National Park Service
U.S. Department of the Interior

Emergency Medical Services Protocols and Procedures

NATIONAL PARK SERVICE

2025

FIELD MANUAL #51

Table of Contents

COLOR LEGEND:

- Emergency Medical Responder (EMR)
- Emergency Medical Technician (EMT)
- Advanced Emergency Medical Technician (AEMT)
- Parkmedic (PM)
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- Online Medical Control (OLMC)
- ALL Providers
- Pediatrics
- Perform as per your scope

Update Brief January 2025

Changes made since the October 2024 version are throughout the Protocols and Procedures document. The list below highlights newly added material, content changes, and some of the formatting changes. This is not a comprehensive list of changes.

Please actively review this document as applicable to your scope of practice.

NEWLY added Treatment Protocol, Procedures, Medications and/or Appendix:
3168 Pralidoxime, 2-PAM

Significant Changes were made in the following:
2240 Nerve Agent Exposure

Edits and/or format changes:
General Considerations section
2020 Altered Mental Status – flow chart
2105 Cardiac Arrest: ALS – flow chart
2300 Trauma: Major/Multi-system
Appendix C, Tactical Emergency Medical Services (TEMS) Supplement

PROCEDURES

NES: Nationally Expanded Scope
LES: Locally Expanded Scope
APO: Assist Patient Only
AIO: Autoinjector Only
INO: Intranasal Only
PO: Oral Only
TOP: Topical

Scope		EMR	EMT	AEMT	Parkmedic (PM)	Paramedic (P)	Page No.
1005	12-lead Electrocardiogram (ECG)				LES	NES	25
1010	AED (Automated External Defibrillator)	X	X	X	X	X	27
1015	Airway Management	X	X	X	X	X	28
1020	Airway Management: Intubation - Endotracheal				NES	X	32
1025	Airway Management: Difficult Airway					LES	34
1030	Airway Management: i-Gel Supraglottic		LES	X	X	X	35
1035	Airway Management: King LTS-D Supraglottic Airway		LES	X	X	X	37
1040	Airway Management: Cricothyrotomy - Needle				X	X	39
1045	Airway Management: Cricothyrotomy - Surgical					LES	41
1047	Airway Management: Cricothyrotomy via QuickTrach					LES	42
1050	Apneic Oxygenation	X	X	X	X	X	43
1055	Blood Glucose Analysis (BGL)	APO	X	X	X	X	44
1060	Blood Sample Collection			LES	LES	LES	45
1063	Carbon Monoxide (CO) Sensor Placement	X	X	X	X	X	46
1065	CO_2 Monitoring/Capnography		LES	LES	LES	LES	47
1070	CPR: Cardiopulmonary Resuscitation	X	X	X	X	X	49
1075	CPR - Lucas Chest Compression System	X	X	X	X	X	50
1080	Cardioversion: Defibrillation				LES	X	53
1085	Cardioversion: Synchronized				LES	X	54
1090	CPAP (Continuous Positive Airway Pressure)				LES	LES	55
1095	Electronic Control Device (ECD) Probe Removal		X	X	X	X	57
1100	Epinephrine Autoinjector	X	X	X	X	X	59
1105	Epinephrine Vial or Ampule	LES	LES	X	X	X	60
1110	Foreign Body Airway Obstruction (FBAO)	X	X	X	X	X	61
1200	Fracture and Dislocation Management: General	X	X	X	X	X	63
1205	Fracture and Dislocation Management: Digit		NES	NES	NES	NES	64
1210	Fracture and Dislocation Management: Patella		NES	NES	NES	NES	65
1220	Fracture and Dislocation Management: Shoulder		NES	NES	NES	NES	66
1225	Fracture and Dislocation Management: Traction Splint	X	X	X	X	X	70
1300	Injections (Intramuscular)	LES	LES	X	X	X	72
1305	IO (Intraosseous) Access		NES	X	X	X	73
1310	IV (Intravenous) Access: Peripheral		NES	X	X	X	75
1315	IV (Intravenous) Access: External Jugular					X	76
1320	IV and IO Fluid Administration		NES	X	X	X	77
1325	Mucosal Atomizer Device	X	X	X	X	X	80
1350	Mass-casualty Incidents (MCI)	X	X	X	X	X	81
1360	Nebulizer Inhalation Therapy			X	X	X	84
1365	Needle Decompression/Thoracostomy		NES	NES	NES	NES	85
1370	Orogastric Tube Insertion					LES	87
1380	Pain Assessment and Documentation	X	X	X	X	X	88
1385	Pelvic Stabilization	X	X	X	X	X	89
1390	Restraint of Patients	X	X	X	X	X	90
1400	Spinal Examination and Clearance	NES	NES	NES	NES	NES	91
1410	Spinal Motion Restriction	X	X	X	X	X	93
1420	Suctioning	X	X	X	X	X	95
1425	Temperature Measurement	X	X	X	X	X	96
1430	Tourniquet Application	X	X	X	X	X	97

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TREATMENT PROTOCOLS

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Scope		EMR	EMT	AEMT	Parkmedic (PM)	Paramedic (P)	Page No.
2285	Shock/Hypotension	SEE INDIVIDUAL PROTOCOLS					211
2290	Stroke/Cerebral Vascular Accident (CVA)						214
2295	Syncope/Near Syncope						216
2300	Trauma: Major/Multi-system						218
2302	Trauma: Crush Injury						220
2305	Trauma: Minor/Isolated Extremity						222
2307	Trauma: Head Injury, Traumatic Brain Injury (TBI)						224
2310	Vaginal/OB/GYN Emergencies						226

MEDICATIONS

NES: Nationally Expanded Scope
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Scope		EMR	EMT	AEMT	Parkmedic (PM)	Paramedic (P)	Page No.
3005	Acetaminophen (Tylenol®, APAP)	APO	X	X	X	X	230
3010	Acetazolamide (Diamox®)		APO	APO	NES	NES	231
3015	Adenosine (Adenocard®)					X	232
3020	Albuterol	APO	NES	X	X	X	233
3025	Amiodarone (Cordarone®)				X	X	234
3030	Aspirin (ASA, Acetylsalicylic acid)	X	X	X	X	X	235
3035	Atropine Sulfate	AIO	AIO	AIO	X	X	236
3040	Bacitracin Ointment	X	X	X	X	X	237
3045	Cefazolin Sodium (Ancef®)				NES	NES	238
3050	Dexamethasone (Decadron®)			NES	NES	NES	239
3055	Dextrose 10%			X	X	X	240
3060	Diltiazem (Cardizem®)					NES	241
3065	Diphenhydramine (Benadryl®)	NES(PO)	NES(PO)	NES(PO)	X	X	242
3070	Epinephrine (Adrenaline®)	LES	LES	X	X	X	243
3072	Epinephrine, Push Dose				X	X	245
3080	Fentanyl (Sublimaze®)				X	X	246
3085	Glucagon		LES	X	X	X	248
3090	Glucose, Oral (Paste)	X	X	X	X	X	249
3095	Haloperidol (Haldol®)				NES	NES	250
3100	Hydromorphone (Dilaudid®)				NES	NES	251
3105	Ibuprofen (Motrin®, Advil®)	APO	X	X	X	X	252
3110	Ipratropium Bromide (Atrovent®)		APO	X	X	X	253
3115	Ketamine Hydrochloride (Ketalar®)				NES	NES	254
3120	Ketorolac (Toradol®)				NES	NES	257
3125	Lidocaine 2% (Xylocaine®)				NES	NES	258
3130	Magnesium Sulfate				X	X	259
3135	Midazolam (Versed®)				X	X	260
3140	Morphine Sulfate				X	X	262
3145	Naloxone (Narcan®)	INO	INO	X	X	X	263
3150	Nifedipine (Procardia®)		APO	APO	NES	NES	264
3155	Nitroglycerin (NTG)		APO	X	X	X	265
3165	Ondansetron (Zofran®)	APO	PO	PO	X	X	266
3167	Oxygen	APO	X	X	X	X	267
3168	Pralidoxime, 2-PAM	AIO	AIO	AIO	AIO	AIO	268
3170	Sodium Bicarbonate				X	X	269
3175	Tranexamic Acid (TXA)		LES(TOP)	LES	NES	NES	270
4005	Canine Opioid Exposure - Naloxone Administration	X	X	X	X	X	271

APPENDICES

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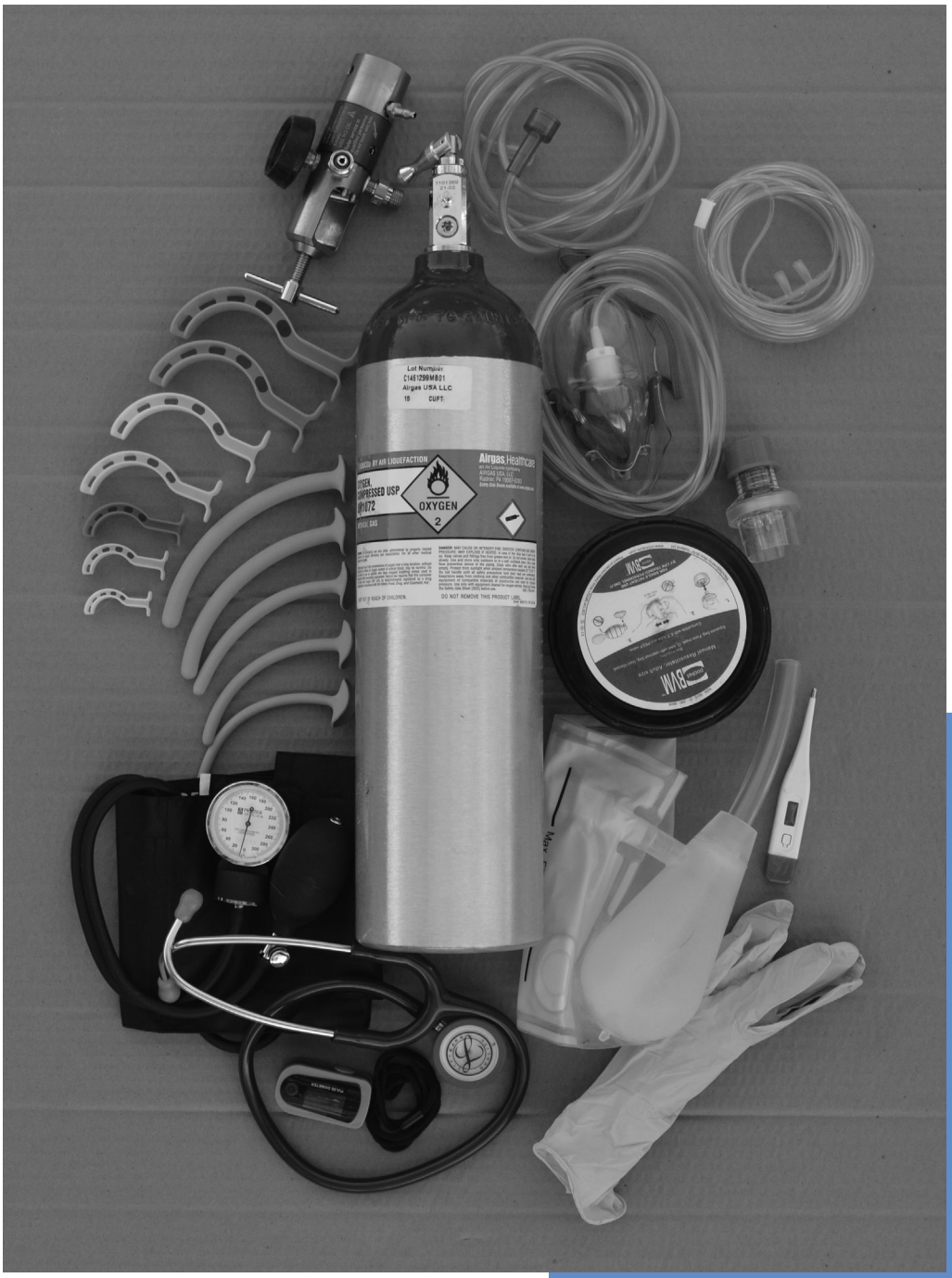

OXYGEN
2
Airgas Healthcare
DO NOT REMOVE THIS PRODUCT LABEL

General Considerations

SECTION 0000


MSA

General Considerations

0010

Introduction: How to Use the Protocols & Procedures

PROTOCOLS & PROCEDURES ORGANIZATION

Sections

The National Park Service EMS Protocols & Procedures (P&P) document is organized into four sections. Subjects are organized alphabetically within the sections and numbered as follows (see Table of Contents):

General Considerations Section	0000-0999
Procedures	1000-1999
Protocols	2000-2999
Medications	3000-3999

Table of Contents

Each procedure, treatment protocol, and medication is listed by section, in alphabetical and numerical order whenever practical. Gaps in the number sequence allow future entries to be inserted in a logical order.

PROTOCOL ORGANIZATION AND DEFINITIONS

CPR, EMR, EMT, AEMT, Parkmedic, and Paramedic Protocols

Each protocol is organized in a flowsheet style, clearly delineating standing orders and Medical Control orders according to level of certification. If a color block and/or letter of a provider level is not specifically delineated in the protocol, then it is implied that all treatments in the protocol are authorized if within the provider's scope of practice. A "Special Considerations" section precedes each protocol and contains background information for the protocol and is for reference.

Statement regarding Intermediate EMT (EMT-I or IEMT)

Even though primary management and regulation of prehospital providers is at the state level, the federal government does have a model scope of practice including minimum skills for EMRs, EMTs, Advanced EMTs and Paramedics set through the National Highway Traffic Safety Administration (NHTSA). Consistent with the EMS Agenda for the Future Planning for the Future: EMS Agenda 2050 | EMS.gov), as of January 2020, no new NREMT EMT-I certifications have been issued. Many states have followed suit and allowed for grandfathering of EMT-I into AEMT or Paramedic depending on the education requirements. States who still partially recognize EMT-I are Alaska, Arizona, Colorado, DC, New Mexico, Oklahoma, Oregon, South Dakota, Virginia, and Wyoming. The majority of these states no longer issue EMT-I certifications, but have agreed to honor existing certifications under AEMT scopes of practice. The National Park Service EMS Program allows the credentialing of EMT-I level providers. EMT-Is should follow the scope of practice in these protocols that is consistent with their current level of training.

Standing Orders

Items under "Standing Orders" may be performed prior to Medical Control contact. Unless otherwise stated, they are written to be completed sequentially.

Base Hospitals

A "base hospital" is an older term defined as the typical communications center providing online medical direction (i.e., where medical consultation is available in real-time by telephone or radio). Some parks may go though a base hospital for medical control, others may go through their Local EMS Medical Advisors (LEMA) outside of a base hospital arrangement. This is defined by the LEMA and

all providers should understand their chain of medical direction. The LEMA will establish policies identifying which interventions may be performed under the circumstances of no base hospital communications being available.

Online Medical Direction Communication Failure Orders

Items labeled "Communication Failure Orders" may be performed by EMS only after Online Medical Control (OLMC) contact has been attempted and was unsuccessful. Reasonable attempts to contact Medical Control must be made, and communication failure documented. Please refer to the Medical Control Protocol 0020.

Online Medical Control (OLMC) Orders Only

Items listed under "Medical Control Only" require base hospital or Online Medical Control (OLMC) approval and may **NOT** be performed in communication failure. Medical Control procedures are per LEMA direction at the local level for a first step.

Treatment Discontinuation

In general, initiated treatment should remain in place unless discontinued under specific guidance from OLMC (e.g., advanced airways, tourniquets). See specific protocols for details.

Navigation

Once a protocol is selected, care should be continuous under that protocol.

Exceptions to this rule are:

- **GO TO:** If an order directs you to "GO TO PROTOCOL: *XXXXX*" (protocol named in italics), then patient care should move to the specified protocol, IF the patient meets the stated criteria. If the patient does not meet the criteria, then continue with the original protocol.
- **Cardiac Arrest:** If a patient experiences cardiac arrest while being cared for under another protocol, then the provider should immediately change to the appropriate cardiac arrest protocol. Medical Control contact, however, should be attempted as soon as possible without compromising patient care.
- **REFERENCE:** Additional relevant information is available in another protocol or procedure if an order directs you to "REFERENCE PROTOCOL or PROCEDURE: *XXXXX*" (protocol or procedure named in italics). This information is intended to supplement knowledge, but patient care should continue to follow the original protocol.

Protocols

Protocols are chief-complaint driven and are designed for patient care. Protocols contain orders for the appropriate care of the patient.

Procedures

Procedures are step-by-step instructions in how to carry out a specific action in the care of a patient (e.g., Intraosseous [IO] needle insertion).

Nationally Expanded Scope (NES)/Locally Expanded Scope (LES)

LES items refer to procedures or medications that are part of a recognized scope in some areas already, but require additional training. Examples include Epinephrine Vial Draw up for EMTs. Local LEMAs and EMS coordinators can arrange the training and verification of the skill. Records of the training may be maintained in any manner the local unit determines adequate.

NES items are those procedures or medications which are considered to be outside of typical scopes of practice, but are recognized as valuable to the NPS EMS Program. Additional training and LEMA sign off is required for these scopes of practice. Records are maintained at the local level. EMS providers are encouraged to keep copies of any expanded scope training certifications for themselves in case of audit.

Medication Pages

Medication pages are designed to be informational. Therefore, as drug dosing may vary depending on the selected protocol, the general range of dosing used throughout the P&P is listed in the drug page; when caring for a specific patient, the administered dose is that designated in the specific protocol. Depending on the drug, the dose will typically be listed as mg/kg or mL/kg. Generic names are always used and in cases where the brand name is commonly used, this will also be listed (e.g., midazolam/Versed).

Pediatric Patients

Most protocols and procedures apply to both adults and children; pediatric considerations are generally commented on within a protocol in a light blue box. Certain protocols apply only to pediatric patients and are listed separately under Pediatric. Depending on the procedure, protocol, or drug dose, the age definition of pediatric varies; if age is not specifically defined, then assume that pediatric refers to prepuberty.

SCOPE OF PRACTICE MODIFICATIONS

In general, this document is designed to be a comprehensive set of protocols and procedures requiring little to no modification. However, given the wide range of needs and unique environments within the National Park Service, some local modifications may be necessary and appropriate for specific parks or regions. Modifications require the initial approval of the unit LEMA and/or final approval by the National EMS Advisory Board.

UPDATES/MODIFICATION GUIDELINES

Most organizations update their medical guidelines periodically (e.g., AHA). Although the updates will be reviewed and incorporated into the P&P, if relevant, the changes will usually be adopted during the normal revision cycle.

Submitting suggestions: Comments may be submitted through a local EMS coordinator or LEMA to be forwarded as needed to other levels or by emailing nps_ems@nps.gov.

EMS PROGRAM CONTACT INFORMATION

National NPS EMS Program: nps_ems@nps.gov

Emergency Medical Services SharePoint: https://doimspp.sharepoint.com/sites/nps-leses/SitePages/es_Emergency-Medical-Services.aspx

Medical Control

Online Medical Control (OLMC), sometimes referred to as Base Hospital, is not required in all circumstances.

OLMC should be contacted if:

- The EMS provider has questions about a protocol or has concerns.
- Directed by the individual procedure, protocol, or guideline.
- If no protocol exists for the patient's presentation or complaint.
- If there is inadequate direction for the situation.
- If the EMS provider has any questions about treatment and/or transport.
- For all patients being released Against Medical Advice (AMA)/Refusal of Medical Assistance (RMA). See also section *0030* on Refer/Against Medical Advice/Refusal of Medical Assistance.

IF ATTEMPTS TO CONTACT ONLINE MEDICAL CONTROL FAIL:

- Proceed with patient care following the appropriate protocol and utilize best judgment.
- If attempts to contact Online Medical Control fail:
  - » **Document** all attempts to communicate with OLMC in the Patient Care Report (PCR).
  - » **Document** all care rendered and any needed explanations or justifications for decisions.

0030

Refer/AMA/RMA

Past Medical History | Assessment | Differential

PURPOSE: To establish which patients may be assessed and not transported by EMS, and to describe the process of documenting a refusal of care and/or ambulance transport, either as "assess and refer" or "against medical advice (AMA)" or "refusal of medical assistance (RMA)."

DEFINITIONS

Against medical advice (AMA)/refusal of medical assistance (RMA)

The refusal of treatment and/or ambulance transport by a patient, or their designated decision-maker, against the advice of medical personnel on scene and/or of Online Medical Control (OLMC). The patient must demonstrate decision-making capacity to sign out AMA/RMA.

EMS provider discretion may be utilized in the following situation:

- If a patient with normal vital signs, normal mental status, and a nonlife-threatening complaint refuses treatment/transport and wishes to sign out AMA/RMA. The patient must have decision-making capacity.

Assess and refer (referral)

The patient is assessed by medical personnel on scene and determined to potentially benefit from further medical evaluation, either at a medical clinic, by a medical professional, or emergency department (ED). The patient is stable for transport via personal vehicle.

Decision-making capacity

The patient's ability to make an educated decision about the need for medical care based on the following criteria:

- Understanding: The patient's ability to comprehend his/her medical condition, as well as why the prescribed treatment/plan is indicated and the risks and benefits of the treatment plan. The condition itself, the specific risks of the condition, treatment, and/or non-treatment, must be explained in plain language to the patient who must then verbalize an understanding of the situation. All patient and provider questions should be addressed.
- Expressing a choice: The patient's ability to communicate a choice when presented with treatment options.
- Appreciation: The patient's ability to recognize how facts about their medical condition are relevant to the patient's personal situation.
- Reasoning: The patient's ability to compare options and infer consequences of their choice.

Emergency medical condition

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

Impaired decision-making capacity

The inability of a patient to understand the nature of their medical condition, to articulate the risks and consequences of refusing care/transport, and/or to provide a reasonable alternative or choice based on the patient's beliefs or values. This can be influenced by altered mental status, psychiatric or neurologic conditions, intoxication, chronic medical conditions, or other factors.

If the patient is a minor or pediatric, follow State law in which the patient is located. Typically, minors under 18 require a parent or authorized legal guardian to approve an AMA/RMA.

Stable

Vital signs are within normal limits, mental status is normal, and the patient's medical condition has a predictable course that is unlikely to acutely deteriorate.

Unstable

Vital signs are outside of normal limits, mental status is altered, an emergency medical condition exists, and/or medical condition is likely to have frequent/unpredictable changes that could reasonably result in deterioration.

NOTES AND PRECAUTIONS

- Legal guardian(s) must be on scene to sign for a minor to refuse treatment/transport. If accompanied by an authorized adult and legal guardian is not on scene, the EMS provider must speak with the parent by phone, confirm identity, and get verbal consent for refusal. An authorized adult on scene should sign the refusal form.
- EMS providers may treat and/or transport a person who requires immediate care under the doctrine of

implied consent. If a provider believes a minor (refer to local law) requires treatment/transport, this may be done without parental consent if the parents/guardians are not present, and a good faith effort is made to contact them.

- Adults with decision-making capacity have the right to refuse care/transport. OLMC may be able to talk to the patient and convince them to accept recommended care. EMS providers should not discuss nonclinical subjects (e.g., specific costs, unit availability) with the patient regarding refusing care/transport.
- Every effort should be made to transport patients with their consent, regardless of capacity. Contact law enforcement and OLMC for assistance with transport of individuals with impaired capacity. Disagreement with the provider does not itself constitute a lack of decision-making capacity.

PROCEDURE

1. Determine if there is an identified patient. OLMC contact is not required if no patient is identified.

2. If a patient is refusing treatment and/or ambulance transport:
   A. Determine if the patient appears to have impaired decision-making capacity (see previous definition).
   B. Consider conditions that may be impairing the patient's ability:
      a. Head injury
      b. Toxic exposure
      c. Drug or alcohol intoxication
      d. Language barrier (e.g., consider a translator)
      e. Medical conditions (e.g., hypoglycemia)
      f. Psychiatric problems

3. For a patient with **IMPAIRED** decision-making capacity:
   A. Treat/transport a person who is incapacitated and has a medical need. Consult OLMC.
   B. Coordinate with other EMS providers, law enforcement, and the patient's family and friends as appropriate.

4. For **STABLE** patients with **ADEQUATE** decision-making capacity, who refuse treatment and/or transport (assess and refer):
   A. Explain the risks and possible consequences of refusing care and/or transport by ambulance. Use plain language and ask patient to voice back the specific risks outlined.
   B. Recommend an appropriate referral facility (ED, clinic, etc.), mode of transport, and time frame to seek further care. Complete the patient refusal form and obtain the patient's signature.

5. For **UNSTABLE** patients with **ADEQUATE** decision-making capacity, who refuse treatment/transport (AMA):
   A. Explain the risks and possible consequences of refusing care and/or transport by ambulance. Use plain language and ask patient to voice back the specific risks outlined.
   B. **Contact OLMC for all AMAs.** OLMC may help convince patient to accept transport.
   C. With permission from the patient, enlist family, friends, or other responders to help convince the patient. Protect the patient's privacy and do not breach confidentiality.
   D. If the patient still refuses, ensure they sign the patient refusal form.
   E. Document thoroughly per section below.

DOCUMENTATION

In addition to documentation required for all PCRs, the following must be included in a referral/AMA PCR:

- An assessment of the patient's decision-making capacity, using criteria listed in the definitions.
- Risks/consequences of refusal of care/transport that were discussed with the patient.
- Communication with family, friends, law enforcement, and/or OLMC regarding refusal process.
- Include the patient's signature in the patient refusal section of the disposition form. Signed disposition forms must be completed and attached to the PCR.
- Use of alcohol/drugs should not be the only factor used to determine decision-making capacity. Contact OLMC.

Advance Directives/DNR/POLST/MOST

PURPOSE

To establish how Advance Directives will be utilized regarding a patient's right to accept or refuse medical care.

NOTE: Refer to the State's laws as applicable.

DEFINITIONS

Advance Directive

A document that contains a health care instruction or a power of attorney for health care in the case of an emergency to ensure the patient's wishes/preferences are carried out if the patient is unable to communicate their desires to the healthcare provider. This is a legal document and not a medical order nor medically binding.

Do Not Resuscitate (DNR)/Do Not Attempt Resuscitation Order (DNAR)

An order written and signed by a physician stating that in the event of cardiopulmonary arrest, cardiopulmonary resuscitation will not be administered. DNR/DNAR orders apply only if the patient is pulseless or apneic.

Living Will

A document that may confirm an Advance Directive or Directive to Physician informing them that if the patient has a terminal illness and death is imminent, the patient will wish or not wish to be placed on artificial life support. In general, the traditional Living Will document alone is not helpful in the prehospital setting because of its multiple restrictions and lack of clarity on when it takes effect. A Living Will is not a medical order and not applicable in the prehospital setting.

Power of Attorney for Health Care (PAHC)

A legal document that designates a person to make healthcare decisions for a patient. This document is only valid when the person signing it has become incapacitated. It is not generally applicable to prehospital providers.

Durable Power of Attorney for Health Care (DPAHC)

A legal document that designates a person to make healthcare decisions for a patient in the event that the patient becomes incapacitated. DPAHC documents are not medical orders and not generally applicable to prehospital providers. This document is only valid when the person signing it has become incapacitated.

Physician's Orders for Life-Sustaining Treatment (POLST)/Medical Orders for Scope of Treatment (MOST)

A document that serves as a medical order, signed by a physician, honoring the specific treatment preferences of seriously ill or frail patients in an emergency. It does not replace an Advance Directive/DNR/DNAR and may work in conjunction with these.

- ***In the pulseless and apneic patient (cardiopulmonary arrest),*** resuscitation may be withheld or discontinued if:
  - » EMS is provided with a valid written DNR/DNAR order.
  - » EMS is provided a valid Advance Directive or POLST/MOST that specifically directs them not to provide cardiopulmonary resuscitation.

    OR
  - » OLMC directs the EMS provider to discontinue resuscitation.
- ***In the patient who is NOT in cardiopulmonary arrest,*** EMS may follow treatment preferences and honor the patient's wishes as conveyed by a valid POLST/MOST.
- It is always appropriate to provide comfort measures as indicated.
- If resuscitation or other treatment has begun prior to Advance Directives or a DNR/DNAR being available to EMS, Online Medical Control should be contacted before discontinuing resuscitation or other care.
- The form must be documented in the PCR and a copy of the Advance Directive, DNR/DNAR, or other legal document used to make treatment decisions should be attached to the PCR.
- Alternatively worded directives to limit medical care, such as supportive care only, limited terminal care, justified use of conservative treatment, living wills or other documents are not acceptable substitutes for a DNR as they are not universally understandable or verifiable. Contact medical control for guidance.

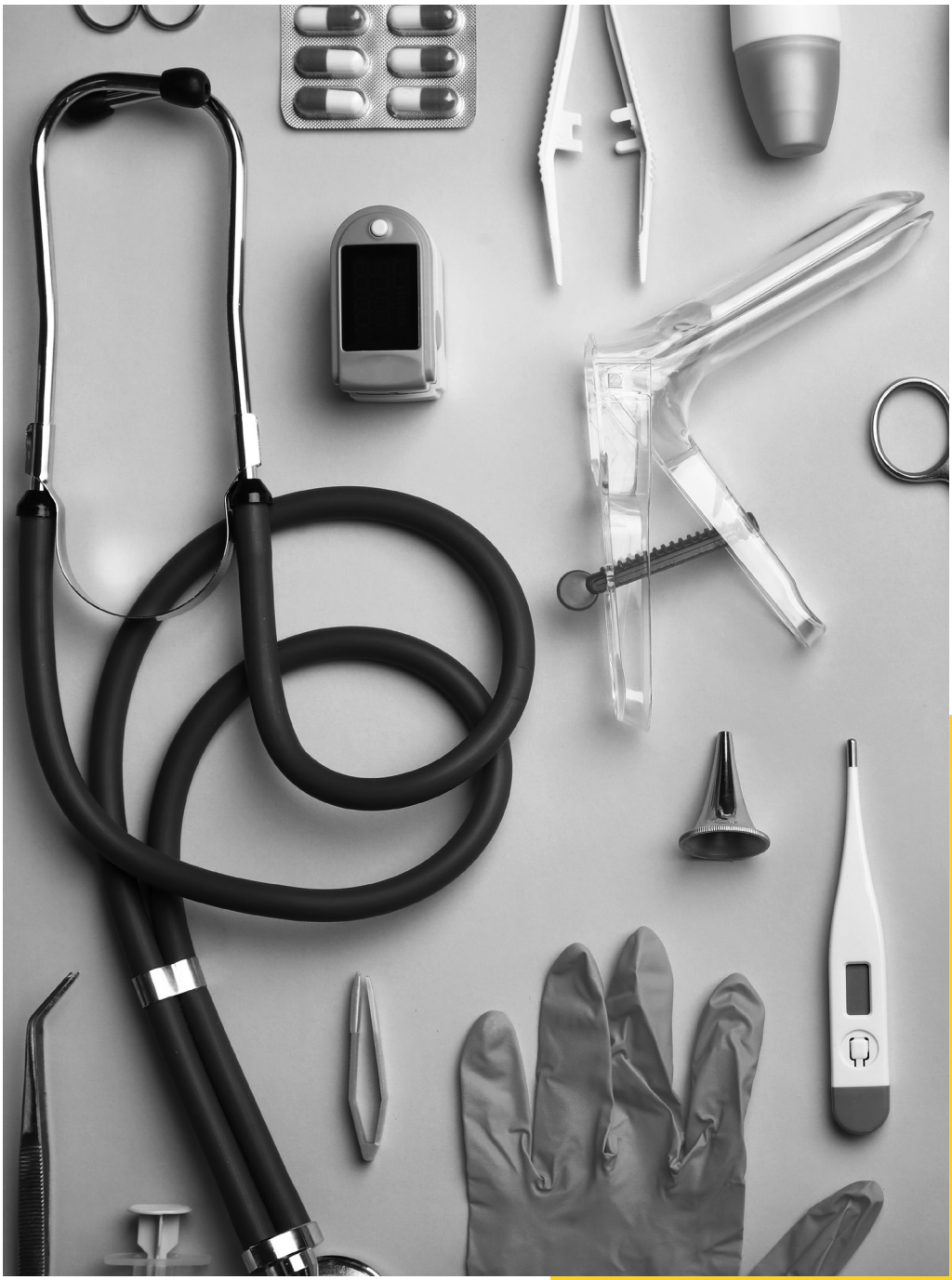
If there are questions regarding the validity or enforceability of a directive or the intent of the patient or guardian, begin resuscitation and contact Medical Control.

0050

Acronyms, Abbreviations and Initialisms

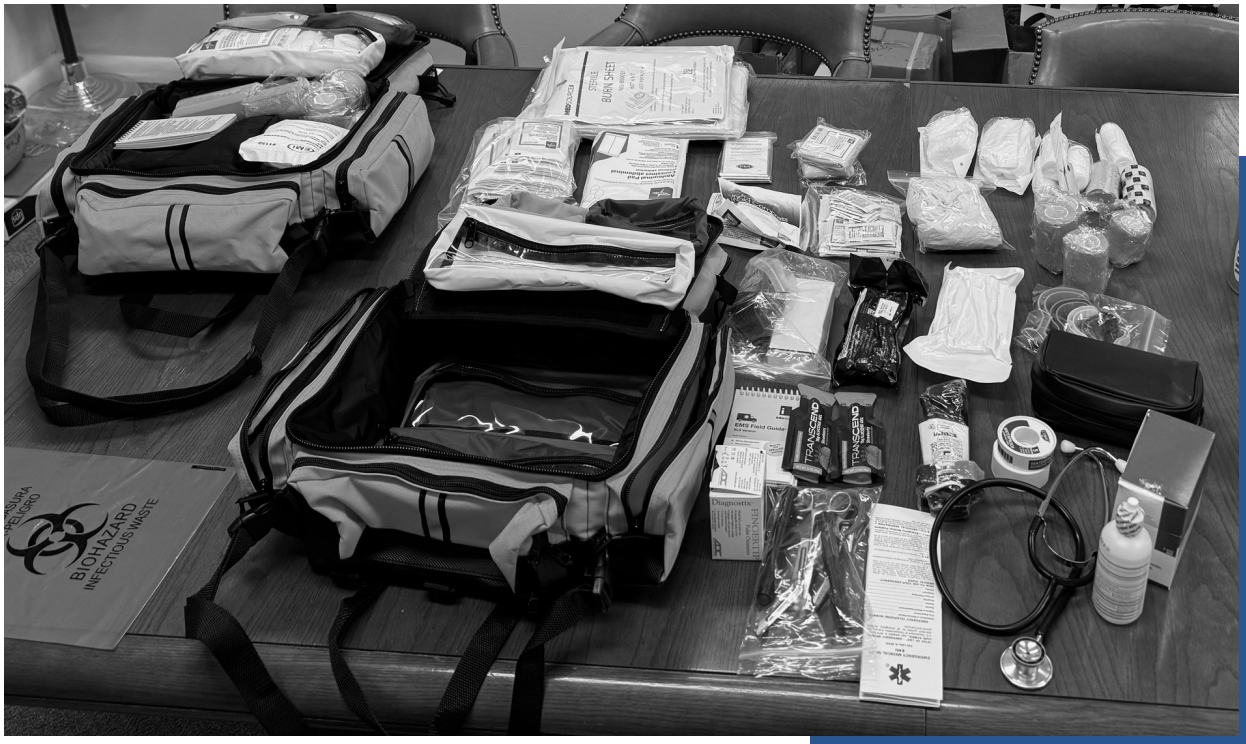
ABCs	Airway, Breathing, Circulation
ACLS	Advanced Cardiac Life Support
AED	Automated External Defibrillator
AEMT	Advanced Emergency Medical Technician
AIO	Autoinjector Only
ALOC	Altered Level of Consciousness
ALS	Advanced Life Support
AMA	Against Medical Advice
AMS	Acute Mountain Sickness
APO	Assist Patient Only
ASA	Aspirin (ASA, Acetylsalicylic Acid)
AVPU	Alert, Verbal, Pain, Unresponsive
BGL	Blood Glucose Level
BIAD	Blind Airway Insertion Devices
BLS	Basic Life Support
BP	Blood Pressure
BVM	Bag Valve Mask
CBRNE	Chemical, Biologic, Radiation, Nuclear, Explosives contamination
CC	Chief Complaint
CCP	Casualty Collection Point
CHF	Congestive Heart Failure
CNS	Central Nervous System
C/O	Complaining Of
CO	Carbon Monoxide
COPD	Chronic Obstructive Pulmonary Disease
CO_2	Carbon Dioxide
CoTCCC	Committee on Tactical Combat Casualty Care
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
CR	Capillary Refill
CSM	Circulation, Sensory, Motor
C-TECC	Committee for Tactical Emergency Casualty Care
CVA	Cerebral Vascular Accident
D10	Dextrose 10%
D50	Dextrose 50%
DBP	Diastolic Blood Pressure
DKA	Diabetic Ketoacidosis
DNR	Do Not Resuscitate
DTC	Direct Threat Care
DVT	Deep Vein Thrombosis
ECD	Electronic Control Device (Taser)
ECG	Electrocardiogram
EMR	Emergency Medical Responder
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
ESOP	Expanded Scope of Practice
$EtCO_2$	End Tidal Carbon Dioxide
ETT	Endotracheal Tube
EVAC	Evacuation Care
FBAO	Foreign Body Airway Obstruction
GCS	Glasgow Coma Scale
GSW	Gunshot Wound
GI	Gastrointestinal
HACE	High Altitude Cerebral Edema
HAPE	High Altitude Pulmonary Edema
HR	Heart Rate
HTN	Hypertension
ICP	Incident Command Post
IM	Intramuscular
IN	Intranasal
INO	Intranasal Only
IO	Intraosseous
ITC	Indirect Threat Care
IUD	Intrauterine Device
IV	Intravenous
IVF	Intravenous Fluid
IVP	Intravenous Push
JVD	Jugular Vein Distension
KED	Kendrick Extrication Device
LE	Law Enforcement
LEI	Law Enforcement & Investigations
LEMA	Local EMS Medical Advisors
LES	Locally Expanded Scope
LMP	Last Menstrual Period
LOC	Level of Consciousness
LR	Lactated Ringers
MAD	Mucosal Atomizer Device
MC	Medical Control
MCI	Multiple Casualty Incident
MDI	Metered Dose Inhaler
MI	Myocardial Infarction

MOI	Mechanism of Injury
MOST	Medical Orders for Scope of Treatment
NES	Nationally Expanded Scope
NG	Nasogastric
NPA	Nasopharyngeal Airway
NRB(M)	Nonrebreather (Mask)
NS	Normal Saline
NSAID	Nonsteroidal Anti-Inflammatory Drug
NTG	Nitroglycerin
N/V	Nausea and Vomiting
O_2	Oxygen
OD	Overdose
ODT	Oral Disintegrating Tablet
OLMC	Online Medical Control
OPA	Oropharyngeal Airway
OTC	Over The Counter
P	Paramedic
PCR	Patient Care Report
PE	Pulmonary Embolism
PEA	Pulseless Electrical Activity
PEEP	Positive end-expiratory pressure
PFC	Prolonged Field Care
PHI	Protected Health Information
PM	Parkmedic
PMH	Past Medical History
PO	Per Os/Per Oral (By Mouth)/Oral Only
POLST	Physician's Orders for Life-Sustaining Treatment
POV	Privately Owned Vehicle
PPE	Personal Protective Equipment
PRN	Pro Re Nata (As Needed)
q	Per or Every
PTA	Prior to Arrival
RMA	Refusal of medical assistance
ROM	Range of Motion
ROSC	Return of Spontaneous Circulation
RR	Respiratory Rate
RSI	Rapid Sequence Intubation
RTF	Rescue Task Force
SAR	Search and Rescue
SBP	Systolic Blood Pressure
SC or SQ	Subcutaneous
SCUBA	Self-Contained Underwater Breathing Apparatus
SCBA	Self-Contained Breathing Apparatus
SDS	Safety Data Sheet
SGA	Supraglottic Airway
SIVP	Slow IV Push
SL	Sublingual
SOB	Shortness of Breath
S/S	Signs, Symptoms
STD	Sexually Transmitted Disease
TBI	Traumatic Brain Injury
TBSA	Total Body Surface Area
TC	Transport Corridor
TCA	Tricyclic Antidepressant
TCCC	Tactical Combat Casualty Care
TECC	Tactical Emergency Casualty Care
TEMS	Tactical Emergency Medical Support
TIA	Transient Ischemic Attack
TKO	To Keep Open
T-POD	Traumatic Pelvic Orthotic Device
TQ	Tourniquet
TTJI	Trans Tracheal Jet Insufflation
TXA	Tranexamic Acid
VS	Vital Signs
WPW	Wolff-Parkinson-White Syndrome
Y/O	Year Old
>	Greater than
≥	Greater than or equal to
<	Less than
≤	Less than or equal to



Procedures

SECTION 1000


BIOHAZARD
INFECTIOUS WASTE
TRANSCEND
TRANSCEND

12-lead ECG

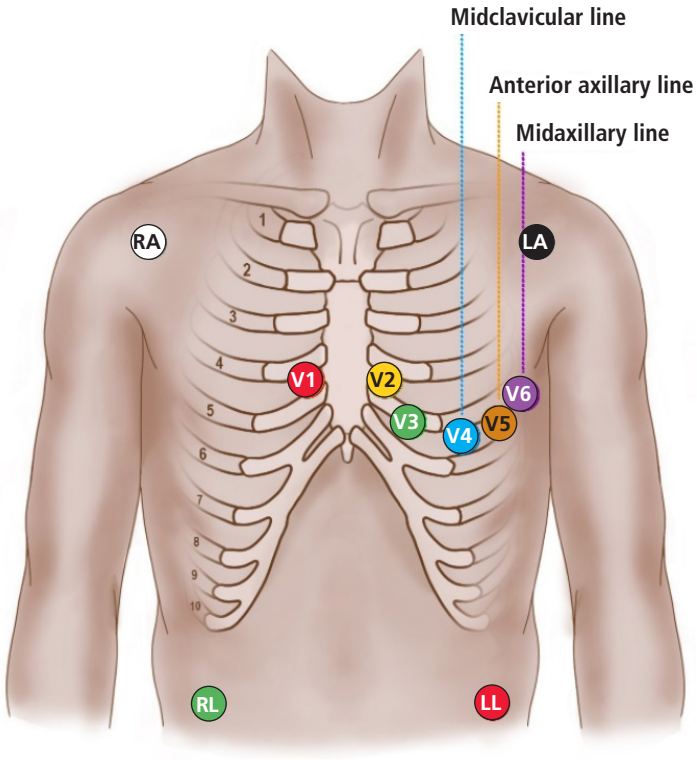
Follow local area protocol regarding availability of 12-lead ECG and transmission to Medical Control.

CLINICAL INDICATIONS

- Suspected cardiac patient
- Chest pain (medical or traumatic)
- Congestive heart failure (CHF)
- Suspected cardiogenic shock (hypotension)
- Return of spontaneous circulation (ROSC)
- Suspected overdose (TCA, ASA, etc.)
- Electrical injuries
- Syncope/severe weakness
- Shortness of breath in the setting of possible pulmonary edema
- New onset stroke symptoms (< 24 hours old)
- Heartburn/epigastric pain

PROCEDURE

1. Assess the patient and monitor their cardiac status.
2. If the patient becomes unstable, definitive treatment is the priority. If the patient is stable or stabilized after treatment, perform a 12-lead ECG.
3. Expose the chest and prep as necessary. Respect the patient's modesty; use gloved, back of the hand for tissue movement.
4. Apply chest leads and extremity leads using the following landmarks:

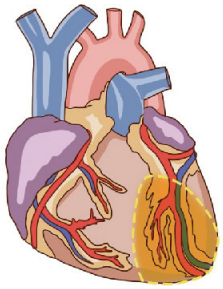


Key:

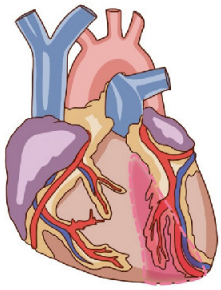
RA Right Arm
LA Left Arm
RL Right Leg
LL Left Leg

V1 (place 1st)—4th intercostal space at right sternal border
V2 (place 2nd)—4th intercostal space at left sternal border
V3 (place 4th)—Directly between V2 and V4
V4 (place 3rd)—5th intercostal space at midclavicular line
V5 (place 6th)—5th intercostal space at left anterior axillary line
V6 (place 5th)—5th intercostal space at left midaxillary line

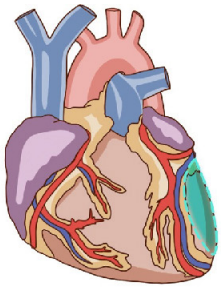
5. Instruct patient to remain still and stop talking.
6. Enter the patient's demographic data (manufacturer's settings or manually) and obtain 12-lead ECG.
7. Document results in the patient care report (PCR).
8. Print the patient's name and date of birth on the printed copy of the 12-lead ECG to give to receiving facility/provider.
9. If system allows, consider sending electronically to receiving hospital.
10. Attach ECG to ePCR.



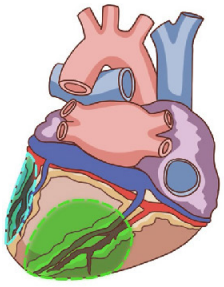
Anterior : V3, V4



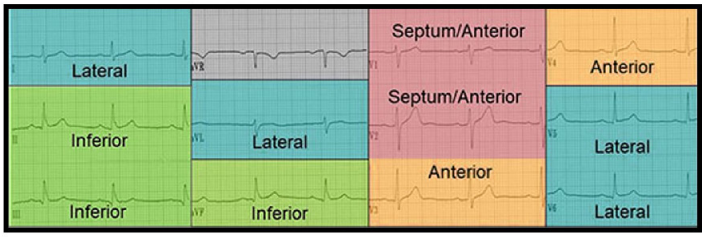
Septal: V1, V2



Lateral: I, AVL, V5, V6



Inferior: II, III, AVF



NOTES AND PRECAUTIONS

- **Show all ECG results immediately to a physician for initial interpretation.**
- If first ECG is within normal limits but chest discomfort remains, repeat ECG in 10 minutes.
- Transport by wheelchair if available—minimize walking if feasible.
- Women and diabetic patients are more likely to present with atypical symptoms.
- Elderly patients may have symptoms such as generalized weakness, altered mental status or syncope as their only sign of acute heart attack.

AED (Automated External Defibrillator)

CLINICAL INDICATIONS

- Patient is in cardiac arrest (pulseless, nonbreathing, unresponsive).
- Age over 8 years, use adult pads.
- Age 1-8 years, use pediatric pads if available, if not available, adult pads may be used—one on chest and one in back. Use pediatric attenuator "key" if available.
- Age over 28 days, less than 1 year, use pediatric pads if available. If not available, adult pads may be used—one on front, one on back.

CONTRAINDICATIONS

Obvious fatal trauma, has a DNR, meets criteria for declaration of death.

PROCEDURE

Refer to Protocol: *Cardiac Arrest: AED/BLS (2100)*

1. If applicable, remove patient from water and dry off wet skin. Remove medication patches on the chest and wipe off residue including nitro paste.
2. Apply defibrillator pads per manufacturer recommendations. Place pads at least 1" from an implanted device such as an automatic implantable cardioverter-defibrillator (AICD) or a pacemaker. Alternate pad placement may be used but DO NOT delay defibrillation with pad placement.
3. Stop CPR and clear the patient for rhythm analysis. Assertively state "CLEAR" and visualize that no one, including you, is in contact with the patient during analysis. Keep interruption in CPR brief (no longer than 10 sec).
4. Defibrillate if indicated by depressing the "shock" button.
5. Immediately begin CPR (chest compressions and ventilations) after the delivery of the defibrillation.
6. After two minutes of CPR, analyze rhythm (AED may be automatically timed to re-analyze) and defibrillate if indicated. Repeat this step every 2 min.
7. If "no shock advised" appears, perform pulse check, if no pulse continue CPR for 2 min. and then reanalyze.
8. Transport and continue treatment as indicated.
9. Keep interruption of CPR compressions as brief as possible (less than 10 sec). Adequate CPR is a key to successful resuscitation. If possible, deliver interventions (e.g., airway, Intravenous [IV], medications) during CPR.
10. **If pulse returns:** See Protocol: *Cardiac Arrest-ROSC (2110).*

NOTES AND PRECAUTIONS

- If pads are too large and overlap when placed on the front of the chest (such as in children or infants) place one pad on the right upper chest and the other on the upper back, slightly left of midline.
- Do not use AEDs in moving vehicles. Stop vehicle to prevent interference with AED analysis.
- Do not focus only on the AED. Monitor the patient for signs of resuscitation (e.g., color change, pupil response, spontaneous respirations). Deliver other interventions for airway, IV, and medications.
- AEDs may have different programming. If the AED prompts conflict with the protocol/procedure, follow prompts and call MC.
- If declaration of death OR if pulse returns, leave the pads attached to the patient.
- Save data stored by the AED regardless of patient outcome. AED data should be downloaded by care team, EMS coordinator or designee.

Be familiar with the AEDs available at your site.

Airway Management
[Provider level indicated with adjunct]

CLINICAL INDICATIONS

- A patient who does not have a patent airway
- A patient who is not breathing adequately
- A patient who meets criteria for oxygen administration (see Medication: *Oxygen (3167)*)

AIRWAY MANAGEMENT OVERVIEW

Proper airway management is the highest priority of the EMS provider. There are several adjuncts used for airway control and protection and the adequate oxygenation and ventilation of patients. Airway management may become necessary for patients who cannot maintain their own airway (respiratory arrest or prearrest).

Always weigh the risks and benefits of airway management in the field. If BLS ventilation and oxygenation is adequate, transport may be the best option.

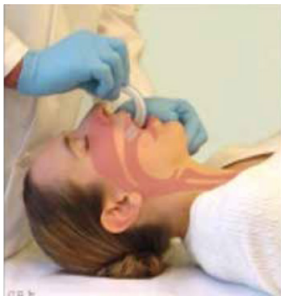
The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (BVM).

BASIC LIFE SUPPORT (BLS) AIRWAY ADJUNCTS

BLS airway adjuncts are indicated when the airway is not patent.

Manual Airway Techniques

- In suspected trauma patients, use jaw-thrust to open the airway. In patients without suspected spinal injury, a head-tilt-chin-lift may be used.
- Manual airway techniques are a bridge maneuver until an adjunct can be safely inserted.

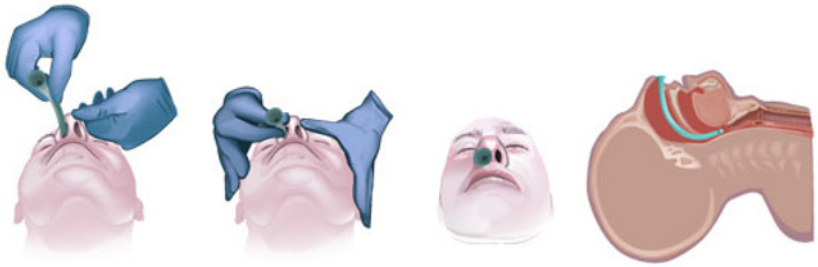


Oropharyngeal Airway (OPA)

- Use an OPA to maintain a patent airway in a patient without a gag reflex.

Nasopharyngeal Airway (NPA)

- Use an NPA to maintain a patent airway in patients with a gag reflex or who cannot tolerate an OPA.
- Do not use in severe facial or nasal trauma that precludes safe insertion of the NPA.



POSITIVE PRESSURE VENTILATION DEVICES

Bag Valve Mask (BVM)

- BVM ventilation is indicated in patients who are not breathing adequately (apnea or too fast/slow/shallow).
- Proper mask seal and head positioning are required to effectively ventilate the patient. This is a two-rescuer device (one rescuer holds mask and keeps airway open with two hands while the other squeezes bag).
- Breaths are administered in a slow, controlled manner over 1 second.

Continuous Positive Airway Pressure (CPAP) (Parkmedic, Paramedic)

- See Procedure: *CPAP (Continuous Positive Airway Pressure) (1090)* for more information.
- CPAP is ***never*** a substitute for BVM ventilation when the patient cannot participate in breathing (e.g., apnea, very slow respirations).

OXYGEN DELIVERY DEVICES

For additional drug information, see the Medications: *Oxygen (3167)*.

Nasal Cannula

- Used when smaller concentrations of oxygen are required.
- Flow rates are generally 2-6 L/min., which provides 24-40% inspired oxygen.
- Exception to this is during Procedure: *Apneic Oxygenation (1050)*.

Nonrebreather Mask

- Used when a higher concentration of oxygen is needed.
- Flow rates are generally 10-15 L/min., which provides 90%+ inspired oxygen.

"Blow-by" Oxygen

- Typically used in infants/toddlers or those who cannot tolerate a cannula or nonrebreather mask.

Nebulizers (Hand-held or Aerosol Mask) [Parkmedic, Paramedic]

- For administration of nebulized medications or humidified oxygen (flow rates are generally 6-8 L/min.).
- Can be used in conjunction with BVM or CPAP.
- See Procedure: *Nebulizer Inhalation Therapy (1360)* for more information.

ADVANCED LIFE SUPPORT (ALS) AIRWAY DEVICES

Supraglottic Airway Devices (SGA)

[AEMT/Parkmedic/Paramedic (EMT—ESOP Medical Director approval)]

- Used in patients who are unconscious and not breathing (i.e., no gag reflex).
- SGAs are designed to be inserted blindly (i.e., without laryngoscope).
- See Procedures: *Airway Management: I-Gel Supraglottic (1030)* and *Airway Management: King LTS-D Supraglottic Airway (1035)* for further information.

Removal of FBAO using Laryngoscope and McGill forceps [Paramedic]

- See Procedure: *Foreign Body Airway Obstruction (FBAO) (1110)* for further information.

Intubation is a park specific expanded scope of practice (ESOP). Talk to local park LEMA for further guidance.

DIFFICULT AIRWAY ASSESSMENT (TIPS FOR AIRWAY ASSESSMENT) DIFFICULT BVM VENTILATIONS

MOANS

M Difficult Mask seal due to facial hair, anatomy, blood, or secretions/trauma
O Obese or late term pregnancy
A Age > 55 years
N No teeth
S Stiff or increased airway pressures (asthma, COPD, obese, pregnant)

Difficult Supraglottic Airway (RODS)

R Restricted mouth opening
O Obstruction or Obese or late pregnancy
D Distorted or disrupted airway
S Stiff or increased airway pressures (asthma, COPD, obese, pregnant)

Difficult Cricothyrotomy/Emergency Airway (SHORT)

S Surgery or distortion of airway
H Hematoma overlying neck
O Obese or late pregnancy
R Radiation treatment skin changes
T Tumor overlying neck

Trauma

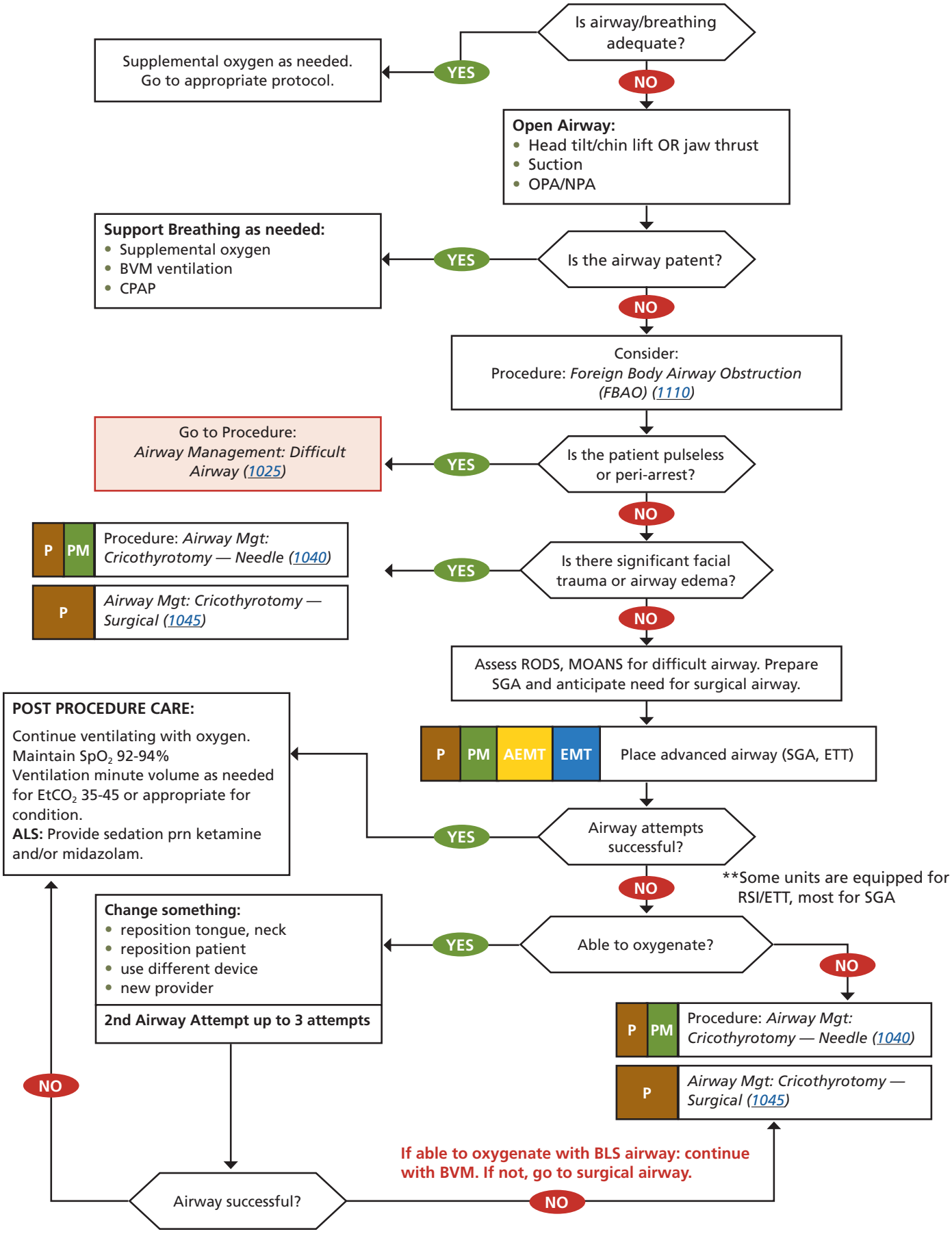
- During advanced airway maneuvers, if C-Collar is in place then the C-Collar front may be open or removed to facilitate translation of the mandible/mouth opening.
- Have another provider stabilize the neck manually during the procedure.

SPECIAL CONSIDERATIONS

- Waveform capnography $EtCO_2$ is required (if available) for the monitoring of all patients with an advanced airway.
- If an effective airway is being maintained by a BVM and/or basic airway adjuncts (e.g., OPA, NPA) with continuous pulse oximetry values > 90%, it is acceptable to continue with basic airway measures. Consider CPAP as indicated by protocol and patient condition.
- For the purposes of this protocol, a secure airway is achieved when the patient is receiving appropriate oxygenation and ventilation.
- An advanced airway attempt is defined as passing the advanced airway device past the teeth.
- An appropriate ventilation rate is typically one that maintains an $EtCO_2$ of 35-45.
- Hyperventilation in head trauma is not indicated.
- Do not assume hyperventilation is psychogenic—use oxygen for goal SpO_2 of 90-99%, not a paper bag.
- Gastric tube placement should be considered in all ventilated patients if available and will not delay transport.
- It is important to secure the advanced airway device well. Manual stabilization of the advanced airway device should be used during all patient moves/transfers. Reassess device placement after all moves and transfers.

In prolonged field care, PEEP valve is recommended with BVM.

AIRWAY MANAGEMENT



1020

Airway Management: Intubation - Endotracheal

CLINICAL INDICATIONS

- Respiratory insufficiency or respiratory arrest
- GCS < 8 with no gag reflex

CONTRAINDICATIONS

- Presence of gag reflex
- Always check blood glucose and administer naloxone if indicated prior to intubation
- Valid Advanced Directive/DNR/POLST form

EQUIPMENT

- Endotracheal tube, 10 mL syringe, laryngoscope handle and blade, BVM, suction, capnography, pulse oximetry.

NOTES AND PRECAUTIONS

- Do not delay BLS airway management, defibrillation, or CPR to place an endotracheal tube.
- In most patients, a properly placed ET tube will have a depth of three times the tube size in centimeters (e.g., 7.0 tube-depth of 21 cm).
- Esophageal intubation most commonly occurs when the operator cannot visualize the tube passing through the vocal cords. **Failure to recognize esophageal intubation is a common and fatal error.** If verification of tube placement is uncertain, remove the tube, oxygenate the patient and re-attempt.
- Vomiting and aspiration during endotracheal intubation can occur when the gag reflex is intact. Be prepared to suction and place an OG tube if available and trained.

PROCEDURE

1. Maintain spinal cord protection if indicated; if not indicated, place the patient's head in a "sniffing position" (ears aligned with the sternal notch).
2. Preoxygenate with a BVM and 100% oxygen for one minute.
3. Prepare suction equipment and make sure it is easily accessible.
4. Select the appropriate size ET tube based on the patient's age and size.
   A. PEDIATRIC: (age in years + 16)/4
5. Check cuff integrity by fully inflating it, deflating it after confirmation.
6. Lubricate tube.
7. Insert stylet.
8. If present, remove dentures, broken teeth, OPA.
9. Have failed airway equipment prepared.
10. Direct or video-assisted laryngoscopy
    A. Lift tongue and lower jaw with the laryngoscope blade in your left hand, directing the force 45° from the patient with a gentle upward/forward lift—do not pry on the teeth.
    B. Hold the ET tube in your right hand so the distal tip curves up.
    C. Visualize the epiglottis and vocal cords.
    D. Introduce the ET tube from the corner of the mouth, advance until the cuff is past the cords.
    E. If attempt fails within 30 seconds—stop—place and OPA and ventilate the patient with a BVM and 100% oxygen for 1 minute.
    F. Do not exceed three attempts (i.e., defined as cessation in ventilation to perform laryngoscopy).
       a. Place supraglottic airway, continue BLS ventilatory maneuvers, or perform surgical airway.
11. Inflate the balloon.
12. Attach $EtCO_2$ monitor and ventilate with a BVM at 15L (100% FIO_2).
13. Verify ET tube placement.
    A. Place capnography and observe wave form, use colorimetric $EtCO_2$ if capnography unavailable.
    B. Observe chest rise and fall.
    C. Listen with a stethoscope while ventilating for absence of epigastric air.
    D. Listen with a stethoscope while ventilating for bilateral lung sounds.
    E. Look for fogging of the ET tube.

F. If unable to ventilate, rapidly troubleshoot (e.g., suction, kinks, biting, obstruction), and remove the tube if the problem is not resolved. Insert OPA, ventilate with BVM and consider supraglottic airway.
G. If unable to ventilate with basic techniques (BVM/OPA) or supraglottic airway, perform surgical airway.

14. Secure ET tube with commercial device or tape.
15. Ensure tube placement (Step 13) every time patient is moved.
16. Consider analgesia and sedation—MC contact as necessary.
17. Document ET tube size, number of attempts (and results), and placement location by marks on tube in reference to the patient's teeth or lips.

CLINICAL INDICATIONS

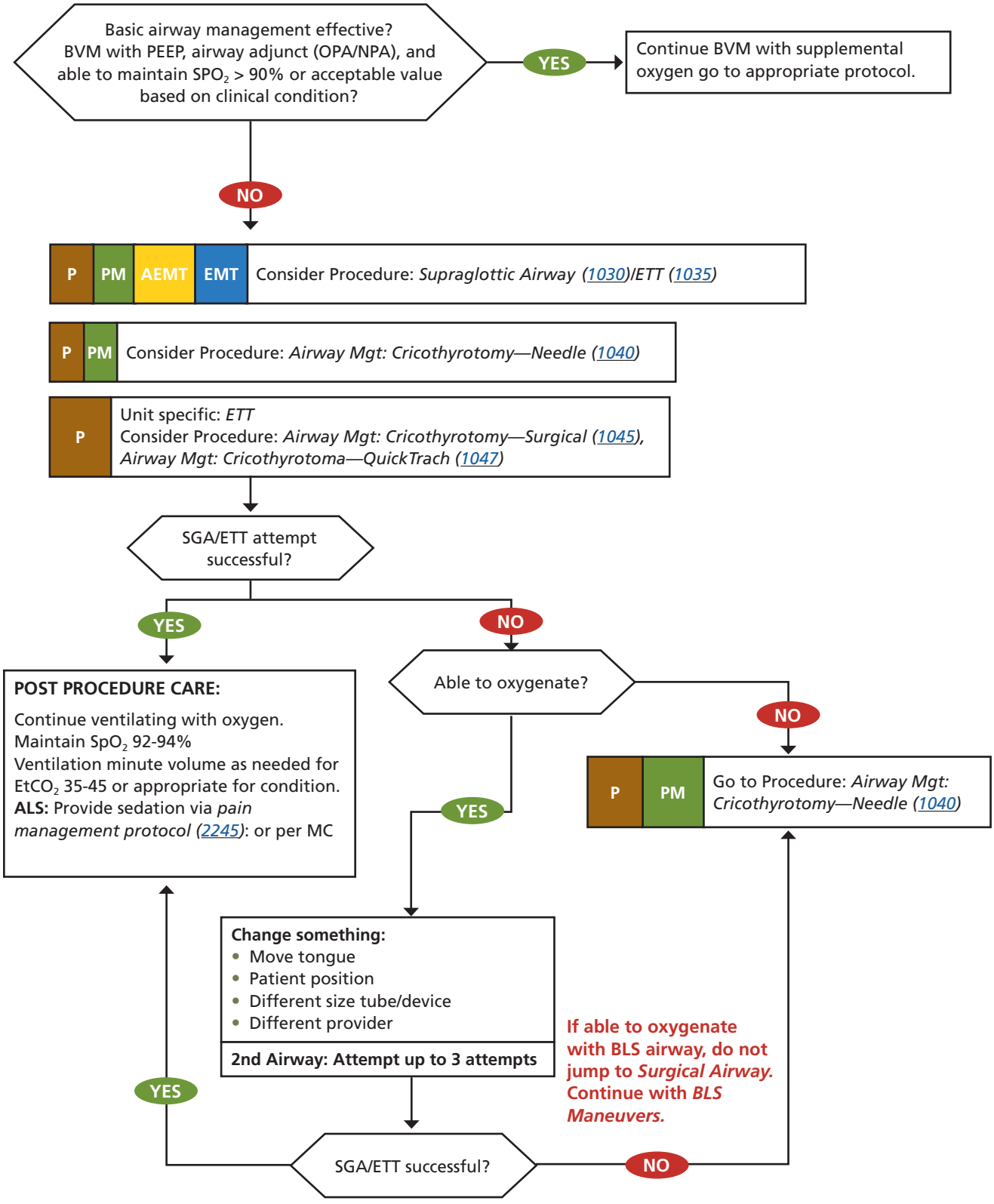
- A difficult airway is an airway that cannot be managed adequately by the provider's level of training.
- Contact MC as soon as possible when a difficult airway is recognized.

NOTE: A patient with a "difficult airway" is one who is near death or dying or not stable or improving. Patients who cannot be intubated or who do not have an oxygen saturation greater than 90% do not necessarily have a failed airway. Many patients who cannot easily accept an advanced airway device may be sustained by basic airway techniques and BVM.

SPECIAL CONSIDERATIONS

- If first advanced airway attempt fails, make an adjustment and consider:
  - » Move tongue
  - » Change head positioning
  - » Different tube size
  - » Different provider
- Continuous pulse oximetry and $EtCO_2$ must be utilized in all patients with an inadequate respiratory function.
- If an effective airway is being maintained by a BVM and/or basic airway adjuncts (e.g., OPA, NPA) with continuous pulse oximetry values > 90%, it is acceptable to continue with basic airway measures.
- Consider CPAP as indicated by protocol and patient condition.

Airway Management: Difficult Airway



Airway Management: i-Gel Supraglottic

CLINICAL INDICATIONS

The patient needs a secured airway.

DEFINITION

The i-Gel airway is a disposable supraglottic airway, or SGA, created as an alternative to tracheal intubation or mask ventilation. The supraglottic airway is designed for positive pressure ventilation as well as spontaneously breathing patients.

CONTRAINDICATIONS

- Intact gag reflex
- Upper airway obstruction
- Known or suspected caustic ingestion or esophageal disease
- Suspected narcotic overdose before the administration of naloxone (may be used if the patient does not respond to naloxone).

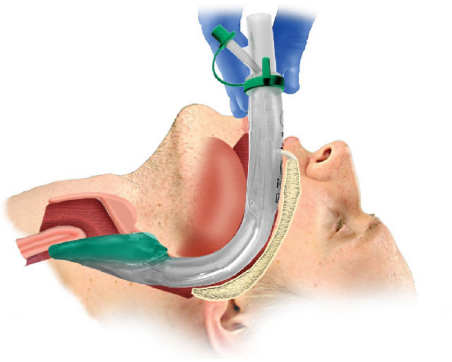
PROCEDURE

MAINTAIN cervical motion restriction if indicated.

1. Attach a pulse oximeter to the patient and prepare capnography, if available.
2. Provide apneic oxygenation by nasal cannula before and during procedure at 15 L/min. in addition to BLS maneuvers (BVM ventilation).
3. Estimate the patient's weight (i.e., for sizing of i-Gel airway).
4. Select the appropriate size based on the patient's weight. See table, below.
5. Lubricate the back, sides, and tip of the cuff with KY-Jelly or other water-based lubricant.
6. Remove broken teeth, dentures, OPA.

	Size		Weight
●	5	Large adult	≥ 90 kg
●	4	Medium adult	50-90 kg
●	3	Small adult	30-60 kg
○	2.5	Large paediatric	25-35 kg
●	2	Small paediatric	10-25 kg
●	1.5	Infant	5-12 kg
●	1	Neonate	2-5 kg

7. 

8. 

7. Remove the i-Gel from the protective cradle. Grasp the lubricated i-Gel firmly along the integral bite block. Position the device so that the i-Gel cuff outlet is facing towards the chin of the patient. The patient should be in the "sniffing" position with head extended and neck flexed. The chin should be gently pressed down before proceeding. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
8. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt.
9. The tip of the airway should be in the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite-block.
10. Attach a BVM to the tube and ventilate the patient. Evaluate breath sounds and verify absence of epigastric sounds. Monitor oxygen saturation, chest rise, and capnography.
11. Secure i-Gel with the support strap provided in i-Gel packaging or with tape.
12. Continue monitoring for adequate ventilations and possible dislodgement.

MEDICATIONS

With MC consultation, sedation (Medications: *Ketamine (3115)* or *Midazolam (3135)*) and analgesic (Medications: *Fentanyl (3080)* or *Morphine (3140)*) administration may be indicated for intubated patients who have become agitated or combative following intubation.

NOTES AND PRECAUTIONS

- Do not delay BLS airway techniques, ventilations, CPR, or defibrillation to place an i-Gel airway.
- The i-Gel gastric access lumen allows insertion of up to a 12 Fr orogastric tube for adult I-gel sizes and 10 Fr for pediatrics.

Airway Management: King LTS-D Supraglottic Airway

CLINICAL INDICATIONS

The patient needs a secured airway.

DEFINITION

The King airway is a disposable extraglottic airway (e.g., referred to as supraglottic here, or SGA) created as an alternative to tracheal intubation or mask ventilation. The supraglottic airway is designed for positive pressure ventilation.

CONTRAINDICATIONS

- Intact gag reflex
- Upper airway obstruction
- Known or suspected caustic ingestion or esophageal disease
- Suspected narcotic overdose before the administration of naloxone (i.e., may be used if the patient does not respond to naloxone)

PROCEDURE

1. Maintain c-spine precautions if indicated.
2. Have suction equipment ready. ONLY SUCTION MAIN AIRWAY TUBE.
3. Attach pulse oximeter and monitor oxygen saturation.
4. Provide apneic oxygenation by nasal cannula before and during procedure at 15 L/min.
5. Estimate patient's height and weight (for sizing of supraglottic airway) and place their head in a neutral position.
6. Use for both pediatric and adult patients:
   - < 5 kg—Size 0 (Transparent)
   - 5-12 kg—Size 1 (White)
   - 35-45 inches tall or 12-25 kg—Size 2 (Green)
   - 41-51 inches tall or 25-35 kg—Size 2.5 (Orange)
   - 4-5 feet tall—Size 3 (Yellow)
   - 5-6 feet tall—Size 4 (Red)
   - 6-7 feet tall—Size 5 (Purple)
7. Check the integrity of both balloons by inflating briefly, then deflate.
8. Lubricate distal end of the supraglottic airway with KY-Jelly or water.
9. Remove dentures, broken teeth, and OPAs.
10. Lift tongue and lower jaw with nondominant hand. Use gauze on tongue for friction if needed.
11. With the supraglottic airway rotated laterally 45-90° such that the blue orientation line is touching the right corner of the mouth, introduce tip into mouth and advance behind the base of the tongue.
12. As the tube gently advances, rotate the tube back to midline so that the blue orientation line faces chin.
13. Advance tube until base of connector aligns with teeth or gums. This should be completed in 30 seconds otherwise insert NPA/OPA, preoxygenate for 1 minute and reattempt tube placement.
14. Inflate the cuffs using the supplied syringe. The supraglottic airway may rise as it seats itself in the airway.
15. Attach BVM to the tube and ventilate patient.
16. Verify supraglottic airway placement: Look for chest rise; Listen with stethoscope for absence of epigastric air entry while bagging; Listen with stethoscope for breath sounds in both axillae while bagging. Attach $EtCO_2$ and monitor capnography waveform. If air is leaking around balloon and out of mouth, add small quantities of air to the balloon (5-10 mL at a time) to ensure oropharyngeal seal.
17. If unable to ventilate the patient after placement, deflate balloons and adjust depth of tube to optimize ventilation. If unsuccessful, insert OPA/NPA and ventilate with BVM. If still unable to ventilate, consider Cricothyrotomy per Procedure: *Airway Mgt: Cricothyrotomy - Needle (1040) or Surgical (1045).*
18. After successful placement, secure tube and continue to monitor for adequate ventilations.
19. Reassess adequate tube placement every time patient is moved.
20. Consider orogastric tube placement (Procedure: *Orogastric Tube Insertion [1370]*).

MEDICATIONS

With MC consultation, sedation (Medications: *Ketamine (3115)* or *Midazolam (3135)*) and analgesic (Medications: *Fentanyl (3080)* or *Morphine (3140)*) administration may be indicated for intubated patients who have become agitated or combative following intubation.

NOTES AND PRECAUTIONS

- Do not delay BLS airway, ventilations, CPR, or AED to place a supraglottic airway.
- If during tube placement patient begins to gag and/or vomit, remove the supraglottic airway, suction as needed, and reassess mental status prior to further attempts.
- If unable to fully insert the supraglottic airway despite changing the angle of insertion, remove the tube, coil it tightly to increase its curvature, and then reinsert it quickly before it fully uncoils.
- If narcotic overdose is suspected as the cause of ALOC, give naloxone per Protocol: *Altered Mental Status (2020)* before inserting the supraglottic airway. If no effect, insert tube as indicated.

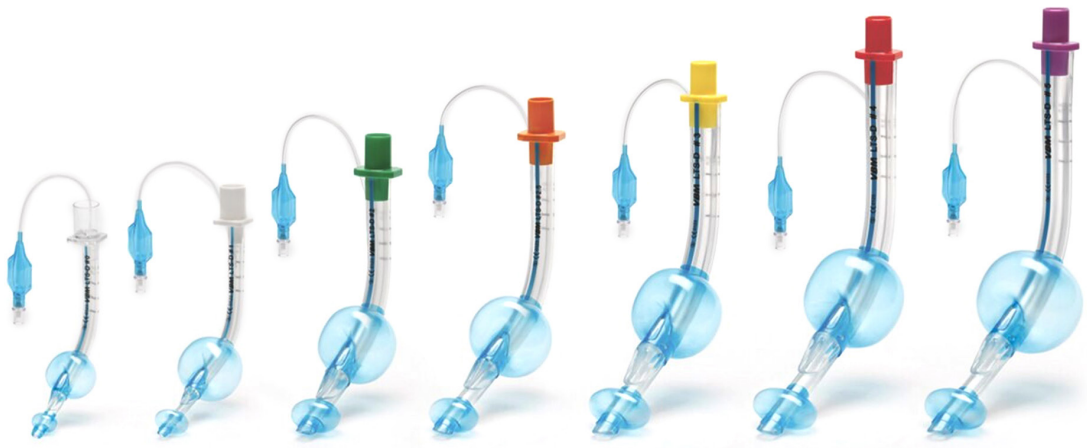
KING LTS-D SIZING

Pediatric

Tube Size	Size 0	Size 1	Size 2	Size 2.5
Connector color	Transparent	White	Green	Orange
Patient criteria	< 5 kg	5-12 kg	26-55 lb. 35-45 in	55-77 lb. 41-51 in
Recommended cuff volume	10 mL	20 mL	35 mL	40-45 mL
Max. cuff pressure	60 cm H_2O	60 cm H_2O	60 cm H_2O	60 cm H_2O
External diameter of the tube	9 mm	9 mm	14 mm	14 mm
Bronchoscopy via ventilation lumen	< 3.0 mm	< 3.0 mm	< 4.0 mm	< 4.0 mm
Suction catheter	10 Fr	10 Fr	16 Fr	16 Fr

Adult

Tube Size	Size 3	Size 4	Size 5
Connector color	Yellow	Red	Purple
Patient criteria	4-5 feet	5-6 feet	> 6 feet
Recommended cuff volume	50-60 mL	70-80 mL	80-90 mL
Max. cuff pressure	60 cm H_2O	60 cm H_2O	60 cm H_2O
External diameter of the tube	17.6 mm	17.6 mm	17.6 mm
Bronchoscopy via ventilation lumen	< 6.0 mm	< 6.0 mm	< 6.0 mm
Suction catheter	18 Fr	18 Fr	18 Fr



Airway Management: Cricothyrotomy - Needle

CLINICAL INDICATIONS

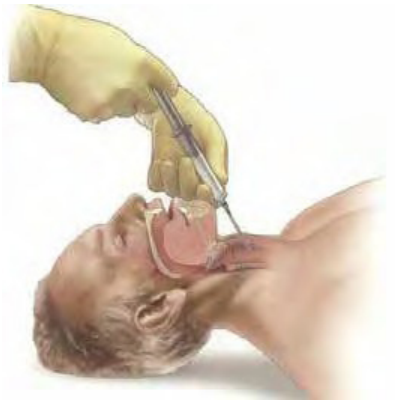
- Complete airway obstruction not relieved by manual procedures.
- Inability to insert ALS airway and inability to successfully ventilate using BVM ventilation.

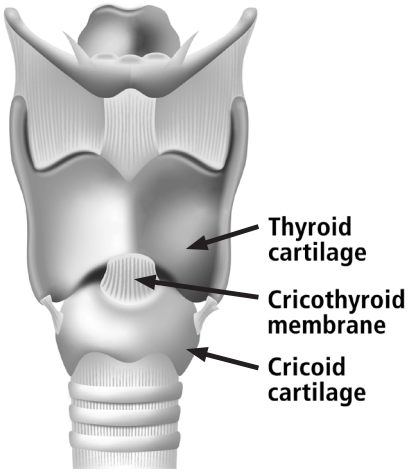
EQUIPMENT

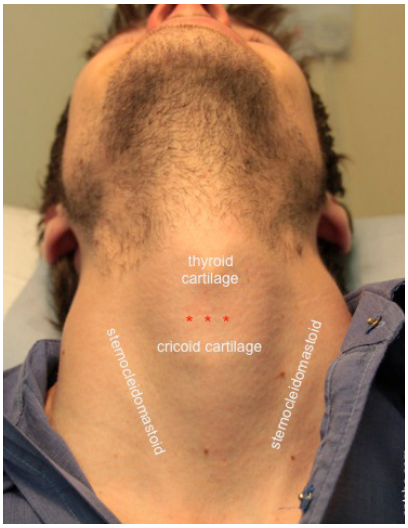
- 10 ga Angio catheter
- 3 mL syringe
- 3.0 and 3.5 ETT adapters, or 7.0 ETT adapter into 3 mL syringe
- BVM attached to oxygen

PROCEDURE - NEEDLE CRIC

1. Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck unless C-spine injury is suspected.
2. Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage, between the thyroid cartilage and the 1st tracheal ring. This is the position of the cricothyroid membrane.
3. Prepare the area with antiseptic solution (iodine preferred unless patient allergic).
4. Stabilize the airway between thumb and forefingers.
5. Attach a 3 mL syringe to the needle with catheter then insert into the cricothyroid membrane at a 45-degree angle toward the feet.
6. Aspirate for air return as catheter is inserted. The trachea is usually 1/2-3/4 in deep to skin surface. Once air return is obtained, remove needle while advancing catheter.
7. Hold manually to stabilize catheter and attach the ETT adapter to the syringe and begin ventilations with the BVM with oxygen.
8. Secure the IV cannula with tape after confirming correct placement:
    - Assess chest rise.
    - Verify absence of gastric sounds.
    - Check adequacy of breath sounds.
    - Assess for complications: reassess ventilation and placement if subcutaneous air is noted.





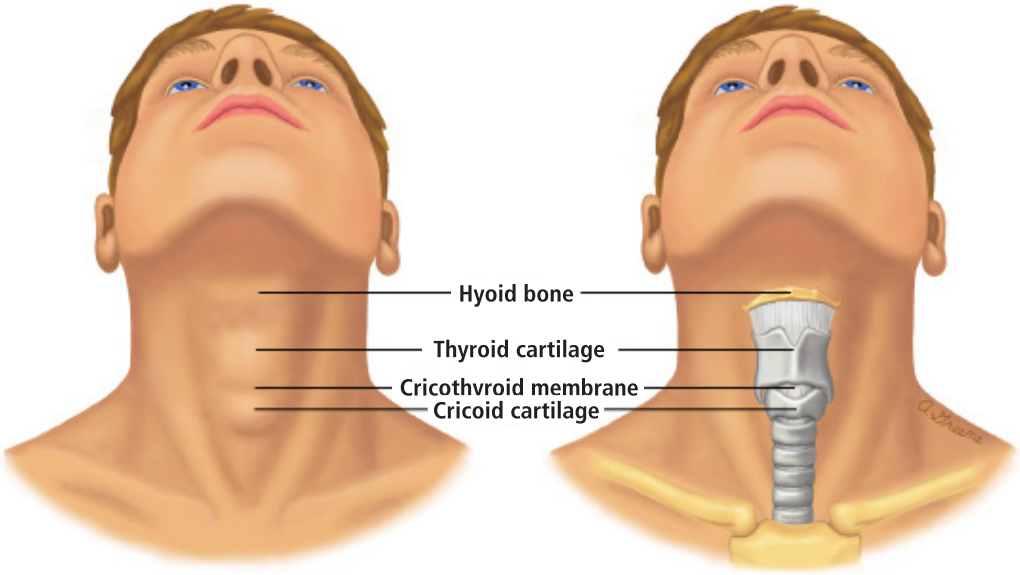


NOTES AND PRECAUTIONS

- Hazards in performing this procedure are primarily those of damage to nearby structures and major vessels on either side of the midline, to the vocal cords if the puncture is made too high, or a through and through injury of the trachea if the puncture is made too deeply.
- Palpation of the cricothyroid membrane is very difficult in the infant and young child. The key to success is immobilization of the trachea throughout the procedure.
- Needle cricothyrotomy is for use only as a temporary measure providing of oxygenation and does not provide adequate ventilation if used for more than 20-30 minutes. If using pulse oximetry and capnography, expect low O_2 saturation levels and high $EtCO_2$ levels. Watch for chest hyperinflation, stopping bagging may be necessary to allow for exhalation. Continue attempts to obtain an advanced airway and remove obstructions.
- Due to the small caliber of this rescue airway, a prolonged exhalation phase is often required. Allow adequate time for exhalation.
- Reassess placement every time patient is moved.
- Different manufacturers may have slight variations in their angiocath and supraglottic airway adapters. The BD 10 g Angiocath and Kimberly Clark 3.0 ET tube adapter fit well together. However, manufacturer's equipment may be used if it fits well and forms an air-tight seal. This set of equipment should be checked and prepackaged before patient care.

MEDICATION CONSIDERATION

Sedation (Medications: *Ketamine (3115)* or *Midazolam (3135)*) and analgesic (Medication: *Fentanyl (3080)*) administration may be indicated for patients who have become agitated or combative following cricothyrotomy.



https://aomcfoamed.com/2020/12/13/cricothyrotomy/

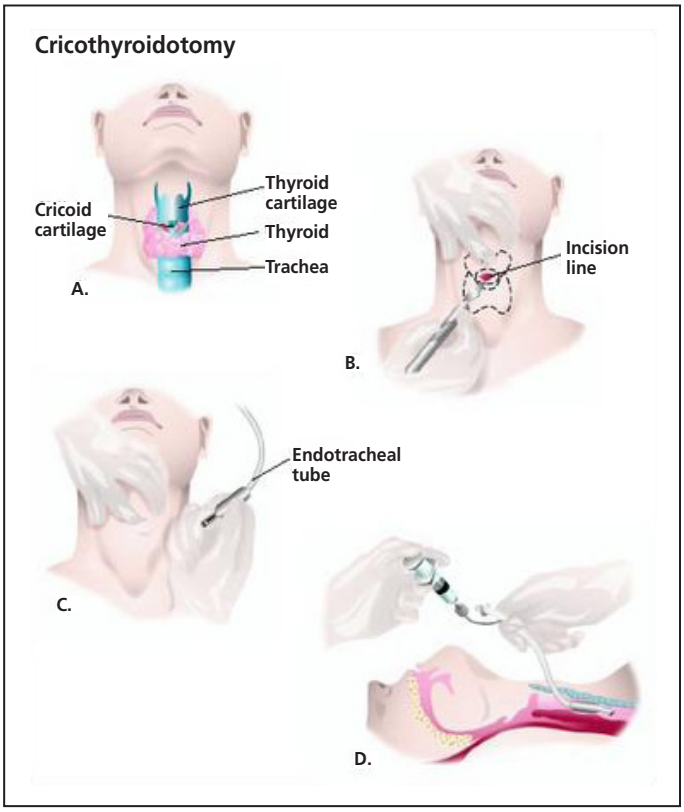
Airway Management: Cricothyrotomy - Surgical

EQUIPMENT

- Cricothyrotomy kit:
  - » scalpel (#10 blade preferred)
  - » gum elastic bougie
  - » 6.0 cuffed tracheostomy tube or ETT
  - » 10 mL syringe
  - » securement device

PROCEDURE

1. Place the patient in a supine position with support under the shoulders.
2. Stabilize the thyroid cartilage with the fingers of your non dominant hand.
3. Palpate the neck in the midline and locate the cricothyroid membrane, a slight depression just below the notch of the thyroid cartilage, between the thyroid cartilage and the 1st tracheal ring.
4. Prepare the area with antiseptic solution.
5. Make a 2-4 cm vertical incision through the skin overlying the cricothyroid membrane.
6. Using a scalpel, puncture the cricothyroid membrane horizontally.
7. Insert your finger or mosquito hemostats through the incision—use a tracheal hook, if available, to keep the incision open.
8. Slide the gum-elastic bougie through the incision, guiding it inferiorly into the trachea.
9. Pass the cuffed endotracheal tube or tracheostomy tube over the bougie until the balloon is no longer visible.
10. Secure in place.
11. Attach the connecting tube to the BVM to ventilate and confirm placement.
12. Confirm placement by visualizing chest rise, checking breath sounds, SpO_2, $EtCO_2$, and absence of gastric sounds.



