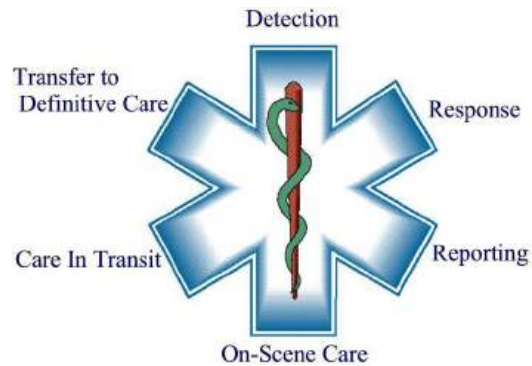




United States Departments of the Army and Air Force

FY26 Joint Prehospital Emergency Care Protocols

Version 5
October 2025



"The Star of Life was designed by Leo R. Schwartz, who was Chief of the EMS Branch of the National Highway Traffic Safety Administration. In 1973, the American Red Cross complained to the NHTSA that the use of the common Omaha Orange Cross on a square background of reflectorized white closely resembled the Red Cross symbol. Once the NHTSA investigated and agreed with the complaint, the new Blue Star of Life (displayed above) was born.

This new symbol was designed using the Medical Identification Symbol as a guide. The Star of Life was registered as a certification mark with the Commissioner of Patents and Trademarks on February 1, 1977.

The center of the star consists of the snake and staff. The staff is named Asclepius, who according to Greek mythology, was the son of Apollo. Theory states Asclepius learned the art of healing from the centaur Cheron. Asclepius was usually shown in a standing position with a long cloak and holding a staff with a serpent coiled around it. This is why the staff is the long-standing symbol representing medicine. In the Physicians and Military Medical Corp, the Caduceus is used. The Caduceus is a winged staff with two serpents intertwined around it.

The six points of the Star of Life Symbol are meant to represent the true meaning of the EMS System. These include Detection, Reporting, Response, On Scene Care, Care in Transit, and Transfer to Definitive Care.

The use of the Star of Life Symbol is regulated and monitored by the NHTSA"

<http://www.globalemergencyvehicles.com/blog/history-of-the-star-of-life/>



U.S. ARMY





REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

OFFICE OF THE SURGEON GENERAL
7700 ARLINGTON BOULEVARD
FALLS CHURCH, VA 22042-5101

DASG-EMS

24 September 2025

MEMORANDUM FOR Army and Air Force EMS Coordinators

SUBJECT: Approved FY26 Joint Prehospital Emergency Care Protocols (JPECP) and Joint EMS Minimum Credentialing Standards

1. This memorandum supersedes previous directives regarding the same subject. Attached are the approved FY26 JPECP and Joint EMS Minimum Credentialing Standards. The JPECP direct the provision of care in the prehospital environment and while en-route to a military treatment facility or civilian emergency department. The JPECP must be used by Army and Air Force servicemember, civil servant, and contractor personnel providing prehospital care under federal medical direction, unless a waiver has been approved during the previous fiscal year.

2. These documents are based primarily on the 2021 National EMS Education Standards and the 2019 National EMS Scope of Practice Model. They are aligned with the USA Individual Critical Task List, USAF Career Field Education and Training Plan, and Tactical Combat Casualty Care (TCCC) standards. Additionally, the Army EMS Program Office (EMSPO) and Air Force State Office EMS (AFSOEMS) ensured these products are optimized for the unique EMS practice environment of CONUS and OCONUS installations. The Army and Air Force EMS Systems function under four key principles: Evidence-Based Aggressive Care, Austere Operations, Hazardous or Extreme Environments, and Mass Casualty Preparedness.

3. Protocols must be implemented within 60 days of receipt of this memorandum.

4. This is a coordinated memorandum. For additional information, contact the Army EMSPO at: usarmy.jbsa.medcom.mbx.medcom-ems-program-ops@health.mil or the AFSOEMS at: usaf.jbsa.afmoa.mbx.ems-program-manager@health.mil

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2 Encl:

1. FY26 Joint Prehospital Emergency Care Protocols
2. FY26 Joint EMS Minimum Credentialing Standards

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Tachycardia, Wide Complex	E - 9	1 October 2025
Altered Mental Status	E - 10	1 October 2025
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Philosophy of Protocols

Prehospital medical protocols are established to ensure the safe, efficient, and effective provision of patient care. All Department of the Army and Air Force Emergency Medical Service (EMS) personnel will utilize these protocols to guide their clinical decision making and delivery of prehospital care. Safety should be the final determinant for all decisions.

EMS personnel will deliver care according to protocols ONLY if trained in the task.

The goals of EMS personnel are to:

- Do no harm.
- Improve patient outcomes while alleviating pain and suffering.
- Provide quality prehospital care - the direct result of comprehensive education, thorough patient assessment, sound clinical judgment, and continuous quality improvement.
- Maintain clinical competency and meet care delivery standards; vital components in providing quality pre-hospital emergency medical care to the patients who rely on our services.

Army and Air Force EMS embrace two fundamental concepts in establishing a standard of care:

- 1) The emergent patient benefits from immediate medical interventions, and timely definitive treatment.
- 2) Early and aggressive treatment modalities will be updated continually based upon published prehospital data (evidence-based medicine).

Our role as EMS professionals is to act as the eyes, ears, and hands of the physician. This task requires a commitment to continuous education and dedication to integration with the total prehospital/hospital care team.

Expectations of EMS Personnel

Ongoing review of protocols is mandatory as evaluations, treatments, and procedures will be updated as prehospital data allows. It is expected that all EMS personnel maintain a functional knowledge of the contents contained herein.

No protocol can anticipate all possible situations. If ever in doubt, EMS personnel should immediately contact On-Line Medical Control (OLMC) to discuss patient care; this may be their EMS Medical Director or the attending physician at the receiving facility. If unable to contact OLMC, EMS personnel will continue contact efforts while providing care in accordance with (IAW) relevant protocols, within his/her scope of practice.

Definition of a Patient

A patient is an individual requesting or potentially needing medical evaluation or treatment. The patient-EMS relationship is established via telephone, radio, or personal contact. It is EMS personnel's responsibility to ensure all potential patients, regardless of the size of the incident, are offered the opportunity for evaluation, treatment, and/or transport. Persons requesting "lift assistance" or similar are patients and will be treated as such.

