IM or via auto-injector
Pregnant Women	2 mg IM or via auto-injector
Geriatric or Frail	1 mg IM or via auto-injector

Mild to Moderate AChEI Agent Exposure		
Patient Weight	Atropine Dose IM or via Auto-Injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0 - 2 years	0.05 mg/kg IM or via auto injector	15 mg/kg IM
Child: 3 – 7 years (13 – 25 kg)	1 mg IM or via auto-injector (e.g. 0.25 mg and or 0.5 mg auto-injector)	15 mg/kg IM or One auto-injector (600 mg)
Child: 8 – 14 years (26 – 50 kg)	2 mg IM or via auto-injector (e.g. 2 mg and or two 1 mg auto-injector)	15 mg/kg IM or One auto-injector (600 mg)
Adolescent/Adult	2 mg IM or via auto-injector	600 mg IM or One auto-injector (600 mg)
Pregnant Women	2 mg IM or via auto-injector	600 mg IM or One auto-injector (600 mg)
Geriatric or Frail	1 mg IM or via auto-injector	10 mg/kg IM or One auto-injector (600 mg)

Severe AChEI Agent Exposure		
Patient Weight	Atropine Dose IM or via Auto-Injector	Pralidoxime Chloride Dose IM or via 600 mg Auto-injector
Infant: 0 - 2 years	0.1 mg/kg IM or via auto-injector (e.g. 0.25 mg and/or 0.5 mg auto-injector)	45 mg/kg IM
Child: 3 – 7 years (13 – 25 kg)	0.1 mg/kg IM or 2 mg via auto-injector (e.g. one 2 mg auto- injectors or four 0.5 mg auto-injectors)	45 mg/kg IM or One auto-injector (600mg)
Child: 8 – 14 years (26 – 50 kg)	4 mg IM or via auto-injector (e.g. two 2 mg auto-injectors or four 1 mg auto-injectors)	45 mg/kg IM or Two auto-injectors (1200 mg)
Adolescent > 14 years	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto- injectors)	Three auto-injectors (1800 mg)
Adult	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto- injectors)	Three auto-injectors (1800 mg)
Pregnant Women	6 mg IM or 6 mg via auto-injector (e.g. three 2 mg auto- injectors)	Three auto-injectors (1800 mg)
Geriatric or Frail	2-4 mg IM or 2-4 mg via auto-injector (e.g. one to two 2 mg auto-injectors)	25 mg/kg IM or Two to three auto-injectors (1200 mg-1800 mg)

Patient safety considerations

1. Continuous and ongoing patient reassessment is critical
2. Clinical response to treatment is demonstrated by the drying of secretion and the easing of respiratory effort
3. Initiation of and ongoing treatment should **not** be based upon heart rate or pupillary response
4. Precautions for pralidoxime chloride administration: Although Duodote® contains atropine, the primary antidote for an AChEI agent poisoning, the inclusion of pralidoxime chloride in the auto-injector can present challenges if additional doses of atropine are warranted by the patient condition and other formulations of atropine are unavailable:
 - a. In the pediatric population, an overdose of pralidoxime chloride may cause profound neuromuscular weakness and subsequent respiratory depression
 - b. In the adult population, especially for the geriatric victim, excessive doses of pralidoxime chloride may cause severe systolic and diastolic hypertension, neuromuscular weakness, headache, tachycardia, and visual impairment
 - c. For the geriatric victim who may have underlying medical conditions, particularly impaired kidney function or hypertension, the EMS provider should consider administering the lower recommended adult dose of intravenous pralidoxime chloride
5. Considerations during the use of auto-injectors
 - a. If an auto-injector is administered, a dose calculation prior to administration is not necessary
 - b. For atropine, additional auto-injectors should be administered until secretions diminish
 - c. Mark I® kits and Duodote® have not been approved for pediatric use by the Food and Drug Administration (FDA), but they can be considered for the initial treatment for children of any age with severe symptoms of an AChEI agent poisoning especially if other formulations of atropine are unavailable
 - d. Pediatric Atro-Pen® auto-injectors are commercially available in a 0.25 mg auto-injector (yellow) and a 0.5 mg auto-injector (red). Atro-Pen® auto-injectors are commercially available in a 1 mg auto-injector (blue) and a 2 mg auto-injector (green)
 - e. A pralidoxime chloride 600 mg auto-injector may be administered to an infant that weighs greater than 12 kg

Patient Care Goals

1. Rapid recognition and intervention of a clinically significant opioid poisoning or overdose
2. Prevention of respiratory and/or cardiac arrest

Pediatric Universal Care

Critical resuscitation (opening and/or maintaining the airway, provision of oxygen, ensuring adequate circulation) should be performed prior to naloxone administration

If the patient is symptomatic from a confirmed or suspected opioid overdose, consider

Naloxone (Narcan) administration.

The administration of the initial dose or subsequent doses can be incrementally titrated until respiratory depression is reversed

Naloxone (Narcan): 0.1 mg/kg IV, IM, IN, or ETT with a **Maximum dose of 2 mg**

- For the intranasal route, divide administration of the dose equally between the nostrils to a **Maximum of 1 ml** per nostril
- The intranasal administration can also be titrated until adequate respiratory effort is achieved.
- Naloxone auto-injectors contain 0.4 mg. The cartons of naloxone prescribed to laypersons contain two naloxone 0.4 mg auto-injectors and one trainer

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Remove patient from hazardous material environment decontaminate to remove continued sources of absorption, ingestion, inhalation, or injection
2. Identify intoxicating agent by toxidrome or appropriate environmental testing
3. Assess risk for organ impairments (heart, brain, kidney)
4. Identify antidote or mitigating agent
Treat signs and symptoms in effort to stabilize patient

Pediatric Universal Care

Pediatric Airway Management

Administer oxygen and if hypoventilation, toxic inhalation or desaturation noted, support breathing

Pediatric IV/IO

infusion of lactated ringers or normal saline
Fluid Bolus 20 ml/kg
if evidence of hypotension

Obtain **Blood Glucose**

if EMS management might change value (e.g. glucose, lactate, cyanide)

General

EMR

EMT

AEMT

Paramedic

Acetaminophen overdose:

- Consider activated charcoal without sorbitol **1 gm/kg** PO
- If risk of rapidly decreasing mental status, do not administer oral agents

Aspirin overdose:

- Consider activated charcoal without sorbitol **1 gm/kg** PO
- If risk of rapid decreasing mental status, do not administer oral agents
- As aspirin is erratically absorbed, charcoal is highly recommended to be administered early

Ingestion of caustic substances (acids and alkali)

- In the few minutes immediately after ingestion, consider administration of water or milk if available (maximum of 250 ml) **Medical Control Approval.**
- Symptomatic dystonia, extrapyramidal signs or symptoms, or mild allergic reactions Consider **Diphenhydramine (Benadryl)** **1 mg/kg** IVP or IM **Maximum single dose 25 mg**

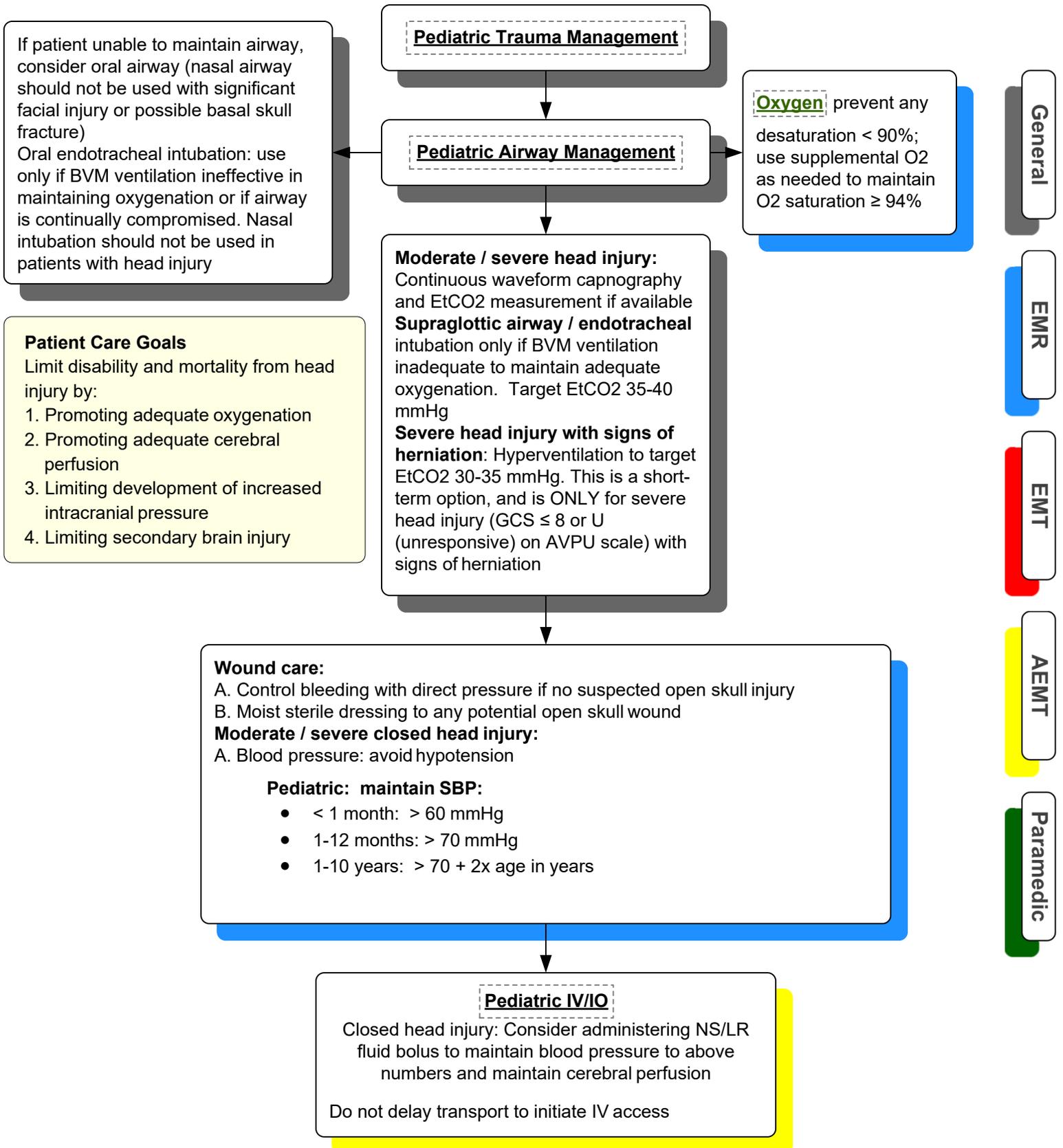
Symptomatic monoamine oxidase inhibitor overdose (MAOI; examples: Isocarboxazid (Marplan), Phenzelzine (Nardil), Selegiline (Emsam), Tranylcypromine (Parnate))

- Consider administration of **Midazolam (Versed)** for temperature control **0.1 mg/kg** in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg

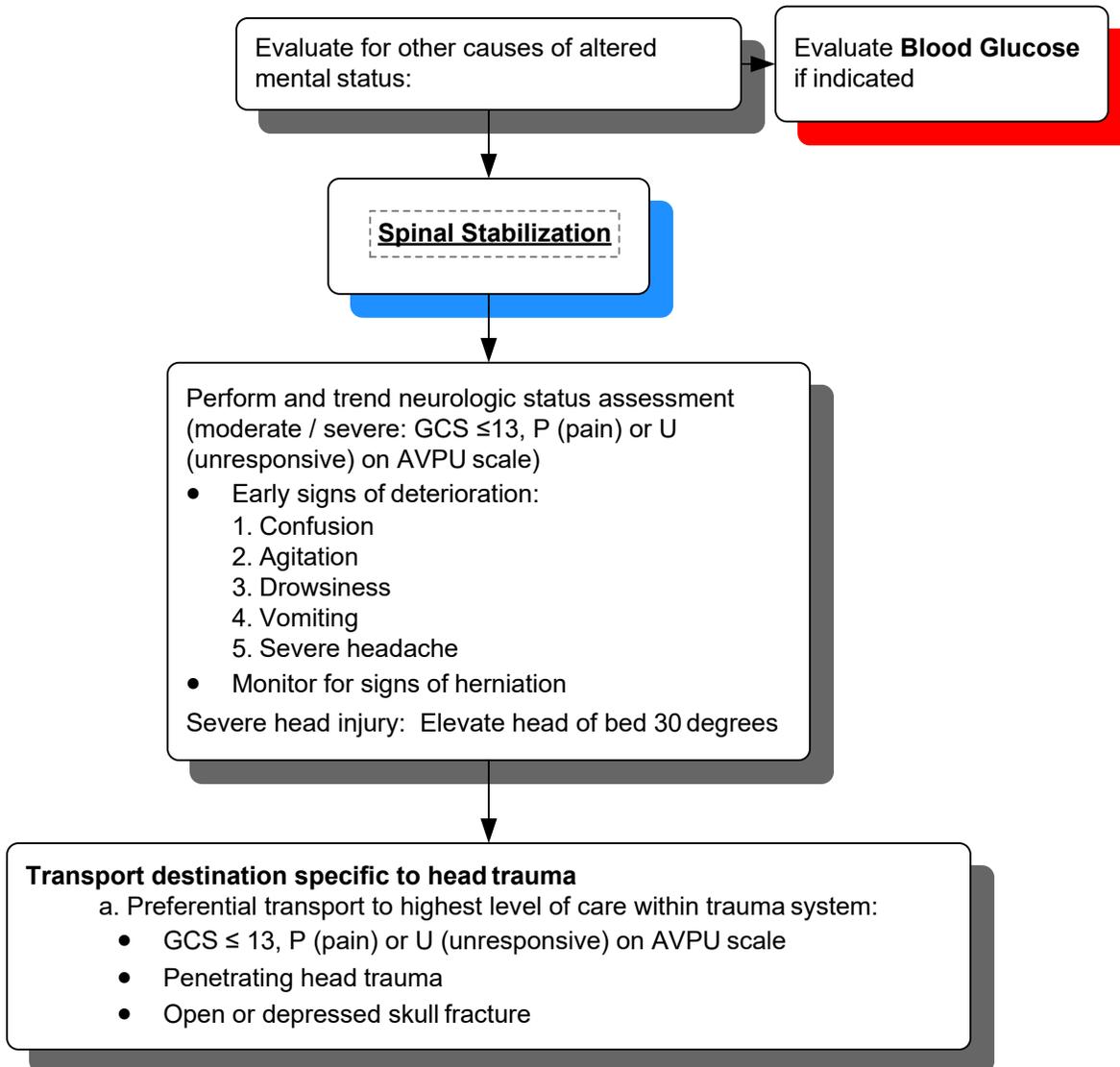
Oral ingestion poisoning:

- Consider administration of **Activated Charcoal** without sorbitol **1 gm/kg** PO particularly if it is within the first 2 hour after ingestion (including acetaminophen)
- Patients who have ingested medications with extended release or delayed absorption should also be administered activated charcoal If there is a risk of rapidly decreasing mental status or for petroleum-based ingestions, do not administer oral agents

Pediatric Head Injury



See: **Pediatric Head Injury-continued**



General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Select patients for whom spinal immobilization is indicated
2. Minimize secondary injury to spine in patients who have, or may have, an unstable spinal injury
Minimize patient morbidity from immobilization procedures

Pediatric Trauma Management**Immobilize patient with cervical collar if there is any of the following:**

- a. Patient complains of midline neck or spine pain
- b. Any midline neck or spinal tenderness with palpation
- c. Any abnormal mental status (including extreme agitation) or neurologic deficit
- d. Any evidence of alcohol or drug intoxication
- e. Another severe or painful distracting injury is present
- f. Torticollis in children
- g. A communication barrier that prevents accurate assessment

If none of the above apply, patients should not have a cervical collar placed

Patients with penetrating injury to the neck / spine should receive spinal immobilization, only if they are exhibiting neurologic symptoms.

If extrication may be required

- A. **From a vehicle:** After placing a cervical collar, if indicated, children in a booster seat and older children should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat
- B. **Other situations requiring extrication:** A padded long board may be used for extrication, using the lift and slide (rather than a logroll) technique

Helmet Removal

If a football helmet needs to be removed, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet while keeping the neck immobilized. Occipital padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning

Patients should not routinely be transported on long boards, unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these rare situations, long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient

Patients should be transported to the nearest appropriate facility, in accordance with the Centers for Disease Control "Guidelines for Field Triage of Injured Patients" (see **General Trauma Management** guideline)

General

EMR

EMT

AEMT

Paramedic

Patient Care Goals

1. Rapid assessment and management of life-threatening injuries
2. Safe movement of patient to prevent worsening injury severity
3. Rapid and safe transport to the appropriate level of trauma care

Airway

- Establish patent airway with cervical spine precautions per **Pediatric Airway Management** guideline and Pediatric **Pediatric Spinal Care** guideline
- If respiratory efforts inadequate, assist with bag-mask ventilation, consider airway adjuncts
- If impending airway obstruction or altered mental status resulting in inability to maintain airway patency, secure definitive airway

Breathing

- If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax, perform needle decompression
- For open chest wound, place semi-occlusive dressing
Monitor oxygen saturation, provide supplemental oxygen

Circulation

- Control external hemorrhage per
- If pelvis unstable and patient is hypotensive, place pelvic binder or sheet to stabilize pelvis

Pediatric IV/IO

Fluid Resuscitation

If SBP < 90 mmHg or HR > 120, give bolus of **20 ml/kg** crystalloid solution and reassess

Disability

If clinical signs of traumatic brain injury, see **Pediatric Head Injury** guideline

Exposure

Avoid hypothermia. Remove wet clothing. Cover patient to prevent further heat loss

Note that patients with major hemorrhage, hemodynamic instability, penetrating torso trauma, or signs of traumatic brain injury often require rapid surgical intervention. Minimize scene time (goal 10 minutes or less) and initiate rapid transport to a trauma center

Decisions regarding transport destination should be based on the CDC Field Triage Guidelines for Trauma Patients

General

EMR

EMT

AEMT

Paramedic

Patient Management**Assessment**

1. Assess scene safety: evaluate for hazards to EMS personnel, patient, bystanders
 - a. Determine number of patients
 - b. Determine mechanism of injury
 - c. Request additional resources if needed. Weigh the benefits of waiting for additional resources against rapid transport to definitive care
 - d. Consider declaration of mass casualty incident if needed
2. Use appropriate personal protective equipment
3. **Primary survey**
 - a. Hemorrhage control
 - Assess for and stop severe hemorrhage (see **Extremity Trauma/External Hemorrhage Management** guideline)
 - b. Airway
 - i. Assess airway patency, ask patient to talk to assess stridor and ease of air movement
 - ii. Look for injuries that may lead to airway obstruction including unstable facial fractures, expanding neck hematoma, blood or vomitus in the airway, facial burns/ inhalation injury
 - iii. Evaluate mental status for ability to protect airway (GCS < 8 likely to require airway protection)
 - c. Breathing
 - i. Assess respiratory rate and pattern
 - ii. Assess symmetry of chest wall movement
 - iii. Listen bilaterally on lateral chest wall for breath sounds
 - d. Circulation
 - i. Assess blood pressure and heart rate
 - ii. Signs of hemorrhagic shock include: tachycardia, pale, cool clammy skin, capillary refill > 2 seconds
 - e. Disability
 - i. Perform neurologic status assessment (see **Appendix VI**)
 - ii. Assess gross motor movement of extremities
 - iii. Evaluate for clinical signs of traumatic brain injury with herniation including: unequal pupils, lateralizing motor signs or posturing
 - f. Exposure
 - i. Rapid evaluation of entire body to identify sites of penetrating wounds or other blunt injuries. Be sure to roll patient and view back. Prevent hypothermia

Secondary Assessment, Treatment and Interventions

1. Assessment

- a. Obtain medical history from patient or family including:
 - i. Allergies
 - ii. Medications
 - iii. Past medical and surgical history
 - iv. Events leading up to the injury
- b. **Secondary Survey:** Head to toe physical exam
 - i. Head
 1. Palpate head and scalp and face and evaluate for soft tissue injury or bony crepitus
 2. Assess pupils
 - ii. Neck
 1. Check for:
 - a. Contusions
 - b. Abrasions
 - c. Hematomas
 - d. JVD
 2. Palpate for crepitus
 3. Evaluate for spinal tenderness
 - iii. Chest
 1. Palpate for instability/ crepitus
 2. Listen to breath sounds
 3. Inspect for penetrating or soft tissue injuries
 - iv. Abdomen
 1. Palpate for tenderness
 2. Inspect for penetrating or soft tissue injuries
 - v. Pelvis
 1. Inspect for penetrating or soft tissue injuries
 2. Palpate once for instability by gentle AP pressure with the heels of the hands on the symphysis pubis and then medial pressure at the iliac crests bilaterally
 - vi. Back
 1. Log roll patient to maintain spinal alignment
 2. Inspect for penetrating or soft tissue injuries
 3. Palpate for spinal tenderness
 - vii. Neurologic status assessment (see **Appendix VI**)
 1. Serial assessment of mental status
 2. Gross exam of motor strength all four extremities
 - viii. Extremities
 1. Assess for fracture/deformity
 2. Assess peripheral pulses/ capillary refill
- c. Additional treatment considerations
 - i. Maintain spine precautions per **Spinal Care** guideline
 - ii. Splint obvious extremity fractures per **Extremity Trauma/External Hemorrhage Management** guideline
 - iii. Provide pain medication per **Pain Management** guideline

Notes

1. Optimal trauma care requires a structured approach to the patient, emphasizing ABCDE
2. Target scene time < 10 minutes for unstable patients or those likely to need surgical intervention
3. Provider training should include the CDC Guidelines for Field Triage
4. Frequent reassessment of the patient is important
 - a. If patient develops difficulty with ventilation, reassess breath sounds for development of tension pneumothorax
 - b. If extremity hemorrhage is controlled with pressure dressing or tourniquet, reassess for evidence of continued hemorrhage
 - c. If mental status declines, reassess ABCs
5. Withholding and termination of resuscitative efforts
 - a. Resuscitative efforts should be withheld for trauma patients with the following:
 - i. Decapitation
 - ii. Hemitorpomy
 - iii. Signs of rigor mortis or dependent lividity
 - iv. Blunt trauma: apneic, pulseless, no organized activity on cardiac monitor
 - b. Resuscitative efforts may be terminated in patients with traumatic arrest who have no return to spontaneous circulation after 15-30 minutes of resuscitative efforts, including minimally interrupted CPR

Patient Presentation

Inclusion Criteria

Patients of all ages who have sustained an injury as a result of mechanical trauma. This includes both blunt and penetrating injury as well as burns

Exclusion Criteria

No specific recommendations

Patient Safety Considerations

1. Life threatening injuries identified on primary survey should be managed immediately and rapidly transported to a trauma center. Secondary survey should be performed while en route
2. Monitor patient for deterioration over time with serial vital signs and repeat neurologic status assessment
 - a. Patients with compensated shock may not manifest hypotension until severe blood loss has occurred
 - b. Patients with traumatic brain injury may deteriorate as intracranial swelling and hemorrhage increase
3. Anticipate potential for progressive airway compromise in patients with trauma to head and neck

This section will discuss the medications and their pharmacology used in the Wooster Community Hospital Health System EMS Protocol and Procedures Manual

Medication List

Acetaminophen (Tylenol)
Activated Charcoal
Adenosine (Adenocard)
Albuterol (Proventil/Ventolin)
Amiodarone (Cordarone)
Aspirin
Atropine Sulfate
Brilinta (Ticagrelor)
Calcium Chloride
Dextrose (D25)
50% Dextrose (D50)
Diphenhydramine HCL (Benadryl)
Duoneb
Epinephrine (Adrenalin)
Etomidate (Amidate)
Fentanyl (Sublimaze)
Glucagon
Haloperidol (Haldol)
Heparin
Ketamine
Ketorolac (Toradol)
Labetalol (Trandate)
Lidocaine (Xylocaine) 2%
Magnesium Sulfate
Methylprednisolone (Solu-Medrol)
Midazolam (Versed)
Morphine Sulfate
Naloxone (Narcan)
Nitroglycerine
Normal Saline 0.9% (NS)
Ondansetron (Zofran)
Oral Glucose
Oxygen (O2)
Oxymetazoline Hydrochloride (Afrin)
Phenergan (Promethazine)
Racemic Epinephrine
Sodium Bicarbonate
Tetracaine (Pontocaine, Ophthalmic)
Tranexamic Acid (TXA)
Ziprasidone (Geodon)

Acetaminophen (Tylenol)

Action: Analgesic

Onset: Peak effect: 0.5 - 2 hours

Indications

Adult Pain Control

Adult Dose

Pain: 650 mg Maximum

Pediatric Dose

Fever greater than 101 degrees Fahrenheit
15 mg/kg PO, Maximum 650 mg. Use syringe to measure

Contra-
indications

Hypersensitivity. Avoid in patients with severe liver disease. Prior dose within 4 hours.

Adverse
Reactions

GI bleeding

Precautions



Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical
Considerations

None

Activated Charcoal (Actidose)

Action: Physical binding of toxins from GI tract. To reduce/prevent systemic absorption of toxins.

EMT can Administer Medication.

Onset: Immediate

Indications

- Beta Blocker Poisoning/Overdose
- Calcium Channel Blocker Poisoning/Overdose
- Overdose/Poisoning/Toxic Ingestion
- Pediatric Beta Blocker Poisoning/Overdose
- Pediatric Calcium Channel Blocker Poisoning/Overdose
- Pediatric Overdose/Poisoning/Toxic Ingestion

Adult Dose

50 gm/240ml – 100 gm/480ml PO

Pediatric Dose

Age < 1 1 gm/kg (5 ml/kg) PO
 Age 1-12 25 gm/120 ml – 50 gm/240 ml PO
 Age > 12 50 gm/240 ml – 100 gm/480 ml PO

Contra-indications

Hypersensitivity. Patients with diminished level of consciousness unable to maintain and protect their own airway. Not to be used for ingestions of caustics, metals, hydrocarbons or alcohols.

Adverse Reactions

Hypothermia, GI bleeding, Nausea, vomiting, darkened stools, constipation or diarrhea.

Precautions



Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

ADMINISTRATION
 Add one part charcoal to 4 part water if not diluted; If already diluted, shake for 30 seconds; administer P.O.

Therapeutic Effects: Slows tachycardias associated with the AV node via modulation of the autonomic nervous system without causing negative inotropic effects.

Onset: Half life < 10 sec.
Adenosine will not convert atrial fib., atrial flutter, or VT to NSR

Indications

Tachycardia w/Pulse-Narrow Complex

Tachycardia w/Pulse-Wide Complex

Pediatric Tachycardia-SVT

Pediatric Wide Complex Tachycardia

Adult Dose

6 mg Rapid IVP, IO (over 1 – 3 seconds) immediately followed with 10 ml saline flush
If no response is observed after 1 – 2 minutes, administer,
12 mg Rapid IVP, IO (over 1 – 3 seconds) immediately followed with 10 ml saline flush
A third dose of 12 mg can be given

Pediatric Dose

0.1 mg/kg Rapid IVP, IO Maximum 6 mg followed with a 10 ml saline flush
If no response is observed after 1 – 2 minutes, administer,
0.2 mg/kg Rapid IVP, IO Maximum 12 mg
followed with a 10 ml saline flush

Contra-indications

2nd & 3rd degree AV Block, Sick Sinus Syndrome, Symptomatic bradycardia, unless patient has functioning artificial pacemaker, Ventricular Tachycardia, Hypersensitivity

Adverse Reactions

Cardiovascular: Facial flushing, Headache, Sweating, Palpitations, Chest Pain, Hypotension
Respiratory: Shortness of Breath, Chest Pressure, Hyperventilation, Head Pressure
Central Nervous System: Lightheadedness, Dizziness, Tingling in Arms, Numbness, Apprehension, Blurred Vision, Burning Sensation, Heaviness in Arms, Neck, and Back
Gastrointestinal: Nausea, Metallic Taste, Tightness in Throat, Pressure in Groin.

Precautions

May be rarely associated with ventricular fibrillation. The effects of adenosine are antagonized by methylxanthines such as caffeine and theophylline. In their presence, larger doses may be required or adenosine may not be effective. At the time of conversion to a sinus rhythm, a variety of new rhythms may occur. Generally these last a short period and are normally corrected on their own with no intervention.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Adult dose: Flush with 20 ml NS after each dose
Pediatric dose: Flush with 10 ml NS after each dose
IV at antecubital site preferred

Therapeutic Effects: Beta-2 stimulator, dilates smooth muscle, bronchodilator.

Advanced EMT can Administer Medication

EMT can administer if patient is prescribed medication

Onset: improvement within 5 min.
Peak effect 2 hours

Indications

Renal Patient **Allergic Reaction/Anaphylaxis Part A**
Asthma/COPD/Reactive Airway **Radiation Exposure** **Crushing Trauma**
Pediatric Allergic Reaction/Anaphylaxis Part A

Adult Dose

2.5 - 5 mg Normal Saline, via nebulizer @ 6 L/M O₂

Pediatric Dose

2.5 – 5 mg Normal Saline, via nebulizer @ 6 L/M O₂

Contra-indications

Hypersensitivity, Excessive prior use of betastimulants. Shortness of breath not from bronchoconstriction

Adverse Reactions

Cardiovascular: Tachycardia, Hypertension
Central Nervous System: Tremors, Dizziness, Nervousness, Headache, Insomnia
Ear, Nose, and Throat: Pharyngitis, Nasal Congestion
Gastrointestinal: Nausea, Dyspepsia
Respiratory: Bronchospasm, Cough, Bronchitis, Wheezing

Precautions

Should be used with caution in patients with cardiovascular disorders, especially coronary insufficiency, cardiac arrhythmias and hypertension, in patients with convulsive disorders, hyperthyroidism or diabetes mellitus.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Use of mouth piece is most effective route if patient is cooperative

Therapeutic Effects: Complex drug with effects on sodium, potassium, and calcium channels as well as alpha and beta-adrenergic blocking properties.