Cricothyroidotomy
To perform a cricothyroidotomy, the surgeon makes an incision into the cricoid cartilage of the throat (B). The incision is held open while an endotracheal tube is inserted (C). The tube is secured in the trachea to maintain an airway for the patient (D). (Illustration by GGS Inc.)

Read more: https://www.surgeryencyclopedia.com/Ce-Fi/Cricothyroidotomy.html#ixzz7q88AXdB5

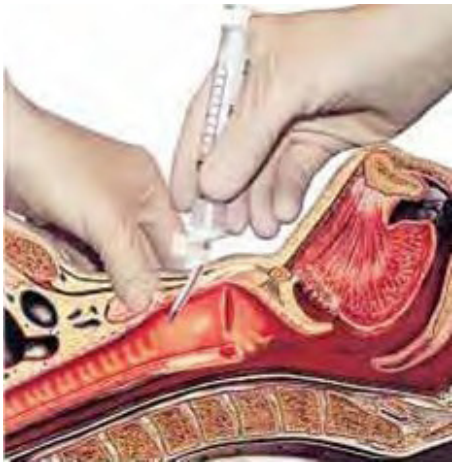
Airway Management: Cricothyrotomy via QuickTrach

EQUIPMENT

- QuickTrach—Emergency Cricothyrotomy Kit
- Contents—1 QuickTrach syringe with stopper,
  1 connecting tube with 15 mm adapter,
  1 cushion neckband

  ADULT—4.0 mm for 77 lbs (35 kg) and heavier
  PEDIATRIC—2.0 mm for 22 lbs to 77 lbs (10 kg to 35 kg)
  —Under 10 kg, use Procedure: *Airway Mgt: Cricothyrotoma - Needle (1040)*

- BVM attached to oxygen



PROCEDURE

1. Place the patient in a supine position with support under the shoulders and mild hyperextension of the head, unless C-spine injury is suspected.
2. Identify the structures of the larynx.
3. Stabilize the thyroid cartilage with the fingers of your nondominant hand.
4. Palpate the neck in the midline and locate the cricothyroid membrane, a slight depression just below the notch of the thyroid cartilage, between the thyroid cartilage and the 1st tracheal ring.
5. Prepare the area with antiseptic solution.
6. With dominant hand, insert the QuickTrach needle with catheter into the cricothyroid membrane at a 90-degree angle.
7. Aspirate for air return as catheter is inserted. A saline flush with 1-2 mL of saline can be used in place of the included syringe. The trachea is usually 1/2-3/4 in deep to skin surface.
8. Once air return is obtained, incline QuickTrach to 45 degrees and advance to the stopper.
9. Remove the stopper.
10. Hold the needle still while advancing the catheter until the flange is against the skin. Then remove the needle.
11. Secure with the padded strap.
12. Attach the connecting tube to the BVM to ventilate.
13. Confirm placement by visualizing chest rise, checking breath sounds, SpO_2, $EtCO_2$, and absence of gastric sounds.

Apneic Oxygenation

Apneic oxygenation (ApOx) is the passive flow of oxygen into the alveoli during apnea. This passive movement occurs due to the differential rate between alveolar oxygen absorption and carbon dioxide excretion producing a mass flow of gas from the upper respiratory tract into the lungs.

Ideally, this process requires a de-nitrogenating of the airway circuit—flooding the airways with oxygen—which allows oxygen to move into the bloodstream and tissues due to bulk flow down and across a pressure gradient. Do not delay performing this step.

Note that without ventilation, CO_2 will continue to build up in the bloodstream and tissues.

Apneic oxygenation should be used during the preoxygenation phase of RSA. It can also be used during hands-only (compression only) CPR as a stop-gap measure until high-quality BVM ventilations can be performed.

EQUIPMENT

Airway adjuncts—NPAs and OPA

Nasal cannula attached to oxygen source 15 L/min.

AND

NRB mask attached to separate oxygen source—15 L/min.

OR

BVM with PEEP valve at 10-15 cm H20 attached to separate oxygen source at 15 L/min.

Note: BVM mask seal with PEEP valve may provide expiratory pressure to splint the alveoli open—like CPAP

PROCEDURE

1. Start preoxygenation with head elevated if possible.
2. During preoxygenation, keep the nasal cannula on underneath your primary preoxygenation technique. Consider taping cannula to face to prevent dislodgement.
3. Normal adjunctive airway techniques/equipment (jaw thrust, oropharyngeal airway) remain useful. In particular, a NPA can maintain patency of at least one NARES.
4. Attach the nasal cannula to a separate oxygen source at 15 L/min.
5. After preoxygenation, leave the nasal cannula on after removing NRB or BVM mask. It should not get in the way of the introduction of the SGA.

1055

Blood Glucose Analysis (BGL)

CLINICAL INDICATIONS

Patients with suspected hypoglycemia (e.g., diabetic emergencies, change in mental status, seizures, syncope)

EQUIPMENT

Test strips, gauze 2x2, lancet, alcohol pad, glucometer

PROCEDURE

1. Gather and prepare equipment.
2. Clean site with an alcohol prep pad or other cleansing swab. Allow the area to dry.
3. Perform finger stick with a lancet. Blood may also be obtained from an IV stick.
4. Place correct amount of blood on reagent strip per the manufacturer's instructions. Dispose of lancet in sharps container.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for re-assessment after treatment and as per protocol.
7. Device may need calibration or control test before use on patient, per instruction manual. Check expiration date of test strips and control solution (both may have different opened and unopened expiration dates).

Protect glucometer kit from heat, light, and freezing.

Blood Sample Collection

PURPOSE

The collection of evidentiary blood by a qualified EMS provider when requested by law enforcement.

DEFINITIONS

Qualified provider: An ALS authorized provider who has been trained in evidentiary blood draw procedures and is approved to conduct this procedure.

DOCUMENTATION

- All blood draw collections will be documented in according to the Blood Collection Kit instructions.
- A patient care report (PCR) is not to be completed unless this person is considered a patient by another procedure, policy, or protocol. Document blood collection on PCR as event during patient care.

EQUIPMENT

- Blood collection kit
- Vacutainer hub
- Butterfly needle or fresh IV site
- Povidone iodine prep pad (or prep pad provided in kit)—do not use alcohol prep pads
- Tourniquet

PROCEDURE

Follow Blood Collection Kit Instructions in conjunction with instructions below.

1. Receive verbal request by law enforcement. LE officer needs to remain present throughout procedure by policy.
2. Prep equipment.
3. Complete "Subject Specimen" labels, "Expiration Date on Tubes" and "Lot # on Tubes" on "CHECKLIST FOR MEDICAL STAFF" (on "BLOOD TEST REQUEST FORM").
4. Apply tourniquet and prep draw site with iodine pad or provided wipe. Do NOT use alcohol prep pads.
5. Complete venipuncture in new site. (Never inject ANYTHING through the same site, including saline).
6. Remove the tourniquet.
7. Fill both blood collection tubes. DO NOT REMOVE VIAL CAPS OR POWDER.
8. Note the time of collection.
9. Mix blood with powder in tube.
10. Affix completed "SUBJECT SPECIMEN" labels to tubes. Seal collection tubes with completed "SPECIMEN SECURITY SEALS" placed over vial cap.
11. Place sealed vials in bubble wrap, seal with initialed "EVIDENCE" seals (one over each pouch). Place bubble wrap package in Ziploc with absorbent pad.
12. Complete "CHECKLIST FOR MEDICAL STAFF" paperwork supplied with Blood Collection Kit. Do NOT complete paperwork intended for Officers.
13. Immediately turn over custody of samples and unsealed collection kit to Law Enforcement Officer.

NOTES AND PRECAUTIONS

- Confirm with law enforcement that scene is safe for noncommissioned personnel.
- Noncommissioned staff are not to engage in controlling a suspect. Remove yourself from situation if indicated.
- Always ensure professionalism by all providers. This is a medical procedure, not punishment.

BEST PRACTICES (IF ABLE)

- This is a time-sensitive procedure; avoid delays whenever possible.
- Have a provider separate from investigating officer do the collection.
- Utilize video recording (could be body-worn camera) during entire process.

Example of test kit shown below. May not be the same in all units.

1063

Carbon monoxide (CO) Sensor Placement

EQUIPMENT

CO-oximeter (*NOT a pulse oximeter*).

PROCEDURE

Site Selection

- Sensor is intended for use on patient's finger only.
- Choose a site that is well-perfused and least restricts a patient's movement.
- Position on ring or middle finger of patient's non-dominant hand, if possible.
- Clean site of debris and dry it before placing the sensor.

Sensor Selection

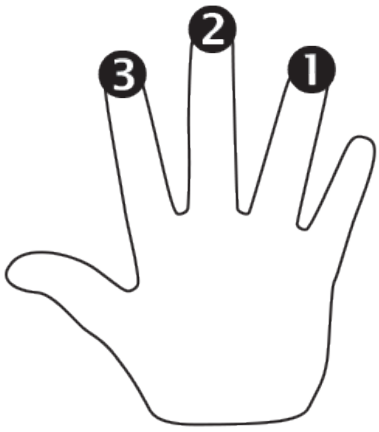
- Use appropriately-sized sensor.
  - » For average/large digits, use adult sensor.
  - » For small/slender digits (pediatric, slender adult, elderly patient) use pediatric sensor.

Applying the Sensor

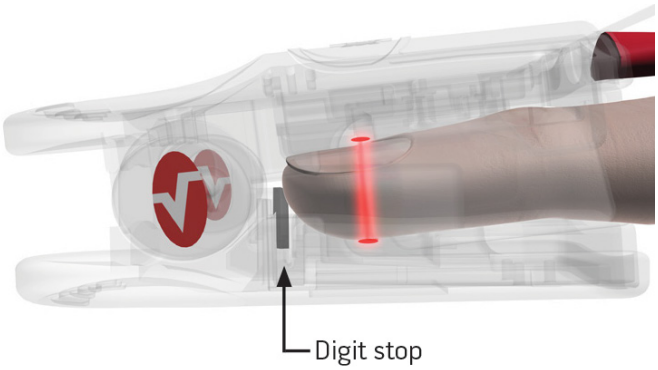
- Position sensor as indicated by image of finger on the device.
- Arrange cable on top of patient's hand.
- Insert finger all the way into sensor until it touches raised digit stop.
- Orient sensor so it is aligned with the patient's finger.

Important Considerations

- Intravascular dyes/externally applied coloring (dark/metallic nail polish) may lead to inaccurate measurements.
- High intensity extreme light may not allow CO-oximeter to obtain readings. In these situations, use ambient light shield.
- Excessive patient movement may affect the accuracy of SpCO measurements.



Use the ring, ❶ middle, ❷ and index ❸ fingers for measuring



CO_2 Monitoring/Capnography

CLINICAL INDICATIONS

- Patient with an advanced airway in place or requiring assisted ventilations
- Altered patients (e.g., suffering from an inhaled poison, toxin, or overdose, DKA, etc.)
- Patients with respiratory distress

DEFINITIONS

Capnometry is the numeric value of expired CO_2 ($EtCO_2$) from the patient. This provides an important measurement of patient ventilation (clearance of CO_2).

Capnography is the waveform display of expired CO_2 from the patient. This is an important confirmation technique for proper airway monitoring.

PROCEDURE

1. Manage airway according to the appropriate Procedure: *Airway Management (1015).*

2. Attach side-stream capnography device to the supraglottic airway. It can also be attached to an oxygen delivery device or a nasal cannula specific to CO_2 monitoring; and can be used on patients who are breathing on their own.

3. Note CO_2 level and maintain $EtCO_2$ output of 35-45 mmHg.

   The following approximates the degree of ventilation:

   > 45 mmHg = hypoventilation
   35-45 mmHg = normal ventilation
   30-35 mmHg = hyperventilation
   < 30 mmHg = aggressive hyperventilation (avoid in all patients)

4. If approved by medical control, patients who are posturing or who have other clinical presentations indicative of head trauma (blown pupil, focal motor findings) should be ventilated to maintain an $EtCO_2$ level between 35-45 mmHg.

5. The capnography device shall remain in place with the airway and be monitored throughout the prehospital care and transport.

Document the procedure and results on the Patient Care Report (PCR).

NOTES AND PRECAUTIONS

- Do not delay medication administration to apply CO_2 monitoring devices.
- Remember, pulse oximetry does not equate to ventilation. You can have a poorly ventilated patient displaying an oxygen saturation of 100%. Excessively high $PaCO_2$ levels can be detrimental to the patient outcome.
- A sudden drop in CO_2 output from normal (35-45 mmHg to 15-20 mmHg) and an obvious change in waveform are indicative of tube displacement, most likely into the hypopharynx. Reassess tube placement immediately and take corrective action.
- DO NOT rely solely on pulse oximetry or $EtCO_2$ monitoring to determine the efficacy of the intubation. It is an adjunct tool and does not replace clinical assessment or judgment.

INTERPRETING CAPNOGRAPHY

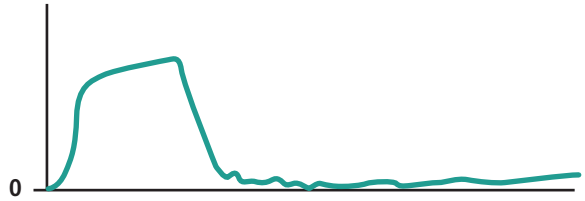
Alterations of the normal capnograph or $EtCO_2$ values are the result of changes in metabolism, circulation, ventilation, or equipment function.

The waveform has four phases that require analysis.

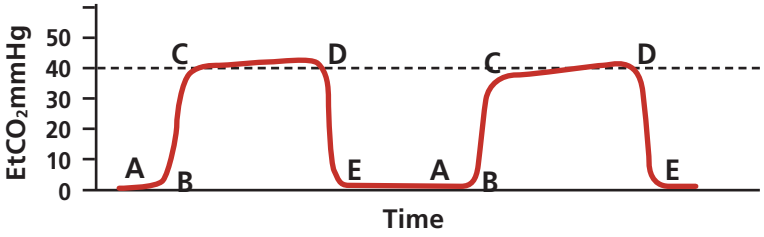
1. A to B is the flat baseline segment or **respiratory baseline** representing the beginning of exhalation of CO_2: free gas that is contained in dead space from the conduction airways (e.g., trachea, bronchi). This value is normally zero.
2. B to C is the **expiratory upstroke** segment, which is a sharp rise representing exhalation of a mixture of dead space gases and alveolar gases.
3. C to D represents the **alveolar plateau** segment characterized by exhalation of mostly alveolar gas. Point D is the end tidal ($EtCO_2$) value that is recorded and displayed by the monitor (peak concentration of CO_2 occurring at the end of expiration).
4. D to E represents the **inspiratory downstroke** segment, which is a sharp fall and reflects the inhalation of gases that are CO_2-free, such as room air or supplemental oxygen.

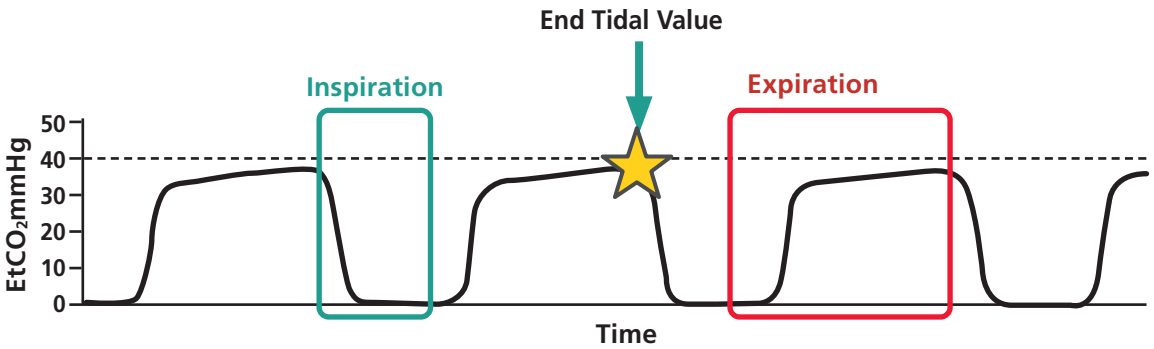
Sudden loss of $EtCO_2$ to zero or near zero:

- Possible causes:
  - » Supraglottic airway is in esophagus
  - » Apnea/Cardiac Arrest
  - » Supraglottic airway is not connected to oxygen supply/capnography detector
  - » Total obstruction/mucus plugging
  - » Capnography malfunction—if abnormal waveform persists with change in capnography adapter, the supraglottic airway MUST be withdrawn and supraglottic airway placement reattempted.



NORMAL WAVEFORM





CPR: Cardiopulmonary Resuscitation

CPR GUIDELINES

Component	Adults and Adolescents	Children (age 1 year to puberty)	Infants (age less than 1 year, excluding newborns)
Verifying scene safety	Make sure the environment is safe for rescuers and victim		
Recognizing cardiac arrest	• Check for responsiveness • No breathing or only gasping (i.e., no normal breathing) • No definite pulse felt within 10 seconds • (Breathing and pulse check can be performed simultaneously in less than 10 seconds)		
Activating emergency response system	***If a mobile device is available, phone emergency services (9-1-1)***		
	If you are alone with no mobile phone, leave the victim to activate the emergency response system and get the AED before beginning CPR. Otherwise, send someone and begin CPR immediately; use the AED as soon as it is available	***Witness collapse*** Follow steps for adults and adolescents on the left ***Unwitnessed collapse, single rescuer*** • Give 2 minutes of CPR • Leave the victim to activate the emergency response system and get the AED • Return to the child or infant and resume CPR; use the AED as soon as it is available	
Compression-ventilation ratio *without advanced airway*	***1 or 2 rescuers*** 30:2	***1 rescuer*** 30:2 ***2 or more rescuers*** 15:2	
Compression-ventilation ratio *with advanced airway*	Continuous compressions at a rate of 100-120/min. Give 1 breath every 6 seconds (10 breaths/min.).	Continuous compression at a rate of 100-120/min. Give 1 breath every 2-3 seconds (20-30 breaths/min.)	
Compression rate	100-120/min.		
Compression depth	At least 2 inches (5 cm)*	At least one third AP diameter of chest Approximately 2 inches (5 cm)	At least one-third AP diameter of chest Approximately 1 1/2 in (4 cm)
Hand placement	2 hands on the lower half of the breastbone (sternum)	2 hands or 1 hand (optional for very small child) on the lower half of the breastbone (sternum)	***1 rescuer*** 2 fingers or 2 thumbs in the center of the chest, just below the nipple line ***2 or more rescuers*** 2 thumb-encircling hands in the center of the chest, just below the nipple line If the rescuer is unable to achieve the recommended depth, it may be reasonable to use the heel of one hand.
Chest recoil	Allow complete recoil of the chest after each compression; do not lean on the chest after each compression.		
Minimizing interruptions	Limit interruptions in chest compressions to 10 seconds or less with a CCF goal of greater than 80%.		

NEONATAL GUIDELINES

- Assisted ventilations should be delivered at a rate of 40-60 breaths/minute using room air, not oxygen: ventilations should be performed for 30-60 sec before chest compressions even if there is no pulse.
- If HR is 60 or faster: no compressions.
- HR < 60 start compressions. The ratio of compressions to ventilations is 3:1 (3 compressions with 1 breath)—compression rate of 90/min., ventilation rate of 30/min.
- Compressions should be delivered to lower 1/3 of sternum at a depth of 1/3 anterior or posterior diameter of chest.

1075

CPR - LUCAS Chest Compression System

CLINICAL INDICATIONS

The LUCAS Chest Compression System is used for performing external cardiac compressions on adult patients who have acute circulatory arrest, defined as the absence of spontaneous breathing and pulse as well as loss of consciousness. LUCAS must only be used in cases where chest compressions are likely to help the patient.

EQUIPMENT

Upper Part which contains the proprietary and rechargeable LUCAS Battery and the compression mechanism with the disposable Suction Cup.

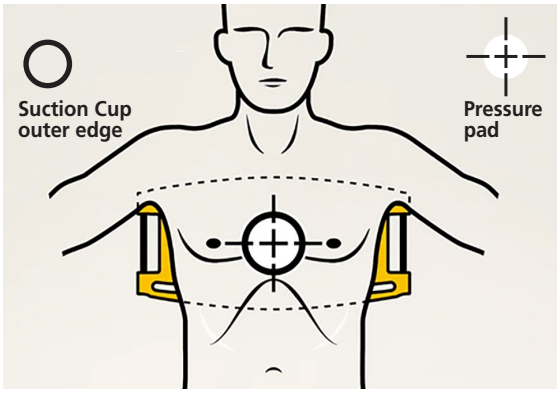
Back Plate which is positioned underneath the patient as a support for the external chest compressions.

Stabilization Strap(s) which helps to secure the position of the device in relation to the patient.

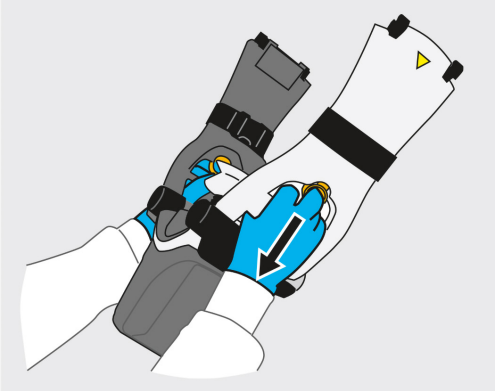
PROCEDURE

1. Push ON/OFF on the **Control Panel** for 1 second to power up LUCAS device and start the self-test. The green LED adjacent to the ADJUST key illuminates when the device is ready for use.

2. Pause manual CPR briefly while putting the LUCAS Back Plate under the patient, immediately below the arm pits. MINIMIZE INTERRUPTIOIN TO MANUAL CPR WHEN PLACING THE LUCAS DEVICE. See diagram for proper placement:



3. Resume manual CPR immediately.
4. Pull the release rings to make sure that the claw locks are open.



5. During manual CPR, attach the support leg nearest to you to the back plate.
6. Stop manual CPR while attaching the other support leg to the back plate.
7. Listen for a click. Pull up once to make sure the parts are correctly attached.
8. Use your finger to ensure that the lower edge of the suction cup is immediately above the end of the sternum.
9. Place the LUCAS device in the ADJUST MODE (1) and then push the suction cup down with two fingers until the pressure pad touches the patient's chest without compressing the chest.
10. Push PAUSE (2) to lock the start position. Use a Sharpie to outline the position of the suction cup.
11. Push ACTIVE (continuous) or ACTIVE (30:2) to start compressions (3).
12. Install the neck strap, place the padded portion as close to the patient's shoulders as possible.
13. Secure the patient's arms to the legs of the LUCAS device using the installed straps.

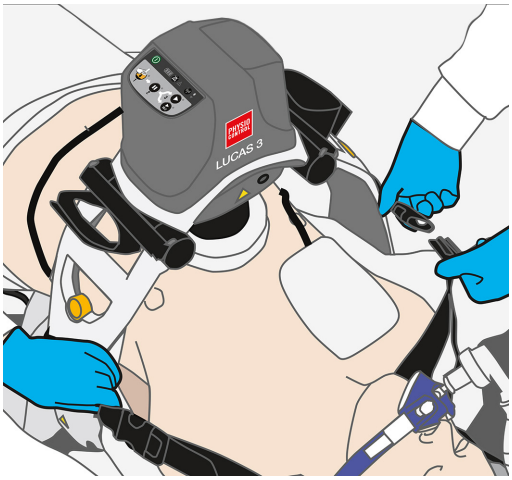
14. IF SUCTION CUP SHIFTS POSITION: Immediately push ADJUST and adjust the position back to the original position outlined by the Sharpie earlier.

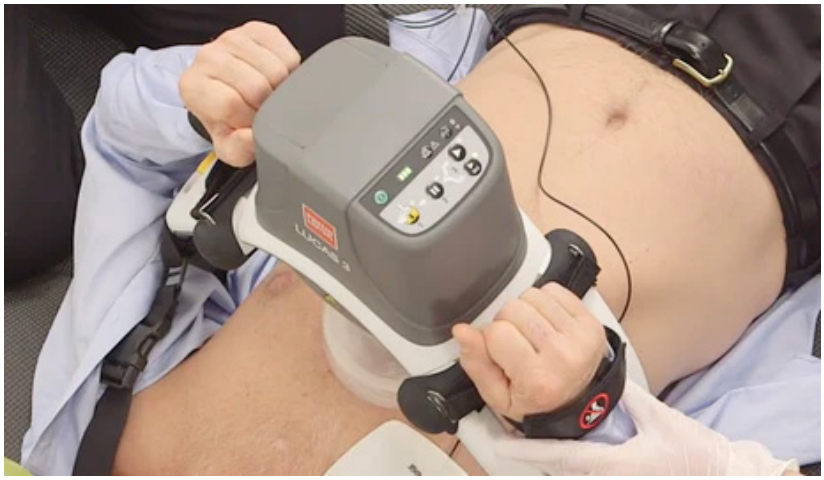
15. To lift the patient to a stretcher:

    A. Push PAUSE to temporarily stop the compressions.
    B. Lift and move the patient to a stretcher or other transportation device.
    C. Make sure that the suction cup is in the correct position.
    D. Push ACTIVE (continuous) or ACTIVE (30:2) to re-start compressions.

16. To remove the LUCAS Device:

    A. Push ON/OFF for 1 second.
    B. Remove all straps.
    C. Pull the release rings to remove the upper part from the back plate.
    D. If patient's condition allows, remove the back plate.





LUCAS® 3 Chest Compression System

Quick reference guide

ON/OFF

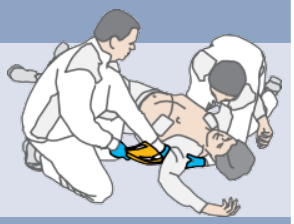
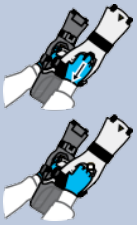
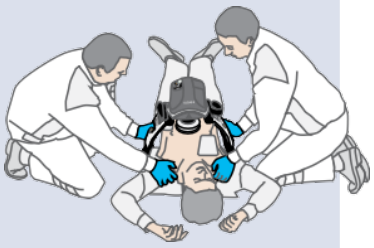
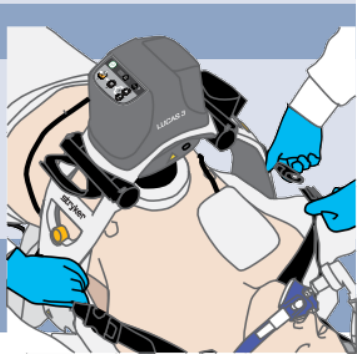
ADJUST

Manual positioning of the Suction Cup

ADJUST

PAUSE

30:2 ACTIVE

Rescuer 1 (LUCAS device operator)	Rescuer 2
1. Power on the LUCAS device	
 • Push ON/OFF to start self-test and power up the LUCAS device. • The device will be ready and in the ADJUST mode.	• Provide manual CPR. 
2. Place the LUCAS BACK PLATE	
 • Pause manual CPR briefly. • Put the BACK PLATE under the patient, immediately below the armpits.	• Assist BACK PLATE placement. • Resume manual CPR. 
3. Attach the UPPER PART	
 • Pull the RELEASE RINGS once to open CLAW LOCKS. Then let go of the rings. • Stop manual CPR briefly while attaching the UPPER PART to the BACK PLATE. Listen for "CLICK" sound. Pull up once to assure attachment.	• Continue manual CPR for as long as possible. • Help to attach the UPPER PART. 
4. Push down SUCTION CUP. Adjust position if needed.	
 • Push down the SUCTION CUP • The lower edge of SUCTION CUP should be immediately above the end of the sternum • Adjust if necessary (stay in ADJUST mode)	• Assist 
5. Lock position. Start compressions.	
 • Push PAUSE to lock START POSITION. • Push ACTIVE (continuous) or ACTIVE (30:2) to start compressions.	• Assist 
Attach stabilization strap. Follow CPR protocols.	

Cardioversion: Defibrillation (Manual Defib)

PURPOSE

- Unsynchronized cardioversion (defibrillation) is a high energy shock which is delivered as soon as the shock button is pushed on a defibrillator. This means that the shock may fall randomly anywhere within the cardiac cycle. Unsynchronized cardioversion (defibrillation) is used when there is no coordinated intrinsic electrical activity in the heart (pulseless VT/VF) or the defibrillator fails to synchronize in an unstable patient.
- Unsynchronized cardioversion (defibrillation) is used for pulseless ventricular tachycardia or ventricular fibrillation.

CLINICAL INDICATIONS

- Pulseless ventricular tachycardia, ventricular fibrillation
- Other unstable rhythms with pulses to which the defibrillator cannot sync to provide shock

PROCEDURE - GENERAL GUIDELINES

1. Assess patient to ensure patient is pulseless and/or unstable.

2. Consider premedication:

   A. Midazolam (3135) or
   B. Fentanyl (3080) and
   C. Ketamine (3115).

3. Apply pads to the patient's chest in the proper position: Adults: anterior-posterior or both pads on chest. Children: anterior-posterior positions

   NOTE: Place ECG electrodes on arms and legs to avoid interference with pads on the chest.

4. Print baseline rhythm strip.

5. Set the defibrillator by setting the joules to either the manufacture recommended setting 150J or the maximum setting of 200J (for biphasic).

   Pediatric dosing:
   1st shock: 2 Joules/kg
   Subsequent shocks: 4 Joules/kg.

6. Continue chest compressions while the defibrillator is charging.

7. Follow the directions for the type of defibrillator being used.

8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check or pulse only if appropriate for rhythm.

9. Repeat the procedure every 2 minutes as indicated by patient response and ECG rhythm. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

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Cardioversion: Synchronized

PURPOSE

- Synchronized cardioversion is an energy shock that uses a sensor to deliver electricity that is synchronized with the peak of the QRS complex (the highest point of the R-wave). When the "sync" option is engaged on a defibrillator and the shock button pushed, there will be a delay in the shock. During this delay, the machine reads and synchronizes with the patients ECG rhythm. This occurs so that the shock can be delivered with or just after the peak of the R-wave in the patient's QRS complex.
- Synchronization avoids the delivery of a low energy shock during cardiac repolarization (t-wave). If the shock occurs on the t-wave (during repolarization), there is a high likelihood that the shock can precipitate VF (ventricular fibrillation).
- Synchronized cardioversion is timed off the peak of the QRS wave and is used to treat clinically unstable tachycardia in patients with a pulse. Note that with the synchronized cardioversion, there is a pause between hitting the button and the actual cardioversion.
- In the prehospital setting, stable patients should be monitored and transported, unstable patients should receive cardioversion/defibrillation as indicated below, and patients with borderline vitals should generally have medical control for consultation before electrical therapy.

CLINICAL INDICATIONS

- Regular, wide-complex tachycardia with a pulse
- Unstable atrial fibrillation, atrial flutter, or supraventricular tachycardia
- Patient has a pulse (i.e., the pulseless patient requires unsynchronized cardioversion/defibrillation)

PROCEDURE - GENERAL PRINCIPLES

1. Assess patient and initiate IV if appropriate and patient is stable.
2. Print baseline rhythm strip.

   NOTE: Place ECG electrodes on arms and legs to avoid interference with pads on the chest.
3. Pad placement per the specific device being used.
4. Be prepared for unsynchronized cardioversion/defibrillation.
5. Consider premedication per Medications: *Midazolam (3135)* or *Fentanyl (3080)* and *Ketamine (3115)*.
6. Set the defibrillator to synchronized mode and start at 50J with increasing subsequent shocks to the maximum setting of 200J (for biphasic).

   Pediatric dosing: 1st shock: 0.5 - 1 Joules/kg
   Subsequent shocks: 2 Joules/kg.

CPAP (Continuous Positive Airway Pressure)

CLINICAL INDICATIONS

CPAP is indicated in patients with inadequate ventilation but who are conscious, breathing spontaneously, and are able to follow commands. This could be as a result of bronchospasm (COPD or asthma), pulmonary edema, CHF, pneumonia, HAPE, or postdrowning hypoxemia.

CONTRAINDICATIONS

- Altered level of consciousness and unable to protect their airway
- Respiratory arrest
- Hemodynamic instability characterized by a systolic blood pressure below 90 mmHg
- Suspected pneumothorax and/or other chest trauma
- Patient has a tracheostomy
- Significant facial trauma and/or lacerations or anatomical incompatibility
- High risk of aspiration i.e., actively vomiting, actively coughing, foreign body airway occlusion

PROCEDURE

1. Explain procedure to patient.
2. Ensure adequate oxygen supply available. Call for additional tanks or ambulances if needed.
3. Attach CPAP mask and associated equipment.
4. Assemble required equipment and personnel for Procedure: *Airway Management: Difficult Airway (1025)* in the event the patient deteriorates or is unable to tolerate CPAP.
5. Place patient on continuous pulse oximetry, capnography, and cardiac monitoring.
6. Turn oxygen source on to 15 L/min. to start airflow. Start at 100% oxygen and titrate for O_2 sat. > 95% if possible.
   A. ADULTS: Start CPAP at 10 cm H_2O and titrate up as needed to max. of 20 cm H_2O. If appropriate, may decrease below 10 cm H_2O.
   B. PEDs: < 12 years old—Start CPAP at 4 cm H_2O, increase by 2 prn up to a max. of 12-14 cm H_2O.
7. Place the mask over the mouth and nose; if possible instruct patient to hold mask until comfortable.
8. Secure the mask with straps and check for air leakage.
9. Monitor and document the patient's respiratory response to treatment, including full vitals.
10. If patient deteriorates especially SBP < 90, discontinue CPAP and assess the patient for positive pressure ventilations (BVM) and the need for Procedure: *Airway Management: Difficult Airway (1025)*. If SBP=80-100, decrease CPAP to 5 cm H_20.
11. Continue to coach patient to keep mask in place and readjust as needed.
12. Notify receiving EMS service or destination hospital that CPAP has been used.
13. If patient is experiencing anxiety, attempt to coach breathing and calm patient, consider Medication: *Ketamine (3115)* (preferred); *Midazolam (3135)* (beware respiratory depression).
14. Check around the mask for leaks and adjust the mask and/or head straps accordingly.
15. If the patient requires suctioning of the oral cavity, insert a suction catheter through the opening of the CPAP system. CPAP pressure will not be affected.
16. Monitor $EtCO_2$ with a nasal $EtCO_2$ adapter.
17. A nebulizer can also be attached to the CPAP mask if indicated; insert the male end of the nebulizer into the face mask, then insert the white end of the CPAP into the nebulizer. **NOTE:** You will need an additional oxygen supply source to run the nebulizer.

NOTES AND PRECAUTIONS

- Purpose of CPAP is to "splint" the airways open with constant pressure of air to reduce the work of breathing. In CHF, to force the excess fluid out of the alveoli and interstitial space back into the vasculature. In asthma and COPD, splinting the constricted airways open allows for more effective air exchange. CPAP may introduce transient hypotension via decreased venous return secondary to elevated intrathoracic pressure.
- Most patients will improve in 5-10 minutes. If no improvement within this time, consider intermittent positive pressure ventilation.
- Due to changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs needs to be obtained every 5 minutes.
- Depending on patient's underlying problem (CHF, COPD, etc.) follow appropriate protocol.
- In hypertensive CHF patients, do not delay initial sublingual nitroglycerin administration to apply CPAP.
- If patient vomits or has high risk of aspiration, remove CPAP unit, clear the airway and provide respiratory assistance with BVM or advanced airway adjunct.

Electronic Control Device (ECD) - Probe Removal

CLINICAL INDICATIONS

EMS personnel may be requested to assess patients post electrical control device (ECD) or "Taser" application, with retained and/or removed probes. Be aware that secondary injuries may result from falls sustained after the device has been deployed or other patient medical emergencies before ECD application. If a patient exposed to an ECD is transported to a medical facility for further evaluation, a law enforcement officer shall accompany the patient.

PREPROCEDURE ASSESSMENT

The probe end is metal with a total overall length of 1.4 inches. The end is a .45-inch flattened probe with sharpened half wedges on either side (one wedge near the tip, one wedge near the base).

Protocol: *ABCs: Universal Patient Care (2001)*

Altered mental status?
- YES → Go to Protocol: *Altered Mental Status (2020)*
- NO

Are there other medical complaints?
- YES → Go to appropriate protocol.
- NO

Is the patient able to walk?
- NO → **(Patient is unable to walk.)**
- YES

Does the patient have any of the following?
- AICD/Pacer
- Pregnancy
- Taking anti-coagulants (blood thinners)

→ YES

- NO

Is the dart in one of the following locations: face, neck joints, groin, bone, or female breasts?
- YES →
- NO

Follow the probe removal procedure.

Is the subject at an elevated safety or health risk with an exposure to the ECD due to a specific age or condition—young, old, infirm, visibly pregnant, under the influence of drugs or alcohol, psychotic, experiencing Psychomotor agitated state, or other medical disabilities—OR has the subject had 3 or more cycle exposures?
- YES →
- NO

Subject may be remanded to custody as appropriate.

Transport to appropriate medical facility for further evaluation.

PROCEDURE

1. Follow universal precautions for infection control and treat probes as bio-hazard sharps.
2. Confirm that the taser cartridge is not connected to the ECD device. It is not necessary to break the wires.
3. When practical and appropriate, photographs of ECD probe impact sites should be taken before and after probe removal by LE. Drive stun sites should be photographed as well by LE.
4. Place open hand firmly against the subject approximately 6-8 inches away from the probe. With your other hand, grasp the probe firmly using your thumb and index finger and pull up forcefully. Once removed, check the probe to verify everything is intact and nothing remained in the skin. Photograph probe after removal by LE, if practical. Apply direct pressure as necessary to control bleeding, then dress the wound.
5. Place the probe into the cartridge's wire spool bay (or a sharps container) to provide protection from the probes and place into a marked evidence bag.
6. Document procedure on a Patient Care Report (PCR).

NOTES AND PRECAUTIONS

- Subjects who are at an elevated safety or health risk with an exposure to the ECD due to a specific age or condition, such as the young, old, frail, infirm, visibly pregnant, those under the influence of drugs or alcohol, psychotics, experiencing psychomotor agitated state, and other medical disabilities should be transported to a medical facility for further evaluation.
- Subjects who have had three or more cycle exposures should also be transported to a medical facility for further evaluation.
- Probes embedded in nonsensitive areas may be removed by a law enforcement officer according to Taser procedures outlined in training. (See RM-9, ch 32).
- Probes and their expended cartridge will be taken custody of and placed into evidence by a commissioned employee. This evidence will be labeled as "bio-hazard." Generally, probes will be placed backwards into the expended cartridge's wire spool bay or a sharps container to provide protection from the probes and placed into a marked evidence bag.
- Review Protocols: *Behavioral and Psychiatric Emergencies (2030)* and *Altered Mental Status (2020)* to help determine why the patient may have needed the use of an ECD to begin with: causes include drug and alcohol intoxication, psychiatric illness, developmental delay, head injury and any causes of altered mental status (e.g., hypoglycemia, hypoxia, infection, etc.).
- Re-examine patient thoroughly looking for secondary injuries. These may include, but are not limited to:
  - » Fall-related injuries such as fractures, lacerations/abrasions, sprains, and intracranial hemorrhage
  - » Muscle contraction-related injuries such as rhabdomyolysis, or renal failure
  - » Other injuries related to subduing an agitated individual.
- **NOTE:** Anticoagulated patients (e.g., taking warfarin, apixaban, rivaroxaban) or patients on antiplatelet agents (aspirin, clopidogrel, etc.) are at an increased risk for secondary injuries.
- Arrest-Related Death (ARD): Should one or more of the following behaviors manifest, the person may require immediate medical assistance due to preexisting conditions: possible overdose, cocaine psychosis, psychomotor agitated state, etc. Persons with psychomotor agitated state are at increased risk of serious illness and death and may require immediate medical assistance after restraint. Psychomotor agitated state signs include bizarre or violent behavior, signs of overheating/profuse sweating, disrobing, violence toward/attacking glass, lights, and reflective surfaces, superhuman strength and endurance, impervious to pain, self-mutilation, loss of consciousness, and/or disturbance in respiratory pattern.
- Patients with AICD/Pacer are potentially at higher risk of cardiac dysrhythmias or damage to the AICD/Pacer. Patients should be transported for evaluation and assessment of AICD/Pacer function.

Epinephrine Autoinjector

CLINICAL INDICATIONS

Anaphylaxis

Respiratory distress—Upper Airway Obstruction Nonmechanical or Bronchospasm

PROCEDURE

1. Refer to Protocols: *Allergic Reaction/Anaphylaxis (2015)* and *Respiratory Distress: Bronchospasm/Asthma/COPD (2260)* for indications, dosages, and detailed assessment.
2. Confirm patient is appropriate candidate to receive epinephrine.
3. Inform the patient they will be receiving an injection; side effects may include feeling shaky or heart racing.
4. Clean skin of the outer thigh with alcohol prep pad if possible.
5. Familiarize yourself with the autoinjector unit.
6. Once you are ready to use the epinephrine autoinjector, start by grasping the unit with neither end covered. The needle comes out of the end of the unit, so make sure you never press, push, or put your fingers or hand over it.
7. Form a fist around the epinephrine autoinjector, with the needle-end tip down.
8. With your other hand, pull off the safety release.
9. To inject, hold the needle-end tip near outer thigh. Then firmly push against outer thigh at a 90-degree angle, until you hear the epinephrine autoinjector click. The epinephrine autoinjector is made to work through clothing, although heavy clothing may inhibit the performance.
10. Continue to hold the epinephrine autoinjector firmly against thigh for approximately 10 seconds to deliver the medicine.
11. Now that the injection is complete, remove the epinephrine autoinjector and massage the injection site for 10 seconds.
12. Note that most of the liquid (~90%) remains in the autoinjector and cannot be reused.
13. Carefully put the unit (needle-end first) back into the carrying case. Dispose of it in a sharps container as soon as possible.
14. Observe patient for improvement or worsening of condition. Repeat exam and vitals after each dose.
15. Document procedure, vitals, and response to treatment.

NOTES

- Never put thumb, fingers, or hand over needle-end tip.
- Do not remove activation cap until ready to use.

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Epinephrine Vial or Ampule

CLINICAL INDICATIONS

Anaphylaxis

Respiratory distress—Upper Airway Obstruction Nonmechanical or Bronchospasm

EQUIPMENT

Epinephrine: vial of 1 mg/mL (1:1,000) epinephrine; 1 mL syringe with 25 ga needle; alcohol prep pad; band-aid

PROCEDURE

- Refer to Protocols: *Allergic Reaction/Anaphylaxis (2015)* and *Respiratory Distress: Bronchospasm/Asthma/COPD (2260)* for indications, dosages, and detailed assessment.
- Inform the patient they will be receiving an injection; side effects may include feeling shaky or heart racing.
- Select and cleanse area with alcohol swab for injection. Primary sites include: Vastus Lateralis (thigh) muscles (preferred), Gluteal (upper buttock or hip site), or Deltaoid (upper arm). See Procedure: *Injections (Intramuscular) (1300)* for site locations.
- Using one hand to stabilize skin, insert needle at 90 degrees into administration site and draw back checking for blood return. If there is blood return, discard the needle, start over with a fresh syringe and needle.
- If there is no blood return, administer appropriate dose of epinephrine per protocol.
- If an additional dose of is required, consult Protocols: *Allergic Reaction/Anaphylaxis (2015)* and *Respiratory Distress: Bronchospasm/Asthma/COPD (2260)*.

Foreign Body Airway Obstruction (FBAO)

CLINICAL INDICATIONS

A patient with a suspected blocked airway (foreign body)

PROCEDURE FOR RESPONSIVE PATIENT

DEFINITIONS

Choking: If the patient can make sounds and cough loudly, encourage patient to continue to cough.

Choking with obstruction: If the patient cannot breathe, has a silent cough, cannot talk, or makes the universal choking sign, continue to the BLS Maneuver.

CHILD OR ADULT (1 year or older)

BLS Maneuver (abdominal thrusts, sometimes called the Heimlich Maneuver):

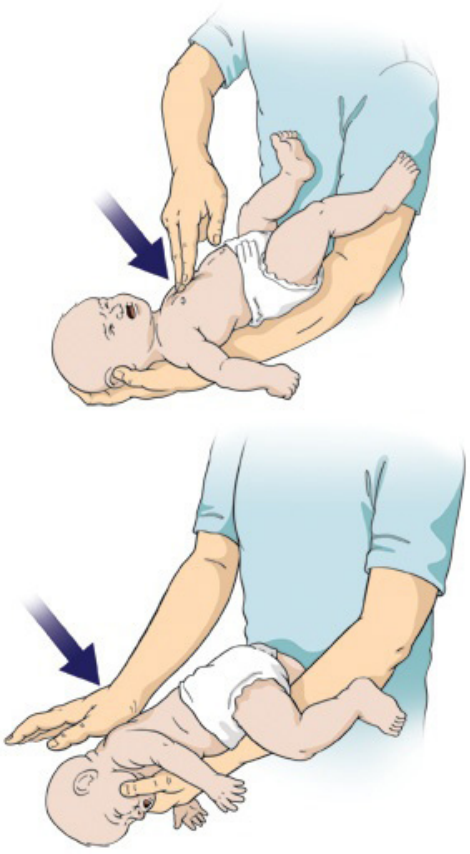
1. Ask the patient if they are choking, if they indicate "yes"—identify yourself as a medical provider and request permission to help them.
2. Stand behind the patient and wrap your arms around the patient's body.
3. Make a fist with one hand with the thumb side slightly above the belly button; make sure the fist is well below the sternum (breastbone).
4. Grasp your fist with your other hand and give quick upward thrusts to the abdomen.
5. Continue to thrust until the object is forced out and the patient can breathe, cough, or talk—or until they become unresponsive.

NOTE: For an **obese** or a **pregnant** patient, give thrusts on the chest instead of the abdomen. Place your arms under the armpits and your hands on the lower half of the breastbone, as shown here.

INFANT (< 1 YEAR)

BLS: Back slaps and chest thrusts:

1. Hold the infant face down on your forearm. Support the infant's head and jaw with your hand.
2. Give up to 5 back slaps with the heel of your other hand between the infant's shoulder blades.
3. If the object does not come out after 5 back slaps, turn the infant onto their back, supporting the head.
4. Give 5 chest thrusts using two fingers of your other hand to push on the chest in the same place you push for CPR.
5. Repeat giving 5 back slaps and 5 chest thrusts until the patient can breathe, cough, cry, or becomes unresponsive.



PROCEDURE FOR UNRESPONSIVE PATIENT

NOTE: Interruptions to patient ventilations should not exceed 30 seconds in duration.

BLS MANEUVERS

CONTRAINDICATION: Patient with an intact gag reflex

Initiate basic life support treatment measures, including suction and removal of visible foreign material.

1. Visually inspect the oropharynx to see if the obstruction has been removed or dislodged by manual removal or abdominal thrusts.
2. If unable to remove the foreign body or ventilate using basic airway maneuvers, begin CPR starting with 30 chest compressions: See Procedures: *CPR: Cardiopulmonary Resuscitation (1070).*
3. Reassess the airway to determine if the foreign body has been dislodged by compressions—if visible, remove the material and continue CPR.

ALS MANEUVERS (Laryngoscopy/Magill forceps are used by Paramedic only)

CONTRAINDICATIONS: Patient has an intact gag reflex

1. If the foreign body is not evident, visualize the entire upper airway using a laryngoscope.
2. If the foreign body is visualized by laryngoscopy, attempt to grasp and remove it using Magill forceps.
   A. You must visualize the foreign body before attempting to remove it. Do not blindly probe the pharynx.
3. If the foreign body is removed, withdraw the laryngoscope, and attempt to ventilate with a BVM.
   A. Continue basic life support protocols and prepare for immediate transport. If patient's mental status does not improve despite successful foreign body removal and basic airway maneuvers—Procedures: *Airway Mgt: I-Gel Supraglottic (1030)* and *Airway Mgt: King LTS-D Supraglottic Airway (1035)*.
4. If the foreign body remains visible but cannot be removed perform a cricothyrotomy and transport immediately.

   Refer to Procedures: *Airway Mgt: Cricothyrotomy—Needle (1040)* or *Airway Mgt: Cricothyrotomy—Surgical (1045)* or *Airway Mgt: Cricothyrotomy via QuickTrach (1047)*.
5. If no foreign body is visible. Proceed to advanced airway maneuvers—Procedures: *Airway Mgt: I-Gel Supraglottic (1030)* and *Airway Mgt: King LTS-D Supraglottic Airway (1035)*.
6. Monitor and reassess patient's airway and vital signs enroute.
7. Notify receiving facility of patient's condition and maneuvers performed.

Fracture and Dislocation Management: General

NOTE: ALL Reductions should have MC contact attempted prior to performing.

CLINICAL INDICATIONS

- Immobilization of an extremity due to suspected fracture, sprain, or injury.
- Immobilization of an extremity to secure medically necessary devices, i.e., IV catheters.
- Reduction of fractures with compromised distal circulation, sensation, and/or motor function.

PROCEDURE

Splinting

1. Assess distal circulation, sensation, and motor function.
2. Irrigate open fractures per Procedure: *Wound Care (1455)*. Use NS or sterile water if available, otherwise potable water. If an open fracture, DO NOT attempt reduction nor apply traction.
3. Reduce dislocations if indicated by specific procedure.
4. Reduce potential fractures, if indicated, per section Reduction of Fracture, below.
5. Long bone injury—immobilize joints above and below. Joint area injury—immobilize the long bones above and blow the joint.
6. Suspected mid-shaft femur fractures may be immobilized with a traction splint per Procedure: *Fracture and Dislocation Management: Traction Splint (1225)*.
7. Suspected pelvic fractures may be immobilized per Procedure: *Pelvic Stabilization (1385)*.
8. Splint should be well padded.
9. Distal pulse sites (e.g., dorsalis pedis, radial) must be accessible for repeat assessments.
10. Elevate the injury, if practical.
11. Consider ice packs for pain management and swelling control—do not place directly on the skin.
12. Consider pain management protocol if immobilization is not adequate for managing pain.
13. Reassess distal circulation, sensation, and motor functions regularly throughout transport.
14. Document all procedures and interventions performed during the patient encounter.

Reduction of Fracture

1. Identify the site of injury.
2. Assess distal circulation, sensation, and motor function.
3. Provide analgesia if available per Protocol: *Pain Management (2245)*.
4. Grasp extremity above and below injury (use two rescuers if available).
5. Apply steady gentle traction below—distal to—injury in direction of long axis of extremity.
6. Continue until the patient complains of intolerable pain, resistance is felt, or reduction is accomplished.
7. Apply splint, then reassess distal CSM, and document the procedure.

NOTE: For deformed femur fractures, reduction is best performed using a traction splint.

NOTES AND PRECAUTIONS

- Deformities (fractures and/or dislocations) with distal neurovascular compromise should be reduced ASAP in an attempt to regain circulation.
- Drawing an "X" on a distal pulse site may aid in reassessing perfusion.

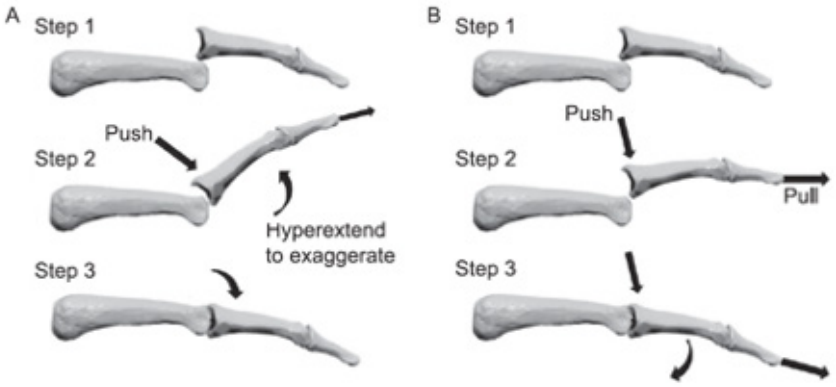
Fracture and Dislocation Management: Digit

NOTE: ALL Reductions should have MC contact attempted prior to performing.

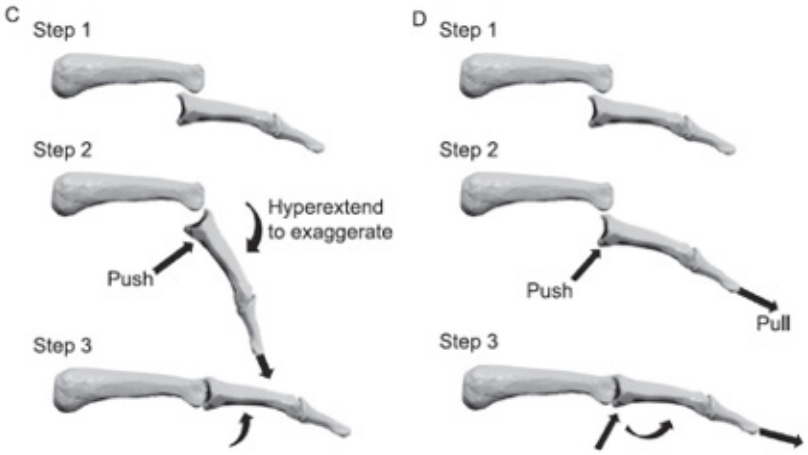
Procedure: Reduction of Dislocated Digit (finger or toe)

1. Assess other injuries, digits and distal circulation, sensation, and motor function.
2. If laceration or exposed bone, irrigate thoroughly per Procedure: *Wound Care (1455)*.
3. Confirm indications:
   A. Clear deformity to proximal or distal interphalangeal joint.
   B. Patient with limited ability to bend finger because of pain.
   C. Procedure does not delay care or transportation of life-threatening injuries.
4. Grasp distal portion of finger securely with gauze.
5. Stabilize the proximal portion of finger and hand per included diagram.
6. Apply gentle, firm, steady, longitudinal traction while gently pushing distal bone back into place.
7. Reduction is confirmed by "clunk," resolution of deformity and pain, and return of motion.
8. If successful, digit should be splinted.
9. If unsuccessful or not attempted, finger should be splinted in the position it was found.
10. Reassess distal circulation, sensation, and motor function.
11. Document the procedure.
12. Recommend that the patient proceed to a medical evaluation due to the high incidence of small fractures present with this injury.

Dislocated on top of finger:

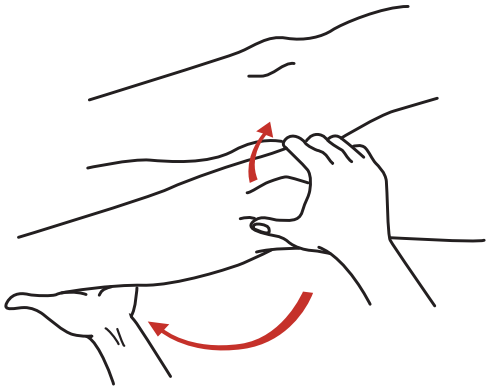


Dislocated underneath finger:



Fracture and Dislocation Management: Patella

NOTE: ALL Reductions should have MC contact attempted prior to performing.

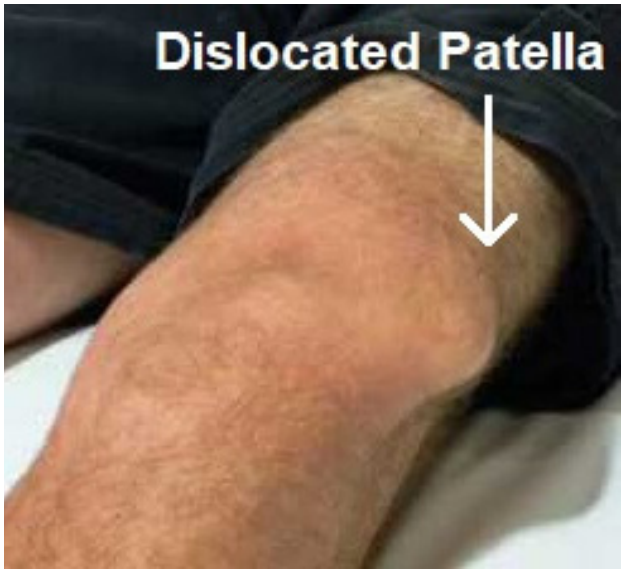


REDUCTION OF DISLOCATED PATELLA (KNEECAP)

(Only Laterally Dislocated Patella)

1. Assess other injuries, knee and distal circulation, sensation, and motor function.
2. Confirm indications:
   A. Obvious lateral displacement of kneecap to outside.
   B. No physical findings of direct knee trauma (e.g., knee lacerations/contusions/abrasions).
   C. Procedure does not delay the care and transportation of life-threatening injuries.
3. Apply steady, gentle pressure from lateral (outside) to medial patella and simultaneously straighten leg.
4. If successful, knee should be immobilized in extension (straight).
5. If there are no other extremity injuries that prevent walking, patient may ambulate with immobilization (e.g., ensolite pad wrapped and secured around leg).

   Minimize walking unless necessary to facilitate evacuation and patient states there is no significant pain.
6. If unsuccessful, time/injuries do not permit reduction, or all indications have not been met, knee should be immobilized in the position it was found.
7. Reassess distal circulation, sensation, and motor function.
8. Document procedure.



Fracture and Dislocation Management: Shoulder

NOTE: ALL Reductions should have MC contact attempted prior to performing.

REDUCTION OF DISLOCATED SHOULDER

(Only ANTERIOR Shoulder Dislocations)

1. Assess other injuries, shoulder and distal circulation, sensation, and motor function.

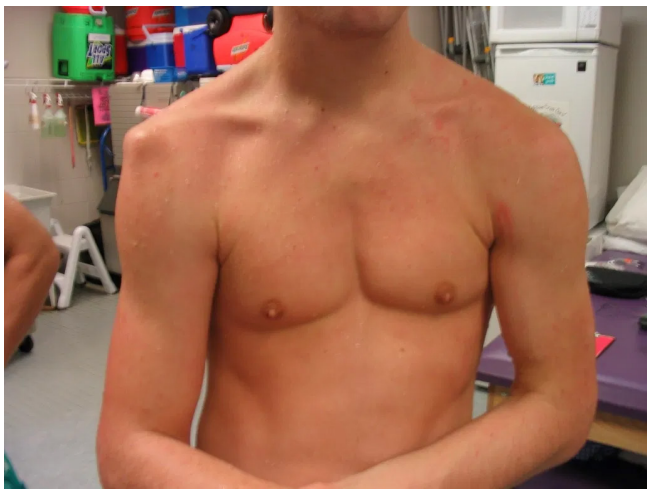
2. Confirm indications:

   A. Is there is greater than 2 hours transport time to hospital or clinic?
   B. Is there is a history of indirect "lever-type" trauma to arm rather than blow directly to shoulder?
   C. Is there is a clear deformity to shoulder (loss of rounded appearance of lateral shoulder)? There should be no physical findings of direct shoulder trauma (e.g., shoulder contusions/abrasions).
   D. Are there no other suspected fractures to same arm?
   E. Does the patient have limited ability to move shoulder because of pain?
   F. Does the procedure not delay the care or transportation of life-threatening injuries?

3. Coach the patient to relax the shoulder muscles by maintaining a calm, reassuring demeanor. If this is unsuccessful, proceed with analgesia Protocol: *Pain Management (2245)*.

Two reduction techniques are described on the following pages.

NOTE: Muscle spasms are common. Move slowly and allow spasms to pass before continuing reduction.



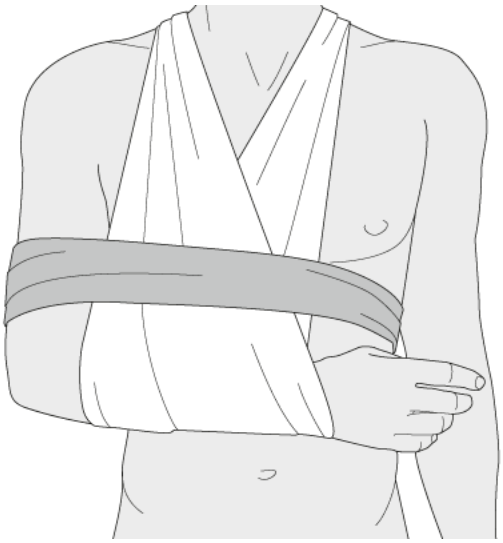
POSTREDUCTION

1. If reduction is accomplished, the arm should be easily moveable into position against body. Apply sling and swath per attached diagram.

2. If reduction is not accomplished, the arm should be slowly moved into its original position, padding applied in the space between arm and body, then secured in position for transport.

3. Reassess distal circulation, sensation, and motor function, then document procedure.

NOTE: Most shoulder dislocations are recurrent injuries and involve very minimal (to no) trauma. All patients should be transported to appropriate definitive care for further evaluation.

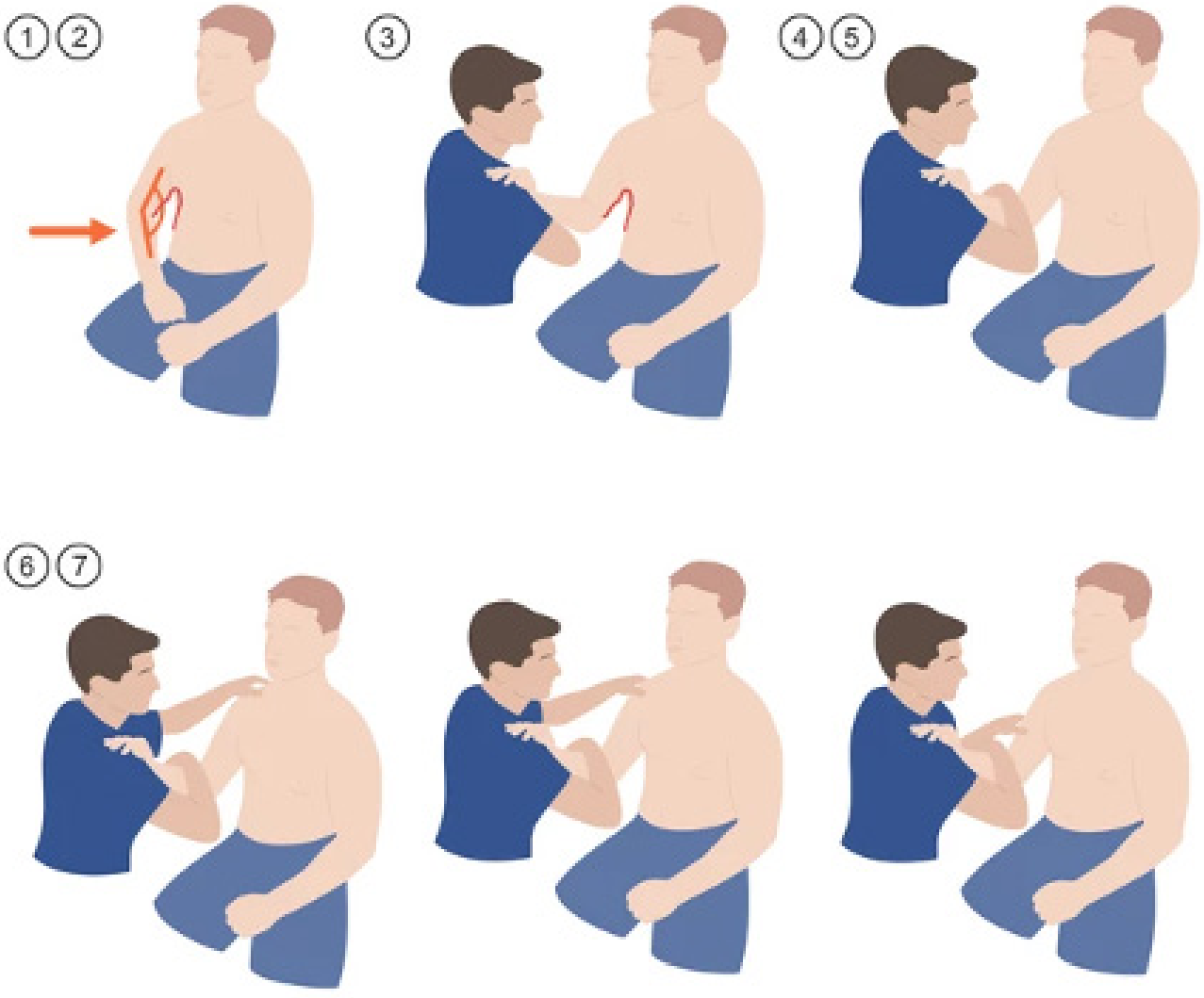


PROVIDER: Only use the technique(s) that you have been trained in and approved for by your LEMA.

CUNNINGHAM METHOD

Reassure the patient and get them as relaxed as possible. Remember, never do any sudden or forceful movements because that will cause pain and spasms, making it not effective.

8. Have your patient sit on a chair with their back nice and straight. Sit in front of them at their level.
9. Gently and slowly bring their affected arm close to their body (adduction) with the elbow flexed.
10. Place their hand on your shoulder.
11. Lay your inside hand on their elbow for gentle traction (weight of arm is enough).
12. Remind your patient to sit up straight and breathe slowly.
13. With the outside hand, massage the trapezius, deltoid, and then the bicep, in that order. Massage (like kneading a strong dough) for about three seconds at each site.
14. Repeat this process for about one to two minutes.



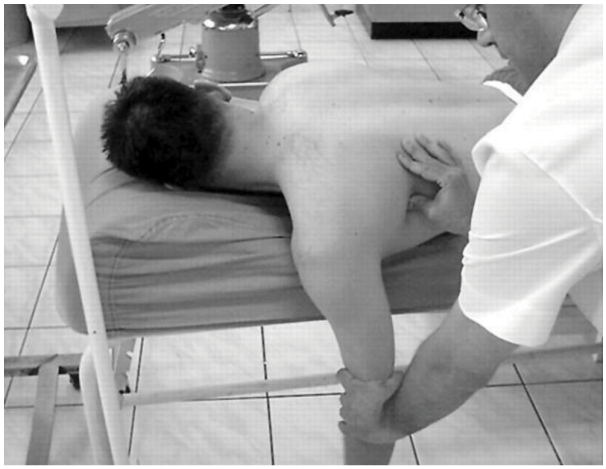
PROVIDER: Only use the technique(s) that you have been trained in and approved for by your LEMA.

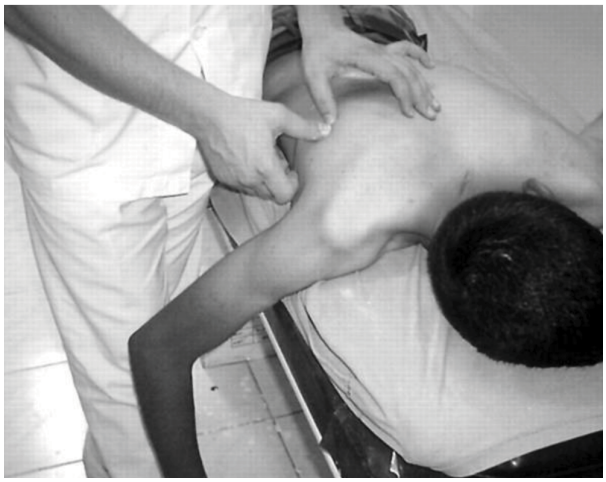
SCAPULAR MANIPULATION METHOD

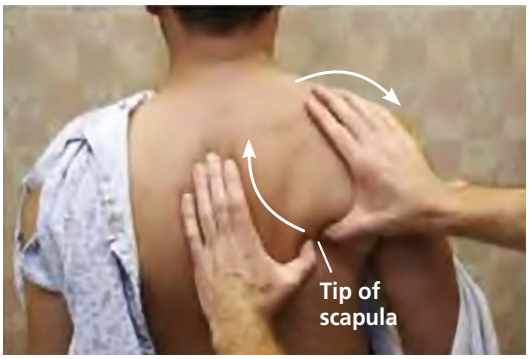
1. Patient may be upright or lying prone, with arm hanging down.
2. If a second provider is available to assist, have them stand or sit facing the patient.
3. Assist patient in flexing the injured arm forward to approximately 90 degrees.
4. The assistant will stabilize the injured arm and provide gentle traction forward by putting counter traction on the patient's clavicle.
5. Standing behind the patient, stabilize the superior border of the scapula, and use your thumbs to press medially on the lateral border of the scapula, rotating the scapula as shown.

(Image obtained from *https://clinicalgate.com/management-of-common-dislocations/)*

Scapular Manipulation

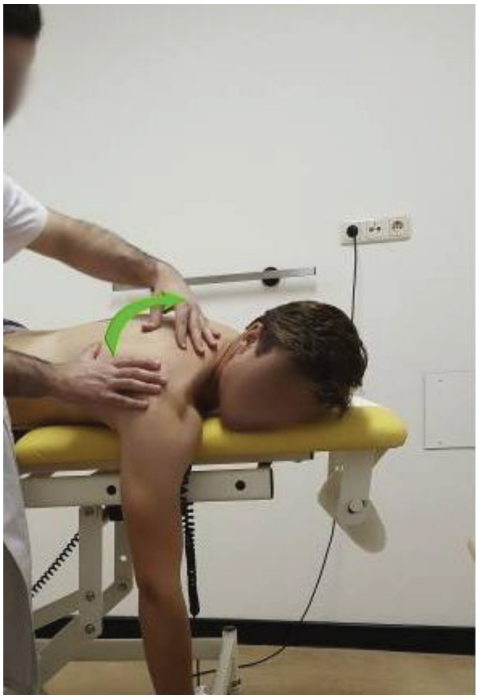






Rotate the inferior tip of the scapula medially and dorsally toward the spine with the tips of your thumbs.

The procedure can take place with the patient prone (as in the Stimson technique) or with the patient seated. For the latter, have an assistant apply traction on the arm while applying countertraction on the ipsilateral clavicle.



PROVIDER: Only use the technique(s) that you have been trained in and approved for by your LEMA.

EXTERNAL ROTATION METHOD

1. Place patient supine.
2. Stand on the side of the affected extremity, facing the patient.
3. Flex the elbow to 90 degrees and stabilize it against the torso (Fig 1:a).
4. Place the shoulder in 20 degrees of forward flexion by use of lower hand at inside of elbow (Fig 1:b) or cupping elbow (Fig 2).
5. Using the grasped wrist as a guide, gently rotate the shoulder until the forearm is in the coronal plane (Fig 1:c and Fig 2). The shoulder will likely reduce before the forearm reaches parallel.
6. If the shoulder does not reduce, lift the flexed arm forward, keeping it in line (i.e., sagittal plane) with the body.
7. Once reduction is achieved, gently rotate the arm internally until the forearm lies across the chest (Fig 1:d).

NOTE: Work slowly and gently!

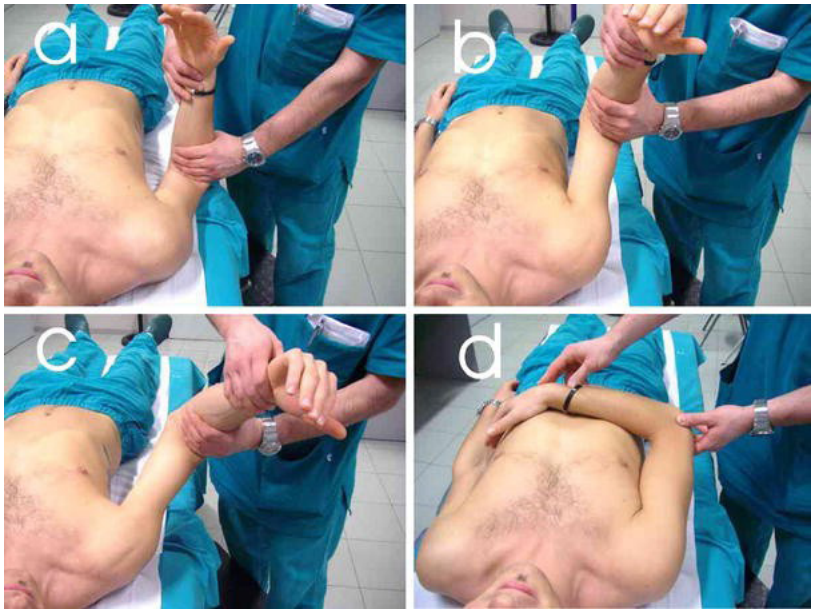


Fig 1. The external rotation method for the reduction of an acute anterior dislocation of the shoulder. a. The patient is in the supine position with the elbow in 90° flexion. b. The arm is adducted to the side of the chest and the shoulder is placed in 20° forward flexion. c. The shoulder is externally rotated until the forearm is in the coronal plane. d. The arm is internally rotated to bring the forearm into the abduction position

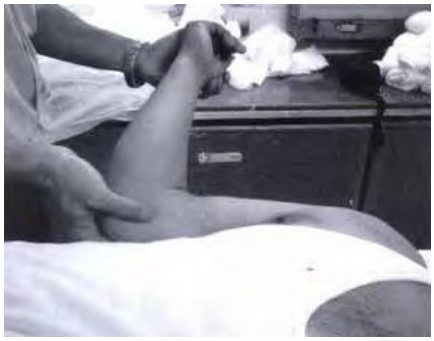


Fig 2. The external rotation method for the reduction of an acute anterior dislocation of the shoulder.

Fracture and Dislocation Management: Traction Splint

CLINICAL INDICATIONS

Suspected mid-shaft femur fracture

CONTRAINDICATIONS

- Pelvic fracture or instability
- Hip dislocation
- Open fracture
- Unstable knee trauma
- Femur fracture near the knee
- Partial amputation or avulsion with bone separation
- Injury to the lower leg or ankle

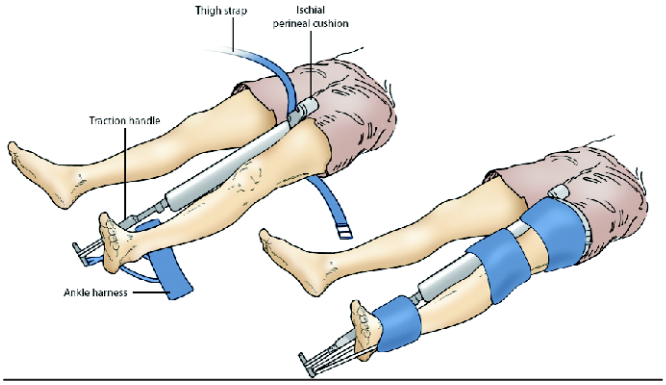
PROCEDURE KENDRICK TRACTION DEVICE

1. Grasp the ankle of the affected leg and maintain manual traction. Apply traction until the patient reports pain relief.
2. Apply ankle hitch around the leg. Tighten the stirrup by pulling the green tab until it is snug under the heel. Manual traction can be held from the stirrup while the rest of the splint is applied.
3. Apply the ischial strap by feeding the male end of the buckle under the leg. Work the strap up the leg until it is firmly seated in the patient's groin. Ensure the patient's genitals are clear of the strap.
4. Buckle hip strap, then tighten so the traction pole receptacle is positioned at the belt line.
5. Assemble the splint and ensure each joint is seated.
6. Place the traction pole alongside the leg so that one section extends beyond the patient's foot. Collapse sections of the pole as appropriate to size the splint.
7. Insert the pole into the traction pole receptacle on the blue strap. Adjust the blue strap of the foot harness so the yellow tab is fully extended.

8. Place the yellow tab over the dart at the distal end of the splint.
9. Steadily tighten the blue ankle strap by pulling on the red tab. Continue to tighten until the provider holding manual traction reports that the splint is supporting the leg.
10. Use the colored Velcro straps to secure the splint to the leg.
11. Reassess distal circulation, sensory, and motor function.

PROCEDURE SAGER TRACTION DEVICE

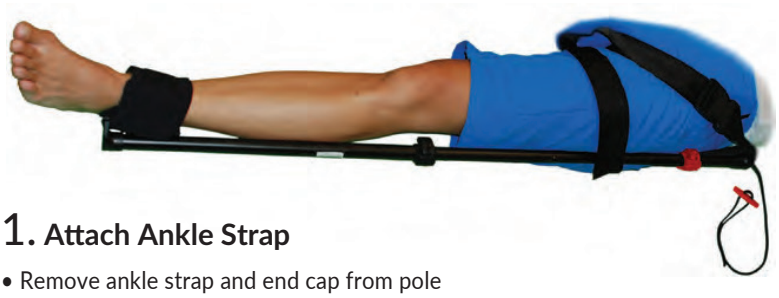
1. Position the splint between the patient's legs, resting the saddle against the ischial tuberosity.
2. Attach the strap to the thigh.
3. Secure the ankle strap tight.
4. Gently extend the inner shaft until the desired amount of traction—approximately 10% of the patient's body weight.
5. Adjust the thigh/leg/foot strap.
6. Reassess distal circulation, sensory, and motor function.



Applying the Sager splint

PROCEDURE SLISHMAN TRACTION DEVICE

HOW TO APPLY

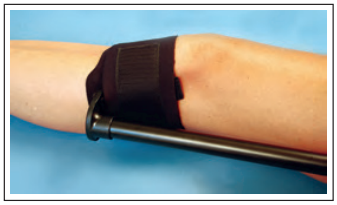


Prior to application assess CMS (circulation, motor and sensory) function and pain level per local protocol.

1. Attach Ankle Strap

- Remove ankle strap and end cap from pole
- Unroll ankle strap and apply with end cap lateral and facing up to receive splint pole
- Secure with Velcro wrap

NOTE: May apply ankle strap above calf in cases of lower leg injury



2. Attach Groin Strap

- Rest female buckle on anterior thigh
- Wrap male buckle and strap behind thigh
- Snap male to female buckle and tighten

3. Apply Coarse Traction

- Extend distal pole after releasing thumb screw on black pole clamp insert distal pole into ankle strap end cap.
- After achieving desired length, tighten thumb screw

4. Apply Fine Traction

- Release thumb screw on red pole clamp
- Pull cord to apply desired traction
- Tighten thumb screw on red pole clamp and release cord

5. Reassess and Monitor

- Reassess CMS and pain level
- Adjust traction as needed to minimize pain, while maintaining perfusion
- For rotational stability attach mid leg strap to splint and wrap (one or both legs) below knee

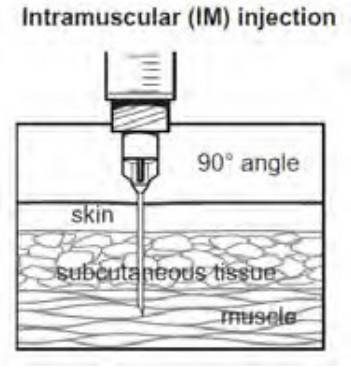
Injections (Intramuscular)

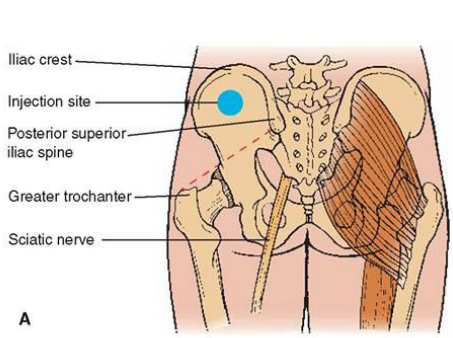
CLINICAL INDICATIONS

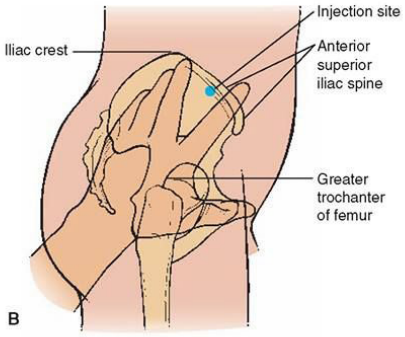
- When medication administration is necessary, and the medication must be given the intramuscular (IM) route or as an alternative route in selected medications.

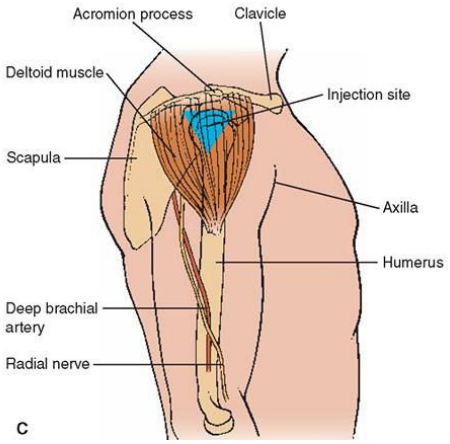
PROCEDURE

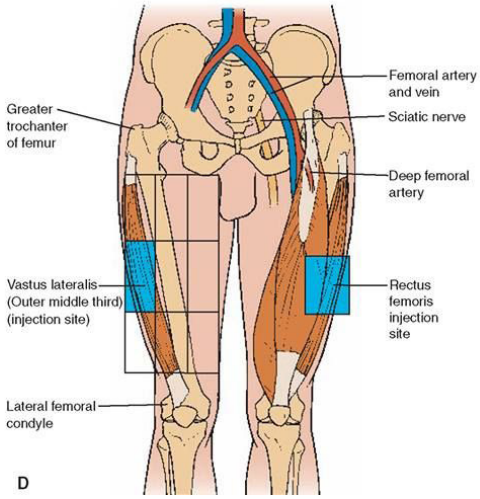
1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication, expelling air from syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. Possible injection sites for intramuscular injections include the arm, buttock, and thigh sites (see below).
5. Injection volumes by site:
   A. Injection volume should not exceed 1 mL for the arm.
   B. Injection volume should not exceed 3 mL in the thigh or buttock.
   C. Pediatrics: the thigh should be used and injection volumes should not exceed 1 mL.
6. Expose the selected area and cleanse the injection site with alcohol or chloraprep wipe.
7. Insert the needle into the skin with a smooth, steady motion (90-degree angle with the skin flattened).
8. Aspirate for blood (if blood pulls back into needle, withdraw the needle and re-stick using a fresh needle).
9. Inject the medication.
10. Withdraw the needle quickly and dispose of it into a sharps container.
11. Apply pressure to the site.
12. Monitor the patient for desired therapeutic effects as well as possible side effects.
13. Document the medication, dose, route, and time in the Patient Care Report (PCR).











IO (Intraosseous) Access

CLINICAL INDICATIONS

- A patient where vascular access is appropriate (significant trauma or mechanism, emergent or potentially emergent medical condition).
- All Ages: IV and IO should be considered equal (see specific protocols).

CONTRAINDICATIONS, RELATIVE CONTRAINDICATIONS, COMPLICATIONS INTRAOSSEOUS (IO) ACCESS

Contraindications

- Fracture of the bone selected for IO insertion
  - » **NOTE:** A fracture of another bone proximal to the bone being considered for the insertion site is NOT a contraindication to use of the site if perfusion distal to the fracture site can be confirmed.
- Insertion site is grossly contaminated

Relative Contraindications

- Previous orthopedic surgery on the same appendage that is being considered for IO insertion.
- The areas that are burned.
- Same bone with previous IO insertion within past 24 hours.
- Inability to locate anatomical landmarks due to significant edema to site.
- Excessive tissue at insertion site (obese or excessive muscle tissue).
- Obvious signs of skin infection including erythema, warmth, or purulent discharge.
- Osteogenesis imperfecta (genetic abnormality resulting in extremely brittle bones).

IO Complications

Fracture of bone or damage to growth plate, bleeding from insertion site, neurovascular injury, misplacement of IO through bone, compartment syndrome, especially if unrecognized fluid extravasation.

Proximal Tibia Site Identification

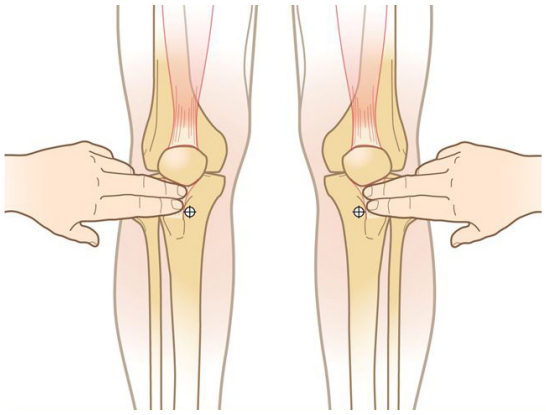
Extend leg and palpate the landmarks at the proximal tibia (patella and tibial tuberosity)

Adult

Insertion site should be approximately 2 cm **medial** to the tibial tuberosity **OR** 3 cm (two finger widths) below the patella and approximately 2 cm **medial**, along the flat aspect of the tibia.

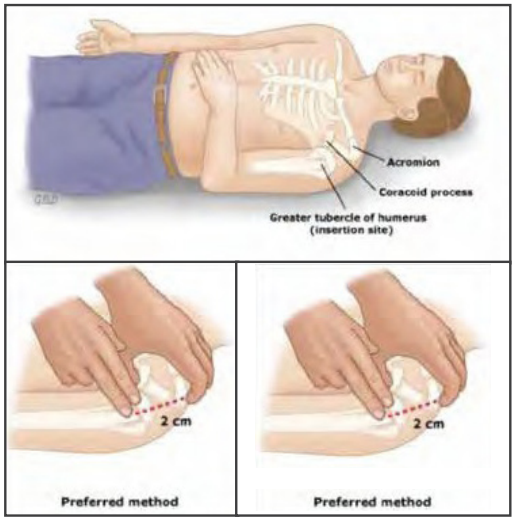
Pediatric (patients weighing 3-39 kg)

Insertion site should be approximately 1 cm **medial** to the tibial tuberosity **OR** just below the patella (approximately 1 cm or one finger width), along the flat aspect of the tibia. Pinch the tibia between your fingers to identify the center of the medial and lateral borders.



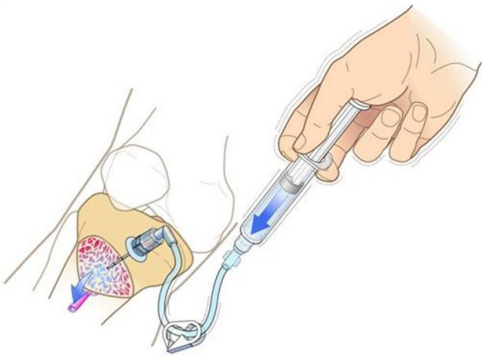
PROXIMAL HUMERUS SITE IDENTIFICATION (FOR ADULT AND PEDIATRIC)

1. Place patient's hand over abdomen (elbow adducted and humerus internally rotated).
2. Place your palm on the patient's shoulder anteriorly.
3. The area that feels like a "ball" under your palm is the general target area.
4. You should be able to feel this ball, even on obese patients, by pushing deeply.
5. Place the ulnar aspect of your hand vertically over the axilla.
6. Place the ulnar aspect of your other hand along the midline of the upper arm laterally.
7. Place your thumbs together over the arm. This identifies the vertical line of insertion on the proximal humerus.
8. Palpate deeply up the humerus to the surgical neck. This may feel like a golf ball on a tee—the spot where the "ball" meets the "tee" is the surgical neck.
9. The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle.