Use of Protocols

- The Table of Contents will include the most recent date of protocol revision.
- Protocols utilize National Registry of Emergency Medical Technicians (NREMT) and Service-specific certification levels to identify appropriate treatments and procedures.
- All skill levels begin care at Skill Level 1 and progress to the current level of the EMS clinician.
- **Advanced Paramedics will follow Skill Level 4 on protocols where Skill Level 5 is not specified.**

S L 1	S L 2	S L 3	S L 4	S L 5	• Skill Level 1 – Emergency Medical Responder (NREMR) (All certifications start here)
					• Skill Level 2 – Nationally Registered Emergency Medical Technician (NREMT)
					• Skill Level 3 – 68W, 4N0, & Advanced Emergency Medical Technician (NRAEMT)
					• Skill Level 4 – Nationally Registered Paramedic (NRP)
					• Skill Level 5 – Advanced Paramedic (AP)

- Each protocol has specific “**Patient History**”, “**Signs and Symptoms**”, and a “**Differential Diagnosis**” to assist EMS personnel in the clinical decision-making process.
 - OPQRST (Onset, Provocation, Quality, Radiation, Severity, Time)
 - SAMPLE (Signs/Symptoms, Allergies, Medications, Past Medical History, Last Oral Intake, Events Preceding)

Medications are bold and blue. Drip calculations are provided in relevant protocols.

- **Procedures** are bolded.
- Associated **Protocols** are bold and purple.
- **Red, BOLDED text** indicates important information (allergies, interactions, specific medication information, etc.)
- Items with a “*” should reference **Additional Considerations**.
- The **Additional Considerations** section provides pertinent content regarding the protocol.

Some protocols have reversible causes of cardiac arrest (Hs & Ts). Although traditionally used in advanced cardiac care, all skill levels have “Hs & Ts” that can be treated within their scope.

A&O x4 refers to a patient’s orientation to person, place, time, and the event that led to the 911 call.

Adult and Pediatric Protocols: Pediatric protocols should be used until the patient is > 60kg or displaying signs of puberty; thereafter adult protocols should be used.

Protocols are color-coded by group for ease of reference. General Patient Care is listed first, followed by cardiac arrest, and other cardiac/respiratory protocols. Individual protocols follow and are in alphabetical order.

The bottom of each protocol details the approval date. Individual protocols may be updated as evidence- based data arises. The Table of Contents will reflect the publication date of the most recently approved version which will be utilized for the provision of prehospital care.

General Protocols – A Series
Adult Medical Protocols – B Series
Adult Trauma Protocols – C Series
Obstetrics / Gynecology & Neonatal Protocols – D Series
Pediatric Medical Protocols – E Series
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Specialty Protocols – G Series
Local Protocols – H Series

The Military Training Network (MTN) has transitioned from American Heart Association (AHA) to American Red Cross (ARC) life support courses. To prevent confusion, the cardiac arrest algorithms detailed within are a hybrid of the organization-specific algorithms, the combination of which meets ARC and AHA intents. CPR compression rates, defibrillation (joules) and medication dosing standards are IAW ARC and AHA guidelines. To ensure care standardization, members are required to utilize the cardiac algorithms contained herein.

Waiver Procedures for Deviation from Protocols

USA EMS: Waivers for use of an installation-produced or regional/State protocols will not be approved. Modification of the JPECP by local Medical Directors is not authorized. In rare circumstances, unique local circumstances will require an additional protocol not necessary to be included for all installations. Such Protocols will be included in the “H Series” with written approval from the Army EMSPO Medical Director. Such protocols will be reviewed and re-approved each calendar year.

USAF EMS: Waivers for use of an installation-produced or regional/State protocols will not be approved. Modification of the JPECP are not authorized. In rare circumstances, unique local circumstances will require an additional protocol not necessary to be included for all installations. Such Protocols will be included in the “H Series” with written approval from the EMS Consultant. Such protocols will be reviewed and re-approved each calendar year.

Procedures in the Prehospital Environment

EMS personnel must be credentialed by the local Medical Director. Credentialing: Local Medical Directors ensure that assigned EMS personnel possess the cognitive, affective, and psychomotor skills to deliver prehospital care IAW Joint Prehospital Emergency Care Protocols. The credentialing process includes initial training, performance of supervisory ride-alongs, continuing education and simulation curricula, and documentation of training and credentialing in electronic training records.

Communication

When communicating with OLMC or a receiving facility, the following format should be utilized for:

- Unit Call Sign and estimated time-of-arrival
 - Patient's age, sex and mental status
 - Mechanism of Injury/Illness
 - Injuries/Illness
 - Signs and Symptoms
 - Treatment
 - Most recent vital signs
- Follow local/state receiving facilities' protocols for trauma, sepsis, STEMI (heart alert), and stroke notifications.

If units possess the capability to transmit 12-Lead EKGs, they should be sent to the receiving facility (if equipped to receive them). If not, they should be printed and delivered to receiving facility staff. EMS should coordinate with their local information technology department for mobile Wi-Fi capabilities.

On-Scene Physician

EMS personnel will not accept orders from an on-scene physician without the approval of OLMC. If a controversy arises with an on-scene physician, contact OLMC for a direct discussion with the on-scene physician. In no case will a non-physician (PA, NP, RN, etc.) provide orders to EMS.

Transfer of Care from ALS to BLS Transport Units

ALS personnel (SL4/SL5) may be a limited resource, particularly on smaller and more remote installations. ALS personnel may assess a patient and consider them suitable for transport at the BLS (SL2+) level in order to preserve ALS capabilities on the installation for a potential critical pt. The pt must not have a condition that could be expected to deteriorate or require interventions above SL2. OLMC must be consulted and concur with such a decision.

Exigent Transport

The standard means of transport for EMS patients is dedicated EMS transport vehicles such as Air Ambulances, Metropolitan or Field Ambulances, etc. However, unusual circumstances may create a requirement for alternative transport methods such as transport within a F&ES apparatus, Law Enforcement vehicle, or EMS Supervisor vehicles. This action is encouraged when life, limb, or eyesight is threatened with a time-sensitive condition that would be worsened by the delay in waiting for a standard EMS transport vehicle. Such a rare situation might include Active Threat or other Mass Casualty events but is not limited to these circumstances as the criterion is resource limitation. EMS personnel at smaller installations without organic transport capability might consider Exigent Transport even with a single patient. The senior EMS clinician on scene will make the determination whether Exigent Transport is required. EMS Supervisor and Paramedic Intercept Vehicles are encouraged to maintain the capability to perform Exigent Transport utilizing NATO litter and dedicated hardware.

Emergency Mode of EMS Vehicle Operation

Use of the Emergency Mode (i.e. "Lights and Sirens") by EMS in response or transport is a primary source of risk to EMS personnel, patients, and the public through proven increases in motor vehicle collisions. Emergency Mode vehicle operation by EMS is a clinical intervention and will be guided by the Medical Director. Response in Emergency Mode is optimally dictated by Emergency Medical Dispatch priority, but in all circumstances will occur only under protocols approved by the Medical Director. Transport in Emergency Mode may be even more controversial than response, and while

benefit has yet to be demonstrated by evidence, studies demonstrate minimal time savings compared to Non-Emergency Mode. The default mode of transport will be non-emergency. Emergency Mode transport will be used only in circumstances where the senior EMS clinician determines the potential time savings is potentially lifesaving. PCR for all transports in Emergency Mode will be reviewed by the EMS Coordinator and Medical Director as a mandatory QA event.