Onset: Immediate

Indications

Cardiac Arrest Part B: Tachycardia w/Pulse-Wide Complex
Pediatric Cardiac Arrest Part B: Pediatric Wide Complex Tachycardia

Adult Dose

Cardiac Arrest Part B: 300 mg IVP, IO
 May be repeated at a dose of 150 mg
Tachycardia w/Pulse-Wide Complex
 150 mg IVP, IO over 10 minutes; may repeat x 1

Pediatric Dose

Pediatric Cardiac Arrest Part B: 5 mg/kg IVP, IO Maximum 300 mg May be repeated once total Maximum dose 150 mg
Pediatric Wide Complex Tachycardia: 5 mg/kg IVP, IO Maximum 150 mg over 10 minutes

Contra-Indications

Known hypersensitivity to any of the components of the medication. Patients in cardiogenic shock. Severe bradycardic rhythms. Second degree blocks

Adverse Reactions

Body as a Whole: Fever
Cardiovascular: Hypotension, Asystole/Cardiac Arrest/EMD, Cardiogenic Shock, CHF, Bradycardia, Ventricular Tachycardia, A-V Block
Digestive System: Nausea

Precautions

Like all antiarrhythmic agents, may cause a worsening of existing arrhythmias or precipitate a new arrhythmia. 2% of patients were reported to have respiratory distress syndrome (ARDS). May produce vasodilation and hypotension. **Do not use with irregular Tachyarrhythmias or Torsades.**

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Use large needle when drawing drug into syringe, and draw slowly. This will help prevent foaming.

Aspirin

Therapeutic Effects: Exhibits analgesic, anti-inflammatory and antipyretic activity. Due to aspirin's ability to inhibit platelet aggregation and cause vasodilation, there is a decreased likelihood of thrombosis.

EMT can Administer Medication.

Onset: Peak effect: 15 minutes to 2 hours

Indications

Chest Pain (ACS/STEMI)

Adult Dose

324 mg (each tablet 81 mg) PO upon onset of cardiac signs and symptoms

Pediatric Dose



Contra-indications

Aspirin hypersensitivity. Active or history of GI lesions. Impaired renal function

Adverse Reactions

GI bleeding, nausea, vomiting, bronchospasm

Precautions

Use cautiously in patients with asthma, pregnancy. A one time dose is safe if patient is on coumadin.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: By blocking parasympathetic (vagal) action on the heart, atropine increases the rate of discharge by the sinus node, enhances conduction through the AV junction and accelerates the heart rate, thereby improving cardiac output.

Onset: 2 – 5 minutes, peak effect 15 – 30 minutes.

Indications

Excited Delirium | **Bradycardia** | **Beta Blocker Poisoning/Overdose**
Calcium Channel Blocker Poisoning/Overdose | **Nerve Agents**
Pediatric Bradycardia | **Pediatric Beta Blocker Poisoning/Overdose**
Pediatric Calcium Channel Blocker Poisoning/Overdose | **Pediatric Nerve Agents**

Adult Dose

Excited Delirium, Bradycardia: 0.5 mg IVP, IO Repeat every 3 – 5 minutes
Beta Blocker Poisoning/Overdose & Calcium Channel Blocker Poisoning/Overdose:
 1 mg IVP, IO every 5 minutes Maximum 3 mg
Nerve Agents: Atro-Pen

Pediatric Dose

Pediatric Bradycardia: 0.01 - 0.02 mg/kg IVP, IO
 Minimum 0.1 mg Maximum 0.5 mg single dose
Pediatric Toxicology: 0.02 mg/kg Maximum 0.5 mg every 5 minutes,
 Maximum total dose 1 mg **Pediatric Nerve Agents:** Atro-Pen

Contra-
indications

Hypersensitivity. Glaucoma-narrow angle. Atrial flutter/fibrillation where there is a rapid ventricular response. Use with extreme caution in myocardial infarction.

Adverse Reactions

Cardiovascular: Palpitations, bradycardia (following low doses of atropine) Tachycardia (after higher doses)
CNS: Headache, Flushing, Nervousness, drowsiness, weakness, dizziness, fever, Elderly may exhibit mental confusion or excitement to even small doses, larger doses, Restlessness, Tremor
Gastrointestinal: Nausea, Vomiting, Heartburn

Precautions

May produce drowsiness, dizziness or blurred vision. Use cautiously in patients with asthma or allergies. Use caution in Coronary artery disease, CHF, Cardiac arrhythmias, Tachycardia, Hypertension, Infants, small children, Debilitated patients with chronic lung disease

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Use caution in patients with asthma, allergies CAD, CHF, HTN, infants, small children, & persons with down's syndrome

Action
Antiplatelet agents

Onset:
Within 1 hour

Indications

Chest Pain (ACS/STEMI) - STEMI patients only

Adult Dose

180 mg PO

Pediatric Dose



Contra-Indications

Hypersensitivity; active pathological bleeding, such as peptic ulcer intracranial hemorrhage. Severe hepatic impairment (Cirrhosis, Hepatitis B or C, liver failure

Adverse Reactions

CNS: dizziness, fatigue, headache
Respiratory: cough, dyspnea
Cardiovascular: atrial fibrillation, bradycardia, hypertension, hypotension, peripheral hypertension, hypotension, peripheral edema
Gastrointestinal: diarrhea, nausea
Skin: rash
Muscular-Skeletal: back pain, extremity pain
Miscellaneous: non-cardiac chest pain.

Precautions

Should be discontinued for active bleeding.

Contraindications

Indications

Adverse Reactions

Adult Dosage

Precautions

Pediatric Dosage

Medical Considerations

Watch for bleeding

Therapeutic Effects: Reverses overdose with magnesium sulfate or calcium channel blockers (such as verapamil).

Onset: Immediate

Indications

Cardiac Arrest Part C **Renal Patient** **Crushing Trauma**
Calcium Channel Blocker Poisoning/Overdose Hydrofluoric acid
Pediatric Cardiac Arrest Part C **Pediatric Calcium channel Blocker Poisoning/Overdose**

Adult Dose

Cardiac Arrest dialysis patient, Crushing Trauma: 10 ml (1,000 mg) Slow IVP, IO
Calcium Channel Blocker Poisoning/Overdose: 0.5 – 1 gm slow IVP, IO
 50 mg/min over 10 minutes

Pediatric Dose

Pediatric Cardiac Arrest Part C: 20 mg/kg IVP, IO Maximum 10 ml (5 gm/5,000 mg)
Calcium Channel Blocker Toxicity: 20 mg/kg 0.2 ml/kg
 Slow IVP, IO over 10 minutes Maximum 1 gm 10 ml

Contra-Indications

Should be given with extreme caution, and in reduced dosage, to persons taking digitalis. Should not be given in the same infusion with sodium bicarbonate, since calcium chloride will combine with sodium bicarbonate to form an insoluble precipitate (calcium carbonate).

Adverse Reactions

Rapid injection may cause tingling sensations, a calcium taste, or heat wave. Peripheral vasodilatation, local burning, or moderate fall in BP. If infiltration occurs, IV administration at the site should be discontinued at once. When given to a patient who has been taking digitalis or when given too rapidly, calcium can cause **sudden death** from ventricular fibrillation.

Precautions

Injections should be made slowly through a small needle into a large vein to minimize venous irritation and avoid undesirable reactions.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Irritating to veins and must not be injected into tissue, severe necrosis and sloughing may occur.

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia.

Advanced EMT can Administer Medication

Onset: 1 - 2 minutes

Indications

Hypoglycemia/Hyperglycemia

Adult Dose

12.5 – 25 gm (25 – 50 ml) IVP, IO
May repeat if continued altered mental status

Pediatric Dose

Age > 8yrs. follow adult dosing
Age < 8yrs. give Dextrose 7.5%

Contra- indications

Sub Q & IM injections, Intercerebral bleeding, Hemorrhagic CVA, cerebral edema, Delirium Tremors if patient dehydrated

Adverse Reactions

Febrile response, Infection at injection site, Tissue necrosis, Venous thrombosis or phlebitis, Extravasation, Hypovolemia, Dehydration, Mental Confusion or unconsciousness. May produce allergic reactions in corn-sensitive persons. Use the largest available peripheral vein. Rapid infusion may cause a generalized flush.

Precautions

Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia.

Advanced EMT can Administer Medication

Onset:
Onset: 1 - 2 minutes

Indications

Hypoglycemia/Hyperglycemia Pediatric Neonatal Care
Pediatric Hypoglycemia/Hyperglycemia

Adult Dose

Administer 150 ml- check BGL. If <60mg/dL give rest of D10 150 – 250 ml add 1 amp D50 to 250 ml of NS

Pediatric Dose

Dextrose 10% 5 ml/kg of a 10% dextrose IVP, IO
(1 amp D50 into a 250 ml NS) (Age >8 follow adult)

Contra-
indications

Sub Q & IM injections, Intercerebral bleeding, Hemorrhagic CVA, cerebral edema, Delirium Tremors if patient dehydrated

Adverse
Reactions

Febrile response, Infection at injection site, Tissue necrosis, Venous thrombosis or phlebitis, Extravasation, Hypovolemia, Dehydration, Mental Confusion or unconsciousness. May produce allergic reactions in corn-sensitive persons. Use the largest available peripheral vein. Rapid infusion may cause a generalized flush.

Precautions

Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Therapeutic Effects: Restores circulating blood sugar level to normal in states of hypoglycemia.

Advanced EMT can Administer Medication

Onset:
Onset: 1 - 2 minutes

Indications

Hypoglycemia/Hyperglycemia **Pediatric Neonatal Care**
Pediatric Hypoglycemia/Hyperglycemia

Adult Dose

150 – 300 ml add 1 amp D50 to 250 ml of NS

Pediatric Dose

Dextrose 7.5% **5 ml/kg** of a 7.5% dextrose IVP, IO
(1 amp D50 into a 250 ml NS) (Age >8 follow adult)

Contra-
indications

Sub Q & IM injections, Intercerebral bleeding, Hemorrhagic CVA, cerebral edema, Delirium Tremors if patient dehydrated

Adverse
Reactions

Febrile response, Infection at injection site, Tissue necrosis, Venous thrombosis or phlebitis, Extravasation, Hypovolemia, Dehydration, Mental Confusion or unconsciousness. May produce allergic reactions in corn-sensitive persons. Use the largest available peripheral vein. Rapid infusion may cause a generalized flush.

Precautions

Inject slowly so that extravasation does not occur. If thrombosis occurs, injection should be stopped.

Contraindications

Indications

Adult Dose

Adverse Reactions

Pediatric Dose

Precautions

Medical Considerations

Do not use Dextrose if IV site is questionable. Perform blood glucose analysis prior to administration and 5-15 minutes after initial analysis.

Therapeutic Effects:
Blocks histamine effects in allergic reactions.

Advanced EMT can Administer Medication

Onset: < 15 min.
Peak effect 1 - 4 hours

Indications

Agitated/Violent Patient Part B; **Allergic Reaction/Anaphylaxis Part A**
Overdose/Poisoning/Toxic Ingestion; **Stimulant Poisoning/Overdose**
Pediatric Agitated/Violent Patient-Part B
Pediatric Allergic Reaction/Anaphylaxis Part A
Pediatric Overdose/Poisoning/Toxic Ingestion

Adult Dose

Agitated/Violent patient: 25 - 50 mg IM 25 mg IVP, IO
Allergic Reaction: 1 mg/kg IVP Maximum 25 mg IV, 1 mg/kg IM Maximum 50 mg
Overdose/Poisoning/Toxic Ingestion: 25 mg IVP, IM
Stimulant Poisoning/Overdose: 25 mg IVP, 50 mg IM

Pediatric Dose

Pediatric Agitated/Violent Patient-Part B: 0.5 mg/kg IM, IVP, IO Maximum 25 mg
Pediatric Allergic Reaction: 1 mg/kg IVP Maximum 25 mg IVP, 1 mg/kg IM Maximum 50 mg
Pediatric Overdose/Poisoning/Toxic Ingestion: 1 mg/kg IVP, IM Maximum 25 mg

Contra-Indications

Hypersensitivity, Newborns, Lactating females

Adverse Reactions

Cardiovascular: Hypotension, Headache, Palpitations, Tachycardia, extrasystoles
CNS: Sedation, Sleepiness, Dizziness, Fatigue, Confusion, Restlessness, Excitation, Nervousness, Tremor, Irritability, Blurred Vision, Vertigo, Tinnitus, Convulsions
Gastrointestinal: Nausea, Vomiting, Diarrhea
Respiratory: Thickening of Bronchial Secretions, Tightness of Chest and Wheezing, Nasal Stuffiness

Precautions

Has Atropine-like action and should be used with caution in patients with a history of bronchial asthma, increased intraocular pressure, cardiovascular disease or hypertension. Use caution in patients with lower respiratory disease, including asthma. Also pregnant patients. Use caution in elderly patient, may cause dizziness, extreme calm and hypotension.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

DuoNeb (Albuterol/Ipratropium)

Therapeutic Effects

Simultaneous administration of both an anticholinergic drug (atrovent) and a beta2-sympathomimetic drug (albuterol) produces a greater bronchodilator effect than when either drug is utilized alone.

Onset: improvement within 5 min.
Peak effect 2 hours

Advanced EMT can Administer Medication

Indications

Asthma/COPD/Reactive Airway | **Pediatric Respiratory Distress (Lower Airway)**

Adult Dose

One 3 ml vial via nebulizer. If additional aerosol treatments are necessary, use albuterol.

Pediatric Dose

age greater than 2 One 3 ml vial via nebulizer. If additional aerosol treatments are necessary, use albuterol.

Contra-indications

Angioedema, severe peanut oil hypersensitivity

Adverse Reactions

Nervousness, tremors, weakness, increased heart rate and angioedema

Precautions



Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: In anaphylaxis, acts as a bronchodilator (beta effect) and helps maintain blood pressure (alpha effect)

Advanced EMT can Administer Medication (IM only)

Onset: 5 - 10 minutes SQ

EMT can administer Medication Auto Injector ONLY

Indications

Allergic Reaction/Anaphylaxis Part A **Allergic Reaction/Anaphylaxis Part B**
Asthma/COPD/Reactive Airway
Pediatric Allergic Reaction/Anaphylaxis Part A
Pediatric Respiratory Distress (Lower Airway)
Pediatric Respiratory Distress (Upper Airway)

Adult Dose

0.3 mg IM,
For stridor 3 ml inhaled (2 ml Normal Saline mixed with 1 ml Epinephrine 1:1,000)

Pediatric Dose

0.15 mg IM via Auto-Injector
(if Auto-Injector not used) 0.01 mg/kg IM Maximum 0.3 mg
For stridor 3 ml inhaled (2 ml Normal Saline mixed with 1 ml Epinephrine 1:1,000)

Contra-indications

None in Cardiac Arrest, Known Hypersensitivity, Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours.

Adverse Reactions

Palpitations, Arrhythmias, Hypertension, Pulmonary Edema, Dyspnea, Nervousness

Precautions

When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur, Do not mix with any other drugs, Very light sensitive, do not use solutions that are discolored or those that have a precipitate, Massage site after injection to counteract possible vasoconstriction, Use with caution on patients with Epi-Pen usage (previous).

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Always transport after treatment due to rebound effect. Use with caution in males over age 35 or in those patients with a known history of hypertension, thyroid disease or angina.

Therapeutic Effects: In cardiac arrest, may restore electric activity in asystole; increases myocardial contractility; and decreases the threshold for defibrillation-all through its actions as a beta sympathetic agent.
In addition, the alpha effects of epinephrine, causing vasoconstriction, elevate the perfusion pressure and may thus improve coronary blood flow during external cardiac compressions.

Onset: < 5 minutes

Indications

Bradycardia **Cardiac Arrest Part B** **Hypotension/Shock (Non-Trauma) Part B**
Post ROSC **Bites and Envenomation** **Allergic Reaction/Anaphylaxis Part B**
Beta Blocker Poisoning/Overdose **Calcium Channel Blocker Poisoning/Overdose**
Pediatric Bradycardia **Pediatric Cardiac Arrest Part B**

Adult Dose

Bradycardia, Hypotension/Shock (Non-Trauma) Part B, Post ROSC, Bites and Envenomation, Allergic Reaction/Anaphylaxis Part B, Beta Blocker Poisoning/Overdose, Calcium Channel Blocker Poisoning/Overdose, Chronotropic medication "push dose epinephrine" Prepare 10 mcg/ml by adding: (1 ml) to 9 ml NS; administer 10 mcg (1 ml) every 1 - 2 minutes as needed
Cardiac Arrest: 1 mg IVP, IO every 3 – 5 minutes

Pediatric Dose

0.01 mg/kg ; (**0.1 ml/kg**) IVP, IO every 3 – 5 minutes
Maximum 1 mg (10 ml)

Additional Dosing

Push Dose Epinephrine
Prepare 10 mcg/ml by adding 1 ml of epinephrine 1:10,000 to 9 ml NS; administer 10 mcg (1ml) every 1 - 2 minutes as needed
0.5 mg (5 ml) Nebulized

Contra-indications

None in Cardiac Arrest, Known Hypersensitivity, Do not give to any patient who has repeatedly used an aerosol bronchodilator within the past 4 hours.

Adverse Reactions

Palpitations, Arrhythmias, Hypertension, Pulmonary Edema, Dyspnea, Nervousness

Precautions

When given to a patient that is stabilized on antidepressants, a hypertensive crisis may occur, Do not mix with any other drugs, Very light sensitive, do not use solutions that are discolored or those that have a precipitate, Massage site after injection to counteract possible vasoconstriction, Use with caution on patients with Epi-Pen usage (previous).

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Action: Non-barbiturate, hypnotic agent. No analgesia

Onset: 30 - 60 seconds
Duration: 30 - 60 minutes

Indications

Drug Assisted Intubation

Adult Dose

0.3 mg/kg IVP, IO SLOWLY (over 30 - 60 seconds)

Pediatric Dose

0.3 mg/kg IVP, IO SLOWLY (over 30 - 60 seconds) **Maximum 30 mg**

Contra-indications

Known hypersensitivity

Adverse Reactions

Transient Venous Pain, Myoclonus, Trismus (clenched jaw)

Cardiovascular: Hypertension, Hypotension, Tachycardia, Bradycardia, and Other Arrhythmias

Respiratory: Hyperventilation, Hypoventilation, Apnea for Short Duration, Laryngospasm, Hiccup and Snoring

Gastrointestinal: Nausea, Vomiting

Precautions

Not recommended in obstetrics

Contraindications

Indications

Adult Dose

Adverse Reactions

Precautions

Pediatric Dose

Medical Considerations

Advantages

Does not affect BP
Decreases intracerebral pressure
Minimal respiratory depression

Therapeutic Effects: A potent synthetic narcotic with properties similar to those of morphine but 50-100 times more potent with a considerably shorter duration. Produces fewer effects on blood pressure and respirations than morphine and also causes less nausea and vomiting.

Advanced EMT can Administer Medication (Pain control only)

Onset: Almost immediate.
Peak effect 3-5 minutes
Duration 30-60 minutes

Indications

Chest Pain (ACS/STEMI) **Adult Pain Control** **Crushing Trauma**
Pediatric Pain Control

Adult Dose

1 mcg/kg IVP, IO, IN every 3 – 5 minutes Maximum 100 mcg per dose
Maximum total dose 200 mcg
Post Intubation Sedation: 50 – 100 mcg every 5 - 10 min. Max. Total 200 mcg
Crushing Trauma: **1 mcg/kg** IVP, IO, IN Maximum 100 mcg
Repeat every 10 minutes at **0.5 mcg/kg** Maximum dose 50 mcg

Pediatric Dose

1 mcg/kg IN, IM, IVP (age greater than or equal to 2 years old)
Maximum 100 mcg

Contra-
indications

Known intolerance to drug.

Adverse
Reactions

Respiratory: Respiratory Depression, Apnea, Laryngospasm
Cardiovascular: Bradycardia, Hypertension, Hypotension
CNS: Dizziness, blurred vision
Gastrointestinal: Nausea & Vomiting
Other: Rigidity, Diaphoresis

Precautions

Use caution in patients with head injuries and elevated ICP. Use caution with bradycardia, COPD and decreased respiratory reserve patients. Also patients using narcotics. Fentanyl should be reduced in elderly and debilitated patients. Also, patients with elevated BP with or without pre-existing hypertension. Fentanyl in high doses (greater **2 - 3 mcg/kg**) can result in "stiff chest" with inability to ventilate patient. Stiff chest is treated with IV succinylcholine and intubation.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Use caution when administering Fentanyl to elderly and debilitated patients, or patients with limited pulmonary reserve.

Glucagon

Therapeutic Effects: Accelerates the breakdown of glycogen in the liver, causing an increase in blood glucose level. Relaxes the smooth muscle of the GI tract.

Advanced EMT can Administer Medication

Onset: Patient should respond within 15 minutes

Indications

Hypoglycemia/Hyperglycemia Beta Blocker Poisoning/Overdose
Calcium Channel Blocker Poisoning/Overdose
Pediatric Hypoglycemia/Hyperglycemia Pediatric Beta Blocker Poisoning/Overdose
Pediatric Calcium Channel Blocker Poisoning/Overdose

Adult Dose

Hypoglycemia: 1 mg IM, IN May repeat 1 mg as needed
Toxicology: 1 mg every 5 minutes IVP, IO (may require 6 mg to see clinical effects)

Pediatric Dose

Pediatric Hypoglycemia/Hyperglycemia: 1 mg IM, IN if ≥ 20 kg (or ≥ 5 yo) 0.5 mg IM, IN if < 20 kg (or < 5 yo).
Toxicology: 1 mg IVP (25-40 kg) or 0.5 mg patient less than (25 kg) every 5 minutes as necessary

Contra-Indications

Hypersensitivity, Hyperglycemia, allergies to beef or porcine proteins, Insulinoma, Patients with adrenal gland tumor

Adverse Reactions

Nausea, Vomiting

Precautions

Glucagon is of little help in patients with adrenal insufficiency. Administration of Glucagon should be followed by supplemental carbohydrates.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Do not mix with saline

Therapeutic Effects: Blocks the dopamine receptors in the brain that are responsible for mood and behavior. Has antiemetic properties.

Onset: 20 – 30 minutes IM

Indications

Agitated/Violent Patient-Part A
Pediatric Agitated/Violent Patient-Part A

Adult Dose

5 mg IVP, IO 5 - 10 minute onset of action, or 5 - 10 mg IM
 10 - 20 minute onset of action

Pediatric Dose

Age 6 - 14 years: 0.05 mg/kg IM to a Maximum of 3 mg

Contra-
indications

Hypersensitivity to the drug, Seizures, Hemodynamic instability

Adverse
Reactions

CNS: Extrapyramidal reactions, restlessness, anxiety, agitation, lethargy, fatigue, weakness, tremor, headache, confusion, vertigo, grand mal seizures
Cardiovascular: Tachycardia, ECG changes, hypotension
GI: Dry mouth, nausea & vomiting, diarrhea
Other: Blurred vision

Precautions

Patient with arrhythmia or seizures

Contraindications

Indications

Adult Dose

Adverse Reactions

Precautions

Pediatric Dose

Medical Considerations

None

Action
Anticoagulant

Onset:
20 - 60 minutes SQ, IV immediate.

Indications

Chest Pain (ACS/STEMI) - STEMI patients only

Adult Dose

60 units/kg IVP over 1 minute
Maximum: 4,000 Units

Pediatric Dose



Contra-Indications

Severe thrombocytopenia (the number of platelets is reduced-the most common cause of bleeding disorders), Uncontrollable active bleeding state.

Adverse Reactions

Hemorrhage, local irritation, hypersensitivity: some reactions to occur include; fever, chills, urticaria, asthma, rhinitis, headache, nausea & vomiting.

Precautions

Heparin resistance encountered in fever, thrombosis, infections, MI, cancer and post surgical patients. Increased risk to older patients and especially women is a higher incidence of bleeding and particularly women over 60 years of age. Pregnant & nursing mothers.

Contraindications

Indications

Adverse Reactions

Adult Dosage

Precautions

Pediatric Dosage

Medical Considerations

Patients over the age of 60 may require low dose.

Therapeutic Effects: A controlled substance that is a rapid acting anesthetic producing an anesthetic state characterized by profound analgesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal tone, cardiovascular and respiratory stimulation.

Onset: IV 30 seconds – 2 minutes
IM 3 – 4 minutes

Advanced EMT can Administer Medication

Indications

Agitated/Violent Patient Part B **Excited Delirium** **Adult Pain Control** **Crushing Trauma**
Pediatric Agitated/Violent Patient-Part B **Wound Care/Bleeding Control** **Cardioversion**

Adult Dose

Agitated/Violent Patient: Mild, Moderate Agitation: 2 mg/kg IM or 1 mg/kg IVP
Profound Agitation/ Excited Delirium: 4 mg/kg IM or 2 mg/kg IVP
Intubation Sedation: 2 mg/kg slow IVP (Max 200 mg) over one min. or 4 mg/kg IM (Max. 500 mg)
Excited Delirium: 4 mg/kg IM Maximum dose 400 mg
Pain Control: 0.1 - 0.3 mg/kg IVP, IO or IN
Wound Care/Bleeding Control: 1 mg/kg IVP, IO or 4 mg/kg IM

Pediatric Dose

(useful for excited delirium, immediate sedation for imminent threat to self or others) Age 14 or greater **(WITH MED CONTROL APPROVAL ONLY)**
1 mg/kg IVP to Maximum dose of 300 mg, or 3 mg/kg IM to Maximum dose of 300 mg

Contra-Indications

Not for use in patients with head injury or other neurogenic cause for intubation (increases intracranial pressure).
Those whom a significant elevation of blood pressure would constitute a serious hazard and in those who have shown hypersensitivity to the drug.

Adverse Reactions

Cardiovascular: BP and pulse rate are frequently elevated following administration. Hypotension and bradycardia have been observed. Arrhythmia has also occurred
Gastrointestinal: Nausea / vomiting; increased salivation
Neurological: Enhanced skeletal muscle tone may be manifested by tonic and clonic movements sometimes resembling seizures.
Respiratory: Although respiration is frequently stimulated, severe depression of the respiration or apnea may occur following rapid IV administration of high doses. Laryngospasms and other forms of airway obstruction have occurred.

Precautions

Resuscitative equipment should be ready for use. IV dose should be administered over 1 minute. More rapid administration may result in respiratory depression or apnea and enhanced pressor response. Use caution in the chronic alcoholic and the acutely alcohol-intoxicated patient.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Monitor vital signs frequently. Use caution with elderly and pediatric patients and use low end of dosing range.

Therapeutic Effects: Non-steroidal anti-inflammatory agent. Unlike narcotics, which act on the central nervous system, Toradol is considered a peripherally acting analgesic. Consequently, it does not have the sedative properties of the narcotics.

Onset: 10 minutes
Peak effect: 1 – 2 hours

Indications

Abdominal Pain **Adult Pain Control**
Pediatric Pain Control

Adult Dose

30 mg IVP or 60 mg IM

Pediatric Dose

0.5 mg/kg IVP Maximum dose IVP: 15 mg
0.5 mg/kg or IM Maximum dose IM: 30 mg

Contra-
indications

Hypersensitivity, Bleeding or blood clotting disorder, bleeding in brain, closed head injury, GI bleeding, pregnancy, severe kidney disease, or ulcers. Renal patients.
Do Not Use if patient has allergy to aspirin NSAIDS

Adverse
Reactions

Bleeding, nausea & vomiting

Precautions

GI irritation or hemorrhage

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Action
Antihypertensive

Onset: 30 - 90 seconds

Indications

Stroke/TIA **Obstetric Emergencies-Eclampsia**

Adult Dose

10 – 20 mg SLOW (over 2 minutes) IVP
With Medical Control Approval ONLY

Pediatric Dose



Contraindications

Bronchial asthma, overt cardiac failure, greater than first degree block, cardiogenic shock, severe bradycardia, other conditions associated with severe and prolonged hypotension, and in patients with a history of hypersensitivity. Beta-blockers, even those with apparent cardioselectivity, should not be used in patients with a history of obstructive airway disease, including asthma.

Adverse Reactions

Cardiovascular: Ventricular arrhythmia
CNS & Peripheral System: Dizziness, tingling of the scalp/skin, hypoesthesia (numbness) and vertigo
Gastrointestinal: Nausea, vomiting, dyspepsia (epigastric discomfort)
Metabolic Disorders: Transient increases in blood urea nitrogen and serum creatinine levels occurred, associated with drops in BP, generally in patients with prior renal insufficiency
Psychiatric: Somnolence/yawning
Respiratory: Wheezing

Precautions

Impaired hepatic function may diminish metabolism of labetalol. Following coronary artery bypass surgery in one uncontrolled study, patients with low cardiac indices and elevated systemic vascular resistance following IV injection experienced significant declines in cardiac output with little change in systemic vascular resistance. High dose labetalol, several patients experienced hypotension and bradycardia.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: Na ion channel inhibiting nerve impulses & conduction (local anesthetic)

Onset: 30 - 90 seconds

Advanced EMT can Administer Medication

Indications

Intraosseous Insertion

Adult Dose

40 mg IO over 2 minutes

Pediatric Dose

0.5 mg/kg IO Maximum 40 mg over 2 minutes

Contra-
indications

Bradycardia, 2nd or 3rd degree heart block, Known hypersensitivity, Stokes-Adams syndrome, WPW

Adverse
Reactions

Drowsiness, Vomiting, Confusion, Seizures, Hypotension, Bradycardia, Slurred speech, Tremors, Restlessness, euphoria, Hypotension, Tinnitus, Blurred, or double vision

Precautions

Contraindicated if allergic to other amide type anesthetics such as Nupercaine. Caution in patients with greater than second degree heart block. DC drug if signs of toxicity appear (i.e.: dizziness, convulsions or confusion. Convulsions may be the first sign of toxicity). Use in caution in patients with digitalis toxicity.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Observe closely for drug toxicity
Signs include:
dizziness,
confusion,
delirium, seizures

Therapeutic Effects: An electrolyte that has antiarrhythmic, anticonvulsant, and antidysrhythmic properties, that also relaxes bronchial smooth muscle and depresses the central nervous system.