EZ-IO® ACCESS PROCEDURE

1. Assemble all necessary equipment. See Procedure: *IV and IO Fluid Administration (1320)*.
2. Determine the most appropriate insertion site.
3. Prep the surface with antiseptic solution.
4. Prepare EZ-IO and medications.
5. Prime EZ-Connect extension kit as follows:
   A. Adult/pediatric unresponsive to pain: prime EZ-Connect extension kit with a normal saline flush.
   B. Adult responsive to pain: prime EZ-Connect extension kit with 40 mg of lidocaine (priming volume is approximately 1 mL). See Medication: *Lidocaine 2% (3125)* for contraindications.
   C. Pediatric response to pain: prime EZ-Connect extension kit with 0.5 mg/kg of lidocaine (max dose 40 mg).
6. Needle Insertion and Drilling
   A. Stabilize patient's extremity and begin insertion from a 90-degree angle to the plane of the center of the bone (if using the proximal humerus, this will result in the needle pointing toward the patient's tailbone). Gently advance the needle set tip through the skin until the tip rests against the bone. The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.
   B. Adults: Gently drill, advancing the needle set approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin.
   C. Pediatrics: Gently drill, then immediately release the trigger when you feel the "pop" or "give" as the needle set enters the medullary space.
7. Once the needle is in proper position, hold the hub and pull the driver straight off. While continuing to hold the hub, twist the stylet off the hub with counterclockwise rotations. The catheter should feel firmly seated in the bone.
8. Connect extension tubing, primed with fluid, to IO hub. Firmly secure by twisting clockwise.
9. Infuse lidocaine (if responsive to pain), flush with normal saline, infuse fluids and/or medication.
10. Assess for free flow of fluid, with no evidence of extravasation under the skin. If proper insertion cannot be confirmed or catheter appears to be locked and cannot flush, repeat procedure at another site; do not remove existing EZ-IO until successful IV/IO has been established.
11. Secure the hub with a dressing/bandage so it does not become dislodged.
12. Continually reassess for extravasation. This will present as obvious fluid around the catheter or swelling and rigidity in the patient's limb (check the calf muscle or biceps/triceps if using the tibial site or humeral site, respectively).



NOTE: Medication and fluid delivery: passive gravity infusions will not work with IO lines. Use a 60 mL syringe or pressure bag to give fluid/boluses. All IV medications can be administered through the IO line. Flush all medications with 10 mL NS. Continue attempts at IV Access. If IV established, use it primarily, but keep IO backup.

IV (Intravenous) Access: Peripheral

CLINICAL INDICATIONS

- A patient where vascular access is appropriate (significant trauma or mechanism, emergent or potentially emergent medical condition).
- All Ages: IV and IO should be considered equal (see specific protocols).

CONTRAINDICATIONS, RELATIVE CONTRAINDICATIONS, COMPLICATIONS

Vascular (IV) Access Contraindications: No absolute contraindications

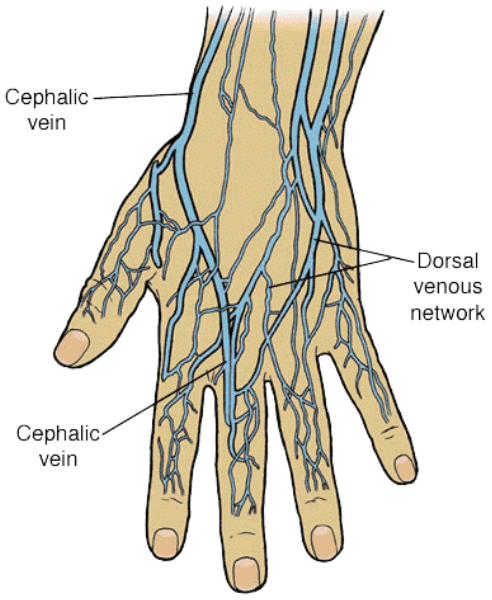
- Relative IV Contraindications—IV placement in an extremity with a suspected fracture, presence of an AV fistula.
- IV Complications—Bleeding, infection, vein, or tissue damage from extravasation.

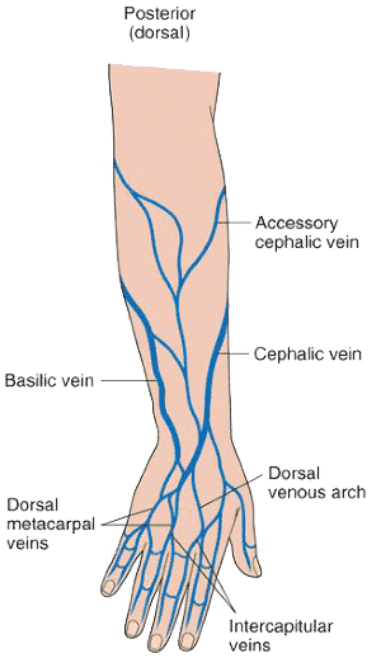
IV ACCESS PROCEDURE

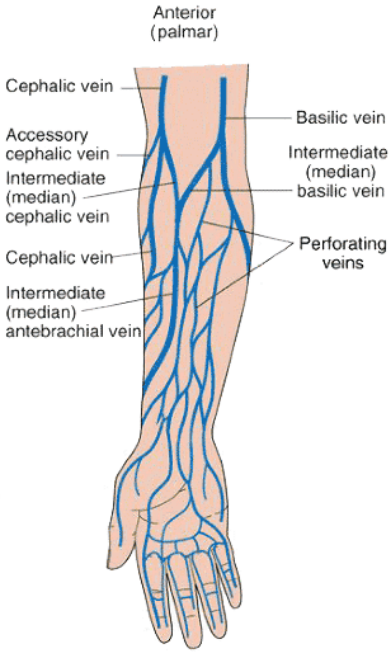
Venous Access: Peripheral (Extremity) Vein

1. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
2. Place a tourniquet around the patient's extremity to restrict venous flow only.
3. Select a vein and an appropriate gauge catheter for the vein and patient's condition. Prep the skin with an antiseptic solution.
4. Place inline and lateral traction on skin to stabilize the vein.

   NOTE: Do not alter your body position between placing tension on vein and inserting needle.
5. Insert the needle, with the bevel up, into the skin in a steady, deliberate motion until blood flashback is visualized in the catheter.
6. Advance the catheter into the vein. NEVER reinsert the needle through the catheter.
7. Dispose of the needle into the sharps container.
8. Remove the tourniquet and connect the IV tubing or saline lock.
9. For fluid administration, go to Procedure: *IV and IO Fluid Administration (1320)*.
10. Cover the site with a sterile dressing and secure the IV tubing.
11. Label or document the IV date, time, catheter gauge, and name of the person starting the IV.
12. Document the above information as well as the results and fluid administration in the PCR.







IV (Intravenous) Access: External Jugular

CLINICAL INDICATIONS

- Age > 12 years who require intravenous access for fluid or medication administration and extremity vein was not attainable.
- Vascular access attempt in life-threatening events after no obvious peripheral site is noted.

CONTRAINDICATIONS

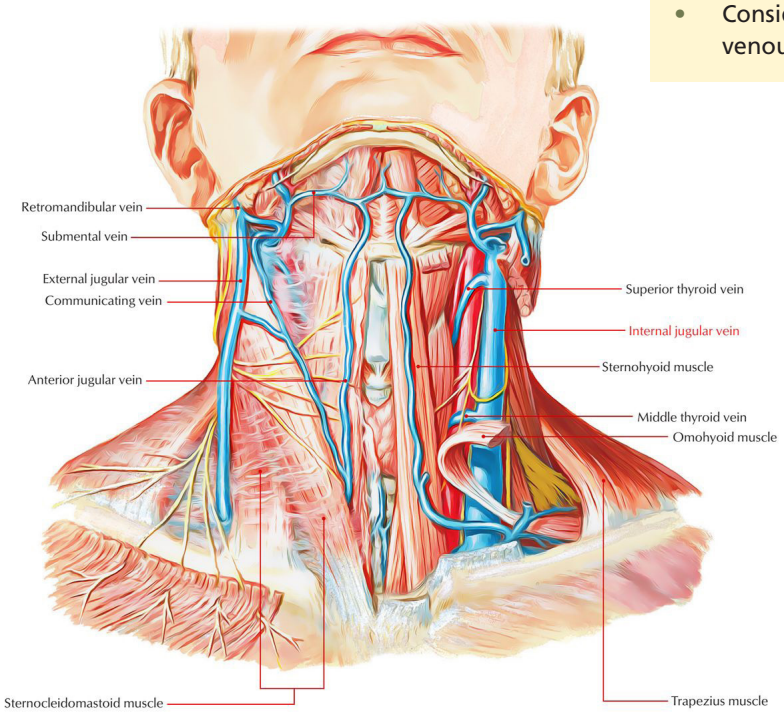
- Patient cannot tolerate supine position
- Active vomiting
- Agitation (unable to keep head still)
- Presence of a neck mass or VP shunt
- Circumferential burns to the neck
- Inability to identify anatomical landmarks

EQUIPMENT

- Appropriate size IV catheter, extension set, 10 mL saline flush, alcohol prep, tegaderm, tape

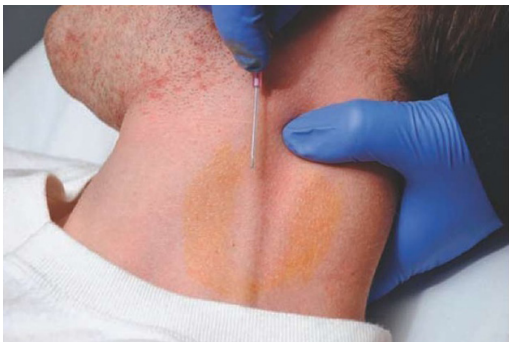
PROCEDURE

1. Don appropriate PPE and prepare equipment. Lay the patient supine.
   A. Identify the external jugular vein on the lateral aspect of the neck.
   B. Turn the patient's head slightly to the side opposite the insertion site.
   C. A slight Trendelenburg position may help accentuate the vein.
   D. Apply light pressure above the clavicle to engorge the external jugular vein.
   E. If unable to visualize the external jugular vein, do not attempt access.
2. Clean the skin with antiseptic solution.
3. Select a site for puncture, away from the clavicle to avoid accidental lung puncture.
4. Puncture the vein midway between the angle of the jaw and the clavicle in a shallow and superficial manner.
5. Once a flash is obtained, advance the catheter over the needle and remove the needle while occluding the proximal tip of the catheter to minimize blood loss.
6. Connect saline lock or tubing to the catheter and flush with normal saline.
7. Secure the catheter hub with a sterile dressing and the extension set with tape.
8. Monitor for signs of extravasation.
9. Document the IV-time, catheter gauge, site, and name of provider who started the IV in the PCR.



NOTES AND PRECAUTIONS

- Consider IO access for patients with difficult venous access.



IV and IO Fluid Administration

CLINICAL INDICATIONS

- A patient where fluid administration or medications are indicated
- Saline lock may be substituted for an IV line if needed. To ensure continued IV patency, TKO is preferred.

EQUIPMENT IV

- Adults
  - » TKO or maintenance fluids: one 18-20-gauge IV catheter
  - » If there are signs, symptoms, or at high risk for shock: two 16-18-gauge IV catheters
- Pediatrics
  - » Medications: One IV catheter appropriate size for vein
  - » Volume resuscitation: two largest age-appropriate IV catheters

IO

- EZ-IO Power Driver
- Appropriate size IO Needle Set based on patient's size and weight:
  - » EZ-IO 15 mm 3-39 kg
  - » EZ-IO 25 mm 40 kg and greater
  - » EZ-IO 45 mm 40 kg and greater with excessive tissue.
- One EZ-Connect® extension set
- Two 10 mL NS syringes
- Lidocaine 2% without preservatives or epinephrine (cardiac lidocaine) for patients responding to pain
- Nonsterile, nonlatex gloves
- Iodine or alcohol prep pads
- 500 mL or 1000 mL NS
- Fluid administration set
- Pressure bag
- Bulky dressing for IO stabilization, or premade IO stabilizer kit
- EZ-IO wrist band.

SPECIFICS—FOLLOW PROCEDURES:

IO (Intraosseous) Access (1305)
IV (Intravenous) Access: Peripheral (1310)
IV (Intravenous) Access: External Jugular (1315)

Fluid delivery

- Adult
  - » All IVs: macro drip set (10-15 drops/mL) or micro-drip set (60 drops/mL)
  - » All IOs: Use a 60 mL syringe or pressure bag to give fluid/boluses.
- Pediatric
  - » All IVs: measured-volume solution administration, 60 mL syringe
  - » All IOs: Use a 60 mL syringe to give fluid/boluses.

IV FLUID

- Saline lock or TKO: may generally use interchangeably if fluid or medication is not currently required but may be needed in the future.
- Maintenance fluids: stable patients with no contraindications to fluid:
  - » Adults: 120 mL/h (macro-drip 1 drop every 2-3 seconds)
  - » Pediatrics: See chart or reference Broselow Tape.
- Fluid Challenge
  - » Adult: 500 mL fluid boluses repeated while lungs are dry, and BP is 80-100 or HR > 100.
  - » Pediatric: Same as bolus.
- Fluid Bolus
  - » Adults
    - » If SBP < 80, 1-L bolus wide open under pressure.
    - » Repeat SBP < 80, repeat bolus once, then contact MC.
  - » Pediatrics
    - » Shock, indicated by protocol: 20 mL/kg bolus.
    - » If no improvement, repeat bolus once, then contact MC.
    - » Pediatric shock: SBP < (70+2x age in years)—consider exam findings of lethargy, poor skin turgor, dry mucus membranes, and prolonged capillary refill. Cuff pressure may not be accurate.

In the case of a fluid challenge or bolus, contact Medical Control as soon as possible. If communication failure, continue per guidelines to a maximum of 3L in adults and 60 mL/kg in pediatrics (up to 3L).

	Maintenance: (Stable)	Challenge: (At Risk)	Bolus: (Shock)	Maximum: (Shock)
Adult	120 mL/h	**SBP 80-100 or HR > 100:** 500 mL bolus	**SBP < 80:** 1 L bolus	3L
0-14 years	**< 10 kg:** 4 mL/kg/h **10-20 kg:** 40 mL/h for first 10 kg of body weight + 2 mL/kg/h for any increment of body weight over 10 kg **> 20 kg:** 60 mL/h for first 20 kg of body weight + 1 mL/kg/h for any increment of body weight over 20 kg (max 100 mL/h)	**SBP < 70 + 2x age in yrs):** 20 mL/kg (same as bolus)	**SBP < 70 + 2x age in yrs):** 20 mL/kg	60 mL/kg

FLUID BOLUS/CHALLENGE PROCEDURE

- Check vitals and lung exam after each fluid bolus/challenge.
- As vitals change, refer to the table above for fluid guidelines.
- If signs of pulmonary edema develop during IV fluid administration, decrease to TKO and contact Medical Control.
- If IV orders differ from this procedure, it will be indicated in the specific protocol.

NOTES AND PRECAUTIONS

- Normal Saline should be used with caution in patients with cardiac and respiratory disorders or extremes of age.
- If the patient is not likely to be transported, contact Medical Control before IV administration.

IV and IO Infusions

CLINICAL INDICATIONS

Administration of IV medications or fluids at a prescribed rate.

PROCEDURE

1. Select appropriate IV tubing/setting.
2. Determine the weight of patient, concentration of medication, appropriate dose of medication, and the time over which the medication will be delivered.
3. Use the following equation to determine the number of drops per minute with a medication that doesn't factor in the patient's weight.

INFUSION CALCULATION (NOT BASED ON PATIENT WEIGHT)

$$\frac{\text{Volume in ml}}{\text{Time in min}} \text{ x drip set } \left(\frac{gtt}{ml}\right) = \text{IV flow rate in } \frac{gtt}{min}$$

EXAMPLE:

Amiodarone – Dose in ROSC is 150mg in 100ml NS over 10 minutes.

$$\frac{100ml}{10\ min} \text{ x } \left(\frac{10gtt}{ml}\right) = \text{IV flow rate in } \frac{gtt}{min}$$

$$\frac{100\cancel{ml}}{10\ min} \text{ x } \left(\frac{10gtt}{\cancel{ml}}\right) = \frac{1000gtt}{10\ min} = \frac{1.67gtt}{1\ sec} \sim \frac{3gtt}{2\ sec}$$

EXAMPLE:

Magnesium Sulfate – Dose in Eclampsia/Pre-eclampsia is 5g in 500ml NS over 20 minutes.

$$\frac{500ml}{20\ min} \text{ x } \left(\frac{10gtt}{ml}\right) = \text{IV flow rate in } \frac{gtt}{min}$$

4. Use the following equation to determine a drip rate for a medication dependent on the patient's weight:

WEIGHT-BASED INFUSION CALCULATION (TYPICALLY FOR EPI DRIP, ETC.)

$$\frac{\text{Dose (mcg per kg per min) x pt weight in kg x drip set } \left(\frac{gtt}{ml}\right)}{\text{Solution in concentration (mcg per ml)}} = \text{IV flow rate in } \frac{gtt}{min}$$

1325

Mucosal Atomizer Device

Medication can quickly be absorbed directly from the olfactory mucosa (the area that allows smelling to occur) and enter the brain cerebrospinal fluid skipping the blood stream/blood brain barrier. This is called the nose-brain pathway.

CLINICAL INDICATIONS

Patients who require rapid medication administration when an IV is not readily accessible. Some medications that can be administered intranasally (IN) include:

- *Fentanyl (3080)*
- *Glucagon (3085)*
- *Ketamine (3115)*
- *Midazolam (3135)*
- *Naloxone (3145)*

See each medication for specific administration protocol.

PROCEDURE

1. Draw the medication up into a syringe.
2. Expel all air from the syringe.
3. Connect the atomizer to the syringe.
4. Insert atomizer into nostril and quickly compress the syringe plunger to atomize the medication.

NOTES AND PRECAUTIONS

- The Mucosal Atomizer Device has a dead space (priming volume) of 0.1 mL. Take this into account when drawing up medication.
- Significant amounts of blood and/or mucosal discharge or nasal obstruction will limit medication absorption.
- Always use the most concentrated form of the medication available—diluted forms are less effective.
- Deliver half the dose to each nostril if possible.
- Do not use more than 1/2 to 1 mL of medication per nostril. If more volume is required, separate doses and allow a few minutes for the previous dose to absorb.
- Can be used in all body positions.

Mass-Casualty Incidents (MCI)

INDICATION

The number of patients cannot be managed adequately by personnel on scene. Typically, 5+ patients.

DEFINITIONS

A mass-casualty incident (MCI) is defined as "an event that overwhelms the local EMS or healthcare system, where the number of casualties vastly exceeds the local resources and capabilities in a short period of time."

NOTE: All EMS providers should take Incident Command System (ICS) and National Incident Management Systems (NIMS) training. This is available through DOI Talent or FEMA.gov.

Triage is the separation of many patients into smaller groups based on severity of illness/injury. In an MCI, providers should prioritize care for the sickest patients, or those most likely to benefit from immediate intervention.

START Triage—A specific triage system (Simple Triage and Rapid Treatment [START]) designed for very large-scale disasters. Patients are each given a triage tag (see below) and a designation to a color group (green, yellow, red, or black) representing acuity based on a 30-sec or less assessment of airway, respiratory rate, capillary refill/radial pulse, and mental status only. See START Triage diagram.

Jump START—A complementary triage system designed to be used with children (defined as shorter than the Broselow tape, generally about 8 years old). See diagram.

Triage tag—Cards designed to be used with the START/Jump START system, but may be used with any triage system. One tag is placed on each patient. Each tag has patient-identifying number and removable colored strips that correspond to the following categories:

- **RED/IMMEDIATE**—Critically ill patients who may survive and are highest priority for transport. Adult patients with RR > 30, airway maneuvers required, altered mental status, no radial pulse, or capillary refill > 2 seconds.
- **YELLOW/DELAYED** patients with significant but not immediately life-threatening injury who require care. Includes patients with significant bleeding that is controlled with basic interventions, open fractures, or any concerning injuries with normal vital signs at time of evaluation.
- **GREEN/MINOR** Patients who are ambulatory with minor injuries and no signs of life-threatening or limb-threatening conditions.
- **BLACK/DECEASED** Patient determined to be dead, or with no reasonable chance of survival with currently available resources.

PROCEDURE

The first responder on scene is Incident Commander (IC) and Triage Officer until someone else assumes one of the roles.

1. **SCENE SAFETY/SCENE SIZE-UP**
2. **START Triage**
   A. The first rescuer shall decide whether they are "overwhelmed" by the number and acuity of patients, considering the ETA of backup.
   B. Begin triage based on START/JUMP-START criteria, simultaneously communicating information to command.
3. **Communicate**
   A. IC keeps Comm Center informed of scene and needs.
   B. Supervisor contact should be attempted as soon as possible; follow agency guidance for transporting patients off scene. This will help distribute patients to the appropriate treatment facilities and to avoid relocating the disaster.
4. **Scene SET-UP**
   A. When practical, patients shall be separated into distinct treatment areas according to color designation based on number of patients/rescuers and geography.
5. Continue triage, initiate treatment, and transport.

MCI CALL-IN FORMAT

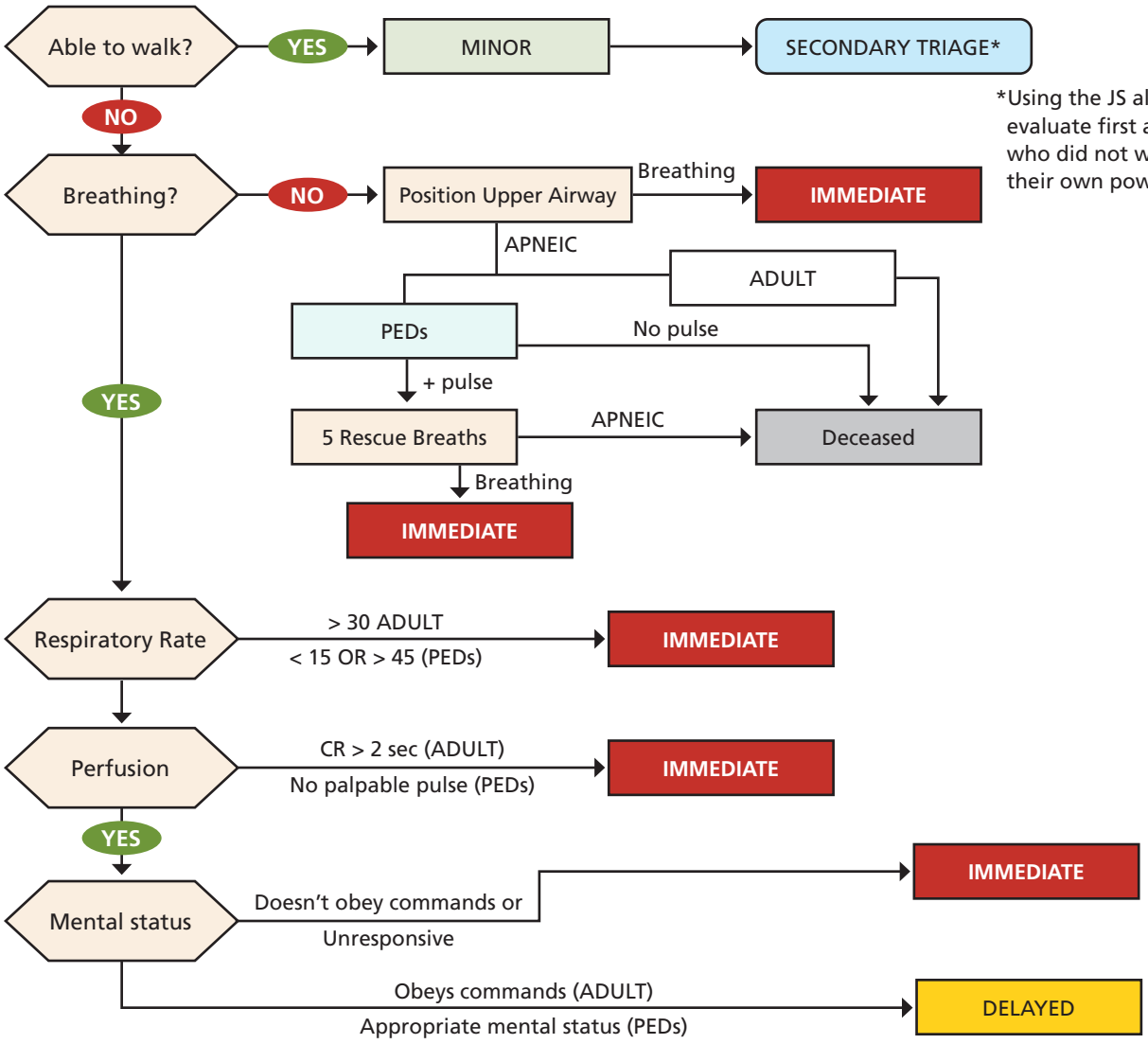
Initial Multi-Casualty Call-In: 8-line standard report

1. **Establish communications and clear channel:**
    A. "Dispatch, stand by for Emergency Traffic—break—please keep channel clear."
2. **Incident summary and command structure:**
    A. Example: "Incident is helicopter crash, EMT Smith acting command, EMT Jones providing medical care."
3. **Initial patient assessments:**
    A. Example: "I have multiple burn patients, multiple trauma patients, multiple airway patients."
4. **Injury severity/transport priority/triage category**
    A. Example: "I have 3 red, 5 yellow, and 10 green patients."
5. **Transport plan**
    A. Request transport method—helicopter, ground transport, ATV, ambulatory.
6. **Additional resources and equipment needed**
7. **Communication**
    A. Identify communication methods, channel for incident.
8. **Evacuation location:**
    A. Example: "Patients will be transported to (location of LZ, closest road, GPS coordinates)."

Multi-Casualty Patient Report: note that PHI is not part of this report

1. Mobile unit name (first responder, EMT, Medic identification)
2. Triage tag number
3. Color Code/Triage designation (may include general class of injury or illness)
4. Destination (if known)
5. Transporting unit (if known)
    A. e.g., "Medic Smith reporting; triage tag 12345, Yellow orthopedic injury, recommend emergency department, transport via ground."

START TRIAGE AND RAPID TREATMENT



*Using the JS algorithm, evaluate first all children who did not walk under their own power.

1360

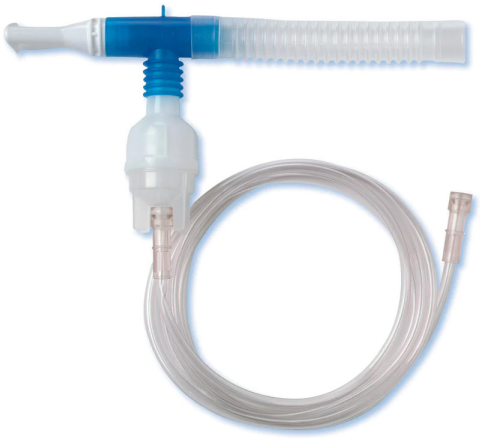
Nebulizer Inhalation Therapy

CLINICAL INDICATIONS

Patients experiencing bronchospasm.

PROCEDURE

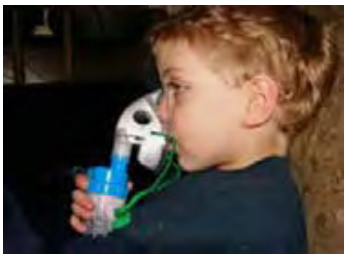
1. Gather the necessary equipment
2. Assemble the nebulizer kit



3. Pour the premixed drug (albuterol or another approved drug) into the reservoir of the nebulizer.
4. Connect the nebulizer device to oxygen at 6-8 L/min. or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of their response to the treatment and reassessment of vital signs, ECG (if appropriate) and breath sounds.
8. Document the treatment, dose, and route in the Patient Care Report (PCR).

SPECIAL CONSIDERATIONS

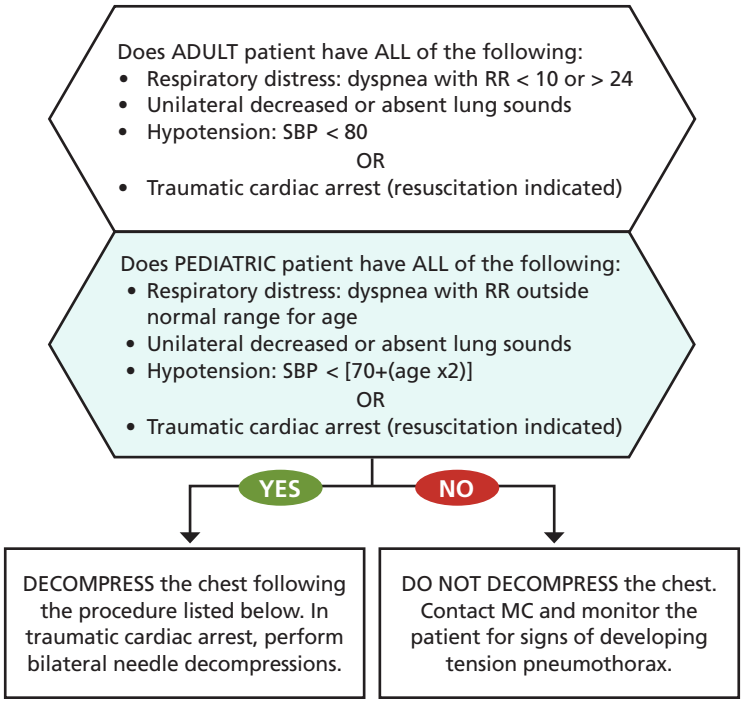
- A nebulizer treatment may be administered via a nonrebreather mask if the patient cannot hold onto the Handheld Nebulizer (HHN) device themselves. The reservoir well will fit into the connection on the mask where the bag attaches to the mask.
- A Bag Valve Mask (BVM) may also be used to administer a nebulizer treatment to a patient who needs ventilator assistance. Use of an inline nebulizer adapter is needed for this process, in addition another oxygen source is required.



Needle Decompression/Thoracostomy

CLINICAL INDICATIONS

- Tension pneumothorax OR Traumatic cardiac arrest (when resuscitation is indicated)



Tension pneumothorax is often difficult to assess clinically. **Contact MC early if tension pneumothorax is suspected and the patient does not meet all the above criteria.** Maintain a high level of suspicion in patients with chest trauma and respiratory distress.

Other signs of tension pneumothorax may include:

- Jugular vein distention
- Tracheal deviation (late sign)
- Hyper-resonance to percussion on the affected side (rare finding)
- Increased resistance during ventilations

EQUIPMENT

ADULT

IV Catheter: 10-16G x 3.25" (or greater)

PEDIATRICS < 8 years

IV Catheter: 14-16G x 2"

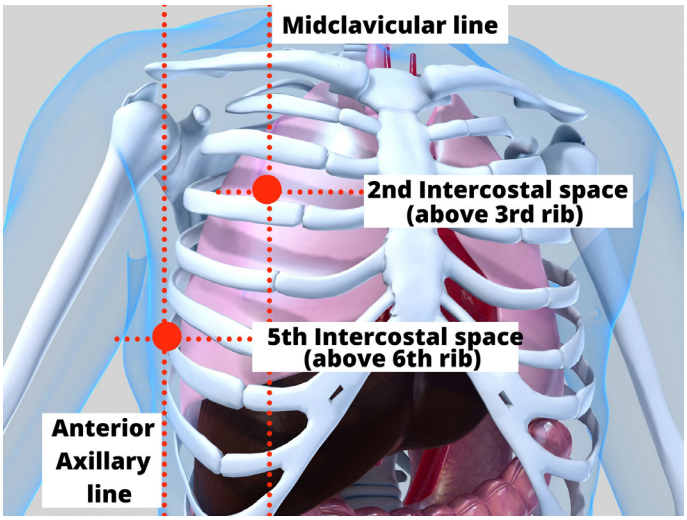
PROCEDURE

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   A. Locate the 5th intercostal space in the anterior axillary line (preferred) on the same side as the pneumothorax. Approximate landmarks: for the 5th intercostal space are the nipple line in males, and inframammary crease in females.
   (It is important that the catheter is not placed below the patient's 5th intercostal space laterally as this may go into the abdomen and cause intra-abdominal injury without decompressing the thorax.)
   B. Prepare the site with iodine and alcohol.
4. Consider placing a finger cut from an exam glove over the catheter hub for a one-way valve. (Note: Do not waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)
5. Insert the catheter into the skin over the 5th rib and direct it just over the top of the rib into the intercostal space
6. Advance the catheter through the parietal pleura until a "pop" is felt and air or blood exits under pressure through the catheter, then advance catheter.
7. Insert the needle catheter unit at a perpendicular angle to the chest wall.

   Then hold the needle/catheter unit in place for 5 to 10 seconds before removing the needle in order to allow for full decompression of the pleural space to occur.
8. Secure the catheter hub perpendicular to the chest wall with dressings and tape.
9. Reassess patient including respiratory distress, breath sounds, and vital signs.

NOTES AND PRECAUTIONS

- If the patient's anterior axillary line cannot be accessed due to positioning, you may perform the above procedure in the 2nd intercostal space along the mid-clavicular line. This location has a higher failure rate however, and if there is no rush of air, the procedure should be repeated as above in the anterior axillary line.
- Catheters placed in the 2nd intercostal space must not be placed more medial than the mid-clavicular/ nipple line. There are arteries running parallel to the sternum in this area that may cause bleeding into the thorax if damaged.
- Use caution when placing the catheter through the intercostal space. The nerve, artery, and vein run just below the edge of each rib. Catheters should be placed over the upper edge of the rib to avoid damaging the structures.



Orogastric Tube Insertion

CLINICAL INDICATIONS

For use with supraglottic airway

RELATIVE CONTRAINDICATIONS

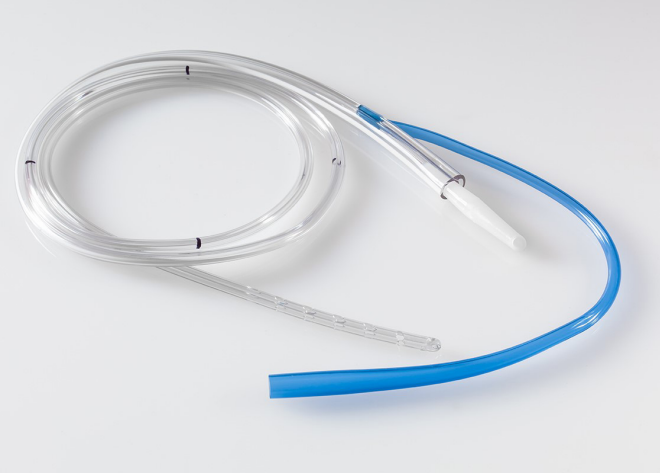
- Severe facial trauma.
- Anterior neck surgery, tumors, injuries, etc.
- Known caustic or hydrocarbon ingestion
- Known esophageal pathology.

PROCEDURE

1. Determine correct size:
   This is based on the supraglottic airway used.
   A. See *Airway Management: King LTS-D Supraglottic Airway (1035)*—refer to chart.
   B. See *Airway Management: I-Gel Supraglottic (1030)*—I-Gel gastric acide lumen allows insertion of up to a 12 Fr orogastric tube.
2. Measure length of OG tube from the nose to the earlobe and then to a point midway between xyphoid process and umbilicus. Note or mark the length of tube.
3. Lubricate tip of tube with water-soluble lubricant.
4. Continue advancing tube until measured length is at the lip. If tube meets resistance or the patient has respiratory distress, remove the tube. Fogging of the tube accompanied by cough or respiratory distress indicates tracheal intubation.
5. If a patient begins to vomit, suction around tube and leave in place as long as confirmation of correct placement has been made. If the patient airway is compromised remove OG tube immediately and maintain airway.
6. Confirm placement of tube by injecting 5 to 20 mL of air while auscultating over the stomach for a “swoosh” indicating gastric placement.
7. Auscultate lung sounds. If the tube is not placed properly, remove immediately. Reinsert following the same procedure. Do not attempt insertion more than 3 times.
8. If the tube is properly placed, tape in place or apply a tube holder securing supraglottic airway.
9. For stomach decompression, allow tube to drain by gravity into an emesis bag.
10. Aspirate stomach contents with syringe.

NOTES AND PRECAUTIONS

- Under no circumstances is the orogastric tube to be connected to continuous, high suction.



1380

Pain Assessment and Documentation

CLINICAL INDICATIONS

Patient in pain.

DEFINITIONS

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain is subjective (whatever the patient says it is).

PROCEDURE

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self-report.
2. Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment and with each set of vitals.
3. Pain should be assessed using the appropriate scale.
4. Three pain scales are available:

   A. **0-10 Scale:** the most familiar scale used by EMS for rating pain with patients. It is primarily used for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0-10, where 0 is no pain and 10 is the worst pain ever.

   B. **Wong-Baker "FACES" scale:** this scale is primarily used for use with pediatrics but may also be used with geriatrics or a patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.

   C. **FLACC scale:** this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in preverbal children (including infants).

CATEGORIES	0	1	2
FACE	No expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
LEGS	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
ACTIVITY	Lying quietly, normal position or moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
CRY	No cry (awake or asleep)	Moans or whimpers, occasional complaints	Crying steadily, screams or sobs, frequent complaints
CONSOLABILITY	Content, relaxed	Reassured by occasional touching, hugging or talking to, distractible	Difficult to console or comfort

Pelvic Stabilization

CLINICAL INDICATIONS

- For pelvic instability in the presence of trauma
- Shock in trauma with suspected pelvic injury—patient has a low threshold for application of the device in trauma
- For pelvic pain without instability as a comfort measure

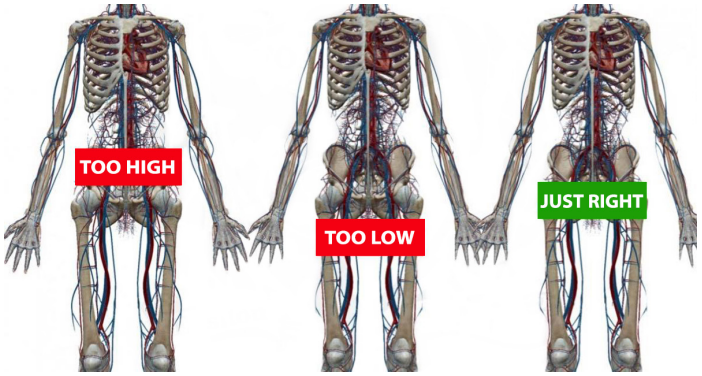
GENERAL PROCEDURE FOR PELVIC STABILIZATION - SHEET METHOD

The principles and placement described here also apply to the numerous commercial devices available. Be familiar with what your unit has available.

1. Maintain spinal precautions if indicated.
2. Fold the sheet smoothly lengthwise to about 9 inches wide (avoid rolling patient unless necessary) and apply underneath the pelvis, centered on the greater trochanters. Remove any bulky or sharp objects from the patient's pockets (if applicable). Document any objects removed from the patient's pockets and where they are left (i.e., at receiving facility with patient or with patient's family per patient's request).
3. Tighten the sheet around the pelvis and adjust the tension to try to return the pelvis to normal anatomical position.
4. Secure using a knot or clamps if available.
5. Document time and date applied.

NOTES AND PRECAUTIONS

1. Blood loss from a pelvic fracture can be significant. Monitor closely and treat per Protocol: *Shock/ Hypotension (2285)*.
2. Consider placing a device before vehicle extrication if feasible.
3. Unless necessary—do not remove once in place.
4. If stabilization device is in place for greater than 24 hours, assess skin integrity every 12 hours.
5. For male patients: ensure genitalia are elevated out of the groin area and not compressed by the stabilizing device.



1390

Restraint of Patients

CLINICAL INDICATIONS

A patient who may harm themself or others may be restrained to prevent injury to the patient or crew. This restraint must be used humanely and only after other means to prevent injury to the patient or crew have failed. The efforts could include reality orientation, distraction techniques, or other less-restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Refer to Protocol: *Behavior and Psychiatric Emergencies (2030).*

PROCEDURE

- Attempt less-restrictive means of managing the patient.
- Ensure that sufficient personnel are available to physically restrain the patient safely.

PHYSICAL RESTRAINT GUIDELINES

1. Use the minimum number of physical restraints required to accomplish necessary patient care and ensure safe transportation (soft restraints may be sufficient). If law enforcement or additional manpower is needed, call for it before attempting restraint procedures. Do not endanger yourself or your crew.

2. Avoid placing restraints in such a way as to preclude evaluation of the patient's medical status.

PHYSICAL RESTRAINT PROCEDURE

1. Place patient face up on long backboard or on the stretcher (backboard recommended for ease of patient transfer)

2. Secure ALL extremities to backboard. Try to restrain the lower extremities first using soft restraints around ankles. Next restrain the patient's arms (either both arms at the patient's sides or one arm at their side and the other above their head).

3. If necessary, utilize cervical spine precautions (tape, foam bags, etc.) to control violent head or body movements.

4. Secure backboard onto stretcher for transport using additional straps as necessary.

5. Evaluate the patient's respiratory and cardiac status every few minutes to ensure that no respiratory compromise exists. Monitor SpO_2 if possible.

6. DO NOT tighten chest straps to the point that they restrict breathing.

CHEMICAL RESTRAINT GUIDELINES

Sedative agents may be used to provide a safe method of restraining a violently combative patient—e.g., alcohol or drug-intoxicated or restless or combative with head injury—who is fighting restraints. CONTACT MC.

NOTES AND PRECAUTIONS

- Patients who are restrained—particularly in a prone position—are at risk for asphyxia and sudden death. Constant evaluation of the patient's respiratory status is necessary.
- Only the minimum amount of restraint is to be used on the patient's chest area.
- Hypoxia and/or hypoglycemia may be a cause of combativeness.

Spinal Examination and Clearance

CLINICAL INDICATIONS

- Suspicion of spinal/neurological injury
- Provider decision to utilize the Spinal Motion Restriction Flow Chart

PROCEDURE

Equipment: Vacuum splint, scoop stretcher, backboard and straps, KED, cervical collar, tape, head supports. Before and after placing a patient in spinal precautions, check circulatory, sensory, and motor functions.

NOTE: This procedure details the spinal examination process and must be used in conjunction with the Spinal Motion Restriction Assessment (next page).

1. Explain to the patient the action that you are going to take. Ask the patient to immediately report pain and to answer questions with a "yes" or "no" rather than nodding their head.

2. With the patient's spine supported to limit movement, begin palpation at the base of the skull at the midline of the spine.

3. Palpate the vertebrae individually from the base of the skull to the bottom of the sacrum.

4. On palpation of each vertebral body, look for evidence of pain and ask the patient if they are experiencing pain. If evidence of pain along the spinal column is encountered, the patient should be immobilized. **(Do not proceed to step 5 if there is midline tenderness.)**

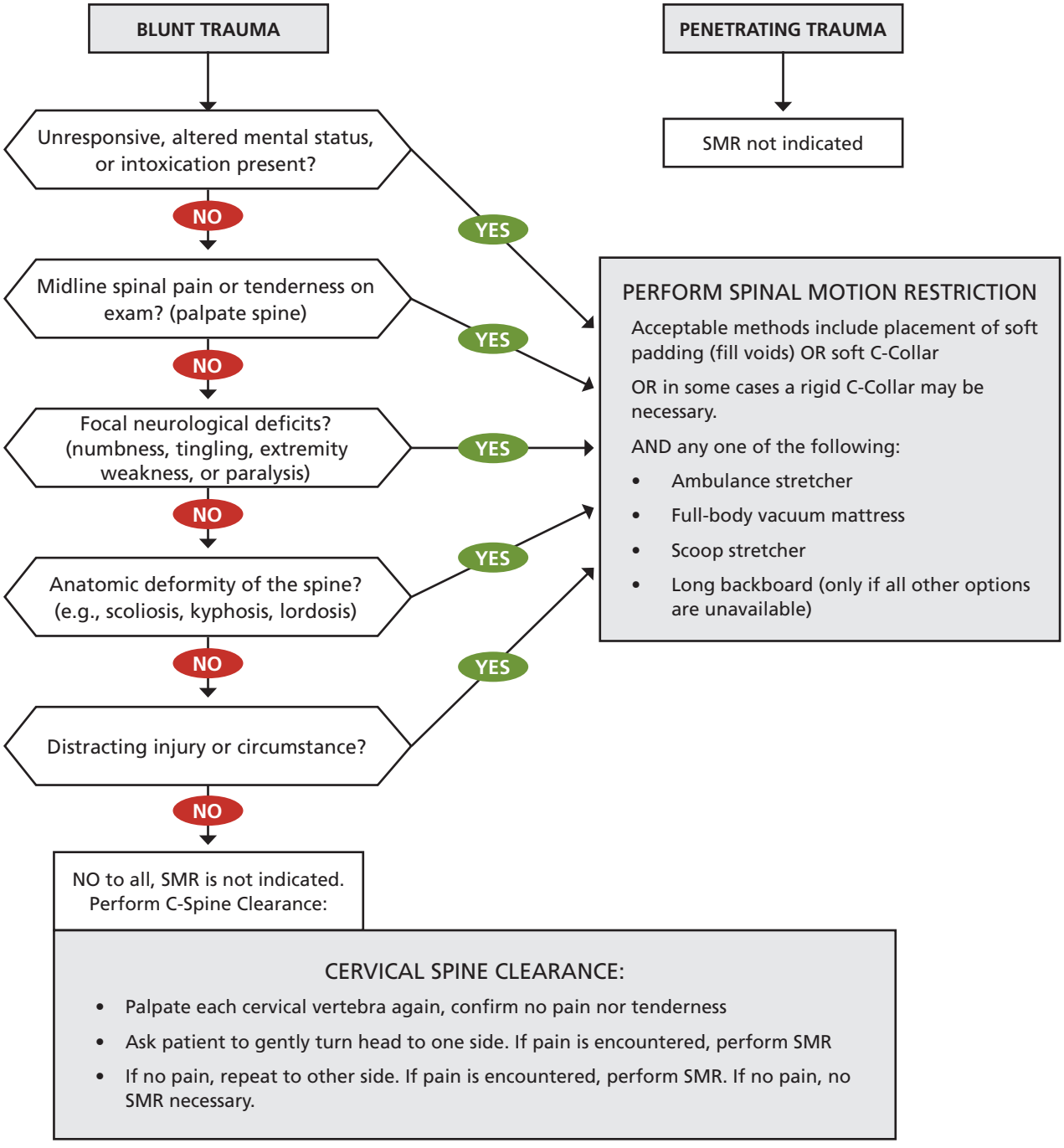
5. If the capable patient is found to be pain free, ask the patient to turn their head, first to one side (so that the chin is pointing toward the shoulder on the same side as the head is rotating) then, if pain free, to the other. If there is evidence of pain the patient should be immobilized.

NOTE: Do not proceed to step 5 (range of motion) if the patient has midline spinal tenderness.

NOTES AND PRECAUTIONS

- **If any doubt exists regarding whether or not the patient has a spinal injury, immobilize. Contact MC for final clearance.**
- In the very old and very young, a normal exam may not be sufficient to rule out a spinal injury.
- Significant mechanisms of injury include high-energy events such as long falls, ejection from a vehicle, rollover motor vehicle accident (MVA), head-on MVA, and an MVA involving abrupt deceleration.
- Maintain a higher index of suspicion for spinal injury in any patient with arthritis, cancer, dialysis, or other underlying spinal or bone diseases.

SPINAL MOTION RESTRICTION (SMR) ASSESSMENT



Spinal Motion Restriction

CLINICAL INDICATIONS

Spinal motion restriction (also referred to as immobilization) is indicated in patients with a mechanism of injury having the potential to cause spinal injury and who have ANY of the following criteria:

- Unresponsive
- Altered mental status
- Evidence of intoxication
- Distracting pain/injury (e.g., severe burns, fractures)
- Distracting situation (e.g., communication barrier, emotional distress)
- Neurological deficit (numbness, tingling, paralysis)
- Spinal tenderness/pain

There are several ways of restricting spinal motion which are not pictured here. You may encounter Sked Basic Rescue System™, Traverse Rescue Stretcher™ (TRS), or others. Be familiar with the equipment you order and carry.

FULL BODY VACUUM SPLINT

Preferred to a long backboard if available

1. Temporarily immobilize the cervical spine with soft or rigid extrication collar (as applicable) extrication collar and continuous manual inline support.
2. Log roll the patient onto the center of the vacuum body splint while maintaining manual spinal immobilization. Make sure there are no sharp objects on the patient—these objects could puncture the splint and render it useless.
3. Replace the rigid cervical collar with headblocks or towel rolls placed around the patient's head. Use soft materials that will maintain cervical spine immobilization as the splint tightens around the patient.
4. Fasten the straps along the vacuum splint.
5. Ask other providers to help conform the splint to the patient's torso and low back. Attach the pump and evacuate the air from the splint. As the splint conforms to the patient, tighten the straps.
6. Helmet chin straps, which could compromise the airway, should be removed as the patient is immobilized. If KED leg straps were used in the initial extrication, loosen or remove them so that the patient can lie flat.
7. Continually reassess the vacuum splint during transport and evacuate additional air as needed. During patient transfer, ensure that the receiving ambulance/facility is familiar with how to use the splint.

LONG BACKBOARD

For use when a full body vacuum splint OR scoop stretcher is unavailable or impractical.

1. Temporarily immobilize the cervical spine with a rigid extrication collar and continuous manual inline support. In severely traumatized patients requiring rapid transport, use a soft or rigid C-collar (as appropriate) with continuous manual inline stabilization during rapid extrication onto a long spine board.
2. Immobilize thoracic and lumbosacral spine to the backboard, when possible, and/or other appropriate device as patient condition allows (e.g., KED). Secure straps diagonally across the shoulders/chest and straight across the hips and thighs. During this procedure, the patient should be moved as little as possible and always as a unit.
3. After immobilizing the patient's body from the neck down, secure head and cervical spine to long backboard using dense, soft support material on both sides of the head and tape.
4. Helmet chin straps, which could compromise the airway, should be removed as the patient is immobilized to the backboard. If KED leg straps were used in the initial extrication, loosen or remove them so that the patient can lie flat.
5. Patients should be strapped securely enough to the long backboard to enable turning the board in the event of vomiting. Additional help may be necessary to turn the patient and manage the airway while maintaining spinal immobilization.

NOTES AND PRECAUTIONS

- **When in doubt, or if a communication barrier exists, err on the side of spinal motion restriction. This is especially true in the elderly, mentally disabled, and patients with whom you have a language barrier.**
- Patients with penetrating injuries to the head, neck, or torso who do not have evidence of spinal injury should NOT be immobilized. Routine immobilization of patients with penetrating trauma has been associated with poor outcomes.

PEDIATRIC CONSIDERATIONS

- **Children injured in motor vehicle collisions should be transported in their car seats if possible (booster seats, which are designed for children 40-80 pounds, are NOT adequate for spinal motion restriction).**
- **Children require extra padding behind the shoulders and are best immobilized in a device made specifically for their size.**
- **Since the pediatric patient is at risk of sliding from side to side on a backboard, place rolled up blankets or other dense, soft support material on both sides of the patient before securing the chest and hip straps.**
- **The location of the straps on the backboard may have to be adjusted to securely hold the pediatric patient in place and to avoid compressing the abdomen.**

Suctioning

CLINICAL INDICATIONS

Respiratory difficulty secondary to secretions or the potential for aspiration exists.

PROCEDURE ORAL SUCTIONING

1. Preoxygenate patient with 100% oxygen.
2. Assemble equipment: Suction unit with tonsil tip, personal protective equipment (gloves, goggles, gown).
3. Turn suction unit on and confirm mechanical suction is present.
4. Insert tip without suction, then cover thumbhole to begin suction.
5. Apply suction for less than 15 seconds.
6. Monitor the patient's oxygenation saturation.
7. Re-oxygenate patient for at least 2-3 minutes between suction attempts.

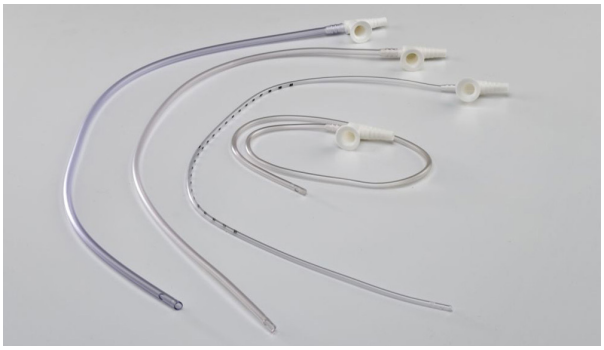
NASAL SUCTIONING (PEDIATRIC)

1. Squeeze air out of the bulb syringe to create a vacuum.
2. Maintain vacuum and gently insert tip of the bulb into one nostril.
3. Gently release the bulb to suction and remove from the nostril.
4. Squeeze secretions out of bulb and repeat procedure for second nostril.
5. Monitor the patient's respiratory status.

TRACHEAL SUCTIONING

(Parkmedic, Paramedic)

1. Preoxygenate patient with 100% oxygen if possible. However, never delay suctioning if the potential for aspiration/airway compromise exists due to large volumes of emesis or blood.
2. Assemble equipment: suction unit with whistle tip suction catheter, personal protective equipment (gloves, goggles, gown).
3. Remove the BVM from the tracheostomy tube, insert the catheter as far as possible, then use intermittent suction and slowly withdraw and rotate the catheter.
4. Do not suction more than 15 sec. UNLESS large volume regurgitation exists.
5. Monitor patient's respiratory status (SpO_2, $EtCO_2$, lung sounds).
6. If possible, re-oxygenate patient for at least 2-3 minutes between suction attempts but do not delay if the airway is completely obstructed.



NOTES AND PRECAUTIONS

- Traditional suctioning time limitations do not apply in situations with large-volume regurgitation. Do everything in your power to clear the airway and prevent severe aspiration: roll the patient onto their side (maintain spinal immobilization if necessary) and suction oropharynx until it is clear.
- Current Neonatal Resuscitation Program (NRP) guidelines do not recommend routine suctioning of neonates with clear amniotic fluid UNLESS the neonate has an obvious obstruction to spontaneous breathing or requires positive pressure ventilation (BVM ventilations). Neonatal suctioning is associated with bradycardia and should be used only when necessary.
- Current NRP guidelines do not recommend routine tracheal suctioning of infants with meconium staining.
- Infants prefer to breathe from their nose, but they are not in fact "obligate nose-breathers" and can breathe from their mouths if a nasal obstruction exists.

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Temperature Measurement

CLINICAL INDICATIONS

Monitoring body temperature in a patient with suspected infection, hypothermia, or hyperthermia

PROCEDURE

- For adult patients who are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred. For infants or adults who do not meet the criteria above, a rectal temperature may be performed. Tympanic temperature measurement is also acceptable. Refer to the manufacturer's instructions for these devices as necessary.

ORAL TEMPERATURE

- To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate clean covering.
- Have the patient seal their mouth closed around the thermometer.
- If using an electric thermometer, leave the device in place until there is an indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least at least 30 seconds (usually 2-3 minutes).

RECTAL TEMPERATURE

- Before obtaining a rectal temperature, assess whether the patient has suffered rectal trauma by history and/or brief examination as appropriate for patient's complaint.
- To obtain a rectal temperature, cover the thermometer with an appropriate clean cover, apply lubricant and insert into rectum no more than 1 to 2 cm beyond the anal sphincter.
- Follow guidelines above to obtain temperature.

NOTES AND CONSIDERATIONS

Record time, temperature, method (oral, rectal, tympanic, etc.) and scale (C or F) in the PCR. Many thermometers do not record below 34.5 °C (94 °F)—an extended-range thermometer is necessary for hypothermic patients.

Tourniquet Application

SCOPE OF PRACTICE

Standing order for All EMS Providers

INDICATIONS

- Massive life-threating bleeding to any extremity
  - » Bleeding that cannot be controlled by direct pressure
  - » Bright red pulsating, squirting, or steady bleeding
  - » Traumatic amputation of an arm or leg
- Austere situations including but not limited to field work, tactical, technical rescue, or MCI where extremity bleeding is occurring, and limited resources or ability to apply direct pressure for initial bleeding control.

CONTRAINDICATIONS

- Extremity bleeding that can be controlled by other means, i.e., direct pressure.
- Tourniquet application is a life-preserving measure, and thus has no true contraindications.

GENERAL PROCEDURE FOR TOURNIQUET (TQ) APPLICATION

NOTE: Consider body substance isolation.

NOTE: Recommend the limb tourniquet is a current generation of the Combat Application Tourniquet (CAT).

This procedure particularly describes use of a combat application tourniquet (CAT) but the basic approach applies to any tourniquet.

1. **EXPOSE** the injury and **ASSESS** the bleeding source.
2. **INSERT** wounded extremity through the loop of band or **ROUTE** band around limb, and through routing buckle.
3. **POSITION** 2-3 inches above wound directly on skin. Do not place over a joint.
4. Pull self-adhering band as **TIGHTLY** as possible.
5. **FASTEN** it back on itself all the way around the limb.
6. **TWIST** the windlass rod until bleeding stops. If distal pulse is present, the tourniquet is not tight enough.
7. **LOCK** the windlass rod in place with the windlass clip.
8. **ROUTE** self-adhering band around the rod and between the clips.
9. **SECURE** with the windlass safety strap.
10. **ANNOTATE** time of application either on tourniquet or conspicuous place (e.g., patient's forehead).

SPECIAL CONSIDERATIONS

If situation dictates rapid tourniquet (other threats, difficulty assessing bleeding location, etc.) place the tourniquet "**High and Tight**" on the wounded extremity.

GENERAL PROCEDURE FOR TOURNIQUET REASSESSMENT

1. If tourniquet was previously applied by law enforcement, good samaritan, first responder, or in an austere environment high and tight, it should be reassessed.
2. Assess for effectiveness (bleeding has stopped and distal pulses are absent).
3. Apply direct pressure if needed to control bleeding.
4. Place a second tourniquet either 2-3 inches above wound directly on skin, or side by side with the first if initial placement was correct.

Note: A severe bleeding wound to the thigh frequently requires a second tourniquet, and may need to be moved more proximal.

Commercial TQ

- Field ready – remove from plastic, prepped
- Metal windlass

Improvised TQ

If a commercial tourniquet is not available, improvised tourniquets may be considered.

- 3 components: a strap, a windlass equivalent rod, and a securing mechanism
  - » strap – ideally ≥ 1.5", fabric (e.g., cravat, belt)
  - » rod – material is hard, strong, capable of withstanding torque without breaking
  - » securing mechanism – maintains constricting force & survive patient transport
- Anticipate & plan for contingency plans of not having commercial TQ

CONSIDERATIONS FOR REMOVING A TOURNIQUET (AKA TOURNIQUET CONVERSION)

SCOPE OF PRACTICE

All EMS Providers.

CONTRAINDICATIONS FOR TQ REMOVAL

- Shock
- Amputation
- Inability to closely monitor for rebleeding
- Tourniquet has been in place for more than 6 hours
- Tactical or medical considerations make transition inadvisable

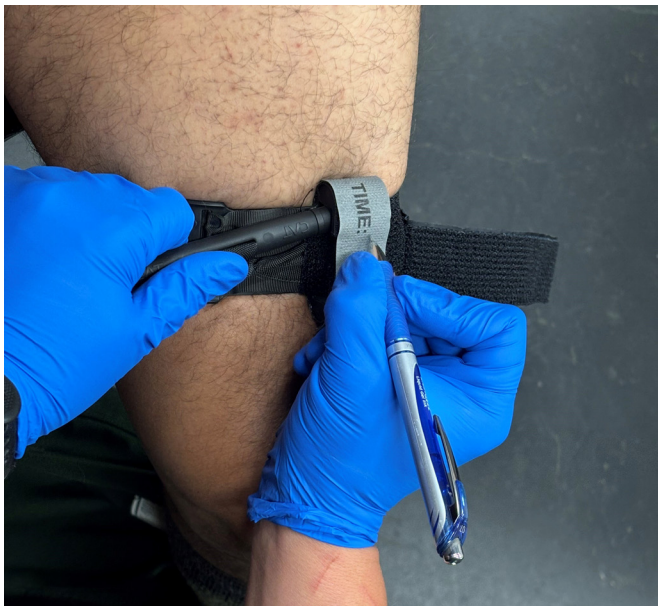
GENERAL PROCEDURE FOR TQ CONVERSION

Every effort should be made to convert tourniquets in less than 2 hours if bleeding can be controlled by other means.

1. Pack wound with gauze and hold pressure until bleeding can be controlled.
2. Apply pressure bandage over the dressing.
3. Slowly release TQ over 1 minute, ensuring no rebleeding occurs, and continue to reassess.
    - » If uncontrolled bleeding occurs, retighten TQ and leave in place (definitive care to remove).
4. If conversion is successful, loosen the TQ and move it down to just above the pressure dressing, in case it is needed later.
5. Document all findings, treatments and times.

References:
Tourniquets in TCCC Guidelines. Joint Trauma Systems. The Committee on Tactical Combat Casualty Care (CoTCCC). DEC 2021.

TQ placement on upper extremity.



Record time TQ was placed onto the patient.

Transcutaneous Pacing

CLINICAL INDICATIONS

- Symptomatic bradycardia
- HR < 50 AND ONE of the following:
  - » Unstable patient (e.g., hypotension, AMS/ALOC, shock, chest pain, severe SOB, heart block)
  - » Unresponsive to atropine. (Atropine administration should not delay implementation of external pacing for patients with poor perfusion.) Medication: *Atropine (3035).*

CONTRAINDICATIONS

- Patients without a pulse
- Patients in traumatic cardiac arrest
- Patients in asystole
- In patients with an effectively firing pacemaker, look for other causes of hypotension.

1. Consider premedication per Medications: *Midazolam (3135)* or *Fentanyl (3080)* and *Ketamine (3115)*.

   A. This is a consideration for a conscious patient—do not delay treatment to administer medications.

2. Consider contacting MC. (If MC contact is not possible at the initiation of the procedure due to the severity of the patient condition—contact when the patient is more stable or more personnel arrive).

3. Ensure ECG limb lead electrodes are attached, and monitor displays a rhythm.

4. Attach pacing pads to anterior and posterior chest. The anterior pad should be placed midway between the xyphoid process and the left nipple at the apex of the heart. The posterior pad should be beneath the left scapula and lateral to the spine at heart level. (There are multiple placement options—follow the recommendations of the device being used)

   Ensure pads adhere properly—most units will not operate if pads are not properly adherent.

5. Print rhythm strips.

6. Set device to "Pacing" mode.

7. Set the rate between 60 and 90 bpm.

8. Set the electrical current (or output) to the lowest setting:

   A. Gradually increase the current until a pacer spike is seen on the monitor.
   B. Continue increasing until a QRS complex is seen—this indicates electrical capture.

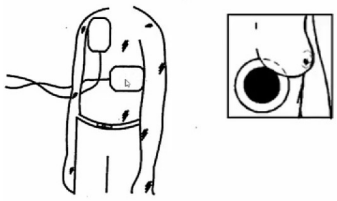
9. Confirm mechanical capture (patient pulse).

10. A paced rhythm will have a spike with each QRS—the T wave will (generally) be broad and tall.

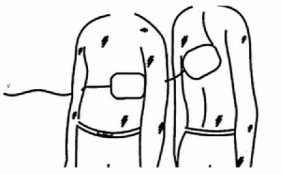
11. Reassess patient

    - V-fib rare—monitor closely
    - Burns: (rare) patients being paced for a long time (> 4 hours) may develop skin burns. Ensure the skin is clean before placing the pads and that the pads are intact.
    - Failure to recognize an underlying treatable ventricular fibrillation due to obscuration of ECG by pacer spikes
      - » Troubleshoot by canceling the TCP—this will pause the spikes to allow for identification of an underlying rhythm.

Examples of proper pad placement:

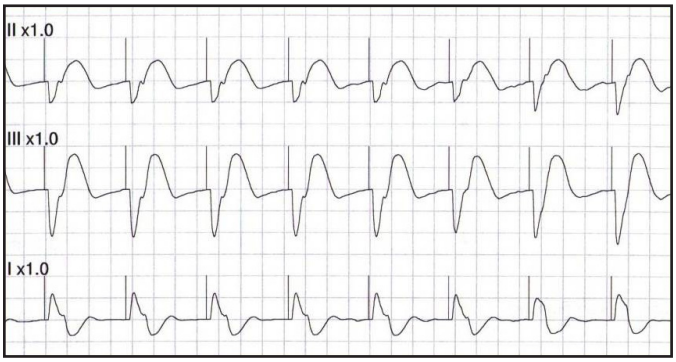


Antero-lateral Pacer Pad Placement



Antero-posterior Pacer Pad Placement

Example of TCP spike with QRS capture:



Vagal Maneuvers

CLINICAL INDICATIONS

- Supraventricular tachycardia
- Tachycardia of unknown etiology

VALSALVA MANEUVER

1. Print a baseline rhythm strip before initiating treatment.
2. For a patient with a dysrhythmia, apply defibrillation pads before initiating treatment to prepare for deterioration.
3. Explain the procedure to the patient.
4. Instruct the patient to inhale, hold their breath, and do one of the following:

   A. Bear down, as if to have a bowel movement, and attempt to hold this position for 20-30 seconds.
   B. Blow forcefully through a straw, syringe, or IV catheter for as long as possible (at least 20 seconds)

5. Monitor the patient's cardiac rhythm continuously and print a rhythm strip if conversion occurs.
6. Stop the maneuver immediately if:

   A. The patient develops an altered mental status
   OR
   B. The heart rate drops below 100 bpm.

DIVE REFLEX

1. Print a baseline rhythm strip before initiating treatment.
2. For a patient with a dysrhythmia, apply defibrillation pads before initiating treatment to prepare for deterioration.
3. Explain the procedure to the patient.
4. Prepare a cold pack wrapped in a damp wash cloth.
5. Apply the cold pack to the forehead and nose for 15-30 seconds.
6. Monitor the patient's cardiac rhythm continuously and print a rhythm strip if conversion occurs.
7. Stop the maneuver immediately if:

   A. The patient's mental status deteriorates
   OR
   B. The heart rate drops below 100 bpm.

NOTES AND PRECAUTIONS

- Vagal maneuvers may be attempted while a provider prepares medications or cardioversion equipment, but they should not delay more definitive treatment for patients with unstable tachycardia.
- The dive reflex may be more effective in pediatric patients than adults.
- See Protocols: *Cardiac Dysrhythmia: Adult Tachycardia (2130)* or *Cardiac Dysrhythmia: Pediatric Tachycardia (2140)* for more information on treatment of patients with tachycardia.

Vital Signs

CLINICAL INDICATIONS

- Transported patients: minimum of two full sets of vital signs regardless of transport time
- Patients refusing treatment/transport (AMA): minimum of one full set of vital signs
- Preintervention (however, do not withhold interventions if patient condition requires immediate treatment)
- After medication administration or procedure
- Every 15 minutes (minimum) for stable patients during transport
- Every 5 minutes for unstable patients during transport

PROCEDURE

1. Obtain an initial set of vital signs, including:

    A. Pulse rate, regularity, and quality
    B. Respiratory rate, effort, and breath sounds
    C. Systolic and diastolic blood pressure (capillary refill may be substituted in patients under 5 years old)
    D. Pain severity (if pain is a complaint)
    E. GCS (patients with trauma or altered mental status)
    F. Pulse oximetry (SpO_2)

2. As soon as feasible, obtain a complete set of vital signs including lung sounds and temperature. If indicated by specific procedures or protocols, obtain $EtC0_2$, ECG, or blood glucose measurements.

3. If equipment is unavailable (such as in a backcountry setting), providers must rely on basic findings, such as skin condition, mental status, and quality of the patient's pulse instead of blood pressures or SpO_2 readings.

4. Be sure to document why traditional vital signs were not taken in the patient care report.

NOTES AND PRECAUTIONS

- In trauma patients, use a manual blood pressure cuff to establish a baseline blood pressure. Manual blood pressure readings are more accurate than automated cuffs, especially in hypotensive patients.
- Do not rely on pulse oximetry alone for a full picture of a patient's respiratory status. Include lung sounds, capnography, skin condition, respiratory rate/volume/effort, and a physical exam of the patient's chest (to evaluate for retractions, chest excursion, signs of trauma, etc.) in the assessment of anyone with a possible respiratory complaint.
- Patients with reactive airway disease (e.g., asthma, COPD) can present with respiratory failure despite normal or near-normal pulse oximetry readings.
- In the setting of carbon monoxide poisoning, pulse oximetry will be within normal range despite profound hypoxia. Carbon monoxide readings should be taken on suspect patients.

1455

Wound Care

CLINICAL INDICATIONS

Protection and care for open wounds before and during transport (including blisters, burns, abrasions, lacerations, punctures, open fractures, avulsions, and amputations).

PROCEDURE

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If the patient is exsanguinating from arterial bleeding (large volume of bright red blood, often spurting and difficult to control), do not hesitate to apply a tourniquet. Irreversible blood loss can occur within minutes. See Procedure: *Tourniquet Application (1430)* if arterial bleeding occurs from a location where a tourniquet cannot be applied (e.g., trunk, axilla), pack the wound with sterile roller gauze and hold firm, direct pressure.
3. For all other bleeding-control situations, apply well-aimed direct pressure with a gloved hand and sterile dressing. If bleeding continues, temporarily remove dressing to ensure that direct pressure is being appropriately applied to the source of bleeding. Pack the wound if needed for additional bleeding control. Bandage the wound to keep dressings in place.
4. Once bleeding control has been achieved continue with wound care. Frequently reassess wounds to ensure bleeding hasn't returned.
5. Document the wound, assessment, and care in the prehospital patient care report.

GENERAL WOUND CARE

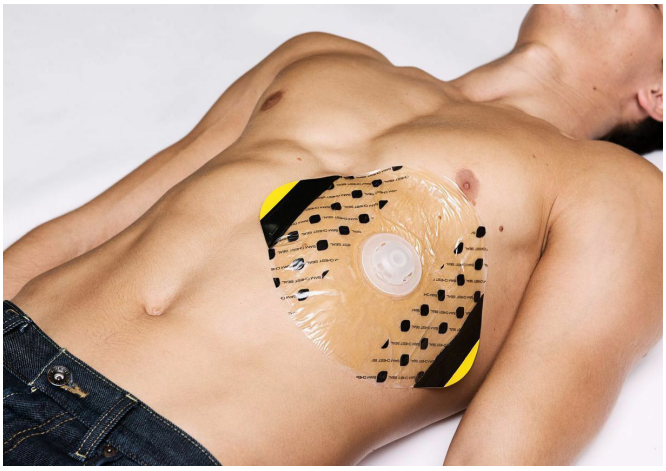
1. Assess whether the patient is stable or unstable. Never delay transport or treatment of other life-threatening injuries (e.g., exsanguination, airway compromise, tension pneumothorax, shock) to perform general wound care.
2. Keep wound as clean as possible: gently remove foreign material (except impaled objects) and remove constricting items, such as rings and watches, as soon as possible.
3. Irrigate open wounds with approx. 100 mL/cm of wound length using NS, sterile water, or potable water as available. See step 5 for list of wounds not to irrigate. Do not use iodine, hydrogen peroxide, alcohol, or other antiseptics for irrigation. Pressure irrigation is preferred. If bleeding was severe or difficult to control, do not disturb the clotting process to irrigate. Cessation of severe bleeding takes priority over irrigation.
4. Burns < 15% total body surface area (TBSA) can be gently rinsed. Do not use high pressure lavage. Be aware of the patient's body temperature and take measures to maintain warmth.
5. Wounds that should NOT be irrigated include:
   A. Wounds that are actively bleeding or wounds with bleeding that was severe and difficult to control
   B. Punctures below the skin surface (inside a body cavity)
   C. Burns > 15% TBSA
6. Apply antibiotic ointment (bacitracin) to abrasions and burns < 5% TBSA and if transport time > 1 hour. DO NOT apply to eyes, large burns, deep wounds, puncture wounds, or impaled objects.
7. Apply sterile, nonadherent dressings and bandage wounds. Use pressure dressings for bleeding control if necessary and consider immobilization, if indicated.

SPECIAL SITUATIONS IN WOUND CARE

- **AMPUTATIONS:** Gently rinse the amputated part and wrap in moist, clean cloth or gauze. Place into a dry, watertight plastic bag. DO NOT IMMERSE SEVERED PART DIRECTLY IN WATER OR ICE. Place the bag in ice water or a cool water bath and transport with the patient. Do not delay transport to look for amputated tissue. Consider air ambulance transport: replantation success is highly time dependent.
- **BURNS > 15% TBSA:** Cover with sterile dry burn sheet or dressing. Keep the patient warm. See Protocol: *Burns (2040)* for detailed treatment instructions.
- **EYE INJURIES:** See Protocol: *Eye Emergencies/ Complaints (2195)* for detailed treatment instructions.
- **EVISCERATION:** Maintain as sterile an environment as possible. Control major bleeding. Do not push protruding bowel back into the abdomen. Cover with a moist sterile nonadherent multi-trauma dressing. Secure with a dry sterile dressing (occlusive dressing (e.g., chest seal) may be used) and ensure limited movement of the affected area.
- **FISHHOOK REMOVAL:** Barbless hooks are relatively easy to remove. Barbed hooks can be removed with MC contact; however all patients need tetanus status verified. Deeply imbedded hooks, or hooks in sensitive body parts should be referred to a clinic or hospital for removal.
- **IMPALED OBJECTS:** Stabilize in place unless the object interferes with ventilation or transport. If shortening or removal of the object is required for either reason, contact MC.
- **NOSE BLEEDS:** See Protocol: *Epistaxis (2190).*
- **LARGE, DEEP, OR GAPING WOUNDS:** Splint if near a joint or if necessary for bleeding control. See Procedure: *Fracture and Dislocation Management: General (1200).*
- **SEVERE WOUNDS (DEEP; CRUSHED; EXPOSED TENDON; OPEN FRACTURE; HEAVY CONTAMINATION),** especially with time from injury to definitive care > 1 hour. Administer cefazolin (see Medication: *Cefazolin Sodium (Ancef) (3045)*. Do not give cefazolin for burns, shallow wounds, or when the expected time from injury to definitive care is < 2 hours.
- **OPEN "SUCKING" CHEST WOUNDS:** Place an occlusive dressing (e.g., chest seal) over the wound. Vent dressing or perform chest decompression if signs of a tension pneumothorax develop. See Procedure: *Needle Decompression/Thoracostomy (1365).*
- **TOOTH INJURIES:** If teeth are avulsed (broken), loosely wrap teeth in moist gauze and place in plastic bag for transport with patient. Handle teeth only by crown (not the root). Best results for reimplantation are using a commercial solution such as "Save a Tooth."

NOTES AND PRECAUTIONS

- Contact MC for questions or unusual circumstances.
- Reassess distal circulation, sensory and motor function every 30 minutes during transport.
- Reassess bandages that may have become constricting and compromising distal CSM.
- If patient with puncture wound refuses transport, advise them regarding tetanus.



An example of a commercial chest seal.

Treatment Protocols

SECTION 2000


SILVER CITY HOTSHOTS
SILVER CITY HOTSHOTS

ABCs: Universal Patient Care

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Ask for past medical history • Ask follow-up questions as indicated, to ensure a clear medical history • Determine history of present illness and similar episodes in the past • Ask about family members (mother/father—heart disease, diabetes, other hereditary disorders)	• Look for clues as to what is going on with the patient • Assess the scene for additional clues (e.g., medical equipment, drug paraphernalia, pill bottles)	• When forming a differential diagnosis, work backward from the most urgent/life-threatening disease processes to the most benign, even if the most benign diseases are more common

SPECIAL CONSIDERATIONS

- Request additional resources as soon as possible.
- BLS should always request ALS when life-threatening conditions are identified.
- For any patient contact that does not result in an EMS transport see *Refusal of Medical Assistance (RMA) (0030)*.
- Required vital signs on every patient include blood pressure, pulse, respirations, and pain/severity. Refer to Procedure: *Vital Signs (1450)*.
- The need for pulse oximetry, glucose measurement, and temperature documentation depends on the specific complaint.
- Scene times should be based on the patient's clinical condition and transport options. Do not delay transport of critically ill patients to perform interventions unless they address immediate life-threats.
- Do not give oral fluids unless directed by specific protocols.

AVPU (Level of Consciousness)

A Patient is **ALERT**

V Patient not alert, but responds to **VERBAL** command

P Patient not alert, responds to **PAIN**

U Patient is **UNRESPONSIVE**

GLASCOW COMA SCALE (GCS) 3-15

EYE OPENING	VERBAL RESPONSE	MOTOR RESPONSE
Spontaneous 4	Oriented 5	Obeys Commands 6
To Voice 3	Confused 4	Localizes Pain 5
To Pain 2	Inappropriate 3	Withdraws from Pain 4
None 1	Incomprehensible 2	Flexion (decorticate) 3
	None 1	Extension (decerebrate) 2
		None 1

SAMPLE HISTORY

Signs/Symptoms

Allergies

Medications

Pertinent Medical History

Last Oral Intake/Outflow

Events Leading Up To Illness/Injury

OPQRST (PAIN/DISCOMFORT ASSESSMENT)

Onset (Sudden/gradual/getting worse? Started?)

Palliative/Provocative factors

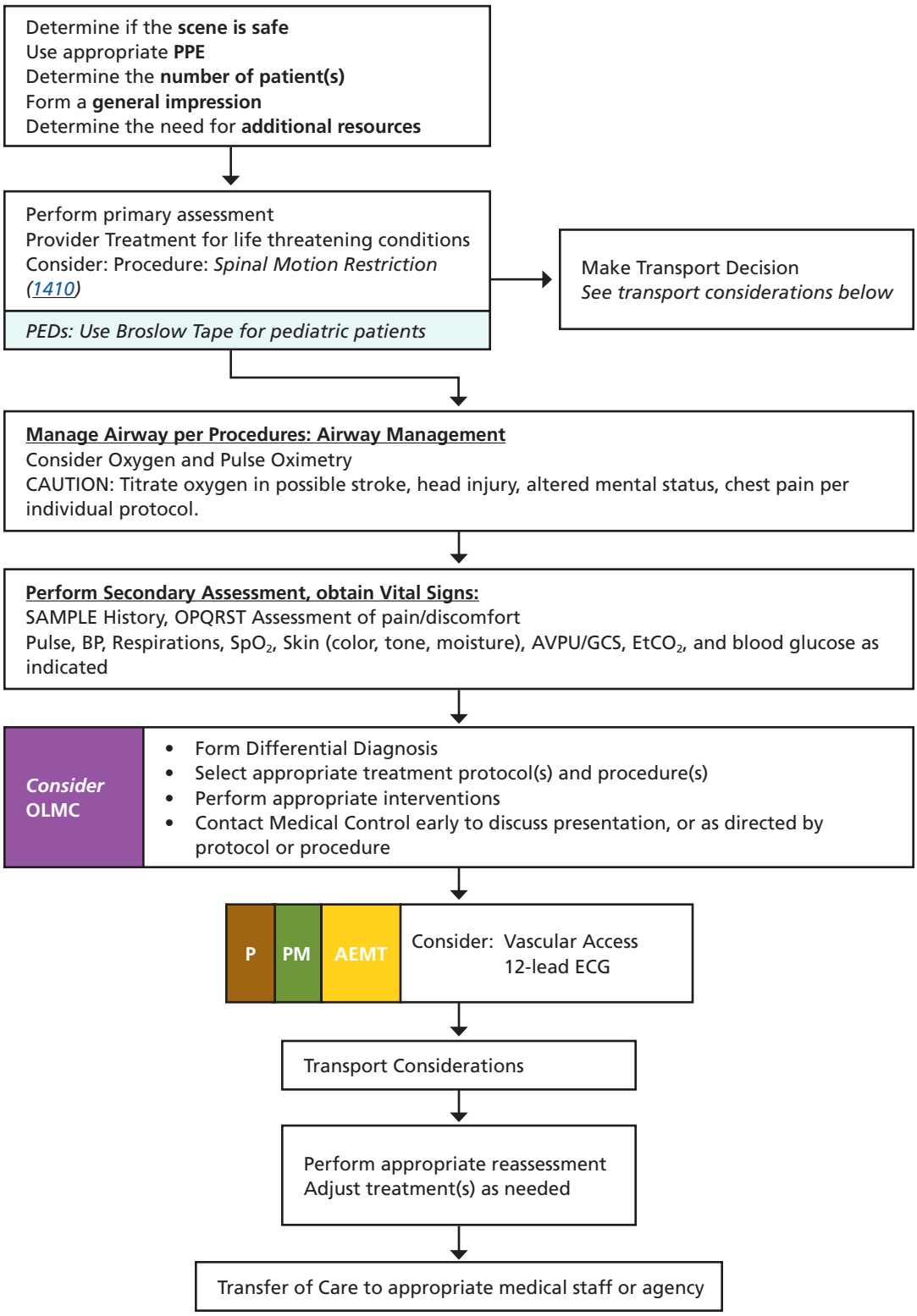
Quality (Feels like?)

Radiates/Refers

Severity (0-10)

Time (is this the first time?)

ABCs: UNIVERSAL PATIENT CARE



Abdominal Pain

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Age • Emesis/vomiting • Fever • Past menstrual history (consider pregnancy) • Past abdominal surgery	• Constipation • Diarrhea • Dysuria • Guarding/rigidity • Nausea • Pain (locations, radiation) • Pulses (equal and strong) • Pregnancy • Tenderness • Vaginal bleeding/discharge • Vomiting/emesis	• Abdominal aortic aneurysm (AAA) • Appendicitis • Bowel obstruction • Diabetic ketoacidosis • Gallbladder • Kidney stone • Myocardial infarction • Pelvic (PID, ectopic pregnancy, ovarian cyst) • Pneumonia or pulmonary embolus • Trauma

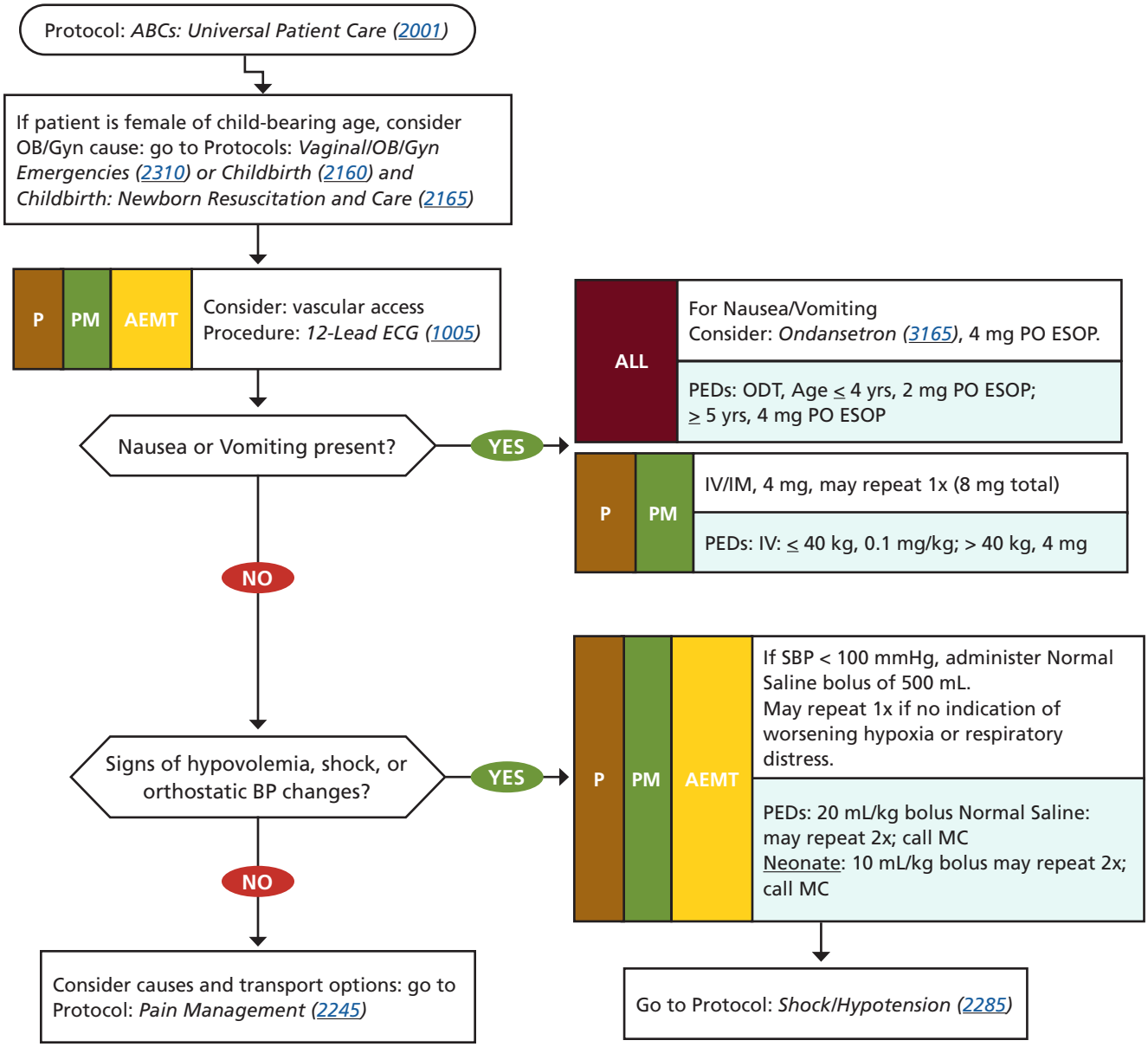
PEDIATRIC CONSIDERATIONS

- Consider nonaccidental trauma (abuse)
- Closely monitor vital signs as the blood pressure may drop quickly

SPECIAL CONSIDERATIONS

- Abdominal pain may be the first signs of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscera, etc.). Monitor for signs of shock.
- The diagnosis of abdominal aortic aneurysm should be considered with abdominal pain if patient is over 40.
- Appendicitis classically begins with vague, periumbilical pain, which migrates to the right lower quadrant over time.
- Remember pneumonia or cardiac episodes can present as abdominal pain.
- The cause of abdominal pain is difficult to determine in the field. Transport and urgency should be guided by vital signs, level of pain, and history of prior conditions. Contact MC early.

ABDOMINAL PAIN



Accidental Exposures to Wildlife Capture Medications

INDICATIONS

Human exposure to wildlife immobilization agents, euthanasia medications, or reversal agents

ROUTES

Exposure may occur via injection (IV or IM), or contact with skin, eyes, or mucous membranes (mouth or nose). For skin or eye exposure, wash the area with saline or clean water for at least 15 minutes.

PROTOCOL

- Contact Poison Control at 1-800-222-1222.
- Contact Medical Control as soon as possible for further directions and possible orders to administer specific antidotes.
- Have Wildlife Biologist contact supervisor and Attending Veterinarian.
- Determine if wildlife staff have administered reversal agent, and record time, dose and name of reversal agent.
- Obtain and review appropriate Safety Data Sheet (SDS) sheet for drug/wildlife agent, but do not delay transport for patient exhibiting symptoms.
- For patient with signs or symptoms of opioid overdose, or known exposure to opioids, administer naloxone.
- See table for common signs, symptoms, and treatment considerations for each agent.

ACCIDENTAL EXPOSURES TO WILDLIFE CAPTURE MEDICATIONS

EXPOSURE

EMR
Decontaminate.
Remove dart.
Assess breathing and gag reflex.

Awake/Responsive
Respiratory Rate ≥ 12
AND Adequate Gag Reflex

EMR
Place individual in a rescue position.
Continue to monitor.
Call for Evacuation/ALS Backup.

EMT
Monitor and transport to ED.