Authorized EMS Transport Destinations

EMS will transport prehospital patients to the closest appropriate Emergency Department (ED), considering the patient's age, chief complaint, severity, expected treatment needs, and transport distance by either ground or air. Trauma, Burn, Stroke, ST Elevation Myocardial Infarction, Pediatrics, and Hyperbaric capabilities must be considered in accordance with the appropriate Protocol and any pertinent regional guidelines. The Medical Director will review receiving facilities in the local area on a continuing basis and provide updates to EMS personnel. EMS Credentialing will include acknowledgement of local receiving facilities and their capabilities.

- EMS may be forced to alter typical best practices due to severe weather, Mass Casualty situations (the Transport Officer should attempt to not overwhelm the closest facility), and hospital-related emergencies (e.g. fires).
- Requests for "diversion" due to overcrowding, downtime of ancillary services (e.g. radiology) or non-availability of specialty services should generally be honored but will be reported to and tracked by the EMS Coordinator. Patients "in extremis" will override any diversion request. The Medical Director will issue guidance if clinicians have concerns regarding potential abuse of diversion or inappropriate handling of patients by receiving facilities.
- EMS should participate in hospital "ED Bypass" procedures for patients with severe trauma (Operating Room) or ST Elevation Myocardial Infarction (Cardiac Catheterization Suite) and encourage their creation in local facilities.
- EMS is not authorized to transport prehospital patients directly to alternate locations (e.g. Urgent Care Clinics, etc.), except in time of disaster.
- Prehospital patients originating from outpatient medical settings (e.g. Family Medicine Clinics, etc.) are not Interfacility Transports (IFT). While outpatient medical personnel can advise EMS and the patient of receiving facility preferences, EMS may only transport to an appropriate ED to assure safe transition in care. If outpatient personnel have already decided for inpatient admission and desire bypass of the receiving facility's ER or transport to a non-approved transport destination (e.g. freestanding psychiatric facilities), Protocol G-2g will apply and OLMC should be consulted.
- Patients (or their legal representative) may express a desire for transport to an ED that is not the closest appropriate ED. This may be influenced by factors such as pre-existing physician relationships, insurance status, specialty availability, or other matters of preference to the patient. In general, these requests should be honored within the limits of reasonability, if excessive transport time will substantially decrease the ability of EMS to provide 9-1-1 coverage.

Transport of Deceased Individuals

Unless death occurs while in transport, EMS will not transport deceased persons except under rare and unusual circumstances (e.g. the remains might be destroyed in its current location).

EMS Coordinators will work with Law Enforcement and MTF leadership to ensure proper transport arrangements for deceased persons in coordination with local Mortuary Affairs.

Addition of Tactical Combat Casualty Care (TCCC) Concepts to Joint Prehospital Emergency Care Protocols

TCCC is not only utilized in a “Tactical Combat” environment. TCCC is evidence-based, directed trauma care which reduces patient mortality. Select TCCC skills/concepts have been added to trauma protocols.

Universal Precautions

Medical history and examination cannot reliably identify patients with communicable diseases. Blood and bodily-fluid precautions will be used for **all** patients. EMS personnel will routinely utilize barrier precautions to prevent skin and mucous-membrane exposure. Gloves will be worn when the possibility of contacting blood /bodily fluids, mucous membranes, and open wounds exists. Gloves will be worn when handling materials soiled with blood and/or bodily fluids and for performing procedures with needles (to include Epi-Pen administration). Gloves will be changed after each patient contact.

Masks and protective eyewear (or face shields) will be worn during all procedures which expose EMS personnel to blood/bodily fluids. N95 masks will be worn for all patients with known or suspected airborne illnesses (i.e. meningitis, influenza, SARS, SARS-CoV-2, TB).

Although communicable diseases are very rarely transmitted through saliva, mouthpieces, and ventilation devices should be available for use in areas in which the need for resuscitation may arise.

Wash hands/skin surfaces immediately and thoroughly if contaminated with blood/bodily fluids. To prevent needle stick injuries, do not recap, bend, or break needles. Dispose of sharps in puncture-resistant containers. In the case of a needle-stick injury, EMS personnel will immediately follow local policies for exposure to blood/bodily fluid.

The EMS professional who has exudative lesions or weeping dermatitis should seek evaluation by his/her primary care physician and refrain from all direct patient care and from handling patient-care equipment until the condition is evaluated IAW Occupational Safety and Health Administration guidelines.

Exposure to Blood/Body Fluids or Needle Sticks

Immediately report the event to the receiving facility on arrival. Additionally, the member should follow local guidance and procedures set forward by Infection Control.

Additions to the National EMS Scope of Practice Model

USA EMS: The following scope of practice additions are required to be implemented, with skills verification by the local Medical Director. Approval for the performance of each skill must be documented in the member’s training record.

USAF EMS: The following scope of practice additions are not required to be implemented but are highly recommended and authorized for use following skills verification by the local Medical Director. Approval for the performance of each skill must be documented in the member’s training record.

Skill Level 1 – EMR and above	Nasopharyngeal Airway (NPA) Insertion High-Flow Nasal Cannula Blood Glucose Testing Oral Glucose Administration Temperature Measurement (oral and tympanic) Co Oximetry (SpCO) Monitoring HEPA Filter for Bag-Valve Mask (BVM)
Skill Level 2 – NREMT and above	Supraglottic Airway Insertion (SGA) Capnometry Continuous Positive Airway Pressure (CPAP) Needle Thoracentesis (<u>must maintain TCCC Tier 2+</u>) 12-Lead Acquisition / Cardiac Monitoring Junctional Tourniquets Positive End Expiratory Pressure (PEEP) Valves w/BVMs Medication Administration: Albuterol, Ipratropium Bromide, CBRN related medications, Oxymetazoline
Skill Level 3 – 68W, 4N0X1, & AEMT	Suction of Advanced Airway Blood/Fluid Warmer Infusion Pump Medication Administration: Controlled Substances for Pain Management, Dexamethasone, Epinephrine 1mg/10 mL, Ertapenem, Hypertonic Saline, Nifedipine, Oxytocin, Tetracaine

*******The following information applies to USAF EMS personnel only*******

Protocols may address the use of equipment not currently possessed by an EMS agency. All ambulance transport agencies operating under an AF Medical Director must possess the mandatory equipment and supplies outlined in the Minimum Ambulance Stock List located on the EMS Kx page. Equipment and supplies on Fire & Emergency Services (FES) response vehicles are limited to those detailed on the O&M funded stock list in AFMAN 41-209. Items not included on the O&M funded stock list may be purchased by F&ES units at their discretion, but they are not required, even if the protocol references the procedure (i.e. cardiac monitors).