Onset: immediate
Lasts about 30 minutes

Indications

Cardiac Arrest Part C, **Tachycardia w/Pulse-Wide Complex**, **Seizures**
Obstetric Emergencies-Eclampsia, **Asthma/COPD/Reactive Airway**
Pediatric Cardiac Arrest Part C

Adult Dose

Cardiac: 2 gm IVP, IO over 2 minutes
Seizures (third trimester pregnancy): 4 gm IVP over 5 minutes
Respiratory: 40 mg/kg IVP Maximum 2 gm over 15 – 30 minutes

Pediatric Dose

25 - 50 mg/kg IVP, IO Dilute to 10% Maximum 2 grams
(take 2 ml's of a 50% solution, then add 8 ml's NS which results in a 10 ml volume
10% dilution of a 1G) 100 mg/ml

Contra-
indications

Heart block or myocardial damage, Hypertension, Caution with renal impairment.
Caution: Reduce dosing with concurrent narcotics and/or hypnotics

Adverse
Reactions

Respiratory depression, Hypothermia,
Circulatory collapse, Respiratory paralysis, Hypotension, Diaphoresis, Facial flushing,
Sweating, Depressed reflexes

Precautions

Use caution on renal impairment patients because drug is solely removed by the kidneys. Clinical indications of a safe dosage regimen include the presence of the patellar reflex (knee jerk) and absence of respiratory depression. When barbiturates, narcotics, or other hypnotics are given in conjunction with Magnesium, their dosage should be adjusted because of the additive central depressive effects. Use caution in patients receiving digitalis.
Stop infusion if hypotension develops, difficulty breathing, decreased deep tendon reflexes or paralysis.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Not compatible with Sodium Bicarbonate

Onset: 1 – 2 hours

Therapeutic Effects: While the exact mechanism of corticosteroid activity is unknown, these agents decrease inflammatory and immune responses by stabilizing membranes within white blood cells responding to a site of infection, injury, irritation or inflammation.

Indications

Hypotension/Shock (Non-Trauma) Part A Allergic Reaction/Anaphylaxis Part A
Asthma/COPD/Reactive Airway
Pediatric Allergic Reaction/Anaphylaxis Part A
Pediatric Respiratory Distress (Lower Airway)

Adult Dose

Hypotension (if history of adrenal insufficiency): 2 mg/kg IVP Maximum 125 mg
 Respiratory: 125 mg IVP, IM

Pediatric Dose

Respiratory: 2 mg/kg IVP, IM Maximum 125 mg

Contra-indications

There are no contraindications, precautions or side effects associated with a single dose used in emergencies.

Adverse Reactions

Fluid & Electrolyte Disturbances: CHF in susceptible patients, HTN
Musculoskeletal: Weakness
Neurological: Convulsions, headache, vertigo
Metabolic: Nausea & vomiting
Cardiovascular: Arrhythmias, hypotension **Skin:** Sweating

Precautions

Nonspecific ulcerative colitis, impending perforation or abscess or other infection. Peptic ulcer, renal insufficiency, hypertension, osteoporosis, myasthenia gravis (weakness of muscles)

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: A short acting benzodiazepine CNS depressant.

Advanced EMT can Administer Medication

Onset: IM 15 minutes
Peak sedation, 30-60 minutes

Indications

Agitated/Violent Patient Part B **Excited Delirium** **Hyperthermia/Heat Exposure**
Seizures **Obstetric Emergencies-Eclampsia** **Beta Blocker Poisoning/Overdose**
Cyanide Exposure **Opioid Poisoning/Overdose**
Calcium Channel Blocker Poisoning/Overdose **Overdose/Poisoning/Toxic Ingestion**
Pediatric Agitated/Violent Patient-Part B **Pediatric Hyperthermia/Heat Exposure**
Pediatric Seizure **Pediatric Beta Blocker Poisoning/Overdose**
Pediatric Calcium Channel Blocker Poisoning/Overdose
Pediatric Opioid Poisoning/Overdose **Pediatric Cyanide Exposure**
Pediatric Overdose/Poisoning/Toxic Ingestion **Cardioversion** **External Pacemaker**

Adult Dose

Behavioral: 2.5 mg IVP, IO, IM, IN see specific page for detailed information
Seizures: 0.1 mg/kg IM, IN Maximum 10 mg, 0.1 mg/kg IVP Maximum 5 mg
Intubation Sedation: 0.3 mg/kg IVP up to Max dose 30 mg
Toxicology: 0.1 mg/kg in 2 mg increments Maximum 5 mg single dose (reduce by 50% for patients 69 years or older) **External Pacemaker:** 2 – 4 mg IVP, IM

Pediatric Dose

Pediatric Behavioral: 0.05 mg/kg IV to Maximum dose of 3 mg, or 0.1 mg/kg IM to Maximum dose of 3 mg, or 0.2 mg/kg IN to a Maximum dose of 5 mg
Pediatric Heat Exposure: 0.1 mg/kg IV or 0.2 mg/kg IN, IM Maximum single dose 1 mg; Note: a 5 mg/ml concentration is recommended for IN, IM administration)
Pediatric Seizure: 0.1 mg/kg IM, IN Maximum 10 mg, 0.1 mg/kg IVP Maximum 5 mg
Pediatric Toxicology: 0.1 mg/kg IVP in 2 mg increments Maximum 5 mg single dose or 0.2 mg/kg Maximum IN dose of 4 mg

Contra-
indications

Hypersensitivity, Pregnant, Nursing mothers, Renal failure, Shock, Glaucoma, Acute alcoholic intoxication with depressed vital signs

Adverse
Reactions

Apnea, Respiratory depression, Hypoxia, Decreased tidal volume, Fluctuations in vital signs, Dysrhythmias, Hypotension if pushed to fast, Euphoria, Confusion, Nausea, Vomiting, Headache, Hiccups

Precautions

Not recommended in pregnancy; refer to Magnesium Sulfate for Eclampsia.
Not given as fast bolus.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Consider reducing the dose on elderly & debilitated patients. These patients may take longer to recover from drug.
Monitor Respiratory status.

Therapeutic Effects: Binds to opiate receptors in the CNS & decreases transmission of pain

Advanced EMT can Administer Medication

Onset: 2 - 3 minutes

Indications

Adult Pain Control **Crushing Trauma**
Pediatric Pain Control

Adult Dose

Trauma: **0.1 mg/kg** IVP, IO Maximum 10 mg Repeat doses **0.05 mg/kg** Maximum 5 mg
Total Maximum 20 mg

Pediatric Dose

0.05 mg/kg IVP Maximum 10 mg IM (per medical control order only)

Contra-indications

Hypersensitivity, Significant hypotension, Acute abdominal conditions, Multisystem trauma, Head injury, Convulsive disorders, Hypovolemia, Asthma, Pregnancy

Adverse Reactions

Major hazards are Respiratory Depression and lesser degree circulatory depression. Respiratory Arrest, Shock and Cardiac Arrest have occurred, particularly with overdose or rapid IV administration.

Cardiovascular: Tachycardia, Bradycardia, Palpitation, Faintness, Syncope, and Orthostatic Hypotension

CNS: Euphoria, Dysphasia, Weakness, Headache, Agitation, Tremor, Uncoordinated muscle movements, Hallucinations and Disorientation, visual Disturbances

Allergic: Reactions to Opiates, Urticaria, Anaphylactic Reactions

Other: Face Sweating, Local Tissue Irritation and pain

Precautions

Systolic BP at least 90 mmHg (may need to manage with fluid bolus). Watch for respiratory depression and be prepared to support ventilations. Narcan® should be readily available when administering Morphine.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Administer slowly to avoid nausea & vomiting.

Antidote: Administer Narcan 2 mg IVP, to reverse effects of morphine if necessary.

Use with caution with the elderly.

Therapeutic Effects: Specific antidote for narcotic agents. Reverses the actions of all narcotic drugs including, heroin, morphine, methadone, codeine, demerol, dilaudid, darvon, paregoric, and percodan.

Advanced EMT can Administer Medication

**EMT can Administer Medication.
(auto-injector or IN only)**

Onset: 2 minutes.

Indications

Altered Mental Status **Pediatric Neonatal Care** **Opioid Poisoning/Overdose**
Pediatric Altered Mental Status **Pediatric Opioid Poisoning/Overdose**

Contraindications

Indications

Adult Dose

0.4 – 2 mg IVP, IO, ETT, IN May repeat if necessary
See: **Mucosal Atomizer Device (MAD)** for administration

Adverse Reactions

Adult Dose

Pediatric Dose

0.1 mg/kg IVP, IO, ETT, IN Maximum 2 mg
Neonatal: **0.2 mg/kg** IN Maximum 2 mg

Precautions

Pediatric Dose

Contra-
indications

Known Hypersensitivity

Adverse
Reactions

Increased BP, Tachycardia, Projectile vomiting, Tremors, Seizures (possibly an opiate addiction withdrawal symptom), Dysrhythmias, Cardiac arrest

Precautions

Nausea, Vomiting, Sweating, Tachycardia, Increased Blood Pressure, Tremulousness, Seizures, and Cardiac Arrest

Medical Considerations

Short half life. Effects last 1-4 hours, patients should be watched closely. Narcotic effect will often outlast the antagonist actions. Subsequent IM dose will prolong IV effects.

Nitroglycerin

Therapeutic Effects: The nprimary pharmacologic effect of nitroglycerin and related drugs is to relax smooth muscle and the effects of nitroglycerin on the cardiovascular system are chiefly due to relaxation of vascular smooth muscle (hence vasodilation).

Advanced EMT can Administer Medication (SL only)

EMT can Assist if patient prescribed medication.

Onset: 2 minutes

Indications

Chest Pain (ACS/STEMI) **Renal Patient** **Pulmonary Edema/CHF**

Adult Dose

Chest Pain (ACS) 0.4 mg SL Every 3 – 5 minutes as long as SBP 100 mmHg or greater
Renal Patient, Pulmonary Edema: 0.4 – 0.8 mg SL Every 5 minutes and/or CPAP for Pulmonary Edema

Pediatric Dose



Contraindications

Known Hypersensitivity, Pericardial tamponade, Restrictive Cardiomyopathy, Constrictive pericarditis Do not administer Nitroglycerin if the following medications were taken, until after hours stated:

Drug	Hours
Cialis	48
Levitra	24
Viagra	24+

Adverse Reactions

Headache, Orthostatic hypotension, Dizziness, Weakness, Palpitations, Nausea & vomiting

Precautions

Contraindicated in head trauma.
 Use caution in any patient whom is intoxicated.
 Be sure to remove any transdermal system before defibrillation.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Check for transdermal patch prior to initiating spray/tablet.

Therapeutic Effects:

Nonpyrogenic solution for fluid and electrolyte replacement

Advanced EMT can Administer Medication

Indications

Adult IV/IO Pediatric IV/IO Peripheral IV

Adult Dose

KVO
Fluid Bolus: 200 - 500 ml

Pediatric Dose

KVO
Fluid Bolus: 20 ml/kg

Contra-
indications

None known

Adverse
Reactions

Reactions which may occur because of the solution or the technique of administration include febrile response, infection at the site of injection, venous thrombosis or phlebitis extending from the site of injection, extravasation, and hypervolemia. If adverse reaction does occur, discontinue infusion.

Precautions

Geriatric use: In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or drug therapy. Do not administer unless solution is clear and seal is intact.

Contraindications

Indications

Adult Dose

Adverse Reactions

Precautions

Pediatric Dose

Medical Considerations

None

Ondansetron (Zofran)

Therapeutic Effects: A selective 5-HT₃ receptor antagonist. While its mechanism of action has not been fully characterized, Ondansetron is not a dopamine-receptor antagonist. Serotonin receptors of the 5-HT₃ type are present both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of the postrema.

Onset: Rapid
Peak effect: 15 – 30 minutes

Advanced EMT can Administer Medication PO

Indications

Excited Delirium **Abdominal Pain** **Nausea/Vomiting**
Stimulant Poisoning/Overdose
Pediatric Abdominal Pain **Pediatric Nausea/Vomiting**

Adult Dose

Behavioral: 4 mg IVP, IO, IM May repeat x 1 dose in 10 minutes
Gastrointestinal: 4 mg IVP, IM or 4 mg, PO

Pediatric Dose

> 30 kg (66 lbs.) – 4 mg IV or 4 mg, PO
 < 30 kg (66 lbs.) but > 15 kg – 4 mg IV or 4 mg (one 4 mg ODT) PO
 < 15 kg (33 lbs.) but > 8 kg – 2 mg IV or 2 mg (1/2 a 4 mg ODT) PO
 < 8 kg (17.6 lbs.) – N/A May repeat x 1 dose in 10 minutes

Contra-indications

Hypersensitivity

Adverse Reactions

Cardiovascular: Angina, Electrocardiographic Alterations, Hypotension, Tachycardia, Syncope, Palpitations
Neurological: Extrapyrimal reactions, Grand Mal Seizure, Dizziness, Lightheadness,
General: Flushing
Local Reactions: Pain, Redness, Burning at site of injection
Other: Hypokalemia, Hiccups

Precautions

Not a drug that stimulates gastric or intestinal peristalsis. Transient ECG changes including, QT interval prolongation.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Oral Glucose

Therapeutic Effects:
Natural sugar

EMT can Administer Medication.

Onset: 1 - 2 minutes

Indications

Hypoglycemia/Hyperglycemia
Pediatric Hypoglycemia/Hyperglycemia

Adult Dose

Glucose 15 g (entire contents of 37.5 gram tube) *Buccal*
If no response within 15 minutes may repeat same dose

Pediatric Dose

0.5 gm/kg 1st dose Maximum 15 gm may repeat x1

Contra-
indications

Do not administer to unconscious person or unable to swallow

Adverse
Reactions



Precautions



Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Oxygen

Therapeutic Effects: Reverses the deleterious effects of hypoxemia on the brain, heart and other vital organs.

EMT can Administer Medication.

Indications

Adult Airway Management
Pediatric Airway Management

Adult Dose

2 - 6 LPM via nasal cannula
10 - 15 LPM via non-rebreather mask
15 LPM or greater via BVM / ET

Pediatric Dose

2 - 6 LPM via nasal cannula
10 - 15 LPM via non-rebreather mask
15 LPM or greater via BVM / ET

Contraindications

None
May depress respirations in rare patients with chronic obstructive pulmonary disease. This is not a contraindication to its use, but simply means that such patients must be watched closely and assisted to breathe if the respiratory rate declines.

Adverse Reactions

Toxicity, depressed hypercarbic drive (Respiratory depression with COPD patients)

Precautions



Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: A direct acting sympathomimetic for nasal vessel constriction.

Indications

Epistaxis

Adult Dose

1 - 2 sprays to effected Nostril
Give the patient the bottle to keep after administration

Pediatric Dose



Contra- indications



Adverse Reactions

Presence of uncontrolled hypertension.

Precautions

Individual nasal spray containers. NOT TO BE REUSED!

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

Action: Antihistaminic, Sedative, Anti-motion-sickness

Onset: 3 - 5 minutes

Indications

Nausea/Vomiting

Adult Dose

12.5 - 25 mg IV, IM Maximum Dose 50 mg

Pediatric Dose



Contraindications

Hypersensitivity, Comatose states and in patients that have demonstrated idiosyncratic reaction. Intra-arterial injection will result in possibility of gangrene. Should not be given subcutaneous. Seizure, Hypotension, Altered Mental Status, Asthma, Patient receiving Epinephrine.

Adverse Reactions

Cardiovascular: Increased or Decreased Blood Pressure, Tachycardia, Bradycardia, Faintness
CNS: Drowsiness, Sedation, Blurred Vision, Dizziness, Confusion, Disorientation, Extrapryamidal Symptoms, Fatigue, Nervousness, Insomnia, Tremors, Convulsions, Excitation, Catatonic-like States, Hysteria, Hallucinations
Gastrointestinal: Dry Mouth, Nausea, Vomiting
Respiratory: Asthma, Nasal Stuffiness, Respiratory Depression, Apnea
Other: Angioneurotic Edema, Neuroleptic Malignant Syndrome (potentially fatal)

Precautions

If active wheezing, do not use. Be sure IV is patent and no signs of infiltration. Can cause phlebitis.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Use cautiously when patient has allergy to sulfa.

Dilute drug with NS or give IVP (slowly) with IV wide open.

If extrapyramidal side effects develop, administer Benadryl 25 mg.

Action: Bronchodilator

Onset: Lasts 90 – 120 minutes

Indications

Adult Dose

0.5 mL of 2.25% in 3 mL saline via aerosol
Nebulized with 6 lpm oxygen

Pediatric Dose

0.5 ml of 2.25% in 3 ml saline via aerosol
Nebulized with 6 lpm oxygen

Contra-
indications

Epiglottitis, Hypersensitivity

Adverse
Reactions

In excessive dosage, epinephrine may cause bronchial edema and inflammation, palpitation, precordial ache or anginal pain, tremor, nervousness, restlessness, sleeplessness, dizziness, headache, nausea and sweating.

Precautions

Vital signs should be constantly monitored. Do not use concurrently with other bronchodilators

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Will increase heart rate.

Therapeutic Effects: By Neutralizing excess acid, helps return the blood towards a physiologic pH, in which normal metabolic processes and sympathomimetic agents (such as epinephrine) work more effectively.

Onset: Immediate

Indications

Cardiac Arrest Part C **Renal Patient** **Crushing Trauma**
Pediatric Cardiac Arrest Part C

Adult Dose

Cardiac: 1 mEq/kg IVP, IO
Renal Patient: 1 amp (50 mEq) IVP, IO over 10 minutes
Crushing Trauma: Prior to extrication: 1 mEq/kg IVP, IO Bolus (Minimum 50 mEq)
 1 amp (50 mEq) to each liter NS infuse at 1,000 ml per hour (maintenance infusion)
 Just prior to extrication: 1 mEq/kg IVP, IO Bolus (Minimum 50 mEq)
 Upon extrication: return to maintenance infusion
Tricyclic Overdose: 1 mEq/kg IVP, IO

Pediatric Dose

Cardiac Arrest: 1 mEq/kg IVP, IO
 Repeat with 0.5 mEq/kg every 10 minutes if cardiac arrest
Tricyclic Overdose: 1 mEq/kg IVP, IO

Contra-
indications

Hypertension, Convulsions, CHF, and other situations where administration of sodium can be dangerous

Adverse
Reactions

Hypernatremia, alkalosis, hypokalemia

Precautions

Over dosage and alkalosis should be avoided, may cause vascular irritation or sloughing if given extravascularly, Avoid scalp vein use. Risks of over dosage and alkalosis should be avoided. Use caution in patient with CHF or other edematous or sodium-retaining states

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

Flush IV tubing before and after administration. If potassium falls too low, the heart may become irritable, especially if the patient is taking a digitalis preparation.

Therapeutic Effects: Provides local anesthetic to eyes

Indications

Topical Chemical Burns; **Eye Injury-continued**

Adult Dose

2 drops in affected eye

Pediatric Dose

2 drops in affected eye

Contra-
indications

Penetrating injury to eye or extrusion of scleral contents

Adverse Reactions

CNS: Dizziness, Drowsiness, sweating, muscle twitching, trembling
Cardiovascular: irregular heart rate
Respiratory: Shortness of breath
Gastrointestinal: Nausea & Vomiting
General: Unusual excitement, Nervousness, Restlessness
Less common occurrences: Burning, Stinging, Redness
Rare occurrences: Itching, Pain, Swelling of eye or eyelid, watering of eyes

Precautions

Do not rub or wipe eye until anesthetic has worn off and feeling in eye returns. To do so may cause injury or damage to the eye.

Contraindications

Indications

Adult Dose

Adverse Reactions

Pediatric Dose

Precautions

Medical Considerations

None

Action: Antifibrinolytic hemostatic

Onset: 3 hour half life.

Indications

Adult Trauma Management

Adult Dose

1 gram mixed in 100 ml NS connected to 10 gtts/ml tubing infused over 10 minutes (app 1½ drop/sec)

Pediatric Dose

15 mg/kg in 100 ml NS connected to 10 gtts/ml tubing infused over 10 minutes Maximum 1 gram

Contra- indications

Non-hemorrhagic shock, Non-traumatic shock, Isolated head injury, known allergy to TXA, > 24 weeks gestation – call medical control for advice

Adverse Reactions

None

Precautions

Monitor for symptoms of severe allergic reaction and changes in vision

Medical Considerations:

TXA has not been shown to cause significant increase in DVT, PE, MI or CVA.
TXA inhibits the breakdown of fibrin, and thus helps prevent clots from dissolving.
TXA is most helpful with internal bleeding that cannot be otherwise controlled and best when given shortly after injury (ideally < 1hr)

Contraindications

Indications

Adult Dose

Adverse Reactions

Precautions

Pediatric Dose

Medical Considerations

None

Therapeutic Effects: Moderately inhibits reuptake of norepinephrine and serotonin; has alpha-blocking and antihistaminic activity

Onset: 10 minutes

Indications

Agitated/Violent Patient-Part A

Adult Dose

10 - 20 mg IM Needs constituted with sterile water

Pediatric Dose



Contra-indications

Patients with a known history of QT prolongation (including congenital long QT syndrome)
 Patients with recent acute myocardial infarction
 Patients with uncompensated heart failure

Adverse Reactions

Cardiovascular: tachycardia, hypertension, postural hypotension
Digestive: anorexia, vomiting
Musculoskeletal: Myalgia
CNS: agitation, extrapyramidal syndrome, tremor, dystonia, hypertonia, dyskinesia, hostility, twitching, paresthesia, confusion, vertigo, hypokinesia, hyperkinesia, abnormal gait, oculogyric crisis, hypesthesia, ataxia, amnesia, cogwheel rigidity, delirium, hypotonia, akinesia, dysarthria, withdrawal syndrome, buccoglossal syndrome, choreoathetosis, diplopia, incoordination, neuropathy
Respiratory: Dyspnea
Whole Body: abdominal pain, flu syndrome, fever, accidental fall, face edema, chills, photosensitivity reaction, flank pain, hypothermia

Precautions

Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at an increased risk of death.

Contraindications

Indications

Adverse Reactions

Adult Dose

Precautions

Pediatric Dose

Medical Considerations

None

I. ACTIONS OF DRUGS

- A. Local Effects
- B. Systemic Effects

II. EFFECTS DEPENDS UPON

- A. Age of Patient
- B. Condition of Patient
- C. Dosage
- D. Route of Administration

III. ROUTE OF ADMINISTRATION

- A. Intravenous (IV)
 - * Most Rapidly Effective
 - * Most Dangerous
 - * Give SLOWLY Through an Established IV Line
- B. Intramuscular (IM)
 - * Takes Longer to Act
 - * Longer Duration of Action
 - * Deltoid or Gluteus Maximus Site
 - * Absorption VERY Dependent on Blood Flow
- C. Subcutaneous (SQ)
 - * Slower and More Prolonged Absorption
 - * Under Skin of Upper Arms, Thigh, Abdomen
- D. Inhalation
 - * Bronchodilators
 - * Steroids
- E. Endotracheal
 - * Epinephrine, Atropine, Lidocaine, Narcan
 - * Dilute Usual IV Dose with 10cc of Sterile Water
- F. Sublingual (SL)
 - * Rapid Absorption
- G. Oral
 - * Ipecac
 - * Charcoal
- H. Rectal
 - * Rapid but Unpredictable Absorption
- I. Intracardiac
 - * Dangerous
 - * No Advantage Over IV or Endotracheal Routes
 - * Dilute Usual IV Dose with 10cc of Sterile Water

IV. RATES OF ABSORPTION

- A. "Directly Related to Route of Administration"
 - * IV -- Fastest
 - * IM
 - * SQ
 - * Oral -- Slowest

IV. ELIMINATION

- A. Many Methods
- B. Usually Metabolized by the Liver
- C. Eliminated by the Kidneys, Lungs, Skin

IV. TERMS

- A. Indications - Conditions Drugs Used For
- B. Contraindications - Conditions Drugs Not Used For
- C. Depressants - Lessens / Decreases Activity
- D. Stimulant - Increases Activity
- E. Physiologic Action - Action From Normal Body Amounts of Drug
- F. Therapeutic Action - Beneficial Action Expected
- G. Untoward Reaction - Harmful Side Effect
- H. Irritation - Damage to Tissue
- I. Antagonism - Opposition Between Effects of Drugs
- J. Cumulative Action - Increased Action After Several Doses
- K. Tolerance - Decreased Effects after Repeated Doses
- L. Synergism - Combined Effects Greater Than Sum of Parts
- M. Potentiation - Enhancement of One Drug by Another
- N. Habituation - Drug Necessary for Feeling of "Well Being"
- O. Idiosyncrasy - Unexpected, Abnormal Response to a Drug
- P. Hypersensitivity - Exaggerated Response, Allergy

VII. AUTONOMIC NERVOUS SYSTEM Controls Automatic or Involuntary Actions

- A. Parasympathetic - Controls Vegetative Functions
- B. Sympathetic - "Flight or Fight"

VIII. PARASYMPATHETIC NERVOUS SYSTEM

- A. Mediated by vagus nerve
- B. Acetylcholine is transmitter (cholinergic)
- C. Atropine is Acetylcholine Blocker

IX. SYMPATHETIC NERVOUS SYSTEM

- A. Mediated by Nerves from Sympathetic Chain
- B. Norepinephrine is Transmitter (Adrenergic)
- C. Epinephrine is Released from Adrenals

X. SYMPATHETIC RECEPTORS

- A. Alpha (a)
- B. Beta (b)

XI. COMMON SYMPATHETIC AGENTS

- A. Isoproterenol (Isuprel) - pure BETA
- B. Epinephrine (Adrenalin) - predominately BETA
- C. Dobutamine (Dobutrex) - predominately BETA, slight ALPHA
- D. Norepinephrine (Levophed) - predominately ALPHA
- E. Dopamine (Intropin) - BETA at low dose: ALPHA at high dose
- F. Metaraminol (Aramine) - predominately ALPHA
- G. Phenylephrine (Neo-Synephrine) - pure ALPHA

VII. SYMPATHETIC BLOCKERS

- A. Propranolol (Inderal) - BETA BLOCKER

VIII. DRUG ADMINISTRATION

Appropriate:

1. Indication
2. Order
3. Dose
4. Observation
5. Dilution
6. Route
7. Rate

Control of a medical emergency scene should be the responsibility of the individual in attendance who is most appropriately trained and knowledgeable in providing prehospital emergency stabilization and transport. When an EMS unit is requested and dispatched to the scene of an emergency, a doctor/patient relationship has been established between the patient and the physician providing medical direction for the EMS unit. Where on-line medical direction exists, treatment and transport of the patient are the ultimate responsibility of the on-line physician. Where on-line medical direction does not exist, treatment and transport of the patient is the ultimate responsibility of the off-line physician or physician committee.

A request for an air ambulance should be made by adequately trained pre-hospital care providers (either BLS or ALS).

- A. Assess patient and/or scene.
- B. Institute appropriate treatment and/or extrication (follow Trauma or Medical protocols).
- C. Contact appropriate Aeromedical transport.

SUMMONING AEROMEDICAL TRANSPORT BEFORE NOTIFICATION OF MEDICAL CONTROL

The following circumstances would lend themselves well to helicopter evacuation. Calling the air ambulance should be considered, in the interest of time,

1. Suspected serious trauma with any the following conditions to a patient who will require an extrication time of longer than 15-20 minutes: Unsecured airway, unconsciousness, hypotension with tachycardia, or unable to obtain venous access.
2. Serious injury or illness in a patient who is not easily accessible to land vehicles, but where an adequate clearing for helicopter landing is nearby.
3. Scenes of numerous seriously-injured patients.

EMS UNIT HAS ON-LINE MEDICAL DIRECTION AND THE AEROMEDICAL TEAM HAS A PHYSICIAN PRESENT:

- A. Until the patient becomes the full responsibility of the flight crew, the on-line physician is responsible. If there is any disagreement between the flight physician and the on-line physician, the EMS personnel must only take orders from the on-line physician and place the flight physician in radio or telephone contact with the on-line physician.
- B. Once care of the patient is turned over to the Aeromedical team, patient care responsibility rests with the flight physician.
- C. The receiving hospital should be determined in consultation between the on-line physician and the flight physician.

- I. Policy
 - A. There is a chance that in the course of providing prehospital emergency care, a patient may have a concealed weapon (i.e. gun or knife) either on their person or within the vehicle in which they are located.
 - B. Personnel safety takes precedence at all times.
 1. Handguns are safe if they are handled in the proper manner.
 2. While handling all guns, keep fingers away from trigger area and keep muzzle of weapon pointing away from everyone.
 3. **Do not** attempt to unload the handgun.
 - C. If at any time emergency responders feel threatened in anyway, leave the scene immediately and notify law enforcement. Do not return to the scene until law enforcement have cleared the scene and declared it safe.
 - D. Any EMS personnel that are called to care for a patient who possesses a handgun will inform the individual that the handgun will be secured in a gun evidence box and/or turned over to law enforcement personnel. The weapon is not to remain with the patient.
 1. Advise the patient that concealed weapons are not permitted in the back of the ambulance or on hospital property.
 - E. If the patient refuses to comply with the handing of the gun over to EMS, EMS personnel are to contact law enforcement personnel immediately and, unless safety is threatened, continue to care for the patient until law enforcement arrives.
 - F. If law enforcement is not on scene by the time the patient is to be transported, the handgun will be transported with the patient, sealed in the handgun evidence box, and will be received at the hospital per the hospital's procedure.
- II. Procedure
 - A. Every attempt should be made to avoid transporting the weapon in the ambulance. If law enforcement is on scene, every attempt should be made to have the officer secure and take custody of the weapon.
 - B. Place the handgun inside the Beaverson Gun Box with the muzzle pointing towards the writing on the box.
 - C. Seal the box with tape and sign your name on the tape to indicate who sealed the box.
 - D. Place the box in a safe area on the ambulance, keeping in mind where the muzzle is pointing.
 1. Use an outside compartment if one is available.
 - E. When calling into the Emergency Department with the patient information, advise them that you are transporting a patient with a secured handgun. Request that security personnel meet you upon your arrival at the ambulance.
 - F. Upon arrival at the Emergency Department:
 1. While keeping in mind the direction of the muzzle, give the box to the Security Guard for him/her to secure.
 - G. If the patient is to be flown from the scene, contact law enforcement to secure the handgun.