Unresponsive
Respiratory Rate ≤ 12
And/or Inadequate Gag

EMR
Insert an NPA/OPA.
Provide respiratory support at 12-15 breaths/minute via bag.

Single Rescuer

EMR

If antagonist is prepared/drawn up
Administer antagonist as identified and calculated during preparation.
Provide respiratory support as needed for 2 minutes.
Administer subsequent doses until spontaneous breathing is achieved or until max dose is administered.
Continue respiratory support as needed until EMS personnel arrive.

If antagonist is not yet prepared/drawn up
Provide 2 minutes of respiratory support.
Then draw up and administer the antagonist and continue respiratory support.
Administer subsequent doses until spontaneous breathing is achieved or until max dose is administered.
Call for emergency transport as soon as possible after 2 minutes of respiratory support and initial administration of antagonist(s).
Consider accompanying EMS ground transportation team to assist in further management.

EMT

Ensure care has been provided in accordance with the HUMAN ANTAGONIST DOSAGE CALCULATION TABLE AND WORKSHEET completed by the Wildlife Biology Responder/EMR.
Consider additional Protocols: *Altered Mental Status (2020). Shock/Hypotension (2285)*
Irrigate per Procedure: *Wound Care (1455)*.
Early base contact is advised.
Monitor and transport to ED: maintain respiratory support as Indicated.

P **PM** **AEMT**

Place IV.
If HR > 100 or SBP < 90, consider IVF boluses per Procedures: *IV Access (1310 and 1315); IV and IO Fluid Administration (1320); IO Access (1305)*

Two or More Rescuers

EMR

Rescuer One: provide respiratory support as needed until EMS personnel arrive.
Rescuer Two: draw up and administer antagonist(s) as calculated during preparation.
1. Administer subsequent doses until spontaneous breathing is achieved or until max dose is administered.
2. If a third rescuer is not present, then Rescuer Two calls for emergency transport immediately after the initial dose of antagonist(s).

Rescuer Three (if available): calls for emergency transport immediately.

KEY POINTS:

- MAX 5 mL per IM injection in the hips/buttocks; MAX 2 mL deltoids.
- Multiple IM injections may be required.
- All exposures require transport for medical evaluation.
- Any remaining antagonist and the antagonist calculation table and any relevant Material Safety and Data Sheet(s) should accompany the exposed team member to the hospital.

Wildlife Control personnel should have the reversal agents on their person. Look for a reversal kit on the patient. Follow Universal Patient Care Protocol and address ABCs.

Animal Sedation Agent	Antagonist	Wildlife Drug Dose Administered (mg)	Conversion Calculation (mg of antagonist x sedation agent dose = maximum dose)	Maximum dose of Antagonist (mg)	Initial dose (mL)	Repeat dose of Antagonist up to maximum dose	Comments
		Dose Calculation			**Dose Administration**		
Thiafentanil (Thianil)	naloxone (Narcan, 4 mg)	NA	4 mg IN	Continue Naltrexone dose		Support respirations with BVM; contact base for repeat dosing	
	Naltrexone (50 mg/mL)	_____ x 10 mg = _____ Max dose			Calculated max dose _____ (mL)(IM)	NA	Support respirations with BVM
Etorphine	naloxone (Narcan, 4 mg)	NA	4 mg IN	Continue Naltrexone dose		Support respirations with BVM; contact base for repeat dosing	
	Naltrexone (50 mg/mL)	_____ x 20 mg = _____ Max dose			Calculated max dose _____ (mL)(IM)	NA	Support respirations with BVM
Butorphanol or Nalbuphine	naloxone (Narcan, 4 mg)	NA			4 mg (IN)	4 mg (IN)	Support respirations with BVM and administer repeat doses every 2 minutes until BVM no longer needed
Medetomidine	Atipamezole (25 mg/mL) or (5 mg/mL as Antisedan)	_____ x 5 mg = _____ Max dose			25 mg (IM) 1 mL (of 25 mg/mL) OR 5 mL (of 5 mg/mL)	25 mg (IM)	Support respirations with BVM. Administer repeat doses every 2 minutes until max dose or BVM no longer needed
Any Additionally Planned "non-reversible" Wildlife Capture Drugs:	1._____ 2._____ 3._____ 4._____				5._____ 6._____ 7._____ 8._____		

Wildlife Captures: Journal of Zoo and Wildlife Medicine 54(4): 873-878, 2023.

Antagonist dose calculation worksheet. This worksheet is meant to be completed before engaging in remote field work and should be carried in the field. If an exposure occurs, refer to this chart for initial and maximum antagonist doses to be given. Be prepared to provide this worksheet to the Emergency Medical Service personnel when they arrive on site or at the point when the patient is transferred to a standard medical provider. Transportation of any additional antagonist with the patient is strongly recommended.

2015

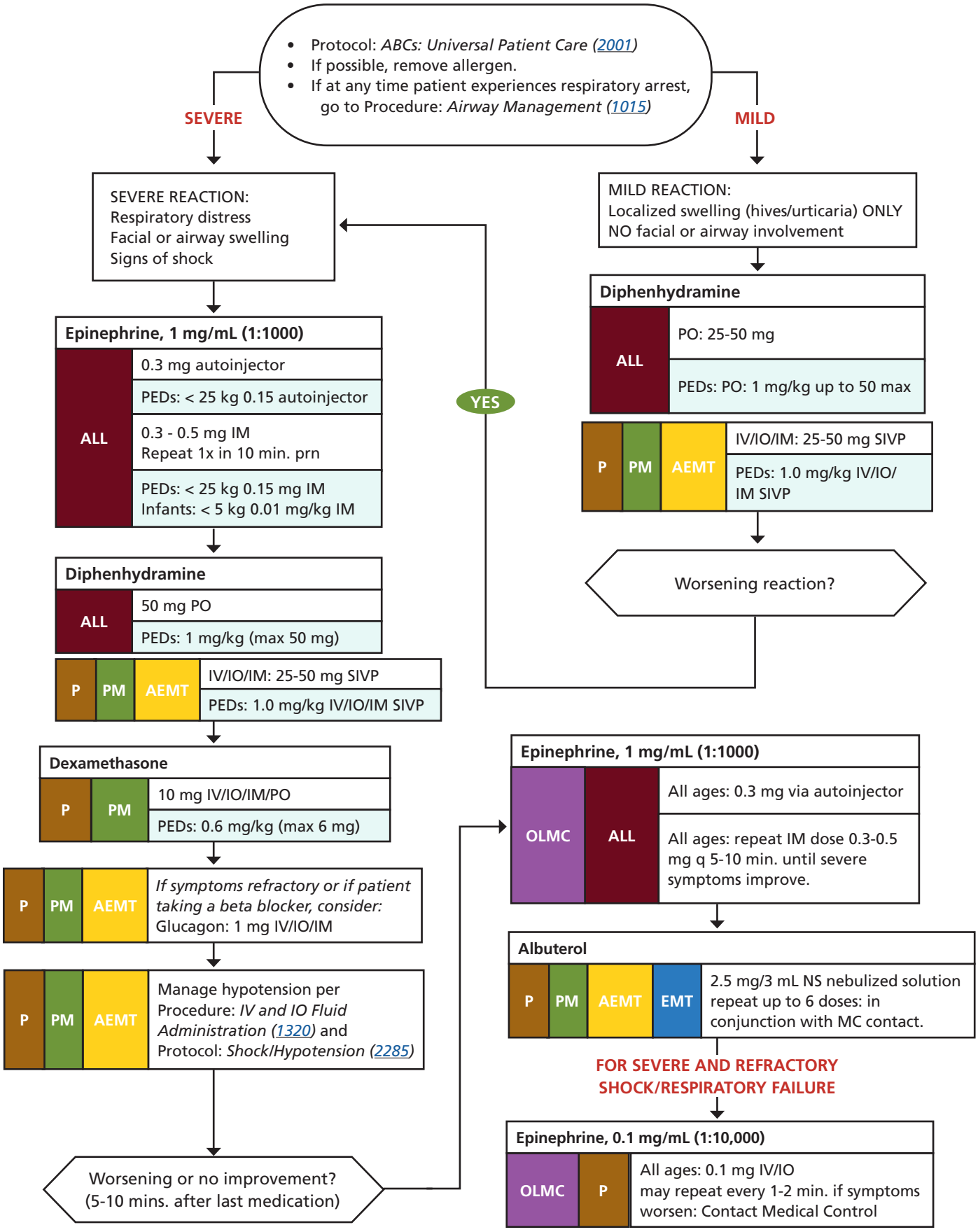
Allergic Reaction/Anaphylaxis

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Onset and location • Insect sting or bite • Food allergy/exposure • Medication allergy/exposure • New clothing, soap, detergent • Past history of reactions	• Itching or hives • Coughing/wheezing/stridor or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotension or shock • Edema/angioedema • Abdominal pain, N/V	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock • Aspiration/airway obstruction • Asthma or COPD • Croup (upper airway obstructive illness) • Organophosphate poisoning

SPECIAL CONSIDERATIONS

- The shorter the onset from contact to symptoms, the more severe the reaction.
- When giving IV epinephrine for allergic reactions ALWAYS use the 1 mg/10 mL (1:10,000) concentration and push slowly (over 20-30 seconds) to minimize risks.
- Past history special considerations include allergic reactions, heart disease, stroke, and hypertension.
- Medication special considerations include beta blockers, epinephrine use before a responder comes on scene.
- Consider Protocol: *Shock/Hypotension (2285)* for anaphylactic shock.

ALLERGIC REACTION/ANAPHYLAXIS



Altered Mental Status

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Baseline mental status • Time last seen normal • Past medical history (e.g., diabetes, epilepsy, dysrhythmias, psychiatric disorders, suicidal ideation/attempts) • Illicit drug use • Toxic ingestion • Alcohol ingestion • Recent trauma • Medications (compliance, over/under medication)	• AVPU, GCS • Baseline vital signs + SpO_2, • $EtCO_2$, ECG, temperature, blood glucose, pupils • Abnormal/bizarre behavior • Hypoglycemia: shakiness, irritability, fatigue, sweating, seizures, combativeness • Diabetic ketoacidosis: fruity breath (ketotic), dry skin/mucosa, ill appearing, dehydration, abdominal pain, Kussmaul respirations	**A** Alcohol, Altitude, Age **E** Epilepsy, Electrolytes, Electrocution, Eclampsia, Encephalopathy **I** Insulin (hypo/hyperglycemia) **O** Overdose, oxygen (hypoxia) **U** Uremia (kidney failure) **T** Trauma, Tumor, Thyroid, Temperature (hypo/hyperthermia) **I** Infection, Infarction **P** Psychosis, Poisons **S** Stroke, Syncope, Shock (septic, hemorrhagic, neurogenic, anaphylactic, cardiogenic, obstructive)

SPECIAL CONSIDERATIONS

- Agitation can be seen in hypoxia, hypoglycemia, infection, some toxic ingestions.
- If there is a safety concern for patient or staff, follow behavioral protocol and consider restraints. See Protocols: *Behavioral and Psychiatric Emergencies (2030)* and *Restraint of Patients (1390)*.
- If oral glucose is the only option and there is an airway concern, place the oral glucose in the buccal area.
- Naloxone is an extremely safe drug; if there is any question of opiate involvement, give the naloxone. See *Naloxone (3145)*.
- Alcohol frequently has concurrent hypoglycemia; intoxicated patient may still need glucose.
- Do not leave suicidal patient alone.

AVPU (Level of Consciousness)

A Patient is **ALERT**

V Patient not alert, but responds to **VERBAL** command

P Patient not alert, responds to **PAIN**

U Patient is **UNRESPONSIVE**

GLASCOW COMA SCALE (GCS) 3-15

EYE OPENING	VERBAL RESPONSE	MOTOR RESPONSE
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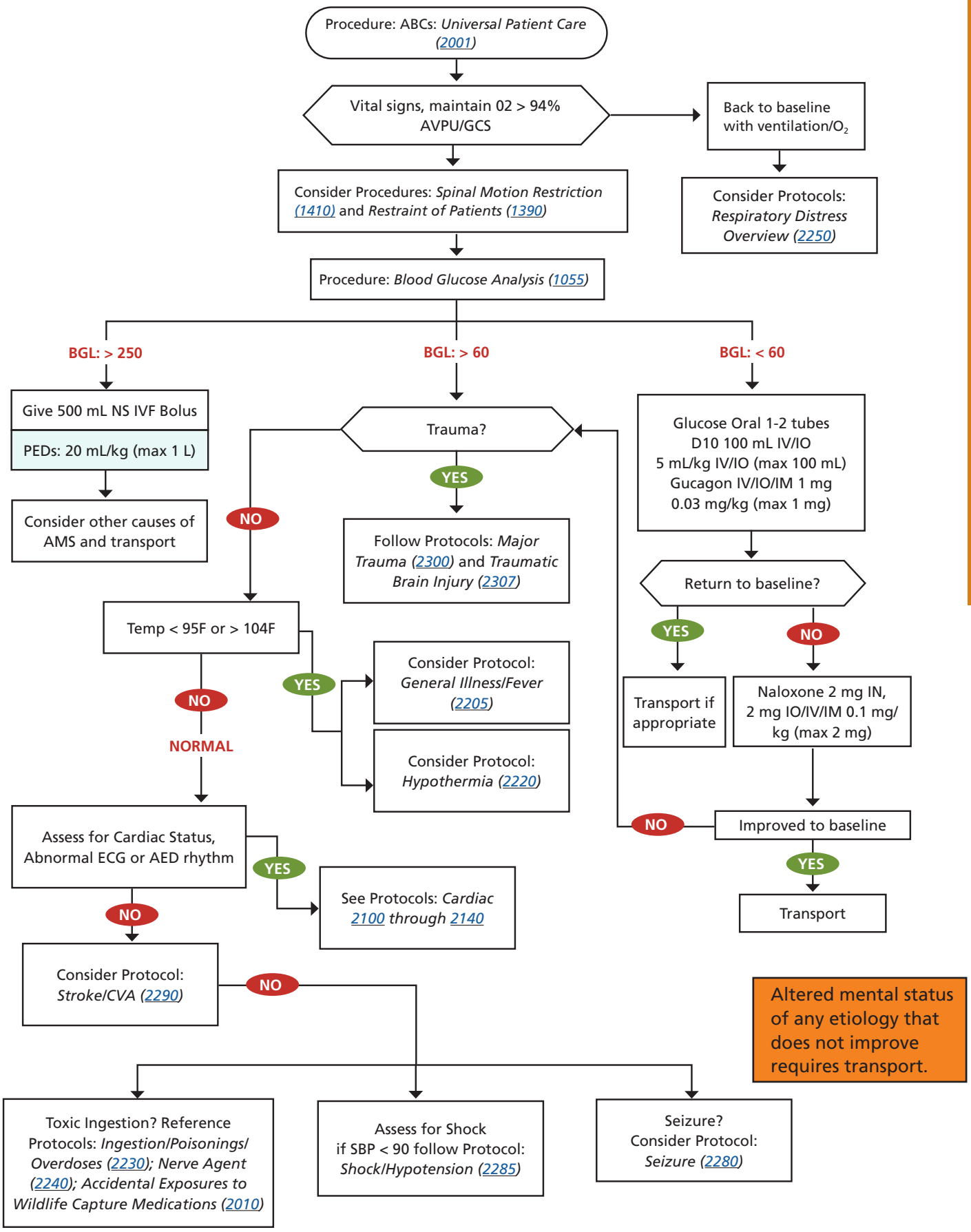
To Pain 2	Inappropriate 3	Withdraws from Pain 4
None 1	Incomprehensible 2	Flexion (decorticate) 3
	None 1	Extension (decerebrate) 2
		None 1

ALTERED MENTAL STATUS



Altitude Illness

HISTORY	ASSESSMENT	DIFFERENTIAL
• Ascent Profile (rate of ascent, nights at elevation, maximum altitude) • Duration of high-altitude exposure • Altitude at which signs and symptoms first began. • Prior history of altitude illness • Prophylactic medications taken? • Fluid intake • Past medical history • Overexertion	• AMS: headache, fatigue, nausea/ vomiting, decreased appetite, insomnia, periodic breathing • HACE: severe headache, ataxia, persistent vomiting, altered mental status • HAPE: shortness of breath at rest, tachypnea, cough, cyanosis, crackles, orthopnea (worsening respiratory distress when lying flat)	• AMS (Acute Mountain Sickness) • HACE (High Altitude Cerebral Edema) • HAPE (High Altitude Pulmonary Edema) • Hypoglycemia • Carbon Monoxide Poisoning • CHF, COPD, Asthma • Pneumonia, Pulmonary embolism (PE) • Hypothermia • Hyperthermia • Infection • Intoxication (drug or alcohol) • Trauma • Stroke

SPECIAL CONSIDERATIONS

- High altitude illness usually occurs above 8000 ft (2438 m), and/or when an individual has ascended to a significantly higher elevation (for example: sea level to 5000 ft). There is no set altitude for when symptoms may develop.
- Rapid ascent increases the risk of illness.
- Above ~9800 ft (3000 m), it is recommended to increase the sleeping altitude by no more than ~1600 ft (500 m) per day.
- All types of altitude illness: Descent is the preferred treatment. If descent is possible, DO NOT wait for a higher level of care.
- Oxygen administration is essential for the treatment of altitude illness. If possible, administer oxygen during evacuation. (If the patient can descend, initiate slow descent while oxygen is coming to the patient.)
- HAPE often presents after the 2nd night after ascent to high altitude.
- Patient's with HAPE must have physical exertion limited. The patient should have no load (e.g., backpack) if self-extricating.
- AMS may progress to HACE. The differentiating factor is altered mental status, including ataxia.
- HAPE may present in isolation or with AMS/HACE.

High Altitude Illness Prophylaxis (common medications taken by mountaineers)

- Acetazolamide 125 mg po BID—many will take half the dose or only once daily
- Dexamethasone 2 mg po q QID (generally for those with a true allergy to acetazolamide)

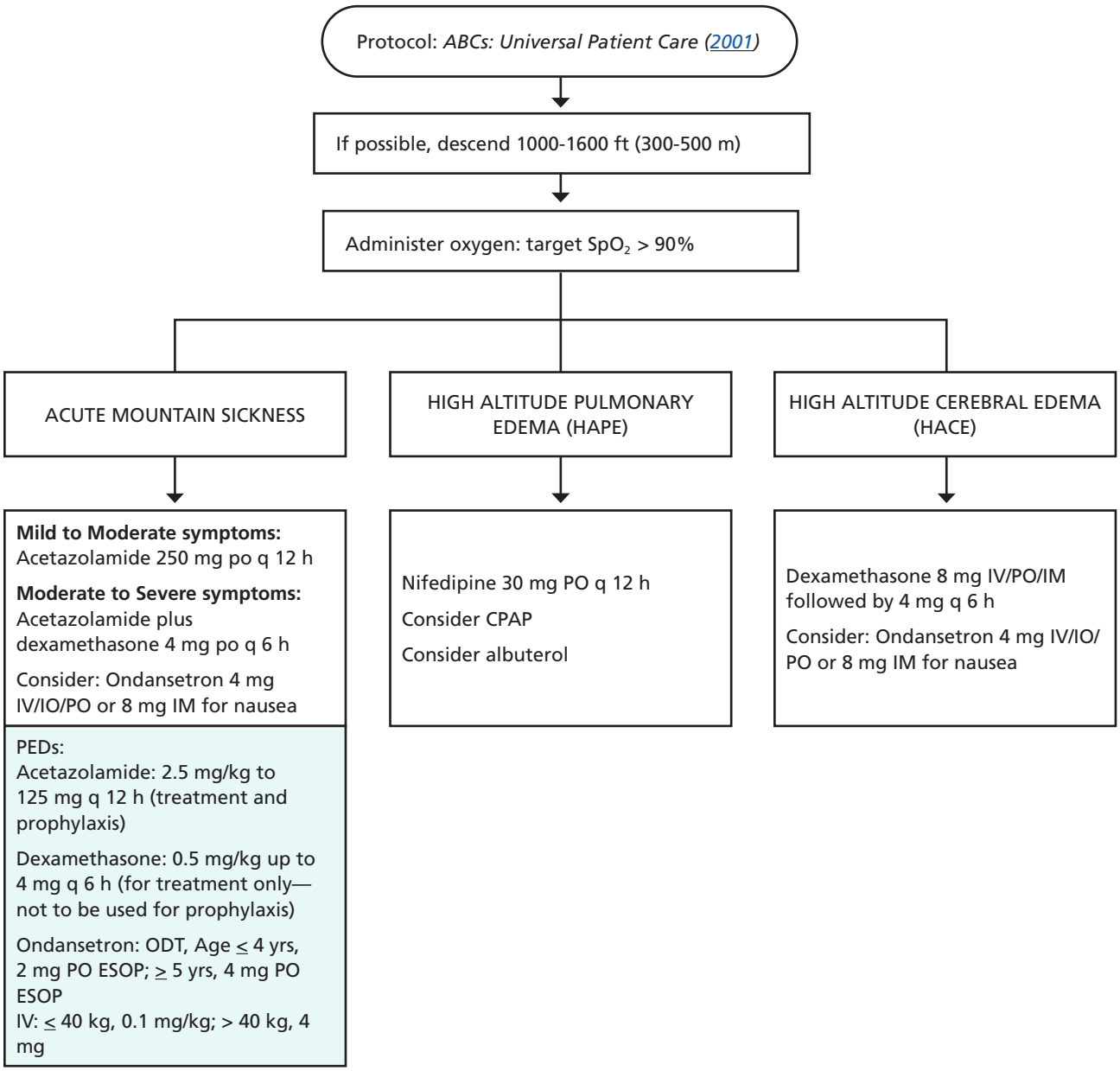
HACE treatment

- Descent, either mechanically or by using a portable altitude chamber
- Oxygen administration
- Dexamethasone 8 mg initially followed by 4 mg (IV/IM/PO)
- Acetazolamide 250 mg po q 12 ft (dexamethasone is the key for treatment, this may potentiate it)

HAPE treatment

- Descent, either mechanically or by using a portable altitude chamber
- Oxygen administration
- Nifedipine 30 mg q 12 ft
- CPAP and albuterol are considerations but not proven to improve symptoms
- May need to treat concurrently for AMS or HACE

ALTITUDE ILLNESS



PORTABLE ALTITUDE CHAMBER

If unable to descend consider use of a portable altitude chamber (e.g., Gamow Bag®). These devices are pressurized by a hand or foot pump. They are NOT to be used for mild to moderate AMS. The chamber creates a relative hyperbaric environment, simulating descent of 460-610 ft (1500-2000 m). If the patient's status improves to the point they can assist with descent, initiate descent but take the bag with you.

Contraindications:

- Comatose patient, patient not protecting their airway
- Severe claustrophobia

Considerations:

- The patient may experience ear pain—slow down the descent
- It can become quite warm within the bag.
- Be sure to insulate from cold (from the ground) and to shade from the sun.
- Most patients will require several hours in the bag.
- If the patient is confused, ensure that the rescuer is able to talk to them, offering reassurance.
- Rapid exit is possible—unzip the bag and trigger the release valve.

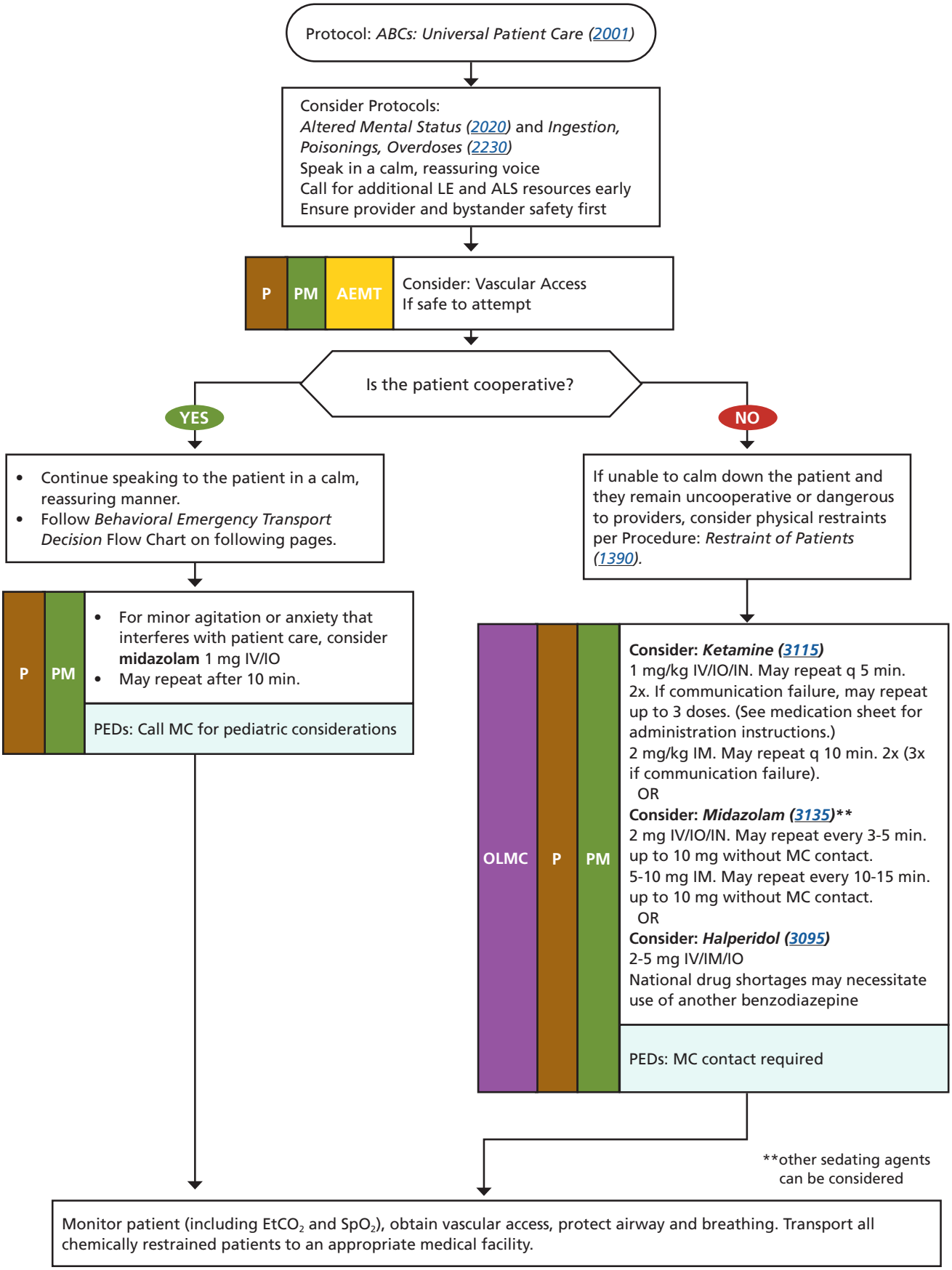
Behavioral and Psychiatric Emergencies

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Drug use • Alcohol intake • Psychiatric illness • Seizure disorder • Diabetes • Traumatic Brain Injury	• Aggressive behavior/combative • Shouting • Paranoia • Hyperthermia • Trauma	• Drug and/or alcohol intoxication • Psychiatric episode, Psychomotor agitated state • Developmental delay • Trauma • Postictal • Diabetic episode • Hypoxia

SPECIAL CONSIDERATIONS

- See Protocol: *Altered Mental Status (2020)* for a more extensive list of conditions associated with altered mental status.
- Speak to the patient in a calm, nonthreatening manner. Do not argue with the patient.
- **Psychomotor agitated state** is an extreme manifestation of behavioral emergencies that can lead to death. The pathogenesis is not well understood, but is likely multifactorial including positional asphyxia, hyperthermia, drug toxicity, and/or catecholamine-induced arrhythmias. Treatment should focus on reduction of stress (minimize noise/light/patient stimulation), pharmacological therapy and rapid monitored transport. If the patient has an elevated temperature or feels hot to the touch, institute cooling measures.
- Consider the possibility of **Psychomotor agitated state** in patients exhibiting a combination of symptoms including:
  - » Bizarre and/or aggressive behavior
  - » Shouting
  - » Paranoia/panic
  - » Violence toward others
  - » Unexpected physical strength
  - » Hyperdynamic vital signs (hyperthermia, tachycardia, hypertension, tachypnea).
- Do NOT use prone, hobbled, or 'hog-tied' restraints. Consider securing one arm up and the opposite arm down. See Procedure: *Restraint of Patients (1390)*.
- Any patient who may be a danger to self or others, including impaired judgment, must be transported. Consider legal psychiatric hold.
- If due only to psychiatric illness patients are usually alert and oriented.
- Closely monitor the cardiorespiratory status of any patient being restrained.
- Any patient who is chemically restrained must be transported to an ER.
- If an LE has applied another form of restraints such as handcuffs, they must accompany the patient in the back of the ambulance during transport.
- Ideally, separation of Law Enforcement and EMS provider responsibilities should be defined to ensure patient safety.
- **Any patient who continues to struggle while in physical restraints should be chemically restrained if possible.**

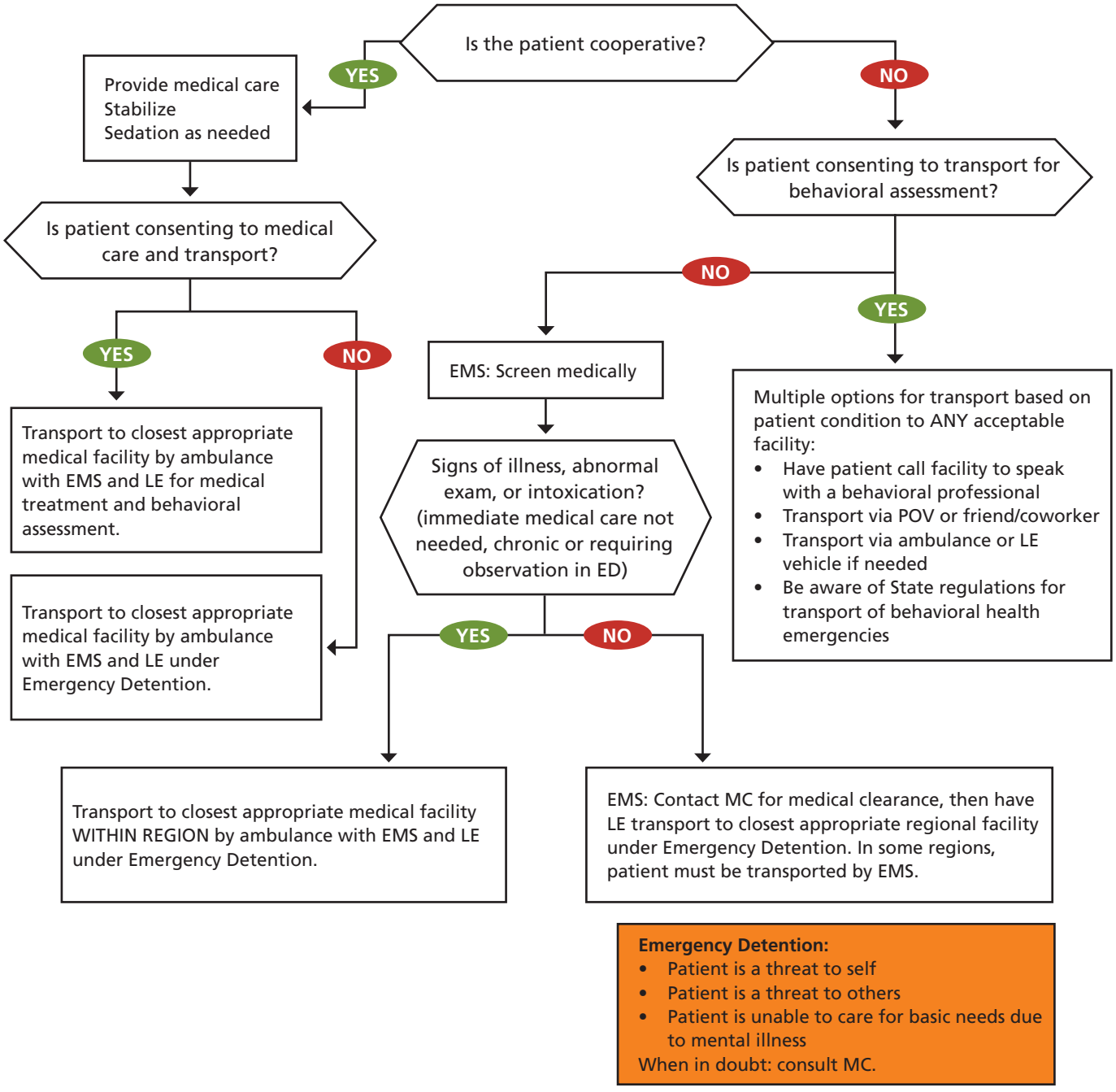
BEHAVIORAL AND PSYCHIATRIC EMERGENCIES



BEHAVIORAL AND PSYCHIATRIC EMERGENCIES

EMS providers:
Contact Law Enforcement as applicable.

Behavioral Emergency Transport Decision



Emergency Detention:
- Patient is a threat to self
- Patient is a threat to others
- Patient is unable to care for basic needs due to mental illness

When in doubt: consult MC.

PSYCHIATRIC EMERGENCY DETENTION

What is an Emergency Detention?

An emergency detention is the legal process for the temporary detainment of a person who is dangerous to self or others as a result of a psychiatric emergency.

Each State has different statutes regarding emergency detention. Be aware if your area requires that the declaration be made by Law Enforcement or if it may be made by a medical provider.

PROCEDURE

1. Make sure the scene and providers are safe!
2. If the patient poses a threat to themselves or others, attempt to gain consent for transport to a medical facility.
    A. If the patient is not violent and consents to medical treatment, treat as a medical incident.
    B. If consent will not be given and the patient is a danger to themselves or others, they may be placed under an emergency detention order.
3. Request a Law Enforcement officer when considering an emergent detention.
4. Contact Medical Control.
5. Only an EMT or higher level of care provider can respond to a psychiatric emergency along with the assistance of a Law Enforcement officer. Law Enforcement should ride in the back of the ambulance with the patient and primary care provider.
    A. Restrain patient in such a way as to allow rapid and adequate maintenance of airway and preservation of peripheral circulation and neurological function. (Consider applying soft restraints).
    B. If patient is acting irrationally, is combative, or is unable to cooperate AND physical restraint is required, consider administration of sedatives for chemical restraint and monitor patient.
6. Treat any medical problems, traumatic injuries and/or possible causes as indicated in specific protocols. Specifically refer to Protocol: *Altered Mental Status (2020)* as appropriate.
7. When possible, one EMS provider should remain as the primary care provider until the patient is transferred to the emergency department—where they will be cleared for admission to a mental health facility. If the patient is placed under emergency detention, the Law Enforcement officer must remain with the patient until care is transferred.
8. If the patient is being transported by Law Enforcement to the hospital in a patrol vehicle, the patient must be medically assessed before transport. A PCR must be completed and Medical Control approval for transport in a patrol vehicle documented.
9. Complete any Federal- and/or State-required emergency detention forms.

Bites and Stings

SPECIAL CONSIDERATIONS

Important: Know the types of animals (insects, arachnids, reptiles, mammals) and diseases present in work location(s) for awareness, prevention, encounter responses, injury and illness risks, symptom identification, etc.

- **Additional guidance.** Contact: MC, State Fish & Game management agencies, Local Health Department, CDC, NIOSH, USGS-Biological Research, University Wildlife & Ag Departments, etc.
- **Poison Control:** 1-800-222-1222.
- **Zoonotic diseases**. Different zoonotic disease exposure risks may exist depending upon the work and location; give consideration as needed.
- **Rabies.** Virus infects the central nervous system and causes acute encephalitis.
  - » Prompt medical treatment is critical after a potential exposure; positive non-treated exposure results in death; treatment after symptom onset is ineffective.
  - » Transmission may occur through bites and/or scratches.
  - » If patient reports unusual animal behavior for either domestic or wildlife (e.g., aggressive; approached by wildlife) then report to appropriate authorities.
  - » Most common carries of rabies (North America): bats, raccoons, foxes, skunks, coyotes, cats, dogs, cattle.
  - » The acute period of disease typically ends after 2 to 10 days. Once clinical signs of rabies appear, the disease is nearly always fatal, and treatment is typically supportive. Less than 20 cases of human survival from clinical rabies have been documented. Only a few survivors had no history of pre- or postexposure prophylaxis.
- **Arachnids.** scorpions, spiders, ticks.

Ticks

- » Not all ticks are infected with tick-borne diseases, but some are and therefore it is important to be aware of the risks of diseases and types of ticks you may be exposed to within a work area.
- » Note the geographical area where you were bitten.
- » If tick is found, identify the species. Bites may go unnoticed.
- » Many tickborne diseases have similar signs and symptoms.
- » Symptoms may vary between individuals; may not show in early disease stage.
- » Symptoms may be new, acute, severe, progressive, or persistent.
- » Symptoms may show early (3 - 30 days) or may take weeks, months or years to exhibit.

Scorpions

- » See IMS Arachnids section (page 316)

Spiders

- » See IMS Arachnids section (page 316)

- **Snakes**. Pit Viper and Coral Species.
  NOTE: Snakes try to avoid contact with people when possible and bites are predominately defensive actions.

  Pit Viper species
  - » Rattlesnake species, water moccasin/cottonmouth species and the copperhead.
  - » Pit vipers are generally heavy-bodied snakes with triangular heads, vertically elliptical pupils, keeled dorsal scales, and a single row of subcaudal scales. The rattle is unique to rattlesnakes.
  - » Dry (without envenoming) or Wet bite? May be difficult to determine as a bite from any animal will often cause inflammation and swelling.
  - » Caution: Handling a dead snake or detached head may result in envenomation due to intact bite reflexes.
  - » Majority of bites occur on upper extremities, fewer on lower extremities. Bites from unintentional encounters are predominantly on lower extremities, whereas those resulting from intentional interaction are mainly on hands and arms.
  - » A priority following snakebite is to avoid another bite, thus the patient should be moved away from the snake.
  - » Calm the patient, as fatalities are rare and serious sequelae are usually preventable.
  - » IF SAFE TO DO SO: photograph from a safe distance; snakes may propel themselves up to a one-third their body length depending upon the species.

  Coral Snakes species
  - » Venom is very potent and may result in onset of significant neurotoxicity and respiratory failure.
  - » Puncture marks may not be present or hard to detect.
  - » Symptoms: mild pain at the bite site, nausea, vomiting, dizziness, abdominal pain.
  - » Neurotoxicity may present with progressive motor deficits: cranial nerve deficits (ptosis, dysarthria, and dysphagia), descending muscle weakness.
  - » Patients should be closely monitored for signs of respiratory muscle weakness with pulmonary insufficiency; this is the most life-threatening complication of coral snake envenomation.

Systemic Signs and Symptoms of Pit Viper Snake Envenomation

LOCAL	SYSTEMIC	HEMATOLOGIC	NEUROLOGIC
Pain	Tachycardia*	Anemia	Diplopia
Localized bleeding	Dyspnea*	Thrombocytopenia	Perioral paresthesias or metallic taste
Erythema	Chest pain	Petechiae	Numbness/tingling (widespread)
Edema	Nausea or vomiting*	Gingival bleeding	Fasciculations (widespread)
Ecchymosis	Hypotension	Epistaxis	Altered mental status
Blistering	Angioedema	Retinal hemorrhage	Cranial nerve dysfunction, especially ptosis (Mohave toxin)
Joint stiffness	Myalgia/cramps	Internal bleeding	
Numbness/tingling (localized)	Rhabdomyolysis	Coagulopathies	
Cramps/fasciculations (localized)		Disseminated intravascular coagulation	

Pit vipers - WMS publication: Wilderness & Environmental Medicine. [Dec. 2015]. 26(4): 472-487.

BITES AND STINGS

Protocol: *ABCs: Universal Patient Care (2001)*
Classify bite (i.e., Arachnid, Insect, Mammal, Reptile - Snake, Reptile - Other)

Arachnid or Insect Bite/Sting

TICKS

Remove tick (attempt to keep intact)

Wash area

Consider MC contact if antibiotic prophylaxis indicated

Inspect wound site
Remove stinger (if possible/as applicable)

Symptoms of Allergic Reaction?
Consider Protocol: *Allergic Reaction/Anaphylaxis (2015)*

Consider ice pack for symptomatic relief

Animal Bite

Bites are a type of trauma and different bites can inject various different bacteria deep into a wound
Control bleeding and irrigate wound per Procedure: *Wound Care (1455)*

Consider splinting affected body part(s)

- Certain body location of bites requires specialist intervention, i.e., hand, face, joints, genitals
- Domestic animal bites may carry different bacteria than wildlife bites—consult MC
- Human bites have high rates of infection and complication, especially when to the hand

Snake Bite

- Remove jewelry or restrictive clothing near the bite quickly
- Document time and date of bite
- Note leading edge of erythema and/or swelling
- Note circumference of the bitten appendage measured above and below the wound

- Immobilization of the affected area by splinting (without compression) may benefit patient
- Depending on evacuation needs, the affected area should be maintained at the level of the heart
- Keep limb and joints in functional position in case they swell and become immobile; maintain patient in position of comfort
- Pain management as needed, but avoid NSAIDS and ASA

Call ahead to transport destination to verify antivenin availability

Consider Protocol: *Pain Management (2245)*

ALL

For Nausea/Vomiting
Consider: *Ondansetron (3165)*, 4 mg PO ESOP

PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP; ≥ 5 yrs, 4 mg PO ESOP

P **PM**

IV/IM, 4 mg, may repeat 1x (8 mg total)

PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg

Contact MC for further therapeutic guidance.

Bees/Wasps:
> 10 stings warrants monitoring for delayed envenomation complications. Contact MC for questions.

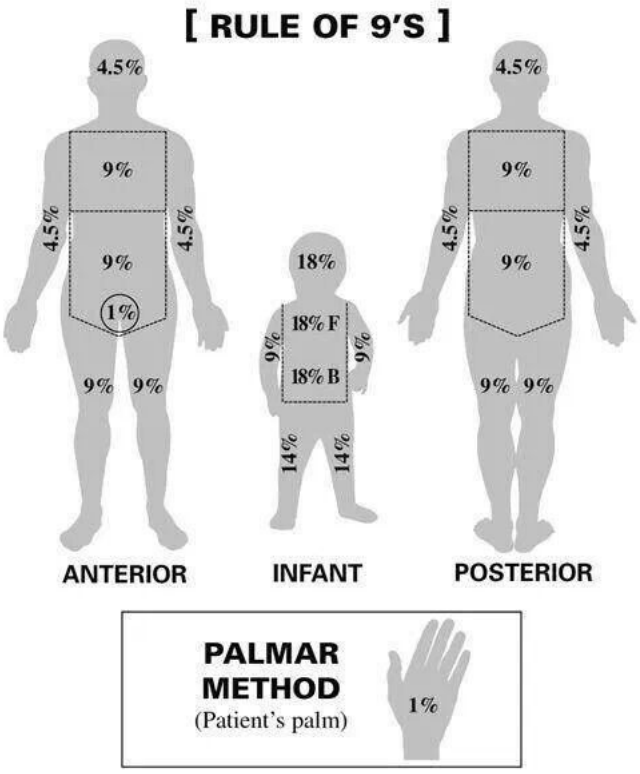
DO NOT use these treatments: oral suction, mechanical suction, laceration or bleeding of the bite, electricity or electrotherapy, cryotherapy or cooling, tourniquets, or pressure bandaging.

Burns

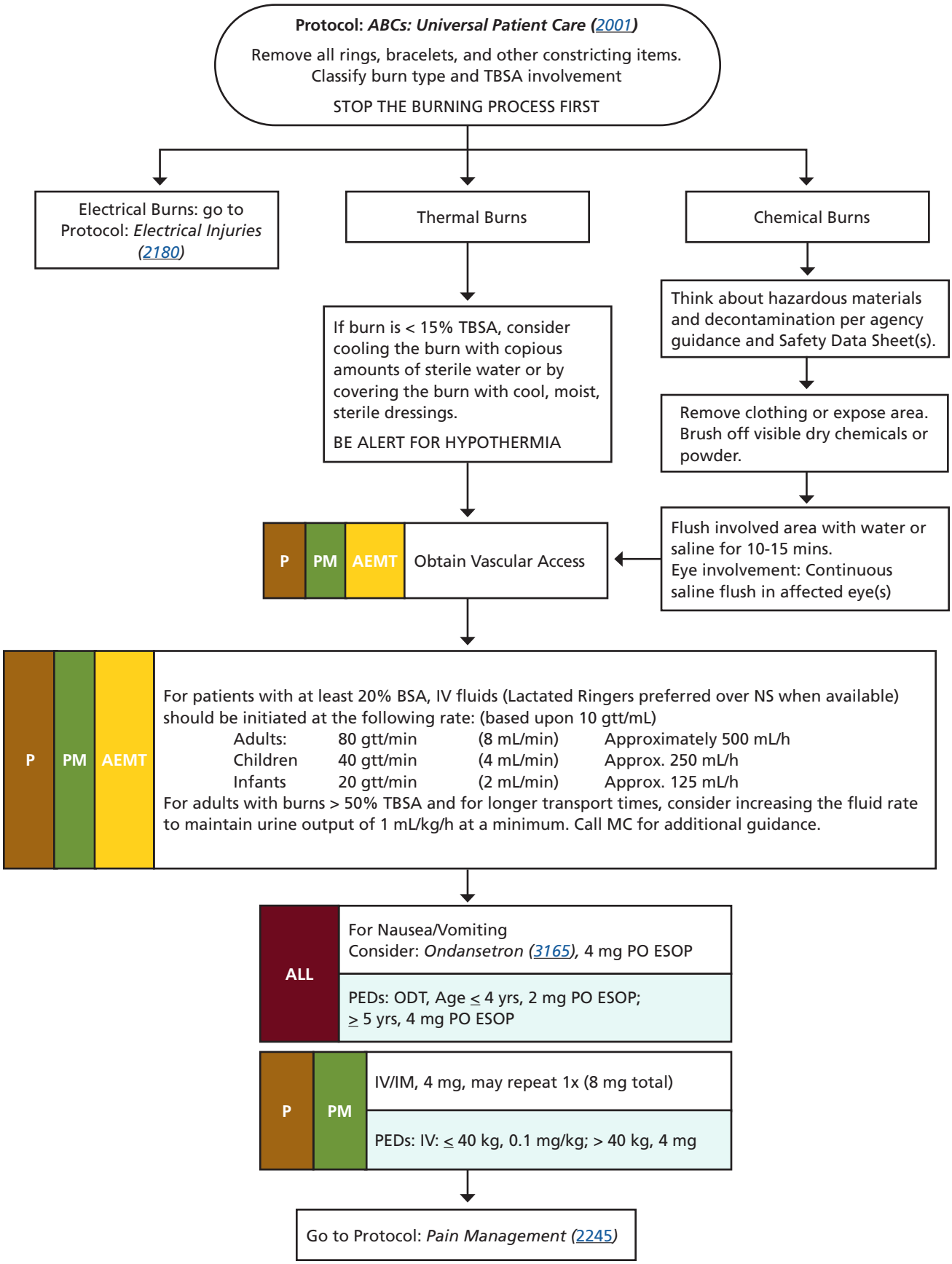
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Type and length of exposure (chemical, thermal, electrical, radiation) • Inhalation injury • Time of injury • Other trauma • Loss of consciousness • Tetanus status • Drug/alcohol intoxication • Past medical history: patients with chronic disease at greater risk	• Stop the burning process • Estimate TBSA of burns and initial severity • Exam: blistering, redness, swelling, charring • Airway involvement: stridor, hoarseness, wheezing, tachypnea, dyspnea, singed facial/nasal hair, black-tinged sputum • Hypotension/shock • Carbon monoxide exposure • Cyanide poisoning	• Superficial (1st) red and painful—like sunburn • Partial thickness (2nd) blistering • Full thickness (3rd) are generally painless with charred or leathery skin • **Note:** initial burn extent is difficult to assess, particularly with burns from hydrothermal features and electrical burns. Estimate to the best of your ability. • Coexisting major trauma

SPECIAL CONSIDERATIONS

- Critical burns with recommended rapid transport to a burn center:
  - » > 10% Partial Thickness
  - » > 5% Full Thickness
  - » Involvement of hands, feet, face, or genitalia
  - » Circumferential burns
  - » Airway burns
  - » Deep chemical burns
  - » Electrical/lightning burns
  - » Burns with extremes of age or chronic disease
  - » Burns with associated major traumatic injury
  - » Burn involving major joints
- Early airway management (cricothyrotomy) may be required in significant inhalation injuries
- Circumferential burns to extremities are dangerous due to potential vascular compromise to soft tissue swelling (compartment syndrome).
- Burn patients are prone to hypothermia. Never ice/cool burns that involve more than 5% TBSA.
- Do not overlook the possibility of multiple system trauma.
- Do not overlook the possibility of child abuse with children and burn injuries.
- Attempt to locate SDS sheets for chemicals that may have caused a burn.
- Serious burns from hydrothermal features occur on federal lands almost every year. Most have circumferential involvement. If possible, identify the thermal feature involved in the incident.



BURNS


Protocol: ABCs: Universal Patient Care (2001)
Remove all rings, bracelets, and other constricting items.
Classify burn type and TBSA involvement
STOP THE BURNING PROCESS FIRST
Electrical Burns: go to Protocol: Electrical Injuries (2180)
Thermal Burns
Chemical Burns
If burn is < 15% TBSA, consider cooling the burn with copious amounts of sterile water or by covering the burn with cool, moist, sterile dressings.
BE ALERT FOR HYPOTHERMIA
Think about hazardous materials and decontamination per agency guidance and Safety Data Sheet(s).
Remove clothing or expose area. Brush off visible dry chemicals or powder.
Flush involved area with water or saline for 10-15 mins.
Eye involvement: Continuous saline flush in affected eye(s)
P
PM
AEMT
Obtain Vascular Access
P
PM
AEMT
For patients with at least 20% BSA, IV fluids (Lactated Ringers preferred over NS when available) should be initiated at the following rate: (based upon 10 gtt/mL)
Adults: 80 gtt/min (8 mL/min) Approximately 500 mL/h
Children 40 gtt/min (4 mL/min) Approx. 250 mL/h
Infants 20 gtt/min (2 mL/min) Approx. 125 mL/h
For adults with burns > 50% TBSA and for longer transport times, consider increasing the fluid rate to maintain urine output of 1 mL/kg/h at a minimum. Call MC for additional guidance.
ALL
For Nausea/Vomiting
Consider: Ondansetron (3165), 4 mg PO ESOP
PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP;
≥ 5 yrs, 4 mg PO ESOP
P
PM
IV/IM, 4 mg, may repeat 1x (8 mg total)
PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg
Go to Protocol: Pain Management (2245)

Carbon Monoxide

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Smoke exposure • Generator use • Vehicle use • Pregnancy • Enclosed space (vehicle/tent) • Smoker	• Altered mental status • Headache • Nausea/vomiting • Syncope • Cardiac arrhythmias and tachycardia • Seizures • Coma • Respiratory arrest • Bright red skin (very late finding and not reliable)	• All causes of Altered Mental Status (see *Protocol 2020*) • Other headache causes • Gastroenteritis • Pulmonary embolism (PE)

CONSIDERATIONS AND NOTES

- Pulse oximetry (SpO_2) cannot detect presence or absence of carbon monoxide. SpO_2 may in fact indicate 100%.
- CO detection via finger sensor is only possible with specific CO detector models.
- If unable to measure in the field environment, any suspicion for CO mandates hospital referral for further testing and treatment.
- Smoking history is important; smokers have higher baseline levels of CO which may be up to 10% in these patients.
- Pregnant patients require hospital attention at much lower levels due to risk to fetus.
- Any evidence of neurologic compromise, altered mental status or cardiac symptoms in the setting of CO exposure should be evaluated regardless of CO reading. If unable to evaluate in the field, promptly transport to closest hospital.
- CO and cyanide are often mixed gases in enclosed space fires. It is important to consider cyanide poisoning in these types of CO exposure cases.
- Hyperbaric chambers have generally very limited availability/access—do not base transport decisions on availability of hyperbaric chamber and instead choose closest hospital facility.

PATIENT CO MONITOR CONSIDERATIONS

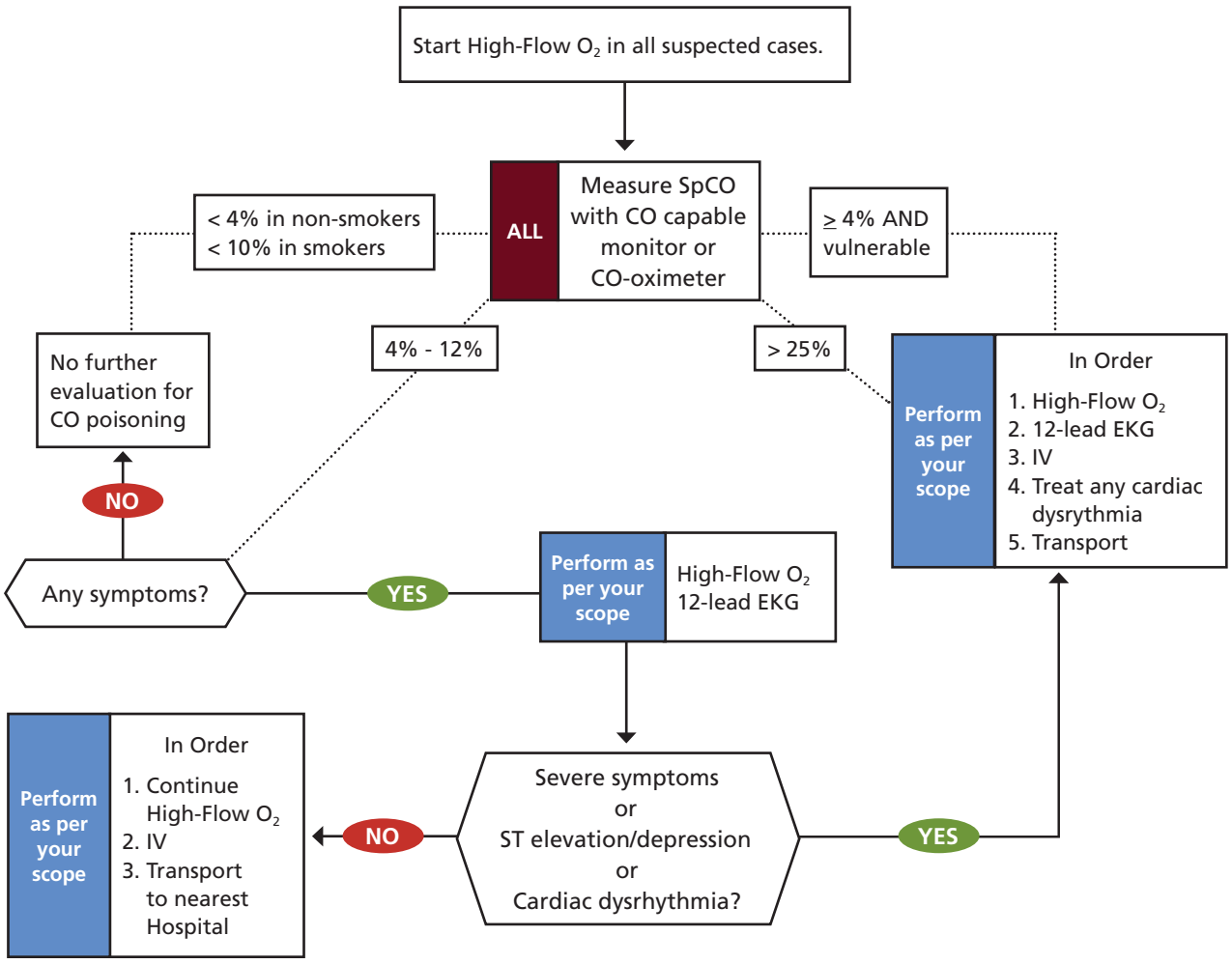
- Intravascular dyes or externally applied coloring (dark/metallic nail polish) may lead to inaccurate measurements.
- High intensity extreme light may not allow CO-oximeter to obtain readings. In these situations, use ambient light shield.
- Accuracy of SpCO measurements may not be reliable during excessive patient movement.

SpCO ASSESSMENT GUIDELINES

FIREFIGHTER REHAB		
SpCO	Initial assessment parameters	Reassessment parameters
0-5%	Considered normal	Acceptable for return to firefighting activities if medically cleared
5-10%	Considered normal in a smoker	Consider high flow O_2 until < 5% regardless of symptoms
10-15%	Abnormal in any person – consider high flow O_2	Abnormal, assess for symptoms, consider high flow O_2
> 15%	Significantly abnormal in any person – treatment necessary	Significantly abnormal – treatment necessary, consider transport

ROUTINE ASSESSMENT (ALL PATIENTS)		
SpCO	Initial assessment parameters	Reassessment parameters
0-5%	> 3% with symptoms, consider high flow O_2, check for CO sources, measure others nearby.	Recommend transport if symptomatic. If not, no further evaluation needed.
5-10%	Normal in smokers. If symptomatic, consider high flow O_2 and inquire if others are ill. Alert Fire Department.	Recommend transport if symptomatic. If not and SpCO > 5%, recommend further medical evaluation. Encourage non-smokers to check environment for CO sources.
10-15%	Abnormal in any patient. Assess for symptoms, consider high flow O_2, check for CO sources.	If symptoms persist or SpCO > 10%, recommend transport. Encourage patient to check environment for CO sources.
> 15%	Significantly abnormal. Administer high flow O_2, assess for symptoms, consider transport. Check for CO sources.	Recommend transport regardless of symptoms. Ensure that others in patient's home or workplace are not ill.

SIGNS/SYMPTOMS OR SUSPICION OF CO POISONING



Symptoms
Confusion/Altered Mental Status
Headache
Nausea
Vomiting
Dizziness
Excessive fatigue
Syncope
Chest pain
Seizures
Palpitations with arrhythmias
Coma

Vulnerable Populations
Pregnant patients
Young children
Elderly
Suspected chronic/long-term exposure

2100

Cardiac Arrest: AED/BLS

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Medications • Event leading to arrest • End-stage renal disease • Estimated downtime • Suspected hypothermia • Suspected overdose • DNR	• Pulseless • Apneic • No auscultated heart tones	• Hypoxia • Hypothermia • Hypovolemia • Hydrogen ion (acidosis) • Hypo-/hyperkalemia • Trauma/medical • Toxins • Tension Pneumothorax • Tamponade (Cardiac) • Thrombosis - coronary or pulmonary • Device error • Death

SPECIAL CONSIDERATIONS

- Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.
- The critical characteristics of high-quality CPR include:
  - » Starting compressions within 10 seconds of recognition of cardiac arrest
  - » Push hard, push fast: compress at a rate of 100-120/minute with a depth of at least 2 inches for adults, approximately 2 inches for children, and approximately 1 1/2 inches for infants.
  - » Allow complete chest recoil after each compression
  - » Minimize interruptions in compressions (try to limit interruptions to LESS than 10 seconds).
  - » Give effective breaths that make the chest rise.
  - » Avoid excessive ventilations
- Do not start CPR if:
  - » Obviously fatal injuries (e.g., decapitation)
  - » Rigor mortis, livor mortis, decomposition
  - » Avalanche burial > 60 min. IF snow in airway AND core temp < 30° C or unattainable
- If the patient has a valid DNR/POLST/MOST form on their person, review the form and follow the directive, either not starting CPR or terminating efforts.

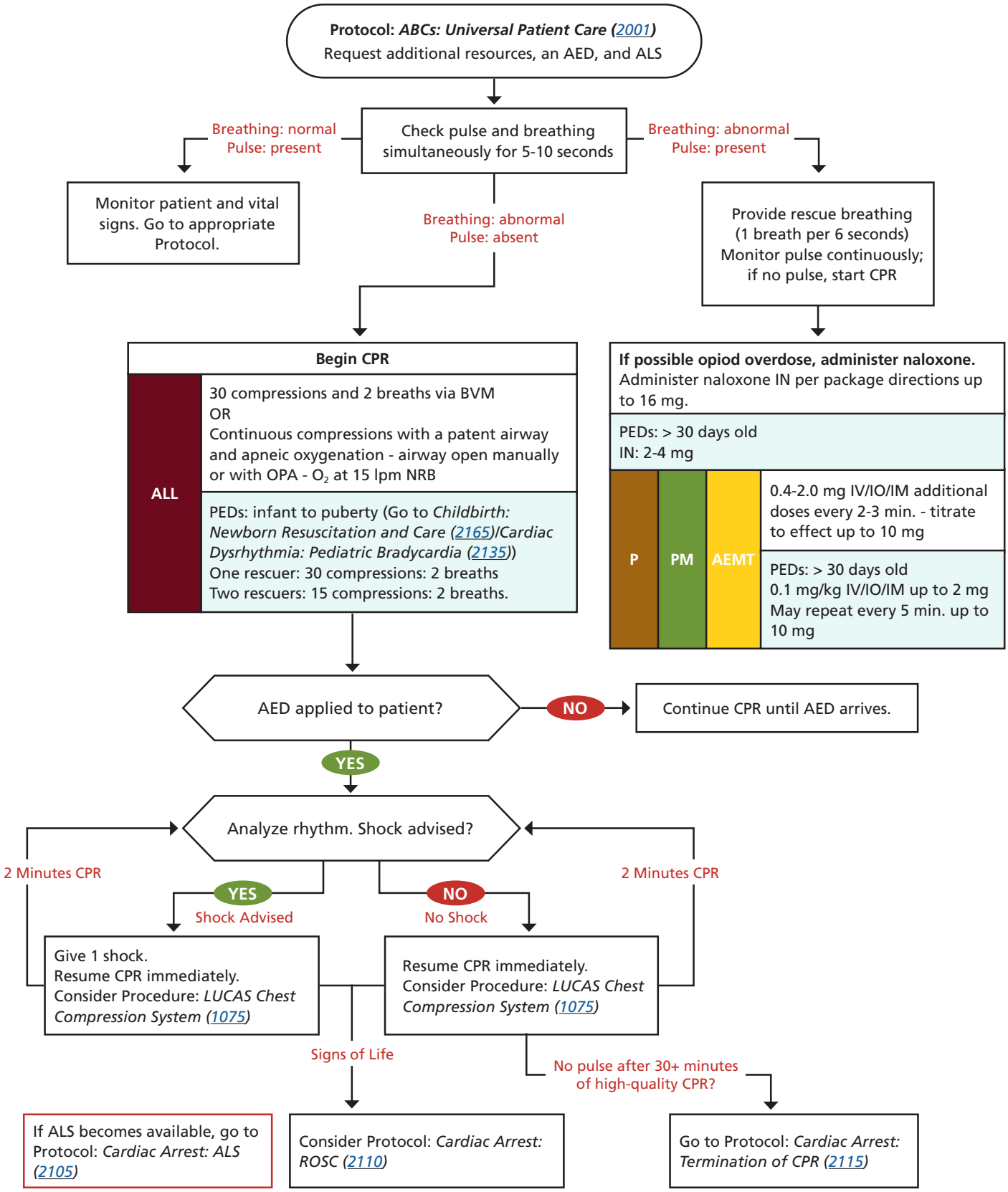
MATERNAL CARDIAC ARREST

- Perform high-quality CPR with attention to ventilation and oxygenation
- If uterus is at or above the umbilicus, perform continuous left lateral uterine displacement to relieve pressure on major vessels in the abdomen.
- For best blood flow, wedge patient into left lateral position.

PEDIATRIC CONSIDERATIONS

- START CPR if the PULSE is < 60 bpm and poor perfusion is noted (altered level of consciousness, respiratory distress/arrest, etc.)

CARDIAC ARREST: AED/BLS



Cardiac Arrest: ALS

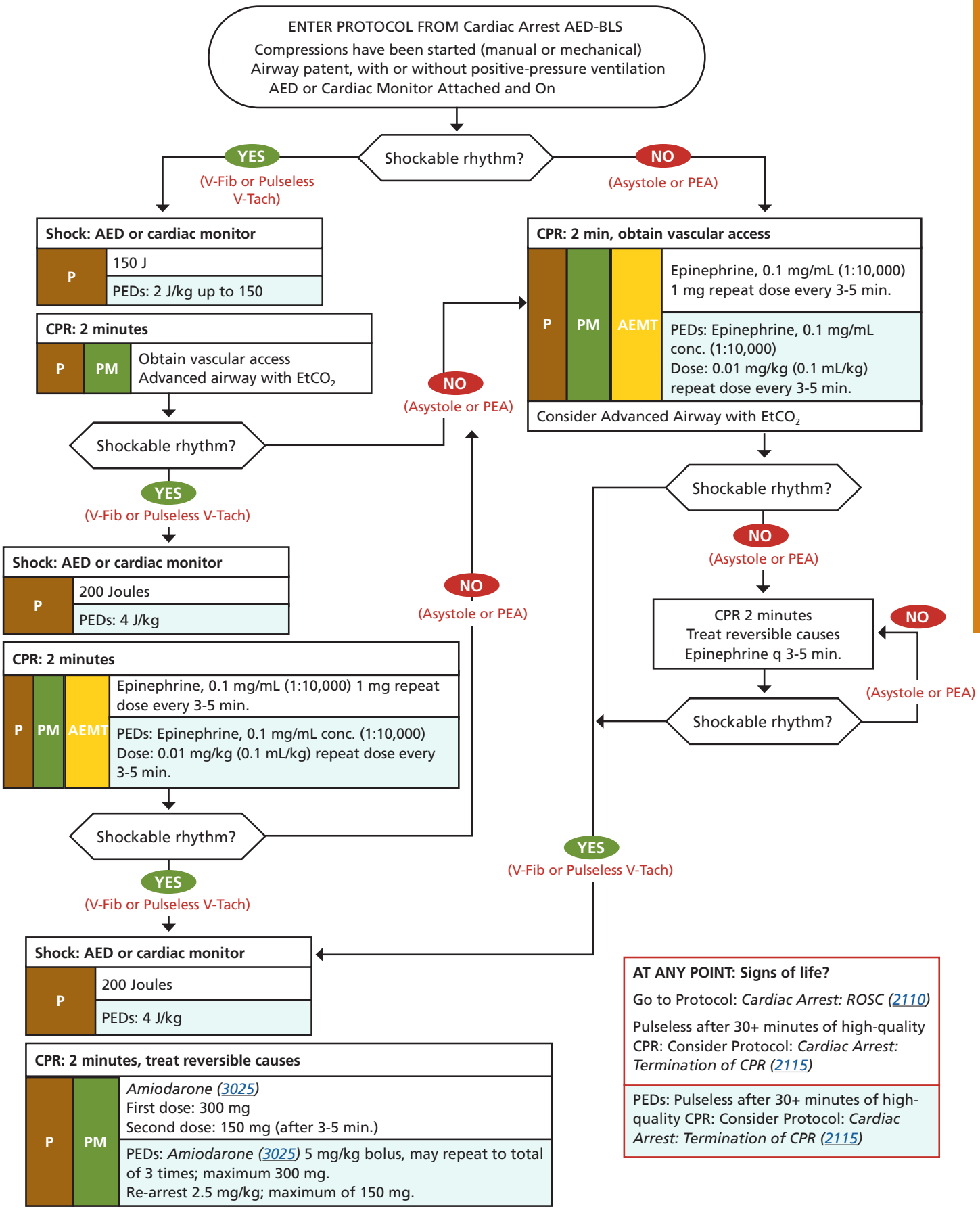
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Events leading to arrest • Estimated downtime • Time last known normal (asymptomatic) • Any signs of extended down time: dependent lividity, rigor mortis, decomposition • Medications • End-stage renal disease • Suspected overdose • DNR or Advanced Directives	• Pulseless • Apneic or agonal (gasping) respirations • No electrical activity on ECG • No auscultated heart tones	• Hypoxia • Hypothermia • Hypovolemia • Hydrogen ion (acidosis) • Hypo-/hyperkalemia • Trauma/medical • Toxins • Tension Pneumothorax • Tamponade (Cardiac), • Thrombosis - coronary or pulmonary • Device (lead) error • Death

SPECIAL CONSIDERATIONS

- Always confirm asystole in more than 1 lead
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Correctable causes must be addressed; survival is based on identifying and correcting the cause.
- If the patient has a valid DNR/POLST/MOST form on their person, review the form and follow the directive, either not starting CPR or terminating efforts.

REVERSIBLE CAUSES OF CARDIAC ARREST (H's and T's)	
Hypoxia	Airway Management Procedures, oxygen
Hypothermia	Active Rewarming
Trauma	Protocol: *Cardiac Arrest: Traumatic (2120)*
Toxins	Protocol: *Ingestion, Poisonings, Overdoses (2230)*
Hypoxia	Airway Management, oxygen
Hypothermia	Active Rewarming
Hypovolemia	Normal Saline Bolus
Hydrogen ion (acidosis)	Sodium bicarbonate (MC contact required)
Tension Pneumothorax	Procedure: *Needle Decompression/Thoracostomy (1365)*
Toxins	Protocol: *Ingestion, Poisonings, Overdoses (2230)*
Trauma	Protocol: *Cardiac Arrest: Traumatic (2120)*
Hyperkalemia	Sodium bicarbonate (MC contact advised)
Torsades de Pointes	Magnesium sulfate
NOT TREATABLE BY EMS	
Hypokalemia	
Tamponade (cardiac)	
Thrombosis (cardiac)	
Thrombosis (pulmonary)	

CARDIAC ARREST: ALS



2110

Cardiac Arrest: ROSC

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Respiratory arrest • Cardiac arrest	• Return of pulse (adequate for perfusion) • Vital signs • 12-Lead ECG	• Continue to address specific differentials • Hypoxia • Hypothermia • Hypovolemia • Hydrogen ion (acidosis) • Hypo/hyperkalemia • Trauma/medical • Toxins • Tension pneumothorax • Tamponade (cardiac) • Thrombosis - coronary or pulmonary • Device (lead) error • Death

SPECIAL CONSIDERATIONS

If return of spontaneous circulation, contact Medical Control for further management as soon as possible without compromising patient care.

- **Hyper**ventilation is a significant cause of hypotension and recurrence of cardiac arrest in post resuscitation phase and must be avoided.
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post resuscitation management may be planned in consultation with medical control.
- Keep AED pads on patient in case of reoccurring arrest. Turn off AED.
- Common causes of post resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Amiodarone may cause bradycardia.
- Titrate pressors to maintain systolic BP of 90 mmHg. Ensure adequate fluid resuscitation is ongoing.

CARDIAC ARREST: ROSC

ENTER ROSC PROTOCOL FROM
Cardiac Arrest: AED/BLS (2100) or
Cardiac Arrest: ALS (2105)

Do not move patient for 10 min. following ROSC if practical.
Leave AED/Cardiac monitor pads attached
Leave LUCAS device on patient
Acquire 12-lead ECG
Obtain 2nd IV/IO line

P | PM | AEMT | EMT

Airway Management
Consider advanced airway: ETT or SGA
Airway sedation as needed

Ventilatory Management
10 breaths/min; titrate to SpO_2 92-98%
$EtCO_2$ 35-45

OLMC | P | PM

Consider post airway sedation

Ketamine (3115)
Midazolam (3135)

Hemodynamic Management: Target SBP > 90; MAP > 65

P | PM | AEMT

If suspected hypovolemia:
250-500 mL bolus of normal saline

PEDs: 20 mL/kg bolus up to 500 mL

If NS bolus not effective, consider:

P

Push dose *Epinephrine (3072)*, 0.1 mg/mL (1:10,000)
(1 mL cardiac epi (1:10,000) with 9 mL Saline = 10 mcg/mL)
Administer 10-20 mcg (1-2 mL) q 3-5 min.

PEDs: 1 mcg/kg - up to 10 mcg (1 mL)
Repeat every 3-5 min.

Continue to treat reversible causes of Cardiac Arrest.

2115

Cardiac Arrest: Termination of CPR

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Medications • DNR or Advanced Directive • Event leading to arrest • Estimated downtime • Special considerations? • Cold water drowning • Hypothermia • Electrical Injuries • Patient < 14 years old	• Pulseless • Apneic • No electrical activity on ECG • No auscultated heart tones	

NOTES

MEDICAL CONTROL CONTACT MUST BE ATTEMPTED PRIOR TO CPR TERMINATION. IF UNABLE TO CONTACT MC ON-SCENE, THEN CONTACT AS SOON AS POSSIBLE AFTER TERMINATION OF CPR.

SPECIAL CONSIDERATIONS

- Special Cases: Cold water drowning, hypothermia, electrical injury, or pediatric patients (< 14 years old)
- Any return of spontaneous circulation restarts the clock (for CPR termination) should the patient subsequently re-arrest.

CARDIAC ARREST: TERMINATION OF CPR

After 30 min. of high-quality CPR, enter from Protocols:
Cardiac Arrest: AED/BLS (2100), or
Cardiac Arrest: ALS (2105), or
Cardiac Arrest: Traumatic (2120)

Any Return of Spontaneous Circulation (ROSC) resets the clock to the beginning of CPR.

OLMC

Contact Medical Control to determine if resuscitation efforts should be discontinued or if other/additional treatment is recommended

IN COMMUNICATION FAILURE:
Is the scene unsafe for providers to continue resuscitation efforts?
OR
Are providers physically unable to continue resuscitation efforts?

YES → Terminate CPR
Contact MC as soon as feasible

Information to include in MC call for CPR Termination:

- Estimated total down time?
- Arrest witnessed or unwitnessed?
- Duration of resuscitation efforts performed by EMS?
- ALS care provided? Advanced airway in place?
- Number of rounds of epinephrine and other medications given?
- Number of shocks given? No shock advised?
- Asystole in two or more leads? Other rhythms?
- Other treatment provided?
- Special circumstances?
  - Cold water drowning
  - Hypothermia
  - Electrical Injuries
  - Patient < 14 years old

2120

Cardiac Arrest: Traumatic

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Indication: Patient who has suffered traumatic injury and is now pulseless • Mechanism of injury • Estimated down time or time of arrest, if known • Complaints before arrest, if known by bystanders (e.g., chest pain, difficulty breathing)	• Evidence of blunt or penetrating trauma • Chest trauma (possible tension pneumothorax or cardiac tamponade) • Evidence of blood loss • Injuries incompatible with life: decapitation, massively deformed head/ chest injuries, etc.	• Medical condition preceding traumatic event as cause of arrest • Tension pneumothorax • Hypovolemic shock • External hemorrhage • Unstable pelvic fracture • Displaced long bone fracture(s) • Hemothorax • Intra-abdominal hemorrhage • Retroperitoneal hemorrhage • Traumatic Brain Injury

SPECIAL CONSIDERATIONS

- Injuries obviously incompatible with life include decapitation, massively deformed head or chest injuries or other features of a particular patient encounter that would make resuscitation futile. If in doubt, place patient on the monitor or AED and initiate resuscitation.
- Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of death.
- Regardless of age, victims of traumatic arrest rarely survive unless they are within minutes of a hospital.
- Fixed and dilated pupils are not a reliable sign of death (e.g., sympathomimetic overdose).
- Hypothermic patients have a higher likelihood of survival and may be viable while appearing to be dead.

CARDIAC ARREST: TRAUMATIC

Protocol: ABCs: *Universal Patient Care (2001)*

Are the patient's injuries obviously incompatible with life (rigor mortis, lividity) or obviously fatal trauma, such as massive head and/or chest deformity)?
OR
Is there a downtime > 15 minutes?
In special cases such as cold water drowning, hypothermia, pediatric patients, electrocution or lightning strike; downtime is extended to 30 minutes.

YES → Resuscitation not indicated/ recommended.

NO

Follow appropriate Cardiac Arrest Protocol with the following considerations:

ALL

Consider procedure if appropriate:
- pelvic stabilization
- bleeding control/tourniquet

P **PM** **AEMT**

Perform Procedures if appropriate:
- *Airway Management (1015)*
- *Needle Decompression/ Thoracostomy (1365)* (bilateral)

Fluid resuscitation

P **PM** **AEMT**

Bolus: Normal Saline 1 L under pressure up to 3 L max

PEDs: Bolus 20 mL/kg normal saline under pressure up to 60 mL/kg max

Return of pulse?

YES → Go to Protocol: *Cardiac Arrest: ROSC (2110)*

NO

CPR may be terminated if the following conditions are met:
- Patient does not respond to resuscitation after 30 min. AND
- Patient has no palpable pulse AND
- Patient has no spontaneous respirations AND
- All criteria are confirmed by a second provider

Reference Protocol: *Cardiac Arrest: Termination of CPR (2115)*

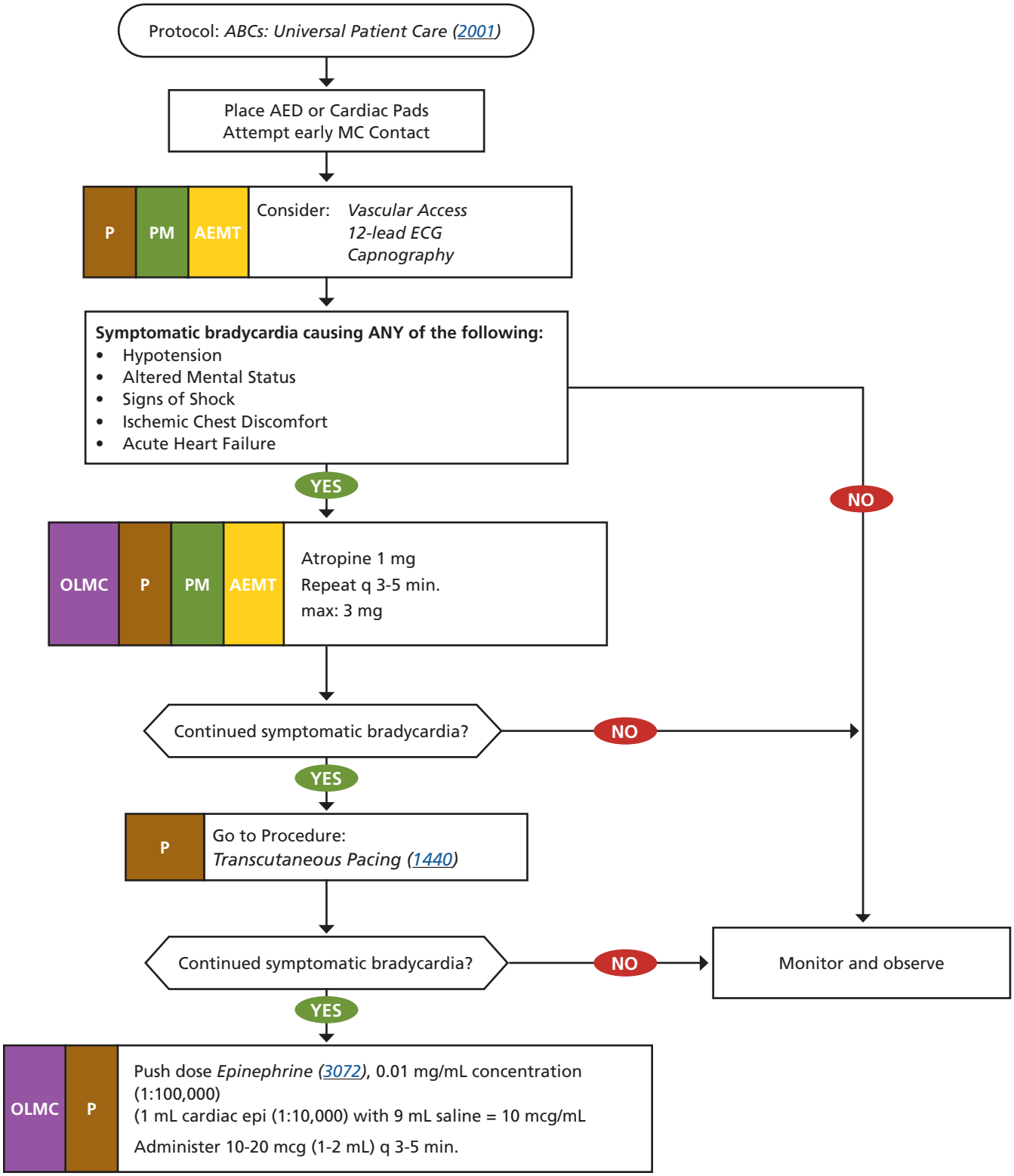
Cardiac Dysrhythmia: Adult Bradycardia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Medications » Beta Blockers (Metoprolol, Atenolol, Propranolol, Esmolol, Labetalol, Carvedilol) » Calcium Channel Blockers (Amlodipine, diltiazem, Verapamil, nifedipine) » Clonidine » Digitalis » Other antidysrhythmic • Pacemaker/AICD • History of renal failure, hypertension, cardiovascular disease • Recent head trauma or falls	• HR < 50/min. • Chest pain • Respiratory distress • Hypotension or Shock • Altered mental status • Syncope • Core Temperature • Toxins • Glucometry	**P** Physiologic (young, athlete, sleeping). **A** AV Block (Mobitz type II second degree AV Block, third degree block). **D** Drugs (Beta-blockers, Calcium Channel Blockers, Digoxin, Clonidine, amiodarone, Opioids, nerve agent/ organophosphate exposure.) **H** Hypothermia, Hypothyroidism, Hyperkalemia (renal failure), Hypoxemia. **I** Increased Intracranial Pressure (head trauma, head tumor, subarachnoid hemorrhage, stroke, spinal cord lesion). **M** Myocardial infarction/ischemia. **S** Sick sinus syndrome

SPECIAL CONSIDERATIONS

- Bradycardia may be a normal variant in an asymptomatic patient, especially in young athletes.
- At any time, a patient with Bradycardia can decompensate into V-Fib/V-Tach or PEA.
- Pharmacological treatment of Bradycardia is based upon the presence or absence of symptoms
- **If symptomatic, treat. If asymptomatic, monitor only.**
- Atropine administration should not delay transcutaneous pacing in patients with poor perfusion.
- Doses of atropine < 0.5 mg (or dose pushed too slow) may paradoxically result in further slowing of the heart rate.
- Oxygenate the patient and support respiratory effort.
- Analyze rhythm and prepare for transcutaneous pacing without delay in patients who are unstable. Consider atropine while awaiting pacer; if atropine is ineffective begin pacing. If pacing is ineffective consider pressors (see Medications: push-dose *Epinephrine (3072)*).
- Hyperkalemia can cause bradycardia and present with a variety of ECG changes, including flattened/absent P-waves, widened QRS, and peaked T-waves.
- **Consider nerve agent/organophosphate exposure if multiple victims and/or ABSLUDGEM present:**
  - **A** ALOC
  - **B** Bronchorrhea, Bradycardia, Bronchospasm
  - **S** Salivation, Sweating, Seizures
  - **L** Lacrimation (tearing)
  - **U** Urination
  - **D** Defecation, Diarrhea
  - **G** GI upset (abdominal cramps)
  - **E** Emesis (vomiting)
  - **M** Miosis/Muscle activity (twitching).

CARDIAC DYSRHYTHMIA: ADULT BRADYCARDIA



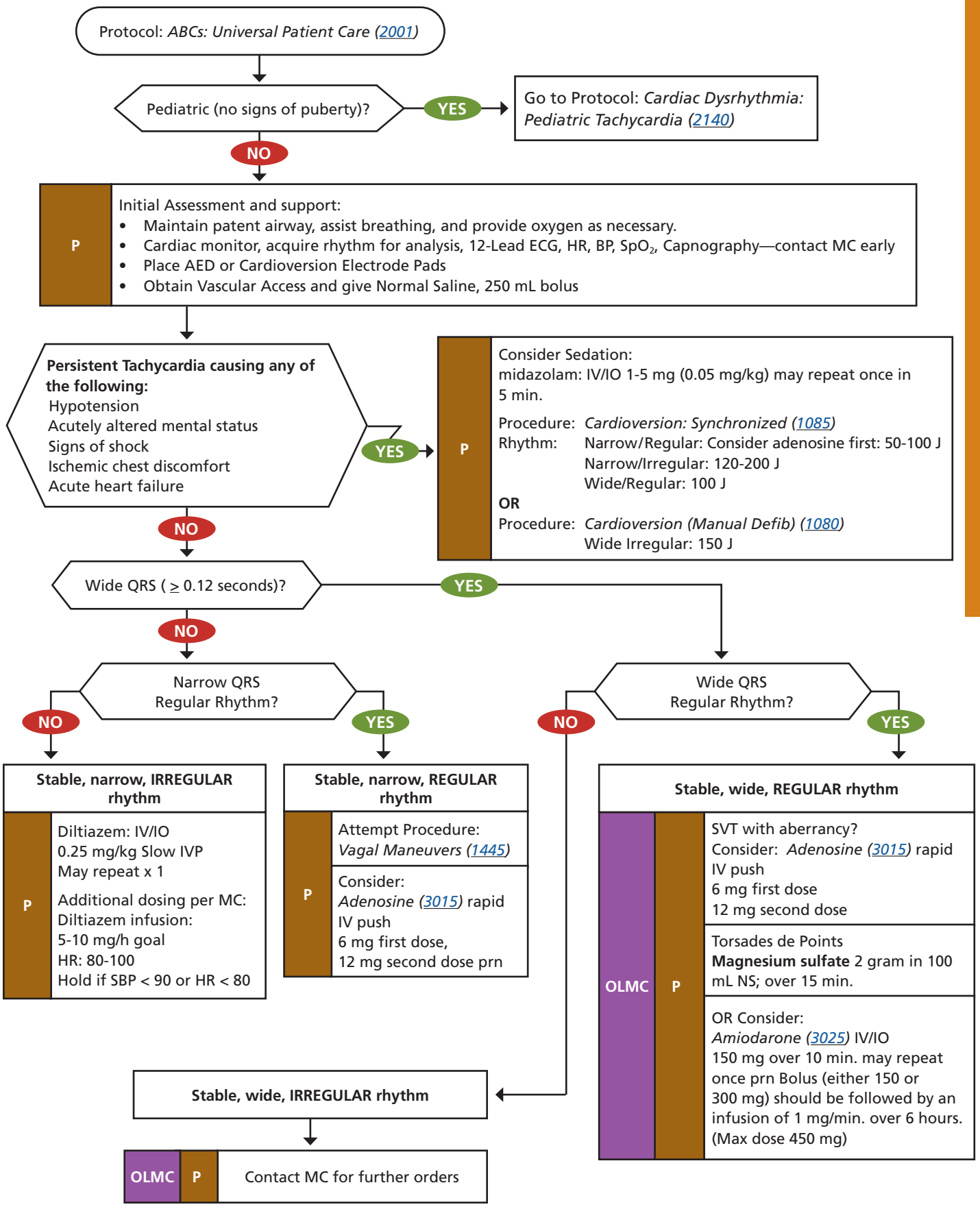
Cardiac Dysrhythmia: Adult Tachycardia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• History of palpitations/heart racing • Medications: e.g., Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin. • Diet (caffeine, chocolate) • Drugs (energy drinks, nicotine, cocaine, methamphetamine) • Anxiety, mental health issues • History of bundle-branch blocks	• HR usually > 150/min. • Patient stable or unstable? • Palpitations, weakness, syncope/ near-syncope, dyspnea • ECG Assessment: rate, QRS (wide or narrow), P waves • Potential presenting rhythms: Sinus tachycardia; Atrial fibrillation/ flutter; Multifocal atrial tachycardia, supraventricular tachycardia	• Shock • Heart disease (WPW, LGL, Valvular) • Sick sinus syndrome • Myocardial infarction • Electrolyte imbalance • Exertion, pain, emotional stress • Fever • Hypoxia • Hypovolemia or anemia • Drug effect/overdose (see history) • Hyperthyroidism • Pulmonary embolism (PE)

SPECIAL CONSIDERATIONS

- Tachycardia is defined as a heart rate over 100 in adults. However, heart rates less than 150 bpm are unlikely to be the cause of serious symptoms and usually are the result of a normal physiologic response to a disease, medication, drug, or other stressor.
- **If patient's HR > (220 - age) = consider pathologic rhythm.**
- **This protocol is intended to address pathologic tachyarrhythmias (usually heart rates > 150), not physiologic tachycardia. Common causes of physiologic tachycardia include fever, hypoxia, hypovolemia/shock, stimulant use, or other diseases that cause an increase in heart rate.**
- Adenosine may not be effective in atrial flutter or fibrillation. Adenosine has a very short half-life of less than 10 seconds. For this reason adenosine has to be given as a very fast bolus followed immediately by a 20 mL saline flush.
- Monitor for hypotension after diltiazem administration.
- Patients with paroxysmal atrial fibrillation are at an increased risk for stroke and may present with stroke symptoms.
- **Sinus Tachycardia** > 100 beats/min. and is usually a normal physiologic response to underlying pathology (a healthy heart responding to a sick body). A patient with signs and symptoms of the following often present with sinus tach: systemic inflammatory response syndromes (SIRS); sepsis; or undifferentiated shock (cardiogenic, hypovolemic, obstructive, distributive, etc.). The patient will not respond well to treatments directed at their sinus tachycardia and may worsen with such treatments. This protocol is not intended for this type of patient. Often, they respond to volume replacement and treatment of the underlying condition(s).
- **Supraventricular Tachycardias (SVT)** are pathologically significant tachydysrhythmias where rates are typically ≥ 150 beats/minute.
- **Narrow-complex SVT (QRS duration < 0.12 seconds)** include: atrial fibrillation; atrial flutter; AV nodal reentrant tachycardia (AVNRT); atrioventricular reentrant tachycardia (AVRT); atrial tachycardia; multifocal atrial tachycardia (MAT); and junctional tachycardia (rare in adults).
- **Wide-complex (QRS duration ≥ 0.12 second) tachycardias** consist of: Ventricular tachycardia (VT); ventricular fibrillation (VF); SVT with aberrancy; Preexcitation tachycardias (WPW, LGL, Mahaim); and Ventricular paced rhythms. Wide-complex tachycardias are often unstable, or progress to instability quickly if not addressed.
- **Vagal maneuvers** may be useful for the conversion of Paroxysmal SVT (PSVT). See Procedure: *Vagal Maneuvers (1445)* for approved methods.