SL5 encompasses skills and procedures associated with an individual trained as a Critical Care/Flight Paramedic (CCP-C or FP-C). SL5 is only authorized by units and personnel following approval by the AFISOEMS, such as AF Critical Care Paramedics (4N0X1H w/SEI 487) assigned to ICUs. USAF SL4/NRP personnel may perform the SL5 skill of endotracheal intubation and laryngoscopy-assisted foreign body removal if they complete SL5 initial and annual requirements for proficiency as published in the Joint EMS Minimum Credentialing Standards and AFISOEMS Prehospital Endotracheal Intubation Policy. Inquiries regarding SL5 utilization and airway skills sustainment should be sent to usaf.jbsa.afmoa.mbx.ems-programmanager@health.mil.

Medication Administration in the Prehospital Environment

Following completion of the USAF Medication Administration Course and 7-Level “Intravenous Medication” task detailed in the Career Field Education and Training Plan (CFETP), 5-level 4N0X1 Emergency Medical Technicians (EMTs) / NRPs assigned to or participating in prehospital response are authorized to administer intravenous medications according to protocol.

F&ES personnel will be trained/validated by their EMS Medical Director regarding the utilization of medications in the Joint Prehospital Emergency Care Protocols.

THIS PAGE NOT USED

ABBREVIATIONS AND ACRONYMS

AAA – Abdominal Aortic Aneurysm
AAL – Anterior Axillary Line
AEMT – Advanced Emergency Medical Technician
AC – Antecubital
AChEI – Acetylcholinesterase Inhibitor
ACLS – Advanced Cardiac Life Support
ACS – Acute Coronary Syndrome
AED – Automated External Defibrillator
AEIOU-TIPS – Acidosis/Alkalosis/Alcohol, Epilepsy/Endocrine/Electrolytes, Infection, Overdose/Organophosphates, Uremia, Trauma/Tremor, Insulin/Intracranial Pressure, Psychosis/Poisoning, Stroke/Shock/Seizure
AD – Advanced Directive
AF – Air Force
A-fib – Atrial Fibrillation
AFMAN – Air Force Manual
AGE – Arterial Gas Embolism
AHA – American Heart Association
AKA – Above the Knee Amputation
ALS – Advanced Life Support
AMA – Against Medical Advice
AMI – Acute Myocardial Infarction
AMS – Acute Mountain Sickness
AMS – Altered Mental Status
A&O x4 – Alert and Oriented to person, place, time, and event
AP – Advanced Paramedic
APGAR – Appearance, Pulse, Grimace, Activity, Respiration
ARC – American Red Cross
ARDS – Acute Respiratory Distress Syndrome
ASAP – As Soon As Possible
ATNAA – Antidote Treatment Nerve Agent Antidote
AV – Atrioventricular
AVPU – Alert, Responsive to Verbal Stimuli, Responsive to Painful Stimuli, Unresponsive
AXP – Ambulance Exchange Point
BEE- Bioenvironmental Engineering
BGL – Blood Glucose Level
BiPAP- BiLevel Positive Airway Pressure
BLS – Basic Life Support
BP – Blood Pressure
Bpm – Beats Per Minute
BRUE – Brief Resolved Unexplained Event
BSA – Body Surface Area
BSI – Body Substance Isolation
BURP – Backwards, Upwards, Rightward Pressure (change in condition, decreased SpO2/vent alarms)
BVM – Bag Valve Mask
CANA – Convulsant Antidote for Nerve Agent
CBRNE – Chemical, Biological, Radiological, Nuclear, High Yield Explosive
cc – cubic centimeter
CCP – Casualty Collection Point
CDC – Center for Disease Control

CEP – Casualty Evacuation Plan
CES – Civil Engineer Squadron
CEW – Conductive Electrical Weapon
CFETP – Career Field Education and Training Plan
CHAPS – Chest Pain, Hypotension, Altered Mental Status, Pulmonary Edema, Signs/Symptoms of Shock
CHF – Congestive Heart Failure
CID – Criminal Investigation Division
cmH₂O – centimeters of water
CNS – Central Nervous System
CO – Carbon Monoxide
COPD – Chronic Obstructive Pulmonary Disease
CoTCCC – Committee on Tactical Casualty Combat Care
COVID-19 – Coronavirus Disease 2019
CP – Chest Pain
CPAP – Continuous Positive Airway Pressure
CPR – Cardiopulmonary Resuscitation
CPSS – Cincinnati Pre-Hospital Stroke Scale
CSF – Cerebral Spinal Fluid
CSM – Circulation, Sensory, Motor
CVA – Cerebrovascular Accident
CVS – Cardiovascular System
DBP – Diastolic Blood Pressure
DCI – Decompression Illness
DCS – Decompression Sickness
DECON – Decontamination
DKA – Diabetic Ketoacidosis
dL – deciliter
DM – Diabetes Mellitus
DMO – Dive Medical Officer
DNI – Do Not Intubate
DNR – Do Not Resuscitate
DOPE – Dislodgement, Obstruction, Pneumothorax, Equipment (vocal cord view)
DUMBELS – Diarrhea, Urination, Myosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation
DVPRS – Defense and Veterans Pain Rating Scale
D10W – Dextrose 10% in Water
D50 – Dextrose 50%
ECP – Entry Control Point
ED – Emergency Department
E-FAST – Extended Focused Assessment with Sonography in Trauma
EJ – External Jugular
EKG – Electrocardiogram
EM – Emergency Medicine
EMR – Emergency Medical Responder
EMS – Emergency Medical Services
EMT – Emergency Medical Technician
EOD – Explosive Ordnance Disposal
EPAP – Expiratory Positive Airway Pressure
ePCR – Electronic Patient Care Report
EPU – Emergency Power Unit
ER – Emergency Room
EtCO₂ – End Tidal CO₂