- A. When a DOA is encountered, the squad members should avoid disturbing the scene or the body as much as possible, unless it is necessary to do so in order to care for and assist other victims. Once it is determined that the victim is in fact dead, the squad members should move as rapidly as possible to transfer responsibility or management of the scene to the police department and/or coroner's office. It is the squad member's responsibility to notify the coroner's office directly or to ensure that the coroner's office has been notified by a police officer on the scene.
- B. A determination that the victim is dead rests with the squad members. Any of the following may be used as guidelines to support the determination that a victim is deceased:
1. There is an injury, which is incompatible with life (i.e., Decapitated, or burned beyond recognition).
 2. The victim shows signs of decomposition, rigor mortis, or extremely dependent lividity.
 3. The patient has experienced an unwitnessed cardiac arrest, has a history of an absence of vital signs for greater than 20 minutes, and is found in asystole, not secondary to hypothermia or drowning.
 - a) In hypothermic patients with a downtime of more than 30 minutes.
 - b) In drowning if recovered in more than 2 hours for icy water, more than 20 minutes for all other drowning.
 4. If there are valid DNR (do not resuscitate) orders, see DNR protocol.
 5. If the patient has a history of terminal disease, the family refuses resuscitation and permission to pronounce the patient dead is given by medical control.
- C. **Medical Control should be consulted on all potential DOA's if needed for extenuating circumstances**
- D. You do not need to notify the Coroner if the patient is a Hospice Patient. Hospice personnel will take responsibility for proper notifications.

Caution: if any doubt exists that the victim is dead at the time of arrival of the squad, resuscitative measures should be instituted immediately. Whenever resuscitative measures are instituted, they must be continued until arrival at a hospital or until a physician has pronounced the victim dead or a valid DNR is produced, or criteria is met to terminate resuscitation efforts. (See appropriate protocol).

Go to: **Natural Death Form** on next page for EMS review.

Wayne County Coroner**Suspected Natural Death form**

Name: _____ DOB: _____ Age: _____

Address: _____

Where victim was found: _____

Anything unusual: _____

Who found: _____

Address: _____

Relationship to victim: _____ Phone: _____

Next of Kin: _____ Phone: _____

Address: _____

Victim's Doctor: _____ Phone: _____

Smoker: Yes / No, if yes, how often: _____

Drinker: Yes / No, if yes, how often: _____

Known Medical Conditions: _____

_____**Prescription Medications: Yes / No**

Name of medicine: _____ Date filled: _____ Should have: _____ Do have: _____

Name of medicine: _____ Date filled: _____ Should have: _____ Do have: _____

Name of medicine: _____ Date filled: _____ Should have: _____ Do have: _____

Name of medicine: _____ Date filled: _____ Should have: _____ Do have: _____

Dr. Jolliff can be reached thru dispatch, please provide dispatch with a phone number you can be reached at on scene

Guideline:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport, or arrival at the hospital when this procedure is followed.

Purpose:

The purpose of this guideline is to:

- Allow for discontinuation of prehospital resuscitation after delivery of adequate and appropriate ALS therapy.

Procedure:

1. Discontinuation of CPR and ALS intervention may be implemented **if ALL** of the following criteria have been met:

- Patient must be 18 years of age or older.
- Adequate CPR has been administered.
- Airway has been successfully managed with verification of device placement. Acceptable management techniques include Orotracheal intubation, King LT and I-gel, or cricothyrotomy.
- IV, IO access has been achieved.
- No evidence or suspicion of any of the following:

-Hypothermia

- Rhythm appropriate medications have been administered according to local EMS Protocol and "an end-tidal carbon dioxide level of 10 mmHg or less measured 20 minutes after the initiation of advanced cardiac life support", accurately predicts death in patients with cardiac arrest associated with electrical activity but no pulse. Cardiopulmonary resuscitation may reasonably be terminated in such patients.
- Asystole verified in two leads
- All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate.
- **Once preceding items are achieved contact medical control for discontinuation of resuscitation**

2. The "**Dead on Arrival Guideline**" should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, and law enforcement on EMS patient care report form.

If patient is a Organ Donor: Lifebanc: (216) 752-5433

BACKGROUND

A. Prehospital (out of hospital) providers are called to care for patients who are known to have incurable or terminal illnesses on an ever-increasing basis. Examples of such patients include those with metastatic cancer, AIDS, severe CVA's. Many patients, and/or their families have intelligently and consciously altered their consent for treatment, made out a living will, or entered into Hospice care agreements.

EMS providers and medical control physicians often find these encounters confusing, frustrating, and charged with emotion. This is especially true when there is no prearranged document or consistent, rational or standardized approach by which to care for these patients and their families.

These guidelines are designed to help EMS providers and medical control physicians determine how, when, and to what level of resuscitation a patient desires or requires. A newer "pro-active" approach is to refer to DNR as **SUPPORT** Care. Ohio ACEP and EMS Board are actively working to develop and pass into law a State of Ohio **SUPPORT** Care (DNR) policy.

DEFINITION

A. DNR orders are defined to withhold CPR and Advanced Life Support from patients suffering from terminal illness.

A DNR order may be written with specific guidelines such as Comfort Care only or Full Medical Management with various "check list" treatment modalities (e.g., medications, blood products, tube feedings), but if not otherwise noted implies not initiating or continuing the following: CPR, intubation, advanced airway management, manual or mechanical ventilatory support, electrical monitoring or therapy, administering ACLS drugs.

DNR orders do not mean, "DO NOT TREAT!"

Prehospital providers and medical control physicians must be sensitive to and actively involved with the administration of other palliative and supportive care interventions, such as to make the patient comfortable, relieve their pain, allay both the patients' and families' fear and apprehension.

Other interventions may, but not necessarily include: oxygen administration; suctioning the airway; IV fluids; control bleeding; splinting; position for comfort; contacting a private/hospice physician or nurse; transport of the patient to a hospital or hospice.

ACTION / IDENTIFICATION

A. The procedure or action by which a healthcare provider identifies a patient with a DNR/Support Care order is usually by one of the following methods:

1. A valid DNR/Support Care document is present.
2. The patient is wearing a DNR / Supportive Care bracelet/ID.
3. The patient is refusing care and is competent.
4. A competent guardian or family (immediate) member refuses care and states the patient has a DNR but is unable to produce it immediately and the cause appears clinically reasonable (no foul play or extenuating circumstances)
5. If there is no written or, but a physician requests the patient be made a DNR, the physician should directly contact medical control. If the patient has a DNR but an immediate family member states that they would like the patient to be worked, then begin basic resuscitation and transport to the emergency department and notify the attending physician of the situation.

B. The following minimum data should be included on the EMS Run Sheet:

1. Name, gender, age.
2. Attending/Hospice physician's names.
3. Date, time, location of run.
4. Event, description, history.
5. Assessment: vital signs; physical exam.
6. Treatment, if applicable.
7. Revocation, if applicable.

REVOCAATION

A. A DNR/Support Care patient may revoke their status at any time by:

1. Direct communication with the prehospital provider.
2. The private physician is directed by the patient, guardian or family to revoke the order. This must be either by written or direct verbal order. This scenario may occur when the patient cannot communicate with the EMS provider.

ACCOMPANIMENT

A. Whenever possible, a copy of, or the original DNR/Support Care order accompany the patient wherever the patient goes. This policy will help prevent confusion about, or inappropriate initiation of advanced care modalities for any terminally ill patient.

3701-62-04

APPENDIX A



DNR IDENTIFICATION FORM

(Check only one box)

- DNRCC** (If this box is checked the DNR Comfort Care Protocol is activated immediately.)
- DNRCC-Arrest** (If this box is checked, the DNR Comfort Care Protocol is implemented in the event of a cardiac arrest or a respiratory arrest.)

Patient Name:		
Address:		
City:	State:	Zip:
Birthdate:	Gender: <input type="checkbox"/> M <input type="checkbox"/> F	
Signature: (optional)		

Certification of DNR Comfort Care Status (to be completed by the physician)*

(Check only one box)

- Do-Not-Resuscitate Order**—My signature below constitutes and confirms a formal order to emergency medical services and other health care personnel that the person identified above is to be treated under the State of Ohio DNR Protocol. I affirm that this order is not contrary to reasonable medical standards or, to the best of my knowledge, contrary to the wishes of the person or of another person who is lawfully authorized to make informed medical decisions on the person's behalf. I also affirm that I have documented the grounds for this order in the person's medical record.
- Living Will (Declaration) and Qualifying Condition**—The person identified above has a valid Ohio Living Will (declaration) and has been certified by two physicians in accordance with Ohio law as being terminal or in a permanent unconscious state, or both.

Printed name of physician*:	
Signature:	Date:
Address:	Phone:
City/State:	Zip:

*A DNR order may be issued by a certified nurse practitioner, clinical nurse specialist, or a physician assistant when authorized by section 2133.211 of the Ohio Revised Code.

See reverse side for DNR Protocol

**DO NOT RESUSCITATE COMFORT CARE PROTOCOL**

After the State of Ohio DNR Protocol has been activated for a specific DNR Comfort Care patient, the Protocol specifies that emergency medical services and other health care workers are to do the following:

WILL:

- Suction the airway
- Administer oxygen
- Position for comfort
- Splint or immobilize
- Control bleeding
- Provide pain medication
- Provide emotional support
- Contact other appropriate health care providers, such as hospice, home health, attending physicians, CNPs, and CNSs

WILL NOT:

- Administer chest compressions
- Insert artificial air way
- Administer resuscitative drugs
- Defibrillate or cardiovert
- Provide respiratory assistance (other than that listed above)
- Initiate resuscitative IV
- Initiate cardiac monitoring

If you have responded to an emergency situation by initiating any of the WILL NOT actions prior to confirming that the DNR Comfort Care Protocol should be activated, discontinue them when you activate the Protocol. You may continue respiratory assistance, IV medications, etc., that have been part of the patient's ongoing course of treatment for an underlying disease.

If family or bystanders request or demand resuscitation for a person for whom the DNR Comfort Care Protocol has been activated, do not proceed with resuscitation. Provide comfort measures as outlined above and try to help the family members understand the dying process and the patient's choice not to be resuscitated.

On an EMS run where an unknown EMT from outside the responding EMS agency wishes to intervene in the care of patients, the following steps should be initiated:

1. Ideally, if no further assistance is needed, the offer should be declined.
2. If the intervener's assistance is needed or may contribute to the care of the patient:
 - a. An attempt should be made to obtain proper identification of a valid Ohio EMT card. Acceptance of borderline states' EMT cards is at the discretion of individual EMS services. Notation of intervener name, address and certification numbers must be documented on the run report.
3. Significant involvement with patient care or variance from protocols will require the intervener to accompany the patient to the hospital.

I GENERAL CONSIDERATIONS I

There is an increasing percentage of the population that has a weight in excess of 300 lbs. As patients, these individuals are frequently classed as high risk because of the increased medical complications associated with their excess weight. In the EMS system they present the additional problem of movement and transportation. These individuals have the right to expect prompt and expert emergency medical care. Therefore, in order to facilitate the care of these individuals without risking the health of EMS workers, the following protocol is established.

A. In managing a patient with weight over 300 lbs., at no time should the patient be moved without at least 4 individuals to assist. At the scene, as many EMS personnel as can be mobilized may be supplemented by police or other safety personnel as appropriate. If 4 individuals are not available, mutual aid will be required.

B. It may be necessary to remove doors, walls or windows. The situation is no different than extrication from a vehicle, although property damage may be higher. At all times the patient's life must be the first priority.

C. The patient is to be placed on at least 2 (double) backboards or other adequate transfer device for support.

D. The patient is to be loaded on a cot that is in the down position, and the cot is to be kept in the down position at all times.

E. Three (3) EMS personnel are to accompany the patient during transport. If additional personnel are available they are to travel in a separate vehicle.

F. The patient will be loaded directly from the squad onto a special hospital bed for this type of patient, which will be brought to the ED entrance.

G. It is NECESSARY TO NOTIFY THE HOSPITAL WELL IN ADVANCE of arrival so that preparations can be completed in a timely fashion.

H. If individuals in the community are known to fall within this special category it is appropriate to inform them in advance of the type of assistance they can expect from the EMS system, and help them make plans well in advance to assist you. When calling for the squad, and if they identify themselves and their special needs, it will promote the timeliness of your efforts.

The transportation of patients from one healthcare facility to another should be carried out in an orderly and expeditious manner. Regardless of origin or destination, patients remain the responsibility of the transferring physician until received by the accepting physician or his/her agent. The transfer papers and accompanying record must document the reason for transfer as well as the time of contact and the name of the receiving facility, physician and/or accepting agent in accordance with nationally recognized standards and federal regulations.

The decision regarding the level and scope of practice of the out-of-hospital transporting agency and the individual providers should be made in consultation with the receiving physician and must be appropriate to the stability of the patient and their medical and equipment needs. The provider will be responsible for carrying out the orders of the transferring physician during the transfer unless acting as the agent of the receiving facility with superseding medical control, or if a physician accompanies the patient. Any questions or concerns regarding those orders, including but not limited to Do Not Resuscitate (DNR) orders, medications or treatments, must be answered or clarified prior to departure. The route(s) of travel, possible diversionary medical facilities and their phone or radio call numbers should also be determined.

If unanticipated problems or concerns arise during transport, direct, on-line medical control will be obtained. If for technical or logistical reasons this is not possible, the transporting agent should follow written protocols or standing orders until the transferring, receiving or nearest diversionary facility can be contacted on-line.

INTERFACILITY TRANSFER POLICY

A The transferring physician is ultimately responsible for the patient until accepted by the receiving physician or his/her agent, i.e., nurse, covering physician.

The out of hospital healthcare provider will be responsible in carrying out the transferring physician's orders. The provider must check, be completely familiarized with, and understand the transfer orders. Any questions or concerns, for example validity or specifics of DNR orders, medications, or treatment(s), must be answered and clarified prior to departing the transferring hospital.

If the provider does not understand or feel comfortable with the orders, then he/she must address these concerns with the physician or his/her agent, i.e., nurse or covering physician. If the concern(s) cannot be rectified, the provider should contact his/her supervisor and not proceed with the transfer until said concerns are rectified. The supervisor may need to directly, either by phone or in person, contact the physician or his/her agent to clarify or rectify any real or perceived concerns of the provider prior to initiating transfer. If the provider still has concerns, he/she should go up the chain of command until such concerns are adequately and appropriately rectified prior to proceeding with the transfer.

In order to avoid any attendant delays in care and transport, said review and clarification should and must occur prior to initiation of transfer. Thirty to sixty minutes prior to transport should usually be sufficient.

It should be documented in the transfer record that the receiving physician and hospital has been notified and has accepted the patient in transfer. Any equipment, airway management, concerns, medication(s), or special needs must also be arranged for and available prior to the immediate transfer time.

Once en route if any problem(s) arises not previously considered or covered in the transfer orders, the provider(s) will immediately contact the transferring hospital, physician or his/her agent for direct on-line medical control. If the transferring hospital cannot be accessed due to vehicle location, communication difficulties, or acts of nature, the provider will follow written protocols or standing orders until such a time that the transferring, receiving or other nearest appropriate medical facility can be contacted and act as on-line medical control for this particular concern. On occasion, for example due to patient care concerns, patient status deterioration not covered in the transfer orders, or equipment failure, the transfer may require diversion to the nearest appropriate medical facility. It is imperative that the most appropriate route(s) of travel, the locations of appropriate possible diversion medical centers and their phone or radio call numbers are made available prior to initiation of the transfer. It is the duty of the provider(s) to familiarize themselves with this information prior to transport.

The immediate supervisor will review the above directives and ensure all is in place prior to initiating transfer.

A. On occasion, the out of hospital provider(s) will be called upon to transport a patient from a non hospital location to another non-hospital facility such as Hospice Center or from Hospice to home or a doctor's office. The provider(s) will follow the written or pre-existing orders of the patient's physician or physician approved Hospice Center orders for the transport. At times, a Hospice nurse may arrive or already be at the scene. He/she should be able to help review orders and/or care directives such as DNR or "Support Care" orders to enable transport in accordance with the wishes of the patient and his/her family. A Hospice patient by definition is DNR.

Medical Control does not need to be contacted unless the DNR is revoked. However, if the provider(s) feels the need to contact Medical Control for advice or direction, the provider(s) will clearly advise Medical Control of the patient's terminal condition and DNRstatus.

If medication(s) needs to be "wasted", e.g., Morphine, Valium or Versed, then the receiving Hospice supervisor, nurse or EMS supervisor may witness and document appropriate disposal of the said medication(s) and administration equipment, e.g., needle(s), syringe(s), IV catheter(s), Heparin or saline lock(s) or IV lines and/or solutions. Medications or equipment should never be transported to an Emergency Department to be disposed of or wasted. Any and all waste materials will be disposed of into approved and appropriately labeled containers.

A number of EMS calls result in non-transport of the patient. If an individual is not transported by the squad, the following guidelines will apply:

1. EMS may receive a call only to assist a patient. These calls may involve moving or lifting a patient at a home who has limited ability and resources to do so for themselves. First priority on these calls is to ensure the patient is not injured or ill. Once patient contact has been established and there are no visible signs of injury or illness and the patient does not complain of any injury or illness and declines treatment/transport, then these types of calls can be considered a public assist. Therefore, no formal EMS report or consult with medical control is required. However, at any time during the course of the call the patient complains of injury or illness, then proper protocol and procedures must be followed.

2. If the patient refuses treatment or transport, the patient refusal procedure should be followed.

3. If the EMT in charge does not feel it is necessary to transport the patient, Medical Control can be contacted by EMT in charge if EMT in charge determines it is necessary.

If after evaluation of a minor, the EMT and medical control agree that the patient is not needed to be transported by EMS. That minor can be left in the care of a responsible adult that is not the parent or legal guardian. The responsible adult may be a family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, mature minor or other person at the discretion of medical control and the EMT or declared a "mature minor" themselves and released to self.

I. A paramedic/Advanced EMT assist is to be requested as soon as any of the following emergencies/patient conditions are recognized. Crew may use dispatch follow up to guide their decision. Also, if intercept will occur near hospital, if resources allow the basic or advance crew may cancel assist

- A. Cardiac arrest
- B. Severe respiratory distress
- C. Anaphylaxis
- D. Shock
- E. Major trauma, including patients that are entrapped
 - I. Any patients that the EMS provider considers critical or unstable
 - II. If possible transport immediately and meet ALS enroute to the hospital
 - III. Documentation

- A. The Basic/Intermediate EMS and the Paramedic EMS providers must complete a patient care report.
 - 1. The Basic or Intermediate EMT needs to complete a patient care report documenting their findings and treatment.
 - 2. The Paramedic must complete a patient care report indicating the history and treatment that has been completed prior to their arrival, and all treatment and findings that the paramedic makes.
- B. In the event the paramedic is a member of the transporting EMS agency, only one patient care report needs completed.

GENERAL STATEMENT I

- A. If concern by EMT for patient well being and/or decision making capacity then medical control should be contacted. Direct communication between the physician and the patient may resolve many questions and often convinces the patient of the importance of treatment and transport. The following is an outline of legal principles which may help the EMT to understand patient refusal.
1. Consent
 - a. The patient has the responsibility and right to consent to refuse treatment. If he or she is unable to do so, a legal guardian has this right.
 - b. A durable power of attorney is an authorization that allows a patient's wishes to be followed even when he or she becomes incompetent.
 - c. When waiting to obtain lawful consent from the person authorized to make such consent would present a serious risk of death, serious impairment of health or would prolong severe pain or suffering of the patient, treatment may be undertaken to avoid those risks without consent. In no event should legal consent procedures be allowed to delay immediately required treatment.
 - d. In non-emergency cases involving minors, consent should be obtained from the parent or legal guardian prior to undertaking any *treatment*. All children must be evaluated for acuity of illness, regardless of obtaining parental consent.
 - e. AGE: Patient must be over 18 years of age or an "emancipated" or "mature" minor to be permitted to consent or refuse treatment. A child under 18 years of age who is married or is living away from home and is financially independent of his/her parents, may consent for their own care and may consent to medical or surgical care for his/her child.
 - f. If the patient is under age, consent should be from:
 1. Legal guardian
 2. Natural parent
 3. Adopted parent
 - g. NOTE: There has not been a single reported decision that held a physician liable where beneficial care was provided to a minor without obtaining consent.
 2. Mental Competence - Decision Making Capability
 - a. A person is mentally competent if he:
 1. Is capable of understanding the nature and consequences of the proposed treatment.
 2. Has sufficient emotional control, judgment, and discretion to manage his own affairs.
 - b. Ascertaining that the patient is oriented, has an understanding of what happened and may possibly happen if treated or not treated, and a plan of action - such as whom he will call for transportation home - should be adequate for these determinations.

- a. Patients with impaired cerebral perfusion, in shock, postictal, or under the influence of drugs will be unlikely to fulfill these criteria.
- b. If the patient is not mentally competent under these guidelines, consent should be obtained from another responsible party - who must also be mentally competent and must be 18 years of age - in the following order of preference:
 1. Legal guardian
 2. Spouse
 3. Adult son or daughter
 4. Parent
 5. Adult brother or sister
- c. If the patient is not mentally competent and none of the above persons can be reached, the person should be treated and transported to a medical facility. It is preferable under such circumstances to obtain concurrence of a police officer in this course of action.
- d. If the patient himself is not competent to consent and a legal guardian as defined under "d" is present, and if that person is competent, he or she has the same right to consent or refuse treatment as the patient himself. Those wishes cannot be ignored in a non-life-threatening situation.
- e. If after evaluation of a minor, the EMT and medical control agree that the patient is a competent, that minor can be left in the care of a responsible adult that is not the parent or legal guardian. The responsible adult may be a family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, or other person at the discretion of medical control and the EMT.

PROCEDURE FOR REFUSAL

- A. If a patient wishes to refuse treatment, examination or transportation, the following steps will be taken.
 1. If needed, Medical Control can be contacted and the refusal reviewed.. This contact and the orders that were given must be documented. If unable to contact medical control, document why.
 2. The patient must be advised of the benefits of treatment and transport as well as the specific risks of refusing treatment and transport.
 3. The patient must be able to relate to the EMT in his or her own words what these risks and benefits are.

Guidelines for Treatment and Transport

While Ebola has grabbed our attention, we will continue to provide treatment and transport to multiple patients with fever, vomiting, and diarrhea secondary to *Clostridium difficile* (C-Diff) and other common etiologies of gastrointestinal symptoms. The following information and guidelines should be used with assessing and treating these patients:

1. Signs and symptoms of Ebola, C-Diff, gastroenteritis, (and many other conditions).

a. Fever (KEY with Ebola)

i. A fever with Ebola does not fluctuate. It goes up and stays up. CDC and ODH define the significant fever as 100.4 or greater.

b. Headache

c. Vomiting

d. Diarrhea

e. Sore throat

f. Joint and muscle aches

g. Weakness

h. Abdominal pain

2. Ebola transmission:

a. A person is only contagious when they are symptomatic.

b. **Direct** contact with blood and body fluids (vomit, diarrhea, urine, saliva, sweat, tears, vaginal secretions, semen).

c. Exposure to objects that are contaminated by an infected person (IV needles, etc.)

d. **Ebola is NOT transmitted through air, water or food.**

3. History taking is critical in determining the risk factors for possible Ebola.

a. Determine the following:

i. **Physical contact** with blood or body fluids of a patient known to have or suspected to have Ebola.

ii. Residence in or travel to a country where Ebola outbreak is occurring (Nigeria, Liberia, Sierra Leone, New Guinea, Senegal, the Democratic Republic of the Congo).

iii. Direct handling of bats or nonhuman primates from these areas.

Central Dispatch is asking callers about risk factors and will pass that information on to the responding EMS crews.

Not all patients with nausea, vomiting and fever require transport

1. Consider transport for:

- i. Signs/symptoms of dehydration or progressively worsening signs/symptoms.
- ii. Signs/symptoms **AND** any of the three above risk factors.

- b. A patient who does not meet any of these requirements should not be transported by ambulance.
- c. Contact Medical Control for advice.

2. Initial encounter with patient complaining of GI signs and/or symptoms:

- a. Only one crew member should greet the patient or go into the residence.
- b. Stay a minimum of 3 feet away from the patient
- c. Ask about risk factors
 - i. If no risk factors, follow current Standing Orders and Protocols for Gastrointestinal complaints
- d. If risk factors are present, don further PPE
 - i. Ask dispatch to activate the Ebola response protocol
 - ii. Restrict other crew members' access to the patient

3. Accidental encounter (patient already being treated or transported) and risk factors identified:

- e. Don PPE (see below)
- f. Place patient in PPE
- g. Avoid IVs and aerosolizing procedures (CPAP, nebulizer treatments, suction, etc.) unless patient is extremely unstable.
- h. Continue transport
- i. Notify hospital immediately, and follow their directions.
- j. Upon arrival at the hospital, DO NOT remove the patient from the ambulance until directed to do so.
- k. Once patient has been removed, keep PPE in place.
- l. Stay with the ambulance and park it in a remote area of the parking lot.
- m. Await arrival of Haz Mat team for decontamination and removal of PPE.

4. Full PPE

- a. There is to be no exposed skin.
- b. Tyvek suits with impermeable gown/apron worn over the suit
- c. Eye protection (goggles which seal the orbital area with face shield)
- d. Double glove
- e. Disposable shoe and lower leg covers
- f. Protective hood
- g. N95 or P100 respirators will be worn from initial patient contact through completion of decontamination.
- h. Place the patient in the same level of PPE for a double barrier of PPE.
- i. Be sure to follow proper procedures for donning and doffing

5. Thorough decontamination of ambulance and equipment

- a. To be completed after all transports:
 - i. Bleach or EPA-registered hospital disinfectants that are effective against viruses are recommended for cleansing patient care equipment, stretchers, and transport vehicles.
 - ii. PPE is to be worn during this activity.

GOOD SAMARITAN PHYSICIAN

This is a physician with no previous relationship to the patient, who is not the patient's private physician, but is offering assistance in caring for the patient. The following criteria must be met for this physician to assume any responsibility for the care of the patient:

1. Medical Control must be informed and give approval.
2. The physician must have proof they are a physician. They should be able to show you their medical license. Notation of physician name, address and certification numbers must be documented on the run report.
3. The physician must be willing to assume responsibility for the patient until relieved by another physician, usually at the emergency department.
4. The physician must not require the EMT to perform any procedures or institute any treatment that would vary from protocol and/or procedure.

If the physician is not willing or able to comply with all the above requirements, their assistance must be courteously declined.

PHYSICIAN IN HIS/HER OFFICE, OR URGENT CARE CENTER

1. EMS should perform its duties as usual under the supervision of Medical Control or by protocol.
2. The physician may elect to treat the patient in their office.
3. The EMT should not provide any treatment under the physician's direction that varies from protocol. If asked, the EMT should decline until contact is made with Medical Control.
4. Once the patient has been transferred into the squad, the patient's care comes under Medical Control.
5. Any care above the scope of practice of EMS must have the physician accompany the patient to the hospital.

Pathogen	Required PPE
Routine Transport	Gloves
Bed Bugs	Gloves, sani suit, goggles, hair covering
HIV	Gloves unless doing advanced airway or major bleeding is present, Gowns, goggles, face shield, shoe covering
Hepatitis	Gloves unless doing advanced airway or major bleeding is present, Gowns, goggles, face shield, shoe covering
TB not active	Gloves
TB active	Gloves, gown, surgical mask for you as well as the patient. Cover or remove equipment in the unit that is not in cabinet/close all cabinet doors.
Pneumonia	Gloves, surgical mask for you and the patient
Meningitis	Gloves, surgical mask for you and the patient, gown
C-Diff	Gloves, gowns, goggles or face shield, shoe covers
Staph	Gloves, gowns, shoe covers, surgical mask (if needed)
MRSA	Gloves, gowns, shoe covers, surgical mask (if needed)
VRE	Gloves, gown, surgical mask (if needed)
EBOLA	Triple Glove, sani suit, Chem suit, boots, mask N95, face shield, hood, NO SKIN EXPOSED. Patient must have on the same PPE Squad interior must be shrouded and taped off Requires extensive disinfecting with bleach solution Requires 3 man crew for transport

Pathogen	Required PPE
H1N1	Gloves, gowns, N95 mask for you and the patient Close all cabinet doors in the unit/cover all equipment in unit not in cabinet Routine disinfection of unit
Trauma	Gloves, depending on the trauma and the risk for blood or body fluids. Mask, gown, face shield, goggles, shoe covers

Any contact with a patient requires the use of gloves.

Depending on the interventions and the risk for possible/probable exposure, the employee may use more or less PPE than suggested/required

See the infection/Exposure Control Plan for spill clean up and for disinfecting guidelines

This protocol is to clarify what constitutes the proper and complete documentation of a public assist call. There are three specific components you must be sure to include in your documentation of these alarms.