CARDIAC DYSRHYTHMIA: ADULT TACHYCARDIA



Cardiac Dysrhythmia: Pediatric Bradycardia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Medications » Beta Blockers (Metoprolol, Atenolol, Propranolol, Esmolol, Labetalol, Carvedilol) » Calcium Channel Blockers (Amlodipine, diltiazem, Verapamil, nifedipine) » Clonidine » Digitalis » Other antidysrhythmic • Pacemaker/AICD • History of renal failure, hypertension, cardiovascular disease, congenital heart defect • Recent head trauma or falls	• HR < 50/min. • Chest pain • Respiratory distress • Hypotension or shock • Altered mental status • Syncope • Core temperature • Toxins • Glucometry	**P** Physiologic (young athlete, sleeping). **A** AV Block (Mobitz type II second degree AV Block, third degree block). **D** Drugs (Beta-blockers, Calcium Channel Blockers, Digoxin, Clonidine, amiodarone, Opioids, nerve agent/organophosphate exposure.) **H** Hypothermia, Hypothyroidism, Hyperkalemia (renal failure), Hypoxemia. **I** Increased Intracranial Pressure (head trauma, head tumor, subarachnoid hemorrhage, stroke, spinal cord lesion). **M** Myocardial infarction/ischemia. **S** Sick sinus syndrome, Spinal cord lesion

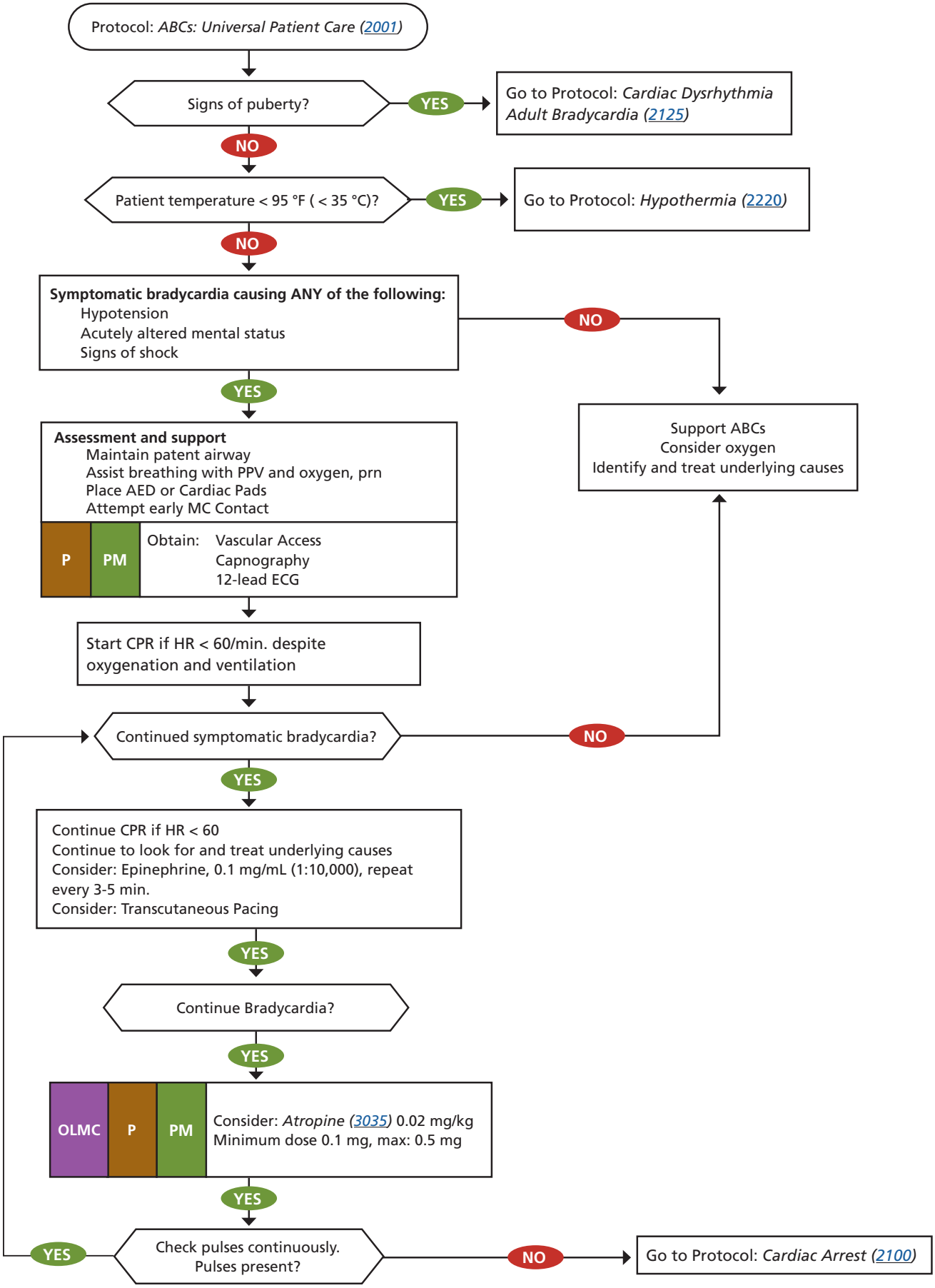
SPECIAL CONSIDERATIONS

- Pediatric dysrhythmias occur most commonly after hypoxic events. Be sure to aggressively oxygenate the patient and support respiratory effort.
- Doses of atropine < 0.1 mg (or dose pushed too slow) may paradoxically result in further slowing of the heart rate.
- Pharmacological treatment of Bradycardia is based upon the presence or absence of symptoms.
  If symptomatic, treat. If asymptomatic, monitor only.
- Consider treatable causes of bradycardia (Beta blocker or Calcium channel blocker OD, etc.)
- **Cardiovascular Compromise** is Hypotension, acutely altered mental status,signs of shock
- Consider nerve agent/organophosphate exposure if multiple victims and/or "ABSLUDGEM":
  - **A** ALOC
  - **B** Bronchorrhea, Bradycardia, Bronchospasm
  - **S** Salivation, Sweating, Seizures
  - **L** Lacrimation (tearing)
  - **U** Urination
  - **D** Defecation, Diarrhea
  - **G** GIupset (abdominal cramps)
  - **E** Emesis (vomiting)
  - **M** Miosis/Muscle activity (twitching).

PEDIATRIC HYPOTENSION (SBP<)

- < 60 mmHg in term neonates (0-28 days)
- < 70 mmHg in infants (1-12 months)
- < 70 mmHg + (2 x age in yrs.) in 1-10 yrs.
- < 90 mmHg in > 10 yrs.

CARDIAC DYSRHYTHMIA: PEDIATRIC BRADYCARDIA



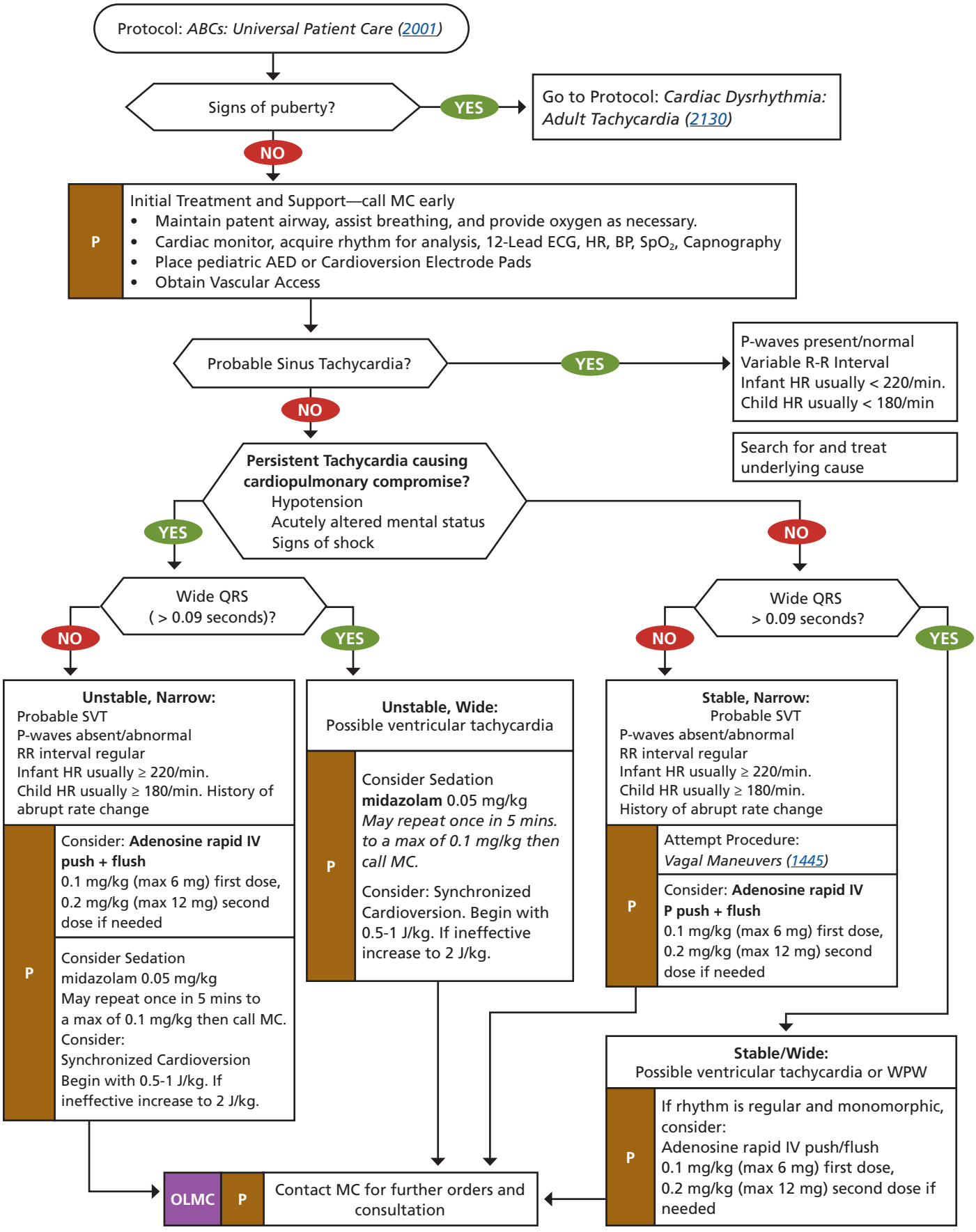
Cardiac Dysrhythmia: Pediatric Tachycardia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Medications, including aminophyline, diet pills, thyroid supplements, decongestants, digoxin • Diet (caffeine, chocolate) • Drugs (nicotine, cocaine, methamphetamine) • History of palpitations/heart racing • Syncope/near syncope	• HR > 180/min. • Dizziness, CP, SOB • Potential presenting rhythm • Sinus tachycardia • Atrial fibrillation/flutter • Multifocal atrial tachycardia	• Heart disease (WPW, LGL, Valvular) • Sick sinus syndrome • Myocardial infarction • Electrolyte imbalance • Exertion, pain, emotional stress • Fever • Hypoxia • Hypovolemia or anemia • Drug effect/overdose (see history) • Hyperthyroidism • Pulmonary embolus

SPECIAL CONSIDERATIONS

- The most common cause of tachycardia in children is fever.
- Sinus Tachycardia in children is generally < 180 and < 220 in infants.
- Adenosine may not be effective in identifiable atrial flutter or fibrillation and in some cases may precipitate cardiac arrest.
- Monitor for hypotension after diltiazem.
- Monitor for respiratory depression and hypotension associated with midazolam.
- Continuous pulse oximetry is required for all SVT patients.
- Contact MC for medication options in irregular narrow complex tachycardia and in cases of polymorphic ventricular tachycardia.
- **Vagal maneuvers** may be useful for the conversion of Paroxysmal SVT (PSVT). There are multiple vagal maneuvers, however the only maneuvers endorsed in this document are Valsalva maneuvers. For Valsalva maneuvers, instruct the patient to "bear down" or hum loudly for approximately 10 seconds. Do not perform carotid body massage.
- **Cardiovascular Compromise** is:
  - » Hypotension
  - » Acutely altered mental status
  - » Signs of shock

CARDIAC DYSRHYTHMIA: PEDIATRIC TACHYCARDIA



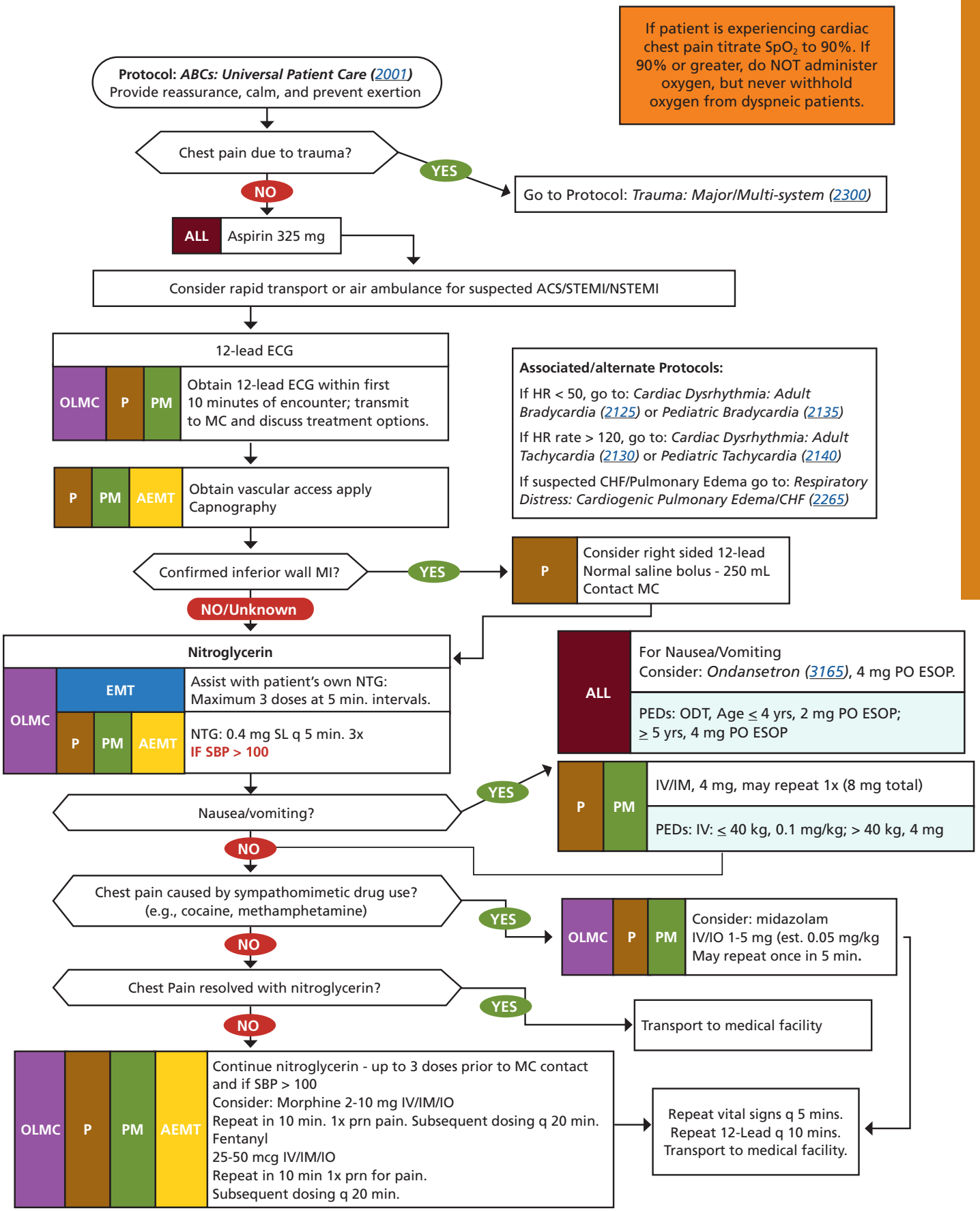
Chest Pain

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Age • Risk Factors: previous MI, angina, diabetes, hypertension, hyperlipidemia, smoking history, postmenopausal • Allergies (morphine, lidocaine) • Recent physical exertion—exertion at onset of symptoms? • Recent use of erectile dysfunction meds (e.g., Viagra, Levitra, Cialis)	• Assess ABCs. Be prepared to provide CPR and defibrillation. • CP (pain, pressure, aching, vice-like tightness) • Location (substernal, epigastric, arm, jaw, neck, shoulder) • Radiation of pain • Pale, diaphoresis • Shortness of breath • Nausea, vomiting, dizziness	• Trauma vs. medical • Angina vs. myocardial infarction • Pericarditis • Pulmonary embolism (PE) • Asthma/COPD • Pneumothorax • Aortic dissection or aneurysm • GE reflux of hiatal hernia • Esophageal spasm • Chest wall injury or pain • Pleural pain • Overdose (cocaine)

SPECIAL CONSIDERATIONS

- Avoid nitroglycerin in any patient who has used Erectile Dysfunction medication (e.g., sildenafil [Viagra], vardenafil [Levitra], tadalafil [Cialis]) in the past 24 hours due to potential severe hypotension.
- Monitor for hypotension after administration of nitroglycerin.
- Caution when administering nitroglycerin in inferior MIs (suspected right ventricular infarction). Patients with right ventricular involvement are preload dependent and prone to hypotension. Establish IV access and consider 250 mL NS bolus before nitroglycerin. Contact MC for consultation.
- If ACS is expected, establish a second IV line while en route to the hospital.
- If initial 12-lead ECG negative but clinical suspicion remains high for ACS, repeat 12-lead ECG every 10-15 minutes and continue with Chest Pain Protocol. Many MIs present with completely normal 12-lead ECGs.
- Diabetics and geriatric patients often have atypical pain or only generalized complaints.
- Notify receiving agency as soon as possible if ST elevation is noted or suspected.
- **Aspirin** dose is 324 mg PO. Providers can administer 4 (81 mg) baby aspirin or 1 (325 mg) adult aspirin. Either way, the medication is to be chewed before swallowing.
- **Nitroglycerin**—if a patient has their own prescription, an EMT may assist in the administration of the Nitro according to the dosing schedule on the **Chest Pain Algorithm** on next page.
- **Morphine and fentanyl**—note that dosing regimen in this protocol is more aggressive and different than all other protocols using this drug. This is due to the fact that in addition to alleviating pain, the medications also help treat the underlying disease process.
- Do not delay transport. Coronary revascularization is the ultimate treatment for patients experiencing an MI.

CHEST PAIN


If patient is experiencing cardiac chest pain titrate SpO2 to 90%. If 90% or greater, do NOT administer oxygen, but never withhold oxygen from dyspneic patients.
Protocol: ABCs: Universal Patient Care (2001)
Provide reassurance, calm, and prevent exertion
Chest pain due to trauma?
YES
Go to Protocol: Trauma: Major/Multi-system (2300)
NO
ALL
Aspirin 325 mg
Consider rapid transport or air ambulance for suspected ACS/STEMI/NSTEMI
12-lead ECG
OLMC
P
PM
Obtain 12-lead ECG within first 10 minutes of encounter; transmit to MC and discuss treatment options.
Associated/alternate Protocols:
If HR < 50, go to: Cardiac Dysrhythmia: Adult Bradycardia (2125) or Pediatric Bradycardia (2135)
If HR rate > 120, go to: Cardiac Dysrhythmia: Adult Tachycardia (2130) or Pediatric Tachycardia (2140)
If suspected CHF/Pulmonary Edema go to: Respiratory Distress: Cardiogenic Pulmonary Edema/CHF (2265)
P
PM
AEMT
Obtain vascular access apply Capnography
Confirmed inferior wall MI?
YES
P
Consider right sided 12-lead
Normal saline bolus - 250 mL
Contact MC
NO/Unknown
Nitroglycerin
OLMC
EMT
Assist with patient's own NTG: Maximum 3 doses at 5 min. intervals.
P
PM
AEMT
NTG: 0.4 mg SL q 5 min. 3x
IF SBP > 100
ALL
For Nausea/Vomiting
Consider: Ondansetron (3165), 4 mg PO ESOP.
PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP;
≥ 5 yrs, 4 mg PO ESOP
Nausea/vomiting?
YES
P
PM
IV/IM, 4 mg, may repeat 1x (8 mg total)
PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg
NO
Chest pain caused by sympathomimetic drug use?
(e.g., cocaine, methamphetamine)
YES
OLMC
P
PM
Consider: midazolam
IV/IO 1-5 mg (est. 0.05 mg/kg
May repeat once in 5 min.
NO
Chest Pain resolved with nitroglycerin?
YES
Transport to medical facility
NO
OLMC
P
PM
AEMT
Continue nitroglycerin - up to 3 doses prior to MC contact and if SBP > 100
Consider: Morphine 2-10 mg IV/IM/IO
Repeat in 10 min. 1x prn pain. Subsequent dosing q 20 min.
Fentanyl
25-50 mcg IV/IM/IO
Repeat in 10 min 1x prn for pain.
Subsequent dosing q 20 min.
Repeat vital signs q 5 mins.
Repeat 12-Lead q 10 mins.
Transport to medical facility.

Childbirth

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Due date • Prenatal care • Time contractions started/how often • Rupture of membranes/"water breaks"/ mucus • Time/amount of any vaginal bleeding • Sensation of fetal activity • Past pregnancy/delivery history (Gravida/ Para/Abortus) status • High-risk pregnancy	• Vaginal discharge or bleeding • Crowning or urge to push • Meconium	• Abnormal presentation » buttock, foot, hand • Prolapsed cord • Placenta previa • Placental abruption (abruptio placenta)

SPECIAL CONSIDERATIONS

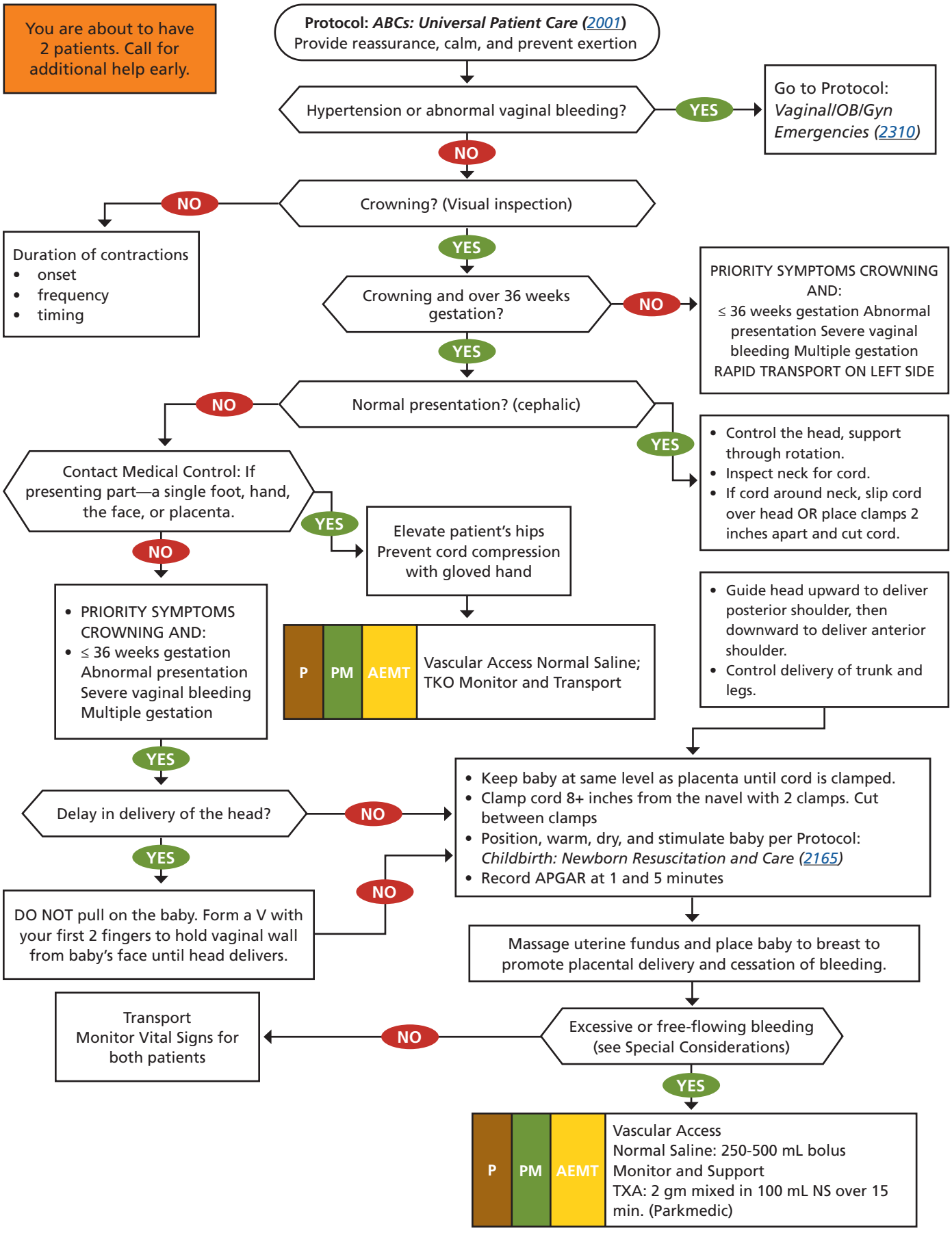
- Document all times (contraction frequency and length, delivery time).
- If maternal seizures occur, refer to the Protocol: *Vaginal OB/GYN Emergencies (2310).*
- After delivery, aggressively massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum bleeding. Bring placenta to the hospital with patient.
- Some perineal bleeding is normal with any childbirth; large quantities of blood or free-flowing blood is abnormal and should be treated with Vascular Access, TXA, and Normal Saline administration.
- Record APGAR at 1 minute and 5 minutes after birth.
- Be aware of local Air Medical Transport guidelines for patients in labor.
- Be aware of local NICU and neonatal resources.

APGAR SCALE

Note: The APGAR score is the sum of the measures of the five factors.

	0	1	2
Appearance	Blue/Pale	Body pink, blue extremities	Completely pink
Pulse	Absent	Slow (< 100)	≥100
Grimace	No response	Grimace	Cough or sneeze
Activity	Limp	Some flexion	Active motion
Respirations	Absent	Slow, irregular	Good, crying

CHILDBIRTH


You are about to have 2 patients. Call for additional help early.
Protocol: ABCs: Universal Patient Care (2001)
Provide reassurance, calm, and prevent exertion
Hypertension or abnormal vaginal bleeding?
YES
Go to Protocol: Vaginal/OB/Gyn Emergencies (2310)
NO
Crowning? (Visual inspection)
NO
Duration of contractions
• onset
• frequency
• timing
YES
Crowning and over 36 weeks gestation?
NO
PRIORITY SYMPTOMS CROWNING AND:
≤ 36 weeks gestation Abnormal presentation Severe vaginal bleeding Multiple gestation
RAPID TRANSPORT ON LEFT SIDE
YES
Normal presentation? (cephalic)
NO
YES
• Control the head, support through rotation.
• Inspect neck for cord.
• If cord around neck, slip cord over head OR place clamps 2 inches apart and cut cord.
Contact Medical Control: If presenting part—a single foot, hand, the face, or placenta.
YES
Elevate patient's hips
Prevent cord compression with gloved hand
NO
• PRIORITY SYMPTOMS CROWNING AND:
• ≤ 36 weeks gestation
Abnormal presentation
Severe vaginal bleeding
Multiple gestation
P
PM
AEMT
Vascular Access Normal Saline; TKO Monitor and Transport
• Guide head upward to deliver posterior shoulder, then downward to deliver anterior shoulder.
• Control delivery of trunk and legs.
YES
Delay in delivery of the head?
NO
YES
DO NOT pull on the baby. Form a V with your first 2 fingers to hold vaginal wall from baby's face until head delivers.
NO
• Keep baby at same level as placenta until cord is clamped.
• Clamp cord 8+ inches from the navel with 2 clamps. Cut between clamps
• Position, warm, dry, and stimulate baby per Protocol: Childbirth: Newborn Resuscitation and Care (2165)
• Record APGAR at 1 and 5 minutes
Massage uterine fundus and place baby to breast to promote placental delivery and cessation of bleeding.
Excessive or free-flowing bleeding (see Special Considerations)
NO
Transport
Monitor Vital Signs for both patients
YES
P
PM
AEMT
Vascular Access
Normal Saline: 250-500 mL bolus
Monitor and Support
TXA: 2 gm mixed in 100 mL NS over 15 min. (Parkmedic)

2165

Childbirth: Newborn Resuscitation and Care

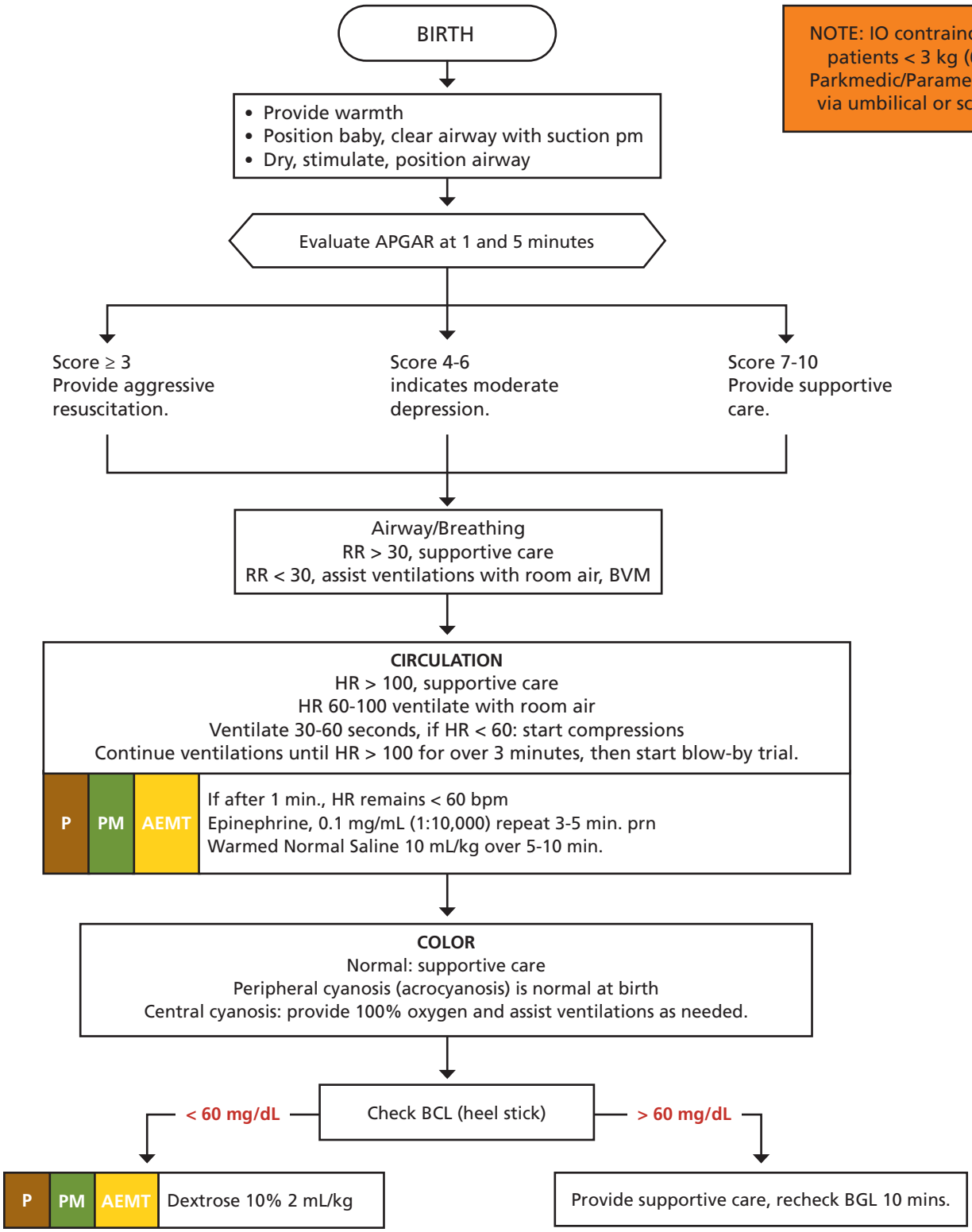
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Gestation (full term, complications, etc.) • Mother's previous pregnancies and current health. • Prenatal care • Maternal drug use	• Amniotic fluid clear? • Breathing or crying? • Good muscle tone? • APGAR at 1 and 5 minutes	• Premature delivery • Narcotic overdose • Neonatal hypoglycemia

SPECIAL CONSIDERATIONS

- Contact MC before ANY naloxone administration to a neonate.
- Try to avoid pressure on the newborn's eyes during BVM ventilation.
- It is important to get a detailed maternal history including drug, tobacco, and alcohol use, hypertension, maternal medications, history of previous pregnancies and complications with past and current pregnancies.
- Newborns < 500 grams (about the size of a 12 oz. soda can) or < 24 weeks gestation may not survive regardless of resuscitation.
- Respiratory distress is indicated by nasal flaring, chest retractions, belly breathing, and head bobbing.
- Reassess HR, respiratory rate, and color every 3 minutes.
- Once blow-by ventilation is initiated, continue regardless of HR.
- Be mindful of how much pressure is applied during ventilations. Excessive pressure may cause damage to lungs.
- Measure pulse oximetry on right hand.
- For IV access, use the umbilical cord while keeping distal cord clamped.
- Be aware of local NICU and Neonatal resources.
- Atropine and calcium are generally contraindicated in neonatal resuscitation.

Drug	Dose (dose/kg)	Weight (kg)	Volume IV ET	Method	Indication
Epinephrine, 0.1 mg/mL (1:10,000)	IV 0.01-0.03 mg/kg (0.1-0.3 mL/kg) ET 0.03-0.1 mg/kg (0.3-1 mL/kg)	1 kg 2 kg 3 kg 4 kg	0.2 mL 0.5 mL 0.4 mL 1.0 mL 0.6 mL 1.5 mL 0.8 mL 2.0 mL	Give IV push or IT push. The current IT doses do not require dilution of flushing with saline. Do not give into an artery; do not mix with bicarbonate; repeat in 5 min. prn	Asystole or severe bradycardia
Sodium bicarbonate 0.5 mEq/mL	2 mEq/kg	1 kg 2 kg 3 kg 4 kg	4 mL 8 mL 12 mL 16 mL	Give IV over 2 min; do not mix with epinephrine, calcium, or phosphate; assure adequate ventilation; repeat 5-10 min. prn	Metabolic acidosis, rarely needed in delivery room. Better to wait for proved acidosis
Volume expanders Normal saline Ringer's lactate O-negative blood	10 mL/kg	1 kg 2 kg 3 kg 4 kg	10 mL 20 mL 30 mL 40 mL	Give IV over 5-10 min. May repeat up to 20 mL/kg. Slower in premature infants	Hypotension because of intravascular volume loss
Naloxone 0.4 mg/mL	0.1-0.2 mg/kg	1 kg 2 kg 3 kg 4 kg	0.25 mL 0.50 mL 0.75 mL 1.00 mL	Give IV push, IM, SQ, or IT; repeat prn 3 times if no response, if material narcotic addiction is suspected do not give; do not mix with bicarbonate	Narcotic depression
Cardioversion/ Defibrillation	1 to 4 J/kg increase 50% each time				

CHILDBIRTH: NEWBORN RESUSCITATION AND CARE



2170

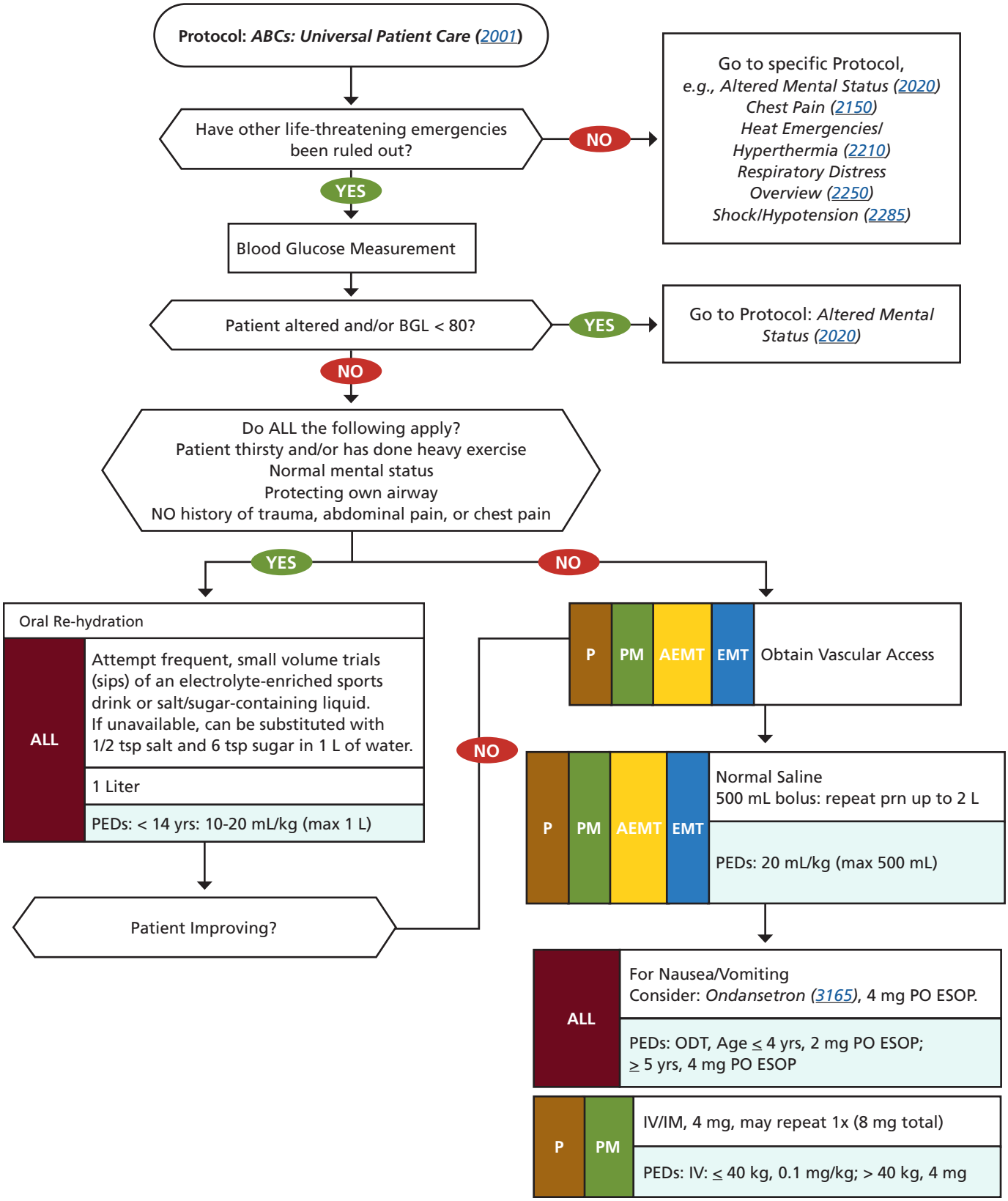
Dehydration

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Most recent fluid intake • Total fluid intake (volume, frequency, type) • Alcohol intake • Food intake • Time of last urination, amount, color • Environmental exposure (heat, cold, altitude) • Recent physical exertion • Recent illness (diarrhea, vomiting, and/or fever) • Past medical history (e.g., diabetes) • Medications (e.g., diuretics)	• Fatigue • Dizziness, weakness, light-headedness • Syncope, near-syncope • Mental status changes • Muscle cramps • Dry mucous membranes • Oliguria (reduced urine output) • Polyuria (in hyperglycemia) • Abdominal pain • Headache	• Heat illness • Hyponatremia • Diabetes insipidus • Diabetic ketoacidosis (DKA) • Hyperosmolar hyperglycemic state (HHS) • Sepsis • Head injury • Medication or drug reaction

SPECIAL CONSIDERATIONS

- **Dehydration should be a diagnosis of exclusion: ensure that a life-threatening disease process (cardiac dysrhythmia, stroke) is not likely the cause of the patient's symptoms.** Obtain a thorough history and perform a complete physical exam with vital signs including temperature and blood glucose.
- Dehydration can cause underlying disease processes to worsen.
- Common causes of dehydration include vomiting, diarrhea, physical exertion with poor fluid intake, and fever.
- Visitors to public lands may not be acclimatized to the heat, humidity, or altitude. Most are also increasing their activity level from "normal" levels at home. Baseline water intake for low activity should be 2 liters per day, minimum.
- Time of last urine output is an important indicator of dehydration.
- People who take diuretics (e.g., "water pills") may be more susceptible to dehydration.
- Dehydration can lead to electrolyte imbalances. Hyponatremia is possible consequence of exertion (sodium loss), excessive water intake, and poor food intake (poor sodium intake). However, rapid overcorrection of hyponatremia is only harmful if the patient has had > 48 hours to adapt to the electrolyte imbalance.
- Orthostatic vitals do not need to be positive to prove the existence of dehydration.
- Blood pressure is not a reliable marker for dehydration until it is severe. Rely on history (urine output, fluid/food intake, exertion, thirst) to develop a full clinical picture of the patient's hydration status.

DEHYDRATION



2171

Contact Dermatitis

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Allergic reactions • Diabetes or pre-diabetes • Adrenal disorders • Bone disorders • History of TB • History of ulcers • Steroid use in last 12 months	• Extensiveness of area • Face, hands, perineum • Any current NSAID use	• Cellulitis • Shingles (Herpes Zoster) • Chicken Pox • Burn

CONSIDERATIONS AND NOTES

ANY signs or symptoms of infection such as: fever, increasing skin redness, red streaks, pus-like discharge mandates referral to hospital or clinic.

Abdominal pain developing while on steroids should prompt discontinuation.

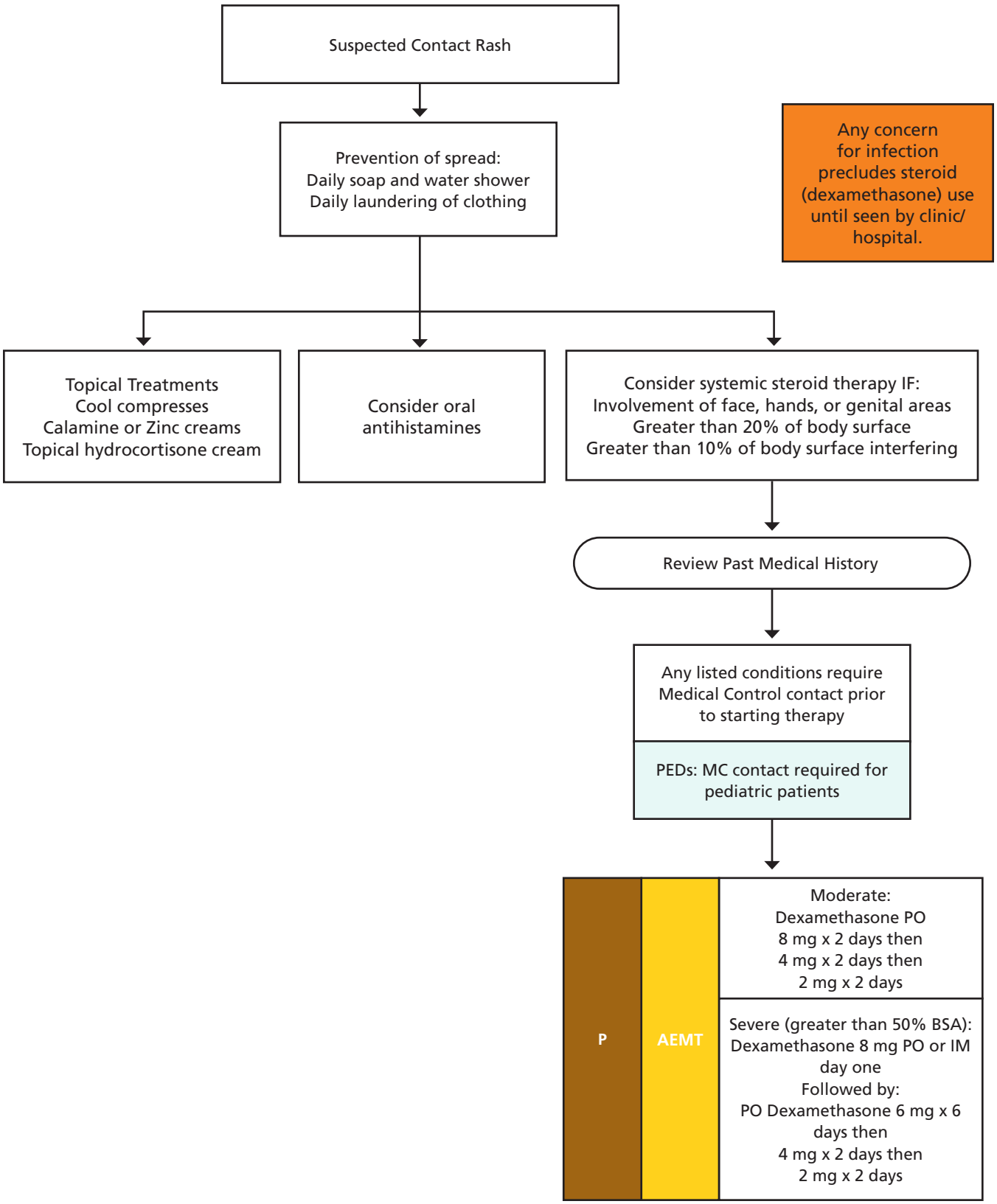
Patient should be told to discontinue any NSAID use if placed on steroid therapy.

Consider checking blood glucose before initiating steroids and on day 3 of treatment.

Things to consider:

- GI mucosal injury/bleeding risk
- Hyperglycemic effects
- Hypernatremia
- Hypertensive effects
- Hypokalemia
- Immunosuppressive effects
- Lowers seizure threshold
- Thrombogenic effects

CONTACT DERMATITIS



2173

Diabetic Emergencies

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Past medical history • Medications • Recent blood glucose check • Last meal	• Altered mental status • Combative/irritable • Diaphoresis • Seizures • Abdominal pain • Nausea/vomiting • Dehydration • Deep/rapid breathing	• Alcohol/drug use • Toxic ingestion • Trauma; head injury • Seizure • CVA • Altered baseline mental status

CONSIDERATIONS AND NOTES

- Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.
- Patients with prolonged hypoglycemia may not respond to glucagon.
- Use caution, consider not administering oral glucose to patients who are not able to swallow or protect their airway.
- Consider checking blood glucose prior to initiating steroids and on day 3 of treatment.

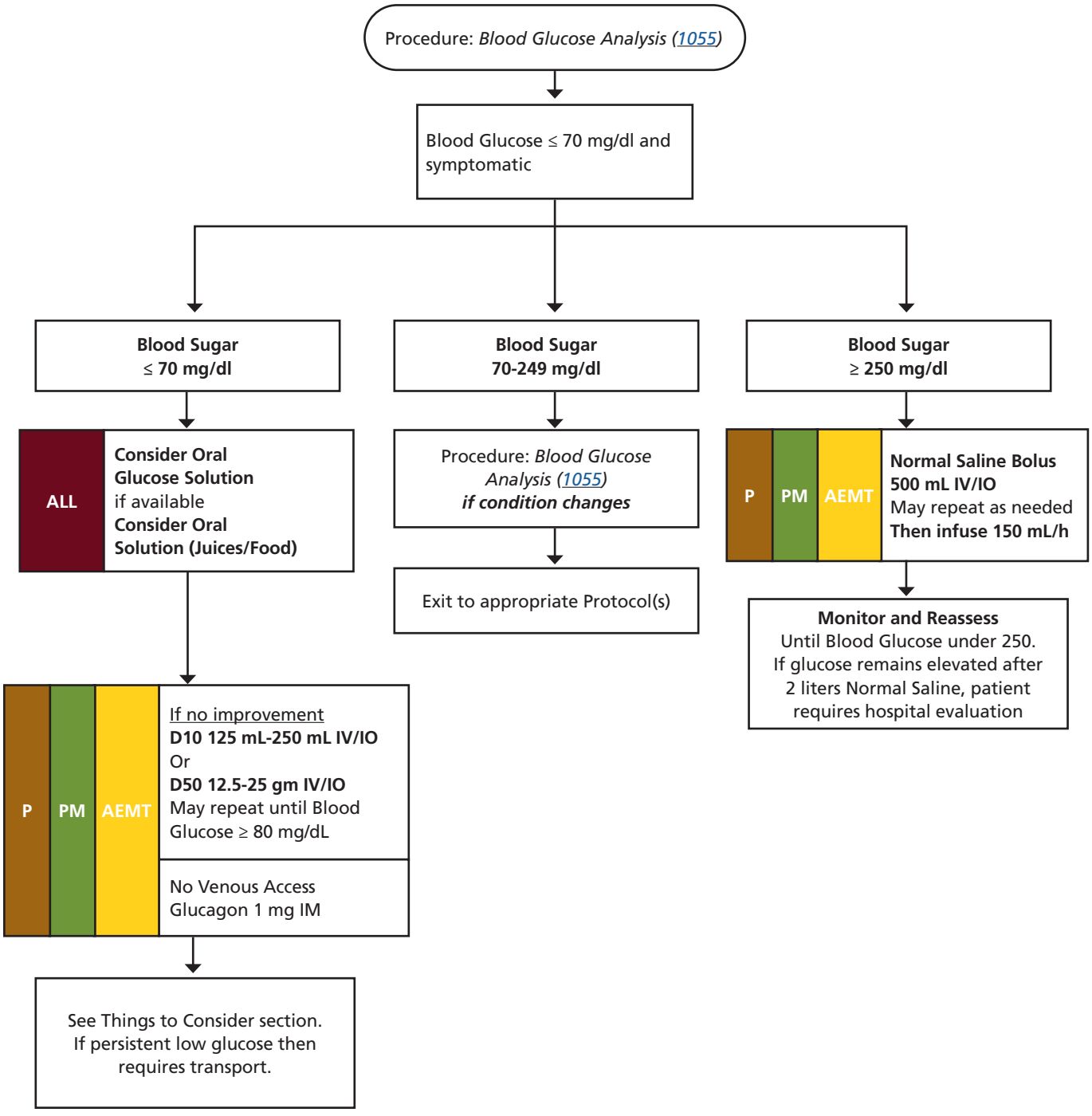
THINGS TO CONSIDER

- **Hypoglycemia with Oral Agents**
  - » Patients taking oral diabetic medications should be encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia and require close monitoring even after normal blood glucose is established.

- **Hypoglycemia with Insulin Agents**
  - » Many forms of insulin now exist. Longer-acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established.
  - » Not all forms of insulin have prolonged action; contact Medical Control for advice.

- **Treat and Release considerations**
  - » The patient has a known history of type 1 or type 2 diabetes.
  - » Blood sugar after treatment is equal to or greater than 80 mg/dL.
  - » The patient has a normal mental status within 10 minutes of treatment.
  - » The patient does not have any other complicating factors referenced above or that require ED evaluation (e.g., chest pain, dyspnea, injuries related to falls, and/or renal dialysis).

DIABETIC EMERGENCIES



2174

Drowning and Dive Injuries

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Submersion in water regardless of depth • Possible history of trauma, i.e., diving board • Duration of immersion • Temperature of water	• Unresponsiveness • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing • Bloody froth from airway • Convulsions	• Trauma • Preexisting medical problem • Pressure injury (diving) • Barotrauma • Decompression sickness • Arterial Gas Embolism

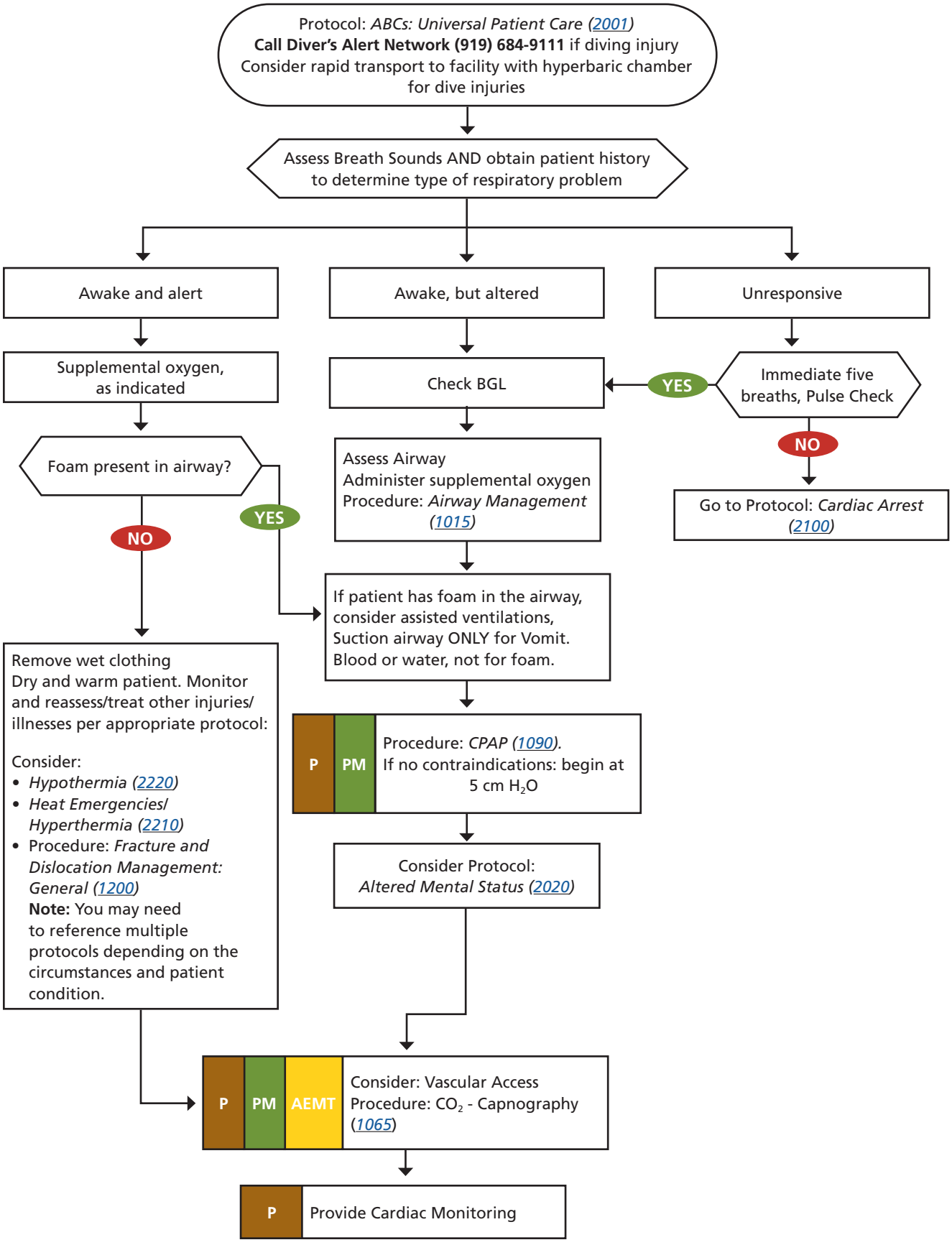
SPECIAL CONSIDERATIONS

- Due to potential worsening over the next few hours, all drowning and dive injury patients should be transported to hospital for observation and evaluation. Life-threatening pulmonary edema can develop hours after the initial incident.
- In the appropriate settings, patients should be resuscitated and warmed (chances of survival after a cardiac arrest are increased in cold water)—[NEARLY] NO PATIENT IS DEAD UNTIL WARM AND DEAD.
- Drowning is a leading cause of death among would-be rescuers.
- Allow appropriately trained and certified rescuers to remove patient from areas of danger.
- Make note of possible pressure injuries (decompression/barotrauma).
- Other medical conditions may cause submersion such as cardiac arrest, seizures, hypothermia, hypoglycemia, intoxication, trauma.
- C-spine injury is very low in drowning and not an initial concern unless obvious axial loading injury is witnessed.
- Vomiting is extremely common even if unresponsive—if patient has pulse and breathing place in recovery position.

SPECIAL CONSIDERATIONS FOR SCUBA AND DIVE-RELATED INJURIES

- CALL DIVERS ALERT NETWORK 24-HR EMERGENCY LINE (919) 684-9111 for consultation.
- Choose the closest ER if stabilization of life-threatening injuries is required before transport to hyperbaric chamber.
- Send all equipment, diving plan, and medical history with diver if possible.
- A careful neurologic exam is key in identifying subtle findings caused by decompression sickness/illness. Check CSMs, vital signs including mental status, coordination, pain, urination, and nausea every 60 minutes.
- Transport SCUBA/dive patients in the left lateral recumbent position in case of an air embolism. Assess for delayed symptoms of decompression sickness: joint/muscle/extremity pain, numbness/tingling, dizziness, coughing spasms, fatigue, paralysis/weakness, collapse/unconsciousness, shortness of breath, or skin itch/rash.

DROWNING AND DIVE INJURIES



2175

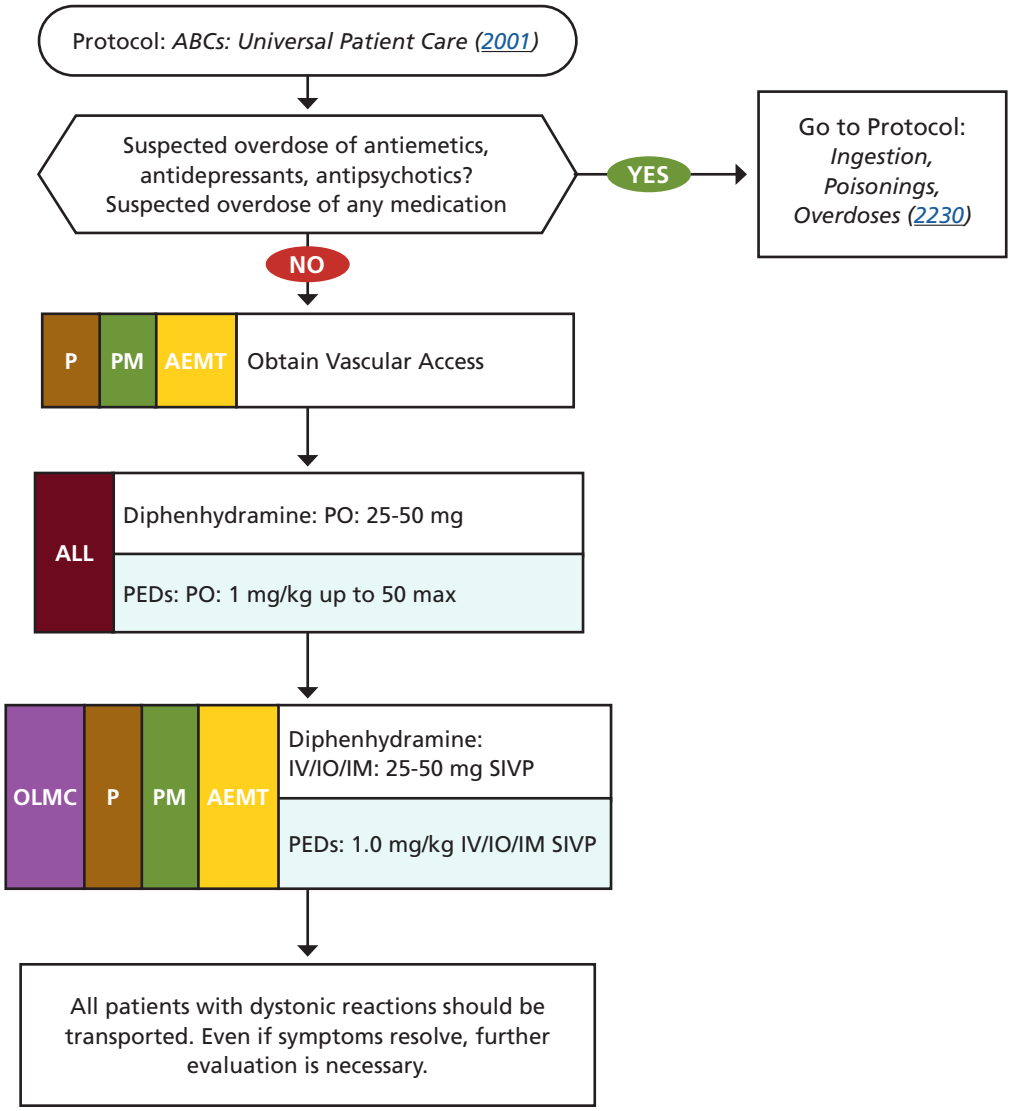
Dystonic Reaction

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Allergic reaction to anti-psychotic medications • Behavioral medical history • Currently taking (neuroleptic) medications such as: » Haldol (haloperidol) » Thorazine (chlorpromazine) » Prolixin (fluphenazine) » Stelazine (trifluoperazine) • Currently taking antiemetic medications such as: » Phenergan (promethazine) » Reglan (metoclopramide) » Compazine (prochlorperazine) • Currently taking antidepressant medications (esp. tricyclic)	• Muscle spasms • Seizure-like activity • Torticollis (neck twisted) • Arm rotation • Protrusion of tongue • Oculogyric condition (unable to move eyes in vertical plane and/or blurred or double vision) • Full body spasm • Extreme restlessness (cannot sit still)	• Seizures • Muscular abnormality • Rheumatoid arthritis • Hypocalcemia • Anticholinergic toxicity (overdoses of diphenhydramine, meclizine, promethazine, quetiapine, etc.) • Previous medical/physical condition causing muscle spasms or muscle constriction • Overdose • Stroke

SPECIAL CONSIDERATIONS

- Attempt to contact MC to discuss the diagnosis of a dystonic reaction before administering diphenhydramine.
- Dystonic reactions are usually caused by antipsychotics, antiemetics, and antidepressants.
- Dystonic reactions may occur immediately after beginning a new medication regimen (or after an increase in dose), or they may be delayed for days. Alcohol and/or cocaine use can increase the risk of a dystonic reaction.
- Dystonic reactions are characterized by involuntary intermittent or sustained muscle contractions. The contractions can cause parts of the body to spasm and twist and can sometimes be painful. Any part of the body can be affected including the arms, legs, trunk, neck, eyelids, and vocal cords.
- Patients with dystonia may not be able to verbally communicate, but they are typically alert, aware, and usually have normal vital signs (unless another condition is present).
- Diphenhydramine is indicated in acute dystonic reactions, but it is not indicated in overdoses of antipsychotics, antiemetics, or antidepressants. Overdoses can be life-threatening and may require rapid transport.
- Overdoses of medications with anticholinergic properties (extensive number of medications) can be confused with dystonic reactions: always be suspicious of overdose and thoroughly interview the patient and family/bystanders.
- All patients with dystonic reactions should be transported for further evaluation.

DYSTONIC REACTION



2180

Electrical Injuries

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Lightning or electrical exposure • Single or multiple victims • Trauma secondary to fall from high wire or MVC into line • Duration of exposure • Voltage and current (AC/DC)	• Cardiac arrest • Respiratory arrest • Burns (fernlike) • Pain including eardrums • Entry and exit wounds • Hypotension or shock • Compartment Syndrome • Transient paralysis of legs • Loss of consciousness	• Cardiac arrest, arrhythmias • Respiratory arrest • Altered mental status • Seizure • Burns (see Protocol: *Burns (2040)*) • Multi-system trauma • Environmental emergencies (hypo/hyperthermia)

SPECIAL CONSIDERATIONS

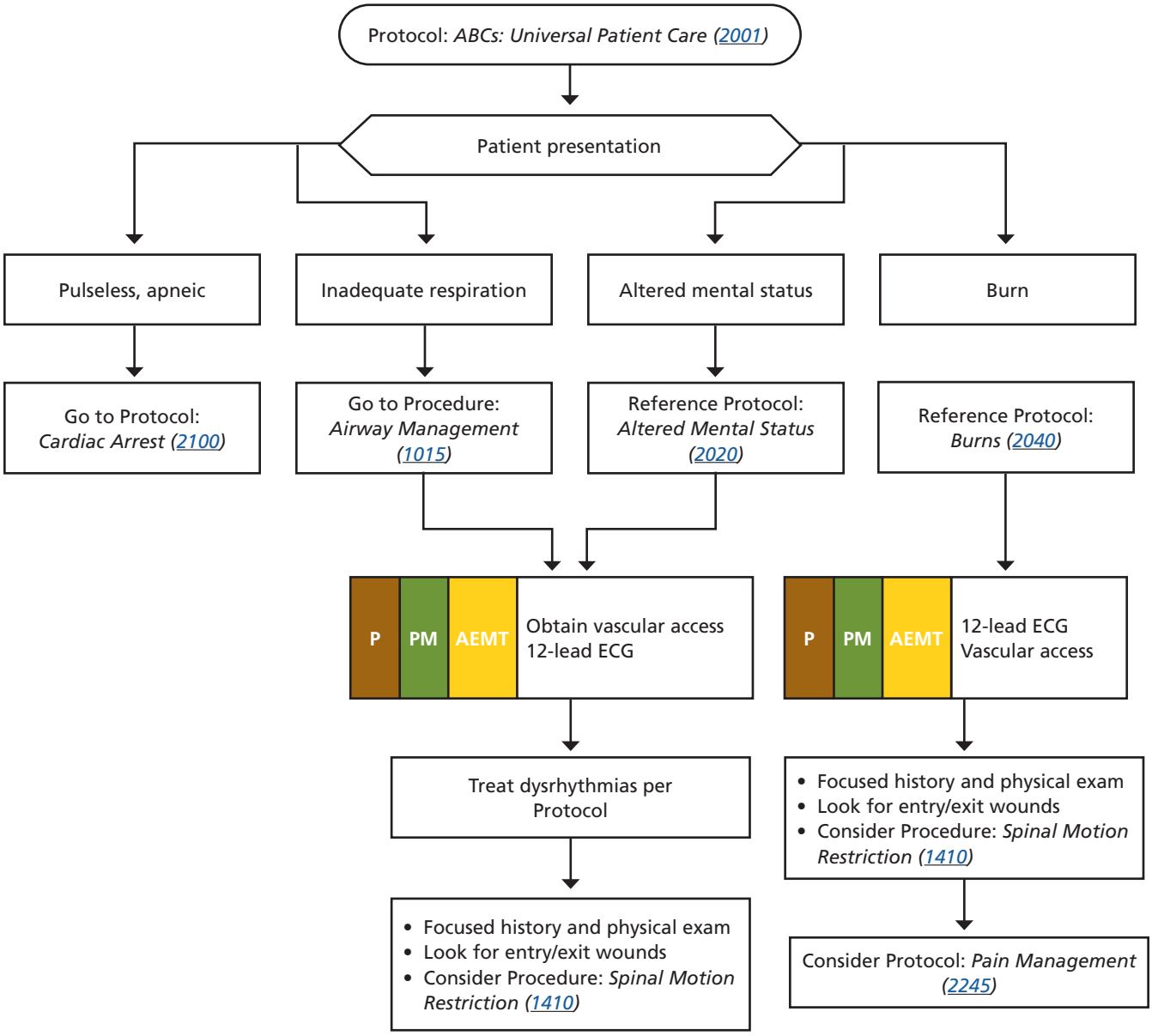
- Ventricular fibrillation and asystole are the common life-threatening dysrhythmias.
- Damage is often hidden; the most severe damage will occur in muscle, vessels, and nerves.
- High voltage > 1000 volts: industrial, high-tension, lightning
- Low voltage < 1000 volts: household voltage
- AC can cause greater internal injuries; DC throws the victim causing more trauma.
- Respiratory arrest may last longer than cardiac arrest. Rescue breaths may be needed after pulse returns.

SPECIAL CONSIDERATIONS: LIGHTNING

In a mass casualty lightening incident, attend to victims in full arrest first ("Reverse Triage"). If the victim did not arrest initially, it is likely they will survive. Attend to ventilation first—administer rescue breaths, and then proceed with routine CPR.

- Do not overlook other trauma (i.e., falls)
- Lightning is a massive DC shock, most often leading to asystole.
- In lightning injuries, most of the current will travel over the body surface producing flash burns.

ELECTRICAL INJURIES



Victims of high voltage electrical discharge, including lightning, are often in primary respiratory arrest and will need ventilatory support.

2190

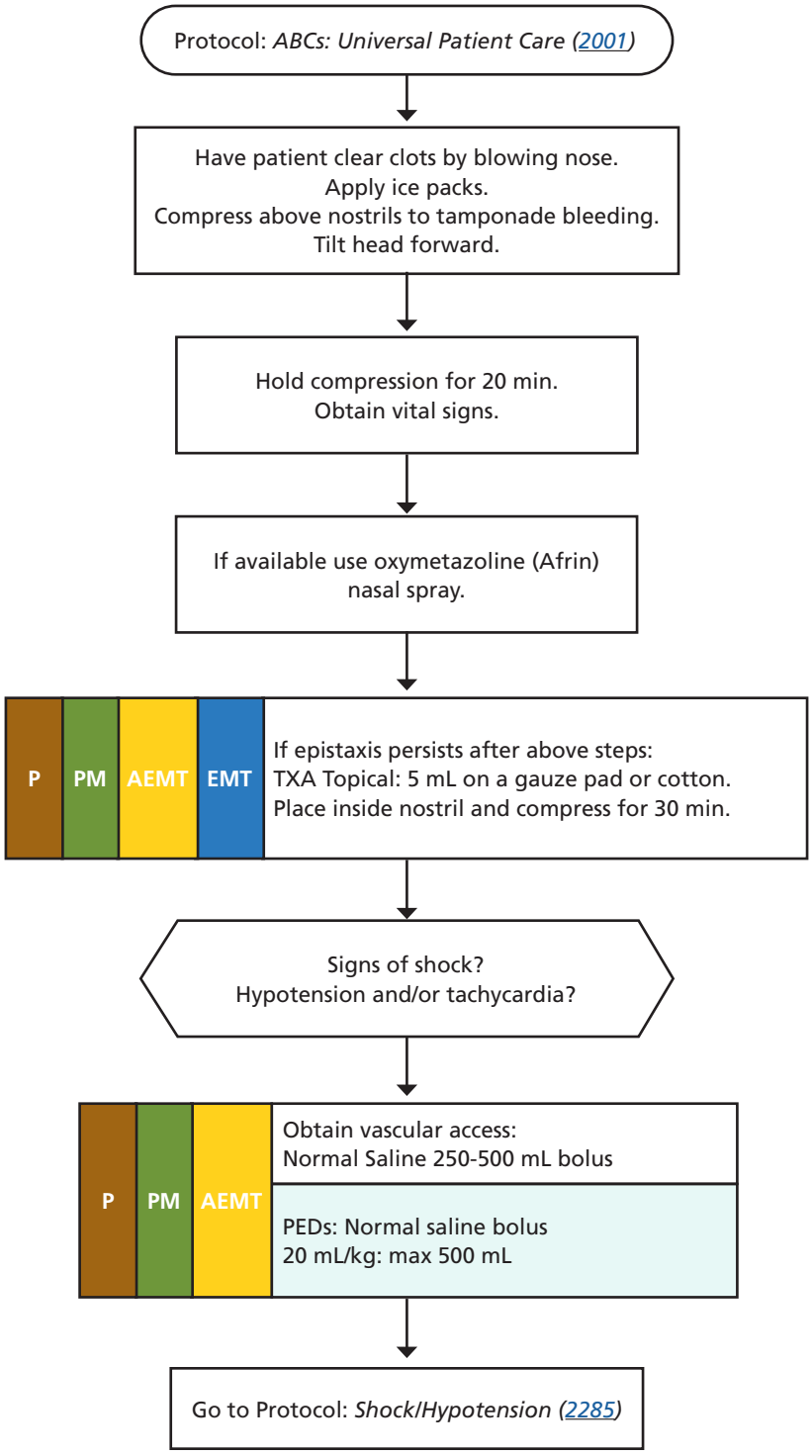
Epistaxis

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Duration and estimated quantity of bleeding • Traumatic vs. atraumatic • Past medical history (e.g., hypertension, blood clotting disorders) • Medications and compliance (anticoagulants, antihypertensives) • Previous episodes of epistaxis	• Bleeding from nasal passage • Pain • Nausea/vomiting • Signs of hypertensive emergency: chest pain, dizziness, blurred vision, altered mental status • Signs of hemorrhagic shock: altered mental status, anxiety, pallor, poorly perfused extremities, tachycardia, hypotension, tachypnea, air hunger	• Hypertensive emergency • Head trauma • Medication or drug toxicity (anticoagulants, cocaine) • Hemophilia (blood clotting disorder) • Thrombocytopenia (low platelet count): leukemia, chemotherapy, liver disease, alcoholism, drug-induced • Barotrauma (diving emergencies) • Nasal foreign body • Infection • Allergic rhinitis • Lesions (polyps, ulcers, tumors)

SPECIAL CONSIDERATIONS

- It is very difficult to quantify the amount of blood loss with epistaxis.
- Anticoagulants include aspirin, warfarin (Coumadin), Xarelto (rivaroxaban), Eliquis (apixaban), Pradaxa (dabigatran), and NSAIDS (such as ibuprofen or naproxen sodium).
- Patients with hemophilia (e.g., "factor VIII" deficiency) are at increased risk for extensive blood loss. Contact MC.
- Make sure to protect airway and breathing in patients with active epistaxis.
- To tamponade a nosebleed, the patient should:
  1. Blow nose to remove blood.
  2. Bend forward over a basin to minimize risk of aspiration or swallowing.
  3. Pinch above the nostrils and below the bony nasal bridge firmly against septum, applying continuous pressure for 20 minutes.

EPISTAXIS


Protocol: *ABCs: Universal Patient Care (2001)*
Have patient clear clots by blowing nose.
Apply ice packs.
Compress above nostrils to tamponade bleeding.
Tilt head forward.
Hold compression for 20 min.
Obtain vital signs.
If available use oxymetazoline (Afrin) nasal spray.
P
PM
AEMT
EMT
If epistaxis persists after above steps:
TXA Topical: 5 mL on a gauze pad or cotton.
Place inside nostril and compress for 30 min.
Signs of shock?
Hypotension and/or tachycardia?
P
PM
AEMT
Obtain vascular access:
Normal Saline 250-500 mL bolus
PEDs: Normal saline bolus
20 mL/kg: max 500 mL
Go to Protocol: *Shock/Hypotension (2285)*

2195

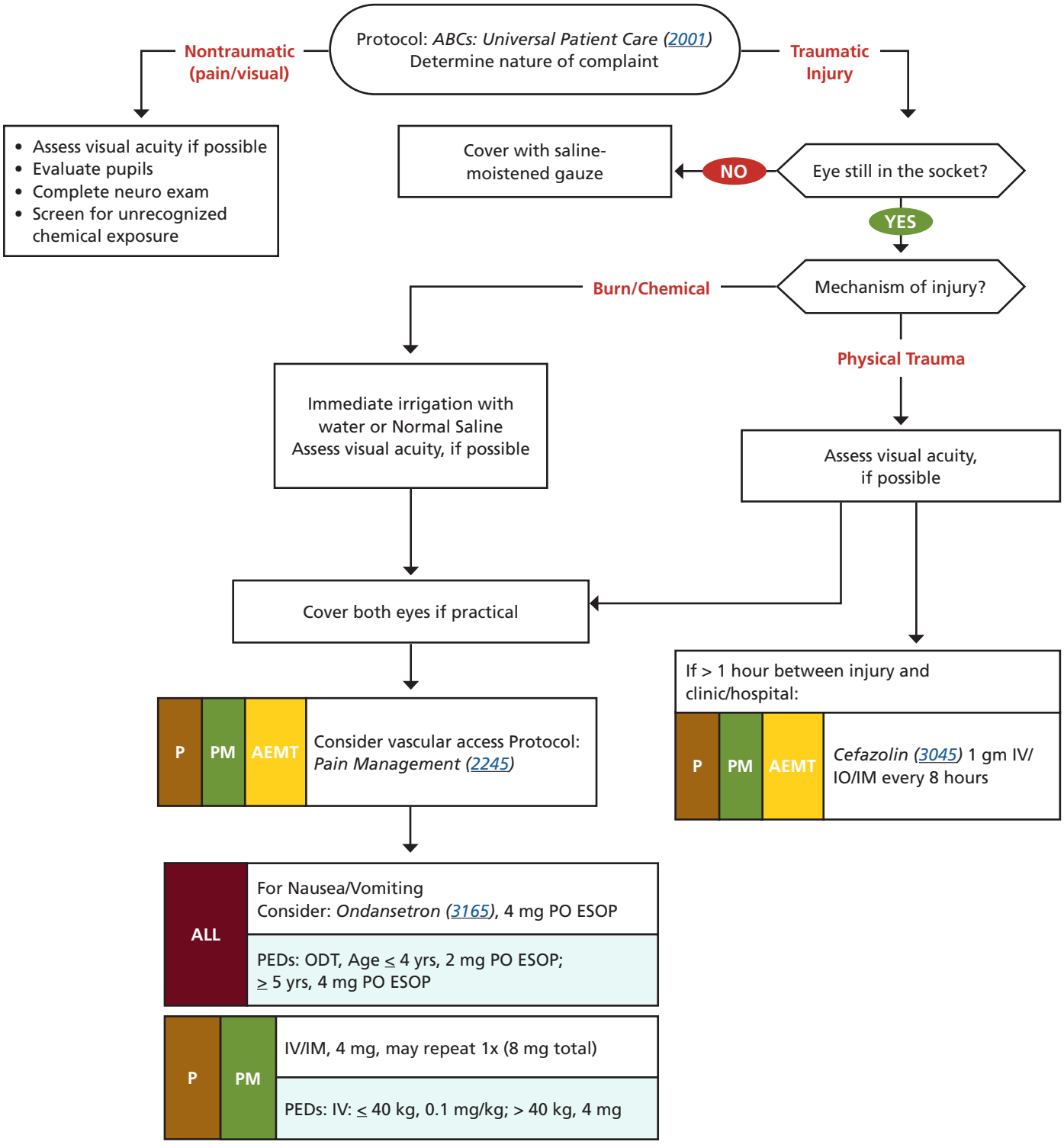
Eye Emergencies/Complaints

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Time of injury • Blunt/penetrating/chemical • Open vs. closed injury • Involved chemicals/SDS • Wound contamination • Tetanus status • Normal visual acuity • Sun exposure	• Pain, swelling, blood • Deformity, contusion • Visual deficit • Leaking aqueous/vitreous humor • Upwardly fixed eye • "Shooting" or "streaking" light • Visible contaminants • Rust ring • Lacrimation	• Abrasion/laceration • Globe rupture • Retinal damage/detachment • Chemical/thermal burn/chemical weapon • Orbital fracture • Neurological event • Acute glaucoma • Retinal artery occlusion

SPECIAL CONSIDERATIONS

- Normal visual acuity can be present even with severe eye injuries.
- Remove contact lens whenever possible.
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult.
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status.
- Use shields, not pads, for physical trauma to eyes. Pads OK for unaffected eye.
- Do not remove impaled objects: pad around object and keep in place.
- Suspected globe rupture requires emergent transport.
- With suspected globe rupture, no irrigation or ointment application. Protect the eye from the environment.
- Avoid NSAIDs in patients with eye injuries.
- Cover both eyes if practical to prevent the patient from moving the injured eye unnecessarily
- Transport keeping the patient's face upward and head of the bed at > 30 degrees to minimize postural/positional increases in intra-ocular pressure.
- In suspected severe eye trauma or open globe, treat nausea aggressively to avoid increased ocular pressure.

EYE EMERGENCIES/COMPLAINTS



2200

Frostbite

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Diabetes • Circulatory problems • Exposure length • Tetanus status • Previous frostbite injury	• Color of skin • Condition of skin • Condition of clothing, gloves, etc. (wet, dry) • CSMs • Core body temperature	• Trauma • Infection • Hypothermia

SPECIAL CONSIDERATIONS

- Prevent further heat loss and injury.
- Consider location of patient, length of extrication, extent of freezing, ambient temperature and if the area can stay warmed throughout contact. DO NOT rewarm if the area has the potential to refreeze. This could cause further tissue damage and death.
- The patient should not walk on thawed feet.
- Rewarming is rarely done in the field—but spontaneous rewarming can occur. Protect the injured area from refreeze or injury.

REWARMING CONSIDERATIONS

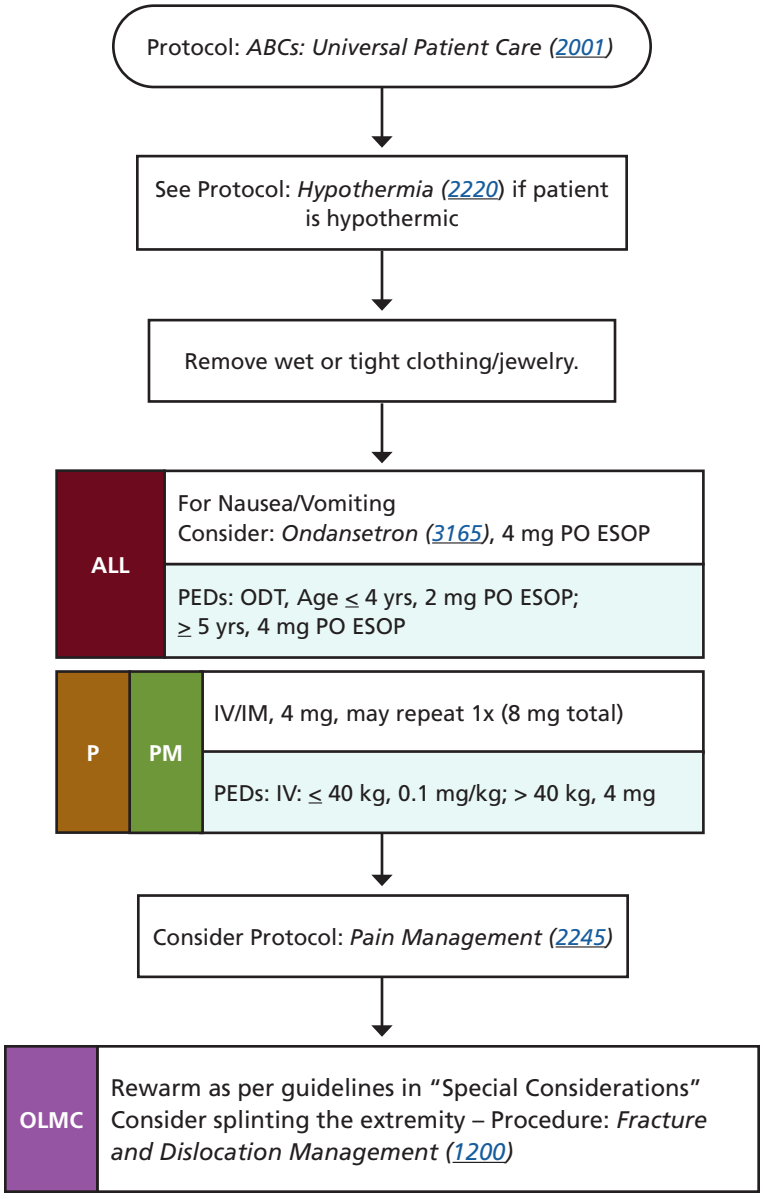
Consider backup transport if rewarming is being attempted. Rewarm and consult MC if ALL the following apply:

- Evacuation not possible in < 12 hour
- Patient is not hypothermic (hypothermic patients require core rewarming first)
- Sufficient supply of warm water with a thermometer
- There is NO risk of refreezing

REWARMING PROCEDURE

1. Water temperature 102 °F
2. Immerse until skin is soft, pink/reddish/purple, and pliable. Expect pain
3. DO NOT RUB
4. Protect from injury and re-freezing
5. Place gauze between fingers and toes
6. Do not rupture blebs

FROSTBITE


Protocol: *ABCs: Universal Patient Care (2001)*
See Protocol: *Hypothermia (2220)* if patient is hypothermic
Remove wet or tight clothing/jewelry.
ALL
For Nausea/Vomiting
Consider: *Ondansetron (3165)*, 4 mg PO ESOP
PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP;
≥ 5 yrs, 4 mg PO ESOP
P
PM
IV/IM, 4 mg, may repeat 1x (8 mg total)
PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg
Consider Protocol: *Pain Management (2245)*
OLMC
Rewarm as per guidelines in "Special Considerations"
Consider splinting the extremity – Procedure: *Fracture and Dislocation Management (1200)*

2205

General Illness/Fever

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Age • Duration of fever • Severity of fever • Immunocompromised (transplant, HIV, diabetes, cancer) • Environmental exposure • Last acetaminophen or ibuprofen • Vaccine history • Hyper/hypoglycemia	• Blood glucose • Warm/flushed • Nausea/vomiting • Sweaty • Chills/rigors • Myalgia, cough, runny nose, headache, dysuria, rash, stiff neck. • Weakness • Dizziness • Diarrhea • Altered Mental Status • Chest pain	• Cardiac (MI, Angina, CHF, Dysrhythmia) • Sepsis • Infection/UTI/pneumonia/viral illnesses • Cancer/tumors/lymphomas • Medication or drug reaction • Hyperthyroidism • Heat stroke • Meningitis • Croup/epiglottitis • Hepatitis/gastroenteritis/renal failure • Sugar or electrolyte issues • Motion sickness

SPECIAL CONSIDERATIONS

- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Fever in the chemotherapy patient is a serious emergency.
- **Droplet precautions** include standard PPE plus a surgical mask or a nonrebreather oxygen mask for the patient. This level of precaution should be used when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses are spread via large particle droplets are suspected.
- **Airborne precautions** include standard PPE plus an N-95 mask or PAPR unit for providers who accompany patients in the back of the ambulance and a surgical mask or nonrebreather oxygen mask for the patient. Use this level of precaution when COVID and COVID-like infections, tuberculosis, measles, varicella, or other infections that are spread by droplet nuclei are suspected.
- **Contact precautions** include standard PPE plus use of a gown, change of gloves after every patient contact, and strict handwashing precautions. Use this level of precaution when multi-drug resistant organisms (MRSA), scabies or zoster (shingles), or other illnesses spread by contact are suspected.
- **All hazard precautions** include standard PPE plus airborne precautions plus contact precautions. Use this level of precaution during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g., SARS-CoV).
- If patient is > 50 years old or > 40 years with a history of diabetes, consider applying a 12-lead ECG.