ETI – Endotracheal Intubation
ETT – Endotracheal Tube
F&ES also known as FES – Fire and Emergency Services
FD – Fire Department
FLACC – Face, Legs, Activity, Cry, Consolability
FS – Flight Surgeon
g – gram
GCS – Glasgow Coma Scale
GEMS – Ground Emergency Medical Service
GI – Gastrointestinal
G#P#AB# – Gravida, Para, Abortions (OB History)
GPS – Global Positioning System
gtt – guttae (Latin for “drop”)
HACE – High Altitude Cerebral Edema
HAPE – High Altitude Pulmonary Edema
HAZMAT – Hazardous Material
HDL – Hyperlipidemia
HEPA – High Efficiency Particulate Air
HEMS – Helicopter Emergency Medical Service
HFNC – High Flow Nasal Cannula
HIV – Human Immunodeficiency Virus
HLZ – Helicopter Landing Zone
HPMK – Hypothermia Prevention and Management Kit
H2O – Water
HR – Heart Rate
hr – hour
H’s & T’s – Hypovolemia, Hypoxia, Hydrogen ion (acidosis), Hypo/Hyperkalemia, Hypothermia, Tension Pneumothorax, Tamponade (cardiac), Toxins, Thrombosis (pulmonary), Thrombosis (coronary)
HTN – Hypertension
Hx – History
IAW – In Accordance With
IC – Incident Commander
ICH – Intracerebral Brain Hemorrhage
ICP – Intracranial Pressure
ICS – Intercostal Space
IDMT – Independent Duty Medical Technician
IFT – Interfacility Transport
ILCOR – International Liaison Committee on Resuscitation
IM – Intramuscular
IN – Intranasal
IO – Intraosseous
IPAP – Inspiratory Positive Airway Pressure
ISR – Institute for Surgical Research
IV – Intravenous
J – Joules
JVD – Jugular Vein Distention
KED – Kendrick Extrication Device
Kg – Kilogram
KIA – Killed in Action
Kx – Knowledge Exchange
LBBB – Left Bundle Branch Block

L - Litter
LE – Law Enforcement
LEMON – Look, Evaluate (3-3-2), Mallampati, Obstruction/Obesity, Neck Rigidity (Difficult Laryngoscopy)
LLL – Left Lower Lobe
LMA – Laryngeal Mask Airway
LMP – Last Menstrual Period
LPM – Liters Per Minute
LOC – Level of Consciousness
LR – Lactated Ringers
LBS – Long Spine Board
LSI – Life Saving Intervention
LUQ- Left Upper Quadrant
LVH – Left Ventricular Hypertrophy
LVO – Large Vessel Occlusion
LZ – Landing Zone
mA - milliampere
MACE – Military Acute Concussion Evaluation
MAP – Mean Arterial Pressure
MARCH - PAWS – Massive Hemorrhage, Airway/AVPU, Respiration, Circulation, Hypothermia/Head – Pain, Antibiotics, Wounds, Splints
MC – Medical Corps
mcg – microgram
MCI – Mass Casualty Incident
MDI – Metered-dose Inhaler
MERS – Middle East Respiratory Syndrome
mEq – milliequivalent
mg – milligram
MI – Myocardial Infarction
mL – milliliter
mmHg – Millimeters of Mercury
MOANS – Mask Seal, Obesity/Obstruction, Age > 55, No Teeth, Sleep Apnea/Stiff Lungs (difficult BVM seal)
MODS- Multi-organ Dysfunction Syndrome
MOI – Mechanism of Injury
MP – Military Police
mph – miles per hour
MR SOPA – (M) Mask Seal/adjust Mask, (R) Reposition head/airway – if not effective – (S) Suction mouth then nose, (O) Open mouth and Lift Jaw Forward, (P) Unable to perform pre-hospital, (A) Consider LMA insertion
MSDS – Material Safety Data Sheet
MTF – Military Treatment Facility
MVC – Motor Vehicle Collision
NAAK – Nerve Agent Antidote Kit (Mark I Kit)
NASA – National Aeronautics and Space Administration
NC – Nasal Cannula
NG – Nasogastric
NHTSA – National Highway Traffic Safety Administration
NIBP – Non-Invasive Blood Pressure
NICU – Neonatal Intensive Care Unit
NPA – Nasopharyngeal Airway

NRAEMT – Nationally Registered Advanced Emergency Medical Technician
NRB – Non-rebreather Mask
NREMR – Nationally Registered Emergency Medical Responder
NREMT – Nationally Registered Emergency Medical Technician
NRP – Nationally Registered Paramedic
NRS – Numeric Rating Scale
NS – Normal Saline
NTG – Nitroglycerine
N/V – Nausea/Vomiting
OB/Gyn – Obstetrics and Gynecology
OC Spray – Oleoresin Capsicum (Pepper Spray)
OD – Overdose
ODT – Oral Disintegrating Tablet
OG – Orogastric
OLMC – On-Line Medical Control
OLMD – On-Line Medical Direction
O&M – Operations and Maintenance
OPA – Oral Pharyngeal Airway
OPQRST – Onset, Provocation, Quality, Radiation, Severity, Time
OSI – Office of Special Investigations
OTFC – Oral Transmucosal Fentanyl Citrate
O2 – Oxygen
PACE Plan – Primary, Alternate, Contingency, Emergency (for HLZ operations)
PALS – Pediatric Advanced Life Support
PCI – Percutaneous Coronary Intervention
PCR – Patient Care Report
PD – Peritoneal Dialysis
PE – Pulmonary Embolism
PEA – Pulseless Electrical Activity
PEEP – Positive End-Expiratory Pressure
PGCS – Pediatric Glasgow Coma Scale
PICC – Peripherally Inserted Central Catheter
PMHx – Past Medical History
PO – per os (Latin for “by mouth”) (oral administration)
POL – Petroleum, Oil and Lubricants
PPE – Personal Protective Equipment
PPM CO – Parts per Million Carbon Monoxide measurement
PR – Per Rectum
PRN – Pro re nata (Latin for “when necessary”) and/or As needed
Pt – Patient
6 Ps – Pain, Pulselessness, Pallor, Paresthesia, Paralysis, Poikilothermia
RLL – Right Lower Lobe
RLQ – Right Lower Quadrant
RN – Registered Nurse
RODS – Restricted Mouth Opening, Obstruction, Disrupted/Distorted Airway, Still Lung/Cervical Spine (difficult extraglottic device)
ROSC – Return of Spontaneous Circulation
RR – Respiratory Rate
RSI – Rapid Sequence Induction
RSI – Rapid Sequence Intubation
RT – Respiratory Therapist (Respiratory Care Practitioner)