You must document the following three areas of concern:

1. That you asked about the presence of any acute illness / injury and the person / caregiver denied acute illness / injury.
2. That you did not find any obvious signs or symptoms of any significant acute illness /injury.
3. That you offered treatment/ transport and the person / caregiver declined treatment /transport.

These components must be included in your handling of the alarm and must be documented in your written report for the alarm to ensure that we are providing the best EMS care for our citizens and covering our bases medical-legally.

From the perspective of an EMS system, freestanding urgent care clinics are no different, and no more appropriate as an EMS transport destination, than any private physician's office, unless they have been through a health system agency or regional EMS review.

EMS units should not transport patients to freestanding urgent care clinics (or private physicians' offices) in response to emergency calls except:

1. When directed by Medical Control.
2. If specifically authorized by on-line medical direction.
3. When the EMS unit is following protocols approved by Medical Control that authorize such transports under certain circumstances.
4. When the EMS unit is a private service responding to a call in which the patient and/or the family requests transport to such facility and the patient is clearly in stable condition.

A freestanding emergency clinic is not automatically expected to be incorporated into the EMS system. However, in certain circumstances these facilities may be a valuable component.

Emergency medical service personnel shall transport a trauma victim, as defined in section 4765.01 of the Revised Code and this chapter, directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:

1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center;
2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time;
3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources
4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay;
5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

INJURY TYPE

*Consider Mechanism of Injury

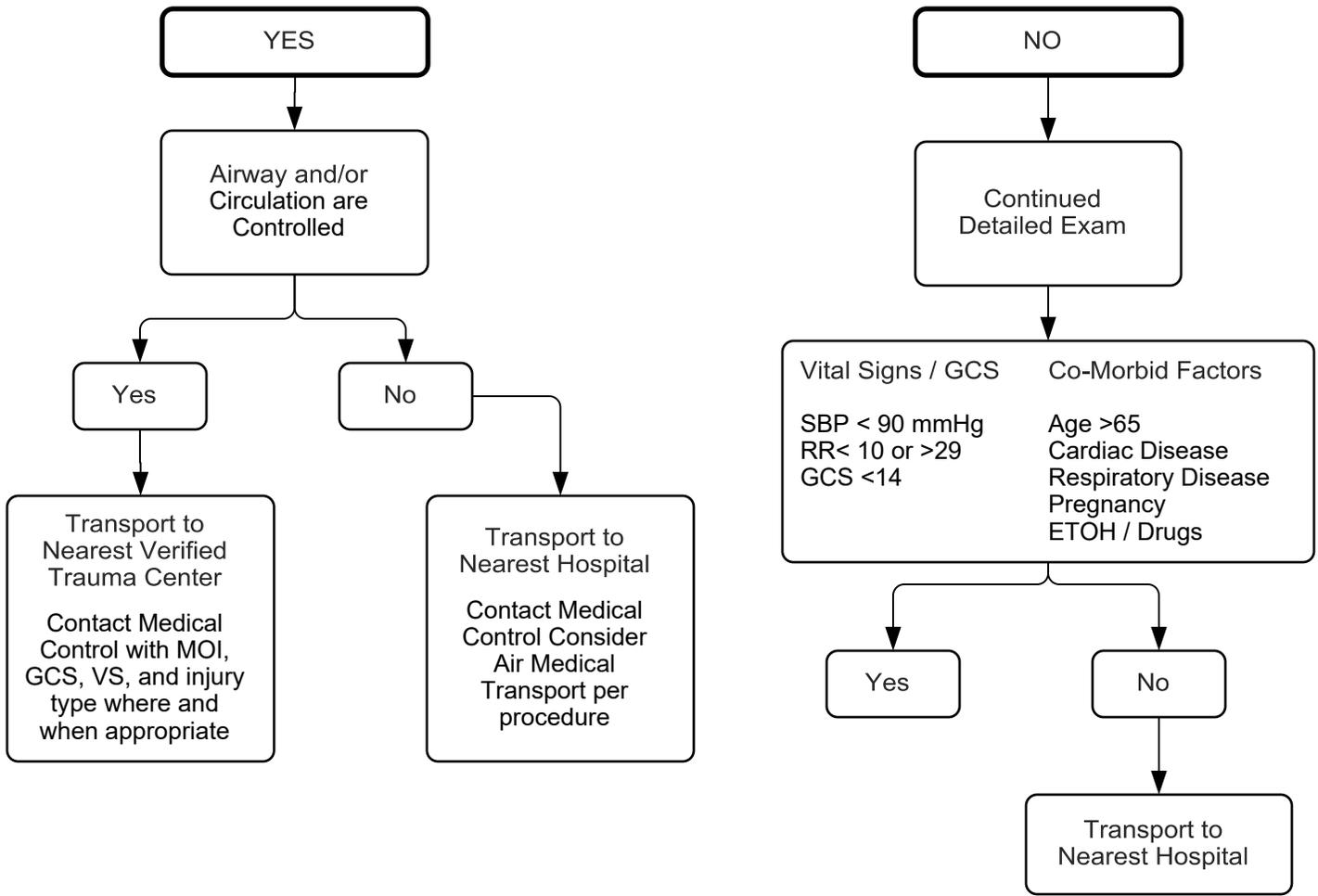
LIMB PARALYSIS

FLAIL CHEST

AMPUTATION PROXIMAL TO WRIST OR ANKLE

BURNS with SIGNIFICANT INJURY SIGNIFICANT

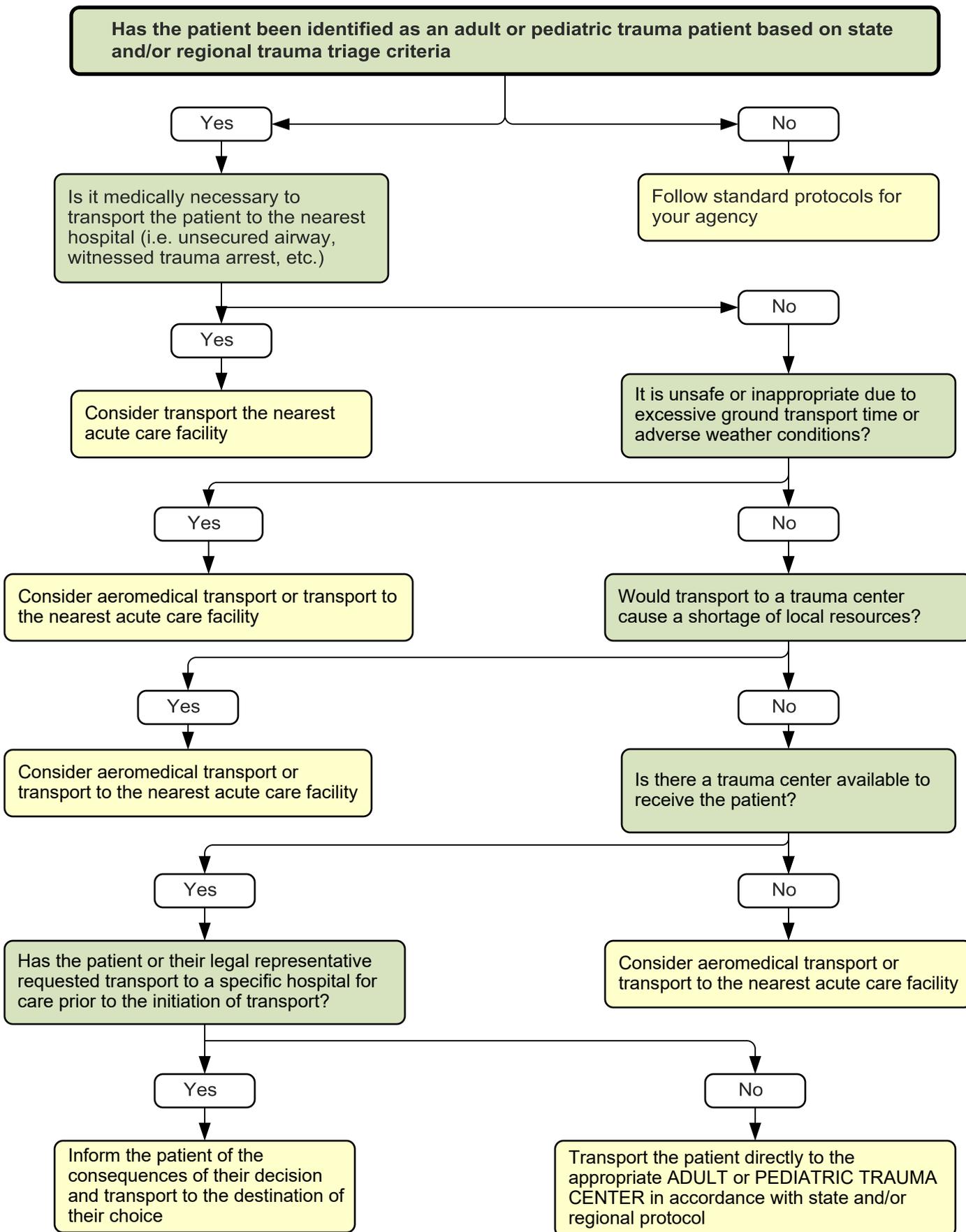
PENETRATING INJURY TO: HEAD/ NECK/ TORSO / EXTREMITY PROXIMAL TO ELBOW/KNEE



When in doubt – Transport to the nearest hospital

***Mechanism of Injury**
 Ejection from vehicle
 Vehicle rollover
 High speed crash
 Vehicle-pedestrian / bicycle crash
 Pedestrian thrown / run over / crushed
 Falls from greater than 20 feet
 Pediatric falls: see Pediatric Trauma Guide

Exceptions to EMS Field Triage to a Trauma Center



INDICATIONS

- A. Suspected cardiac patient
- B. Suspected tricyclic overdose
- C. Electrical injuries
- D. Syncope

EMT-Set-Up Only & Transmit

EMT

Steps

Was performed ?

1. Assess patient and monitor cardiac status. Administer oxygen as patient condition warrants.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

2. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

3. Prepare ECG monitor and connect patient cable with electrodes.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

4. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.

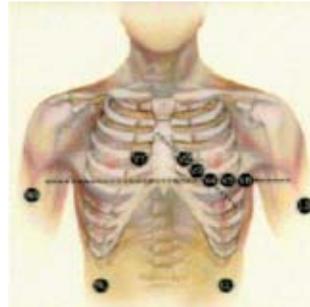
<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

5. Expose chest and prep as necessary (Drying, shaving, roughing up, etc.). Modesty of the patient should be respected.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

6. Apply chest leads and extremity leads using the following landmarks:

1. RA -Right arm
2. LA -Left arm
3. RL -Right leg
4. LL -Left leg
5. V1 -4th intercostal space at right sternal border
6. V2 -4th intercostal space at left sternal border
7. V3 -Directly between V2 and V4
8. V4 -5th intercostal space at left midclavicular line
9. V5 -Level with V4 at left anterior axillary line
10. V6 -Level with V5 at left midaxillary line



<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

7. Instruct patient to remain still. Press the appropriate button to acquire the 12Lead ECG.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

8. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

9. Monitor the patient while continuing with the treatment protocol. Interpret the results of the 12-lead.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

10. Transmit 12-lead after 12-lead completion to appropriate hospital

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

11. Print the 12-lead and attach a copy of the 12 lead to the PCR.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

General

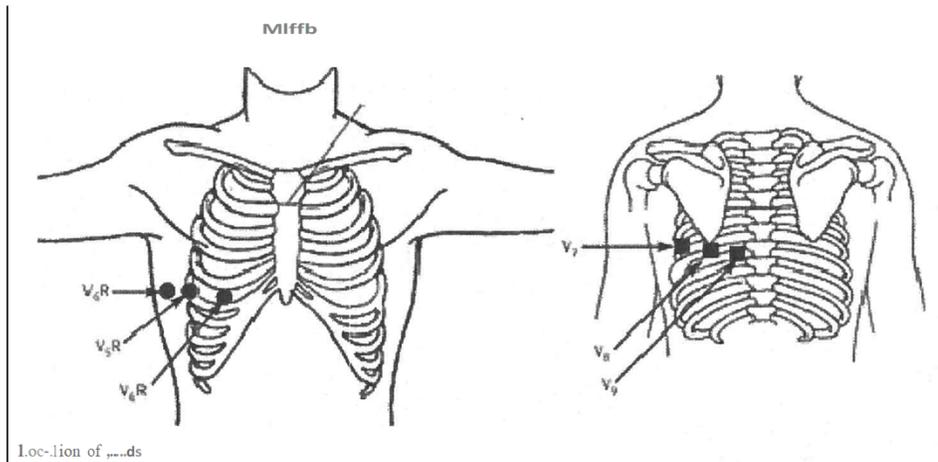
EMR

EMT

AEMT

Paramedic

Steps	Was performed ?		
	YES	NO	
12. If the original 12-lead shows ST segment elevation in the inferior leads {II, III, and AvF) perform a right sided chest lead ECG. <ol style="list-style-type: none"> 1. RA - Right arm 2. LA - Left arm 3. RL - Right leg 4. LL - Left leg 5. V1R - 4th intercostal space at the left sternal border 6. V2R - 4th intercostal space at the right sternal border 7. V3R- Directly between V2 and V4 8. V4R - 5th intercostal space at the right midclavicular line 9. V5R - Level with V4 at the right anterior axillary line 10. V6R - Level with VS at the right midaxillary line 	<input type="checkbox"/>	<input type="checkbox"/>	General
13. Clearly label the printout as a right sided 12-lead	<input type="checkbox"/>	<input type="checkbox"/>	EMR
14. If the original 12-lead shows ST segment depression in the anterior leads (V1, V2, V3, and V4) perform a posterior lead EKG. <ol style="list-style-type: none"> 1. RA - Left in place 2. LA - Left in place 3. RL - left in place 4. LL - Left in place 5. V1 - Left in place 6. V2 - Left in place 7. V3 - Left in place 8. V4 - move to become V7 - level with V6 at the posterior axillary line 9. VS - move to become V8 - level with V7 at the mid scapular line 10. V6 - move to become V9 - level with V8 paravertebral 	<input type="checkbox"/>	<input type="checkbox"/>	EMT
15. Clearly label the printout as a posterior 12-lead	<input type="checkbox"/>	<input type="checkbox"/>	AEMT
16. Follow device specific procedure for transmission of the 12-lead to the receiving facility.	<input type="checkbox"/>	<input type="checkbox"/>	Paramedic
17. Document the procedure, time, and results on/with the patient care report (PCR).	<input type="checkbox"/>	<input type="checkbox"/>	



Clinical Indications:

Paramedic

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Steps	Was performed ?	
	YES	NO
1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion. Consider Anterior/Posterior pad placement and apply capnography.	<input type="checkbox"/>	<input type="checkbox"/>
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.	<input type="checkbox"/>	<input type="checkbox"/>
3. Consider sedation with: Midazolam (Versed) 2 – 4 mg IVP (Adult) or Ketamine (Ketalar) 0.1 - 0.3 mg/kg IVP, IO or IN (Adult or Pediatric)	<input type="checkbox"/>	<input type="checkbox"/>
4. Set energy selection. Adult LifePak: 50, 100, 120, 150, 200, 300, 360 Joules Zoll: 50, 70, 120, 150, 200 Joules Pediatric Pediatric Tachycardia-SVT 2 J/kg Repeat dose 3 J/kg Pediatric Wide Complex Tachycardia 0.5 - 1 J/kg	<input type="checkbox"/>	<input type="checkbox"/>
5. Set monitor/defibrillator to synchronized cardioversion mode. (SYNC button)	<input type="checkbox"/>	<input type="checkbox"/>
6. Make certain all personnel are clear of patient.	<input type="checkbox"/>	<input type="checkbox"/>
7. Press the button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may be a delay between activating the cardioversion and the actual delivery of energy.	<input type="checkbox"/>	<input type="checkbox"/>
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.	<input type="checkbox"/>	<input type="checkbox"/>
9. If the patient's condition is unchanged, repeat steps 2 to 8 above.	<input type="checkbox"/>	<input type="checkbox"/>
10. If the patient has not improved after cardioversion, continue with drug therapy.	<input type="checkbox"/>	<input type="checkbox"/>
11. Note procedure, response, and time in the patient care report (PCR).	<input type="checkbox"/>	<input type="checkbox"/>

EMT

Clinical Indications:

- Imminent delivery with crowning

Steps

Was performed ?

Steps	Was performed ?		
	YES	NO	
1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.	<input type="checkbox"/>	<input type="checkbox"/>	General
2. Support the infant's head as needed.	<input type="checkbox"/>	<input type="checkbox"/>	
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.	<input type="checkbox"/>	<input type="checkbox"/>	EMR
4. Do NOT routinely suction the infant's airway (even with a bulb syringe) during delivery	<input type="checkbox"/>	<input type="checkbox"/>	
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.	<input type="checkbox"/>	<input type="checkbox"/>	
6. Gently pull up on the head to allow delivery of the posterior shoulder.	<input type="checkbox"/>	<input type="checkbox"/>	EMT
7. Slowly deliver the remainder of the infant.	<input type="checkbox"/>	<input type="checkbox"/>	
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.	<input type="checkbox"/>	<input type="checkbox"/>	
9. Record APGAR scores at 1 and 5 minutes. After delivery of infant, suctioning (including suctioning with a bulb syringe) should be reserved for infants who have obvious obstruction to the airway or require positive pressure ventilation (follow Neonatal Resuscitation guideline for further care of the infant)	<input type="checkbox"/>	<input type="checkbox"/>	AEMT
10. Follow the <u>Pediatric Newborn/Neonatal Resuscitation</u> Protocol for further treatment.	<input type="checkbox"/>	<input type="checkbox"/>	
11. The placenta will deliver spontaneously, often within 5 minutes of the infant. Do not force the placenta to deliver.	<input type="checkbox"/>	<input type="checkbox"/>	
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions. Contain all tissue in plastic bag and transport.	<input type="checkbox"/>	<input type="checkbox"/>	
13. After delivery, massaging the uterus and allowing the infant to nurse will promote uterine contraction and help control bleeding.	<input type="checkbox"/>	<input type="checkbox"/>	Paramedic

Indication

For those patients of suspected sudden cardiopulmonary arrest (cardiac nature not respiratory) presenting in ventricular fibrillation or pulseless ventricular tachycardia (shockable rhythm). PEA and Asystole

Exclusion

1. Age 8 or less
2. Suspected pulmonary/respiratory cause of arrest
3. Drug O.D.
4. Trauma

Steps

Was performed ?

Preparation

YES NO

1. Assess patient's responsiveness, respirations and pulse.

YES NO

2. If in full cardiopulmonary arrest:
 a. Immediately institute chest compressions of at least 100 – 120 /minute
 b. Apply monitor for rhythm analysis.
 c. Direct a provider to prepare airway/ ventilation management

YES NO

3. If patient meets criteria for Cardiocerebral Resuscitation proceed with:
 a. Chest compressions for 1-2 minutes before first defibrillation
 b. "Passive airway/ breathing" management with:
 i. OPA / High flow O2 mask (15 LPM)
 ii. I-Gel/ High flow O2 (15 LPM through non-squeezed BVM)
 iii. I-Gel/ High flow O2 (15 LPM) through CCR port if available
 c. Obtain humeral 1.0. access in preparation for medication administration.
 After 3 cycles of CCR then move to standard ACLS management (Step 5).

YES NO

4. If patient does **NOT**:
 a. Meet criteria for CCR or,
 b. Respond to 3 cycles of CCR or,
 c. At anytime there is a change to asystole or PEA, then,

YES NO

5. Proceed with standard ACLS management

YES NO

*** Do NOT apply a "Res-q-pod" at anytime during "passive" airway/breathing management.

*** May apply post-resuscitation for unresponsive, non-intubated patients with ROSC.

General

EMR

EMT

AEMT

Paramedic

General Considerations

The treatment of tension pneumothorax involves decompression of the affected chest cavity to release the pressure that has developed.

Decompression can be achieved, with minimal risk, by the insertion of a 14 or 16 gauge needle into the second inter-costal space at the midclavicular line. Also an approach in the mid-axillary line between the fifth and sixth rib is possible, and considered safer by some physicians.

The needle must be inserted superior to the rib because the intercostal artery, vein and nerve follow the inferior portion of the rib.

Indications

Tension pneumothorax indicated by:

- A. Diminished or absent lung sounds.
- B. Cyanosis and difficulty breathing.
- C. Distended neck veins.
- D. Tachycardia, tachypnea, hypotension, narrow pulse pressure.
- E. Tracheal shift to the unaffected side. (May not always be present)

Contraindications

Insufficient training

Steps

Was performed ?
YES NO

	YES	NO
1. Prepare equipment: 10 or 14 gauge needle, antiseptic solution. (Intracath needle with stylet removed is preferred, because sheath provides one-way valve.) Catheter length of 3.25" preferred	<input type="checkbox"/>	<input type="checkbox"/>
2. Locate site: <ul style="list-style-type: none"> 1. Preferred Fourth intercostal space between the forth and fifth rib, Anterior Axillary. 2. Second or third intercostal space, midclavicular. 	<input type="checkbox"/>	<input type="checkbox"/>
3. Prep site, if time permits.	<input type="checkbox"/>	<input type="checkbox"/>
4. Insert the needle just superior to the rib until a rush of air is felt and/or heard.	<input type="checkbox"/>	<input type="checkbox"/>
5. Secure needle in place.	<input type="checkbox"/>	<input type="checkbox"/>
6. Support patient with 100% oxygen and transport without delay.	<input type="checkbox"/>	<input type="checkbox"/>

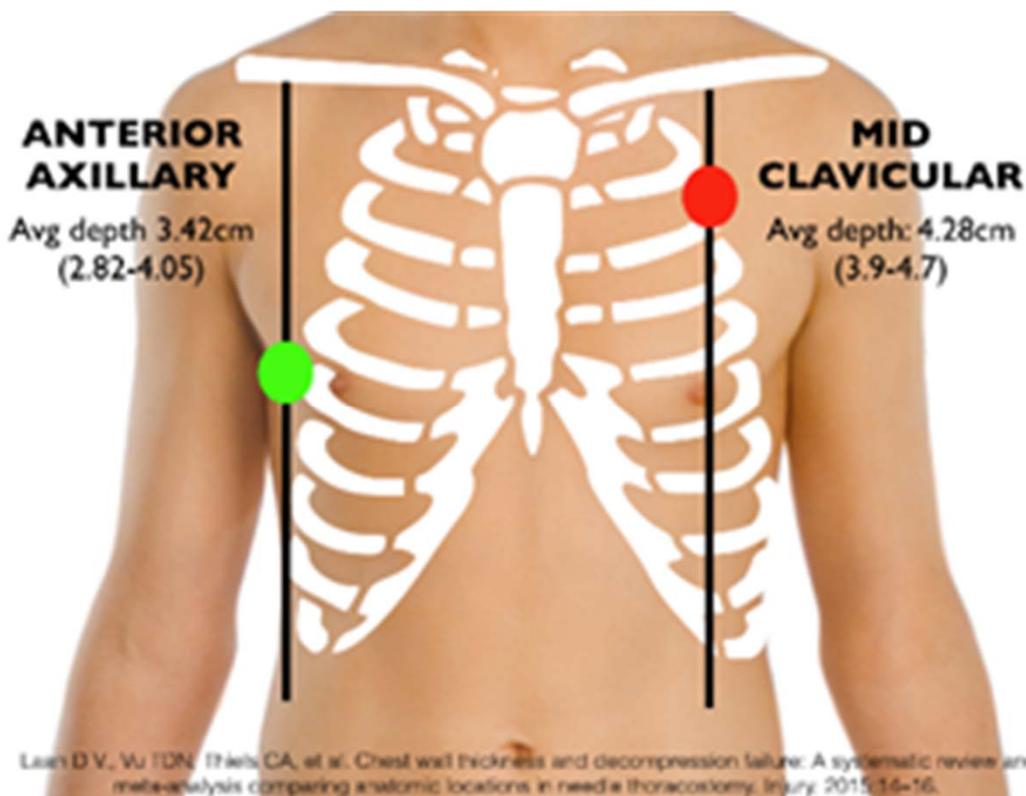
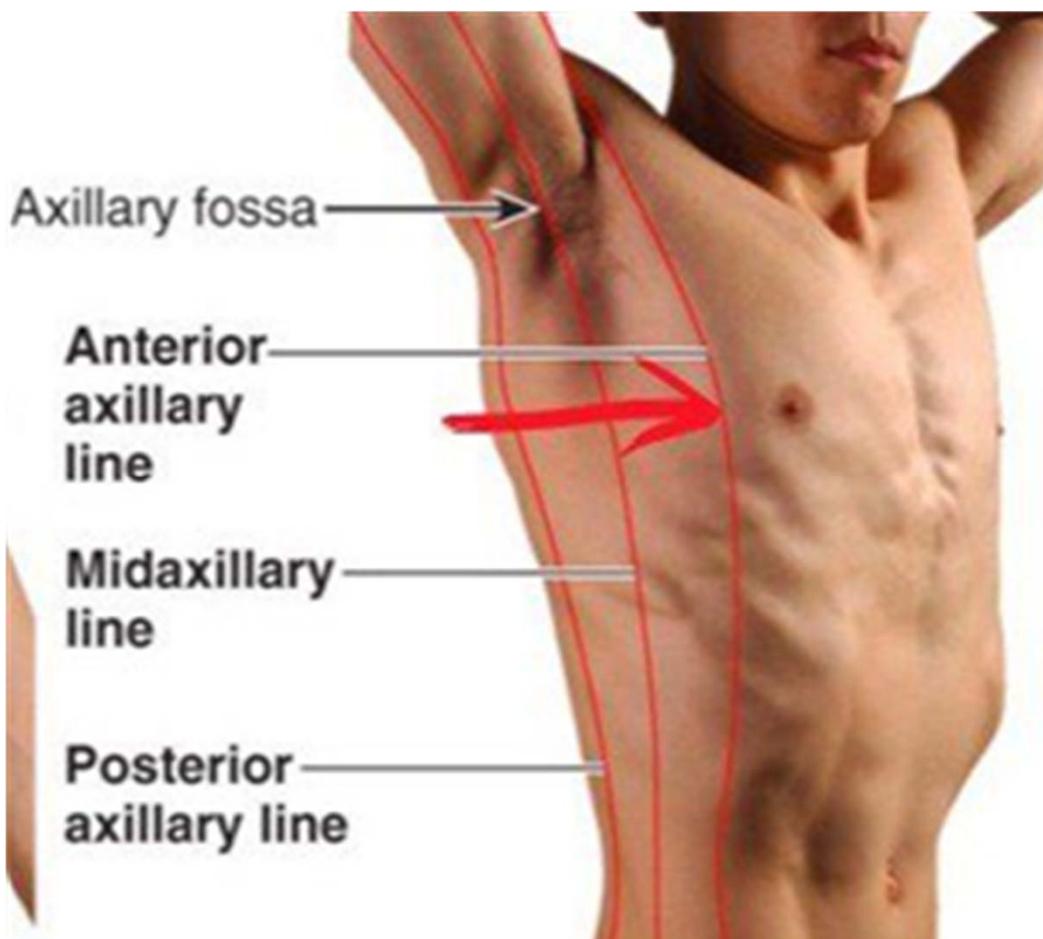
General

EMR

EMT

AEMT

Paramedic



GENERAL CONSIDERATIONS

Continuous Positive Airway Pressure

- A. The use of CPAP has long been recognized as an effective treatment for patients suffering from exacerbation of congestive heart failure and COPD / Asthma. CPAP has recently shown promise in the out-of-hospital setting as well, by demonstrating favorable results in the treatment of acute congestive heart failure.
- B. The use of CPAP for the treatment of patients who might otherwise receive endotracheal intubation holds several benefits:
 - 1. CPAP is a less invasive procedure with lesser risk of infection. This eliminates the possibility for adverse reactions following the administration of any antibiotics given for infection.
 - 2. CPAP eliminates the necessity of wheening the patient off an ET tube and ventilator.
 - 3. CPAP eliminates the necessity of sedating or paralyzing an alert patient by ALS or the emergency department staff in order to perform laryngoscopy.
 - 4. CPAP allows the alert patient to have a continued dialogue with his / her caregivers. This allows for the exchange of additional medical history. It also allows for the patient to be involved in the decision-making process for his/ her care.

INDICATIONS

- A. Respiratory distress or failure, due to pulmonary edema or COPD / Asthma in which the patient demonstrates spontaneous respirations and a patent, self-maintained airway, able to follow commands / instructions.
- B. Patients 12 years of age or older.

CONTRAINDICATIONS

- A. Circumstances in which Endotracheal intubation, supraglottic device or a surgical airway is preferred or necessary to secure a patent airway. (Agonal / Respiratory Arrest)
- B. Circumstances in which the patient does not improve or continues to deteriorate despite CPAP administration.
- C. Suspected pneumothorax.
- D. Shock, SBP less than 90 mmHg.
- E. Nausea/ Vomiting

Steps

Was performed ?

	YES	NO
1. Assure there is a patent airway.	<input type="checkbox"/>	<input type="checkbox"/>
2. Administer 100% oxygen via appropriate delivery system.	<input type="checkbox"/>	<input type="checkbox"/>
3. Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter reading, EtCO2 and cardiac rhythm.	<input type="checkbox"/>	<input type="checkbox"/>
4. Apply CPAP device and start at 5 cmH2O and may titrate up to 10 cmH2O.	<input type="checkbox"/>	<input type="checkbox"/>
5. Continuously reassess the patient.	<input type="checkbox"/>	<input type="checkbox"/>
6. Monitor continuous pulse oximetry.	<input type="checkbox"/>	<input type="checkbox"/>
7. Monitor continuous end tidal carbon dioxide monitoring (with nasal prongs if available).	<input type="checkbox"/>	<input type="checkbox"/>
8. Contact medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel.	<input type="checkbox"/>	<input type="checkbox"/>

Note: For circumstances in which the patient does not improve or continues to deteriorate despite CPAP and/or medicative therapy, terminate CPAP administration and perform BVM ventilation and endotracheal intubation / supraglottic device if necessary.