GENERAL ILLNESS/FEVER

Protocol: *ABCs: Universal Patient Care (2001)*

Consider PPE for droplet, airborne, and/or contact precautions.

Consider differential and go to appropriate Protocol based on history and primary assessment: *Abdominal Pain (2005); Allergic Reaction/Anaphylaxis (2015); Altered Mental Status (2020); Cardiac Dysrhythmias: Adult Bradycardia (2125), Adult Tachycardia (2130), Pediatric Bradycardia (2135), Pediatric Tachycardia (2140); Chest Pain (2150); Heat Emergencies (2210); Ingestion, Poisonings, Overdoses (2230); Respiratory Distress Overview (2250); Seizure (2280); Shock/Hypotension (2285); Stroke/CVA (2290); Syncope/Near Syncope (2295); Trauma: Major/Multi-system (2300)*

Oral Fluids/food:
If patient is thirsty or has done heavy exercise AND if normal mental status and protecting airway AND no history of trauma, abdominal pain, or chest pain: Attempt frequent, small trials of oral electrolyte sports drink or salt/sugar-containing liquid or food. If unavailable, substitute potable water.

Suspected Fever or Temperature > 100.4° F; 38° C

YES

EMT	**Acetaminophen:** 650-1000 mg PO
	PEDs: < 12 yrs: 15 mg/kg up to 650 mg PO

P, PM, AEMT	Obtain Vascular Access Normal Saline: 250-500 mL bolus
	PEDs: Normal Saline 20 mg/kg up to 500 mL

If acetaminophen is ineffective, consider **ibuprofen**

EMT	Ibuprofen: 600 mg PO
	PEDs: > 30 kg, same as adult < 30 kg, contact MC

OR **ketorolac**

P, PM	IV 15 mg IM 30 mg
	PEDs: > 30 kg, same as adult < 30 kg, contact MC

NO

ALL	For Nausea/Vomiting Consider: *Ondansetron (3165)*, 4 mg PO ESOP
	PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP; ≥ 5 yrs, 4 mg PO ESOP

P, PM	IV/IM, 4 mg, may repeat 1x (8 mg total)
	PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg

Two or more of the following present?
Temperature > 100.4° F (38° C) or < 96.8° F (36° C) Heart Rate > 90 bpm
Respiratory Rate > 20/min.

Increased likelihood of serious infection/sepsis. Transport patient to appropriate facility. Consider: *Cefazolin (3045)* if transport is greater than 1 hour.

2210

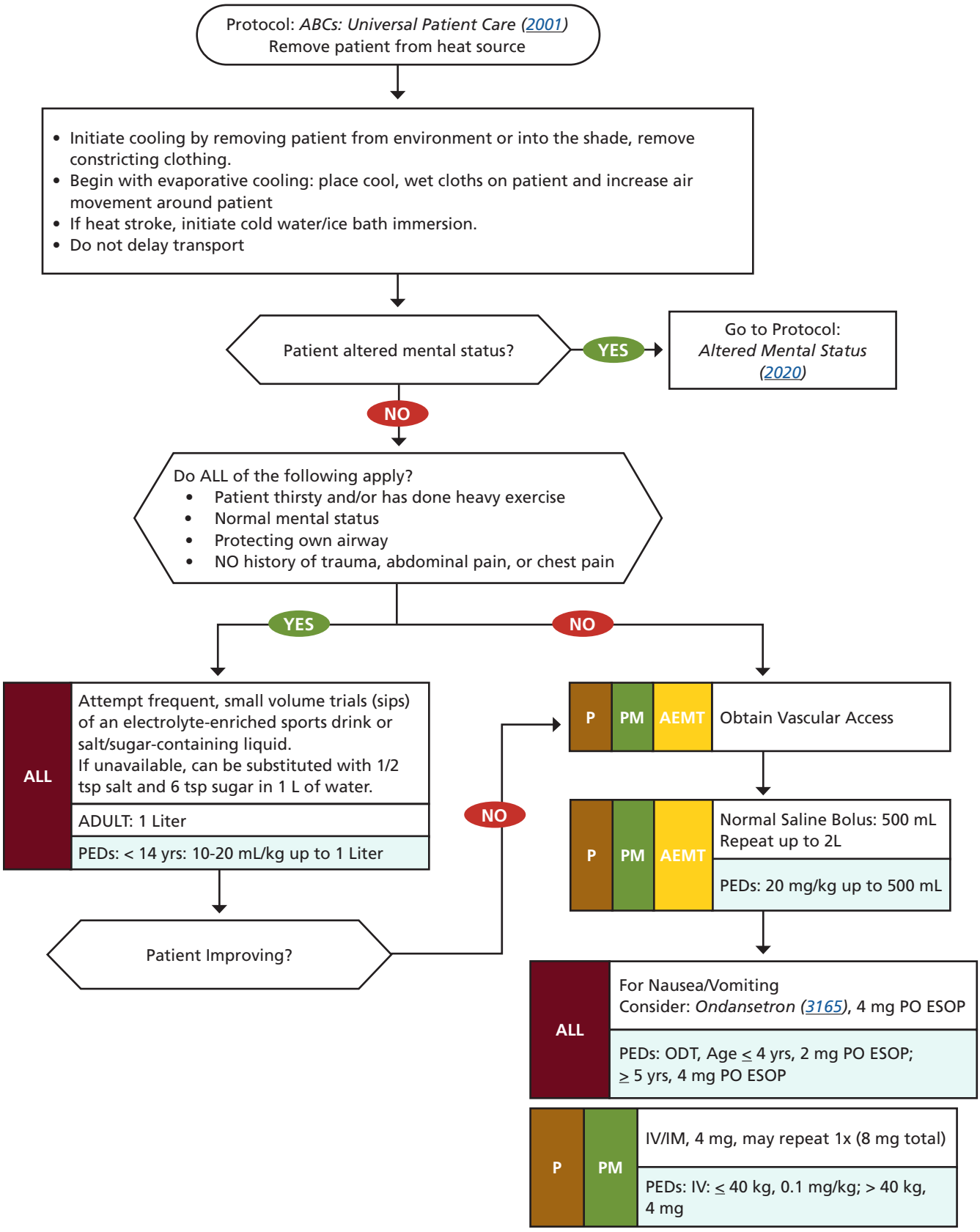
Heat Emergencies/Hyperthermia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Age • Exposure to increased temperatures and/or humidity • Medications (e.g., antihypertensives, diuretics) • Illicit drugs, alcohol use • Extreme exertion • Time and length of exposure • Poor PO intake • Fatigue and/or muscle cramping	• Altered mental status or unconsciousness • Hypotension or shock • Seizure • Nausea, vomiting • Fatigue • Muscle cramps • Combativeness	• Fever (infection), meningitis • Dehydration • Hyperthyroidism (Thyroid Storm) • Status epilepticus • Heat cramps • Heat exhaustion • Heat stroke • CNS lesions or tumors • Diabetic complications • Drug overdose, alcohol withdrawal, Delirium tremens (DTs) • Cerebral hemorrhage • Serotonin Syndrome

SPECIAL CONSIDERATIONS

- Extremes of age are more prone to heat emergencies (i.e., young and old). They are also more sensitive to overzealous fluid replacement.
- Cocaine, amphetamines, and salicylates may elevate body temperatures.
  DO NOT use the presence or absence of sweating alone to differentiate between heat stroke and heat exhaustion.
- Intense shivering may occur as a patient is cooled.
- Limit cold water immersion to 10-15 minutes.
- **Heat injuries** can present with a variety of symptoms which MAY include: sweating, faintness, dizziness, fatigue, muscle cramps, nausea, and headache. Vital signs may include weak, thready pulse and low BP when standing.
- **Heat stroke** hallmark is altered mental status.
- The following alter body's ability to regulate temperature: diuretics, beta-blockers, antihistamines, antipsychotics, alcohol, acclimatization, humidity, amount/type of fluid replacement.
- An oral temperature should only be taken with normal mental status.

HEAT EMERGENCIES/HYPERTHERMIA



HEAT EMERGENCIES/HYPERTHERMIA

	Who/Why	Symptoms	Treatment
Heat Edema	Elderly, or those not acclimated to hot environment. History of rigorous activity then sitting/ standing for long periods.	Redness, swelling of hands, ankles and feet.	Resolves with elevation of extremity and acclimatization.
Heat Rash (prickly heat)	Anyone, usually in tropical/humid environments.	Blockage of sweat glands causing red, painful, itchy rash in areas where clothing rubs.	None in field. Loose clothing, antihistamines.
Heat Syncope	Elderly most common. Relative volume depletion. Must rule out other serious causes of syncope.	Dizziness and syncope with postural changes in hot environment.	Oral or IV fluids.
Heat Tetany	Anyone doing vigorous activity in a hot environment.	Hyperventilation, hand/foot spasm and tingling/numbness.	Shade and normal breathing.
Heat Cramps	Unconditioned people starting vigorous activity in the heat. Fluid replacement with water and lack of adequate salt and potassium replacement.	Involuntary, spasmodic, painful cramps in calves, thighs, or shoulders during or after exercise.	Rest and rehydration with sport drink or salted water. (Not salt pills)
Heat Exhaustion Normal mental status Body temp usually 104 °F (< 40 °C)	Anyone active in hot environment without adequate fluid replacement. Caused by water and/or salt depletion.	Dizziness, weakness, fatigue, body aches, headache, nausea, sweating, vomiting, syncope, positional hypotension, tachycardia, elevated body temperature but NORMAL MENTAL STATUS!	Rest, cooling, aggressive fluid/ electrolyte replacement.
Heat Stroke Altered mental status Body temp usually 104 °F (> 40 °C) MEDICAL EMERGENCY	Anyone active in hot environment without adequate fluid replacement. Water and/or salt depletion. *Classic:* elderly in heat wave—poor ability to regulate heat because of age/meds. *Exertional:* young, healthy athletes after strenuous exercise in hot environment.	Same as heat exhaustion but no longer able to regulate heat: ALTERED MENTAL STATUS incoordination, combative, hallucinations, seizures. Severe vasodilation=hypotension, tachycardia Dry skin=loss of sweating mechanism, i.e., temp control.	Rapid cooling, airway protection, IV fluids, seizure treatment if present.

Hypertension

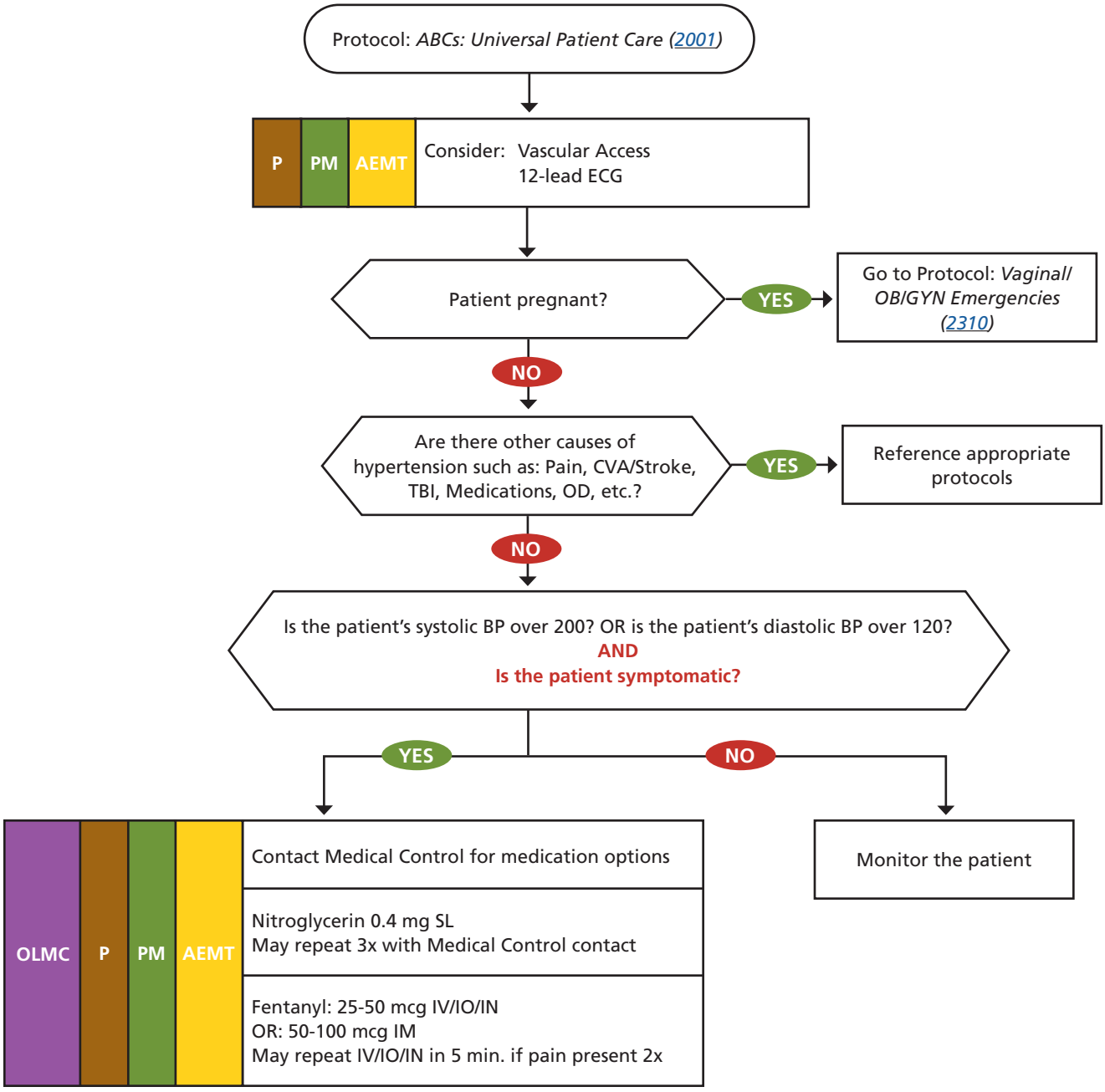
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL

• Past medical history: hypertension, heart failure, stroke, aortic aneurysm, renal failure
• Pregnancy (≥ 20 weeks) or postpartum
• Medications and medication compliance (e.g., MAOIs, beta blockers, antihypertensives, diuretics)
• Use of erectile dysfunction medications: e.g., Viagra, Levitra, or Cialis
• Alcohol/drug use
	• Systolic BP 200 or greater And/or Diastolic BP 120 or greater
	• AND at least one of the following:
	  • Headache
	  • Altered mental status
	  • Dizziness
	  • Nosebleed
	  • Blurred vision
	  • Pulmonary edema
	  • Chest pain
		• Hypertensive encephalopathy
		• Primary CNS injury (Cushing's triad: bradycardia, hypertension, irregular respirations)
		• Myocardial infarction
		• Acute heart failure
		• Aortic dissection (aneurysm)
		• Preeclampsia/eclampsia
		• Illicit drug use/overdose (esp. stimulants: cocaine, methamphetamine)
		• Medication or drug withdrawal (e.g., alcohol, beta-blockers, clonidine)

SPECIAL CONSIDERATIONS

- Hypertensive emergency is defined by the presence of end-organ dysfunction in the presence of severe, uncontrolled hypertension. End-organ dysfunction may be primarily neurologic (altered mental status, dizziness, severe headache, seizures) or cardiovascular (acute heart failure/pulmonary edema, chest pain). Other indications of hypertensive emergency include vision changes and nosebleeds.
- Never treat hypertension based on a single set of vital signs.
- Symptomatic patients should be transported with the head of the stretcher elevated.
- Pregnant (usually > 26 weeks) or postpartum women with a systolic blood pressure over 140 or a diastolic pressure over 90 meet criteria for hypertension in pregnancy (preeclampsia). See Protocol: *Vaginal/OB/GYN Emergencies (2310).*
- Hypertension associated with alcohol withdrawal and stimulant use is best treated with benzodiazepines.

HYPERTENSION



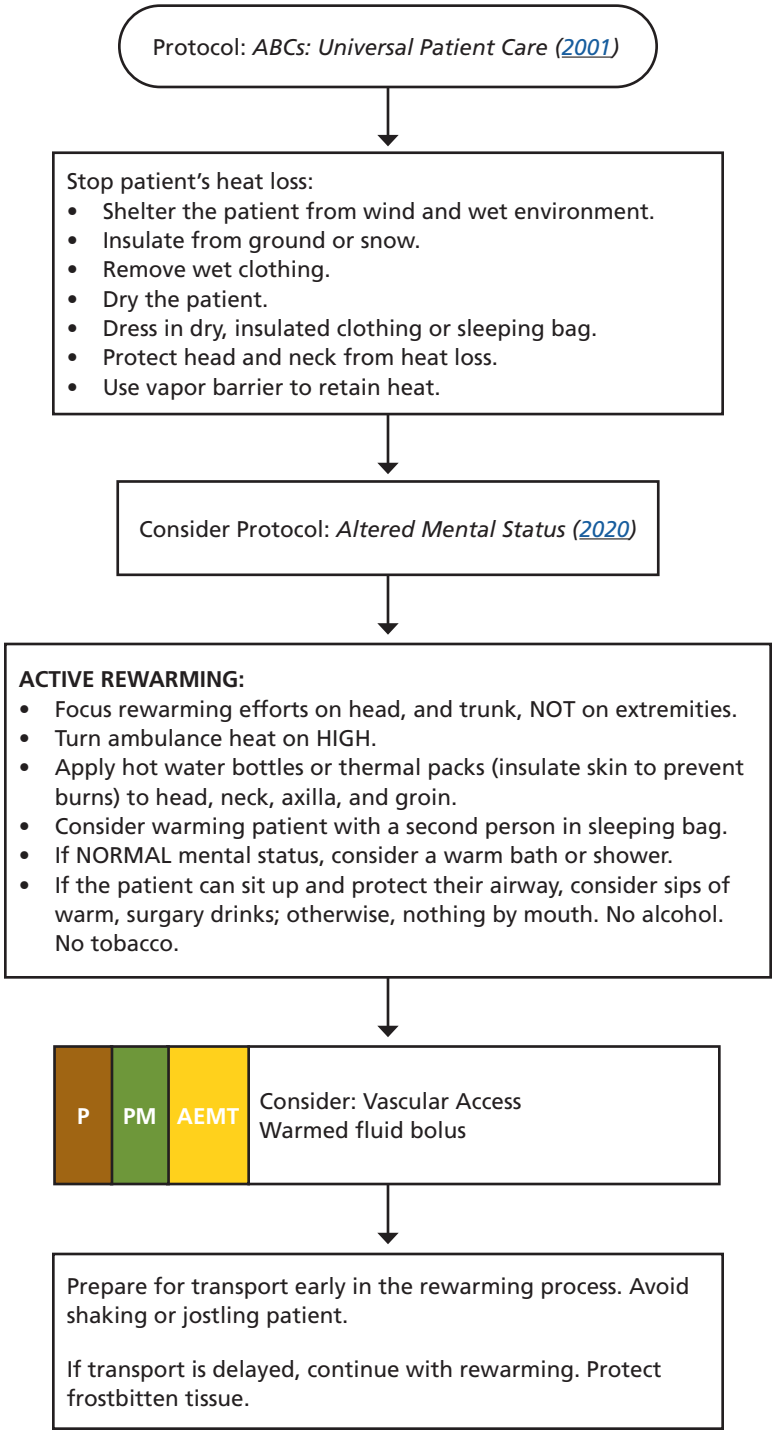
Hypothermia

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Exposure to environment even in normal temperatures • Exposure to extreme cold • Extremes of age • Drug or alcohol use • Infections/Sepsis • Length of exposure/wetness	• Mild hypothermia: tachycardia, tachypnea, shivering, ataxia, cold diuresis • Severe hypothermia: altered mental status/unresponsive, bradycardia, hypotension, hypoventilation, pulmonary edema, loss of shivering, paradoxical undressing • ECG changes in severe hypothermia: slow atrial fibrillation, junctional bradycardia, Osborn/J waves, prolonged intervals, VF, asystole	• Altered mental status of any cause • Overdose (e.g., beta-blocker, calcium channel blocker) • Sepsis • Hypoglycemia • CNS dysfunction (stroke, head injury, spinal cord injury) • High altitude cerebral edema (HACE) • Hypothyroidism (myxedema coma) • Adrenal insufficiency

SPECIAL CONSIDERATIONS

- Core temps are the most accurate measurement of hypo/hyperthermia. As this is difficult in the field, clinical signs may be used to assess the degree of hypothermia.
- In the appropriate settings, patients should be resuscitated and warmed—**[NEARLY] NO PATIENT IS DEAD UNTIL WARM AND DEAD.**
- Hypothermia is defined as core temperature less than 95 °F (35 °C).
- **MILD hypothermia** (core temp of 90-95 °F/32-35 °C) the body can still maintain temperature if heat loss is stopped. Signs may include tachycardia, hypertension, or shivering, with normal mental status.
- **SEVERE hypothermia** (core temp < 90 °F/32 °C)—the body is unable to maintain temperature and signs may include bradycardia, hypotension, loss of shivering, slowing of functions, or cardiac arrest. Vital signs become depressed. Mental Status declines—confusion leading to coma.
- Extremes of age are more susceptible (i.e., young and old).
- With core temperature less than 86 °F (30 °C) ventricular fibrillation is a common cause of death, Handling patients gently may prevent this (rarely responds to defibrillation)
- Fatal dysrhythmias can occur during rewarming. Carefully monitor the patient and be sure to warm the patient's core first. Simultaneous rewarming of the core and extremities can cause further drop in core temperature as cold acidotic blood from the extremities returns to the core with peripheral vasodilation.
- If the temperature cannot be measured, treat the patient based on their suspected temperature.
- Prepare for transport early in the rewarming process. Avoid shaking or jostling patient. If transport is delayed, continue with rewarming.
- Do not attempt to increase heat production through exercise in moderate/severe hypothermia.

HYPOTHERMIA



Infectious Pathogens (COVID/SARS/MERS/EBOLA/Others)

Past Medical History	ASSESSMENT	Differential
• Patient with known exposure	• Fevers, Tachycardia, Tachypnea • Travel history	• Febrile Illness

AIRBORNE PRECAUTIONS

Standard PPE with fit-tested N95 mask (or PAPR respirator) and use of a gown or coveralls, change of gloves after every patient contact, and strict handwashing precautions. This level is used with Aspergillus, SARS/MERS/COVID-19, tuberculosis, measles (rubeola), chickenpox (varicella-zoster) smallpox, influenza, disseminated herpes zoster, or adenovirus/rhinovirus.

CONTACT PRECAUTIONS

Standard PPE with use of a gown or coveralls, change of gloves after every patient contact, and strict handwashing precautions.

This level is used with GI complaints, blood or body fluids, C diff, scabies, wound and skin infections, MRSA.
NOTE: Clostridium difficile (C diff) is not inactivated by alcohol-based cleaners and washing with soap and water is indicated.

DROPLET PRECAUTIONS

Standard PPE plus a standard surgical mask for providers who accompany patients in the treatment compartment and a surgical mask or NRB O_2 mask for the patient. This level is utilized when influenza, meningitis, mumps, streptococcal pharyngitis, pertussis, adenovirus, rhinovirus, and undiagnosed rashes.

ALL-HAZARDS PRECAUTIONS

Standard PPE plus airborne precautions plus contact precautions.

This level is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g., SARS, MERS-CoV, COVID-19).

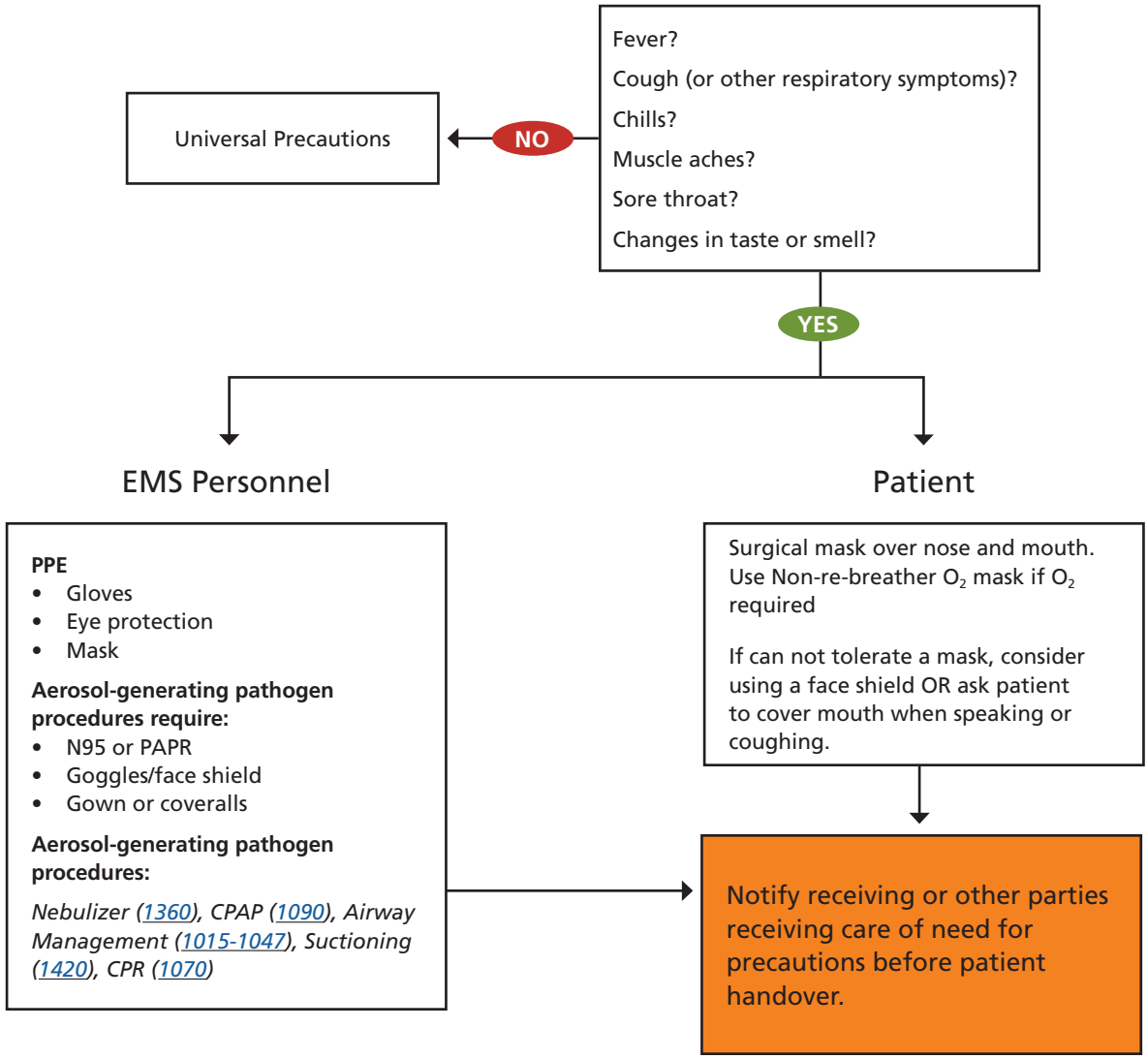
COVID-19 (NOVEL CORONAVIRUS)

For most current criteria to guide evaluations of patients under investigation:
https://www.cdc.gov/coronavirus/2019-ncov

INFECTIOUS PATHOGENS (COVID/SARS/MERS/EBOLA/OTHERS)

If nature of call/patient condition allows:

Send only one provider into scene to complete quick screen
Stand at distance of > 6 feet and perform screening questions



Exit to appropriate Treatment Protocol

PPE Supply chain disruptions:

- Prioritize respirators/N95 for aerosol-generating procedures
- Prioritize gowns/coveralls for aerosol-generating procedures
- Consider using one mask per shift if not grossly soiled or damaged

Ingestion, Poisonings, Overdoses

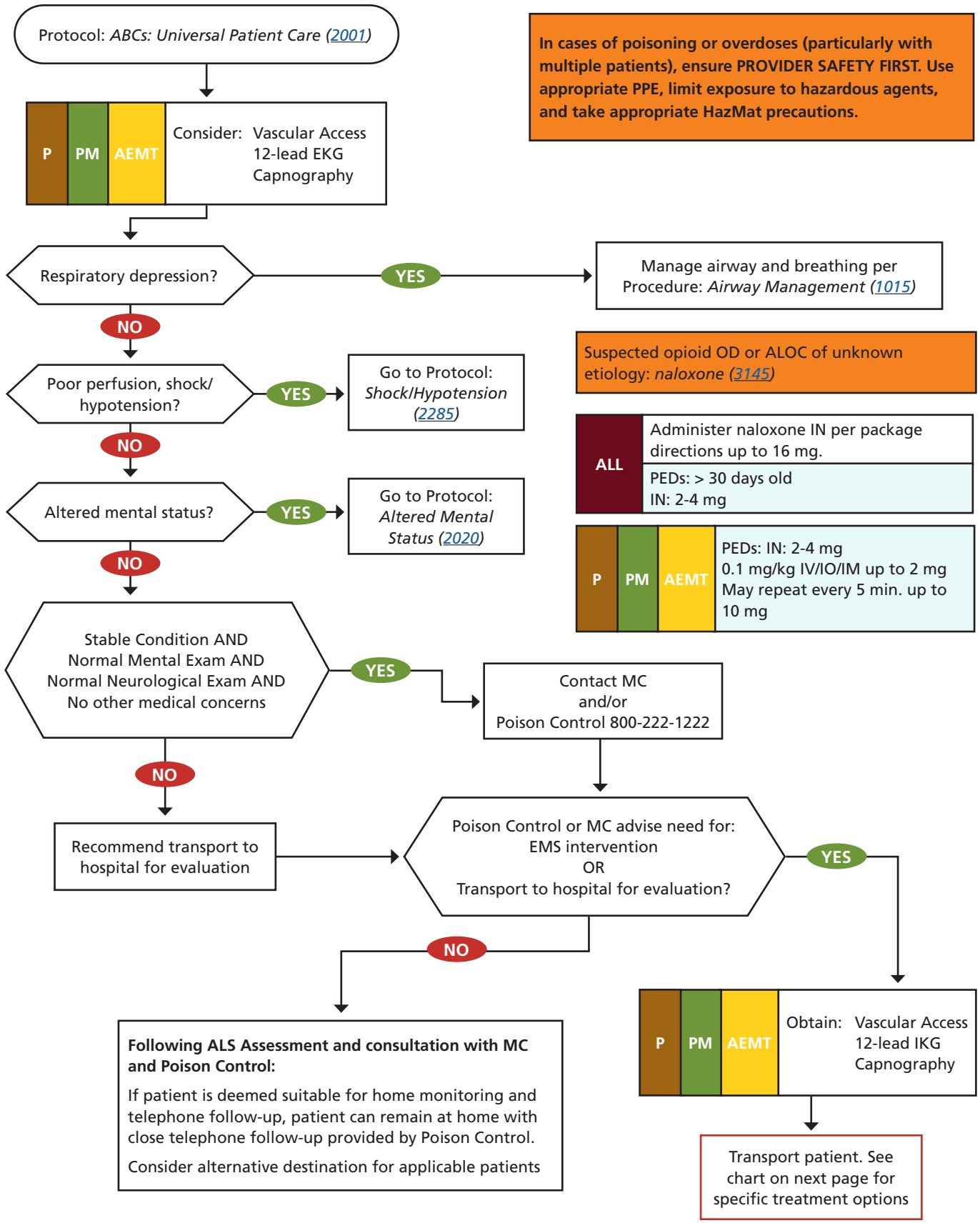
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Ingestion or suspected ingestion of a potentially toxic substance • Substance ingested, route, quantity • Time of ingestion • Reason (suicidal note, accidental, criminal) • Available medications and/or toxins in home? • Patient vomiting?	• Airway, lung sounds • Mental status changes • Hypotension/hypertension • Decreased respiratory rate • Tachycardia, dysrhythmias • Seizures • Track marks • Vomiting • Pupils PERRL? • Route of exposure: ingestion, inhalation, absorption, or injection.	• Tricyclic antidepressants (TCAs) such as Amitriptyline and Nortriptyline • Acetaminophen • Aspirin • Depressants • Opiates • Anti-psychotics • Diphenhydramine • Stimulants • Anticholinergic • Cardiac medications (Beta blockers, calcium channel blockers, digoxin/ lanoxin) • Solvents, alcohols, cleaning agents • Insecticide/organophosphate poisoning • Caustic agents (agents with a high/basic pH) • Other.

SPECIAL CONSIDERATIONS

- **Be very cautious with any contamination/decontamination, especially with organophosphate poisoning. Providers can rapidly become patients.**
- Consider contacting Medical Control early. Contact Poison Control if needed 800-222-1222.
- Medication supplies needed for Organophosphate Poisoning (atropine) or Beta Blocker Overdose (glucagon) will exceed the amount carried by a single ambulance. Arrange for additional medication ASAP.
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Beware of possible co-ingestions (polypharmacy)—that is, it is not uncommon for an overdose victim to mix drugs and alcohol.
- Bring patient's medications, possible intoxicants (including bottle or container) and emesis to ED with patient.
- Consider restraints if necessary for patient's and/or personnel protection. See Procedure: *Restraint of Patients (1390)*.
- Organophosphates come in a liquid or powder form, are absorbed through the skin, and are found near farms or gardens. **ABSLUDGEM: A**ltered mental status, **B**reathing difficulty, bradycardia, **S**alivation, sweating, seizures, **L**acrimation, **U**rination, **D**efecation, diarrhea, **G**I upset/cramping, **E**mesis/vomiting, **M**iosis/muscle activity/twitching. Usually presents with more than one symptom. **DUMBBELS:** Diarrhea, Urination, Miosis, Bradycardia, Bronchospasm, Emesis, Lacrimation, Seizures

	Respirations	Heart Rate	BP	Temp.	Mental Status	Pupils	Other
Acetaminophen	Initially normal with possible nausea/vomiting. If not detected and treated may cause irreversible liver failure.						
Depressants	Decreased	Decreased	Decreased	Decreased		Nonspecific	
Stimulants	Increased	Increased	Increased	Increased		Dilated	
Anticholinergic		Increased		Increased	Altered	Dilated	
Cardiac Meds		Dysrhythmias			Altered		
Solvents					Altered		Nausea/Vomiting
Insecticides	Increased secretions	Increased or decreased				Pinpoint	Nausea/Vomiting Diarrhea

INGESTION, POISONINGS, OVERDOSES



REMEMBER: CONTACT MEDICAL CONTROL And/or POISON CONTROL!

Antidote/Reversal agent	Indication	Notes	Dosage
Atropine Sulfate	Organophosphate/ carbamate insecticide poisoning and other cholinesterase inhibitors (e.g., warfare agents); bradycardia induced by a variety of toxins	May require large amounts in severe cholinesterase inhibitor poisoning.	ADULT: IV/IO 2 mg Repeat dose every 5 minutes prn secretions (no max dose) PEDs: IV/IO 0.04 mg/kg (Min dose 0.1 mg, Max single dose 2 mg) Repeat dose every 5 minutes prn secretions (no max dose)
Glucagon	Beta blocker/calcium channel blocker poisoning	Anticipate nausea and vomiting	ADULT: IM/IN/IV/IO 2 mg May repeat every 5 mins. for bradycardia/hypotension (shock) PEDs: IM/IN/IV/IO 0.06 mg/kg May repeat every 5 mins. for bradycardia/hypotension (shock)
Naloxone	Opioid overdose	Use small initial dose to avoid abrupt awakening/ withdrawal	ADULT: IN 4-16 mg titrate to effect (**Parkmedic:** IM/IV/IO) 0.4-2 mg Additional doses q 2-3 minutes prn ALOC (max 10 mg) PEDs: IN 2-4 mg **Parkmedic:** IM/IV/IO) 0.1 mg/kg Additional doses every 2-3 minutes prn ALOC (max 10 mg)
Sodium Bicarbonate	Sodium channel blocker ("membrane stabilizer") toxicity and urinary alkalinization Consider in overdoses of: • Tricyclic Antidepressants • Salicylate (aspirin) • Seizures • Diphenhydramine • Any wide-complex tachycardia	IV bolus dosing for reversal of sodium channel blocker toxicity; monitor alkalemia	ADULT: IV/IO 1 mEq/kg (max 50 mEq) SIVP, consider serial ECGs to titrate to effect (narrowing of QRS) PEDs: Contact MC

2235

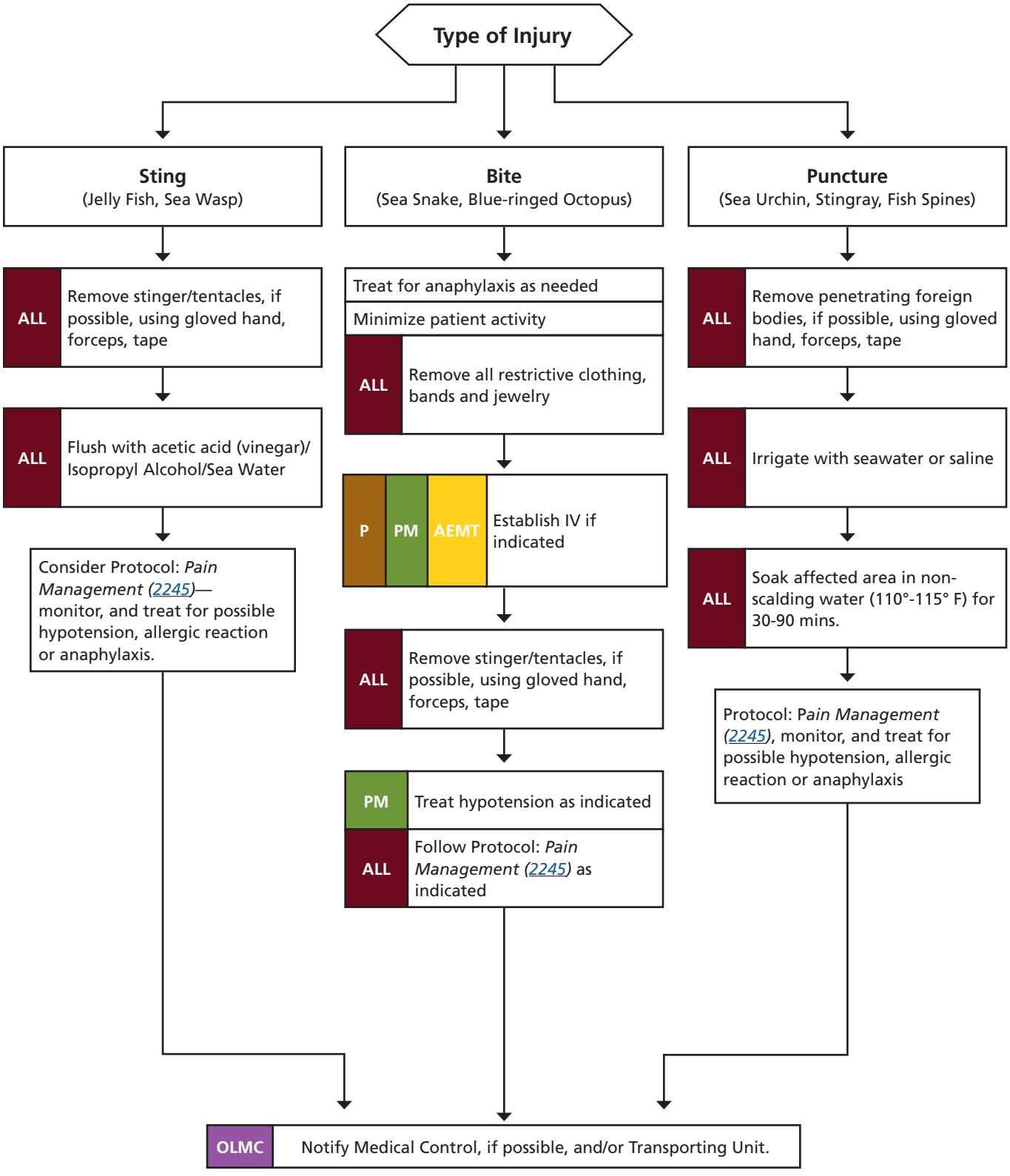
Marine Envenomations

Past Medical History	ASSESSMENT	Differential
• Patient is in marine environment or exposed to exotic aquarium animal • Respiratory distress or ventilatory failure	• Respiratory status, may have ventilatory failure • Nausea, vomiting • Progressive mental status changes including confusion • Paralysis • Ascending limb edema	• Anaphylaxis • Soft tissue infection • Nonmarine envenomation

SPECIAL CONSIDERATIONS

- Urgent evacuation should be done if evidence of severe envenomation (cardiovascular collapse, anaphylaxis, paralysis, ascending edema of limb).
- Envenomation results from stings by jellyfish, fire corals, sting rays, sea urchins, bristle worms, fish spines, sea snakes, etc.
- Sea snake venom is 2-10 times more potent than cobra venom, but only about 25% of those bitten develop symptoms due to snake's inefficient delivery system and small mouth.
- Sea snakes may have a latent period of 10 minutes to several hours between the bite and onset of symptoms. May initially present with mental status changes progressing to nausea, vomiting, paralysis—leading to respiratory distress/failure.
- Blue ringed octopus bites are painless and may go unnoticed. Patient may become paralyzed with respiratory distress.
- Symptoms are usually rapid in onset and extremely variable in severity.
- HOT, but tolerable seawater/saline (at least 110 °F will deactivate the proteins) to wash the wounds out.
- Check on proper application of compression wrap.
- Elevate to level of heart.
- Application of tap water (hypotonic fluids) may trigger additional injection of toxins into skin stung by marine animals. Irrigation with ocean water or 3% saline is preferred, though 0.9% (Normal Saline) is acceptable.
- Venom (TTX) from the blue-ringed octopus often requires respiratory support due to diaphragmatic paralysis.

MARINE ENVENOMATIONS



Nerve Agent Exposure

NOTE: Autoinjectors are approved at all EMS levels with appropriate training.

Past Medical History	ASSESSMENT	Differential
• Exposure to Nerve Agent • Note that multiple patients with pinpoint pupils suggest nerve agent exposure	• Miosis (pinpoint pupils) • Copious secretions • Bronchospasm • Chest tightness • Respiratory failure • Muscle twitching • Flaccid paralysis • Seizures • Confusion • Coma • Nausea, vomiting, cramps, diarrhea	• Minor exposure may mimic URI • Minor exposure may produce symptoms of "narrowing vision" • GI symptoms may be only symptoms and can vary by age • Opioid abuse or overdose

SPECIAL CONSIDERATIONS

- Nerve agents are the most toxic of known chemical warfare agents. They are chemically similar to organophosphate pesticides.
- Nerve agents can cause loss of consciousness and convulsions within seconds and death from respiratory failure within minutes of exposure.
- A nerve agent is a highly toxic systemic poison that is absorbed well by inhalation and through the skin. Victims exposed only to nerve agent vapor do not pose secondary contamination risks to rescuers, but do not attempt resuscitation without a barrier. Victims whose clothing or skin is contaminated with liquid nerve agent can secondarily contaminate response personnel by direct contact or through off-gassing vapor. Avoid dermal contact with nerve agent contaminated victims or with gastric contents of victims who may have ingested nerve agent-containing materials.

Volatile Nerve Agents (vapor)

- Vapor is readily absorbed by inhalation and ocular contact, producing rapid local and systemic effects.
- DO NOT attempt resuscitation without a barrier.

Low Volatility Agents (liquid)

- Liquid nerve agents are readily absorbed through the skin; effects may be delayed for several minutes

PPE Required: LEVEL A:
https://chemm.hhs.gov/na_prehospital_mmg.htm#top

Precautions

- Many of these symptoms can be caused by other chemicals commonly seen in marijuana gardens. Care should be taken to rule out other causes of symptoms before administering autoinjector.
- Organophosphate poisoning requires large amounts of atropine; there is no maximum dose.
- Call to obtain more doses early.
- Titrate until bronchial secretions are controlled.
- Atropine inhibits sweating which can lead to hyperthermia and heat injury. To the extent feasible, avoid excessive heat exposure.

TRIAGE FOR NERVE AGENT CASUALTIES

Immediate (1)	Effects: Unconscious, talking but not walking, moderate to severe effects in two or more systems (e.g., respiratory, GI, cardiac arrest, muscular, CNS)
	Clinical Signs: seizing or postictal, severe respiratory distress, recent cardiac arrest
Delayed (2)	Effects: recovering from agent exposure or antidote
	Clinical Signs: diminished secretions, improving respiration
Minimal (3)	Effects: walking and talking
	Clinical Signs: pinpoint pupils, runny nose, and mild to moderate difficulty breathing
Expectant (4) (limited resources)	Effects: Unconscious
	Clinical Signs: Cardiac/respiratory arrest of long duration

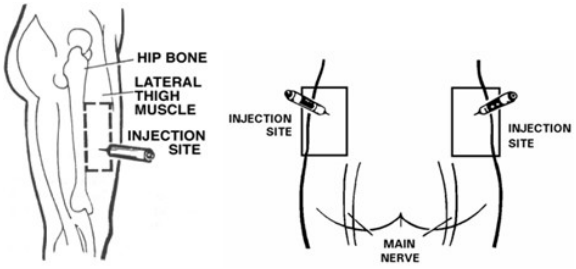
NAAK: Nerve Agent Antidote Kit

MARK 1 KIT ADMINISTRATION:

Medications: **Atropine** (*3035*) Autoinjector 2 mg in 0.7 mL and
Pralidoxime (2-PAM) (*3168*) Autoinjector 600 mg in 2 mL

INJECTION SITE SELECTION

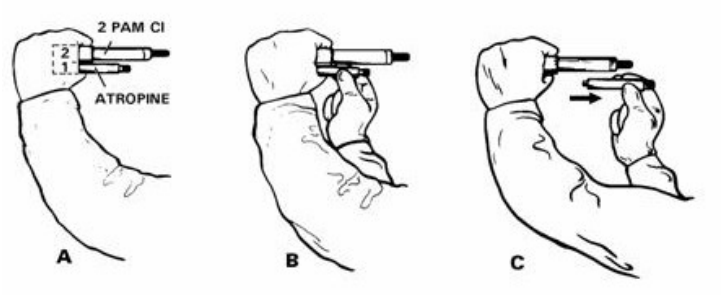
1. Injectors must be given in a large muscle, with the most common site being the lateral thigh.



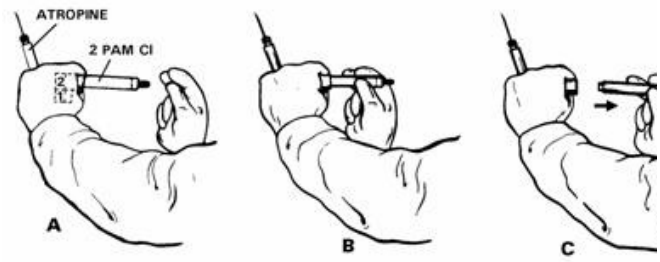
ANTIDOTE ADMINISTRATION

Administer up to **3** Mark 1 kits as needed.

1. Remove the kit from protective pouch
2. Grasp the **atropine** autoinjector (smaller of the two) and remove from slot 1 of plastic clip
   A. The yellow safety cap remains in the clip and the injector is now **armed**.



3. Grasp the unit and position the green tip into the victim's injection site, apply firm even pressure to the injection site (DO NOT JAB), hold in place for 10 seconds. Carefully remove the device and dispose of properly (sharp is exposed)
4. Remove the **2-PAM** injector from slot 2 of the clip and administer the same way.



DuoDote: Nerve Agent Antidote

DuoDote ADMINISTRATION

- Do Not Remove Gray Safety Release until ready to use.
- Never touch the Green Tip (Needle End)!

1. Tear open the plastic pouch at any of the notches. Remove the DuoDote autoinjector from the pouch.
2. Place the DuoDote autoinjector in your dominant hand. (If you are right-handed, your right hand is dominant.) Firmly grasp the center of the DuoDote autoinjector with the Green Tip (needle end) pointing down.
3. With your other hand, pull off the Gray Safety Release. DuoDote is now ready to be administered.
4. The injection site is the mid-lateral thigh area. The DuoDote autoinjector can inject through clothing. However, make sure pockets at the injection site are empty. People who may not have a lot of fat at the injection site should also be injected in the mid-lateral thigh, but before giving the injection, bunch up the thigh to provide a thicker area for injection.
5. Firmly push the Green Tip straight down (a 90° angle) against the mid-lateral thigh. Continue to firmly push until you feel the DuoDote autoinjector trigger. After the autoinjector triggers, hold the DuoDote autoinjector firmly in place against the injection site for approximately 10 seconds.
6. Remove the DuoDote autoinjector from the thigh and look at Green Tip. If the needle is visible, the drug has been administered. If the needle is not visible, check to be sure the Gray Safety Release has been removed, and then repeat above steps beginning with Step 4, but push harder in Step 5.
7. After the drug has been administered, push the needle against a hard surface to bend the needle back against the DuoDote autoinjector.
8. Put the used DuoDote autoinjector back into the plastic pouch, if available. Leave used DuoDote autoinjector(s) with the patient to allow other medical personnel to see the number of DuoDote autoinjector(s) administered.
9. Immediately move yourself and the patient away from the contaminated area and seek definitive medical care for the patient.

Pain Management

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Age • Location • Duration • Severity (1-10) • Medications • Drug allergies	• Physical exam: Inspect, Palpate, Auscultate • Onset • Palliative/Provocative factors • Quality (Feels like?) • Radiates/Refers • Severity (0-10) • Time (is this the first time?)	• Reference specific protocol • Musculoskeletal • Visceral (abdominal) • Cardiac • Pleural/Respiratory • Neurogenic • Renal (colic)

SPECIAL CONSIDERATIONS

- Pain severity (0-10) should be recorded at initial contact as well as before and after medication administration.

- A full set of vital signs and mental status should be recorded 3-5 minutes before and after pain medication administration.
- To administer opioids, SBP > 100 or appropriate for age and normal mental status of patient.
- Fentanyl and morphine can cause respiratory depression that is reversible with naloxone. Respiratory depression is exacerbated by underlying lung diseases and use of other respiratory depressant drugs so it should be used with caution with patients with known asthma or COPD.
- Fentanyl and morphine should be used cautiously at altitudes > 8,000 ft due to possible respiratory depression.
- If administered rapidly in very large doses, fentanyl can cause muscle spasm and chest wall rigidity.
- The action of fentanyl is prolonged and its elimination slower in the elderly. Smaller maintenance doses are advisable.
- Fentanyl must be used cautiously in patients who have already received morphine.
- For IV administration, ketamine must be diluted with equal amount of sterile water or saline. Dilution in a 100 mL bag and given over 5+ minutes is preferred administration route for pain management use of ketamine.
- Ketamine provides strong analgesia with minimal risk for respiratory depression or hypotension. Ketamine may be co-administered with narcotics or midazolam in some patients (contact MC).
- Ketorolac is a potent NSAID and has been shown to be a safe and effective in patients with kidney stones (renal colic).
- Do not use ketorolac if you suspect internal bleeding, renal failure (CKD stage 4), or in patients with acute coronary syndrome (cardiac chest pain, MI). Be cautious in the elderly as many have comorbidities. Limit use in severe dehydration.
- See individual medication pages and protocols for specific pain control considerations.
- Individual units may have different opioid or pain medication options, such as hydromorphone for prolonged transport.

PAIN MANAGEMENT

Protocol: *ABCs: Universal Patient Care (2001)*

Cardiac Chest Pain?

YES → Go to Protocol: *Chest Pain (2150)*

NO

P	PM	AEMT	Consider: Vascular Access

Nausea/vomiting (or history with narcotic adminstration?

YES →

P	PM	IV/IM, 4 mg, may repeat 1x (8 mg total)
		PEDs: IV: ≤ 40 kg, 0.1 mg/kg; > 40 kg, 4 mg

NO

ALL	For Nausea/Vomiting Consider: *Ondansetron (3165)*, 4 mg PO ESOP
	PEDs: ODT, Age ≤ 4 yrs, 2 mg PO ESOP; ≥ 5 yrs, 4 mg PO ESOP

Consider analgesics: Consider contacting MC for pain management recommendations OR choose the most appropriate medication from below and proceed.

Mild to Moderate Pain

EMT	*Acetaminophen (3005)* PO: 650-1000 mg every 4 hours up to 4000 mg in 24 hours
	PEDs: 15 mg/kg up to 650 mg may repeat every 4 hours

EMT	And/or *Ibuprofen (3105)* PO: 400-800 mg every 4 hours
	PEDs: 10 mg/kg up to 200 mg - should be able to swallow tablets; may repeat every 6 hours

P	PM	Consider *Ketorolac (Toradol® - NSAID) (3120)*
		15 mg IV or 30 mg IM if prolonged care scenario; may repeat in 6 hours
		PEDs: > 30 kg: same as adult contact MC if < 30 kg

OLMC	P	PM	Consider other opioid/narcotic medications Morphine: 2-5 mg IV/IO q 15 min. up to 20 mg Hydromorphone: 0.5-1 mg IV/IO q 30 min. up to max 2 mg
			PEDs: Contact medical control for pediatric dosing of other opioids

Severe Pain

P	PM	Consider: *Ketamine (3115)*
		IV/IO 0.3 mg/kg: mix in 100 mL NS infuse over 5 min. may repeat q 15 min. prn: recommend Medical Control contact may advance to total of 2 mg/kg if communication failure: IM: 1 mg/kg may repeat as above
		PEDs: same as adult

P	PM	Consider Opioids
		Fentanyl: 25-50 mcg IV/IO/IN OR: 50-100 mcg IM May repeat q 15 min. up to 200 mcg
		PEDs: 1 mcg/kg IV/IO/IN up to 50 mcg max 2 mcg kg IM up to 100 mcg may repeat in 15 min. 1x

Fentanyl effective?

NO →

YES →

OLMC	P	PM	Continue fentanyl administration

Prolonged Field Care (PFC)

It is imperative to document all exams and interventions with time and reassessments.

Establish early and frequent contact with Medical Control.

GENERAL APPROACH TO PATIENT MANAGMENT

- The MARCH algorithm is designed for the provider to **stop and perform interventions** at each step before proceeding. See also Protocols: *ABCs: Universal Patient Care (2001)* and *Trauma (2300, 2302, 2305, 2307)*.
- The AVPU acronym is utilized for assessing and reassessing gross mental status. Reassess frequently per below.
- MARCH-PAWS-L and AVPU acronyms are meant to be used upon initial stabilization of a patient, and for frequent reassessments per below.
- Every attempt should be made to protect patient from hypothermia (either through blood loss or environmental), or cooled if hyperthermic.
- Proceed to a thorough secondary survey of the patient (i.e., Head to Toe and SAMPLE) and continue to monitor vital signs (document trend).

INITIAL EVALUATION

- Perform initial evaluation and stabilization using: MARCH PAWS L + AVPU

MARCH-PAWS-L

Massive hemorrhage
Airway management
Respiratory management
Circulation/**C**ommunications (additional help/resources)
Hypo/**H**yperthermia & **H**ead injury (**H**ike/**H**elicopter Extrication)

Pain Control
Antibiotics
Wounds (expose & ongoing care, including burns)
Splinting

Logistics (monitoring & reassessment; transport preparation, triage, etc.)

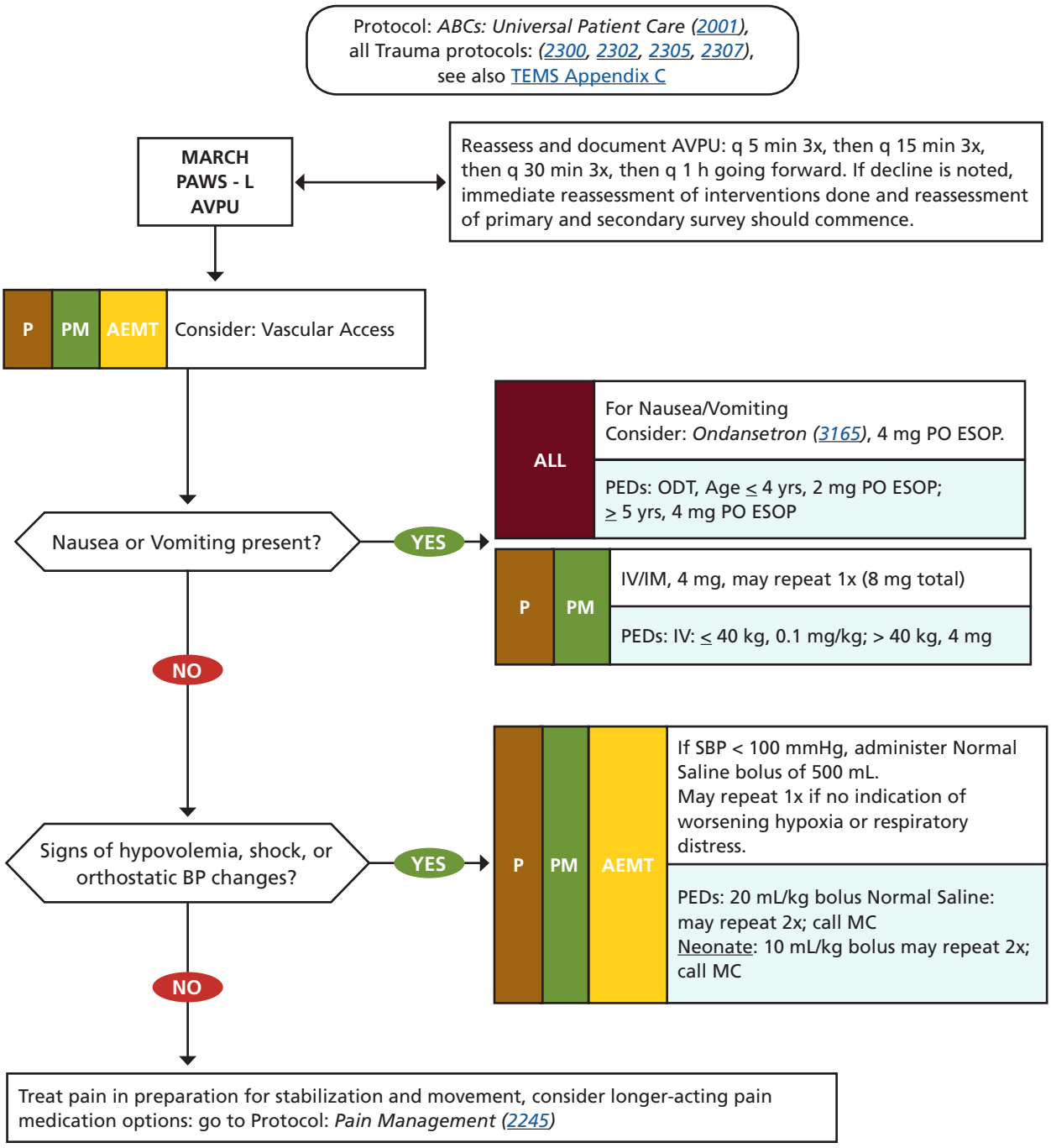
AVPU (Level of Consciousness)

A Patient is **ALERT**
V Patient not alert, but responds to **VERBAL** command
P Patient not alert, responds to **PAIN**
U Patient is **UNRESPONSIVE**

Frequent, timed reassessments are required.

NOTE: This protocol is not meant to be a complete, but rather a guideline to the best practices for the care of a patient in a prolonged out of hospital austere environment.

PROLONGED FIELD CARE (PFC)



PROLONGED FIELD CARE (PFC)

Perform as per your scope

Monitor:
- Charting of BP, HR, pulse ox, and urine output q 30 minutes.
- Chart evaluation of tissue/compartments adjacent and distal to any suspected splinted fractures.
- AVPU assessments.
- Time/dose/name of medication used.
- Bolus hydration unless otherwise treating for specific pathology (e.g., burn, rhabdomyolysis, trauma) as needed.
- IV/oral fluids to support urine output and vital signs.
- Maintain normal body temperature.

Resuscitate:
- Proceed with appropriate IV/oral fluids.
- Consider IV fluid bolus resuscitation if indicated.
- Attempt to convert tourniquets if possible.

Monitor urine output with a goal of 1 mL/kg/h.

↓

General prolonged care:
- Clean and redress wounds every 24 h.
- Pad pressure areas.
- Head elevated or patient tilt 30 degrees.
- Monitor/maintain patient's urine output and defecation while maintaining cleanliness.
- Move limbs passively to maintain range of motion (ROM) (unless immobilized/splinted).
- Continue treatment with documentation.

↓

See next page for specific prolonged field care situations.
See specific injury protocols for further guidance.

↓

Environmental Considerations, Package and Prepare for Evacuation:
- Anticipate and prevent hypothermia/hyperthermia – see protocols: *Hypothermia (2220), Hyperthermia (2210)*.
- Be familiar with all ground/air/water evacuation options.
- Anticipate a need for multiple evacuation options.
- Be familiar with all available options such as helicopter and hoist, fixed wing, boat and LZ availability.
- Anticipate patient motion sickness (preventative medications to control nausea).
- Anticipate patient need for eye/ear/head/face protection.
- Assure all documentation of care goes with patient.

WOUNDS AND EXTREMITY PROLONGED CARE

- Wounds: Irrigate with potable clean water and dress with sterile dressings.
- Splint: Evaluate for pulse below injury as well as signs of poor perfusion (below) and determine if immediate reduction is needed.
  - » Splint in place and position of comfort, sling where appropriate.
  - » Monitor q 30 minutes for any signs of compartment syndrome (below).
- Antibiotics: Choose the longest-acting antibiotic appropriate for injury if indicated – refer to both EMS and IMS available medications.

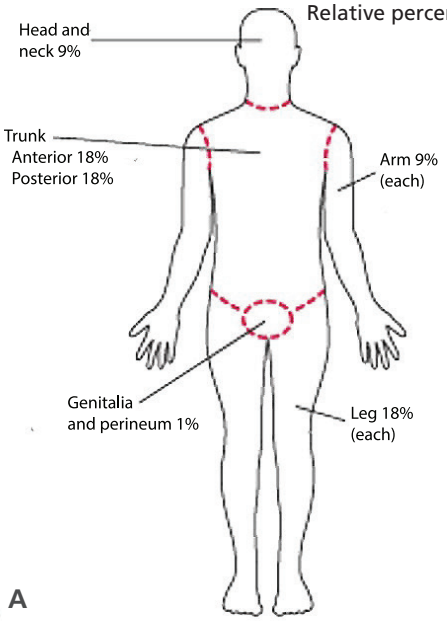
Compartment Syndrome Signs
Pain (with passive movement)
Parasthesia (decreased sensation)
Pallor (pale skin)
Paralysis (new weakness)
Pulselessness (new)

Signs of Poor Tissue Perfusion
- Pale or dusky skin compared to other skin of patient.
- Delayed capillary refill (> 3 s) compared to opposite limb.
- Isolated mottling of skin below fracture site.
- Poor sensation below fracture site.

PROLONGED FIELD CARE (PFC)

BURNS PROLONGED CARE

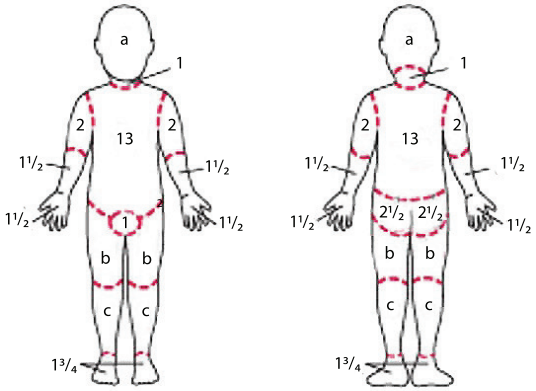
- Determine % BSA burned.
- Irrigate burns less than 20% BSA for 20 minutes with potable water if possible.
- Dress with clean/sterile dressing preferably.
- Protect against hypothermia.
- Calculate fluid needs per Protocol: *Burns (2040)* and ongoing requirements.



A

Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	**0 yr**	**1 yr**	**5 yr**	**10 yr**	**15 yr**
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4



B

Shortcut Burn Fluids for ADULTS

- Rate of mL/h of LR = % TBSA (round to nearest 10) x 10
- Add 100 mL/h for every 10 kg over 80 kg body weight
- Titrate rate by 10-25% hourly by monitoring perfusions and urine output

PAIN/SEDATION/ANALGESIA/ANXIETY

- As first line local treatment: consider elevation, ice, compression, splinting as these help significantly with pain.
- Within scope, consider acetaminophen (Tylenol®), ibuprofen (Motrin®/Advil®) for pain.
- Conversation and distraction help with anxiety.
- Escalation to controlled substance for pain and anxiety as per scope of practice and medication availability.
- Utilize online/offline medical direction for any escalation of pain/sedation/anxiolytic medication use.

RHABDO/CRUSH PROLONGED CARE

Also see Protocol: *Trauma - Crush Injury (2302)*, *Rhabdo (2270)*

- If situation dictates prolonged field care prior to transport: IV saline or LR bolus of 1-2 L followed by 200 mL/h over the next 4 hours.
- Monitor urine output: if 2 mL/kg/h, continue 200 mL/h fluids; if little urine output after 4 hours, stop IV fluids (kidneys likely already compromised).
- For cardiac arrest in the setting of crush injury or rhabdo, give calcium gluconate 2 grams and 50 mEQ sodium bicarb.

Respiratory Distress Overview

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Asthma, COPD, chronic bronchitis, emphysema, congestive heart failure • Home treatment (oxygen, nebulizer, CPAP) • Medications (theophylline, steroids, inhalers) • Toxic exposure, smoke inhalation • Pulmonary embolism risk factors: recent surgery, extended travel/immobility, cigarette smoking + oral contraceptive use, prior history of deep vein thrombosis (DVT) or PE	• Shortness of breath • Pursed lip breathing • Tripod positioning • Decreased ability to speak • Cyanosis • Increased respiratory rate and effort, diaphoresis • Wheezing, rhonchi, rales, stridor, silent chest • Use of accessory muscles • Fever, cough • Tachycardia • JVD, tracheal deviation • Drooling • Universal choke sign • Peripheral edema	• Anemia • Asthma • Anaphylaxis • Aspiration/FBAO • Cardiac (MI or CHF) • COPD • Croup • Cystic fibrosis • Early Shock • Emphysema, Bronchitis • Epiglottitis • Diabetic ketoacidosis • Hyperthyroidism • Hyperventilation/anxiety attack • Inhaled toxin (CO, etc.) • Noncardiogenic pulmonary edema (HAPE, ARDS) • Pericardial tamponade • Pleural effusion • Pneumonia • Pneumothorax • Pulmonary embolus

In every Respiratory Distress incident, always consider the following:

- Protect the airway and assist in ventilations if needed.
- Administer high flow oxygen if moderate to severe distress or altered mental status.
- Assess all vitals including temperature, lung sounds, mental status, pulse oximetry, capnography.
- A 12-lead ECG should be obtained in high-risk patients if circumstances allow.
- Absence of lung sounds, or significantly decreased lung sounds may be a sign of impending respiratory arrest ("silent chest").
- Pulse oximetry readings can be inaccurate in cases of carbon monoxide poisoning or if extremities are poorly perfused.
- Consider nerve agent/organophosphate exposure.
- Always place the patient in a position of comfort.
- If at any time the patient goes into respiratory arrest, follow the Procedure: *Airway Management (1015).*
- If the patient deteriorates to cardiac arrest, follow the Protocol: *Cardiac Arrest AED/BLS (2100).*

Classify the Type of Respiratory Distress and go to Appropriate Protocol				
Provisional Diagnosis	**Protocol**	**History**	**Sputum**	**Physical Exam**
FBAO (Foreign body airway obstruction such as food, toy)	Procedure: *Foreign Body Airway Obstruction (1110)*	Onset during meal or play	None	Grabbing neck, unable to speak, drooling
Anaphylaxis Croup Epiglottitis	*Upper Airway Obstruction - Nonmechanical (2255)*	Known allergy and exposure. Fever, drooling, sore throat.	None	Inspiratory stridor, anxious, leaning forward to breathe, drooling.
Asthma and/or COPD	*Bronchospasm/Asthma/ COPD (2260)*	PMH: asthma, emphysema, bronchitis, heavy smoking Meds: home oxygen, albuterol, prednisone	If present: Thick, may be any color	Prolonged expiratory phase with wheezes, poor air movement, little to no pitting edema. Pursed lip breathing in emphysema.
CHF Cardiogenic Pulmonary Edema	*Cardiogenic Pulmonary Edema/CHF (2265)*	PMH: CHF, MI, angina, paroxysmal nocturnal dyspnea, orthopnea. Meds: digoxin, nitro-glycerin, BP meds	May be watery/ foamy white or pink/blood-tinged	Wheezes or rales (crackles), pitting edema in legs, distended neck veins. Typically have very elevated BP
Pneumonia	Consider Procedure: *Airway Management (1020);* Protocol: *General Illness/Fever (2205)*	Any age. Progressive SOB with cough, fever, chills, sputum. May be on antibiotics	Thick, any color	Asymmetric or localized rales (crackles), may have mild wheezing, no peripheral edema.
Pulmonary Embolus	Consider Procedure: *Airway Management (1020)*	Sudden onset SOB	None to Bloody	Tachypneic, low SpO_2 that does not improve with oxygen administration. Tachycardia common

Respiratory Distress: Upper Airway Obstruction Nonmechanical

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Croup or epiglottitis: Fever, drooling, sore throat • Anaphylaxis: Known allergy and exposure	• Ability to speak • Temperature • Mental status • Croup or epiglottitis: Inspiratory stridor, anxious, leaning forward to breathe, drooling • Anaphylaxis: Airway edema, chest tightness, low BP. • Look for urticaria	• Asthma • Anaphylaxis • Diabetic ketoacidosis • Early shock • Emphysema, bronchitis, croup/epiglottitis • Pneumonia • Pulmonary embolus • Pneumothorax • Pericardial tamponade • Hyperventilation/anxiety attack • Inhaled toxin (CO, etc.), drug abuse • Hyperthyroidism • Anemia

SPECIAL CONSIDERATIONS

- Pulse oximetry should be monitored continuously if initial saturation is less than 96% or if there is a decline in patient's status despite normal pulse oximetry readings.
- Absence of lung sounds, or significantly decreased lung sounds may be a sign of impending respiratory arrest.
- Pulse oximetry readings can be inaccurate in cases of carbon monoxide poisoning.
- Interruptions to patient ventilations should not exceed 30 seconds in duration.
- Consider air transport if febrile child, severe distress, or unstable vitals.
- **Medical Control contact must be attempted prior to patient release.**

RESPIRATORY DISTRESS: UPPER AIRWAY OBSTRUCTION NONMECHANICAL

Protocol: *ABCs: Universal Patient Care (2001)*
Ensure patient is in position of comfort.
If at any time the patient experiences respiratory arrest, go to Procedure: *Airway Management (1015)*

Assess Breath Sounds AND obtain patient history to determine type of respiratory problem

- **Prolonged expiration with wheezes,** poor air movement, very little to no pitting edema, pursed lip breathing in emphysema
  Go to Protocol: *Bronchospasm/Asthma/COPD (2260)*
- **Wheezes or rales (crackles),** pitting edema in legs, or distended neck veins typically have very elevated BP.
  Go to Protocol: *Cardiogenic Pulmonary Edema/CHF (2265)*
- **Asymmetric or localized rales (crackles)** may have mild wheezing, no peripheral edema, fever.
  Likely pneumonia, consider Procedure: *Airway Management (1015)* and Protocol: *General Illness/Fever (2205)*
- Clear breath sounds. Tachypneic, low SpO_2 that does not improve with oxygen administration.
  Likely Pulmonary Embolus, consider Procedure: *Airway Management (1015)*

Inspiratory stridor, pt anxious, leaning forward to breathe, drooling is likely: UPPER AIRWAY OBSTRUCTION

Sudden onset while eating or playing with toys (PEDs), no other symptoms?

- NO → UPPER AIRWAY OBSTRUCTION NONMECHANICAL
- YES → Go to Procedure: *Foreign Body Airway Obstruction (1110)*

Consider Protocol: *Allergic Reaction/Anaphylaxis (2015)*

Consider nebulized epinephrine

P, PM	0.5 mg (mL) of 1 mg/mL epinephrine mixed with 2-4 mL NS. May repeat nebulized dose q 15 min.
	PEDs: same as adult

Epinephrine (3070), 1 mg/mL (1:1000)

ALL	All ages: 0.3 mg via autoinjector
	PEDs: < 25 kg 0.15 autoinjector
	0.3 - 0.5 mg IM Repeat 1x in 10 min. prn
	PEDs: < 25 kg 0.15 mg IM Infants: < 5 kg 0.01 mg/kg IM

P, PM, AEMT — Consider: Vascular Access

P, PM	*Dexamethasone (3050)* 10 mg IV/IO/IM/PO
	PEDs: 0.6 mg/kg up to 6 mg IV/IO/IM/PO

Worsening or no improvement?

YES →

Epinephrine (3070), 1 mg/mL (1:1000)

OLMC, ALL	All ages: 0.3 mg via autoinjector
	All ages: repeat IM dose q 10 min. until severe symptoms resolve: contact MC

Worsening or no improvement?

YES → Go to Procedure: *Airway Management (1015)*

Respiratory Distress: Bronchospasm/Asthma/COPD

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Asthma • COPD, chronic bronchitis, emphysema • Congestive heart failure • Home treatment (oxygen, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure • Smoke inhalation • History of meth/cocaine use • History of prior MI, longstanding hypertension	• Prolonged expiratory phase with wheezes, poor air movement • Rales (crackles) or rhonchi may be present • Pursed lip breathing (COPD) • Increased respiratory rate and effort • Diaphoresis • Use of accessory muscles, retractions • Tachycardia • JVD, tracheal deviation • Peripheral edema	• Asthma • Diabetic ketoacidosis • Early Shock • Emphysema, Bronchitis, croup/epiglottitis • Pneumothorax • Hyperventilation/anxiety attack • Inhaled toxin (CO, etc.), drug abuse • Hyperthyroidism • Anemia • Wildlife capture drugs

SPECIAL CONSIDERATIONS

- Pulse oximetry should be monitored continuously.
- Absence of lung sounds, or significantly decreased lung sounds may be a sign of impending respiratory arrest.
- Pulse oximetry readings can be inaccurate in cases of carbon monoxide poisoning.
- Assume patients with SBP < 90 with severe CHF in respiratory distress are in cardiogenic shock.
- If poisoned by organophosphates, see Protocol: *Ingestion, Poisonings, Overdoses (2230)*.
- COPD patients are less likely to benefit from epinephrine compared to asthmatics.
- Use caution with oral medications in respiratory distress patients.
- **Medical Control contact must be attempted prior to patient release.**

RESPIRATORY DISTRESS: BRONCHOSPASM/ASTHMA/COPD

Protocol: *ABCs: Universal Patient Care (2001)*
Ensure patient is in position of comfort.
If at any time the patient experiences respiratory arrest, go to Procedure: *Airway Management (1015)*

Assess Breath Sounds AND obtain patient history to determine type of respiratory problem

- Inspiratory stridor, grabbing neck, unable to speak, drooling (choking)
  Go to Procedure: *Foreign Body Airway Obstruction (1110)*
- Inspiratory stridor, anxious, leaning forward to breathe, drooling
  Go to Protocol: *Upper Airway Obstruction - Nonmechanical (2255)*
- **Wheezes or rales (crackles),** pitting edema in legs, distended neck veins, Typically have very elevated BP.
  Go to Protocol: *Cardiogenic Pulmonary Edema/CHF (2265)*
- **Asymmetric or localized rales (crackles),** may have mild wheezing, no peripheral edema, fever.
  Likely pneumonia, consider Procedure: *Airway Management (1015)* and Protocol: *General Illness/Fever (2205)*
- Clear breath sounds. Tachypneic, low SpO_2 that does not improve with oxygen administration.
  Likely Pulmonary Embolus, consider *Airway Management (1015)*

Prolonged expiratory phase with wheezes, poor air movement, little to no pitting edema OR pursed-lip breathing in emphysema (COPD) is likely BRONCHOSPASM

Albuterol (3020)

EMR	Albuterol inhaler 2-4 puffs.
EMT	Albuterol inhaler or 2.5 mg in 3 mL NS nebulized
P, PM, AEMT	Albuterol 2.5 mg in 3 mL NS nebulized Consider: Vascular Access CPAP (Parkmedic) For severe COPD: may need to go to Procedure: *CPAP (1090)* first

Patient improved? — YES

NO

EMR	Albuterol inhaler 2-4 puffs.
EMT	Albuterol inhaler or 2.5 mg in 3 mL NS nebulized
P, PM, AEMT	Consider: albuterol 2.5 mg in 3 mL NS WITH 3 mg ipratropium bromide mixed and AEMT nebulized

Patient improved? — YES

NO

P, PM, AEMT	Repeat albuterol 2.5 mg in 3 mL NS nebulized as needed for recurrent symptoms Consider dexamethasone (Parkmedic)

Epinephrine (3070), 1 mg/mL (1:1000)

ALL	0.3 mg autoinjector
	PEDs: < 25 kg 0.15 autoinjector
ALL	Epinephrine 0.3 - 0.5 mg IM repeat 1x in 5-10 min. prn
	PEDs: < 25 kg 0.15 mg IM Infants: < 5 kg 0.01 mg/kg IM Repeat 1x in 10 min. prn

P, PM	*Dexamethasone (3050)* 10 mg IV/IO/IM/PO
	PEDs: 0.6 mg/kg up to 6 mg IV/IO/IM/PO

Improvement? — NO

Consider: *Epinephrine (3070)*, 1 mg/mL (1:1000)

P, PM	0.5 mg (mL) of 1 mg/mL epinephrine mixed with 2-4 mL NS. May repeat nebulized dose q 15 min.
	PEDs: same as adult Epinephrine, 1 mg/mL (1:1000)

Epinephrine (3070), 1 mg/mL (1:1000)

OLMC, ALL	All ages: repeat IM dose given prior until symptoms improve

OLMC, P, PM	Consider magnesium sulfate 2 gm IV over 20 mins.
	For < 14 years old contact Medical Control for dosing.

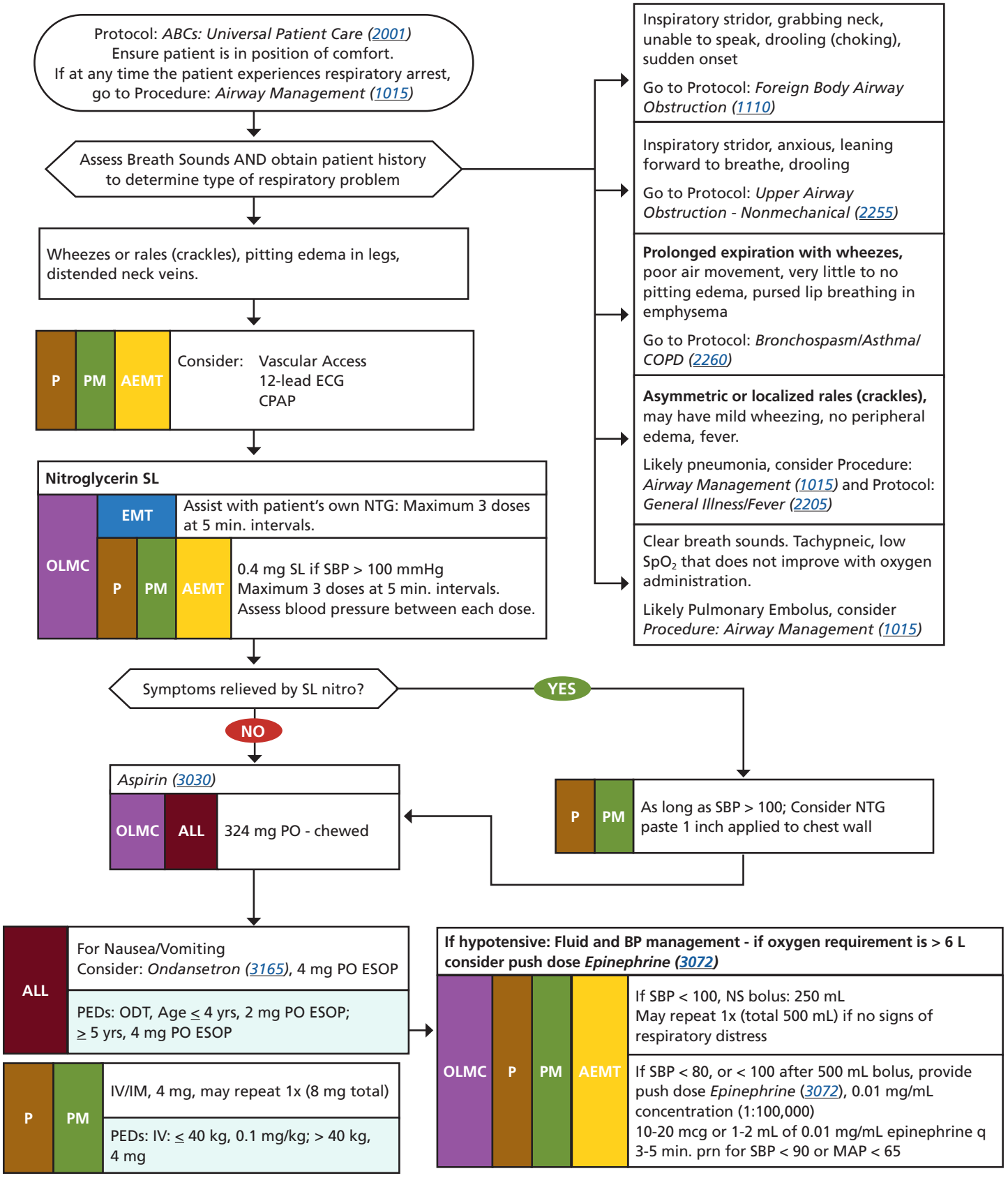
Respiratory Distress: Cardiogenic Pulmonary Edema/CHF

PAST MEDICAL HISTORY	PHYSICAL FINDINGS	DIFFERENTIAL
• Asthma; COPD—chronic bronchitis, emphysema, congestive heart failure • Home treatment (oxygen, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure, smoke inhalation	• Breath sounds = wheezes or rales (crackles) • Mental status • Cyanosis • Inspiratory/expiratory ratio • Increased respiratory rate and effort, diaphoresis • Use of accessory muscles, retractions • Chest pain • JVD, tracheal deviation • Peripheral edema	• Diabetic ketoacidosis • Early shock • Pulmonary embolus • Pneumothorax • Cardiac (MI or CHF) • Pericardial tamponade • Inhaled toxin (CO, etc.), drug abuse • Hyperthyroidism • Anemia

SPECIAL CONSIDERATIONS

- Avoid nitroglycerin in any patient who has used sildenafil (Viagra), vardenafil (Levitra), or tadalafi (Cialis) in the past 24 hours due to possible severe hypotension.
- If patient has taken nitroglycerin without relief, consider the potency of the medication.
- Consider myocardial infarction in all patients.
- Diabetics and geriatric patients often have atypical pain or only generalized complaints.
- Careful monitoring of level of consciousness, BP, and respiratory status with above interventions is essential.
- Allow patients to be in their position of comfort to maximize their breathing effort.
- **Medical Control must be contacted before patient is released.**

RESPIRATORY DISTRESS: CARDIOGENIC PULMONARY EDEMA/CHF



Rhabdomyolysis

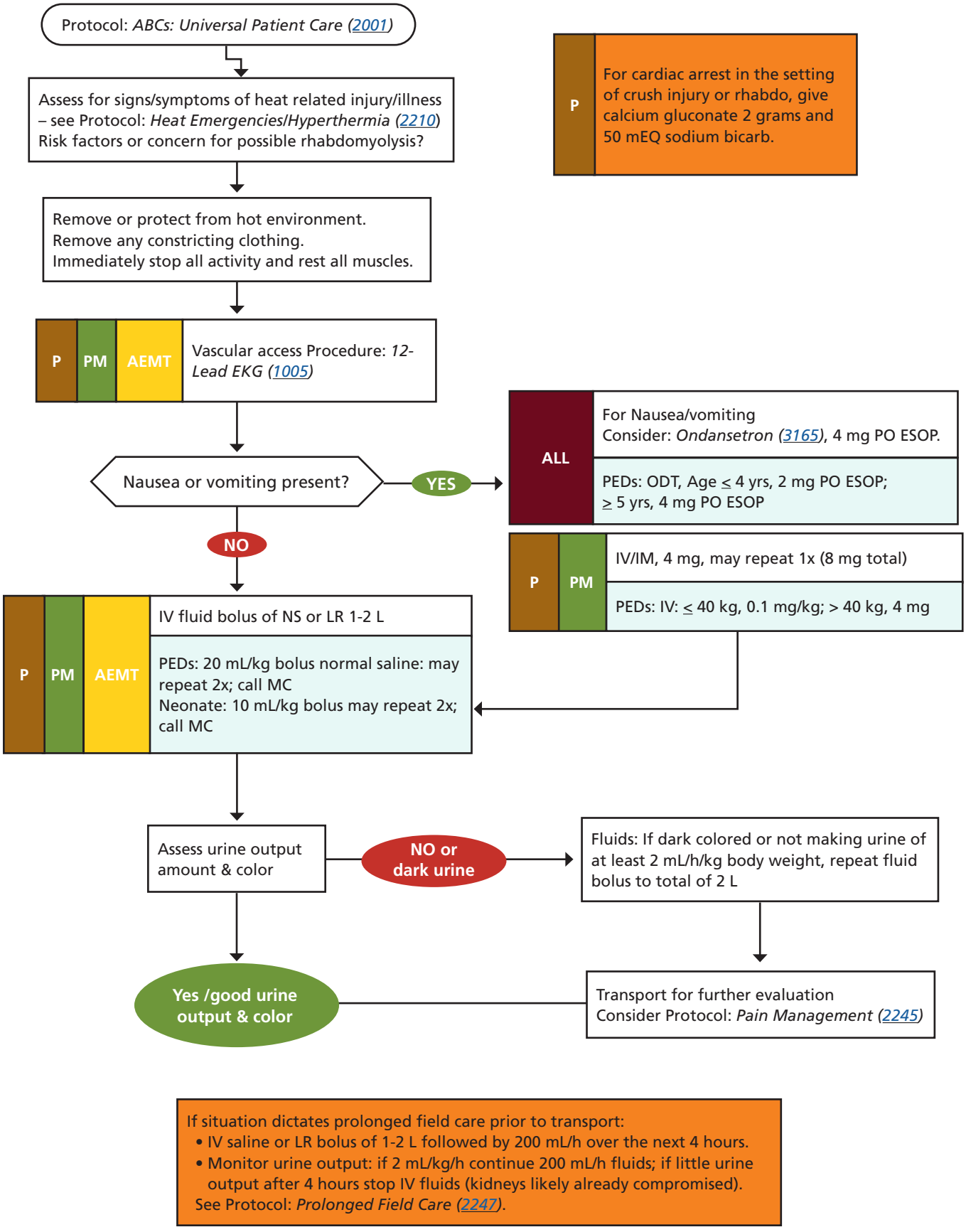
PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Work/activity history • Heat exposure • Crush injuries • Tight splints • Over-the-counter medications such as decongestants and antihistamines • Certain antibiotics • Dietary supplements such as creatine • Some weight loss products • Cholesterol lowering drugs known as statins • Excessive caffeine intake	• Muscle pain/cramping • Swelling of affected area of limb • Weakness/decreased ROM of affected limb • Dark, tea-colored urine • Evaluate any crush injuries or splints • Heart arrhythmias	• Heat cramps • Dehydration • Electrolyte imbalances • Renal failure • DVT

SPECIAL CONSIDERATIONS

Rhabdomyolysis is often mistaken for heat stress and dehydration. It can occur in well-conditioned individuals even during usual activities, so DO NOT ignore these symptoms.