RUQ – Right Upper Quadrant
SAMPLE – Symptoms, Allergies, Medications, Previous medical history, Last meal, Events preceding
SARS – Severe Acute Respiratory Syndrome
SBP – Systolic Blood Pressure
SCBA/SAR – Self-contained Breathing Apparatus/Supplied Air Respirator
SCT – Specialty Care Transport
SCUBA – Self-Contained Underwater Breathing Apparatus
SDS – Safety Data Sheet
Sec – Seconds
SF – Security Forces
SF 600 – Standard Form 600
SFS – Security Forces Squadron
SFS – Senior Flight Surgeon
SG – Surgeon General
SGA – Supraglottic Airway
SHORT – Surgery/scars (other obstruction), Hematoma (infection/abscess/mass), Obesity, Radiation distortion (deformity), Tumor (difficult cricothyroidotomy)
SI/HI – Suicidal Ideations/Homicidal Ideations
SIRS – Systemic Inflammatory Response Syndrome
SJA – Staff Judge Advocate
SL – Skill Level
SL – Sublingual
SLUDGE – Salivation, Lacrimation, Urination Defecation, GI Upset, Emesis
SMR – Spinal Motion Restriction
SOB – Shortness of Breath
SpCO – Carbon Monoxide measurement
SpHb – Hemoglobin Measurement
SpO2 – Pulse Oximetry (Oxygen)
SQ Port – Subcutaneous Port
S&S (S/Sx) – Signs and symptoms
STEMI – ST-Elevation Myocardial Infarction
SurgHX – Surgical History
SVT – Supraventricular Tachycardia
Sx – Symptoms
TB – Tuberculosis
TBI – Traumatic Brain Injury
TBSA – Total Body Surface Area
TCA – Tricyclic Antidepressant
TCCC – Tactical Casualty Combat Care
TIA – Transient Ischemic Attack
TQ – Tourniquet
Triage - SALT – Sort, Assess, Life-saving Interventions, Treatment/Transport
Triage - START – Simple Triage and Rapid Transport
Triage – JumpSTART – Simple Triage and Rapid Transport (used for pediatric mass casualty incident)
Tx – Treatment
TXA – Tranexamic Acid
USA – United States Army
USAF – United States Air Force
USAISR – U.S. Army Institute of Surgical Research
VAN Stroke Exam – Vision, Aphasia, Neglect
VF – Ventricular Fibrillation

V-fib – Ventricular Fibrillation
VS – Vital Signs
VT – Ventricular Tachycardia
V-tach – Ventricular Tachycardia
WB – Whole Blood
WPW – Wolff-Parkinson-White
W/WO – With/Without
q – quaque (Latin for “every”)

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Trauma Center / Air Ambulance Criteria



*Both CDC Trauma Center Criteria and HEMS guidance is subject to change

Use the below algorithm to determine Trauma Center Criteria*

National Guideline for the Field Triage of Injured Patients

RED CRITERIA High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
<ul style="list-style-type: none">• Penetrating injuries to head, neck, torso, and proximal extremities• Skull deformity, suspected skull fracture• Suspected spinal injury with new motor or sensory loss• Chest wall instability, deformity, or suspected flail chest• Suspected pelvic fracture• Suspected fracture of two or more proximal long bones• Crushed, degloved, mangled, or pulseless extremity• Amputation proximal to wrist or ankle• Active bleeding requiring a tourniquet or wound packing with continuous pressure	<p>All Patients</p> <ul style="list-style-type: none">• Unable to follow commands (motor GCS ≤ 6)• RR < 10 or > 29 breaths/min• Respiratory distress or need for respiratory support• Room-air pulse oximetry $< 90\%$ <p>Age 0-9 years</p> <ul style="list-style-type: none">• SBP < 70 mm Hg + (2 x age years) <p>Age 10-64 years</p> <ul style="list-style-type: none">• SBP < 90 mmHg or• HR > 58P <p>Age ≥ 65 years</p> <ul style="list-style-type: none">• SBP < 110 mmHg or• HR > 58P

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

YELLOW CRITERIA Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgement
<ul style="list-style-type: none">• High-Risk Auto Crash<ul style="list-style-type: none">- Partial or complete ejection- Significant intrusion (including roof)<ul style="list-style-type: none">• > 12 inches occupant site OR• > 18 inches any site OR• Need for extrication for entrapped patient- Death in passenger compartment- Child (Age 0-9) unrestrained or in unsecured child safety seat- Vehicle telemetry data consistent with severe injury• Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.)• Pedestrian/bicycle rider thrown, run over, or with significant impact• Fall from height > 10 feet (all ages)	<p>Consider risk factors, including:</p> <ul style="list-style-type: none">• Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact• Anticoagulant use• Suspicion of child abuse• Special, high-resource healthcare needs• Pregnancy > 20 weeks• Burns in conjunction with trauma• Children should be triaged preferentially to pediatric capable centers <p>If concerned, take to a trauma center</p>

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

<https://www.ems.gov/assets/FTG-FICEMS-presentation-5.2022.pdf>

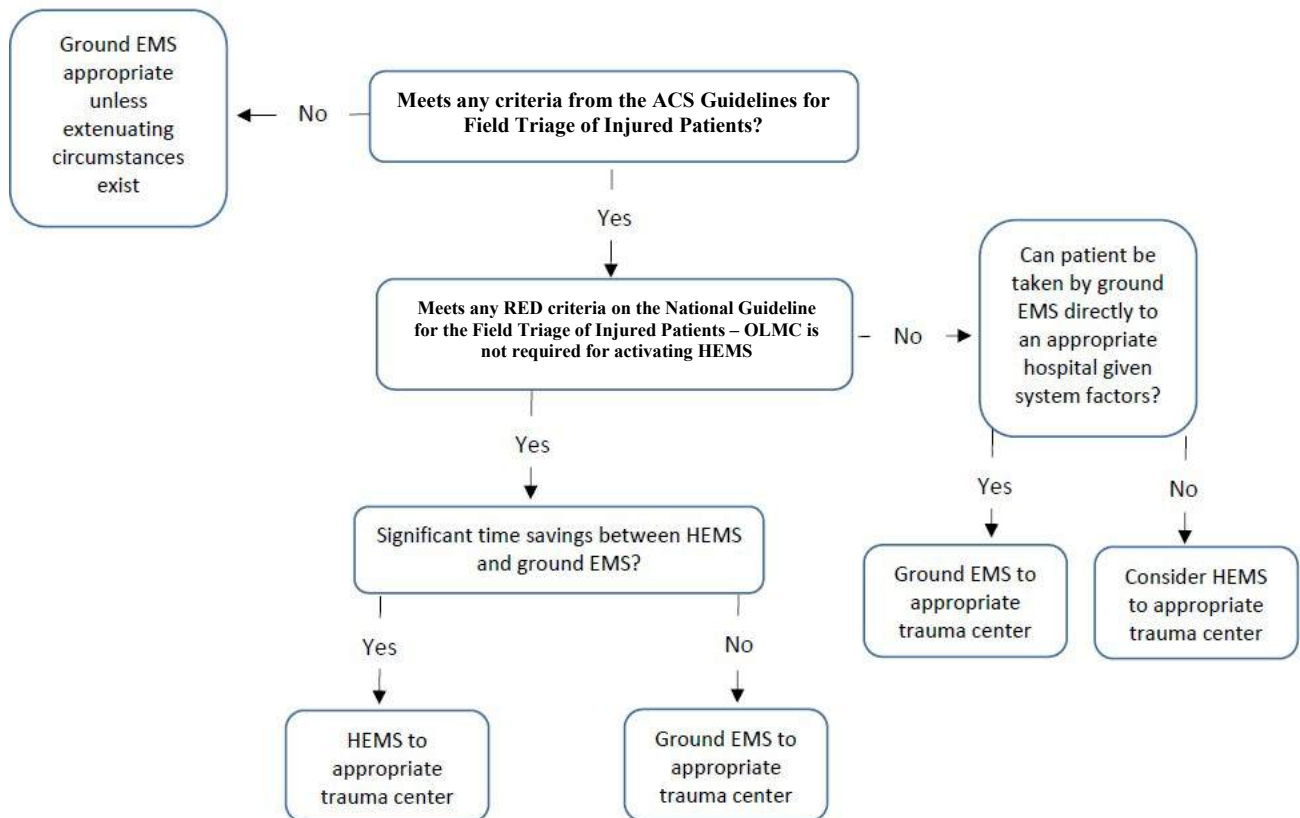
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General Protocols
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//Signed//
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LTC Nicholas M. Studer