General

EMR

EMT

AEMT

Paramedic

Cricothyrotomy-Surgical

NOTE: Surgical cricothyroidotomy should be considered an airway of last resort which is considered when the patient cannot be ventilated by any other method including LMA, Combitube and bag-valve-ventilation.

Indications for surgical cricothyroidotomy:

1. Unable to intubate without compromising cervical spine control
2. Unsuccessful nasotracheal or orotracheal intubation attempts where no alternative airway can be established
3. Impacted foreign body
4. Severe facial or laryngeal trauma or significant oropharyngeal hemorrhage
5. Obstructing tumors
6. Burns of face or upper airway precluding intubation
7. Pharyngeal hematomas, usually secondary to cervical spine fractures

Steps

Was performed ?

	YES	NO
1. Palpate hyoid, thyroid notch, cricothyroid interval and sternal notch.	<input type="checkbox"/>	<input type="checkbox"/>
2. If time permits, prep area with Betadine swabs or Hibiclens	<input type="checkbox"/>	<input type="checkbox"/>
3. Stabilize thyroid cartilage with left (or right) and make transverse or vertical skin incision approximately 2.5 cm over lower half of cricothyroid membrane. Carefully incise through the membrane	<input type="checkbox"/>	<input type="checkbox"/>
4. Insert fingertip into trachea, Keep fingertip in trachea until bougie fully inserted into trachea.	<input type="checkbox"/>	<input type="checkbox"/>
5. Insert Gum Elastic Bougie into trachea to appropriate depth and hold in position.	<input type="checkbox"/>	<input type="checkbox"/>
6. Insert an appropriately sized cuffed endotracheal tube or tracheostomy tube over the Gem Elastic Bougie (at least a 6.0 mm endotracheal tube). Insert just past the point that the cuff enters the cricothyroid incision (some tubes have a dark line at this point). Remove Gum Elastic Bougie.	<input type="checkbox"/>	<input type="checkbox"/>
7. Inflate the cuff and ventilate the patient. Apply end-tidal CO ₂ detector	<input type="checkbox"/>	<input type="checkbox"/>

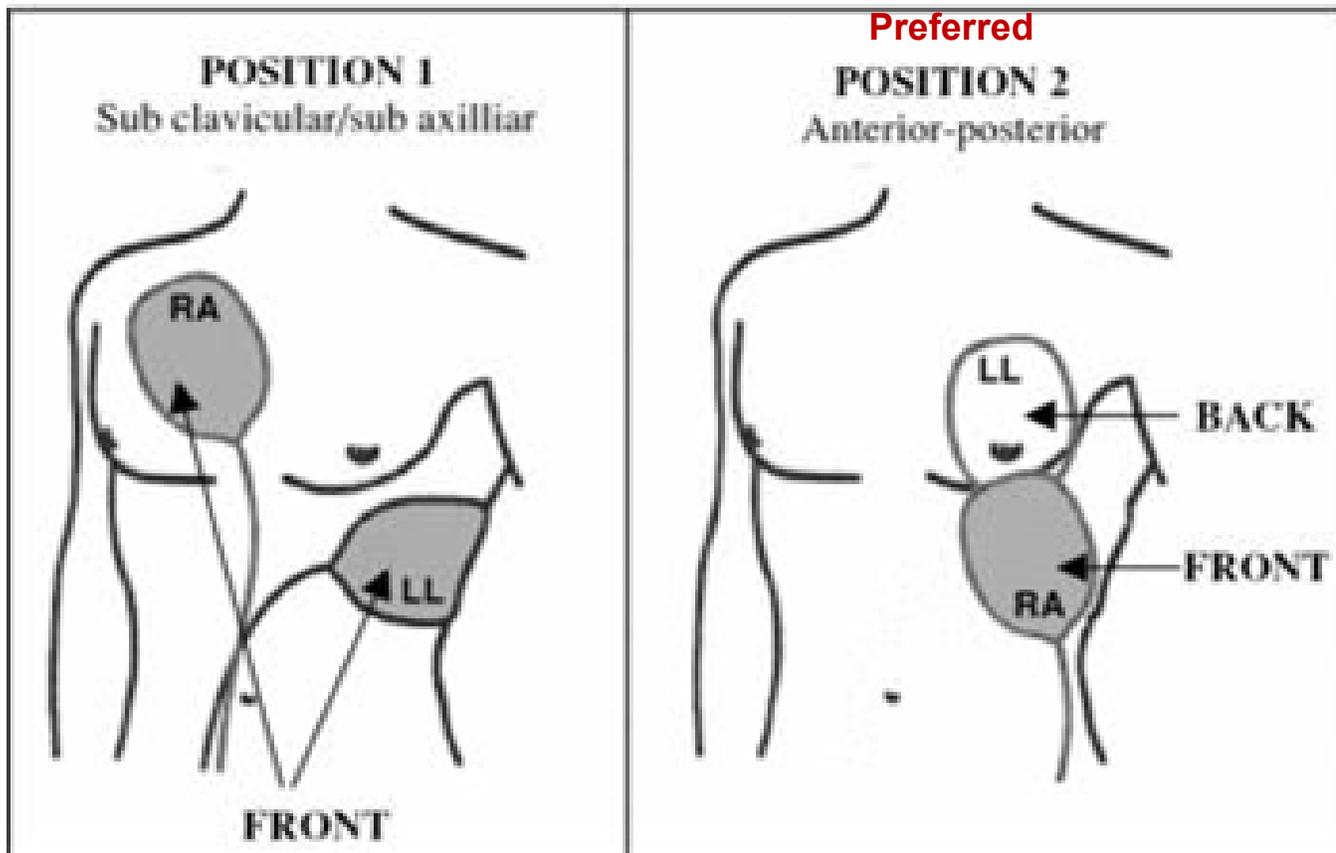
General

EMR

EMT

AEMT

Paramedic

**Notes**

Indications: Defibrillation, External Pacemaker and Cardioversion

AED Mode: EMR and EMT

Manual Defibrillation: AEMT and Paramedic

External Pacemaker and Cardioversion: Paramedic

General

EMR

EMT

AEMT

Paramedic

Equipment needed:

1. Tissue for patient to blow nose
2. Emesis bag to capture run off blood
3. Gloves and mask for provider
4. Cotton balls
5. Medication cup
6. Oxymetazoline bottle
7. Atomizer
8. Clamp for nose

Steps**Was performed ?****Preparation**

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

1. Provide a gown or chuks and tissue paper to the patient to capture the blood.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

2. **DO NOT** use oxymetazoline if diastolic pressure is greater than 110)

Procedure

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

1. Ask the patient to blow their nose to clear all the blood clots from the nasal passage. This will clear the nasal cavity and expose the nasal mucosa so that the medication is more effective.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

2. Position the patient approximately 45 degrees recumbent in the bed/cot.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

3. Place bottle tip within affected nostril.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

4. Briskly compress bottle atomized spray into the affect nostril. Ask them to inhale during the time you spray.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

5. Allow the patient to capture any run off blood and solution.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

6. Repeat in other nostril if it is also bleeding.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

7. Sit the patient back up.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

8. Ask the patient to pinch their nostrils firmly with one hand to reduce blood flow to anterior nose. Alternatively, you can clamp their nose with a pre-made nasal clamp.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

9. Notify personnel at the receiving facility of the time placed. (Suggest removal after 15 minutes)

INDICATION

Endotracheal intubation is to be utilized for any victim with respiratory arrest and/or insufficiency to achieve complete control over the airway. It protects the airway from aspiration of foreign material and it allows for intermittent positive pressure ventilation to be achieved with 100% oxygen. It makes the trachea and the respiratory tract available for suctioning, and also eliminates the problem of gastric distention.

HAZARDS

- A. Esophageal intubation.
- B. Tracheal rupture.
- C. Right mainstem bronchus intubation.
- D. Broken teeth.
- E. Laryngospasms.
- F. Trauma to the oral-pharynx.
- G. Trauma or puncture of trachea due to misplacement of stylet.

Steps

Was performed ?

General

EMR

EMT

AEMT

Paramedic

1. Always begin artificial ventilation as soon as possible using mouth-to-mouth, bag valve-mask or oxygen powered manually triggered ventilation device.

2. Assemble and ready equipment:

- 1. Endotracheal tubes of various sizes
- 2. Laryngoscope and blades
- 3. Malleable stylet
- 4. Magill forceps
- 5. 10cc syringe
- 6. Suction apparatus and catheters
- 7. Water soluble lubricant
- 8. ET tube tape
- 9. Oropharyngeal airway

3. Check cuff on tube for leaks and lubricate tube.

4. Put victim's head in sniffing position. Do not allow the head to hang over the end of the table or bed; the occiput of the head should be on the same horizontal plane as the back of the shoulders, with the neck somewhat elevated.

5. Holding the laryngoscope in the left hand, insert the blade to the right of the midline, moving the tongue up and to the left, with the blade ending up in the midline, giving clear visualization of the glottic opening.

6. Suction the mouth and the pharynx. Visualize the epiglottis and vocal cords.

7. Select the proper size tube and insert in with the right hand, starting at the corner of the mouth down into the trachea, past the vocal cords approximately 2 inches.

8. Remove laryngoscope and stylet (if used), holding the tube securely with the right hand.

9. Attempt to ventilate with mouth-to-tube or bag-valve-mask and check for breath sounds in BOTH lungs.

Steps

Was performed ?

10. If breath sounds are heard, inflate the tube's cuff with 4 - 6 ml of air and secure the tube in place with oropharyngeal airway used as bite block.

11. Initial Confirmation with End Tidal Capnography

12. Maintain ventilation until adequate respirations resume or victim is delivered to an emergency department.

13. Recheck lungs sounds and verify tube placement each time patient is moved or every 10 minutes.

14. Document the intubation by noting the following:

1. Number of attempts.
2. Person(s) making attempts.
3. Size of tube used.
4. Type of laryngoscope blade used on each attempt.
5. Lung sounds before intubation.
6. Lung sounds after intubation and time of each check.
7. Measurement on tube at lips of patient when lung sounds are present.
8. Any complications.

General

EMR

EMT

AEMT

Paramedic

If the patient begins to breathe spontaneously and effectively and is resisting the presence of the tube, removal of the tube may be necessary. The following procedures will be followed:

Steps	Was performed ?		General
Tube Removal			
1. Explain procedure to victim.	<input type="checkbox"/>	<input type="checkbox"/>	EMR
2. Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth and pharynx.	<input type="checkbox"/>	<input type="checkbox"/>	EMT
3. The lungs should be completely inflated so that the patient will initially cough or exhale as the tube is taken from the larynx. This is accomplished in 2 ways: A. The patient is asked to take the deepest breath they possibly can and, at the very peak of the inspiratory effort, the cuff is deflated and the tube removed rapidly; or B. Positive pressure is administered with a hand-held ventilator and, at the end of deep inspiration, the cuff is deflated and the tube rapidly removed.	<input type="checkbox"/>	<input type="checkbox"/>	AEMT
4. Prepare to suction secretions and gastric content if vomiting occurs.	<input type="checkbox"/>	<input type="checkbox"/>	Paramedic
5. Appropriate oxygen is then administered.	<input type="checkbox"/>	<input type="checkbox"/>	
6. The patient's airway is immediately evaluated for signs of obstruction, stridor or difficulty breathing. The patient should be encouraged to take deep breaths and to cough.	<input type="checkbox"/>	<input type="checkbox"/>	
7. The patient is not to be left unattended until there is no doubt of their ability to function without the artificial airway.	<input type="checkbox"/>	<input type="checkbox"/>	

Tube Sizing

The size of tube that can be passed easily into most adults is 8.0 mm (id). Therefore this tube should be tried first on the average adult. The size of tube is judged by the size of the adult, not by age.

For children, the proper tube is usually equal to the size of the child's little finger. The following guide will also help in determining the proper size tube:

Premature.....3mm (id)	18-24 months.....5-6mm (id)
14-24 weeks....4mm (id)	2-4 months.....6mm (id)
6-12 months....4-5mm (id)	4-7 years.....6-7mm (id)
12-18 months....5mm (id)	7-10 years.....7mm (id)

All the above tube sizes are still dependent on the child's size in consideration of age.

Children before puberty should have a cuffless tube, or if the tube has a cuff it should not be inflated after insertion.

In the event an intravenous or intraosseous route for administration of medication cannot be established, but an endotracheal tube has been properly put in place, medications such as Narcan, Atropine, Epinephrine and Lidocaine can effectively be administered through the tube.

EMS personnel under this protocol will use the Emergency Medication Tube "EMT" endotracheal tube for all adult patients needing oral-tracheal intubation. For pediatric patients, personnel will use the "Endo-Ject" adapter and catheter. Both of these systems will allow for the administration of medication in accordance with current guidelines, and allow for simultaneous ventilation and medication administration.

The current guidelines state a catheter should be passed beyond the tip of the endotracheal tube, compressions stopped, and the medication sprayed quickly into the lower airway.

Medications should be administered at two (2) times the IV dosage and diluted with 10 ml of saline or sterile water before administration.

If the "EMT" or "Endo-Ject" is not used, the following procedure should be followed:

1. Remove needle from syringe.
2. Hyperventilate patient and make sure ET tube and airway are clear of mucous.
3. Disconnect ventilation device from tube and squirt medication rapidly into tube.
4. Reconnect ventilation device and rapidly ventilate patient to assure passage of medication down the tube and airway.

SPECIAL NOTE: Do not take longer than 15 seconds to administer medication in order to prevent hypoxia of the patient.

General

EMR

EMT

AEMT

Paramedic

Clinical Indications:

Patients who are prescribed an Epinephrine auto-injector for the treatment of allergic reaction.

EMR

Cautions:

This device is for use by those patients for whom they are prescribed.

Steps

Was performed ?

1. Use body substance isolation procedures.
2. Contact medical control for authorization if possible.
3. Assure medication is prescribed for the patient.
4. Check the expiration date, if medication is outdated, cloudy or discolored, do not administer.
5. Remove the cap and select an injection site (thigh or shoulder).
6. Prep the skin by cleansing with an antibacterial wipe (from center out, in circular motion), if at all possible.
7. Push firmly against the site, holding in place for at least 10 seconds.
8. Properly discard the injector into an approved container.
9. Monitor the patient during transport (vital signs as a minimum; if on an ALS unit, monitor cardiac rhythm).

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

General

EMR

EMT

AEMT

Paramedic

Additional Information:

Selection of the appropriate dosage strength is determined according to a patient's body weight. Each epinephrine auto-injector can deliver one dose of epinephrine in either

0.15 mg or 0.3 mg.

The 0.15 mg dose is for patients who weigh approximately 33-66 pounds (15-30 kilograms).

The 0.3 mg dose is for patients who weigh approximately 66 pounds or greater (30 kilograms or greater).

External Jugular IV

Steps

Was performed ?

YES NO

1. Locate external jugular vein.

2. Cleanse site with Betadine solution and alcohol. (The only time Betadine is not required is when the patient has an allergy to Betadine type solutions.)

3. Select IV catheter.

- On adults, a large bore (16ga or 18ga) may be used.
- Use 2" IV catheter when available.

4. Position yourself at patient's head.

5. Turn patient's head so as to maximally expose vein and minimize interference of jaw.

6. Canulate the vein by directing the needle caudal at an angle nearly parallel to the neck.

7. Attach IV tubing.

8. Secure IV using appropriate measures to insure stability of the line.

9. Check for signs of infiltration.

10. Adjust flow rate.

11. Document IV procedure on runsheet.

General

EMR

EMT

AEMT

Paramedic

INDICATIONS

An external pacemaker may be used in the following situations:

A. Patients with symptomatic bradycardia, unresponsive to Atropine.

NOTE: Depending on the clinical severity of the patient, pacing may be initiated prior to atropine.

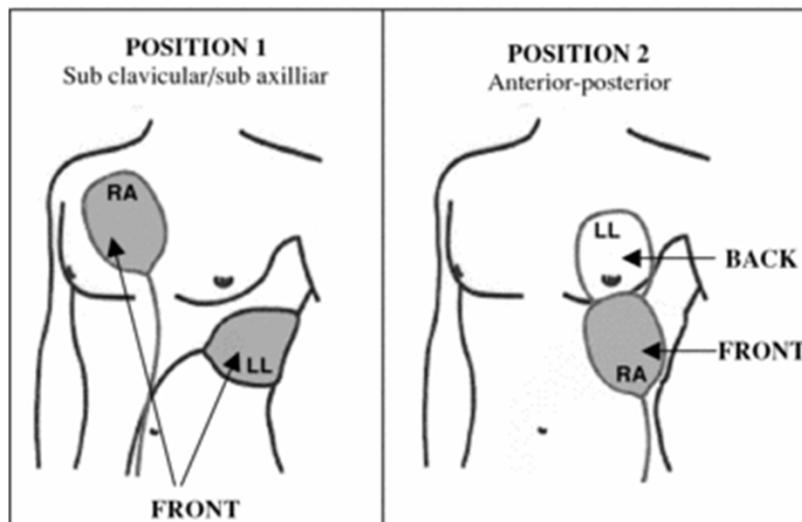
Consider sedation: **Midazolam (Versed)** 2 – 4 mg IV, IM, then in the conscious patient with bradycardia, the rate is to be set at **70 beats per minute** and the current at **20 milliamperes**, which is to be increased by **20 milliamperes** every 10 seconds until complete capture is obtained.

Once complete electrical capture is obtained, check for mechanical capture (pulse).

Use Capnography to assist with mechanical capture confirmation

The external pacemaker is only to be used on pediatric patients with On-line Medical direction.

Nitroglycerine patches are to be removed before pacing.



General

EMR

EMT

AEMT

Paramedic

General Assessment

A. Special assessment needs for patients wearing helmets.

1. Is the helmet impeding the patient's airway or affecting their ability to breath?
2. Is the helmet sized appropriately for the patient? In other words, does the patients head fit snugly inside the helmet or is there room for movement of the head inside the helmet?
3. Does the helmet limit the EMTs access to manage the patient's airway or breathing?

B. Indications for leaving the helmet in place.

1. A good fit with little or no movement of the patient's head within the helmet.
2. No impending airway or breathing problems.
3. Removal of the helmet may cause further injury to the patient.
4. Proper spinal immobilization can be performed with the helmet in place.
5. The helmet does not cause interference with the EMTs ability to assess and reassess airway and breathing.

C. Indications for removing thehelmet.

1. The helmet causes an inability to assess and / or reassess the patient's airway or breathing.
2. The helmet causes an inability to or impedance to properly managing the airway and/ or breathing.
3. It is an improperly fitted helmet that allows for excessive movement of the patients head within the helmet.
4. The helmet will not allow for proper spinal immobilization.
5. The patient is in full cardiac arrest.

D. Types of helmets.

1. Sports - football, lacrosse, hockey, etc.
 - i. Typically open anteriorly
 - ii. Typically allow easier access to the airway.
2. Motorcycle
 - iii. Full face - impede access to the airway.
 - iv. Shield
3. Other recreational helmets - bicycle, skateboard, paintball, etc.

Helmet Removal-Process

Steps

Was performed ?

YES NO

1. If dealing with a football helmet: consider the helmet and shoulder pads as a unit. If the helmet is removed, shoulder pads should also be removed. If the helmet is left on, shoulder pads should also be left on. This is to ensure proper c-spine alignment. Also, regardless of the patient's current condition, anytime a helmet is left in place the faceguard must be removed to allow access to the airway. It is now accepted that the football helmet and shoulder pads should be removed if possible at the scene IF a sports trainer in charge of that player is present to direct the removal procedure.

General

2. Ill-fitting or oblong recreational helmets are typically removed to prevent flexion of the c-spine during immobilization.

EMR

3. The specific technique for removal of a helmet depends on the actual type of helmet worn by the patient.

4. Remove the patient's eyeglasses before removing the helmet.

5. One EMT should stabilize the helmet by placing his hands on either side of the helmet with his fingers on the mandible to prevent movement.

EMT

6. The second EMT loosens the strap.

7. The second EMT places one hand on the mandible at the angle of the jaw and the other hand posteriorly at the occipital region.

8. The EMT holding the helmet pulls the sides of the helmet apart and gently slips the helmet halfway off the patient's head and then stops.

AEMT

9. The EMT managing stabilization of the neck repositions, sliding the posterior hand superiorly to secure the head from falling back after complete helmet removal.

10. The helmet is removed the rest of the way.

Paramedic

11. The EMTs can now proceed with spinal immobilization.

I-gel Supraglottic Airway

Clinical Indications:

EMT can perform

For establishing a patent airway during resuscitation of the unconscious patient in the pre-hospital setting

Contraindications:

- Patients with intact gag reflexes
- Patients with unknown esophageal pathology
- Patients after ingestion of caustic substances
- Central-airway obstruction



General

Steps

Was performed ?

YES NO

1. Assure a patent airway and ventilate with 100% O₂ before attempting placement of any advanced airway. Do NOT hyperventilate the patient. YES NO
2. Monitor SpO₂ with a pulse oximeter and provide 100% O₂ via a BVM. YES NO
3. Select the proper size tube. Assemble and check the necessary equipment. YES NO
4. Lubricate the back, sides and front of the cuff with a thin layer of water soluble lubricant (do not use silicone based). YES NO
5. Grasp the i-Gel firmly along the integral biteblock. Position the device so that the i-Gel cuff outlet is facing towards the chin of the patient. YES NO
6. Patient should be in the "sniffing" position with head extended and neck flexed. The chin should be gently pressed down before proceeding to insert the i-Gel. YES NO
7. Introduce the leading soft tip into the mouth of the patient towards the hard palate. YES NO
8. Glide the tube downward and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt. YES NO
9. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. YES NO
10. The incisors should be resting on the integral bite-block. YES NO
11. Confirm the SGA placement with an end-tidal CO₂ monitoring device and additional confirmation methods such as negative epigastric sounds and positive bilateral breath sounds. YES NO
12. Secure the SGA with tape or commercially available device. YES NO
13. Continually monitor the pulse oximeter and end-tidal CO₂ levels. YES NO
14. Provide ventilations at a rate to keep the ETCO₂ between 35-45 mmHg. YES NO

EMR

EMT

AEMT

Paramedic

I-Gel Size	Patient Size	Patient weight guidance (kg)
Size 1.0	Neonates	2 - 5 kg (5 - 11 lbs.)
Size 1.5	Infants	5 - 12 kg (11 - 25 lbs.)
Size 2.0	Small Pediatrics	10 - 25 kg 22 - 55 lbs.
Size 2.5	Large Pediatrics	25 - 35 kg (55 - 77 lbs.)
Size 3	Small Adults	30 - 60 kg (65 - 130 lbs.)
Size 4	Medium Adults	50 - 90 kg (110 - 200 lbs.)
Size 5	Large Adults	90+ kg (200+ lbs.)



Indications

- Intravenous fluids or medications are urgently needed **and** a peripheral IV cannot be established in 2 attempts or **90** seconds AND the patient exhibits extremis with immediate need for delivery of fluids and/or medications.
- EZ-10 should be considered prior to peripheral IV attempts in the following situation:
- Cardiac Arrest

Contraindications:

Fractured the bone selected for IO Insertion

Excessive tissue at the Insertion site with the absence of anatomical landmarks Previous significant orthopedic procedures (IO with 24 hours, prosthesis, etc.) Infection at the Insertion site

Precautions

THE EZ-10 IS NOT INTENDED FOR PROPHYLACTIC USE.

CONSIDERATIONS**Proximal Humerus IO Site Preferred for ALL IO Insertions on Adult patients.**

PAIN: Insertion of the EZ-IO in unconscious patients has been noted to cause mild to moderate discomfort HOWEVER, IO Infusion for conscious patients has been noted to cause severe discomfort. Prior to IO syringe bolus or continuous infusion in alert patients, SLOWLY (over 1 - 2 minutes) administer preservative free Lidocaine 2% through the EZ-IO hub (ensure patient has no allergies or sensitivity to Lidocaine).

Dosage as follows:

EZ-IO AO-slowly administer **Lidocaine 2%** 40 mg (2 ml cardiac Lidocaine)

EZ-IO PD-slowly administer **Lidocaine 2%** 0.5 mg/kg (to **Maximum 40 mg**)

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.

EZ-IO AD=Rapid syringe bolus with 10 ml NS

EZ-IO PD=Rapid syringe bolus with 5 ml of NS

To improve continuous flow rates, always use a syringe or pressure bag.

EQUIPMENT

EZ-IO driver

EZ-IO AD or EZ IO PD needle set

Alcohol or Betadine swab

EZ-Connect or standard extension set

10 ml syringe

NS

Pressure bag

Lidocaine 2% (preservative free) EZ-IO yellow wristband

Intraosseous Insertion

Steps	Was performed ?		
	YES	NO	
1. Wear approved BSI equipment	<input type="checkbox"/>	<input type="checkbox"/>	General
2. Determine EZ-IO AD or EZ-IO PD Indications	<input type="checkbox"/>	<input type="checkbox"/>	
3. Rule out contraindications	<input type="checkbox"/>	<input type="checkbox"/>	
4. Locate insertion site at proximal tibia or proximal humerus. Proximal Humerous (Preferred IO Site).	<input type="checkbox"/>	<input type="checkbox"/>	EMR
5. Prepare Insertion site using aseptic technique	<input type="checkbox"/>	<input type="checkbox"/>	
6. Prepare EZ-1010 Driver and appropriate needle set	<input type="checkbox"/>	<input type="checkbox"/>	EMT
7. Stabilize the site Insert appropriate needle set	<input type="checkbox"/>	<input type="checkbox"/>	
8. Remove EZ-IO Driver from needle set while stabilizing catheter hub	<input type="checkbox"/>	<input type="checkbox"/>	
9. Remove stylet from catheter, place stylet In sharps container	<input type="checkbox"/>	<input type="checkbox"/>	AEMT
10. Connect primed EI-Connect	<input type="checkbox"/>	<input type="checkbox"/>	
11. Confirm placement	<input type="checkbox"/>	<input type="checkbox"/>	Paramedic
12. Slowly administer 40 mg of Lidocaine 2% to conscious adult patients (0.5 mg/kg in pediatrics Maximum 40 mg)	<input type="checkbox"/>	<input type="checkbox"/>	
13. Syringe bolus (flush) the EZ-IO catheter with the appropriate amount of normal saline	<input type="checkbox"/>	<input type="checkbox"/>	
14. Utilize pressure (pressure bag or syringe bolus) for continuous infusions	<input type="checkbox"/>	<input type="checkbox"/>	
15. Begin infusion	<input type="checkbox"/>	<input type="checkbox"/>	
16. Dress site, secure tubing and apply wristband as directed	<input type="checkbox"/>	<input type="checkbox"/>	
17. Monitor EZ-IO site and patient condition - Remove catheter within 24 hours	<input type="checkbox"/>	<input type="checkbox"/>	

IV Therapy Documentation

ALL IV attempts must be recorded on run sheet and include the following:

Steps

Was performed ?

1. When successful:

- i. Time IV was started.
- ii. Type and amount of solution hung and infused during run.
- iii. Flow rate.
- iv. Size of catheter or needle used.
- v. Location of IV site.
- vi. Initials of all EMTs who attempted and/or started IV.
- vii. Signature of EMT In-charge of run.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

General

2. When unsuccessful:

- i. Time IV was attempted.
- ii. Type of solution.
- iii. Size of catheter or needle used.
- iv. Location of attempted site.
- v. Initials of all EMTs who attempted and/or started IV.
- vi. Signature of EMT In-charge of run.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

EMR

EMT

3. Record all IV medications given.

- i. Name of medication.
- ii. Dosage and amount given.
- iii. Time ordered (if applicable).
- iv. Time given.
- v. Initial of all EMTs who administered medication.
- vi. Signature of EMT In-charge of run.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

AEMT

Paramedic

EMS RESPONSE

- A. It is each agency's responsibility to have a thorough knowledge of their counties Mass Casualty Plan.
- B. It is recognized that when responding to a MCI, issues and situations may require modification to some part or parts of the plan.
- C. WCH EMS squads should utilize the START triage system when triaging the victims of a mass casualty incident.
- D. Upon arrival at a MCI, the first arriving unit should notify their dispatch of the need to implement the Mass Casualty Plan, call for additional resources, establish a safe staging area, and estimate the total number of victims.

NOTIFICATION OF COORDINATING HOSPITAL

Each EMS service has a pre-defined coordinating hospital based on their county's mass casualty plan. It is the responsibility of the responding jurisdiction to notify their appropriate coordinating hospital as soon as possible, giving a brief description of the incident and the estimated number of victims. The coordinating hospital will then notify the receiving hospitals of the MCI. The transportation officer should maintain a constant contact with the coordinating hospital until the scene has been cleared of salvageable victims.

SIMPLE TRIAGE AND RAPID TREATMENT (START)

A In the event of multiple patients, the Simple Triage and Rapid Transport {START} system shall be utilized.

General

EMR

EMT

AEMT

Paramedic

Steps

Was performed ?

YES NO

1. Have all patients who can walk move to a designated and supervised area. These victims will be initially triaged GREEN (minor).

YES NO

2. Begin where you stand and move orderly through the remaining victims, quickly assessing and marking the victims with tags from the Mass Casualty Kit.

YES NO

3. Provide minimal treatment and consider using other victims to assist:
 i. Airway. ii. Bleeding control.

YES NO

4. Steps of assessment in the START system (RPM).

i. Respiration

- 1. None - blacktag.
- 2. Greater than 30 per minute - red tag.
- 3. Less than 30 per minute - go to nextstep

ii. Perfusion (check radial pulse).

- 1. Absent or capillary refill greater than 2 seconds - red tag.
- 2. Present or capillary refill less than 2 seconds - go to next step.

YES NO

iii. Mental status.