- The only sure way to diagnose is to seek medical care. A serum creatine phosphokinase (CPK or CK) test to look for muscle proteins in the blood may be required.
- Do not go by symptoms alone if concerned for rhabdomyolysis.
- Severe cases of rhabdomyolysis require hospitalization to monitor the heart and kidneys and to provide emergency treatment for dangerous heart rhythms and loss of kidney function.
- High rates of intravenous fluids are needed to flush out the muscle proteins and electrolytes without damaging the kidneys.

RHABDOMYOLYSIS



If situation dictates prolonged field care prior to transport:
- IV saline or LR bolus of 1-2 L followed by 200 mL/h over the next 4 hours.
- Monitor urine output: if 2 mL/kg/h continue 200 mL/h fluids; if little urine output after 4 hours stop IV fluids (kidneys likely already compromised).

See Protocol: *Prolonged Field Care (2247)*.

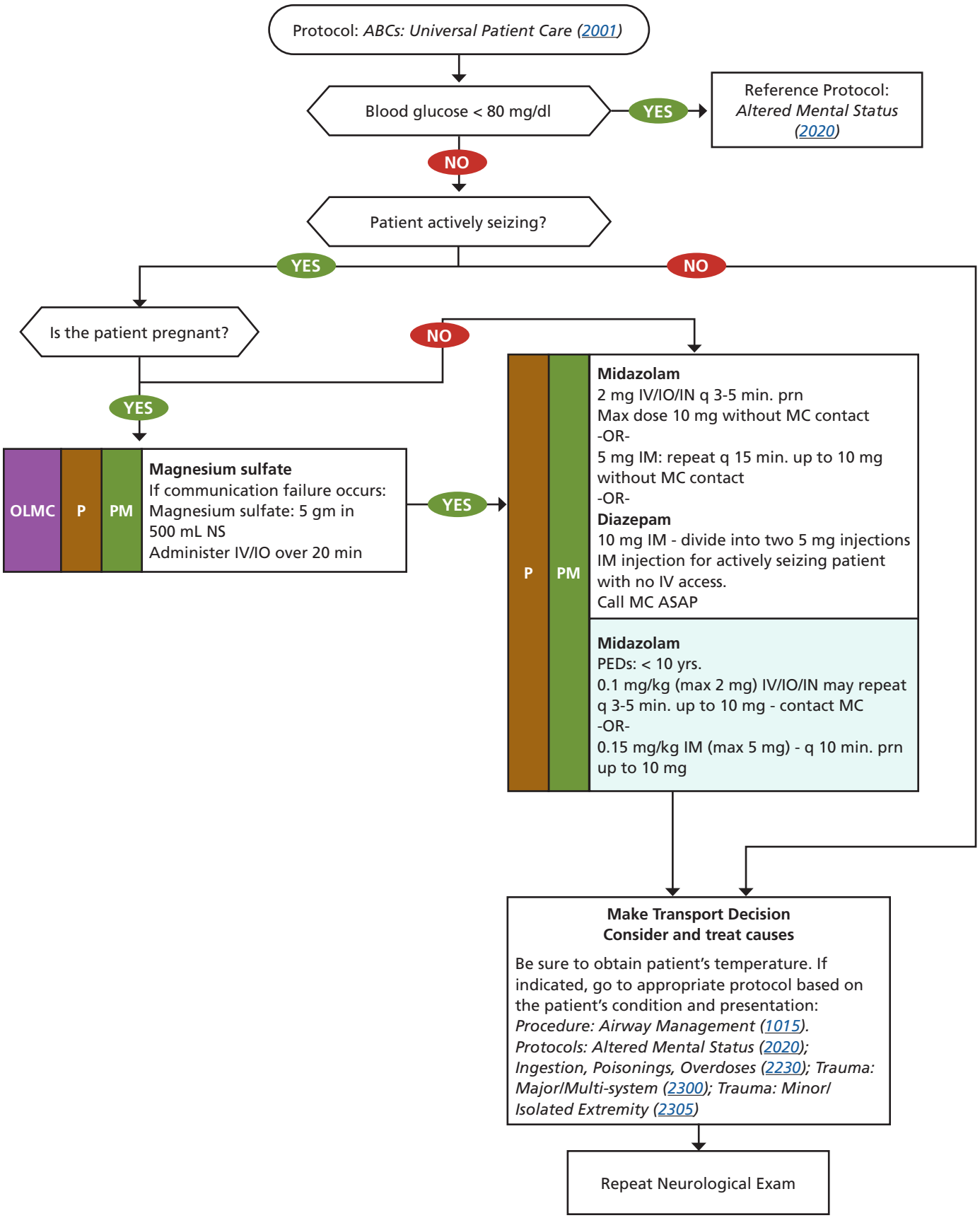
Seizure

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Reported/witnessed seizure activity • Duration and character of convulsions • Medical alert tag information • Seizure medications • History of trauma • History of diabetes • History of pregnancy • History of alcohol withdrawal	• Temperature • Decreased mental status • Sleepiness • Incontinence • Observed seizure activity • Evidence of trauma • Unconsciousness • Altered facial symmetry • Tonic/clonic activity	• CNS (head) trauma • Hypoxia • Intracranial hemorrhage or stroke • Cardiac dysrhythmia • Electrolyte abnormality (Na, Ca, Mg) • Eclampsia • Metabolic, hepatic, or renal failure • Drugs, medications, noncompliance • Infection/fever • Alcohol withdrawal • Hyperthermia • Hypoglycemia • Tumor

SPECIAL CONSIDERATIONS

- **Status epilepticus is defined as a seizure lasting more than 5 minutes or two or more successive seizures without a period of consciousness or recovery.** This is a true emergency requiring rapid airway control, treatment and transport.
- **Generalized seizures** (grand mal) are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures** (petit mal) affect only a part of the body and are not usually associated with incontinence.
- Be prepared for airway problems and continued seizures. Place in lateral decubitus position if able.
- For any seizure in a **pregnant** patient, follow the Protocol: *Vaginal/OB/GYN Emergencies (2310)*.
- If unable to gain IV access, consider the use of intranasal midazolam. See Procedure: *Mucosal Atomizer Device (1325)* for additional information.
- Patients who are not convulsing at the time of arrival should still receive a thorough assessment and evaluation. Some patients may refuse transport.
- First protect patient from complications of the seizure, then address the cause of seizure if cause is found.
- Patients without seizure history should be strongly encouraged to consent to ambulance transport for care.

SEIZURE


Protocol: ABCs: Universal Patient Care (2001)
Blood glucose < 80 mg/dl
YES
Reference Protocol: Altered Mental Status (2020)
NO
Patient actively seizing?
YES
NO
Is the patient pregnant?
NO
YES
OLMC
P
PM
Magnesium sulfate
If communication failure occurs:
Magnesium sulfate: 5 gm in 500 mL NS
Administer IV/IO over 20 min
YES
P
PM
Midazolam
2 mg IV/IO/IN q 3-5 min. prn
Max dose 10 mg without MC contact
-OR-
5 mg IM: repeat q 15 min. up to 10 mg without MC contact
-OR-
Diazepam
10 mg IM - divide into two 5 mg injections
IM injection for actively seizing patient with no IV access.
Call MC ASAP
Midazolam
PEDs: < 10 yrs.
0.1 mg/kg (max 2 mg) IV/IO/IN may repeat q 3-5 min. up to 10 mg - contact MC
-OR-
0.15 mg/kg IM (max 5 mg) - q 10 min. prn up to 10 mg
Make Transport Decision
Consider and treat causes
Be sure to obtain patient's temperature. If indicated, go to appropriate protocol based on the patient's condition and presentation:
Procedure: Airway Management (1015).
Protocols: Altered Mental Status (2020); Ingestion, Poisonings, Overdoses (2230); Trauma: Major/Multi-system (2300); Trauma: Minor/ Isolated Extremity (2305)
Repeat Neurological Exam

Shock/Hypotension

PAST MEDICAL HISTORY	PHYSICAL FINDINGS	DIFFERENTIAL
• Blood loss—vaginal or gastrointestinal bleeding, AAA, ectopic pregnancy, trauma, internal bleeding • Fluid loss—vomiting, diarrhea, fever, burns • Infection • Cardiac ischemia (MI, CHF) • Allergic reaction • Pregnancy • History of dehydration	• Altered Mental Status • Restlessness, confusion • Anxiety • Weakness, dizziness • Weak, rapid pulse • Pale, cool, clammy skin • Delayed capillary refill • Hypotension • Coffee-ground emesis • Tarry stools • JVD • Edema • Tachypnea • Shortness of breath • Oliguria (low urine output)	• Shock » Septic » Neurogenic » Anaphylactic » Hypovolemic • Ectopic pregnancy, trauma • Cardiogenic • MI, dysrhythmia • Obstructive • PE, cardiac tamponade, tension pneumothorax • Vasovagal response • Physiologic hypotension • Heat stroke • Overdose

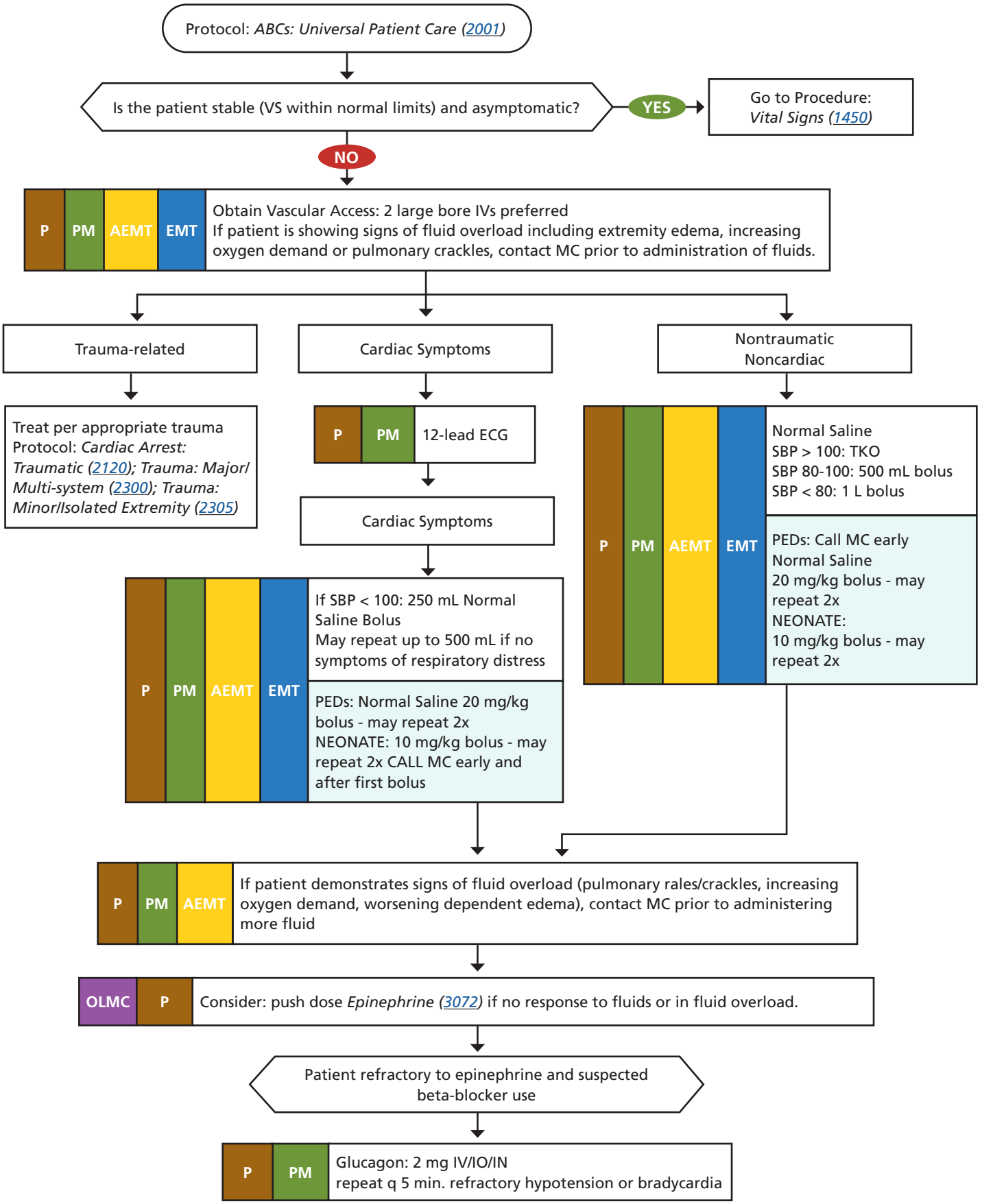
SPECIAL CONSIDERATIONS

- Hypotension can be defined as a systolic blood pressure of less than 100 mmHg in most adult patients. But adults with preexisting hypertension may be symptomatic at SBP > 100 mmHg.
- In critical trauma or medical patients, use manual blood pressure to establish a true baseline. For heart rate, if a radial pulse is too weak or cannot be felt, use the brachial pulse and palpate while taking the blood pressure. Manual blood pressures are more accurate than auto cuffs, especially in SBP ≤ 90.
- Maintaining a high index of suspicion for shock is critical. Not recognizing or treating shock could compromise an otherwise treatable patient.
- Consider shock in any patient with persistent tachycardia and cool, poorly perfused extremities.
- Children compensate for shock better than adults: tachycardia is an early sign. **Decreased blood pressure is a sign of critical, decompensated shock.**
- Consider all possible causes of shock and treat with the appropriate protocol.

Adults: Skin signs may vary from cool/moist to hot/flushed
Altered Mental Status
Tachycardia (HR > 100)
Hypotensive (SBP < 100; late sign!)

Pediatric: Skin signs may vary from cool/moist to hot flushed
Altered mental status or lethargy
Tachycardia
Delayed capillary refill

SHOCK/HYPOTENSION



TYPE/CAUSE OF SHOCK	HISTORY	PHYSICAL EXAM	PATIENT MEDICATIONS	TREATMENT CONSIDERATIONS (WITHIN SCOPE)
Cardiogenic	Heart disease, chest pain, Orthopnea, SOB, PMH: MI, angina, CHF, dialysis	Pulmonary edema (wet lung sounds), cool, diaphoretic, peripheral edema	Lasix, nitro, digoxin, beta-blocker, calcium channel blocker, ACE inhibitors, aspirin	Difficult to treat in the field. Pressors (push-dose epinephrine)
Pericardial Tamponade	MI in last 2 weeks, chest trauma, recent heart/ chest surgery, cancer, dialysis patients	Normal lung sounds, +/- muffled heart sounds, JVD	Similar to cardiogenic meds	Fluids and pressors (push-dose epinephrine)
Pulmonary Embolism	Postpartum, blood clot in leg, long car/plane ride, immobilized (cast), cancer patients	Normal lung sounds, JVD, +/- swollen leg, +/- smoker	Birth control pills, Coumadin, Eliquis, Xarelto	Fluids and pressors (push-dose epinephrine)
Tension Pneumothorax	Chest pain, SOB, recent procedure or prior pneumothorax, lung disease (COPD), HIV	Absent breath sounds on one side with hyper-resonance, deviated trachea, JVD	Inhalers, Isoniazid	Needle thoracostomy. Consider fluids. Pressors not indicated
Hypovolemic	Vomiting, diarrhea, fever, GI/OB bleed, decreased PO, abdominal pain, trauma	Normal lung sounds, flat neck veins, signs of bleeding, fever	Anti-diarrheal, antiemetic, proton pump inhibitor, blood thinners	Fluid boluses (up to 2-3 L) and pressors (push-dose epinephrine)
Neurogenic	PMH: spinal cord injury, lower extremity weakness	Normal lung sounds, flat neck veins, warm skin, lower extremity weakness, bradycardia		Fluid boluses (up to 2-3 L) and pressors (push-dose epinephrine)
Septic	Recent fever or infection	Normal/wet lung sounds, flat neck veins, warm skin, lethargic	Antibiotics	Fluid boluses (up to 2-3 L) and pressors (push-dose epinephrine)
Anaphylactic	Onset after food/drug/ sting exposure, prior reactions	Normal lung sounds or wheezing/stridor, flat neck veins, rash, red skin, airway edema, +/- Med Alert Tag	Epinephrine autoinjector, diphenhydramine	Consider epinephrine, diphenhydramine, albuterol, and fluids. Pressors not indicated.
Heat Stroke	Hot weather and exertion, dehydration	Normal lung sounds, flat neck veins, high temperature		IV fluid boluses. Cooling measures.
Drugs or Toxins	IV drug abuse, chemical or fire exposure, farm worker	Highly variable vitals, skin, lung, eye and mental status findings		Give naloxone before ALS airway if suspected narcotic overdose. Fluids, pressors are potentially harmful.

Stroke/Cerebral Vascular Accident (CVA)

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• TIME LAST SEEN WELL • Previous stroke/cerebral vascular accident (CVA), TIAs • Previous cardiac/vascular surgery • "Associated diseases" diabetes, hypertension, CAD, atrial fibrillation • Medications (blood thinners) • History of trauma, falls • Drug/alcohol use	• Altered mental status • Weakness/paralysis • Blindness or other sensory loss • Aphasia/dysarthria • Vertigo/dizziness/syncope • Vomiting • Headache • Seizures • Respiratory pattern change • Hypertension/hypotension	• See Differential under *Altered Mental Status (2020)* • TIA (Transient ischemic attack) • Seizure • Sepsis • Hypoglycemia • Stroke • Thrombotic • Embolic • Hemorrhagic • Tumor • Trauma • Migraine

SPECIAL CONSIDERATIONS

- With duration of symptoms of less than 4.5 hours, scene times and transport times should be minimized. Consider delay of procedures such as IV initiation until transport is underway.
- The window for patients to receive thrombolytics or other early interventions can be extended to 4.5 hours or more (from symptom onset) depending on the situation. Contact MC and consider rapid transport
- Onset of symptoms is defined as the last witnessed time the patient was symptom-free (i.e., awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom-free).
- Whenever possible, a family member should accompany patient to hospital/rendezvous to provide additional history and/or consent.
- The differential listed on the Protocol: *Altered Mental Status (2020)* should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Document the Cincinnati evaluation/or other prehospital stroke evaluation in the prehospital patient care report. Repeat as possible q 10 mins.
- Use restraints only if necessary to protect patient or personnel from injury. Restrain in swimmer's position (supine, head of bed elevated, one arm laterally up, one arm laterally down) for airway protection. Reassess mental status and distal neurovascular function every 10 minutes.

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: *Have patient show teeth or smile.*

Normal: both sides of the face move equally

Abnormal: one side of face does not move as well as the other side

2. ARM DRIFT: *Patient closes eys & holds both arms out for 10 sec.*

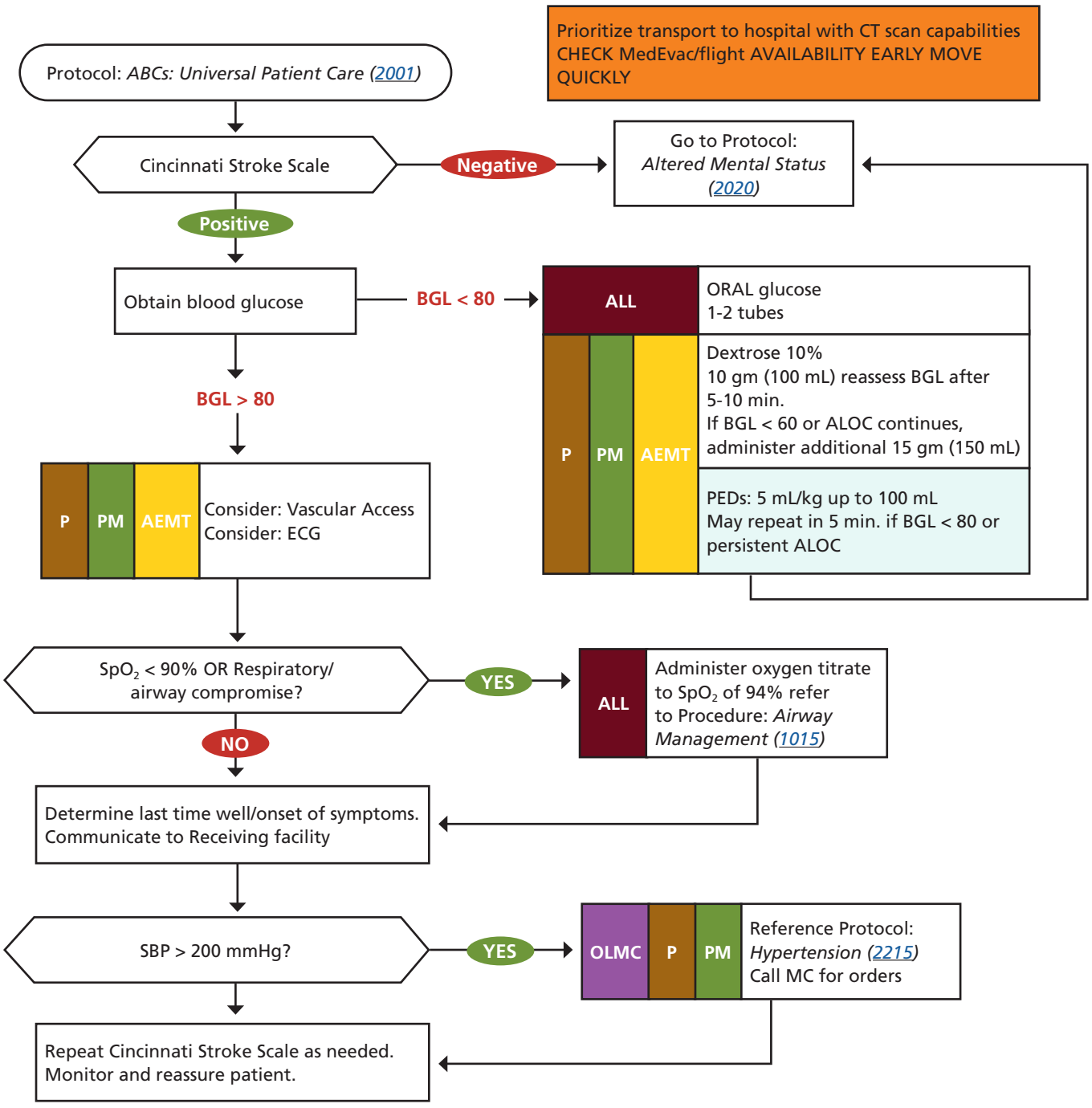
Normal: both arms move the same or both arms do not move at all

Abnormal: one arm does not move or drifts down compared to the other

3. ABNORMAL SPEECH. *Have the patient say "you can't teach an old dog new tricks."*
Normal: patient uses correct words with no slurring Abnormal: patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

STROKE/CEREBRAL VASCULAR ACCIDENT (CVA)



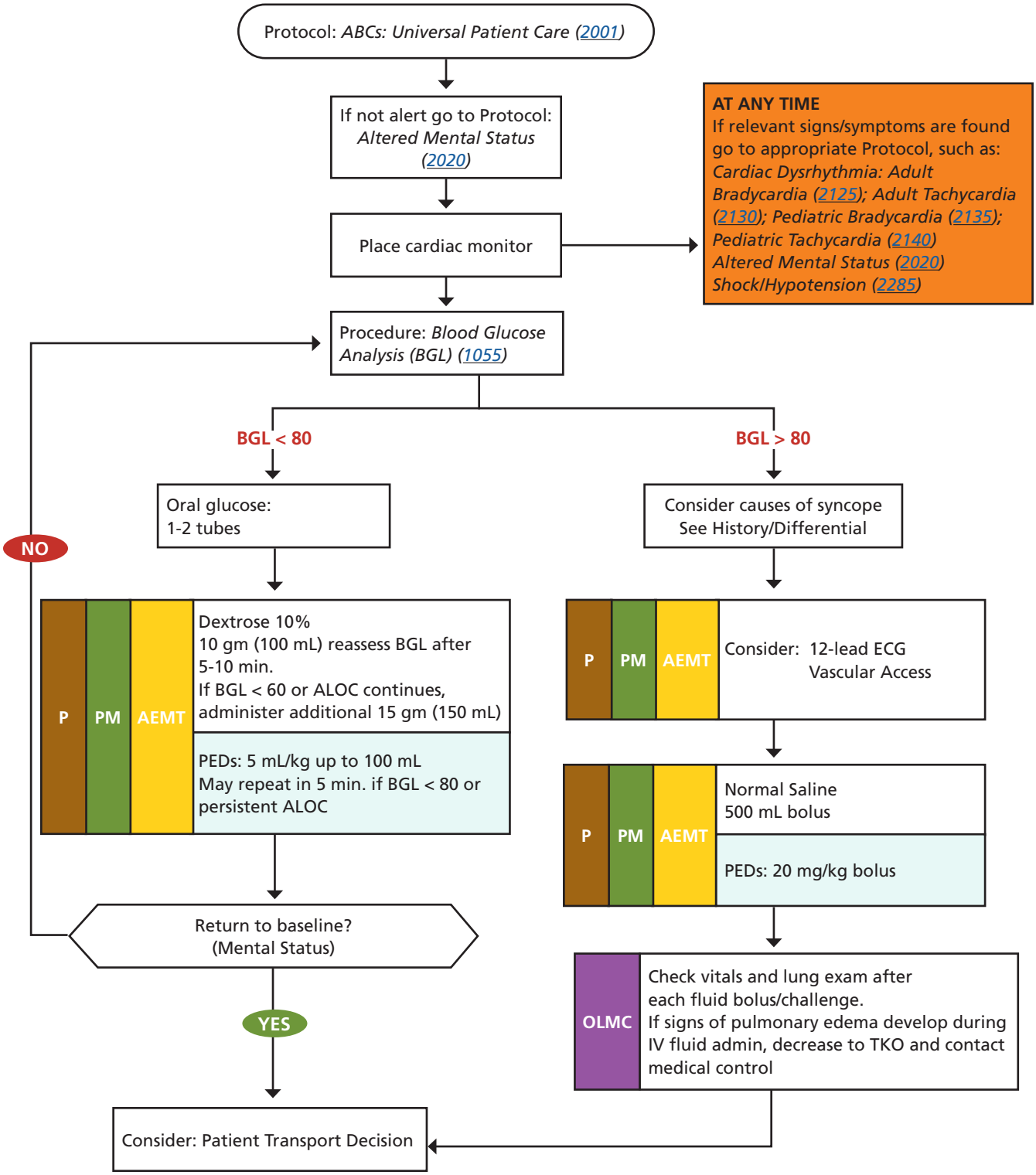
Syncope/Near Syncope

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Activities leading up to the syncope or near syncope • Any witnessed seizure activity • Cardiac history, stroke, seizure, diabetes • Females: LMP, vaginal bleeding • Fluid and food intake • Fluid loss: nausea, vomiting, diarrhea • Medications, alcohol, recreational drug use • Occult blood loss (GI, ectopic pregnancy, AAA)	• Loss of consciousness with recovery • Lightheadedness, dizziness • Palpitations, slow or rapid pulse • Pulse irregularity • Decreased blood pressure	• See Differential under Protocol: *Altered Mental Status (2020)* • Vasovagal reaction • Orthostatic hypotension • Cardiac dysrhythmia • Micturition/Defecation syncope • Psychiatric condition • Stroke • Hypoglycemia • Metabolic derangement • Seizure • Shock (see Protocol: *Shock/Hypotension (2285)* • Toxicological (alcohol) • Medication effect (e.g., anti-hypertensives) • Pulmonary embolism • Aortic aneurysm/dissection

SPECIAL CONSIDERATIONS

- If a patient reports they are unsure if they lost consciousness or if they don't remember losing consciousness, assume a loss of consciousness occurred.
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope. These patients should be transported
- More than 25% of geriatric syncope is cardiac dysrhythmia based. Consider cardiac dysrhythmias as a possible cause of syncope in patients of any age.
- Syncopal episodes associated with exercise should increase provider suspicion for a cardiac dysrhythmia or structural heart defect, even in young patients. Palpitations, dizziness, chest pain, and shortness of breath just before a syncopal episode are concerning for a dysrhythmia.
- Syncope patients should receive cardiac monitoring during assessment and transport.

SYNCOPE/NEAR SYNCOPE



2300

Trauma: Major/Multi-system

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Time and mechanism of injury • Damage to structure or vehicle • Location in structure or vehicle • Others injured or dead • Speed and details of MVC • Restraints/protective equipment	• Pain, swelling • Deformity, lesions, bleeding • Altered mental status or unconsciousness • Hypotension or shock • Cardiac arrest • Tracheal Shift • Neck vein distention • Flail chest • Seat belt sign	• Chest: Tension pneumothorax, pericardial tamponade, open chest wound, hemothorax • Intra-abdominal bleeding, diaphragmatic rupture • Pelvis/femur fracture • Vertebral fracture/cord injury • Head injury, facial fractures • Extremity fracture/dislocation/ amputation • Airway obstruction • Hypothermia

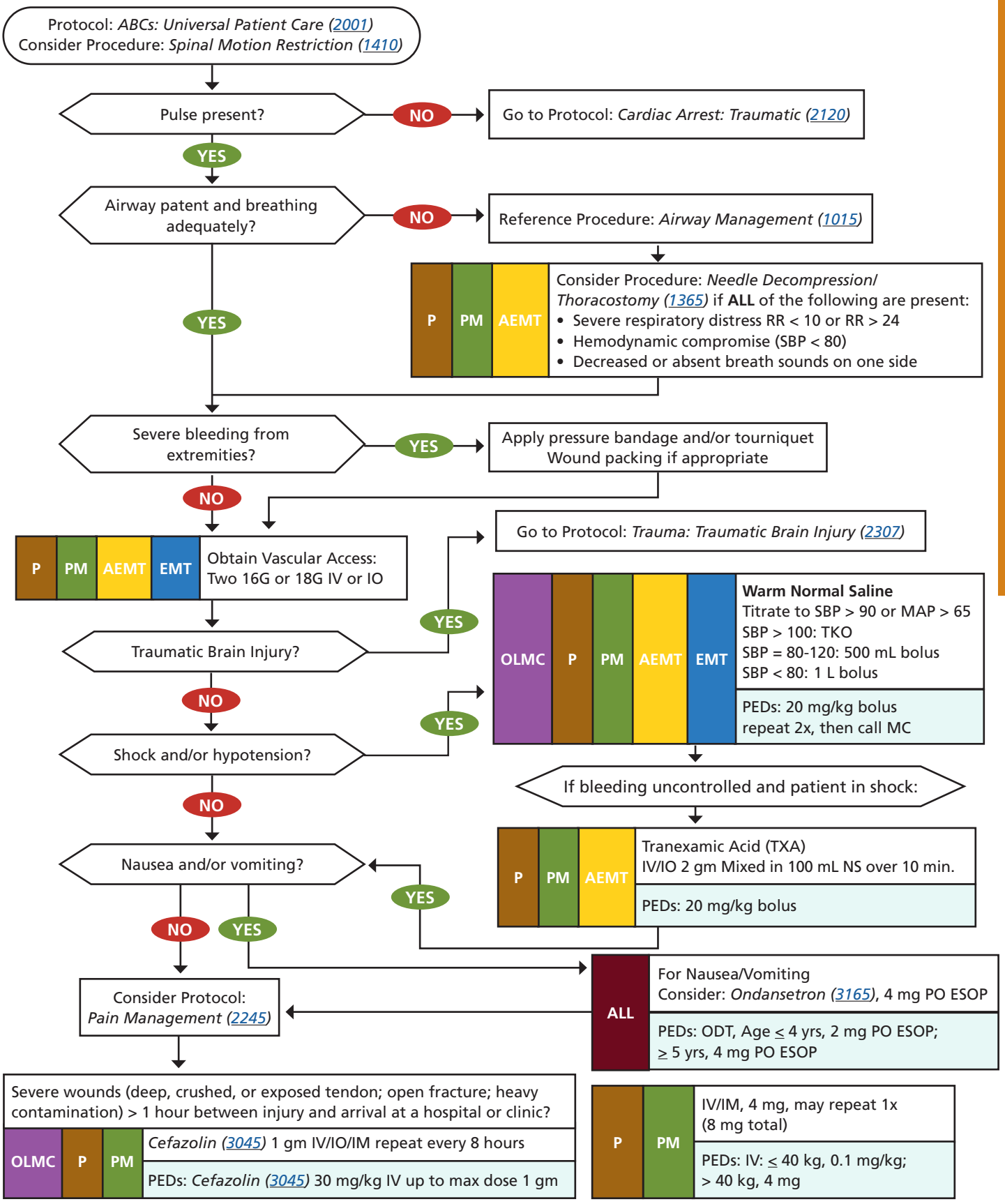
SPECIAL CONSIDERATIONS

- Continually reassess ABCs in major trauma patients. Treat life-threats as soon as they are recognized.
- MARCH PAWS is another good approach for trauma assessment. See Protocol: *Prolonged Field Care (2247)* and TEMS Appendix C.
- **Keep trauma patients warm. If hypotensive, administer warmed IV fluids.**
- Severe, uncontrolled bleeding from an extremity may require a tourniquet.
- Severe injuries can detract from more substantial and deadly injuries. Don't get tunnel vision.
- To administer narcotics, SBP > 100 or appropriate for age and normal mental status of patient.
- Isolated closed head injuries do not cause hypotension in trauma patients unless the patient is peri-arrest. Uncontrolled scalp bleeding, however, that continues over time can lead to hemorrhagic shock.
- For a penetrating trauma, secure impaled object in place and transport
- A tension pneumothorax is a rare, but life-threatening condition and is often difficult to assess clinically. Tracheal deviation may not be observed but can be palpated at the sternal notch.
- Limit scene time to < 10 minutes when possible.
- For prolonged entrapment consider Protocol: *Trauma: Crush Injury (2302)*.
- If a head injury is suspected, titrate oxygen saturation to 100%.

PEDIATRICS

- Often pediatric patients have no external signs of trauma.
- Hypotension is a very late sign for shock in the pediatric patient. The following are earlier indicators that a patient may be hypovolemic: altered mental status, pallor, peripheral pulses, capillary refill, tachypnea, and tachycardia.

TRAUMA: MAJOR/MULTI-SYSTEM



2302

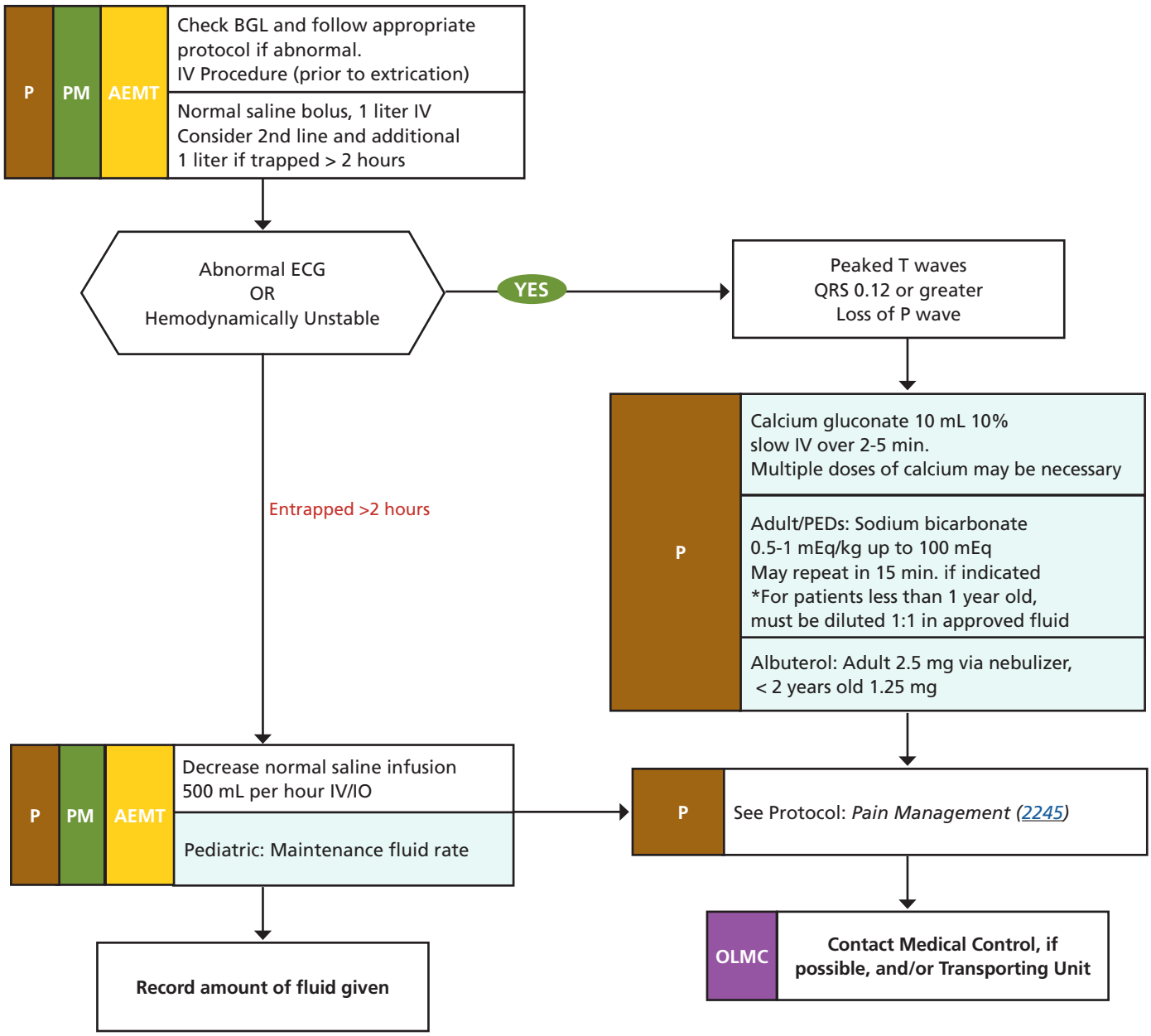
Trauma: Crush Injury

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Renal Disease • Diabetes	• Difficult if patient is still entrapped • Vital signs in any accessible extremity • Check pulses above and below crush site if able	• Fracture • Rhabdomyolysis • Compartment syndrome • NOTE: All of these can be present in crush injury

SPECIAL CONSIDERATIONS

- For patients who have prolonged entrapment, contact Medical Control, if possible, for additional treatment options.
- Albuterol temporarily suppresses potassium surge.
- Crush injury is very painful. Contact Medical Control if additional pain medication is needed.
- Tourniquet only for hemorrhage control and not to be used to "isolate" the extremity.
- ECG changes with hyperkalemia include those in this protocol, but may also be a bizarre, wide complex.
- Patients may become hypothermic, even in warm environments.
- Do not administer sodium bicarbonate or calcium gluconate together as they will form a precipitate.
- Recommended exam: Mental Status, Musculoskeletal, Neuro.
- If possible, administer IV/IO fluids prior to release of crushed body part, especially with crush > 1 hour. If access to patient and initiation of IV/IO fluids occurs after 2 hours, give 2 L of IV fluids in adults and 20 mL/kg of IV fluids in pediatrics, and then begin > 2 hour dosing regimen.
- Oral fluids is encouraged if possible.
- Consider all possible causes of shock and treat per appropriate protocol.
- Once freed—q 15 min. reassessment, including any devices (IVs, tourniquets, splints) in place for swelling or compromise, is recommended.

TRAUMA: CRUSH INJURY



2305

Trauma: Minor/Isolated Extremity

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Mechanism: crush /penetrating/ amputation • Time of injury • Open vs. closed wound/fracture • Wound contamination • Assess risk of rabies (bite, etc.) • Tetanus history	• Pain, swelling • Altered sensation/motor function • Diminished pulse/capillary refill • Decreased extremity temperature • Crepitus • Open wounds and degree of contamination • Other injuries? May be masked by distracting injury	• Deformity • Contusion • Abrasion • Punctures/penetrations • Laceration • Sprain • Dislocation • Fracture • Amputation • Compartment syndrome

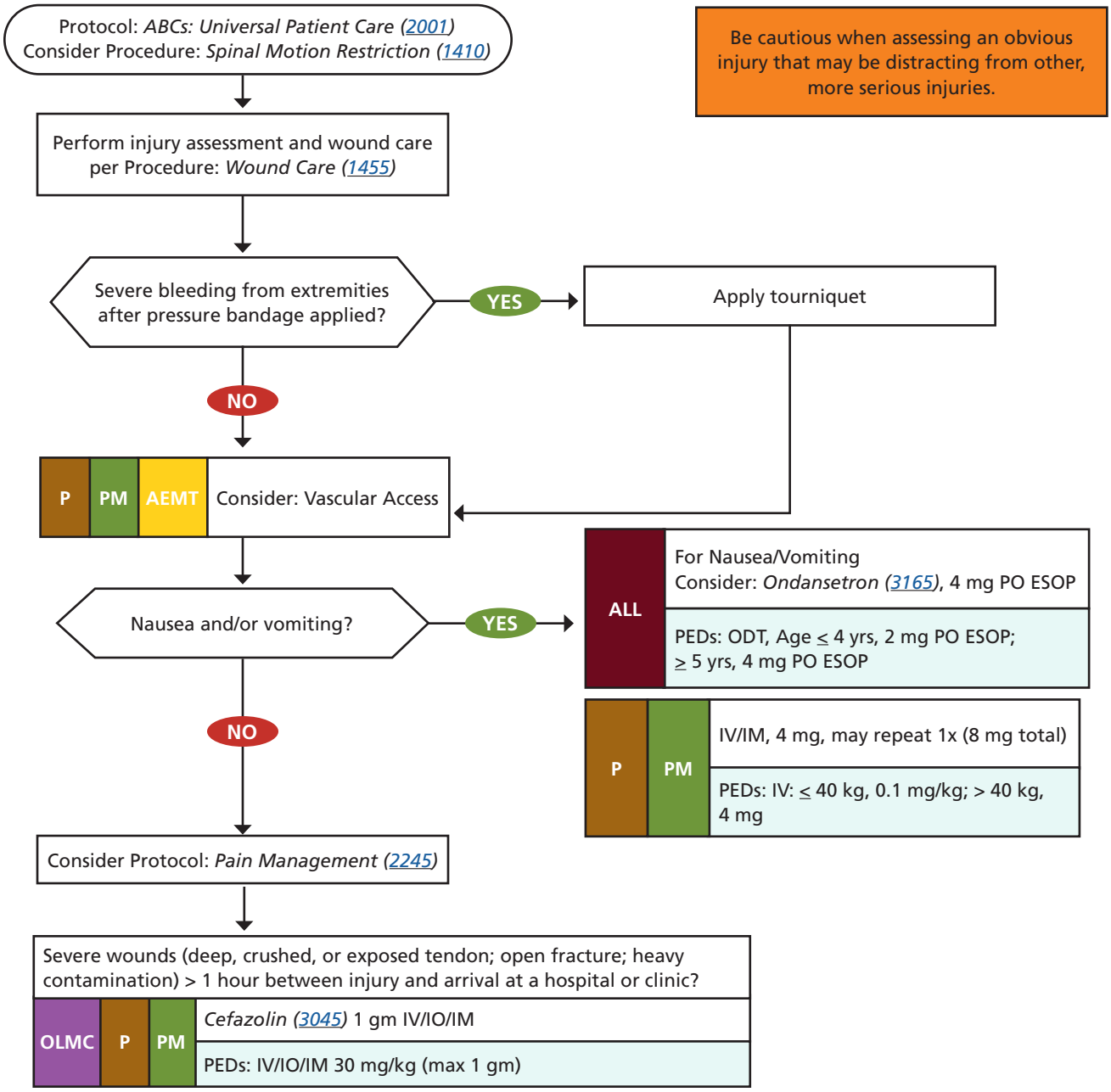
SPECIAL CONSIDERATIONS

- Maintain an increased index of suspicion for bleeding in patients taking anticoagulants or in patients with a history of hemophilia.
- Amputated parts should not be placed directly on ice
- In an amputation, time is critical
- Hip dislocations and knee and elbow fracture/ dislocations have a high incidence of vascular compromise. Frequently reassess distal CSMs.
- Urgently transport any injury with vascular compromise (consider helicopter evacuation)
- Blood loss may be concealed or not apparent with extremity injuries
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet
- Always check the bones and or joints above and below injury and stabilize if necessary
- Document depth, length, width of wound and if bleeding is active or pulsatile
- Joint dislocation usually includes any joint injury symptoms with a deformity
- If there is no obvious fracture, test for pain-free range of motion and ability to bear weight
- Splinting should be applied with all possible fractures or joint injuries except for the knee or ankle if the injury does not limit function for self-evacuation.

DENTAL TRAUMA

- If permanent teeth are avulsed (broken), loosely wrap teeth in moist gauze and place in plastic bag for transport with patient. Handle teeth only by crown. Best results for re-implantation are using a commercial solution, such as "Save a Tooth"; otherwise use saline.
- For dental bleeding, pack gauze in cavity and have patient bite down.
- For uncontrolled dental bleeding, soak gauze with 5 mL TXA, and apply to area of bleeding for 30 min. (ALS only)

TRAUMA: MINOR/ISOLATED EXTREMITY



Trauma: Head Injury, Traumatic Brain Injury (TBI)

PAST MEDICAL HISTORY	ASSESSMENT	DIFFERENTIAL
• Diabetes • Cardiovascular disease (CAD, Carotid disease, high or low blood pressure) • Previous concussions or head injury	• Blunt vs penetrating Trauma • Assess cervical spine and consider Procedure: *Spinal Motion Restriction* (*1410*) • Level of consciousness using Glascow Coma Scale or AVPU • Other neurologic deficits	• Seizure with post ictal period • Stroke • Hypoglycemia • Hypoxia or Anoxia • Substance Use • Other causes of *Altered Mental Status* (*2020*)

AVPU (Level of Consciousness)

A Patient is **ALERT**

V Patient not alert, but responds to **VERBAL** command

P Patient not alert, responds to **PAIN**

U Patient is **UNRESPONSIVE**

GLASCOW COMA SCALE (GCS) 3-15

EYE OPENING	VERBAL RESPONSE	MOTOR RESPONSE
Spontaneous 4	Oriented 5	Obeys Commands 6
To Voice 3	Confused 4	Localizes Pain 5
To Pain 2	Inappropriate 3	Withdraws from Pain 4
None 1	Incomprehensible 2	Flexion (decorticate) 3
	None 1	Extension (decerebrate) 2
		None 1

SPECIAL CONSIDERATIONS

- Hypotension is rarely from head injury—search for other causes of low BP.
- Comorbidities such as diabetes and cardiovascular disease can affect outcomes.

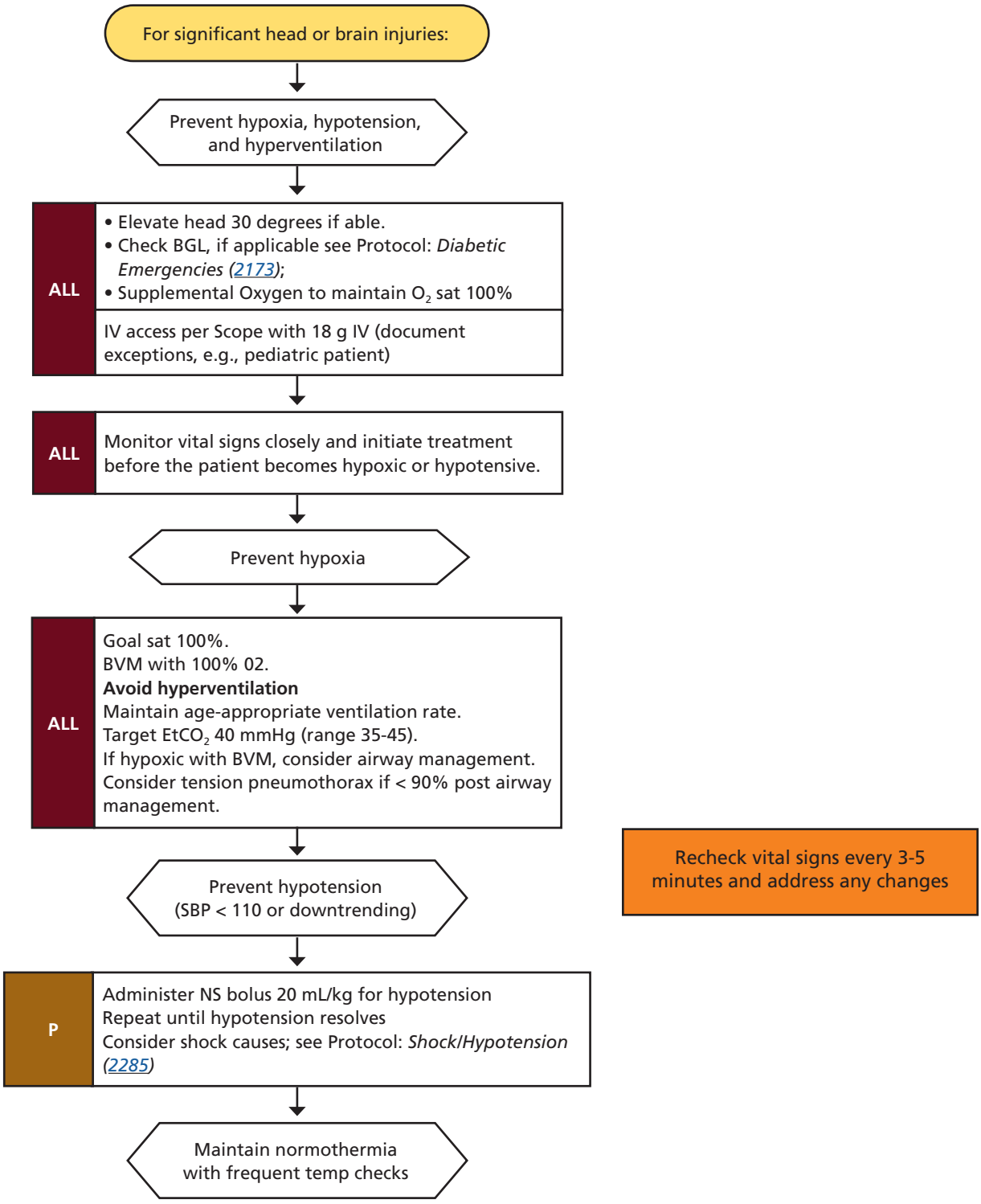
CONCUSSION

Concussion is a type of TBI—concussion treatment guidances vary. Consult Medical Control for appropriate evaluation and return-to-activity guidelines after concussion.

Vomiting more than twice, or altered level of consciousness mandates higher level of care evaluation.

SIGNS	SYMPTOMS	TREATMENT
• Appears dazed or stunned • Is confused about events • Answers questions slowly • Repeats questions • Can't recall events prior to the hit, bump, or fall • Can't recall events after the hit, bump, or fall • Loses consciousness (even briefly) • Shows behavior	• Headache • Nausea or vomiting • Balance problems or dizziness • Blurry or double vision • Sensitivity to light or noise • Feeling sluggish, hazy, foggy, or groggy • Difficulty concentrating or remembering	• Assure adequate oral hydration. • Acetaminophen (3005) or Ibuprofen (3105) if indicated for headache. • Ondansetron (Zofran®) (3165) for nausea per Scope of Practice.

TRAUMA: HEAD INJURY, TRAUMATIC BRAIN INJURY (TBI)



Recheck vital signs every 3-5 minutes and address any changes

Pediatric	Age > 14 yr	Age 6-13 yr	Age 1 wk-5 yr	Age < 1 wk
Heart Rate		60-150	60-160	
SBP	> 90	> 80	> 70 + (Age x2)	> 70

Age-appropriate ventilation rates:
Infants (0-24 mos) **25 bpm**
Children (2-14 yrs) **20 bpm**
> 14 yrs **10 bpm (same as adults)**

2310

Vaginal/OB/GYN Emergencies

SPECIAL CONSIDERATIONS

- A patient may not know or may be in denial about being pregnant. Always ask LMP (last menstrual period) and if > 1 month ago, assume pregnancy if in childbearing years (10-50 years old).
- In the setting of pregnancy, hypertension is defined as a BP > 140 systolic or > 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (prepregnancy) blood pressure.
- Maintain patient in the left lateral recumbent position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding—number of soaked pads used per hour/per day.
- Any pregnant patient involved in a potentially significant traumatic event should be transported for evaluation and fetal monitoring.
- Eclampsia/Preeclampsia: if patient > 5 months pregnant OR has delivered in past 2 weeks, AND is hypertensive or with a headache, ask about prior history of eclampsia or current symptoms (edema of face and hands, seizures, vision changes). Usually no vaginal bleeding. See Protocol: *Seizure (2280)*.

DEFINITIONS

- Gravida indicates the number of times the patient has been pregnant, regardless of whether the pregnancies were carried to term. A current pregnancy, if any, is included in this count.
- Parity, or "para" indicates the number of > 20-week births (including viable and nonviable, i.e., still-births). Pregnancies consisting of multiples, such as twins or triplets, count as one birth for the purpose of this notation.
- Abortus is the number of pregnancies that were lost for any reason, including induced abortions or miscarriages. The abortus term is sometimes dropped when no pregnancies have been lost. Stillbirths are not included.

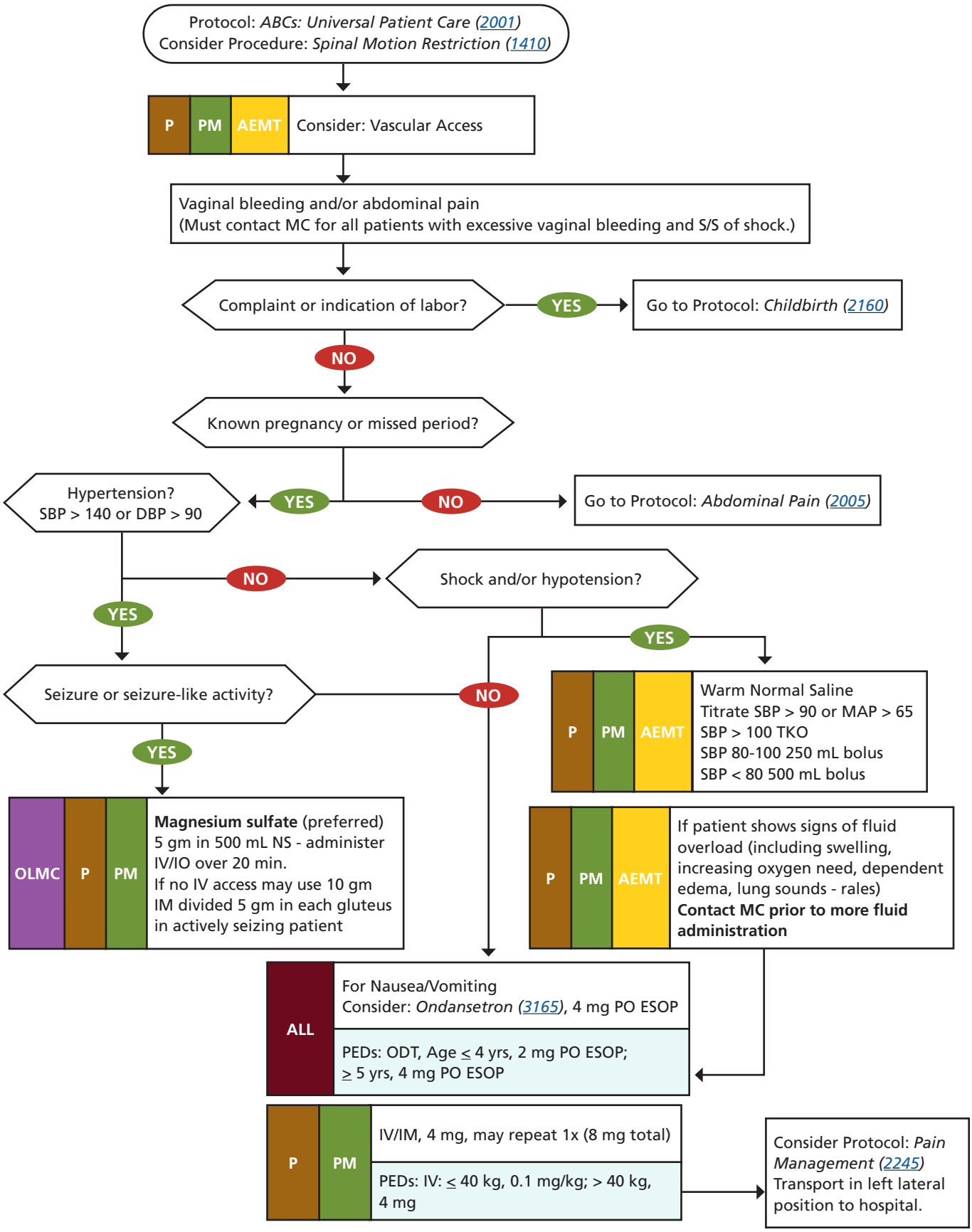
PAST MEDICAL HISTORY

- Hypertension medications
- Date of last menstrual period
- Prenatal care
- Passing tissue?
- Prior pregnancies/births
- History of trauma?
- Gravida/Para/Abortus (see definitions)
- Pelvic infections, STDs

DIFFERENTIAL DIAGNOSES FOR VAGINAL BLEEDING

- Nonpregnancy related: STD complications, ovarian torsion, fibroids, etc.
  - » Regular menses (pain, bleeding)
  - » Foreign body (IUD, rape): consider uterine perforation/rupture (rare).
  - » Hormonal imbalance: irregular menses (very common).
  - » Tumors: cervical and uterine, typically painless.
  - » Nonvaginal sources: rectal or urethral.
- First and Second Trimester bleeding (up to 20 wks.):
  - » Ectopic pregnancy: a ruptured ectopic pregnancy is a life-threatening emergency. There may be little to no vaginal bleeding, but internal hemorrhage may be present. Patients typically complain primarily of abdominal pain as opposed to vaginal bleeding. Watch for shock.
  - » Threatened abortion (bleeding during pregnancy)
  - » Spontaneous abortion (miscarriage): if patient is passing tissue, save it and bring it to the hospital. It can be important to determine if all products of conception have passed.
  - » Delivery: be prepared for possible premature delivery if late term pregnancy
- Third Trimester bleeding (> 20 wks.):
  - » Abruptio placentae (placenta separates from uterus): can occur after blunt trauma. High risk of fetal death.
  - » Trauma: consider pelvic fracture, or placental bleeding if in third trimester.

VAGINAL/OB/GYN EMERGENCIES



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Medications

SECTION 3000

3005

Acetaminophen (Tylenol®, APAP)

SCOPE:	EMR APO EMT X AEMT X PM X PARAMEDIC X
FORM:	500 mg tablet or Children's Liquid Solution 32 mg/mL
CLASS:	Antipyretic, analgesic
PHARMACOLOGY AND ACTIONS:	Acetaminophen, also called N-acetyl para-aminophenol or paracetamol, is one of the most widely used over-the-counter analgesic and antipyretic agents. Although its exact mechanism of action remains unclear, it is historically categorized along with NSAIDs because it inhibits the cyclooxygenase (COX) pathways. Like NSAIDs, acetaminophen has analgesic and antipyretic properties. However, studies have shown that acetaminophen lacks peripheral anti-inflammatory properties. It may be that acetaminophen inhibits the COX pathway in the central nervous system but not peripheral tissues. Additionally, acetaminophen does not appear to bind to the active site of either the COX-1 or COX-2 enzyme, instead of reducing the activity of COX by a different mechanism.
ONSET:	20 minutes
DURATION:	4 hours
INDICATIONS:	Fever (acetaminophen is the first-line medication). Pain
CONTRAINDICATIONS:	• Known hypersensitivity • Severe liver disease/hepatic impairment

See specific protocols for Medical Control requirements

ADULT DOSING (older than 12 years)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Fever or Pain	PO	650 - 1000 mg	May repeat every 6 hours Do not exceed 4000 mg in 24 hours

PEDIATRIC DOSING (less than 12 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Fever or Pain	PO	15 mg/kg (Max 1000 mg)	May repeat every 4 - 6 hours Do not exceed 75 mg/kg in 24 hours

Liquid Acetaminophen Dosing Chart

Less than 12 years old (15 mg/kg)
Concentrate: 160/5 mL

Weight (lbs)	Weight (kg)	Dose in mg (32 mg/ 1 mL)	Total Volume to draw into syringe in mL
5	2	30	***0.9***
10	5	75	***2.3***
15	7	105	***3.3***
20	9	135	***4.2***
25	11	165	***5.2***
30	14	210	***6.6***
35	16	240	***7.5***
40	18	270	***8.4***
45	20	300	***9.4***
50	23	345	***10.8***
55	25	375	***11.7***
60	27	405	***12.7***
65	30	450	***14.1***
70	32	480	***15.0***
75	34	510	***15.9***
80	36	540	***16.9***
85	39	585	***18.3***
90	41	615	***19.2***
100	45	675	***21.1***

Acetazolamide(Diamox®)

SCOPE:	EMT APO AEMT APO PM NES PARAMEDIC NES
FORM:	tablet; 125 mg, 250 mg
CLASS:	carbonic anhydrase inhibitor
PHARMACOLOGY AND ACTIONS:	Acetazolamide is a carbonic anhydrase inhibitor that inhibits H+ ion excretion in renal tubule, increasing sodium, potassium, bicarbonate, and water excretion, producing alkaline diuresis. Additionally decreases rate of aqueous humor formation for patients with glaucoma.
ONSET:	PO 1 - 1.5 hours
DURATION:	8-12 hours
INDICATIONS:	Prophylaxis for acute mountain sickness, treatment of acute mountain sickness
CONTRAINDICATIONS:	• Hypersensitivity to acetazolamide or sulfa agents • Severe renal disease • Cirrhosis
PRECAUTIONS:	• May impair alertness and or physical coordination in higher doses • Severe adverse effects include tachypnea, tachycardia
SIDE EFFECTS AND NOTES:	• Commonly causes tingling in fingers and toes • May contribute to drowsiness • Carbonated beverages taste "flat"

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Altitude illness prophylaxis and treatment	PO	for prophylaxis; 125 mg BID (may be as low as 62.5 mg daily for treatment: 250 mg BID	

PEDIATRIC DOSING (no signs of puberty)			
INDICATION	ROUTE	DOSE	NOTES
Treatment of AMS		2.5 mg/kg every 8-12 h **Call Medical Control**	

Adenosine (Adenocard®)

SCOPE:	PARAMEDIC X
FORM:	3 mg/mL – 6 mg and 12 mg prefilled syringe
CLASS:	Antidysrhythmic
PHARMACOLOGY AND ACTIONS:	Adenosine is a naturally occurring nucleoside that has the ability to slow conduction through the AV node. Since most cases of PSVT involve AV nodal reentry, adenosine is capable of interrupting the AV nodal circuit and stopping the tachycardia, restoring normal sinus rhythm.
ONSET:	IV: Immediate
DURATION:	less than 10 seconds
INDICATIONS:	Narrow complex tachycardia (QRS duration < 0.12 second), to convert PSVT to a normal sinus rhythm, including PSVT that is associated with accessory bypass tracts. (WILL NOT CONVERT A-Fib, A-Flutter, or V-Tach)
CONTRAINDICATIONS:	• Second- or third-degree heart AV block • Sick Sinus Syndrome • Known hypersensitivity to adenosine • Known WPW (Wolff-Parkinson-White Syndrome) • Irregular tachycardia (relative) • Wide complex tachycardia (QRS ≥ 0.12 second) • Patient on Tegretol (carbamazepine), Persantine (Dipyridamol), heart transplant patients
PRECAUTIONS:	• A defibrillator should be attached to the patient before adenosine administration in case of deterioration. • Larger doses of adenosine may be required to overcome the effects of caffeine or methylxanthines (e.g., Theophylline). • Dipyridamole (Persantine) can enhance adverse effects of adenosine and result in prolonged asystole. • Carbamazepine (Tegretol) can enhance adverse effects of adenosine and result in high degree heart block. • When doses larger than 12 mg are given by injection there may be a decrease in blood pressure secondary to a decrease in vascular resistance. • Adenosine is not effective in converting atrial fibrillation, atrial flutter, or ventricular tachycardia.
SIDE EFFECTS AND NOTES:	• May commonly cause facial flushing, shortness of breath, chest pressure, nausea, headache and lightheadedness, transient asystole. • Severe side effects: bradycardia, complete heart block, dysrhythmias. • Adenosine has a very short half-life of less than 10 seconds. For this reason, adenosine has to be given as a very fast bolus followed immediately by a 20 mL saline flush.

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Narrow complex tachycardia (QRS < 0.12 sec)	Rapid IV	6 mg first dose, 12 mg second dose if needed. Max total dose is 30 mg.	Use a large proximal IV site with fluid bolus flush.

PEDIATRIC DOSING (no signs of puberty)

INDICATION	ROUTE	DOSE	NOTES
Narrow complex tachycardia (QRS < 0.12 sec)	Rapid IV	0.1 mg/kg (max 6 mg) first dose, 0.2 mg/kg (max 12 mg) second dose if needed. Max total dose is 30 mg.	Use a large proximal IV site with fluid bolus flush.

Albuterol

SCOPE:	EMR APO EMT NES AEMT X PM X PARAMEDIC X
FORM:	2.5 mg/3 mL vial (HHN dose); Metered Dose Inhaler
CLASS:	Sympathomemetic B2 agonist, bronchodilator
PHARMACOLOGY AND ACTIONS:	Albuterol is a potent, relatively selective Beta-2 adrenergic bronchodilator and is associated with relaxation of bronchial smooth muscle and inhibition of release of mediators of immediate sensitivity from cells, especially MAST cells. Albuterol has occasional Beta-1 overlap with clinically significant cardiac effects including tachycardia increased cardiac workload—use with caution in suspected cardiogenic shock.
ONSET:	Immediate
DURATION:	2-4 hours
INDICATIONS:	• Respiratory distress with bronchial spasms (allergic reaction, asthma, COPD) • Suspected hyperkalemia
RELATIVE CONTRAINDICATIONS:	• Chest pain suspected to be of cardiac origin, known active heart disease • Severe hypertension • Acute MI within the past 6 weeks
PRECAUTIONS:	• The patient's rhythm should be observed for arrhythmias. Stop treatment if frequent PVCs develop or any tachyarrhythmias other than sinus tachycardia appear, or if heart rate increases by more than 20 beats/minute. • Paradoxical bronchospasm may occur with excessive administration.
SIDE EFFECTS AND NOTES:	Clinically significant arrhythmias may occur, especially in patients with underlying cardiovascular disorders such as coronary insufficiency and hypertension. Palpitations, tremors, anxiety (uncommon when taken recommended doses)

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Respiratory distress	Nebulized (HHN)	2.5 mg	Start oxygen at 6-8 L/min, increase to 10 L/min. prn. May repeat as needed up to 6 doses. No maximum dose for young asthmatic. May add ipratropium to second dose.
Suspected hyperkalemia	Nebulized (HHN)	10 mg	
Inhaler	Inhaled	90 ucg	2-4 puffs, repeat as needed q. 5-10 min. If not improving after 6 doses consider higher level of care.

PEDIATRIC

INDICATION	ROUTE	DOSE
Respiratory distress	Nebulized (HHN)	SAME AS ADULT

3025

Amiodarone (Cordarone®)

SCOPE:	PM X PARAMEDIC X
FORM:	150 mg/3 mL prefilled syringe or vial
CLASS:	Antidysrhythmic, class III
PHARMACOLOGY AND ACTIONS:	Amiodarone depresses automaticity of the SA node: slows conduction and increases refractory duration of the AV node; increases atrial and ventricular refractory period; prolongs the QT interval. In IV form is predominately an AV nodal blocker. Amiodarone is effective in preventing recurrent monomorphic VT and treating refractory ventricular arrhythmias.
ONSET:	IV/IO: Immediate
DURATION:	10-20 minutes
INDICATIONS:	• Ventricular fibrillation, pulseless ventricular tachycardia—cardiac arrest • Patient has been shocked by AICD or has ROSC after AED shock • Ventricular tachycardia with pulses (Paramedic ONLY)
CONTRAINDICATIONS:	• HR < 80 bpm • 2nd and 3rd degree AV block
PRECAUTIONS:	• In high concentrations (> 3 mg/mL) amiodarone can cause phlebitis. Infusion concentrations should not exceed 2 mg/mL. • Amiodarone will precipitate if administered in the same IV line as sodium bicarbonate or heparin.
SIDE EFFECTS AND NOTES:	In perfusing patients, amiodarone may cause hypotension, prolonged QT interval, proarrhythmic effects (torsades and ventricular fibrillation), severe bradycardia and atrioventricular block. Also, may cause CHF, cardiac arrest, shock, respiratory depression, rash, anaphylaxis, vomiting.

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Cardiac Arrest (Shockable: V-fib/V-tach)	IV/IO	300 mg	IVP. An additional dose of 150 mg 3-5 mins. after initial dose may be indicated
Re-Arrest (Shockable: V- fib/V-tach)	IV/IO	150 mg	IVP. ONLY IF patient did not receive 2nd dose above.
ROSC (Return of Spontaneous Circulation)	IV/IO	150 mg in 100 mL NS over 10 min	IF responsive to shock AND no amiodarone given during resuscitation. Parkmedic requires Medical Control order.
(Paramedic ONLY) Stable, Wide Complex Monomorphic V-Tach with pulse	IV/IO	150 mg over 10 min	May repeat once. Either bolus should be followed by an infusion of 1 mg/min. over 6 hours (Max dose 450 mg)

PEDIATRIC DOSING (1 month-14 years)

INDICATION	ROUTE	DOSE	NOTES
Cardiac Arrest (Shockable: V-fib/V-tach)	IV/IO	5 mg/kg (Max 300 mg)	SIVP. An additional dose of 5 mg/kg 3-5 minutes after initial dose may be indicated 2x (Max total 3 doses, 450 mg)
Re-Arrest (Shockable: V-fib/V-tach)	IV/IO	2.5 mg/kg (Max 150 mg)	SIVP. ONLY IF patient did not receive max 15 mg/kg or 450 mg above.
Not indicated for patients less than 1 month old			

Aspirin (ASA, Acetylsalicylic acid)

SCOPE:	EMR X EMT X AEMT X PM X PARAMEDIC X
FORM:	81 mg chewable tablets
CLASS:	Nonsteroidal Anti-inflammatory agent (NSAID), platelet inhibitor ("Blood thinner"), Analgesic
PHARMACOLOGY AND ACTIONS:	Aspirin inhibits prostaglandins and disrupts platelet function for the life of the platelet. It inhibits aggregation and reduces the chances of complete coronary artery blockage in an AMI reducing heart muscle death. It is also a mild analgesic and anti-inflammatory agent. Also, an anti-pyretic although ibuprofen or acetaminophen should be used to reduce fever.
ONSET:	PO: 5-30 minutes
DURATION:	Anti-inflammatory: 1-4 hours Anti-platelet activity slowly decreases over 10 days
INDICATIONS:	In unstable angina and acute myocardial infarction, aspirin has been shown to lower mortality and is indicated in patients with suspected ischemic chest pain.
CONTRAINDICATIONS:	• Allergy to aspirin or other NSAID medications or aspirin-induced asthma • **NOTE:** Many people are told not to take aspirin because it upsets their stomach or they have a history of GI bleeding (e.g., ulcers). In the setting of cardiac chest pain, this is NOT a contraindication—give them aspirin. • History of bleeding disorder (i.e., hemophilia) • Active, uncontrolled bleeding
SIDE EFFECTS AND NOTES:	• May cause heartburn, nausea, and vomiting. • Aspirin is the MOST important drug to give during an acute myocardial infarction (MI). The sooner aspirin is given to a patient having an acute MI, the less potential for damage to the patient's heart. • If the patient takes aspirin daily and has already taken it within the past 12 hours, do not give aspirin. If there is any doubt, give aspirin. • If patient has a history of a bleeding disorder or is on anticoagulants (i.e., Coumadin, Warfarin, Lovenox, Pradaxa), contact MC before administering aspirin. If in communication failure, give aspirin. • An acute aspirin overdose is potentially lethal. Signs and symptoms may include tinnitus, vomiting, rapid respirations, high fever, seizure, hypoglycemia, or altered mental status.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Cardiac chest pain (AMI)	PO	324 mg	Instruct the patient to chew the aspirin, then swallow
PEDIATRIC DOSING (Not indicated for pediatric patients)			

3035

Atropine Sulfate

SCOPE:	EMR AIO EMT AIO AEMT AIO PM X PARAMEDIC X
FORM:	1 mg/10 mL prefilled syringe NERVE AGENT AUTOINJECTORS: EMR, EMT, AEMT
CLASS:	Anticholinergic (antimuscarinic)
PHARMACOLOGY AND ACTIONS:	Atropine is a muscarinic-cholinergic blocking agent. As such, it blocks the receptors of the parasympathetic nervous system (vagal) resulting in: • Increased heart rate causing increased cardiac output. • Decreased smooth muscle activity in stomach, intestine, and bladder causing decreased sweating, salivation, tears, urine, and mucus secretions.
ONSET:	IV/IO/IM Immediate
DURATION:	4 hours
INDICATIONS:	• Symptomatic bradycardia (HR < 50, SBP < 90 AND symptoms: active chest pain, shortness of breath, nausea/vomiting, or altered mental status) • Organophosphate poisoning
CONTRAINDICATIONS:	None for emergency use.
PRECAUTIONS:	Bradycardia in the setting of an acute myocardial infarction is common and likely beneficial. Do not treat unless there are signs of poor perfusion (low blood pressure, mental confusion). May increase myocardial demand causing angina or to worsen MI. Low dose or slow administration of atropine can cause paradoxical bradycardia. Organophosphate poisoning requires large amounts of atropine; there is no maximum dose. Call for more medications early and titrate until bronchial secretions are controlled.
SIDE EFFECTS AND NOTES:	Atropine blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal. Enhanced anticholinergic effects may occur with antihistamines, Haloperidol, meperidine, procainamide, quinidine, and tricyclic antidepressants. Tachycardia, palpitations, hypertension, dry mouth, increased thirst, headache, nervousness, weakness, dilated pupils, blurred vision may occur.

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Symptomatic Bradycardia	IV/IO	1 mg	Every 3-5 min. prn (max of 3 mg)
Organophosphate Poisoning	IV/IO	2 mg	Repeat dose every 5 minutes prn secretions (no max dose)

PEDIATRIC DOSING (less than 14 years old)

INDICATION	ROUTE	DOSE	NOTES
Symptomatic Bradycardia	IV/IO	0.02 mg/kg (Min dose 0.1 mg, Max dose 0.5 mg)	See Protocol: *Cardiac Dysrhythmia: Pediatric Bradycardia (2135)*
Organophosphates	IV/IO	0.04 mg/kg (Min dose 0.1 mg, Max dose 2 mg)	Repeat dose every 5 minutes prn secretions (no max dose)

Bacitracin Ointment

SCOPE:	EMR X EMT X AEMT X PM X PARAMEDIC X
FORM:	Small foil pouches
CLASS:	Topical (skin) antibiotic
PHARMACOLOGY AND ACTIONS:	Inhibits bacterial growth, thereby helping prevent infection
INDICATIONS:	Minor cuts and scrapes, partial thickness burns (< 15% total body surface area)
CONTRAINDICATIONS:	• Known hypersensitivity • Large deep wounds (any wound that you think may require stitches) • Any full-thickness burn, partial thickness burns over 15%, puncture wounds, animal bites
SIDE EFFECTS AND NOTES:	• Local allergy—rash • Systemic allergy—wheeze, diffuse rash, anaphylaxis • May provide some pain relief

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Minor cuts and scrapes	Topical	After cleansing the area, apply a thin amount over the affected part and cover with a bandage. Apply only once.	
PEDIATRIC DOSING (SAME as adults)			

3045

Cefazolin Sodium (Ancef®)

SCOPE:	PM NES PARAMEDIC NES
FORM:	1 g powder in vial, reconstituted in 2 mL sterile water when needed
CLASS:	Cephalosporin antibiotic
PHARMACOLOGY AND ACTIONS:	Prevents and treats infection
ONSET:	IV/IO /IM: Immediate
DURATION:	8 hours
INDICATIONS:	Severe wounds (deep, crushed or exposed tendon; open fracture; heavy contamination) with more than 1 hour between injury and arrival at a hospital or clinic.
CONTRAINDICATIONS:	• Allergy to cephalosporin antibiotics • Prior anaphylactic reaction to penicillin (simple rash/itching is NOT a contraindication)
SIDE EFFECTS AND NOTES:	• Side effects are rare. • To reconstitute dose, add 2 mL of sterile water to vial and shake well to mix. • IM: Inject into buttock or thigh muscle (no more than 2 mL per injection). • IV: Dilute the reconstituted dose in 100 mL normal saline and administer over 10 minutes. • Due to possible anaphylactic reaction to cephalosporin antibiotics, IV/IO route is preferred as medication can be discontinued if reaction occurs.

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Severe wound	IV/IO/IM	1 gm mix in 100 mL NS, give over 10 min	May repeat every 8 hours

PEDIATRIC DOSING

INDICATION	ROUTE	DOSE	NOTES
Severe wound	IV/IO/IM	30 mg/kg (max 1 gm) mix in 100 mL NS, give over 10 min	May repeat every 8 hours

Dexamethasone (Decadron®)

SCOPE:	AEMT NES PM NES PARAMEDIC NES
FORM:	Vial of 10 mg in 1 mL; 2 mg and 4 mg tablets
CLASS:	Corticosteroid
PHARMACOLOGY AND ACTIONS:	Anti-inflammatory, decreases cerebral edema, decreases immune response
ONSET:	IV/IO/IM: 15-30 minutes; PO can take several hours
DURATION:	6 hours – 24 hours
INDICATIONS:	• Acute COPD • Severe asthma • Severe allergic reaction/anaphylaxis • Nonmechanical airway obstruction (croup, epiglottitis, other airway swelling) • HACE/HAPE • Contact Dermatitis
CONTRAINDICATIONS:	None in the emergency setting
PRECAUTIONS:	• Be prepared to treat anaphylaxis/manage airway: Because rare instances of anaphylactic reactions have occurred in patients receiving corticosteroid therapy, appropriate precautionary measures should be taken before administration, especially when the patient has a history of allergy to any drug. • Protect medication from heat and light. • Stop use of other NSAIDS.
SIDE EFFECTS AND NOTES:	Potential gastrointestinal bleeding, elevation of blood sugar.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
COPD, asthma, allergic reaction, nonmechanical airway obstruction, HACE/ HAPE	IV/IO/IM	8-10 mg	May repeat dose at 4-5 mg IV/ IO/IM every 6 hours.
Contact Dermatitis	PO or IM	2, 4 or 8 mg per contact dermatitis protocol	See Protocol: *Contact Dermatitis (2171)* for precautions, taper dosing and other considerations

PEDIATRIC DOSING (less than 12 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Suspected croup, COPD, asthma, allergic reaction, nonmechanical airway obstruction	IV/IO/IM	0.6 mg/kg (Max 6 mg)	May repeat every 6 hours at 0.3 mg/kg (Not to exceed 16 mg in 24 hours)
Contact Dermatitis			For Contact Dermatitis refer pediatric cases to local medical care facility.

3055

Dextrose 10%

SCOPE:	AEMT X PM X PARAMEDIC X
FORM:	Premixed bag (25 g/250 mL)
CLASS:	Carbohydrate (sugar)
PHARMACOLOGY AND ACTIONS:	Dextrose elevates blood glucose rapidly. Its use is regulated by insulin and glucagon: insulin allows glucose to move intracellularly, and glucagon mobilizes stored glucose from the liver into the bloodstream.
ONSET:	IV/IO: 1 minute
DURATION:	Variable
INDICATIONS:	• Hypoglycemia (less than 80) • Unconscious patient, BGL reading unobtainable • When directed by specific protocol
CONTRAINDICATIONS:	None in the acute setting
PRECAUTIONS:	• An IV should be placed in as large a vein as possible and well-secured. Free return of blood into the syringe or tubing should be checked 2-3 times during administration. If extravasation occurs, IMMEDIATELY stop administration. • Report any extravasation to receiving hospital personnel and document on the PCR. • Do not use in the same IV line as sodium bicarbonate.
SIDE EFFECTS AND NOTES:	• Hyperglycemia may complicate or worsen several medical conditions (e.g., myocardial infarction, stroke). • D10 should be given whenever hypoglycemia is documented by blood glucose meter. If the findings are not available, the provider should use judgment based on signs and history. If unable to determine blood glucose level and patient has altered mental status more severe than disorientation to time and date, glucose should be given. • IV/IO is preferred administration for altered mental status or seizures, second line PO glucose paste, third line IM glucagon. • Effects may be delayed in elderly patients or those with poor circulation.

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Hypoglycemia (Altered Mental Status)	IV/IO	10 g (100 mL) Reassess blood glucose after 5-10 min. If BGL < 60 or ALOC, give additional 15 g (150 mL)	

PEDIATRIC DOSING (less than 2 years old)

INDICATION	ROUTE	DOSE	NOTES
Hypoglycemia (Altered Mental Status)	IV/IO	5 mL/kg IV/IO (max initial dose 100 mL) May repeat in 5 minutes if ALOC or BGL still < 80	

Diltiazem (Cardizem®)

SCOPE:	PARAMEDIC NES
FORM:	ADD-Vantage system, 100 mg/100 mL
CLASS:	Calcium Channel Blocker (antidysrhythmic)
PHARMACOLOGY AND ACTIONS:	Blocks calcium from moving into the heart muscle cell, which prolongs the conduction of electrical impulses through the AV node, decreasing myocardial contractility and oxygen demand. Can slow irregular narrow complex tachycardias. Also dilates coronary arteries and arterioles (weak vasodilator). If adenosine or vagal maneuvers fail to convert narrow-complex SVT, SVT recurs after such treatment, or the treatments disclose a different form of SVT (such as atrial fibrillation or flutter), it is reasonable to use longer-acting AV nodal blocking agents such as calcium channel blockers (diltiazem). Their alternate mechanism of action and longer duration may result in more sustained termination of SVT or afford more sustained rate control of atrial dysrhythmias (such as atrial fibrillation or flutter). For refractory SVT, further dosing should be administered under the direction of a MC physician.
ONSET:	IV/IO: 3 minutes
DURATION:	1-3 hours
INDICATIONS:	Narrow complex tachycardia
CONTRAINDICATIONS:	• Second- or third-degree AV blocks w/o pacemaker • Hypotension or cardiogenic shock • Wide complex tachycardia • Known sensitivity to diltiazem
PRECAUTIONS:	• Use with extreme caution in patients who are taking beta blockers, because the two drug classes potentiate each other's effects and toxicities. • Patients with a history of heart failure and heart block are at a higher risk for toxicity.
SIDE EFFECTS AND NOTES:	• May cause hypotension, headache, fatigue, dizziness, nervousness, confusion, nausea and vomiting, edema, bradycardia, AV block • May worsen CHF

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Narrow Complex Tachycardia	IV/IO	0.25 mg/kg slow IV/ IO up to 25 mg. May repeat 1x 0.35 mg/kg prn up to 35 mg.	Additional dosing per MC: diltiazem infusion: 5-10 mg/h for a goal HR of 80-100. Hold for SBP < 90 or HR < 80.
PEDIATRIC DOSING—Contact MC			

Diphenhydramine (Benadryl®)

SCOPE:	EMR NES(PO) EMT NES(PO) AEMT NES(PO) PM X PARAMEDIC X
FORM:	50 mg/1 mL vial; 25 mg/tablet; 25 mg/10 mL liquid suspension
CLASS:	Antihistamine
PHARMACOLOGY AND ACTIONS:	Diphenhydramine blocks the action of histamines released from cells during an allergic reaction. It has direct CNS effects, which may act as either a stimulant, or more commonly as a depressant, depending on individual variation. Diphenhydramine also has an anticholinergic and antiparkinsonian effect that is used to treat acute dystonic reactions to antipsychotic drugs (e.g., Haldol, Thorazine, Compazine, Inapsine) and other some other drugs. It also has mild anti-nausea and sedative effects. Binds and blocks H1 histamine receptors.
ONSET:	IV/IO/IM/PO: Variable
DURATION:	6-8 hours
INDICATIONS:	• Anaphylaxis and severe allergic reactions • To counteract acute dystonic reactions • Mild allergic reactions • Motion sickness and nausea
CONTRAINDICATIONS:	• Known allergy or sensitivity • Patient taking MAO inhibitors (phenelzine [Nardil], tranylcypromine [Parnate]): these medications can increase the anticholinergic effects.
PRECAUTIONS:	• May potentiate effects of alcohol or other CNS depressants. Halve the dose if intoxicated or elderly. • Although useful in acute dystonic reactions it is not antidote for antipsychotic toxicity or overdose. Dystonic reactions can occur up to 48 hours after patient has taken certain medications (commonly antipsychotic or antiemetic). The reaction often involves twisting of facial or neck muscles. • May cause hypotension if given too rapidly by IV. • Contact Medical Control before administration if patient is hyperthermic or in a hot environment.
SIDE EFFECTS AND NOTES:	• Remember: epinephrine is the first-line drug for severe allergic reaction or anaphylaxis. • Diphenhydramine side effects can include tachycardia, thickening of bronchial secretions, sedation, dry mouth, and paradoxical agitation.