Use the below algorithm to determine Ground EMS (GEMS) vs Helicopter EMS (HEMS)

Helicopter EMS (HEMS) Evidence Based Guidelines



Prehospital personnel must utilize clinical judgement, anticipated transport length, incorporate logistical considerations to determine whether primary air transport is appropriate.

Installations shall develop local guidance for “Early Launch” and “Auto-Launch” criteria if the flight distance is greater than 10 minutes and/or 29 miles or if a critical patient is greater than 20 miles from a specialty hospital

<http://aams.org/wp-content/uploads/2014/01/EarlyActivationFINAL.pdf.pdf>

• Helicopter Landing Zones (HLZ), see **G - 2d, Helicopter Landing Zone (HLZ) Operations:**

- Installations should have Primary, Alternate, Contingency and Emergency HLZs established and/or pre-determined helicopter landing zones (HLZ) for rotary-wing aircraft, especially if unable to contact the aircraft. Communication should be relayed through National Interagency Air Guard frequency (168.6250 mHz), dispatch, or a mobile phone patch.
- Ambulances or fire apparatus should be equipped with GPS to provide alternate HLZ coordinates if needed.

General Protocols

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- Literature support for air transport of non-trauma patients from the scene is limited. EMS personnel should consider discussion with OLMC to determine whether primary air transport is appropriate in this patient population:

Patient Diagnoses for Medical Launch Consideration:

- Acute coronary syndrome with the need for interventional therapy (e.g. cardiac catheterization, intra-aortic balloon pump)
- Cardiogenic shock (especially in the presence of a ventricular assist device or an intra-aortic balloon pump)
- Cardiac tamponade with impending hemodynamic compromise
- Mechanical cardiac disease (e.g. valve failure, ventricular wall rupture)

Critically Ill Medical/Surgical Patients:

- Post cardiac/respiratory arrest
- Requirement for IV vasoactive medications or mechanical ventilation
- Risk for airway deterioration (e.g. angioedema, epiglottitis)
- Severe poisoning/overdose requiring specialized toxicology services
- Urgent need for hyperbaric oxygen therapy (e.g. vascular gas embolism, carbon monoxide toxicity)
- Requirement for emergent dialysis
- Gastrointestinal hemorrhage with hemodynamic instability
- Surgical emergencies: aortic dissection or aneurysm, extremity ischemia, etc.

Special Populations:

Neonatal, pediatric, obstetric, and neurologic patients should be transported to receiving facilities capable of providing appropriate evaluation and treatment (e.g. transport of neurologic patients to stroke centers, etc.).

Systems Considerations:

- If the local community EMS systems, utilize a different triage protocol when compared to above, local procedures may be followed to maintain alignment and coordination with local EMS response.
- In regions in which air ambulance crews represent the only asset capable of treating/transporting critically ill/injured patients, Installation leadership should partner with the local Medical Director and the air transportation asset to determine local policies for air ambulance dispatch and transport.
- Air medical dispatch may be appropriate in miscellaneous settings including: transplant (e.g. organ salvage or organ recipient requires air transport to the transplant center to maintain viability of time-critical transplant), Search and Rescue operations, and field training exercises.

Reference the National Association of EMS Physicians *Guidelines for Air Medical Dispatch* Position Paper:
<https://aams.org/wp-content/uploads/2014/01/GuidelinesAirMedDispatch.pdf.pdf>



Care of Minors

Consent & Implied Consent / Abuse & Neglect / Sexual Assault

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• Provide life-saving interventions for all patients IAW credentialing level and applicable protocol• Contact Law Enforcement (LE) as needed• If suspected abuse (or known assault), ensure LE is on-scene prior to arrival of EMS / F&ES personnel <p>Note: A legal guardian is defined by installation, county, state, or federal law; agencies must be familiar with local guidance</p>
L	L	L	L	L	
1	2	3	4	5	

Additional Considerations

Consent & Implied Consent

- **Care of Minors:** Generally, a minor is any patient under the age of 18; individual states dictate legal age
- **Parent/Guardian Consent (in person or over the phone):** Consent must be given by a legal guardian for the evaluation, treatment, and transport of a non-emancipated minor **who requires care for a non-life-threatening condition**. If unable to reach Parent(s)/Guardian(s) or Parent(s)/Guardian(s) refuse evaluation/transport: Contact OLMC for further guidance and intervention.
- **Parent/Guardian Consent may not be required for minors who present with complaints related to pregnancy, sexually transmitted infections, mental health, and/or substance abuse;** MTFs should develop local guidance IAW state requirements with the advice of the installation SJA.
- **Parent/Guardian Consent is not required for emancipated minors.** The definition of an emancipated minor varies by state. EMS/F&ES personnel should be aware of geographic state law. Emancipated minors commonly include:
 - Individuals < 18 years of age serving in the military.
 - Persons who are financially self-supporting and living independently of guardians.
 - Persons who have been declared emancipated by a court of law.
- **Emancipated minors:** Patient **MUST** be able to show proof of legal emancipation. If a patient poses a risk to self or others (self-harm, suicide attempt, etc.), contact OLMC to discuss LE involvement and transport. If the patient appears to be under the influence of a known/unknown substance, but is able to demonstrate capacity, every effort should be made to provide care. If the patient refuses, contact OLMC; see **A - 4, Patient Refusal**.
- **Implied Consent:** Applies to scenarios in which consent is not expressly given by a legal guardian, but in which a reasonable person would expect it to be given. If a patient is suffering from a life-threatening condition and does not possess the capacity to provide consent, consent is implied.