- 1. Altered level of consciousness - red tag.
- 2. Can not follow commands - red tag.
- 3. Follows commands - yellow or green tag.

START patient management.

Steps

Was performed ?

In the patient treatment area:

1. Group the patients according to triage tag color.

YES NO

General

2. Maintain the airway and control the C-spine. Ensure adequate airway and provide oxygenation as the patient's condition requires and number of victims and rescuers allows. If the patient's respiratory rate is less than 12 or greater than 24 per minute, ventilate with 100% oxygen using a bag-valve-mask.

YES NO

EMR

3. Obtain incident history.

1. Mechanism of injury.
2. Integrity of vehicle if applicable.
3. Ballistic or blast information if applicable.
4. Loss of consciousness.

YES NO

EMT

4. Perform initial assessment (primary survey).

YES NO

5. Evaluate patients for "Load and Go" conditions:

1. Uncorrectable airway obstruction.
2. Tension pneumothorax.
3. Pericardial tamponade.
4. Penetrating chest wounds with shock.
5. Hemothorax with shock.
6. Head trauma with unilaterally dilated pupils.
7. Head trauma with rapidly deteriorating condition.
8. Unconsciousness.

YES NO

AEMT

6. Treat life threatening problems only.

YES NO

Paramedic

7. Re-triage (re-tag) as necessary or as patient condition changes.

YES NO

General Considerations

This method of medication delivery is only an option when specified in any given section of the protocol. The only medications that may be administered via the intranasal route are specified in the protocol.

Contraindications

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

- Facial trauma.
- Epistaxis (nose bleed) except for Afrin for the treatment of Epistaxis
- Nasal congestion or discharge.
- Any recognized nasal mucosal abnormality.

Steps

Was performed ?

YES NO

1. Prepare the equipment.

 YES NO

2. Check the medication for proper name, expiration date, vial integrity, and color and clarity

 YES NO

3. Draw the medication into the syringe.

- **Maximum adult administration: 1 ml per nostril.**
- **Maximum pediatric (< 10 years old) administration: 0.5 ml per nostril.**

 YES NO

4. Expel all of the air from the syringe.

 YES NO

5. Securely attach the mucosal atomizer to the syringe.

 YES NO

6. The patient should be in a recumbent or supine position. If the patient is sitting, compress the nares after administration.

 YES NO

7. Briskly compress the syringe plunger to properly atomize the medication.

 YES NO

8. Monitor the patient.

 YES NO

General

EMR

EMT

AEMT

Paramedic

MEDICATION APPROVED FOR IN USE:

1. Narcan
2. Versed
3. Fentanyl
4. Glucagon
5. Afrin (nose bleed)
6. Ketamine

General Considerations

- A. Patient situations with suspected blood/ fluid loss/ dehydration.
- B. Patients > 8 years of age: or patients larger than the Broselow tape

Steps

Was performed ?

YES NO

1. Assess the need for orthostatics.	<input type="checkbox"/>	<input type="checkbox"/>
2. Obtain patient's pulse and blood pressure while supine.	<input type="checkbox"/>	<input type="checkbox"/>
3. Have the patient stand for one minute.	<input type="checkbox"/>	<input type="checkbox"/>
4. Obtain patient's pulse and blood pressure while standing	<input type="checkbox"/>	<input type="checkbox"/>
5. If pulse has increased by 30 BPM S2,Lsystolic blood pressure decreased by 30 mmHg, the orthostatics are considered positive.	<input type="checkbox"/>	<input type="checkbox"/>
6. If the patient has an increase in dizziness, weakness, nausea, or other symptoms prior to standing for the whole minute stop the test. An increase or worsening of the symptoms is considered a positive test result. It is not necessary and not recommended to have these patients continue standing.	<input type="checkbox"/>	<input type="checkbox"/>
7. If patient is unable to stand, orthostatics may be taken while the patient is sitting with feet dangling	<input type="checkbox"/>	<input type="checkbox"/>
8. If positive orthostatic changes occur while sitting, DO NOT continue to the standing position.	<input type="checkbox"/>	<input type="checkbox"/>
9. Document the time and vital signs for supine and standing positions on/with the patient care report (PCR).	<input type="checkbox"/>	<input type="checkbox"/>
10. Determine appropriate treatment based on protocol.	<input type="checkbox"/>	<input type="checkbox"/>

General

EMR

EMT

AEMT

Paramedic

Adult / Pediatric ≤ 34 kg (75 lbs.)

Indications:

High risk mechanism with:

- Pelvic, low back or groin pain and SBP < 90 mmHg or pediatric age specific hypotension

Application:

- Possible Pelvic / Hip Fracture (Stabilization only)
- Identify greater trochanters
- Place sheet or binder under the patient with center at the level of the greater trochanter
- Tighten per manufacturer instruction. With sheet binder, tighten by twisting and secure to maintain tension

Contraindications:

- Isolated neck or femur fracture
- Suspected traumatic hip dislocation

NOTES

Assess for distal pulse before and after application

Pelvic fractures are associated with high risk mechanisms of injury, including:

- Motor vehicle collisions – especially if the patient was in the front seat with a head-on or there was a lateral impact on the patient side
- Auto vs pedestrian accidents
- Motorcycle collisions
- Fall from heights

Patients > 65 have a greater likelihood of pelvic fractures even with low energy mechanism

Possible signs and symptoms of a pelvic fracture:

- Any pain at pelvis or lower back/groin/hips
 - DO NOT rock or “spring” the pelvis
 - Use scoop of multi-person lift when moving
- Hypotension, bruising or swelling over bony prominences, pubis, perineum or scrotum
- Leg length discrepancies/rotations
- Wounds over the pelvis, bleeding from the rectum, vagina or urethra



General

EMR

EMT

AEMT

Paramedic

General Considerations

IVs will be started by the EMT-Intermediate and/or the Paramedic as allowed by each patient care Protocol. IV placement must not delay transport of any critical patient involved in trauma.

Generally, no more than two (2) attempts or more than five minutes should be spent attempting an IV. If unable to initiate IV line, transport patient and notify hospital IV was not able to be started.

IVs may be started on patients of any age providing there are adequate veins and patient's condition warrants an IV.

IV Solution

0.9% Sodium Chloride will be the only fluid used in the pre-hospital setting under this protocol. Sodium Chloride solution is provided in 500 ml bags and 3cc syringes for TKO IVs and 1,000 ml bag for fluid replacement.

The solution is to be infused as directed by specific treatment protocols.

IV Tubings

The following tubing will be used for this protocol:

- A. **For all adult fluid lines**, use regular administration set (10 drop) tubing.
- B. **For child and infant patients**, use 10 drop set with 3-way stopcock and extension tubing.
- C. **For all patients needing TKO lines**, use extension tubing with pre-pierced adapter as saline lock.

Steps

Was performed ?

YES NO

1. Prepare equipment.	<input type="checkbox"/>	<input type="checkbox"/>
2. The initial attempt should be the dorsum of hand. Further attempts should proceed to the forearm; do not use the antecubital fossa unless necessary. Apply tourniquet.	<input type="checkbox"/>	<input type="checkbox"/>
3. Cleanse site with Betadine solution and alcohol. (The only time Betadine is not required is when the patient has and allergy to Betadine type solutions.	<input type="checkbox"/>	<input type="checkbox"/>
4. First attempt at insertion on an adult patient should be With appropriately sized IV Catheter	<input type="checkbox"/>	<input type="checkbox"/>
5. Canulate the vein checking for a flash and proper filling of the vacuum portion of the needle	<input type="checkbox"/>	<input type="checkbox"/>
6. Attach IV tubing. Secure IV using appropriate measures to insure stability of the line.	<input type="checkbox"/>	<input type="checkbox"/>
7. Check for signs of infiltration. Adjust flow rate.	<input type="checkbox"/>	<input type="checkbox"/>
8. Document IV procedure on run sheet.	<input type="checkbox"/>	<input type="checkbox"/>

General

EMR

EMT

AEMT

Paramedic

General Considerations

Pulse oximetry is used in conjunction with other assessment processes to determine the actual available oxygen in the blood for use by body tissue. Pulse oximetry measures the oxygen saturation of the red blood cells, (%SpO₂). Studies have shown that EMS personnel are fairly accurate in the assessment and treatment of patients in profound hypoxia. However in mild to moderate hypoxic states, EMS personnel sometimes do not react until the patient has progressed to profound hypoxia. Signs of progressive hypoxia need to be identified rapidly and the condition treated before profound hypoxia occurs.

Use of pulse oximetry in conjunction with other assessment processes may sometimes identify those patients in mild to moderate hypoxia, and with proper intervention profound hypoxia can be prevented.

If available, pulse oximetry should be used on all patients. Pulse oximetry should be maintained and evaluated until the patient is delivered to the Emergency Department.

REMEMBER, INITIATE NORMAL AIRWAY AND OXYGENATION SUPPORT REGARDLESS OF THE AVAILABILITY OF PULSE OXIMETRY.

NEVER BASE ANY TREATMENT OR OXYGEN THERAPY SOLELY ON THE READING FROM THE PULSE OXIMETER.

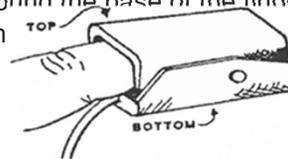
Steps

Was performed ?

YES NO

1. Finger Clip Sensors - These are designed for spot-check monitoring of older pediatric and adult patients and/or continuous monitoring less than 30 minutes where patient movement is not expected.

- a. Insert finger (preferably left or right index finger) completely into sensor, keeping fingernail side facing the sensor top. It is specifically recommended that the thumb not be used in the finger clip sensor.
- b. For best results when using the finger clip in longer term monitoring or with active patients, secure the sensor cable independently from the sensor, preferably around the base of the finger. Make sure blood supply to the finger is not impaired by the application



2. Flex Sensor - This sensor is designed for monitoring pediatric and adult patients in whom moderate patient movement is expected.

- a. Position the sensor on the top and bottom of the end of the finger or toe. Place the light emitter portion on the finger/toe-nail side and the detector of the side opposite of the nail, making sure to align the emitter and detector through the tissue.
- b. Secure the sensor with 3M Micropore tape, making sure not to restrict blood flow. Attach the sensor cable independently at the base of the finger, again being careful not to restrict blood flow.



General

EMR

EMT

AEMT

Paramedic

Steps

Was performed ?

YES NO

3. Infant and Neonatal Sensors - These sensors are designed for continuous monitoring of infants and neonates since fingertip monitoring is impractical.
- a. The infant sensor is designed for application on the big toe of infants greater than 2 kilograms (5 pounds).
 - b. The neonatal sensor is designed for application on the foot of infants less than 2 kilograms in weight.
- Apply and secure these sensors as described for the flex sensor, being sure not to restrict blood supply to the monitored area.



4. Ear Clip Sensor - This sensor is used when finger clip sensing is not possible. Be sure to clean the ear lobe with alcohol before applying the sensor. Be aware pierced ears may allow some light to pass directly to the detector and result in an inaccurate reading.

5. Reflectance Sensor - This sensor is used on well vascularized skin surfaces in adult patients only. This method is not preferred in the pre-hospital setting.

6. Turn oximeter on and verify operation according to manufacturer's operating procedure.

7. A relative operation check can be achieved by applying the sensor to your own finger.

8. Always cleanse sensor site of blood and dirt for reliable reading. Some fingernail polishes may have to be removed to obtain a reading.

9. Apply sensor to patient and obtain reading. Interpretation of Reading:

100% to 96% Ideal Range - Maintain oxygen and airway support methods being used

95% to 90% Mild to Moderate Hypoxemia - Check airway and increase oxygen support until ideal range is achieved.

89% to 85% Severe Hypoxemia -Aggressive airway and oxygen support is essential Look for and treat cause: i.e. COPD, metabolic imbalance, peripheral vascular shutdown.

Below 85% BE PREPARED TO INTUBATE AND/OR ASSIST VENTILATION.

General

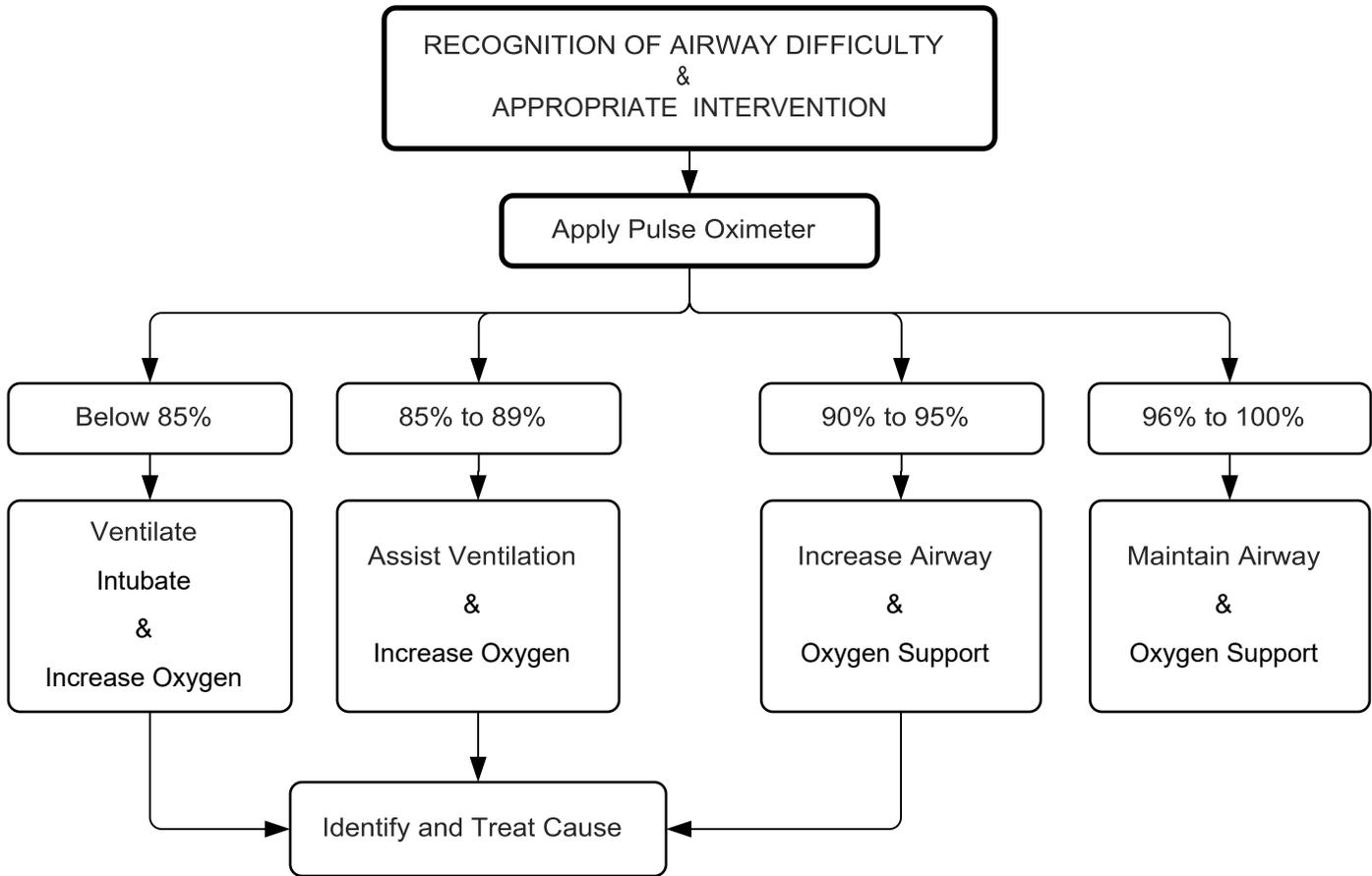
EMR

EMT

AEMT

Paramedic

See: [Pulse Oximeter Chart](#)



General

EMR

EMT

AEMT

Paramedic

Considerations:

- A. Hypovolemic, hypothermic, and peripheral vascular disease patients may not be suitable candidates for pulse oximetry due to peripheral shutdown.
- B. Be aware that there may be a 30 to 60 second delay between changes in %SpO₂ conditions and pulse oximetry readings.
- C. A pulse must be detected by the oximeter to determine the %SpO₂
- D. Pulse oximetry is not indicated in carbon monoxide poisoning.
- E. COPD patients will normally have a low %SpO and should not be treated in accordance with this guideline

The ResQPOD Circulatory Enhancer is a device for enhancing blood circulation in patients who require cardiopulmonary resuscitation.

Steps

Was performed ?

1. Attach the ResQPOD Circulatory Enhancer:
 - Secure the unit directly to the face mask with a strap or with two-handed mask seal. Or
 - Secure the unit directly to the airway tube. {If an electronic EtCO2 monitoring device is used, place that device's tubing after the ResQPOD Circulatory Enhancer is placed.}
2. Attach a bag-valve-mask with high flow oxygen.
3. Slide the "timing assist light" switch to the "on" position.
4. Administer ventilation timed with the flashing light.
5. Discontinue use of the ResQPOD Circulatory Enhancer when there is a return of spontaneous circulation.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

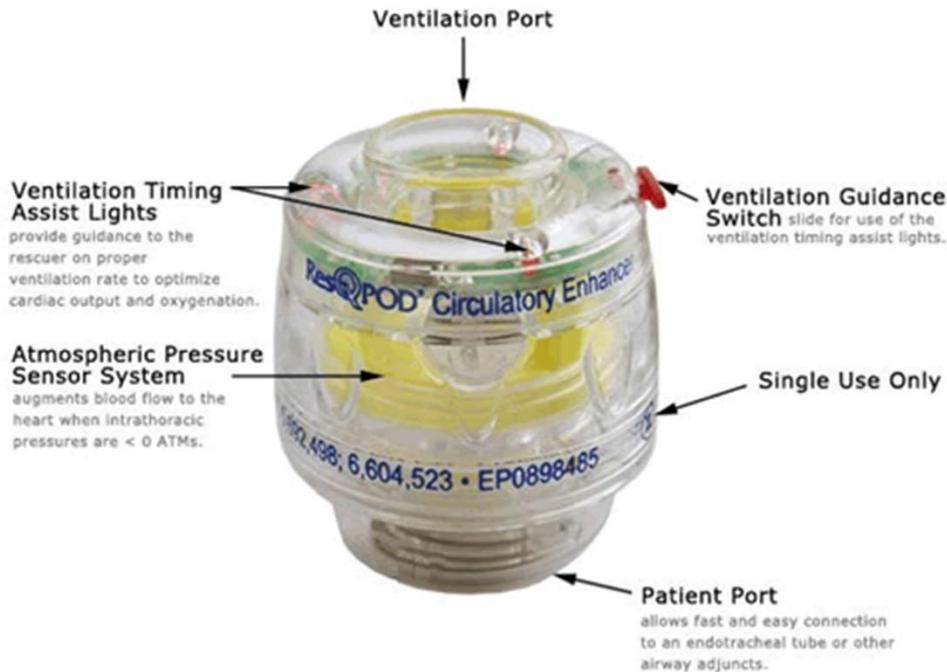
General

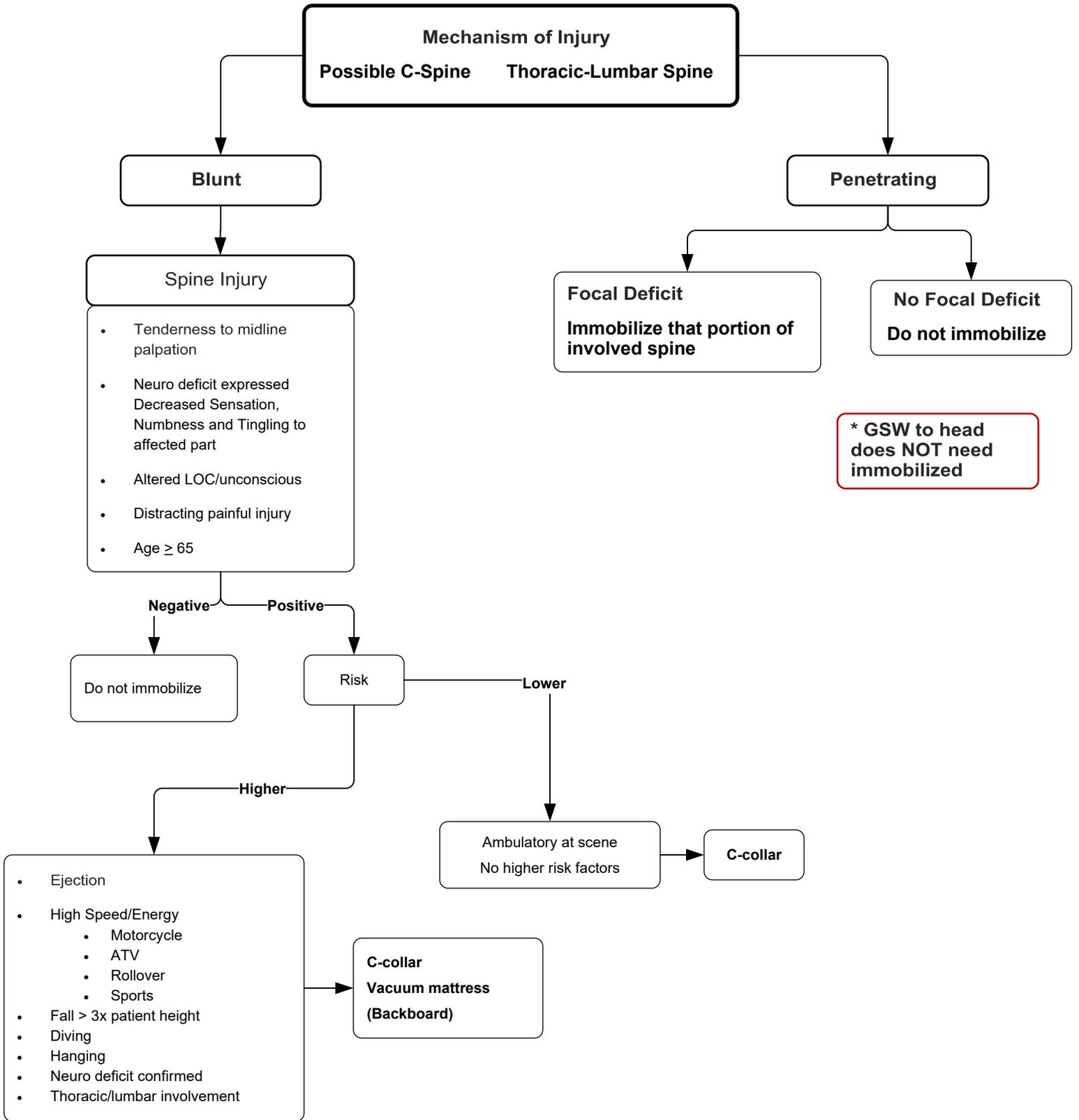
EMR

EMT

AEMT

Paramedic





Steps

Was performed ?

YES NO

With the increased use and deployment of TASERs by our area's local law enforcement agencies, EMS Providers must be aware of the appropriate medical assessment of the tasered patient. The TASER is designed to transmit electrical impulses that temporarily disrupt the body's central nervous system. Its Electro-Muscular Disruption (EMD) Technology causes an uncontrollable contraction of the muscle tissue, allowing the TASER to physically debilitate a target regardless of pain tolerance or mental focus.

General

When assessing a patient who has been "hit" with a TASER, EMS evaluation shall include:

1. Possible underlying medical condition for aggressive/ agitated behavior.
2. The presence of any injuries sustained from falling after being "tasered".
3. Any injuries from the barb of the TASER, or injuries from the removal of the barb.
4. Be aware of and suspect injury in the following at risk patient's:
 - a. The elderly
 - b. Pregnant women
 - c. Patients with known heart disease
 - d. Patients with a pacemaker or AICD
5. Be aware of and suspect injury with high risk barb strikes to the following areas:
 - a. Eye
 - b. Open mouth
 - c. Neck
 - d. Genitals
 - e. Large blood vessels in thegroin
6. Always apply the cardiac monitor and obtain a strip for patients with irregular/ abnormal pulse, elderly, pacer, AICD, known CAD.

EMR

Not all tasered patients need to be transported. Those that should be transported are:

1. Patients from the at riskgroup.
2. Patients with a at risk barb strike.
3. Patients with significant underlying predisposing medical condition.
4. Patients who sustained a significant injury from fall.
5. If you are unable to remove the barb.
6. If the patients has an abnormal monitor strip (when indicated).

AEMT

These patients require:

1. Medical attention for their specificproblem(s)
2. Cardiac monitor (when indicated as above)
3. Transport

Paramedic

Otherwise, patients may be treated at the scene and released with:

1. Local wound care
2. Tetanus immunization inquiry andrecommendation
3. TASER barbs that do penetrate the skin and are removed in the field are to be treated as "contaminated sharps" and are to be placed in an appropriate "red box" sharps container. Use small single use containers as law enforcement may wish to hold custody of the barbs after removal.
4. Appropriate documentation of medical assessment and release to custody of given law enforcement agency.

An important consideration for EMS in the pre-hospital management of the extremely combative patient is the condition known as Excited Delirium. These patients are generally extremely agitated and present with bizarre and potentially violent behavior. A stereotypical case would be the middle aged male who after stripping naked is a bloody mess from breaking out all of the windows in his house and is now running through traffic or wandering aimlessly in an unusual location. Law enforcement officers are often called upon to confront and control these patients and some of them may fall victim to a phenomenon known as sudden, unexpected in-custody death. Many standard law enforcement techniques have taken the blame for these deaths over the years, including pepper spray, post restraint prone positioning, and most recently, the TASER.

With that in mind, when EMS is called to evaluate a patient that has been subdued with a TASER, your primary reason for evaluating the patient is to consider underlying conditions (such as Excited Delirium) that led up to the TASER device needing to be applied and not just because of the TASER "hit" itself.

The components of Excited Delirium are:

- Bizarre behavior
- Nonsensical speech
- Constant motion
- Paranoia
- Attraction to shiny objects /lights
- Superhuman strength
- Decreased pain sensation
- Hyperthermia

It is not unusual for an Excited Delirium patient, once they are subdued, to exhibit difficulty breathing, hyperthermia, unresponsiveness, or other signs and symptoms of a medical emergency. Without prompt intervention and treatment, a certain number of these patients may progress to sudden, unexpected in custody death.

The current explanatory theories behind these deaths and the things EMS providers need to be aware of are:

1. Underlying health problems:
Underlying health conditions put the patient at an increased risk of sudden death after such extreme exertion.
2. Illicit stimulant intoxication:
Long term abuse and/or severe overdose of illicit stimulants such as cocaine or methamphetamine seem to predispose the patient to Excited Delirium type behavior and can lead to metabolic acidosis.
3. Metabolic acidosis:
These patients tend to be functioning at a very high metabolic state. This can cause an un-survivable metabolic acidosis.
4. Hyperpyrexia:
These patients tend to have an elevated body temperature.
5. Psychiatric illness:
Certain psychiatric illnesses or conditions can lead to a hyper-manic state and again cause metabolic acidosis.
6. Ventilation problems:
The primary means by which the body corrects metabolic acidosis is through ventilation. It is debatable, but many believe that certain restraint devices or positions limit adequate ventilation and may exacerbate metabolic acidosis.

Patients who are in a state of Excited Delirium are at risk for sudden death and require medical intervention. Be prepared to support ventilation and resuscitate. If the patient requires further sedation, know that the physical restraint policy alone can intensify the patient's condition and the use of Haldol may result in seizures and should not be used. Therefore, Versed is the drug of choice for sedation / restraint of the Excited Delirium patient.

Patients who are potentially in a state of Excited Delirium should be transported expediently to an ER for evaluation and treatment by a physician.

Assessment and Treatment

Assessment will involve ascertaining why the person was "hit" with the TASER in the first place. A detailed interview with both the patient and the officers on scene is necessary as patients may be under the influence of drugs or have psychiatric problems. It is important for the EMTs to determine the individual's mental status before he or she was stunned, taking into account the usual causes of altered mental status such as hypoglycemia, drug use, or pre-existing head injury. Trauma assessment should involve a careful examination of the head and neck. If the individual has any pain, or reports striking their head or back during the fall, proper C-spine precautions should be employed.

"Barbs can be safely removed just by pulling back on them," says Mark Johnson, government affairs manager for TASER International, Inc. "The barbs are simply a number eight Eagle Claw fishhook, which is not bent." Local protocols however will dictate whether these barbs can be removed in the field. TASER will be releasing a CD on barb removal by the end of the summer. Additional information can be obtained from the company's website (www.taser.com) or by e-mailing Johnson (mark@taser.com).

Tourniquet

EMR

Indications:

- Life-threatening hemorrhage from an extremity that cannot be controlled by direct pressure and elevation.

Steps

Was performed ?

	YES	NO	General	EMR	EMT	AEMT	Paramedic
1. Apply tourniquet directly to the skin proximal to the area of bleeding.	<input type="checkbox"/>	<input type="checkbox"/>					
2. Secure the tourniquet in place.	<input type="checkbox"/>	<input type="checkbox"/>					
3. Continue to tighten the tourniquet until hemorrhage is controlled – avoid “over-tightening” the tourniquet.	<input type="checkbox"/>	<input type="checkbox"/>					
4. Note the time the tourniquet was applied in the Patient Care Report.	<input type="checkbox"/>	<input type="checkbox"/>					
5. Notify the receiving hospital that a tourniquet is in place.	<input type="checkbox"/>	<input type="checkbox"/>					

Wound Care/Bleeding Control

Clinical Indications:

- Active bleeding

EMR

Steps

Was performed ?