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Anaphylaxis, Allergic Reaction	IV/IO/IM/PO	25-50 mg	IV: SIVP Over 1 minute May repeat every 6 hours

PEDIATRIC DOSING (less than 14 years old)

INDICATION	ROUTE	DOSE	NOTES
Anaphylaxis, Allergic Reaction	IV/IO/IM/PO	1-2 mg/kg (Max 50 mg)	IV: SIVP Over 1 minute May repeat every 6 hours

Weight (lbs)	Weight (kg)	Dose (2.5 mg/mL)	Volume in Syringe (mL)
10	5	5 mg	2.0 mL
20	9	9 mg	3.5 mL
30	14	14 mg	5.5 mL
40	18	18 mg	7.0 mL
50	23	23 mg	9.0 mL
60	27	27 mg	11.0 mL
70	32	32 mg	13.0 mL
80	36	36 mg	14.5 mL
90	41	41 mg	16.5 mL
100	45	45 mg	18.0 mL
110	50	Use max dose 50 mg	Use max dose 20 mL
115	50		

Epinephrine (Adrenaline®)

SCOPE:	EMR LES EMT LES AEMT X PM X PARAMEDIC X
FORM and CONCENTRATIONS:	Autoinjector (Adult 0.3 mg/0.3 mL, PEDs 0.15 mg/0.3 mL) Vial or Ampule 1 mg/mL (1:1,000) ampule or vial Prefilled Syringe 1 mg/10 mL (1:10,000)
CLASS:	Sympathetic Alpha-beta-receptor agonist (sympathomimetic), adrenergic catecholamine
PHARMACOLOGY AND ACTIONS:	Epinephrine is a catecholamine with both alpha and beta effects. Generally, the following cardiovascular responses can be expected: increased heart rate, increased myocardial contractile force, increased systemic vascular resistance, increased blood pressure, increased myocardial oxygen consumption, increased automaticity. Potent bronchodilator.
ONSET:	IV/IO Immediate IM 3-5 minutes
DURATION:	IV/IO 5-60 minutes IM 1-4 hours
INDICATIONS:	• Anaphylaxis (severe allergic reaction) • Severe respiratory distress; severe asthma • Cardiac arrest • Vasopressor after ROSC • Symptomatic bradycardia or hypotension refractory to other treatment (except hypovolemia)
CONTRAINDICATIONS:	• NONE if patient is hypoxic secondary to anaphylaxis or asthma, or in cardiac arrest • Relative contraindications: Cocaine use, coronary artery disease
PRECAUTIONS:	• Double check the concentration IM=1 mg/mL (1:1,000) vs. IV/IO=0.1 mg/mL (1:10,000) and route. • Epinephrine increases cardiac workload and can precipitate hypertension, angina, MI or major dysrhythmias in individuals with ischemic heart disease. IV epinephrine should be limited to near-death situations because of higher risk from cardiac side effects. • Do not administer epinephrine concurrently with alkaline solution (e.g., sodium bicarbonate).
SIDE EFFECTS AND NOTES:	• May cause anxiety, tremor, and headache • Cardiac side effects include tachycardia, palpitations, PVCs, angina, and hypertension

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Anaphylaxis	IM	0.3 - 0.5 mg of 1 mg/mL	Repeat dose every 5-10 minutes per protocol (*2015*)
Cardiac Arrest	IV/IO	1 mg of 1 mg/10 mL	Repeat dose every 3-5 minutes per protocol (*2105*)
Respiratory Distress	IM	0.3 - 0.5 mg of 1 mg/mL	May repeat every 5-10 minutes per protocol (*2260*)

PEDIATRIC DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Anaphylaxis	IM	0.15 mg of 1 mg/mL	Repeat dose every 5-10 minutes per protocol (*2015*)
Cardiac Arrest	IV/IO	0.01 mg/kg of 1 ml/10 mL	Repeat dose every 3-5 minutes per protocol (*2105*)
Respiratory Distress	IM	4-10 = 0.2 mg of 1 mg/mL < 4 = 0.1 mg of 1 mg/mL	May repeat every 5-10 minutes per protocol (*2260*)

Epinephrine - Push Dose

SCOPE:	AEMT X PM X PARAMEDIC X
OLMC REQUIREMENT:	Contact OLMC for push-dose epinephrine. Proceed in communication failure.
FORM:	Push Dose: Epinephrine 0.01 mg/mL (= 10 mcg/mL) concentration. This can be done by using one mL of 1 mg/10 mL and adding 9 ml of saline.
CLASS:	Sympathetic Alpha-beta-receptor agonist (sympathomimetic), adrenergic catecholamine
PHARMACOLOGY AND ACTIONS:	Epinephrine is a catecholamine with both alpha and beta effects. Generally, the following cardiovascular responses can be expected: increased heart rate, increased myocardial contractile force, increased systemic vascular resistance, increased blood pressure, increased myocardial oxygen consumption, increased automaticity. Potent bronchodilator
ONSET:	IV/IO Immediate
DURATION:	IV/IO 5-60 minutes
INDICATIONS:	Hypotension after ROSC; hypotension refractory to other treatment (except hypovolemia).
CONTRAINDICATIONS:	NONE if patient is hypoxic secondary to anaphylaxis or asthma, or in cardiac arrest • Relative contraindications: Cocaine use, coronary artery disease
PRECAUTIONS:	• Epinephrine increases cardiac workload and can precipitate hypertension, angina, MI, or major dysrhythmias in individuals with ischemic heart disease. IV epinephrine should be limited to near-death situations because of higher risk from cardiac side effects. • Do not administer epinephrine concurrently with alkaline solution (e.g., sodium bicarbonate).
SIDE EFFECTS AND NOTES:	May cause anxiety, tremor, and headache; cardiac side effects include tachycardia, palpitations, PVCs, angina, and hypertension.

ADULT DOSING (> 14 years)

INDICATION	ROUTE	DOSE	NOTES
Shock	IV/IO Push Dose	10-20 mcg (1-2 mL) of 0.01 mg/mL (= 10 mcg/mL) IV/IO push every 3-5-minute prn (if SBP < 90 or MAP < 65)	Epinephrine, 0.01 mg/mL concentration. This can be done by using one mL of 1 mg/10 mL and adding 9 mL of saline. This makes 10 mL of Epi 0.1 mg/mL (=10 mcg/mL).

PEDIATRIC DOSING (0-14 years old)

INDICATION	ROUTE	DOSE	NOTES
Shock	IV/IO Push Dose	1 mcg/kg, Max dose 10 mcg (1 mL). Repeat q 3-5 min. prn	Mix 10 mcg/mL epi as above.

3080

Fentanyl (Sublimaze®)

SCOPE:	PM X PARAMEDIC X
FORM:	Carpuject or vial, 100 mcg/2 mL
CLASS:	Synthetic opioid agonist, narcotic analgesic
PHARMACOLOGY AND ACTIONS:	Binds to opiate receptors, producing analgesia and euphoria. Fentanyl is a potent, synthetic opioid analgesic that produces analgesia and sedation with a short duration of action. Fentanyl is about 50-100 times more potent than morphine on a weight basis. 100 micrograms (0.1 mg) is approximately equivalent in analgesic activity to 10 mg of morphine. Fentanyl produces remarkably few hemodynamic changes, minimal histamine release, minimal nausea/vomiting.
ONSET:	IV/IO Immediate IM 7-8 minutes IN 1-2 minutes
PEAK EFFECT:	IV/IO 5 minutes IM 10-12 minutes IN 5 minutes
DURATION:	30 minutes-1 hour (all routes)
INDICATIONS:	• Severe pain in STABLE patients (SBP >100 mmHg) • Cardiac chest pain • Analgesia after ALS airway (see Procedure: *Airway Management: King LTS-D Supraglottic Airway (1035)*)
CONTRAINDICATIONS:	• Shock/hypotension (SBP < 100) • Known allergy to fentanyl • Altered mental status (esp. head injury)
PRECAUTIONS:	• Fentanyl can cause respiratory depression that is reversible with naloxone. Respiratory depression is exacerbated by underlying lung diseases and use of other respiratory depressant drugs so it should be used with caution with patients with known asthma or COPD. • Should be used cautiously at altitudes > 8,000 ft due to possible respiratory depression. • If administered rapidly in very large doses, fentanyl can cause muscle spasm and chest wall rigidity. • The action of fentanyl is prolonged and its elimination slower in the elderly. Smaller maintenance doses are advisable. • Fentanyl must be used cautiously in patients who have already received morphine for prehospital analgesia. • Should be given before joint reduction if possible and if patient meets indications. • Should be used with caution with patients who have multi-system trauma.
SIDE EFFECTS AND NOTES:	• If hypotension develops, it is usually responsive to naloxone administration and fluids. • Bradycardia, nausea/vomiting may also occur. • Side effects are increased by alcohol or drugs that are CNS depressants and other narcotics. • If transport time is > 2 hours, or if repeated doses of fentanyl are ineffective, consider switching to morphine 15-30 minutes after previous dose of fentanyl. Discuss with Medical Control per protocol. • Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status.

FENTANYL (Sublimaze)

General note on fentanyl dosing:

All patients respond differently to pain medication administration. Use clinical judgment for dosing based on patient weight, age, and background medical history (e.g., hepatic/renal disease, multi-system trauma, drug/alcohol use). When in doubt, start low and titrate up to desired effect.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Cardiac Chest Pain (If ongoing pain or unresponsive to nitro, SBP > 100, and normal mental status)	IV/IO/IN	25-50 mcg	Repeat in 10 min. 1x prn pain. Subsequent dosing, repeat q 20 minutes 2x prn pain—i.e., fastest possible dosing schedule would be at 0, 10, 30, 50 min.
	IM	50-100 mcg	May repeat q 20 minutes 2x prn pain—i.e., fastest possible dosing schedule would be at 0, 20, 40 min.

For general pain management (NOT Chest Pain):
Parkmedic & Paramedic: The first 100 mcg of fentanyl are standing order, regardless of route.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
All protocols EXCEPT Cardiac Chest Pain (If ongoing pain, SBP > 100, and normal mental status)	IV/IO/IN	25-50 mcg	Repeat in 15 min. 1x prn pain. Subsequent doses q 15 min. to max total dose of 100 mcg without Medical Control
	IM	50-100 mcg	Repeat in 15 min. 1x prn pain. Subsequent doses q 15 min. to max total dose of 100 mcg without Medical Control

PEDIATRIC DOSING (0-10 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
All protocols (If ongoing pain, SBP appropriate for age, and normal mental status)	IV/IO/IN	1 mcg/kg (Max 50 mcg/dose)	Repeat in 15 min. 1x prn pain. Subsequent doses q 15 min. to a max total dose of 100 mcg without Medical Control
	IM	2 mcg/kg (Max 100 mcg/dose)	Repeat in 15 min. 1x prn pain. Subsequent doses q 15 min. to a max total dose of 100 mcg without Medical Control

3085

Glucagon

SCOPE:	EMT LES AEMT X PM X PARAMEDIC X
FORM:	Two-vial kit: 1 mg powder and 1 mL of dilutant
CLASS:	Anti-hypoglycemic agent, pancreatic islet hormone
PHARMACOLOGY AND ACTIONS:	Increases blood glucose levels through release of glycogen stores from the liver. Counteracts action of insulin. Glucagon is a hormone that causes glucose mobilization in the body. It works opposite to insulin, which causes glucose storage. It is released at times of insult or injury when glucose is needed and mobilizes glucose from body glycogen stores.
ONSET:	IV/IO/IM/IN: 5-20 minutes
DURATION:	Variable
INDICATIONS:	• Known hypoglycemia (preferably demonstrated by BGL) when patient is confused or comatose and dextrose is not available or an IV cannot be started. • Possible beta blocker overdose
CONTRAINDICATIONS:	**None**
PRECAUTIONS:	• IV dextrose is the treatment of choice for hypoglycemia in the patient who cannot tolerate oral glucose. The use of glucagon is restricted to patients who are seizing, comatose, combative, or with collapsed veins and in whom an IV cannot be started. • PREFERRED ROUTE IM; IV/IO route requires slow administration. • For hypothermic patients consider IN administration.
SIDE EFFECTS AND NOTES:	• Nausea and vomiting may occur with administration. • Persons who have no liver glycogen stores (malnutrition, alcoholism) may not be able to mobilize any glucose in response to glucagon. • Hyperglycemia (not clinically significant)

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Hypoglycemia	IM/IN/IV/IO	1 mg	May repeat once in 15 min. if ALOC persists and glucose remains < 80
Beta blocker overdose	IM/IN/IV/IO	2 mg	May repeat every 5 minutes for bradycardia/hypotension (shock)

PEDIATRIC DOSING (less than 14 years old)

INDICATION	ROUTE	DOSE	NOTES
Hypoglycemia	IM/IN/IV/IO	0.03 mg/kg (max 1 mg) < 6 years old: 0.5 mg ≥ 6 years old: 1.0 mg	May repeat once in 15 min. if ALOC persists and glucose remains < 80
Beta blocker overdose	IM/IN/IV/IO	0.06 mg/kg	May repeat every 5 minutes for bradycardia/hypotension (shock)

Glucose - Oral (Paste)

SCOPE:	EMR X EMT X AEMT X PM X PARAMEDIC X
FORM:	15 g per tube
CLASS:	Carbohydrate (sugar)
PHARMACOLOGY AND ACTIONS:	Glucose is the body's basic fuel, and it produces most of the body's quick energy. Its use is regulated by insulin that stimulates storage of excess glucose from the bloodstream and glucagon that mobilizes stored glucose into the bloodstream.
ONSET:	PO: Within 1 minute
DURATION:	Variable
INDICATIONS:	When directed by specific protocol, if glucose < 80, or ALOC and unable to determine glucose.
CONTRAINDICATIONS:	**None**
PRECAUTIONS:	To give solutions orally, patients must be continually assessed for the ability to protect their own airway. If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on their side. IV/IO dextrose is preferred (first-line) for patients with altered mental status or seizure; second-line is PO glucose paste, and third-line is IM/IN glucagon.
SIDE EFFECTS AND NOTES:	• Research suggests that hyperglycemia may complicate, or worsen, a number of medical conditions (i.e., myocardial infarction, stroke). Oral glucose should be given to a conscious patient whenever hypoglycemia is documented by blood glucose meter. If the objective findings are not available, use judgment based on signs and history. Hyperglycemia does not have clinically significant side effects. • Effects will be delayed in the elderly and people with poor circulation. • May be more tolerable if administered with liquid between dosages. Do not overfill mouth, increasing potential for aspiration. • Patient's condition may require more than one dose of oral glucose.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Hypoglycemia	Oral	15 grams (one tube)	If patient is unable to swallow, paste may be placed outside of the teeth, between the gum and the cheek while the patient is positioned on their side to protect airway.
	May repeat in 10 minutes if altered mental status persists and/or blood glucose is still under 80		
PEDIATRIC DOSING (Same as adult)			

3095

Haloperidol (Haldol®)

SCOPE:	PM NES PARAMEDIC NES
MC REQUIREMENT:	Parkmedic: For any use of haloperidol. Paramedic: For subsequent doses.
STANDARD SUPPLY:	Ampule (5 mg/1 mL) (5 mg/mL)
CLASS:	Antipsychotic
MECHANISM OF ACTION:	Haloperidol is a butyrophenone that likely has antipsychotic effects by blocking postsynaptic dopaminergic receptors in the brain.
ONSET:	IV: 1-2 minutes; IM: 10 minutes
DURATION:	4-8 hours
INDICATIONS:	• Behavioral emergencies involving extreme agitation or combativeness • Psychomotor agitated state
CONTRAINDICATIONS:	• Hypersensitivity • Prolonged QT syndrome • Pregnancy • Parkinson's disease
PRECAUTIONS:	• Use caution when administering haloperidol to patients with impaired liver function. • Haloperidol is not approved for the treatment of patients with dementia-related psychosis due to increased mortality. • Haloperidol should not be administered to nursing mothers.
SIDE EFFECTS AND NOTES:	• May cause acute dystonic reactions. Treat with diphenhydramine (contact Medical Control). • May cause hypotension. Treat with IV fluid administration. • May cause autonomic reactions such as dry mouth, blurred vision, urinary retention, and diaphoresis. • Respiratory depression is more likely when haloperidol is given rapidly or in patients who have taken other CNS depressants such as opioids.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Behavioral emergencies, combativeness, Psychomotor agitated state	IV/IN	2.5-5 mg	Contact MC for repeat doses
	IM	5-10 mg	Contact MC for repeat doses
NOT INDICATED IN PEDIATRIC PATIENTS less than 14 years old			

Hydromorphone (Dilaudid®)

SCOPE:	PM NES PARAMEDIC NES
MC REQUIREMENT:	Consider contacting MC on a case-by-case basis and after max dose has been administered.
STANDARD SUPPLY:	Vial (2 mg/1 mL) 0.5 mg/mL
CLASS:	Semisynthetic opioid, analgesic
MECHANISM OF ACTION:	Hydromorphone binds to opioid receptors and inhibits pain perception. It has a relatively long duration of action. Hydromorphone results in minimal histamine release, minimal hemodynamic compromise, and minimal nausea/vomiting.
ONSET:	IV/IO: 5 minutes; IM: 5-20 minutes
DURATION:	4-5 hours
INDICATIONS:	• Severe pain in stable patients, especially when extended pain control is warranted • Analgesia after advanced airway placement
CONTRAINDICATIONS:	• Known hypersensitivity/allergy to drug class or other narcotics • Shock/hypotension, or concern for falling blood pressure
PRECAUTIONS:	• Monitor for respiratory depression. Underlying pulmonary disease may exacerbate respiratory depression. Be prepared with equipment to assist respirations and with naloxone for reversal. • Use with caution in head injuries, multi-system trauma patients, and in patients at altitudes > 8000 feet. • Side effects of hydromorphone are increased by alcohol, CNS depressants, and other narcotics.
SIDE EFFECTS AND NOTES:	• Potential side effects include respiratory depression, bradycardia, hypotension, nausea/vomiting, flushing, sedation/ drowsiness, pruritus, hypertension (rare). • Carefully monitor blood pressure and mental status before and after hydromorphone administration. • Use the lowest effective dose.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Severe pain	IV/IO	0.5-1.0 mg	May repeat prn every 30 minutes to max of 2 mg
Severe pain	IM	1 mg	May repeat prn every 30 minutes to max of 2 mg

PEDIATRIC DOSING (10 - 14 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Severe pain	IV/IO	0.015 mg/kg (max 1.0 mg)	May repeat prn every 30 minutes to max of 1 mg
Severe pain	IM	0.015 mg/kg (max 1.0 mg)	May repeat prn every 30 minutes to max of 1 mg
PEDIATRIC DOSING (less than 10 years old): Contact MC			

Ibuprofen (Motrin®, Advil®)

SCOPE:	EMR APO EMT X AEMT X PM X PARAMEDIC X
FORM:	200 mg tablet, 100 mg/5 mL liquid
CLASS:	Antipyretic, analgesic, nonsteroidal anti-inflammatory drug (NSAID)
PHARMACOLOGY AND ACTIONS:	Prostaglandin synthetase inhibition
ONSET:	20 minutes
DURATION:	6-8 hours
INDICATIONS:	Fever (acetaminophen is the first-line medication for fever) Pain
CONTRAINDICATIONS:	• Known hypersensitivity • Pregnancy • Known ulcer or GI bleeding • Trauma other than isolated extremity • Known renal disease
SIDE EFFECTS AND NOTES:	• May cause GI upset • If the person appears acutely ill in your judgment, do your best to convince the person of the need for evaluation. A PCR shall be completed in this instance, even if the evaluation is declined.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Fever or pain	PO	600 mg	Repeat every 6 hours

PEDIATRIC DOSING (10-14 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Fever or pain	PO	200 mg	Must be able to swallow tablets. Repeat every 6 hours 6 mo-10 yrs: 10 mg/kg (max dose 200 mg) liquid PO every 6 hours

LIQUID IBUPROFEN DOSING CHART: AGES 6 MOS.-10 YRS. (10 MG/KG)

Concentration 100 mg/5 mL

Weight (lbs)	Weight (kg)	Dose (10 mg/ .5 mL)	Total Volume to draw into syringe
5	2	20	1.0 mL
10	5	50	2.5 mL
15	7	70	3.5 mL
20	9	90	4.5 mL
25	11	110	5.5 mL
30	14	140	7.0 mL
35	16	160	8.0 mL
40	18	180	9.0 mL
45	20	Use max dose 200 mg	Use max dose 10 mL
50	23		

Ipratropium Bromide (Atrovent®)

SCOPE:	EMT APO AEMT X PM X PARAMEDIC X
FORM:	500 mcg in 2.5 mL NS per unit-dose vial
CLASS:	Anticholinergic, parasympatholytic
PHARMACOLOGY AND ACTIONS:	Ipratropium is an atropine derivative used for inhalation therapy. For severe asthma, ipratropium taken in addition to a short-acting beta agonist (such as albuterol) can provide greater bronchodilation and clinical benefit than the beta agonist alone. It has no anti-inflammatory effects and does not decrease bronchial hyperresponsiveness.
ONSET:	15 minutes
PEAK EFFECT:	1-2 hours
DURATION:	3-6 hours
INDICATIONS:	As a supplement to albuterol in patients with respiratory distress from secondary bronchospasm such as asthma and COPD.
CONTRAINDICATIONS:	• Do not use in patients with severe glaucoma • Known hypersensitivity to ipratropium bromide • Peanut, soy, or lecithin allergy
PRECAUTIONS:	If patient gets significantly worse within 60 seconds of starting ipratropium or starts coughing (and was not previously coughing) then stop administration of ipratropium but continue albuterol.
SIDE EFFECTS AND NOTES:	• CNS: nervousness, dizziness, headache, delirium, psychosis, paresthesia, tremors. • Dry mouth, palpitations, GI distress, blurred vision, pharyngeal irritation • Increased intra-ocular pressure in glaucoma patients • Ipratropium is to be given only every 4 hours, as opposed to albuterol, which may be used continuously. • Ipratropium and albuterol can be mixed in a single nebulizer treatment.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Respiratory distress due to bronchospasm (asthma/COPD)	Nebulized with 10 L/ min. oxygen	0.5 mg	Can combine with albuterol (DuoNeb). Ipratropium should only be given every 4 hours, whereas albuterol can be used continuously. Contact MC for additional doses.
PEDIATRIC DOSING (Same as adult)			

Ketamine Hydrochloride (Ketalar®)

SCOPE:	PM NES PARAMEDIC NES
FORM:	Clear liquid vial: 100 mg/mL (preferred concentration) or 50 mg/mL
CLASS:	Dissociative agent, anesthetic, analgesic
PHARMACOLOGY AND ACTIONS:	Produces a state of anesthesia while maintaining airway reflexes, heart rate, and blood pressure. Blocks impulses of pain perception; suppresses spinal cord activity; affects CNS transmitter systems; anesthesia with profound analgesia, minimal respiratory depression; minimal skeletal muscle relaxation.
ONSET:	IV/IO: 20-30 seconds IN/IM: sedation, 3-4 minutes; analgesia 10-15 minutes
DURATION:	IV: 10-20 minutes IN/IM: 15-30 minutes
INDICATIONS:	• Behavioral emergencies: extreme agitation or combativeness; Psychomotor agitated state • Moderate to severe pain with normal LOC • Sedation • Refractory bronchospasm
CONTRAINDICATIONS:	Hypersensitivity to ketamine
RELATIVE CONTRAINDICATIONS:	• Pregnancy • Hyperthyroidism • Cardiovascular disease • Gastroesophageal reflux • Hepatic dysfunction • History of alcohol abuse
PRECAUTIONS:	• With high doses or rapid administration, respiratory depression may occur. • For IV/IO administration, MUST dilute with equal amount of sterile water or saline.
SIDE EFFECTS AND NOTES:	• May cause hallucinations, hypertension, increased cardiac output, tachycardia, hypotension, bradycardia, nausea, vomiting. • Use with opioid analgesics may result in prolonged recovery time. • Concurrent administration with midazolam may decrease incidence of unpleasant dreams. • Assess level of consciousness frequently—patient will experience a dissociative state and may emerge from this agitated, anxious, and/or hallucinating.

See specific protocols for Medical Control requirements

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Sedation (Dissociative dose)	IV/IO/IN	1 mg/kg	IV/IO: Must dilute with equal parts saline, SIVP 2 min. Repeat q 5 min. 2x prn, max 3 doses total in communication failure.
	IM	2 mg/kg	Repeat q 10 min. 2x prn, max 3 doses total in communication failure.
Analgesia (subdissociative dose)	IV/IO/IN	0.3 mg/kg	IV/IO: Mix dose in 100 mL NS, infuse over 5+ minutes. Repeat q 15 min. prn pain max 2 mg/kg total in communication failure.
	IM	1 mg/kg	Repeat q 15 min. prn pain max 2 mg/kg total in communication failure.

PEDIATRIC DOSING (0-14 years old): Same as adult

SEE KETAMINE DOSAGE CHARTS ON FOLLOWING PAGES—CHECK YOUR MEDICATION CONCENTRATION!

Double-check your concentration!

These charts are for 100 mg/mL concentration.

KETAMINE DOSE FOR SEDATION

(Dissociative Dose)

IV/IO: 1 mg/kg—MUST DILUTE with equal volume NS or Sterile Water, SIVP 60+ seconds.
IN: 1 mg/kg (add 0.1 mL for MAD device volume)
IM: 2 mg/kg

Patient Wt		IV/IO		IN	IM	
lb	kg	Dose mg	Dose mL	Add 0.1 mL for MAD	Dose mg	Dose mL
10	4.5	4.5 mg	0.05 mL	0.15 mL	9.1 mg	0.09 mL
20	9.1	9.1 mg	0.09 mL	0.19 mL	18.2 mg	0.18 mL
30	13.6	13.6 mg	0.14 mL	0.24 mL	27.3 mg	0.27 mL
40	18.2	18.2 mg	0.18 mL	0.28 mL	36.4 mg	0.36 mL
50	22.7	22.7 mg	0.23 mL	0.33 mL	45.5 mg	0.45 mL
60	27.3	27.3 mg	0.27 mL	0.37 mL	54.5 mg	0.55 mL
70	31.8	31.8 mg	0.32 mL	0.42 mL	63.6 mg	0.64 mL
80	36.4	36.4 mg	0.36 mL	0.46 mL	72.7 mg	0.73 mL
90	40.9	40.9 mg	0.41 mL	0.51 mL	81.8 mg	0.82 mL
100	45.5	45.5 mg	0.45 mL	0.55 mL	90.9 mg	0.91 mL
110	50	50 mg	0.5 mL	0.6 mL	100 mg	1 mL
120	54.5	54.5 mg	0.55 mL	0.65 mL	109.1 mg	1.09 mL
130	59.1	59.1 mg	0.59 mL	0.69 mL	118.2 mg	1.18 mL
140	63.6	63.6 mg	0.64 mL	0.74 mL	127.3 mg	1.27 mL
150	68.2	68.2 mg	0.68 mL	0.78 mL	136.4 mg	1.36 mL
160	72.7	72.7 mg	0.73 mL	0.83 mL	145.5 mg	1.45 mL
170	77.3	77.3 mg	0.77 mL	0.87 mL	154.5 mg	1.55 mL
180	81.8	81.8 mg	0.82 mL	0.92 mL	163.6 mg	1.64 mL
190	86.4	86.4 mg	0.86 mL	0.96 mL	172.7 mg	1.73 mL
200	90.0	90.9 mg	0.91 mL	1.01 mL	181.8 mg	1.82 mL
210	95.5	95.5 mg	0.95 mL	1.05 mL	190.9 mg	1.91 mL
225	102.3	102.3 mg	1.02 mL	1.12 mL	204.5 mg	2.05 mL
250	113.6	113.6 mg	1.14 mL	1.24 mL	227.3 mg	2.27 mL
275	125.0	125 mg	1.25 mL	1.35 mL	250 mg	2.5 mL
300	136.4	136.4 mg	1.36 mL	1.46 mL	272.7 mg	2.73 mL
325	147.7	147.7 mg	1.48 mL	1.58 mL	295.5 mg	2.95 mL
350	159.1	159.1 mg	1.59 mL	1.69 mL	318.2 mg	3.18 mL
375	170.5	170.5 mg	1.70 mL	1.80 mL	340.9 mg	3.41 mL
400	181.8	181.8 mg	1.82 mL	1.92 mL	363.6 mg	3.64 mL

KETAMINE DOSE FOR PAIN

(Sub dissociative Dose)

IV/IO: 0.3 mg/kg—MUST DILUTE in 100 mL NS, run over 5 minutes.
IN: 0.3 mg/kg (add 0.1 mL for MAD device volume)
IM: 1 mg/kg

Patient Wt		IV/IO		IN	IM	
lb	kg	Dose mg	Dose mL	Add 0.1 mL for MAD	Dose mg	Dose mL
10	4.5	1.4 mg	0.01 mL	0.11 mL	4.5 mg	0.05 mL
20	9.1	2.7 mg	0.03 mL	0.13 mL	9.1 mg	0.09 mL
30	13.6	4.1 mg	0.04 mL	0.14 mL	13.6 mg	0.14 mL
40	18.2	5.5 mg	0.05 mL	0.15 mL	18.2 mg	0.18 mL
50	22.7	6.8 mg	0.07 mL	0.17 mL	22.7 mg	0.23 mL
60	27.3	8.2 mg	0.08 mL	0.18 mL	27.3 mg	0.27 mL
70	31.8	9.5 mg	0.1 mL	0.2 mL	31.8 mg	0.32 mL
80	36.4	10.9 mg	0.11 mL	0.21 mL	36.4 mg	0.36 mL
90	40.9	12.3 mg	0.12 mL	0.22 mL	40.9 mg	0.41 mL
100	45.5	13.6 mg	0.14 mL	0.24 mL	45.5 mg	0.45 mL
110	50	15 mg	0.15 mL	0.25 mL	50 mg	0.5 mL
120	54.5	16.4 mg	0.16 mL	0.26 mL	54.5 mg	0.55 mL
130	59.1	17.7 mg	0.18 mL	0.28 mL	59.1 mg	0.59 mL
140	63.6	19.1 mg	0.19 mL	0.29 mL	63.6 mg	0.64 mL
150	68.2	20.5 mg	0.2 mL	0.3 mL	68.2 mg	0.68 mL
160	72.7	21.8 mg	0.22 mL	0.32 mL	72.7 mg	0.73 mL
170	77.3	23.2 mg	0.23 mL	0.33 mL	77.3 mg	0.77 mL
180	81.8	24.5 mg	0.25 mL	0.35 mL	81.8 mg	0.82 mL
190	86.4	25.9 mg	0.26 mL	0.36 mL	86.4 mg	0.86 mL
200	90.0	27.3 mg	0.27 mL	0.37 mL	90.9 mg	0.91 mL
210	95.5	28.6 mg	0.29 mL	0.39 mL	95.5 mg	0.95 mL
225	102.3	30.7 mg	0.31 mL	0.41 mL	102.3 mg	1.02 mL
250	113.6	34.1 mg	0.34 mL	0.44 mL	113.6 mg	1.14 mL
275	125.0	37.5 mg	0.38 mL	0.48 mL	125.0 mg	1.25 mL
300	136.4	40.9 mg	0.41 mL	0.51 mL	136.4 mg	1.36 mL
325	147.7	44.3 mg	0.44 mL	0.54 mL	147.7 mg	1.48 mL
350	159.1	47.7 mg	0.48 mL	0.58 mL	159.1 mg	1.59 mL
375	170.5	51.1 mg	0.51 mL	0.61 mL	170.5 mg	1.70 mL
400	181.8	54.5 mg	0.55 mL	0.65 mL	181.8 mg	1.82 mL

Double-check your concentration!

These charts are for 50 mg/mL concentration.

KETAMINE DOSE FOR SEDATION

(Dissociative Dose)

IV/IO: 1 mg/kg—MUST DILUTE with equal volume NS or Sterile Water, SIVP 60+ seconds.
IN: 1 mg/kg (add 0.1 mL for MAD device volume)
IM: 2 mg/kg

Patient Wt		IV/IO		IN	IM	
lb	kg	Dose mg	Dose mL	Add 0.1 mL for MAD	Dose mg	Dose mL
10	4.5	4.5 mg	0.09 mL	0.19 mL	9.1 mg	0.18 mL
20	9.1	9.1 mg	0.18 mL	0.28 mL	18.2 mg	0.36 mL
30	13.6	13.6 mg	0.27 mL	0.37 mL	27.3 mg	0.55 mL
40	18.2	18.2 mg	0.36 mL	0.46 mL	36.4 mg	0.73 mL
50	22.7	22.7 mg	0.45 mL	0.55 mL	45.5 mg	0.91 mL
60	27.3	27.3 mg	0.55 mL	0.65 mL	54.5 mg	1.09 mL
70	31.8	31.8 mg	0.64 mL	0.74 mL	63.6 mg	1.27 mL
80	36.4	36.4 mg	0.73 mL	0.83 mL	72.7 mg	1.45 mL
90	40.9	40.9 mg	0.82 mL	0.92 mL	81.8 mg	1.64 mL
100	45.5	45.5 mg	0.91 mL	1.01 mL	90.9 mg	1.82 mL
110	50	50 mg	1 mL	1.1 mL	100 mg	2 mL
120	54.5	54.5 mg	1.09 mL	1.19 mL	109.1 mg	2.18 mL
130	59.1	59.1 mg	1.18 mL	1.28 mL	118.2 mg	2.36 mL
140	63.6	63.6 mg	1.27 mL	1.37 mL	127.3 mg	2.55 mL
150	68.2	68.2 mg	1.36 mL	1.46 mL	136.4 mg	2.73 mL
160	72.7	72.7 mg	1.45 mL	1.55 mL	145.5 mg	2.91 mL
170	77.3	77.3 mg	1.55 mL	1.65 mL	154.5 mg	3.09 mL
180	81.8	81.8 mg	1.64 mL	1.74 mL	163.6 mg	3.27 mL
190	86.4	86.4 mg	1.73 mL	1.83 mL	172.7 mg	3.45 mL
200	90.0	90.9 mg	1.82 mL	1.92 mL	181.8 mg	3.64 mL
210	95.5	95.5 mg	1.91 mL	2.01 mL	190.9 mg	3.82 mL
225	102.3	102.3 mg	2.05 mL	2.15 mL	204.5 mg	4.09 mL
250	113.6	113.6 mg	2.27 mL	2.37 mL	227.3 mg	4.55 mL
275	125.0	125 mg	2.5 mL	2.6 mL	250 mg	5 mL
300	136.4	136.4 mg	2.73 mL	2.83 mL	272.7 mg	5.45 mL
325	147.7	147.7 mg	2.95 mL	3.05 mL	295.5 mg	5.91 mL
350	159.1	159.1 mg	3.18 mL	3.28 mL	318.2 mg	6.36 mL
375	170.5	170.5 mg	3.41 mL	3.51 mL	340.9 mg	6.82 mL
400	181.8	181.8 mg	3.64 mL	3.74 mL	363.6 mg	7.27 mL

KETAMINE DOSE FOR PAIN

(Sub dissociative Dose)

IV/IO: 0.3 mg/kg—MUST DILUTE in 100 mL NS, run over 5 minutes.
IN: 0.3 mg/kg (add 0.1 mL for MAD device volume)
IM: 1 mg/kg

Patient Wt		IV/IO		IN	IM	
lb	kg	Dose mg	Dose mL	Add 0.1 mL for MAD	Dose mg	Dose mL
10	4.5	1.4 mg	0.03 mL	0.13 mL	4.5 mg	0.09 mL
20	9.1	2.7 mg	0.05 mL	0.15 mL	9.1 mg	0.18 mL
30	13.6	4.1 mg	0.08 mL	0.18 mL	13.6 mg	0.27 mL
40	18.2	5.5 mg	0.11 mL	0.21 mL	18.2 mg	0.36 mL
50	22.7	6.8 mg	0.14 mL	0.24 mL	22.7 mg	0.45 mL
60	27.3	8.2 mg	0.16 mL	0.26 mL	27.3 mg	0.55 mL
70	31.8	9.5 mg	0.19 mL	0.29 mL	31.8 mg	0.64 mL
80	36.4	10.9 mg	0.22 mL	0.32 mL	36.4 mg	0.73 mL
90	40.9	12.3 mg	0.25 mL	0.35 mL	40.9 mg	0.82 mL
100	45.5	13.6 mg	0.27 mL	0.37 mL	45.5 mg	0.91 mL
110	50	15 mg	0.3 mL	0.4 mL	50 mg	1 mL
120	54.5	16.4 mg	0.33 mL	0.43 mL	54.5 mg	1.09 mL
130	59.1	17.7 mg	0.35 mL	0.45 mL	59.1 mg	1.18 mL
140	63.6	19.1 mg	0.38 mL	0.48 mL	63.6 mg	1.27 mL
150	68.2	20.5 mg	0.41 mL	0.51 mL	68.2 mg	1.36 mL
160	72.7	21.8 mg	0.44 mL	0.54 mL	72.7 mg	1.45 mL
170	77.3	23.2 mg	0.46 mL	0.56 mL	77.3 mg	1.55 mL
180	81.8	24.5 mg	0.49 mL	0.59 mL	81.8 mg	1.64 mL
190	86.4	25.9 mg	0.52 mL	0.62 mL	86.4 mg	1.73 mL
200	90.0	27.3 mg	0.55 mL	0.65 mL	90.9 mg	1.82 mL
210	95.5	28.6 mg	0.57 mL	0.67 mL	95.5 mg	1.91 mL
225	102.3	30.7 mg	0.61 mL	0.71 mL	102.3 mg	2.05 mL
250	113.6	34.1 mg	0.68 mL	0.78 mL	113.6 mg	2.27 mL
275	125.0	37.5 mg	0.75 mL	0.85 mL	125.0 mg	2.5 mL
300	136.4	40.9 mg	0.82 mL	0.92 mL	136.4 mg	2.73 mL
325	147.7	44.3 mg	0.89 mL	0.99 mL	147.7 mg	2.95 mL
350	159.1	47.7 mg	0.95 mL	1.05 mL	159.1 mg	3.18 mL
375	170.5	51.1 mg	1.02 mL	1.12 mL	170.5 mg	3.41 mL
400	181.8	54.5 mg	1.09 mL	1.19 mL	181.8 mg	3.64 mL

Ketorolac (Toradol®)

SCOPE:	PM NES PARAMEDIC NES
MC REQUIREMENT:	For administration to pediatric patients.
FORM:	Vial (30 mg/1 mL)
CLASS:	Analgesic, nonsteroidal anti-inflammatory drug (NSAID)
PHARMACOLOGY AND ACTIONS:	Inhibits the synthesis of prostaglandins.
ONSET:	IV/IM: 10 minutes
DURATION:	IV/IM: 4-6 hours
INDICATIONS:	Moderate to severe pain.
CONTRAINDICATIONS:	• Allergies to NSAIDs or aspirin • Pregnancy, active labor, or women who are breastfeeding • Renal impairment • Bleeding or high risk of bleeding, such as: multi-system trauma; suspected internal bleeding; GI bleeding/ulcers; suspected or confirmed cerebrovascular bleeding; asthmatics, esp. with nasal polyps.
PRECAUTIONS:	• Avoid use in dehydrated patients. • Do not administer to patients with renal failure (stage 4 CKD). Use caution in patients with hepatic impairment. • NSAIDs can cause edema and fluid retention in patients with cardiac disease or hypertension: use caution. • Carefully observe patients with bleeding disorders or those who take anticoagulants.
SIDE EFFECTS AND NOTES:	• Ketorolac is an NSAID that provides opioid-level analgesia. • Ketorolac has been shown to be as safe and effective as narcotics in patients with kidney stones (renal colic). • Use lower dose (15 mg) IV/IM in patients > 65 yrs or with concern for renal function. • Side effects include headache and dyspepsia. • Serious adverse effects include acute kidney injury, GI bleed or ulcer perforation, prolonged bleeding times (ketorolac inhibits platelet aggregation).

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Pain management	IV	15 mg	Max one dose IM or IV. For extended patient care > 6 hours, contact MC.
	IM	30 mg	
PEDIATRIC DOSING: Over 30 kg, same as adult. Less than 30 kg, contact MC.			

3125

Lidocaine 2% (Xylocaine®)

SCOPE:	PM NES PARAMEDIC NES
SUPPLIED:	100 mg/5 mL
CLASS:	Local anesthetic
PHARMACOLOGY AND ACTIONS:	Lidocaine works as a numbing agent when used before administration of fluids and medications after IO insertion. Produces local anesthesia by reducing sodium permeability of sensory nerves, which blocks impulse generation and conduction.
ONSET:	45-90 seconds
DURATION:	10-30 minutes
INDICATIONS:	Intraosseous access needle use only, for pain control at injection site.
CONTRAINDICATIONS:	Hypersensitivity to amide-type anesthetics (lidocaine, bupivacaine, mepivacaine).
PRECAUTIONS:	Watch for adverse reactions, particularly anaphylaxis, seizures, dysrhythmia
SIDE EFFECTS AND NOTES:	• Side effects are rare, but can include slurred speech, drowsiness, confusion, nausea, vertigo, ataxia, tinnitus, paresthesia, muscle twitching, psychosis, seizures, respiratory depression, allergic reaction, anaphylaxis, dysrhythmia, palpitations, hypotension. • Toxicity is more likely in elderly patients.

See specific protocols for Medical Control requirements

ADULT DOSING		
INDICATION	**DOSE**	**NOTES**
IO Insertion	40 mg (2 mL)	Push slowly over 2 minutes, once, if conscious or significant pain

PEDIATRIC DOSING		
INDICATION	**DOSE**	**NOTES**
IO Insertion	0.5 mg/kg (max of 40 mg)	Push slowly over 2 minutes, once, if conscious or significant pain

Magnesium Sulfate

SCOPE:	PM X PARAMEDIC X
FORM:	50%, 5 gm in 10 mL vial (500 mg/mL)
CLASS:	Antiarrhythmic, anticonvulsant, electrolyte, smooth muscle relaxant
PHARMACOLOGY AND ACTIONS:	Magnesium is a cation that has antiarrhythmic effects by prolonging conduction of cardiac impulses and stabilizing excitable membranes. It may relax bronchial smooth muscle in patients with severe bronchospasm
ONSET:	IV Immediate
DURATION:	3-4 hours
INDICATIONS:	• **Eclampsia:** In third trimester patients with hypertension and active seizures. Administer magnesium sulfate to stop eclamptic seizure and then may be continued to prevent recurrent seizures. • **Preeclampsia:** MC may order magnesium for preeclampsia prophylaxis or for patients who have recently suffered a seizure secondary to eclampsia. • **Pulseless torsades de pointes:** after defibrillation, epinephrine, and amiodarone in the treatment of pulseless torsades de pointes or cardiac arrest from suspected hypomagnesemia torsades de pointes with a pulse: do not delay defibrillation of unstable patients to administer magnesium. • **Severe asthma:** in severe/life-threatening exacerbations after conventional treatment has failed.
CONTRAINDICATIONS:	• 2nd or 3rd degree heart blocks • Renal disease • Hypersensitivity
PRECAUTIONS:	In the nonarrest patient magnesium sulfate may cause hypotension, bradycardia, decreased reflexes, and respiratory depression.

NOTE: Use of magnesium sulfate for eclampsia/preeclampsia and any administration to pediatric patients is by Medical Control only.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Eclampsia/preeclampsia	IV/IO	5 g in 500 mL NS over 20 minutes	After initial dose, consider infusion of 1-2 g/hour
	IM	10 g divided 5 g each glute in actively seizing patient	If no IV access, may use 10 g IM to stop eclamptic seizure. Then establish IV and contact MC for orders.
Torsades de pointes	IV/IO	1-2 g slow IV (15 minutes) in 100 mL NS	Give as IV push in pulseless torsades de pointes
Asthma	IV/IO	Usual dose is 2 g in 100 mL NS over 20 minutes	Contact MC for use in this situation
PEDIATRIC DOSING (over 14 years old: 50 mg/kg up to max 2 g): MC orders ONLY (not communications failure)			

NOTE: If patient less than 14 years old is pregnant or has recently given birth (< 4 weeks postpartum), treat as an adult.

3135

Midazolam (Versed®)

SCOPE:	PM X PARAMEDIC X
FORM:	5 mg in 1 mL vial
CLASS:	Benzodiazepine, sedative/hypnotic, anticonvulsant, muscle relaxant
PHARMACOLOGY AND ACTIONS:	Midazolam binds to benzodiazepine receptors in the central nervous system, resulting in hyperpolarization and stabilization of neuronal membranes. It has potent sedative, anti-anxiety, and anticonvulsant properties. It depresses level of consciousness and causes significant amnesia.
ONSET:	IV/IO/IN: 1-2 minutes IM: 7-8 minutes
DURATION:	20-30 minutes
INDICATIONS:	• Active seizures, status epilepticus • Chest pain associated with cocaine use • Sedation during cardioversion or pacing • Behavioral emergencies: extreme agitation or combativeness; consider for ketamine-induced emergence reactions • Sedation after ALS airway (Supraglottic Airway)
CONTRAINDICATIONS:	• Hypotension • None, if actively experiencing seizures • Respiratory depression
PRECAUTIONS:	Midazolam causes respiratory depression and/or hypotension especially if administered rapidly. All patients should be closely monitored using $EtCO_2$ and pulse oximetry to assess for respiratory depression.
SIDE EFFECTS AND NOTES:	• Common side effects include drowsiness, altered mental status, hypotension, respiratory depression, and apnea. These are more likely to occur in the elderly or COPD patients. Rarely, patients may experience paradoxical agitation. • Respiratory depression is more likely in patients who have taken other CNS depressant drugs such as opioids, and alcohol, or when midazolam is given rapidly. • Midazolam is metabolized in the liver and excreted by the kidney. Doses should be adjusted accordingly in patients with underlying hepatic or renal diseases and low-flow states such as congestive heart failure. • All patients should be on oxygen if possible to support possible respiratory depression. • In communication failure, titrate IV/IN or IM doses to control active seizures or behavioral emergencies, without maximum, while carefully monitoring vitals. • Consider midazolam to treat/prevent emergence reactions in patients receiving ketamine (start with 1 mg IV/IO/IN).

SCOPE: PM, PARAMEDIC

NOTE: Use of midazolam for behavioral emergencies in children less than 10 years old is by Medical Control only.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Agitation, ketamine-induced emergence, pacing, cardioversion, chest pain caused by sympathomimetic drug use (e.g., cocaine, methamphetamine)	IV/IO/IN	1-5 mg (estimated 0.05 mg/kg)	May repeat once in 5 min
	IM	5 mg	Call MC for repeat dosing.
Seizures, status epilepticus	IV/IO/IN	2 mg	May repeat every 3-5 minutes prn, max dose 10 mg without MC.
	IM	5 mg	May repeat every 15 minutes prn max dose 10 mg without MC.
Chemical Restraint	IV/IO/IN	2 mg	May repeat every 3-5-minute prn max dose 10 mg without MC.
	IM	5-10 mg	May repeat every 10-15 minutes prn max dose 10 mg without MC.

PEDIATRIC DOSING (less than 10 years old)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Agitation, ketamine-induced emergence, pacing, cardioversion, chest pain caused by sympathomimetic drug use (e.g., cocaine, methamphetamine)	IV/IO/IN	0.05 mg/kg	May repeat once in 5 min. to a max of 0.1 mg/kg up to 2 mg then call MC.
Seizures, status epilepticus	IV/IO/IN	0.05 mg/kg (max 2 mg)	May repeat once in 5 min. to a max of 0.1 mg/kg then call MC.
	IM	0.1 mg/kg (max 5 mg)	May repeat once in 5 min. to a max of 0.2 mg/kg then call MC.
Chemical restraint	IV/IO/IN	MC ONLY	
	IM		

3140

Morphine Sulfate

SCOPE:	PM X PARAMEDIC X
FORM:	10 mg in 1 mL, vial or preloaded syringe
CLASS:	Narcotic analgesic
PHARMACOLOGY AND ACTIONS:	Acts on specific receptors in the brain to relieve pain, depress mental status, and depress respiratory drive. Peripheral vasodilation causing decreased venous return to the heart, decreased systematic vascular resistance, and hypotension. All decrease oxygen demand of the heart.
ONSET:	IV/IO: immediate IM: 10-30 minutes
DURATION:	IV/IO/IM: 3-4 hours
PEAK EFFECT:	IV/IO: 20 minutes IM: 40-60 minutes
INDICATIONS:	• Chest pain unrelieved by nitroglycerin. • Severe pain in hemodynamically STABLE patients. • Analgesia after ALS airway (see Procedure: *Airway Management: King LTS-D Supraglottic Airway (1035)*)
CONTRAINDICATIONS:	• Patients in whom respiratory depression or histamine release should be avoided (asthma/COPD) • Patients in whom CNS (mental status) depression should be avoided (head injury) • Shock/hypotension • Allergy to morphine • Altitude Illness—HAPE
PRECAUTIONS:	• SBP > 100 and normal mental status to administer (SBP appropriate for age, pediatrics). • If transport time > 2 hours, or if repeated doses of fentanyl are ineffective, consider switch to administration of morphine 15-30 minutes after previous dose fentanyl. Discuss with Medical Control. • Do NOT use without Medical Control order if any other systems injured (e.g., traumatic abdominal pain, altered mental status). • Hypotension should be treated with fluids. Use caution with altitudes > 8,000 ft, elderly who may require smaller doses and are more susceptible to hypotension, and alcohol or drugs that are CNS depressants.
SIDE EFFECTS AND NOTES:	• May cause hypotension, flushing, sedation, dizziness, respiratory depression, nausea, vomiting. • Monitor vitals and mental status before and after each dose. • Be prepared for respiratory depression and monitor closely with $EtCO_2$. Have equipment to assist respirations and naloxone prepared for drug reversal if necessary.

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Chest pain or severe pain	IV/IO/IM	2-5 mg (0.2-0.5 mL)	Repeat dose q 15 min. prn pain (max 20 mg)

PEDIATRIC DOSING (0-10 years old)

INDICATION	ROUTE	DOSE	NOTES
Severe pain	IV/IO	0.1 mg/kg (0.01 mL/kg) 5 mg max single dose	Repeat dose in 15 minutes 1x prn pain. (Max 10 mg)
	IM	0.2 mg/kg (0.02 mL/kg) 5 mg max single dose	Repeat dose in 15 minutes 1x prn pain. (Max 10 mg)

Naloxone (Narcan®)

SCOPE:	EMR INO EMT INO AEMT X PM X PARAMEDIC X
FORM:	Preloaded syringe, 2 mg/2 mL
CLASS:	Opioid narcotic antagonist
PHARMACOLOGY AND ACTIONS:	Naloxone is an opioid antagonist that competes with narcotics for opiate receptor sites in the brain that affect pain and breathing, thereby reversing the respiratory depressant effects of narcotic drugs.
ONSET:	IV/IO: 2 minutes IM/IN: 5 minutes
DURATION:	1-4 hours
INDICATIONS:	• Suspected narcotic intoxication with altered mental status AND apnea or slow, shallow breathing. • Altered level of consciousness (ALOC) of unknown etiology
CONTRAINDICATIONS:	None
PRECAUTIONS:	• In patient physically dependent on opioids, violent withdrawal symptoms may occur (combativeness, pain, nausea, vomiting, diarrhea, hypertension, tachycardia, tremors). Be prepared to restrain the patient and contact MC for guidance on managing patient in withdrawal. • Administering a lower dose (0.5 mg) to chronic opioid users may lessen withdrawal symptoms. If giving a lower dose, closely monitor the patient and ensure patient is breathing adequately. Administer additional doses as necessary. • Some opioid overdoses (e.g., methadone, designer drugs) may require multiple doses of naloxone to treat. • Patients with damaged nasal mucosa or prolific nasal secretions may be unable to absorb intranasal naloxone and may require either higher doses or naloxone administration by a different route.
SIDE EFFECTS AND NOTES:	• The effect we are attempting to reverse is respiratory depression/failure. Adequate airway management is the first goal that must be achieved. • Some opioids have longer durations of action than naloxone; repeat doses may be necessary. Monitor the patient closely. • Patients who have received naloxone must be transported. Symptoms may recur when naloxone wears off. • Pinpoint pupils are a classic sign of narcotic use/overdose. However, pupil findings may vary in multi-drug intoxications. • Naloxone is remarkably safe and side effects are rare. Do not hesitate to use it if indicated. • If no effect is seen from naloxone administration, consider other causes of altered mental status or respiratory depression. • For use of patient's own autoinjectors or nasal spray, follow instructions on drug packaging.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Reversal of opioid effects, ALOC of unknown etiology	IN/IM/ IV/IO	0.5 - 2.0 mg titrate to effect	Additional doses every 2-5 minutes prn ALOC (max 10 mg)

PEDIATRIC DOSING (less than 20 kg)			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Reversal of opioid effects, ALOC of unknown etiology	IN/IM/ IV/IO	0.1 mg/kg (Max 2 mg)	Additional doses every 2-5 minutes prn ALOC (max 10 mg)

3150

Nifedipine (Procardia®)

SCOPE:	EMT APO AEMT APO PM NES PARAMEDIC NES
FORM:	30 mg ER or 20 mg ER
CLASS:	Calcium Channel Blocker
PHARMACOLOGY AND ACTIONS:	Nifedipine, in its use as an altitude treatment agent, is predominantly for its pulmonary vasodilatory effect.
ONSET:	IPO - 30 minutes (Extended release)
DURATION:	24 hours
INDICATIONS:	High Altitude Pulmonary Edema (HAPE) prophylaxis for susceptible individuals and for treatment of those demonstrating symptoms of HAPE
CONTRAINDICATIONS:	• Hypersensitivity to calcium channel blockers • Cardiogenic shock • Hypotension
PRECAUTIONS:	Although hypotension is not commonly seen with these doses, be aware that it is a possibility.
SIDE EFFECTS AND NOTES:	• Flushing • Dizziness • Cough

ADULT DOSING			
INDICATION	**DOSE**	**ROUTE**	**NOTES**
Treatment of HAPE	30 mg ER q 12 h or 20 mg ER q 8 h	PO	

Nitroglycerin (NTG)

SCOPE:	EMT APO AEMT X PM X PARAMEDIC X
FORM:	Pump spray or tablet (0.4 mg per spray or tablet); paste: multi-dose or single dose tube
CLASS:	Nitrate, vasodilator
PHARMACOLOGY AND ACTIONS:	Increases cardiac output primarily by decreasing preload, but also decreases afterload and dilates coronary arteries. Nitroglycerin is an organic nitrate and is a vasodilating agent. Its cardiovascular effects include reduced venous tone (causing pooling of blood in the peripheral veins and decreased return of blood to the heart), decreased peripheral resistance and dilation of coronary arteries.
ONSET:	Tablet/Spray: immediate to 2 minutes; Paste: 10 minutes
DURATION:	Tablet/Spray: 10-30 min; Paste 24 hours
INDICATIONS:	Chest pain thought to be related to cardiac ischemia Pulmonary edema from CHF (not HAPE or noncardiogenic)
CONTRAINDICATIONS:	• Hypotension (SBP < 100) • Erectile dysfunction drug use in past 24 hours: Viagra (sildenafil citrate), Levitra (vardenafil HCl) or Cialis (tadalafil) • Cerebral edema or increased intracranial pressure
PRECAUTIONS:	• Generalized vasodilation may cause profound hypotension and reflex tachycardia. • Use with caution in patients with borderline blood pressure or with inferior/right side MI. • Tablets should be placed under tongue, not chewed nor swallowed. • Always handle nitro paste with gloves and place away from potential AED pad sites. • Monitor vitals after 2-3 minutes after each dose. • Patients taking nitrates chronically may develop a tolerance and require higher doses. • Date bottle after opening. It is good for 2 months once opened. Protect it from heat and light.
SIDE EFFECTS AND NOTES:	• Common side effects are headache, hypotension, tachycardia, flushing, dizziness, diaphoresis, rash. • Nitroglycerin is not indicated for children.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Chest pain	SL	0.4 mg tablet or one spray every 5 minutes prn chest pain (max 8 tablets/sprays)	If SBP > 100 mmHg
	Topical	One inch on special paper and applied to anterior chest wall	Wipe paste off if SBP < 90
CHF/pulmonary edema	SL	SBP=100-120: 0.4 mg tablet or one spray OR SBP=120-200: two 0.4 mg tablets/sprays OR SBP > 200: three 0.4 mg tablets/sprays and call Medical Control; dose can be repeated per protocol.	Wipe paste off if SBP < 90
	Topical	One inch on special paper and applied to anterior chest wall	Wipe paste off if SBP < 90
PEDIATRIC DOSING (NOT indicated)			

3165

Ondansetron (Zofran®)

SCOPE:	EMR APO EMT PO AEMT PO PM X PARAMEDIC X
FORM:	4 mg/2 mL vial OR 4 mg ODT (orally dissolving tablet)
CLASS:	Antiemetic
PHARMACOLOGY AND ACTIONS:	Ondansetron is a potent, highly selective serotonin (5-HT3) receptor agonist. Treats and prevents nausea and vomiting. Its precise mode of action in the control of nausea is not known. Pharmacologic agents and other triggers may cause release of 5-HT3 receptors. Ondansetron blocks the initiation of this reflex. Ondansetron is commonly used in the treatment of nausea in patients who are receiving chemotherapy or as a postoperative nausea treatment.
ONSET:	IV/IO/IM/ODT 2-5 minutes
PEAK EFFECT:	IV/IO 5 minutes IM 20 minutes SL/PO 30-120 minutes
DURATION:	IV/IO/IM/ODT 5-6 hours
INDICATIONS:	Prevention and control of uncomplicated nausea and vomiting
CONTRAINDICATIONS:	• Known hypersensitivity to ondansetron or similar medications • Prolonged QTc
PRECAUTIONS:	• Hypersensitivity reactions have been reported in patients who have exhibited hypersensitivity to other HT3 medications (Anzemet, Kytrik). • Patients with bowel obstruction should be monitored closely following administration. • Ondansetron may precipitate if mixed with alkaline solutions.
SIDE EFFECTS AND NOTES:	• The most common side effects include headache, dizziness, drowsiness, diarrhea, dry mouth, and shivers. • Body aches, agitation, dysuria, hypotension, and rash have also been reported in a very small number of patients. • Rare cases of angina and tachycardia have been reported as well. • Consider administration of ondansetron before transport in patients who are fully immobilized.

See specific protocols for Medical Control requirements

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Nausea and vomiting	IV/IO	4 mg	SIVP over 2-5 min., repeat in 15 minutes 2x prn (max 3 doses)
	ODT	4 mg	May repeat in 15 minutes 2x prn nausea (max 3 doses)
	IM	8 mg	May repeat in 15 minutes 1x prn nausea (max 2 doses)

PEDIATRIC DOSING (3 months—14 years old)			
Nausea and vomiting	IV/IO	0.1 mg/kg (max 4 mg)	SIVP over 2-5 min., repeat in 15 min. 2x prn (max 3 doses)
	ODT	4-10 yrs: 1/2 tab (2 mg)	
	IM	0.2 mg/kg (max 8 mg)	May repeat every 15 minutes 1x prn nausea (max 2 doses)
OLMC CONTACT required for patients age 0-3 months.			

Oxygen

SCOPE:	EMR APO EMT X AEMT X PM X PARAMEDIC X
CLASS:	Medical Gas
PHARMACOLOGY AND ACTIONS:	Oxygen added to the inspired air raises the amount of oxygen in the blood and the amount delivered to the tissues. Breathing in most persons is regulated by small changes in acid/base balance and CO_2 levels and it takes a large drop in oxygen concentration to stimulate respiration.
INDICATIONS:	• Suspected hypoxemia or respiratory distress from any cause (Adults: RR < 10 or RR > 24) • Acute chest pain, in which cardiac ischemia or myocardial infarction is suspected • Shock from any cause • Major trauma • Carbon monoxide poisoning • Irregular heart rhythms (Adult: HR < 50 or HR > 120) • Acute altered mental status/neurologic symptoms • *Traumatic Brain Injury (2307)*
CONTRAINDICATIONS:	None
PRECAUTIONS:	• If the patient is not breathing adequately on their own, the treatment of choice is ventilation with oxygen, not just supplemental oxygen. • With COPD patients, administration of oxygen may decrease respiratory drive. Do not withhold oxygen because of this possibility. Start O_2 at 2 L/min. via nasal cannula. If patient is continuing to be dyspneic, increase oxygen gradually until cyanosis clears. Change to NRBM and high flow if still cyanotic at 6 L/min. Be prepared to assist ventilation if needed with BVM. • If patient is experiencing cardiac chest pain titrate to 90%. If 90% or greater, do NOT administer oxygen. • In a patient with altered mental status or possible stroke use low-flow oxygen and titrate oxygen saturation to 94%. If 94% or above, DO NOT administer oxygen. • Never withhold oxygen for patients with respiratory distress.
SIDE EFFECTS AND NOTES:	• Humidified oxygen should be used if the patient experiences airway discomfort, transport time is greater than 1 hour, or if directed by a specific protocol. • Restlessness may be an important sign of hypoxia. • Oxygen toxicity is not a risk in acute administration. • Nasal cannula prongs work equally well on nose and mouth breathers (move nasal prongs to mouth).

DOSING

ADJUNCT	FLOW	INSPIRED O_2
Nasal cannula (mild distress, stable vitals)	2-6 liters/minute	24-40%
Nonrebreather mask (severe distress, unstable vitals, ALOC)	10-15 liters/minute	90%
BVM (apnea, respiratory distress) (Target SaO_2 is 100%)	Room air	21%
	15 liters/minute	40%
	With reservoir	90+%
CPAP	10-25 liters/minute	90+%

3168

Pralidoxime (2-PAM)

SCOPE:	EMR AIO EMT AIO AEMT AIO PM AIO PARAMEDIC AIO
FORM:	Autoinjector of 600 mg Pralidoxime Chloride in either single chamber (DuoDote®)–or part of 2 injector kit (Mark I®)
CLASS:	Nerve agent antidote--cholinesterase re-activator
PHARMACOLOGY AND ACTIONS:	Pralidoxime (2-PAM) is used in organophosphate poisoning to reactivate the Acetylcholinesterase enzyme allowing it to resume the function of hydrolyzing the accumulated acetylcholine from organophosphate poisoning. This helps to restore proper cholinergic function at the neuromuscular junction.
ONSET:	2-10 minutes
DURATION:	Varies depending on exposure.
INDICATIONS:	• Known exposure to organophosphate and at least 2 symptoms (see protocol Nerve Agent Exposure 2240).
RELATIVE CONTRAINDICATIONS:	None
PRECAUTIONS:	• Tachycardia and tachycardic dysrhthymias can occur. Caution in patient with known history of these conditions. The patient's rhythm should be observed for arrhythmias. • Cardiac ischemia can result from tachycardia. • Use of the Nerve Agent antidotes kits can inhibit sweating, increasing risk for heat injury.
SIDE EFFECTS AND NOTES:	• Any patient having received this medication must be transported to hospital for further observation and care. • Multiple doses up to three may be needed in the field. • **Further doses beyond three of 2-PAM not indicated, but additional atropine may be–contact MC.**

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Organophosphate exposure and 2 mild symptoms	IM autoinjector	600 mg	Wait 10-15 min after initial dose, if no worsening or additional symptoms, no additional doses. If any severe symptoms give 2 additional autoinjector doses if available. All patients will need to be observed in hospital setting 48 - 72 hours after receiving dose

PEDIATRIC DOSING			
Same as adult		Weight above 40kg--use adult autoinjector Weight under 40kg 25-50 mg/kg dose.	PEDs autoinjectors don't exist–contact MC

Sodium Bicarbonate

SCOPE:	PM X PARAMEDIC X
FORM:	50 mEq/50 mL prefilled syringe (1 mEq/mL)
CLASS:	Alkalinizing agent
PHARMACOLOGY AND ACTIONS:	Buffers the acids present in the body during and after severe hypoxia or ischemia. Counteracts cardiac effects of tricyclic antidepressants (TCAs). Alkalinizes urine to enhance elimination of some drugs (TCAs, aspirin). Lowers serum potassium. Acids are increased in the blood when body tissues become hypoxic due to cardiac or respiratory arrest. Acidosis depresses cardiac contractility and cardiac response to catecholamines and makes the heart more likely to fibrillate and less likely to defibrillate. In the nonperfusing patient sodium bicarbonate has been shown to increase the intracellular acidosis and worsen acid/base balance; thus, it is not recommended in the routine cardiac arrest sequence.
ONSET:	IV/IO Immediate DURATION: IV/IO 30 minutes
INDICATIONS:	• Cardiac arrest/dysrhythmias • Suspected hyperkalemia • Consider for TCA or aspirin OD with abnormal vitals or wide QRS on ECG • Acidosis, including that caused by prolonged cardiac arrest/dysrhythmias or drug intoxication (i.e., salicylates [aspirin], methyl alcohol, tricyclic antidepressants) • Consider in Psychomotor agitated state
CONTRAINDICATIONS:	None
PRECAUTIONS:	• Addition of too much bicarbonate may result in alkalosis that is difficult to reverse and may cause as many problems in resuscitation as the initial acidosis. • May increase cerebral acidosis, especially in diabetics who are ketonic. • Although no longer recommended in routine cardiac arrest, sodium bicarbonate may be indicated with a history of toxicologic exposure, renal failure, or excessive exertion. • Flush IV line before and after administration of any other drugs. • Severe tissue necrosis may occur of sodium bicarbonate extravasates. • May worsen CHF.
SIDE EFFECTS AND NOTES:	• Hypoventilation, volume overload, muscle cramps, pain, tetany. • Each amp of sodium bicarbonate contains 50 mEq of sodium. This may increase intravascular volume and hyperosmolarity resulting in cerebral impairment.

MC REQUIRED: Parkmedic—in cases other than cardiac arrest. Paramedic—in cases other than cardiac arrest or overdoses

ADULT DOSING

INDICATION	ROUTE	DOSE	NOTES
Overdoses: Tricyclic antidepressant or aspirin	IV/IO	1 mEq/kg (max 50 mEq)	SIVP, consider serial ECGs to titrate to effect.
Cardiac Arrest	IV/IO	1 mEq/kg (max 50 mEq)	SIVP, may repeat at 0.5 mEq/kg in 10 min
Hyperkalemia	IV/IO	1 mEq/kg (max 50 mEq)	SIVP, consider serial ECGs to titrate to effect.

PEDIATRIC DOSING (0-14 years old): Contact MC for dosing. Children < 10kg, dilute with equal parts NS before administration.

3175

Tranexamic Acid (TXA)

SCOPE:	EMT LES(TOP) AEMT LES PM NES PARAMEDIC NES
FORM:	1 gm/10 mL vial (100 mg /mL)
CLASS:	Antifibrinolytic, antihemophilic, hemostatic agent
PHARMACOLOGY AND ACTIONS:	Tranexamic acid inhibits the conversion of plasminogen to plasmin, thus preventing the breakdown of fibrin, the protein that holds clots together (i.e. TXA stabilizes blood clots).
ONSET:	10 minutes
DURATION:	Up to 48 hours
INDICATIONS FOR TOPICAL USE:	Uncontrolled epistaxis or dental bleeding
INDICATIONS FOR TRAUMA:	• Adult (15 years or older) with signs of hemorrhagic shock from trauma OR postpartum hemorrhage • Obvious bleeding from external wounds (neck to mid-thigh) and/or suspected severe internal injuries from blunt or penetrating trauma • Trauma occurred within the last 3 hours • Sustained tachycardia (HR > 110) and/or sustained hypotension (SBP ≤ 90 mmHg)
ADDITIONAL USE:	• Childbirth with post partum hemorrhage
CONTRAINDICATIONS:	• Non-hemorrhagic shock • Hemorrhagic shock stabilized by other hemostatic interventions • Patient less than 15 years old
SIDE EFFECTS AND NOTES:	• TXA has not been shown to cause significant increase in deep venous thrombosis, pulmonary embolism, myocardial infarction, or stroke in published trials to date, despite theoretical concerns that it may do so. • Give TXA as soon as possible if all indications are met.

ADULT DOSING			
INDICATION	**ROUTE**	**DOSE**	**NOTES**
Hemorrhagic shock with all criteria for use met (see above indications)	IV/IO	2 gm	Mixed in 100 mL NS over 10 min
Uncontrolled epistaxis or dental bleeding	Topical	5 mL on gauze	Soak gauze/cotton with 5 mL TXA, and apply to area of bleeding for 30 min. (inside nostril, or in mouth)
PEDIATRIC DOSING (0-14 years old): Not Indicated			

Canine Opioid Exposure – Naloxone Administration

SCOPE: EMR X EMT X AEMT X PM X PARAMEDIC X

WHEN TO ADMINISTER NALOXONE TO A K9:

Known overdose of opioid

- Heroin, morphine, fentanyl, carfentanil
- Clinical signs can present within 15 minutes

Clinical Signs can include:

- Drowsiness
- Difficulty standing
- Failure to respond to commands
- Blank stare
- Weakness, progressing to unconsciousness
- Inability to breathe, leading to death

WHAT IS THE DOSAGE?

- 4.0 mg Intranasal (IN)
- Dose will depend on the amount of opioid exposure

ATOMIZER

- 2.0 mg
- 4.0 mg

ADMINISTRATION

- Hold snout closed with one hand and place tip of atomizer inside one nostril
- Compress atomizer
- Place basket muzzle on dog IMMEDIATELY after administration
  - » Allow dog to pant (cooling mechanism), vomiting MIGHT occur
  - » HUMAN should wear mask, eye cover and gloves
- Repeat every 2 minutes if clinical signs do not resolve
  - » If not breathing, apply tight fitting facemask and attach to ambubag and ventilate 6 breaths per minute
  - » Remove muzzle to re-dose and replace immediately, continue to monitor for breathing
- **Transport to veterinary medical facility**

ADVERSE SIGNS TO OBSERVE FOR:

- Excitability, vomiting, and tachycardia (rapid heart rate)

Dogs can come out of the overdose very excited and disoriented. They may not respond to handler commands. Care should be taken to keep dog from harming itself, the handler, or bystanders.

K9 SAR. Sabre (left-facing) and K9 Officer Gator

Appendices

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Appendix A

	Patient Care Report **Refer also to IRPG (Pink Section) and Medical Incident Report (8-Line)***	

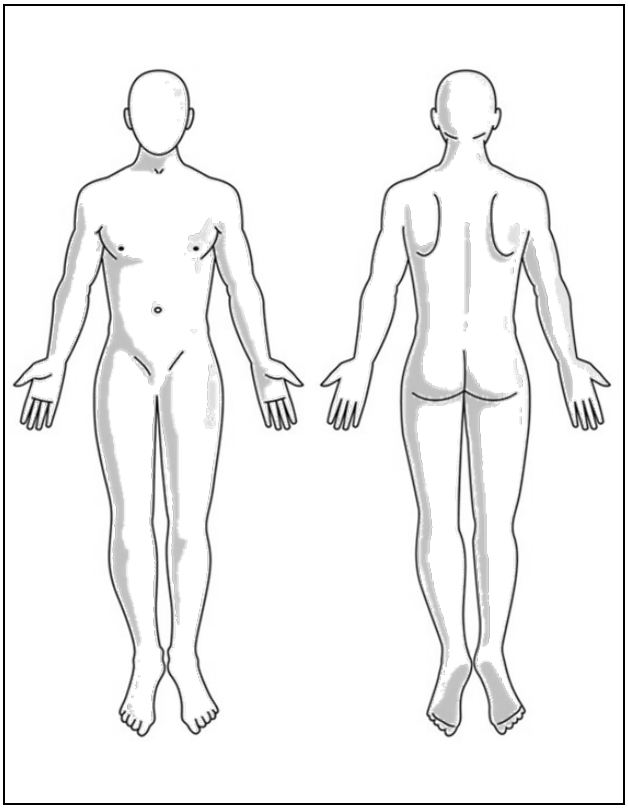
Patient Name:				Date:		
				Age:	Weight:	
*Incident Name / Number:				DOB:	☐ Male	☐ Female
*Evac Priority:	Red / Priority 1	Yellow / Priority 2	Green / Priority 3	POC:		
☐ Medical ☐ Trauma ☐ Cardiac ☐ First Aid	Chief Complaint:					
*NOI / MOI:						
S / S:						

					Glasgow Coma Scale:	Eye:	Verbal:	Motor:	Total (E+V+M):
A	Patent	NPA	OPA	Advanced Airway		4 3 2 1	5 4 3 2 1	6 5 4 3 2 1	
B	O_2	Canula	NRB	BVM					
C	Radial	Carotid	None						

Patient Signs	Speech	Skin Moisture	Color	Respiratory	Pulse	Pupils
	Coherent	Normal	Normal	Clear L / R	Normal	Reactive L / R
	Incoherent	Dry	Pale	Wet L / R	Rapid	Dilated L / R
	Slurred	Moist / Clammy	Bluish	Decreased L / R	Weak/Slow	Equal
	Silent	Profuse Sweating	Flushed / Red	Absent	Absent	Unequal

Vitals

Time	LOC / AVPU	Pulse	BP	RR / Quality	O_2 Saturation	BGL	Pain
			/				
			/				
			/				
			/				
			/				
			/				



Loss of Consciousness:	☐ No	☐ Yes	Minutes:

Medications

Time	Medication	Route	Response

Waiver of Treatment / Patient Refusal

I acknowledge that I have been informed that my medical condition requires immediate treatment and/or transport to a physician and that with refusing further emergency medical treatment there is a risk of serious injury, illness, or death. Understanding these risks, I hereby release the attending medical personnel, their home agency, and their advising physician from all responsibility regarding any ill effects which may result from this decision.

Patient Signature: Date:	Witness Signature: Date:

Transfer of Care

☐ Hospital ED	☐ ALS - Air	☐ ALS - Ground
☐ BLS	☐ Other (Specify):	

Receiving Signature:
Date:

EMS Provider Signature:
Date:

	**Patient Care Report - Additional Information** **Refer also to IRPG (Pink Section) and Medical Incident Report (8-Line)***	

Sample History
Signs / Symptoms:
Allergies:
Medications:
Past History
Last Intake:
Events:

*** Patient Assessment Findings**	
Time	

*** Treatments, Interventions, and Response**		
Time	Treatment / Intervention	Patient Response

*** Transportation Plan and/or ETA to Evacuation Location**

*** Additional Resource / Equipment Needs**

*** Additional Information and Notes**

Times		
	Onset (CC)	
	Dispatched	
	En Route	
	On Scene	
	Depart Ref.	
	Arrive Rec.	
	Available	

Other Information

Appendix C

Tactical Emergency Medical Services (TEMS) Supplement

PURPOSE

- To provide guidance and procedures for pre-hospital medical care where there is an actual or suspected: ballistic, explosive, chemical, violence, or other type of danger/threat.
- To provide effective patient care in tactical/hazardous environments:
  - » Active shooter scenarios
  - » Barricaded suspects/subjects
  - » Hostage situations
  - » Suicidal individuals with explosives and/or firearms
  - » Riots/civil disturbances
  - » Mass gatherings
  - » Illegal grow operations
  - » Clandestine laboratory raids
  - » Escaped convict searches
  - » Bomb threats
  - » National security incidents
  - » Terrorist incidents
  - » Other dynamic life-threatening situations
- To provide emergency medical care in the field.
- To ensure continuum of care for all patients in the Tactical EMS environment.

GENERAL

National Park Service, in conjunction with other EMS providers and law enforcement agencies, can train and deploy pre-hospital medical personnel in alignment with current Tactical EMS guidelines.

The Committee for Tactical Emergency Casualty Care (C-TECC) and the Committee on Tactical Combat Casualty Care (CoTCCC) are examples of TEMS guidelines that provide best practice recommendations for casualty management during high-threat civilian tactical and rescue operations. Based upon many of the principles of Tactical Combat Casualty Care (TCCC), Tactical Emergency Casualty Care (TECC) guidelines account for differences in the civilian environment, resources allocation, patient population, varied hazard types, and scope of practice.

Tactical/hazardous environments by nature are incidents requiring joint operations by NPS law enforcement and other law enforcement agencies. Separate tactical objectives are defined and met to achieve strategic success. **These objectives may be independent of any EMS objectives**.

The C-TECC recognizes three phases of tactical emergency casualty care. The phases are listed in the following table with priorities associated with mission success.

TCCC PHASES	C-TECC PHASES	ASSOCIATED PRIORITIES
Care Under Fire (CUF)	**Direct Threat Care (DTC)** • Hot zone • Area of evolving or unmitigated risk; hostile environment • Law enforcement, bomb team, hazmat team, or first responder buddy care • Extraction / Extrication	• Mitigate the threat • Move wounded to cover or area of relative safety (e.g., casualty collection point) • Manage massive hemorrhage • Self-Aid/Buddy Aid
Tactical Field Care (TFC)	**Indirect Threat Care (ITC)** • Warm zone/Cold zone boundary (casualty collection point) • Cleared but unsecured environment • Fire/EMS personnel with attached law enforcement, bomb team or hazmat team (Rescue Task Force)	• Initiated once the casualty is in an area of relative safety • Focus on preventable causes of death: » Hemorrhage, ABCs » Disability, environment • Initial triage
Tactical Evacuation Care (TACEVAC)	**Evacuation Care (EVAC)** • Cold zone • Secured transport corridor • Fire/EMS personnel with attached law enforcement, bomb team, or hazmat team	• Movement of casualty to higher-level care • Continuous reassessment of interventions and hypothermia management • Continued EMS Operations

DEFINITIONS

Casualty Collection Point (CCP)
Designated location where responder personnel gather, triage, provide Indirect Threat Care (ITC) and package patients for transport to medical treatment facilities.

Extraction/Extrication
Use of drags, lifts, and casualty evacuation platforms for rapid movement of patients from hot zone; plus other aspects of technical rescue.

Force Protection
Actions taken by law enforcement to conserve operational ability of any fire or EMS resources to extract, care for, and evacuate patients.

Rescue Task Force (RTF)
EMS personnel paired with law enforcement, bomb team or hazmat team that operate in the warm zone.

Transport Corridor
Secured area beyond casualty collection point for patient movement and ambulance access.

EXCLUSION/OPERATIONAL ZONES

(1) HOT ZONE: Area where a direct and immediate threat exists. Examples are active shooters, barricaded suspects, hostage situations, high-risk warrant services, possible terrorist acts, environments of risk, and areas with confirmation of chemical, biologic, radiation, nuclear, explosives contamination (CBRNE).

(2) WARM ZONE: Area where a potential threat exists, but the threat is not considered direct or immediate. Examples include areas cleared but not secured, areas of possible hostility, and unconfirmed hazardous environments.

(3) COLD ZONE: Area where no significant danger or threat can be reasonably anticipated. Examples include transport corridor, staging of resources, incident command post.

CASUALTY COLLECTION POINT and THE RESCUE TASK FORCE

Casualty Collection Point (CCP)

The CCP is an area designated to receive patients extracted from the hot zone, location may be in the warm or cold zone, or at the boundary between the warm and cold zones. The CCP operates under force protection, with the location of the CCP designated by Unified/Incident Command. Law enforcement and EMS personnel will establish the CCP as soon as feasible to begin receiving patients. The CCP can be located within a stronghold created by law enforcement or through the use of fire/EMS apparatus in order to provide a protected space for treating patients (e.g., large room, cafeteria) until it is safe to move them further.

The use of additional personal protective equipment (PPE) within the CCP (i.e., ballistic protective equipment [body armor] or hazardous materials suit) will be designated by the incident commander or safety officer.

The CCP is managed by the medical group supervisor or treatment unit leader, as designated. The CCP acts as the initial treatment area.

Indirect threat care principles will guide EMS personnel assigned to the CCP. These can be remembered by the MARCH-PAWS-L acronym. This expands on the XABC acronym (exsanguinating hemorrhage, airway, breathing, circulation).

RESCUE TASK FORCE

A Rescue Task Force (RTF) includes EMS medical personnel generally paired with law enforcement, bomb team, or hazardous materials personnel deployed to provide care to victims where there is a risk of ongoing ballistic, explosive, or hazardous materials threat. These teams treat, stabilize, and remove the injured in a rapid manner while wearing body armor and ballistic helmets or designated level of chemical protective clothing.

An RTF generally operates within the cold and warm zones, following the first wave of law enforcement, bomb team, or hazardous materials personnel, securing the area. RTF responders come from the cadre of public safety personnel, firefighters, EMTs and paramedics.

The RTF, including EMS medical personnel, will generally deploy into the warm zone.

INITIAL TRAINING

EMS or LE personnel participating in TEMS may require additional training that emphasizes lifesaving skills in tactical or high-risk environments. Specialized skills through the expanded scope process are components of TEMS.

PRE-PLANNING CONSIDERATIONS

- Assess "soft targets" identified by law enforcement (e.g., campgrounds, incident command posts, spike camps).
- Build and maintain medical kits (e.g., IFAK, first aid kit, AED, trauma kit).
- Determine potential PPE for both warm and hot zone deployment.
- Promote interoperability between LEI, EMS, other fire/EMS, outside law enforcement, or other cooperating agencies.
- Develop plan for accountability of personnel.
- Have a pre-established radio communications plan including:
  - » Federal (FED) Interoperability Plan (IOP) channels from National Interoperability Field Operations Guide (NIFOG)
  - » Local Emergency Dispatch including tactical and main dispatch frequencies and repeaters.

ACTIVATION OF TACTICAL MEDICAL RESPONSE

Initial Considerations

- Confirm type of incident (i.e., active shooter, barricaded suspect, hostage situation, terrorist acts).
- Consider options for scene security and EMS access.
- Gather intelligence on approximate number of victim(s)/hostage(s)/perpetrator(s), and their status.
- Consider complexities and risk vs. benefit of evolving mass violence and hybrid targeted threat (e.g., secondary devices).
- Identify or assist in the establishment of an incident command post (ICP) location, staging areas, control points, and any established perimeters.
- Responding NPS personnel establish Unified Command with corresponding agencies.
- Establish a medical group supervisor within the command system.
- Unified Command and medical group supervisor determine initial area for CCP.
- Establish RTF team with necessary law enforcement, bomb tech, or hazmat team members.

- RTF members don appropriate PPE.
- Determine appropriate access and response routes.
- Identify communications plan.
- Consider additional resources early.
- Consider activation of MCI protocol (see EMS P&P Protocol: *Mass Casualty Incidents (1350)*.
- Notify confirmed medical facilities early.

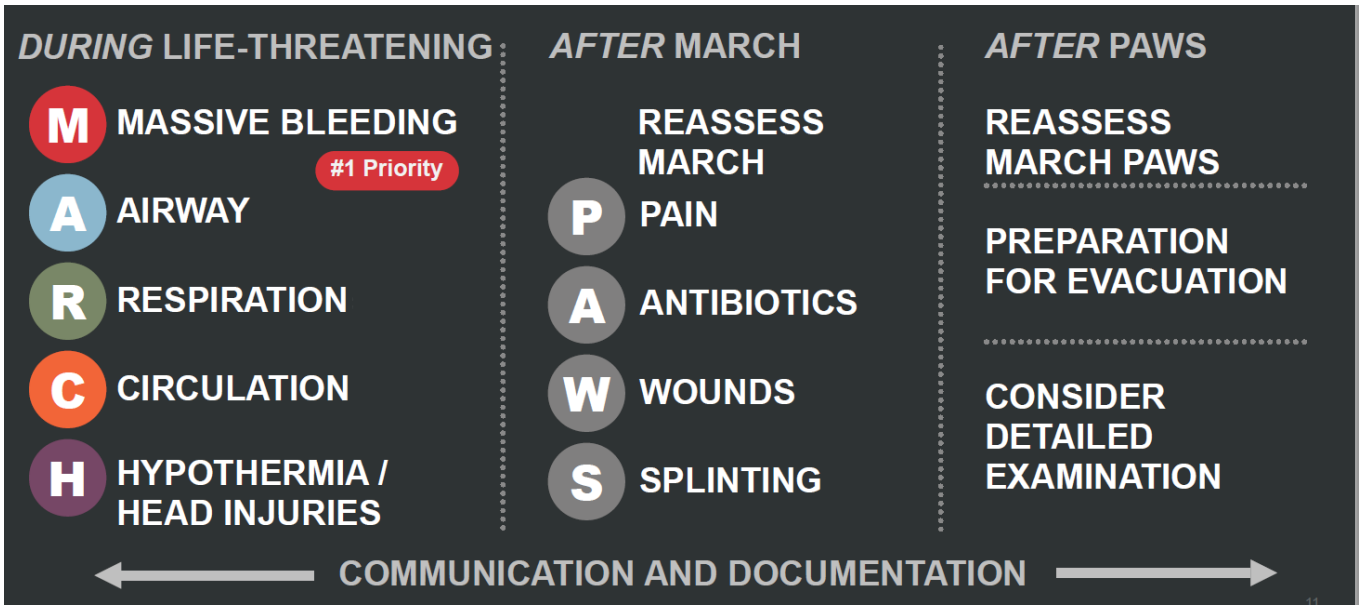
Initial Briefing

- Obtain briefing from Operations/LEI/Incident Command.
- Determine availability and extent of force protection for CCP and RTF.
- Confirm type and location of threat based on best available intelligence.
- Obtain current incident status and threat assessment.
- Determine resources currently assigned, requested, and their locations.
- Identify hot, warm and cold zones with perimeters. **Note:** Some scenes can be dynamic.
- Identify incident objectives.
- Determine if "shelter in place" or "evacuation" strategy is to be implemented.
- Confirm locations of CCP and transportation corridor.
- Consider sorting areas to facilitate law enforcement processing of evacuees.
- Confirm communications plan.

MARCH ASSESSMENT SEQUENCE

M	**MASSIVE HEMORRHAGE**	**OBJECTIVE:** **- Stop blood loss**	• Direct pressure • Pressure bandage(s) - Not over joints/ breaks • Tourniquet(s) • Wound packing
A	**AIRWAY**	**OBJECTIVE:** **- Ensure clear airway**	• Listen for breaths. Look for chest rise & fall • Recovery position - Patient lying on side • Chin lift or jaw thrust if no head/neck injury • Check for obstructions - abdominal thrusts
R	**RESPIRATIONS**	**OBJECTIVE:** **- Functional breathing**	• Check front and back for torso punctures • Treat with occlusive dressing (e.g., chest seal) • Monitor for Tension Pneumothorax (TP) • If TP confirmed, remove or burp chest seals • Needle decompression if indicated. **See Procedure: *Needle Decompression (1365)***
C	**CIRCULATION/ COMMUNICATION**	**OBJECTIVE:** **- Continue assessment** **- Call for additional help & resources**	• Perform full body blood sweep with your hands • Check distal pulse in limbs with no tourniquet • If no pulse, and no breathing, start CPR (if situation allows)
H	**HYPO/HYPERTHERMIA, HYPOVOLEMIA (SHOCK), HEAD INJURY**	**OBJECTIVE:** **- Proper body temperature** **- Ensure organ perfusion** **- Assess LOC using AVPU**	• Maintain proper body temperature • Body heat loss follows blood loss • Keep patient warm regardless of environment • Use heat-reflective or dry regular blankets • Insulate from cold ground or wet clothing • Other H's include Hike/Helicopter extraction

Based on the Tactical Emergency Casualty Care (TECC) Tactical Field Care (TFC) Guidelines



MEDICAL TRANSPORT

Transport will be tailored to the specific circumstances of the event and will likely include some combination of NPS ambulances, aeromedical units, local EMS and in some situations may include alternate vehicles, e.g. busses, helicopter resources.

STAND-DOWN and POST-MISSION DEBRIEFING

Stand-down and demobilization of CCP and tactical EMS resources will be made by Unified Command in conjunction with medical group supervisor.

Consider resources to support responders such as Critical Incident Stress Manangement (CISM), Stress First Aid (SFA), Employee Assistance Program (EAP), and others.

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