YES NO

<p>1. Use personal protective equipment, including gloves, gown, and mask as indicated.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>2. Observe for and control obvious bleeding. Evaluate and treat all life threatening injuries first.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>3. Bleeding control by:</p> <ol style="list-style-type: none"> 1. Direct Pressure/Elevation 2. If not successful, tourniquet 3. Pack with QuikClot LE Hemostatic gauze for cavity wounds of axilla, groin, clavicle and neck. 	<input type="checkbox"/>	<input type="checkbox"/>
<p>4. Uncontrolled bleeding: Assess for life threatening injuries and resuscitate if necessary. If tourniquet necessary see: Tourniquet Application Watch for signs and symptoms of hypoperfusion</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5. Obtain history:</p> <ul style="list-style-type: none"> Time of Injury Area of occurrence (risk of infection) Mechanism of injury (associated injuries) Amount of blood loss Severity of pain Patient's medical history Tetanus immunization 	<input type="checkbox"/>	<input type="checkbox"/>
<p>6. Wound Care: For cavity producing wounds of non compressible areas such as the axilla, groin, clavicle or neck, pack the wound using QuikClot LE Hemostatic Gauze.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>7. Further Evaluation & Care: Many times open wounds need further evaluation and care by a physician. Including the following: Neural, muscular, or vascular Tendon or ligament compromise Contamination Foreign bodies Medical history-especially patients with diabetes and other vascular problems</p>	<input type="checkbox"/>	<input type="checkbox"/>

General

EMR

EMT

AEMT

Paramedic

Protocol Changes 3/20/2020

Preface

General Requirements Added PHTLS Certification (every 4 years) & ASLS Certification (every 4 years)

ADULT

Assessment

Adult Universal Care Added “Shock Index” information box

Behavioral

Agitated/Violent Patient Part B Moved "Dissociative Agents" up and in bold in place of

Secondary Medication

Cardiovascular

Cardiac Arrest Part A: Defibrillation box, Added link to “Defibrillation-Pad Placement”

Cardiac Arrest Part B: Added “ASAP” in bold letters above Epinephrine 1:10,000 5th box, Added Next to Advanced airway placement: Preferred Airway (highlighted lettering)

Cardiac Arrest-Notes Part A: Added Humoral IO Placement preferred

Chest Pain (ACS/STEMI): Morphine removed from page.

Hypotension/Shock (Non-Trauma) Part A: Added information box with “Unstable signs”

Tachycardia w/Pulse-Wide Complex Added information box with “Unstable signs”.

Removed Adenosine and added Cardioversion.

Endocrine

Hypoglycemia/Hyperglycemia Dextrose medication box. Moved Dextrose 10% & Dextrose 7.5% above Dextrose 50% and added “preferred”.

General

Adult IV/IO: Peripheral IV box, removed “unless patient is critical”

Adult Pain Control Merged medication boxes (Fentanyl, Ketorlac, Morphine & Ketamine) into one.

Emerging Infectious Disease: New page added

Renal Patient: Removed information box top left corner, referencing accessing patient shunt only if in full arrest.

Renal Dialysis: Added EMT Red Box: “Consider Tourniquet if bleeding is uncontrollable by direct pressure”.

Respiratory

Drug Assisted Intubation: New page added

Drug Assisted Intubation Checklist: New page added

Trauma

Adult Trauma Management: Added, Tranexamic Acid (TXA)

Crushing Trauma: Ketamine (Ketalar) new medication added

Traumatic Cardiac Arrest: New page added

PEDIATRIC

Pediatric Cardiac Arrest Part A: Added new box at bottom of page referencing “effectiveness of chest compressions decreases with any movements.....”

PHARMACOLOGY

Medication List: Added, Etomidate (Amidate) & Tranexamic Acid (TXA)

Albuterol (Proventil): Added EMT can administer if patient is prescribed medication (in red)

Dextrose 10%: Adult dose changed to, “Administer 150 ml check BGL. If <60mg/dL give rest of D10”

Epinephrine 1:1,000: Added, “EMT can administer Medication Auto Injector ONLY (in red)”

Fentanyl (Sublimaze): Added, Drug Assisted Intubation
Added, Post Intubation Sedation: 50 – 100 mcg every 5-10 min. Max. Total 200 mcg

Ketamine (Ketalar): Added, Drug Assisted Intubation
Added Intubation Sedation: 2mg/kg slow IVP (Max 200mg) over one min. or 4 mg/kg IM (Max. 500 mg)

Midazolam (Versed): Added, Drug Assisted Intubation
Added, Intubation Sedation: 0.3 mg/kg IVP up to Max dose 30 mg

Morphine: Removed Indication “Chest Pain (ACS/STEMI)” and dosing for Chest Pain

GUIDELINES

Discontinuation of Resuscitation: Removed under “No evidence or suspicion of any of the following: “Drug/Toxin overdose, Active internal bleeding, & Preceding trauma”

Added, Once preceding items are achieved contact medical control for discontinuation of resuscitation

PROCEDURES

Chest Decompression: #1. 14 or 16 gauge changed to 10 – 14 gauge.

Added, “Preferred 1. Fourth Intercostal space between fourth and fifth rib,
Anterior Axillary”

Chest Decompression-Images: New images added

Cricothyrotomy-Needle: Page removed

Cricothyrotomy-Quicktrach: Page removed

Defibrillation-Pad Placement: New page added

EMS Blood Draw: New page added

External Pacemaker: Added, Anterior/Posterior Pad Placement images

Intraosseous Information: Add: Proximal Humerus IO Site Preferred for ALL IO
Insertions on Adult patients

Peripheral IV: Removed sentence above “IV Solution”, “Blood draws for hospital
laboratory testing will not be required under this protocol”

Pelvic Binder Application: New page added

ResQPOD: Removed sentence at bottom of first step, “That is-place the ResQPOD
between the BVM and the EtCO2 detector”

Wound Care/Bleeding Control: Removed Ketamine (Ketalar) from page.

Protocol Changes 3/23/2020

Emerging Infectious Disease: Added, call Wooster Community Hospital ED, and
changed phone number that was listed.

Capnography

Considered the ventilation vital sign

Capnography gives a true accurate picture of ventilation status frequently before patient symptoms are recognized by health care providers.

Gives objective data regarding clinical course of management and treatment

Arterial blood gas CO₂ has a normal range of 35 – 45.

EtCO₂ will normally be within 0 – 5 mm of ABG CO₂ value

ETCO₂ can be used to estimate ABG PaCO₂

Elevated ETCO₂ = Hypoventilation / ROSC / increased metabolism

Decreases ETCO₂ = Hyperventilation / decreased metabolism

Prehospital Airway

- *Intubated Patients*
 - Maintains Airway Presence during transport and patient movement
 - Quality of Ventilation
 - Early notification of problems or ROSC
 - Advantages to head trauma patients by maintaining ventilation rates in head injured patients
- *Non Intubated Patients*
 - Assesses ventilation status in patients with respiratory distress
 - Shows bronchodilator effectiveness
 - Indicates patients ventilation rate
 - Diabetics patients
- *The diagnostic element of CO₂ is in the waveform not in the numeric value!!!*

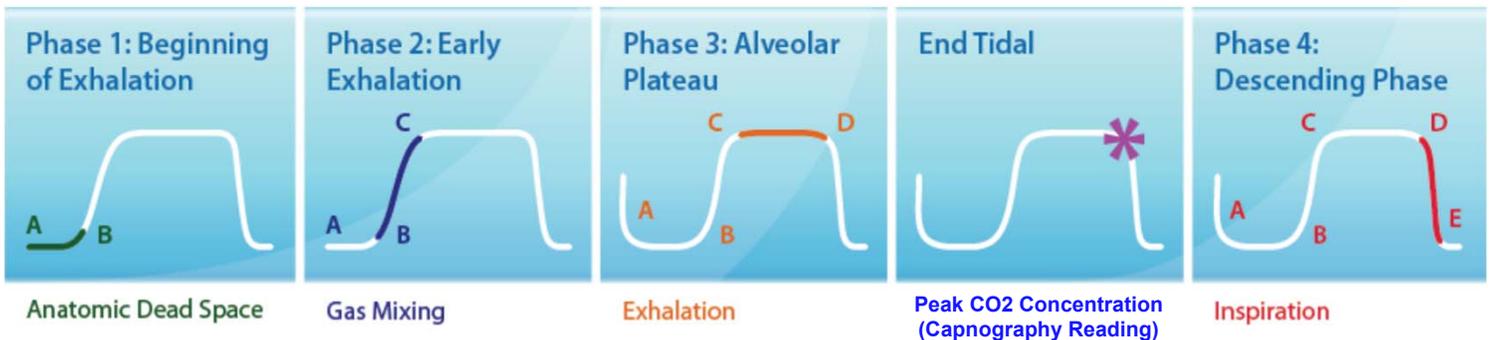
False Positives Possible?

After recent ingestions of a carbon beverages or alcohol, this can give a false positive EtCO₂ for 2 – 3 ventilated breaths.

Several ventilations should wash out stomach CO₂ content.

Displacement of ETT against the lateral tracheal wall can cause flat wave

Phases of the Capnogram



Normal Capnography Waveform



Capnography Uses

Increased ICP - You can use capnography to maintain ventilation rates to obtain EtCO₂ at the low end of normal

Use in Ventilation Rates - useful in the prehospital setting to help maintain appropriate manual and mechanical ventilation –

Inadvertent Hyperventilation - Inadvertent hyperventilation is common following paramedic RSI despite EtCO₂ monitoring and target parameters.(1)

Cardiac Arrest - Reductions in EtCO₂ during CPR are associated with comparable reductions in cardiac output making EtCO₂ more reliable than radial pulses. (2)

Return of Spontaneous Circulation - The use of CO₂ is able to be used in the determination of ROSC often the first indicator. Increase occurs due to the excess CO₂ being washed out of the previously hypoperfused tissue.(3)

Use in Death Confirmation - Studies indicate that patients that have been intubated and have a CO₂ less than 10 which does not increase are clinically dead.(4)

ACLS Medication - You will see an initial increase in the EtCO₂ after administration of Sodium Bicarbonate. This will come back down after several ventilations. This demonstrates the reason ACLS suggest no NaHCO₃ unless adequate ventilation present

Paralytics - You may see a “curare cleft” Caused by the stronger thoracic muscles that are more paralyzed than the weaker diaphragm, This is an indicator that the patient is coming up from medication, Consider further sedation and/or paralyzation.

Pacemaker - Can be used to help determine when a patient has captured during pacing as you will see an increase in CO₂ prior to feeling a pulse. The increase is due to the increase in cardiac output that should accompany capture.

Trauma Patients - Decrease levels when determined to be not from other causes should lead you to suspect hypovolemia as severe shock will have low CO₂ due to poor perfusion. You will see an increase in CO₂ as perfusion status improves during resuscitation.

Nasotracheal Intubation - In NTI capnography can be used to guide the ET tube into proper position You will see an increase in CO₂ as the tube passes into the hypopharynx and decrease if you remove it from the hypopharynx and move toward the esophagus.(5)

Diabetic – In DKA patients, Kussmaul respiration helps correct acidosis. Patients with an EtCO₂ of less than 29 were found to be in acidosis 95% of the time, whereas no patients with EtCO₂ of 36 or higher were in acidosis.(6)

Seizure Patients - Capnography is a very valuable and reliable assessment tool to assure airway patency in seizure patients or those medicated with Valium, Versed, or Ativan for seizure activity.

- Can be used in actively seizing patients
- Increases in CO₂ are common in the seizure patient due to the exaggerated muscular activity
- Continued increases or very high EtCO₂ can indicate hypoventilation, commonly associated with benzodiazepine use.

Pain Management - Patients that are given sedatives or narcotics for pain are at risk for hypoventilation, Capnography can assure continued airway presence during extrication and/or transport with just a glance at the monitor.

Asthma - EtCO₂ is specifically good for assessing the severity of asthma or the presence of bronchospasm

- Bronchospasm can give the appearance of a “shark fin” on the waveform.
- Diagnosis of asthma versus panic attack

Patients experiencing bronchoconstriction will develop a shark fin appearance to the waveform. This sharkfin will resolve as the patient responds to treatment. In the event the patient fails treatment the shark fin will not resolve and increases in EtCO₂ may be seen as the patient gets tired.

CPAP - You can use the cannula with CPAP as long as you can good get a good seal.

It is a good idea to place it on the patient to monitor respiratory status of your patient during CPAP use. Prevents missing apnea in CPAP patients

Pulmonary Embolus (PE) - Typical presentation of SOB, tachycardia, risk factors. EtCO₂ can present with normal waveform appearance and a lower numeric value due to respiratory rate and decrease perfusion to lungs. **If the PE is small you may see no change.** Small PE may demonstrate no change in EtCO₂ values and should not be used as a single assessment tool for assessment of a PE

Pregnant Patients - compression of the vena cava restricts blood flow back to the heart and lungs which can cause decreases in EtCO₂ due to decrease perfusion.

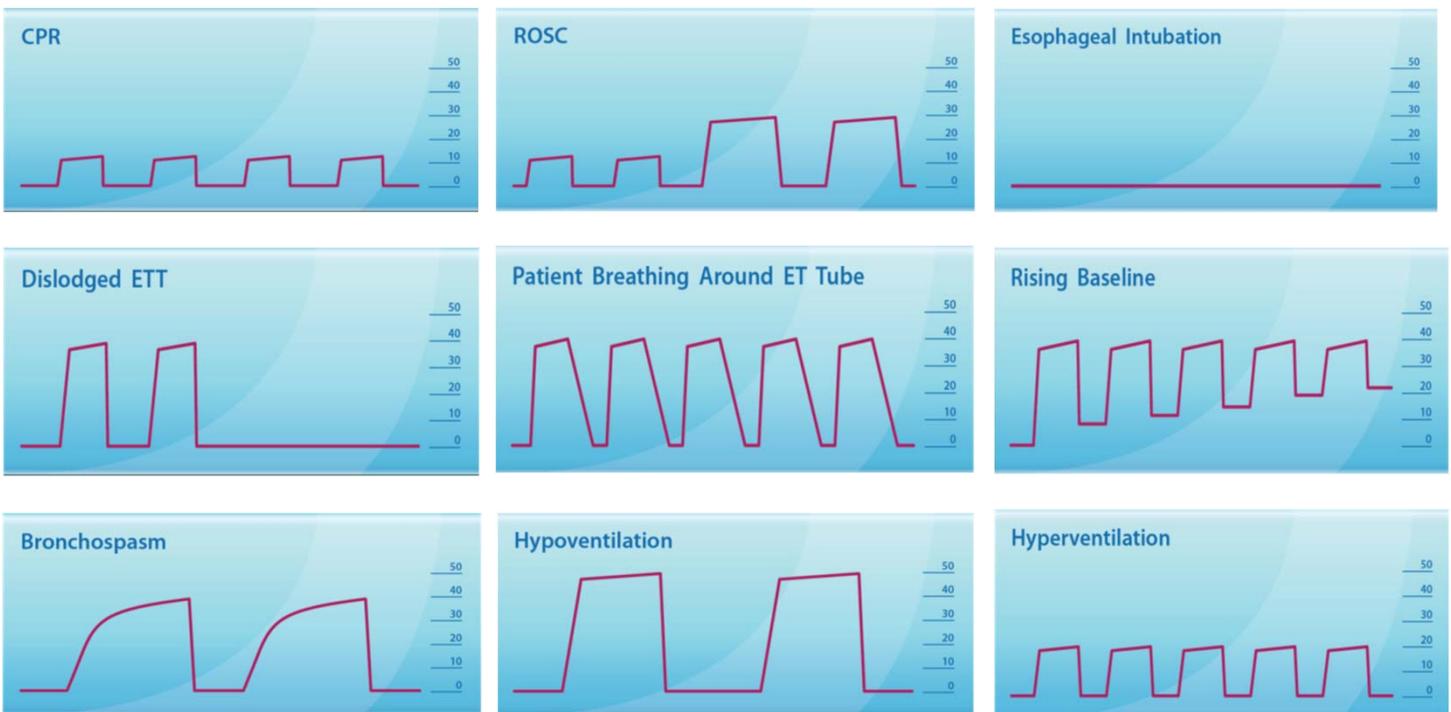
Note: Shark-fin waveform appearance in pregnant patients can be a normal finding and does not specifically indicate bronchoconstriction.

Rescue Airway Device – Rescue Airway Devices - Used to confirm adequate ventilation. without other evidence of bronchoconstriction as this may be a normal finding.

Remember

- Capnography assesses ventilation
- It confirms adequate ventilation – not a confirmed secured airway!!!!
- You have to have adequate perfusion
- Changes are immediate long before pulse oximetry
- You need to use it to be comfortable with it

Capnography Wave Forms



References

- (1) Davis, DP.,Dunford,JV. Inadvertent Hyperventilation following Paramedic RSI of Severely Head-injured Patients. Acad Emerg Med. Vol. 10, No. 5 446. 2003
- (2) Weil, M. Cardiac Output and End-Tidal Carbon Dioxide. Critical Care Medicine, November 1985
- (3) Singh Amar. Comparing the Ability of Colormetric and Digital Waveform End Tidal Capnography to Verify ET tube placement. Academic Emergency Medicine Vol. 10 No. 5 466-467
- (4) Levine R. End-tidal Co₂ and outcome of out-of-hospital cardiac arrest. New England Journal of Medicine. July 997;337:301-306
- (5) Phillips 2003
- (6) Fearon D., Steele D. End-tidal CO₂ predicts the presence and severity of Acidosis in Children. Academic Emergency Medicine Vol 9 No. 12 1373-1378

Drugs Narcan Will Block

Ambenyl
 Anapolon
 Anexsia
 Astramorph
 Bancap HC
 Codalan
 codeine
 Co-Gesic
 Compal
 Damacet-P
 Darvocet
 Darvon
 Demerol
 Diagesic
 dihydrocodeine
 Dilaudid
 Dolophine
 Duragesic
 Duramorph
 Endocet
 fentanyl
 heroin
 Hycodan
 hydrocodone
 hydromorphone
 levofloxacin
 Lomotil
 Lonox
 Lortab
 Mepergan
 meperidine
 methadone
 morphine sulfate
 MS Contin
 Norco
 Nucofed
 Numorphan
 opium
 Orlaam
 oxycodone
 OxyContin
 oxymorphone
 Percocet
 Percodan

Drugs Narcan Will Block (continued)

Pethadol
 propoxyphene
 Roxanol
 Roxidcet
 Roxidcodone
 Sublimaze
 Tussend
 Tussionex
 Tylenol #2, #3, #4
 Tylox
 Vicodin

Common Drugs Narcan Will Have No Effect On

alcohol
 Ambien
 cocaine
 ecstasy
 marijuana
 methamphetamine
 muscle relaxants
 Rohypnol
 sedatives
 sleeping pills
 Valium
 Xanax

Reference

JEMS.com/JEMS**Meet Narcan**

Karen Barker, RN, CCRN, EMT-
 P, Don Hunjadi, EMT-I
 August 2008 JEMS Vol. 33 No. 8
 2008 Aug 1

Epinephrine Drip

Epinephrine 1:1,000	
1 mg / 100 ml in NS (Use 60 gtts administration set)	
mcg / min.	gtts / min.
1	6
2	12
3	18
4	24
5	30
6	36
7	42
8	48
9	54
10	60

EMS Guide

March 2018



Reprinted with the permission of Thoratec Corporation

Patient Management For VADs

1. Assess the patients airway and intervene per your protocol.
2. Auscultate Heart Sounds to determine if the device is functioning and what type of device it is. If it is continuous flow device, you should hear a “whirling sound”.
3. Assess the device for any alarms.
4. Look on controller usually found around the waist of the patient and to see what color tag and device it is.
5. Match the color on the device tag to the EMS Guide.
6. Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.
7. Start Large Bore IV.
8. Assess vital signs – Use Mean BP with Doppler – with the first sound you hear is the Mean Arterial Pressure (MAP).
9. If no Doppler, use the Mean on the non invasive blood pressure machine.
10. Transport to closest VAD center. Call the number on the device to get advice.
11. Bring all of the patients equipment.
12. Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.

MARCH 2018

ORANGE

ORANGE

ORANGE

ORANGE

HeartMate II® with Pocket Controllers

1. Can I do external CPR?
Only if absolutely necessary
2. If not, is there a "hand pump" or external device to use?
No.
3. If the device slows down (low flow state), what alarms will go off?
A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 lmp. Can give a bolus of normal saline and transport to an LVAD center.
4. How can I speed up the rate of the device?
No, it is a fixed speed.
5. Do I need to heparinize the patient if it slows down?
Usually no, but you will need to check with implanting center.
6. Can the patient be defibrillated while connected to the device?
Yes.
7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
No.
8. Does the patient have a pulse with this device?
May have weak pulse or lack of palpable pulse.
9. What are acceptable vital sign parameters?
MAP 70 - 90 mm Hg with a narrow pulse pressure
10. Can this patient be externally paced?
Yes.

FAQs

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, gray batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring ALL of the patient's equipment with them.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

Trouble Shooting HeartMate II® with Pocket Controllers

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see *changing batteries section on next page*)
- If pump does not restart, change controllers. (see *changing controllers section on next page*)

Alarms: Emergency Procedures



Yellow or Red Battery Alarm:
Need to Change Batteries. See changing batteries section on next page.



Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient—the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure— treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.



MARCH 2018

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

Trouble Shooting HeartMate II® with Pocket Controllers

Changing Batteries

WARNING: At least one power lead must be connected to a power source **AT ALL TIMES**. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 1 and 2)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 3)

- Controller will start beeping, flash yellow signals and will read power disconnect on the front screen.
- Replace with new battery by lining up **RED** arrows on battery and clip. (Figure 4)
- Slide a new, fully-charged battery (Figure 2) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and yellow flashing will stop.
- Repeat previous steps with the second battery and battery clip.

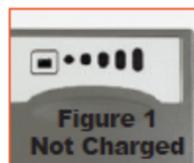


Figure 1
Not Charged



Figure 2
Fully Charged



Figure 3



Figure 4

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the **RED** arrows.



Half-Moons



Release Button

Driveline
Connector

Safety Tab

- On the back of the replacement controller, rotate down the perc lock so the red tab is fully visible. Repeat this step on the original controller until the red tab is fully visible.
- Disconnect the drive line from the original controller by pressing down on the red tab and gently pulling on the metal end. The pump will stop and an alarm will sound. Note: The alarm will continue until the original controller is put to sleep. You can silence the alarm by holding down the silence button. Getting the replacement controller connected and pump restarted is the first priority.

- Connect the replacement Controller by aligning the **BLACK ARROWS** on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:



- Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.
 - Step 2. Check the powersource to assure that power is going to the controller.
 - Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.
- After the pump restarts, rotate up the perc lock on the new controller so the red tab is fully covered. If unable to engage perc lock to a fully locked position, gently push the driveline into the controller to assure proper connection. Retry to engage perc lock.
 - Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.
 - Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

MARCH 2018

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

Trouble Shooting HeartMate II®

Changing Batteries

WARNING: At least one power lead must be connected to a power source **AT ALL TIMES**. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 3 and 4)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 1)
- Controller will start beeping and flashing green signals.
- Replace with new battery by lining up **RED** arrows on battery and clip. (Figure 2)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.



Figure 1



Figure 2

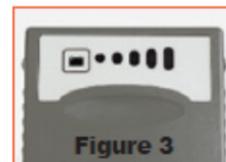


Figure 3



Figure 4

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the **RED** arrows. **ALARMS WILL SOUND-THIS IS OK.**
- Depress the silence alarm button (upside-down bell with circle) until the alarm is silenced on the new, replacement Controller.
- Rotate the perc lock on the replacement controller in the direction of the "unlocked" icon until the perc lock clicks into the fully- unlocked position. Repeat this same step for the original Controller until the perc lock clicks into the unlocked position.
- Disconnect the perc lead/driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound.



Half-Moons



Perc Lock

Note: The alarm will continue until power is removed from the original Controller. *Getting the replacement Controller connected and the pump restarted is the first priority.*

- Connect the replacement Controller by aligning the **BLACK LINES** on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.



Tug gently on metal end in this direction

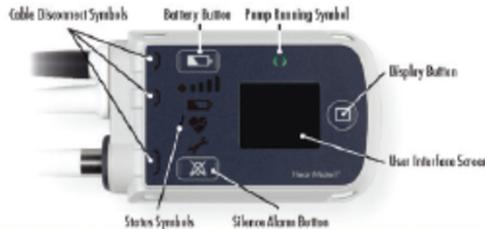
- After the pump restarts, rotate the perc lock on the new controller in the direction of the "locked" icon until the perc lock clicks into the fully-locked position. If unable to engage perc lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

MARCH 2018

ORANGE

HeartMate II® Controller Comparison Guide

POCKET CONTROLLER™



3 Modes: Run, Charge, Sleep

Run: Driveline + Power source connected.
Charge: Only power source connected.
Sleep: No driveline or power source connected; ready to use.

Backup Battery

An emergency backup battery is built into Pocket Controller, powering the pump for 15 minutes in the absence of an external power source. The backup battery is supplied NONSTERILE.

Event Logger

Pocket Controller includes date/time records in event history. Pocket Controller can store 240 events.

Green Pump Running Symbol

Green "pump running" symbol signifies that the pump is on and running.

Controller Buttons

Display Button: Enables viewing of pump parameters and backup battery charge status.
Silence Alarm Button: Silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
Display Button + Silence Alarm Button Together: Displays previous six alarms.
Battery Button: Displays the battery power gauge when pressed. Activates a self test when held for 5 seconds then released. Enters sleep mode when driveline and external power are disconnected and button is held for 5 seconds then released.

Self Test

Press and hold the Battery Button for 5 seconds.

Low Power

Yellow Diamond Symbol: Displayed when only 15 minutes of external power is remaining.
Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

Backup Battery Mode: Entered after external power is depleted. Provides 15 minutes of internal emergency backup battery power.
Power Saver Mode: Entered when pump has run on backup battery for 15 minutes. Pump Speed is reduced to the set Low Speed Limit.

Starting the Pump

>8000 RPM: Pump starts automatically.
<8000 RPM with Backup Battery: Start pump by pressing any button on Pocket Controller.
<8000 RPM with no Backup Battery: Pump can only be started via System Monitor.

System Monitor Event History Screen

PI Event:	10/24/13 07:20	4.0	8900	5.8	5.4	PI Event
System Information:	10/24/13 01:30	4.0	8000	5.7	5.6	* System Information

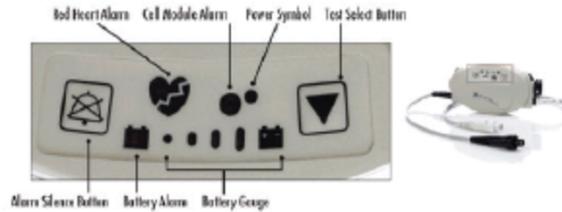
Compatibility

System Monitors I and II, Power Module, Power Module Patient Cable (14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips.

Alarms

For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, Item 107526. Pocket Controller includes a yellow wrench icon to denote advisory alarms. Note that Pocket Controller includes driveline fault detection.

EXTERNAL PERIPHERAL CONTROLLER (EPC)



2 Modes: On, Off

On: Driveline + Power source connected.
Off: No driveline or power source connected.

Cell Module Battery

No backup battery. The cell module battery powers or audible tone if EPC is removed from power while the driveline is connected. The cell module battery is supplied STERILE.

Event Logger

EPC does not include date/time records in event history. EPC can store 120 events.

Green Power Symbol

Green light only means that the controller is receiving power. Listen over the pump pocket for confirmation that the pump is running.

Controller Buttons

Alarm Silence Button: Displays the battery fuel gauge. Also silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
Test Select Button: Activates a self test when held for 3 seconds.
Note: EPC does not include a display button or user interface screen. The Display Module is used to view pump parameters and alarm events.

Self Test

Press and hold the Test Select Button for 3 seconds.

Low Power

Yellow Battery Symbol: Displayed when only 15 minutes of external power is remaining.
Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

Power Saver Mode: Entered when the battery voltage falls to a critically low level. Pump Speed is reduced to 8000 RPM.

Starting the Pump

>8000 RPM: Pump starts automatically.
<8000 RPM: Start pump by pressing Alarm Silence Button or Test Select Button on EPC.

System Monitor Event History Screen

PI Event:	10/24/13 07:20	4.0	8900	5.8	5.4
System Information:	10/24/13 01:30	4.0	8000	5.7	5.6

Compatibility

System Monitors I and II, Power Module, Power Base Unit (PBU), Power Module Patient Cable (12 Volt and 14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips, 12 Volt SLA and NiMH Batteries and Clips.

Alarms

For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, Item 103851. Note that EPC does not include driveline fault detection.

MARCH 2018

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

ORANGE

HeartMate II Controller Comparison Guide

DRIVELINE CONNECTION

Pocket Controller:

A safety tab is located on the back of the controller.



Unlocked



Locked

External Peripheral Controller (EPC):

A percutaneous lock is located on the side of the controller.



Unlocked

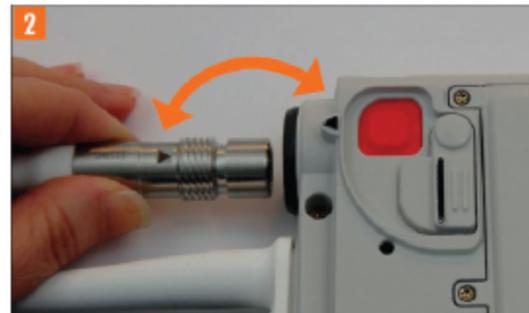


Locked

The Pocket Controller driveline connection and locking mechanism are different from the EPC. To insert and lock the driveline into Pocket Controller:



Slide the safety tab back to expose the red button.



Align the arrow on the driveline to the arrow on the Pocket Controller. Firmly insert the driveline until it snaps into place.



Tug gently on the metal portion of the driveline to ensure that it is fully engaged.



Slide the safety tab over the red button. Ensure the safety tab completely covers the red button.

Thoratec, HeartMate II, Pocket Controller, and the Thoratec logo are registered trademarks of Thoratec Corporation.
©2013 Thoratec Corporation. All rights reserved. 109816.A



MARCH 2018

ORANGE

ORANGE