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General Protocols
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//Signed//
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LTC Nicholas M. Studer

Abuse & Neglect
(MANDATORY REPORTING to Child Protective Services)

- **Child Abuse and/or Neglect** is the physical or mental injury, sexual abuse, negligent treatment, and/or maltreatment of a child under the age 18 by a person who is responsible for the child's welfare. The recognition and reporting of abuse/neglect is critical to ensuring child safety and reducing the risk for future abuse.
- **Suspected Abuse and/or Neglect:** Suspect that the patient may be a victim of abuse if the injury or illness is not consistent with the reported history or physical exam:
 - Assess for/document psychological characteristics of abuse (excessive passivity, complaint/fearful behavior, excessive aggression, violent tendencies, excessive crying, etc.).
 - Assess for/document physical signs of abuse (unexplained bruises, abrasions, bite marks, cigarette burns, etc.)
 - Assess for/document signs of neglect (inappropriate levels of clothing, inadequate hygiene, absence of an attentive caregiver, or malnutrition).
- **Contact OLMC for immediate reporting of suspected abuse and/or neglect** IAW installation policy. This is a legal requirement. In discussion with OLMC, contact installation LE to obtain protective custody, provide care IAW specific protocol and certification level, and transport the patient.

Sexual Assault
(MANDATORY REPORTING to Child Protective Services)

- Assess for/document signs of sexual abuse (pain, itching, bleeding, bruising in the genital area; inappropriate dress, multiple layers in a hot environment; reports of recurrent urinary tract infections).
- **If sexual assault is suspected, contact OLMC for immediate reporting** (to Family Advocacy, Child Protective Services, and LE). This is a legal requirement for all first responders. In discussion with OLMC, contact installation LE to obtain protective custody, provide care IAW specific protocol and certification level.
- **When providing care: address only life threats to avoid destruction of evidence.** If applicable: clothing should be placed in paper bags. If the patient is unable to wait until arrival at the hospital to utilize the restroom, or they vomit enroute, attempt to collect all bodily fluids for evidence processing.
- LE should secure the scene and evidence IAW their local policies.
- **Transport the patient to a facility capable of performing pediatric sexual assault examinations.**



Care of Adults

Consent & Implied Consent / Abuse & Neglect / Sexual Assault

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Provide life-saving interventions for all patients IAW credentialing level and applicable protocol• Contact Law Enforcement (LE) as needed• If suspected abuse (or known assault), ensure LE is on-scene prior to arrival of EMS/F&ES personnel <p>Note: A legal guardian is defined by installation, county, state, or federal law; agencies must be familiar with local guidance</p>
L	L	L	L	L	
1	2	3	4	5	

Additional Considerations	
Consent & Implied Consent	
<ul style="list-style-type: none">• Consent: Consent must be given for evaluation, treatment, and transport of a patient with a non-life-threatening condition.• Patients must demonstrate capacity in order to provide consent: Alert and oriented, GCS 15, possesses the ability to understand his/her condition and associated outcomes, and is able to verbalize an understanding of the risk(s)/benefit(s) of evaluation and treatment. If a patient poses a risk to self or others (self-harm, suicide attempt, etc.), contact OLMC to discuss LE involvement and transport. If the patient appears to be under the influence of a known/unknown substance, but is able to demonstrate capacity, every effort should be made to provide care. If the patient refuses, contact OLMC; see A - 4, Patient Refusal.• Implied Consent: Applies to scenarios in which consent is not expressly given, but in which a reasonable person would expect it to be given. If a patient is suffering from a life-threatening condition and does not possess the capacity to provide consent, consent is implied.• Legal Incompetence: A court of law may identify an individual as “Legally Incompetent,” or lacking capacity. In this scenario, the court will have appointed a legal guardian or power of attorney for medical decision-making. This appointed individual must consent to patient evaluation and treatment, unless the patient presents with a life-threatening condition as above (Implied Consent).	
Elder/Incompetent Patient Abuse & Neglect	
<ul style="list-style-type: none">• Abuse and/or Neglect: EMS/F&ES personnel should be aware of geographic state law. Abuse may be physical, emotional, sexual, or financial.• Suspected Abuse and/or Neglect: Suspect that the patient may be a victim of abuse if the injury or illness is not consistent with the reported history or physical exam:<ul style="list-style-type: none">- Assess for/document psychological characteristics of abuse (excessive passivity, complaint/fearful behavior, excessive aggression, violent tendencies, excessive crying, etc.).- Assess for/document physical signs of abuse (unexplained bruises, abrasions, bite marks, cigarette burns, etc.)- Assess for/document signs of neglect (inappropriate levels of clothing, inadequate hygiene, absence of an attentive caregiver, or malnutrition).• Contact OLMC for immediate reporting of suspected abuse and/or neglect (to Family Advocacy, Adult Protective Services, and LE). This is a legal requirement. In discussion with OLMC, contact installation LE to obtain protective custody, provide care IAW specific protocol and certification level, and transport the patient.	

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Domestic Violence

- **Known or Suspected Domestic Violence:** EMS/F&ES personnel should be aware of state and federal law as well as service regulations - reporting requirements vary. The vast majority of states require reporting for firearm injuries, rape, torture, and stabbings.
- **Always ensure scene safety.** Contact LE as needed.

Sexual Assault

- Assess for/document signs of sexual abuse (pain, itching, bleeding, bruising in the genital area; reports of recurrent urinary tract infections).
- **If sexual assault is reported, when providing care: address only life threats to avoid destruction of evidence.** If applicable: clothing should be placed in paper bags. If the patient is unable to wait until arrival at the hospital to utilize the restroom, or they vomit enroute, attempt to collect all bodily fluids for evidence processing.
- LE should secure the scene and evidence IAW their local policies.
- **Transport the patient to a facility capable of performing a sexual assault examination.**
- **Contact of law enforcement is at the discretion of the patient. The Patient Advocate who has been assigned by the Sexual Assault Response Coordinator will counsel the patient regarding reporting options.**



Patient Refusal / AMA & Active Duty Considerations

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Provide life-saving interventions for all patients IAW certification level and applicable protocol• See A - 2, Care of Minors or A - 3, Care of Adults to determine if refusal is appropriate
L	L	L	L	L	
1	2	3	4	5	

Additional Considerations

- Adults & Emancipated Minors - If a patient is alert, oriented to person, place, time, and event (A&O x4); has a GCS of 15, and able to demonstrate capacity a refusal may be accepted.
 - Capacity: The ability to understand the benefits and risks of obtaining treatment for a particular condition. The ability to verbalize the consequences of failing to obtain treatment, to include the possibility of death. The ability to verbalize reasons for electing to refuse treatment/transport.
- Children (< 18 who are not emancipated) - Must obtain parental/guardian consent for a refusal.

If the patient has a life-threatening injury/illness and is refusing treatment, contact OLMC immediately.

- If the patient is GCS 15/A&O x 4 and demonstrates capacity but is refusing care for a condition EMS personnel believe should be treated/evaluated, the EMS provider should:
 - Contact OLMC. OLMC should speak with the patient/guardian to provide additional guidance and recommendations.
 - If, after a discussion with the OLMC, the patient/guardian refuses treatment, document the patient release as "Against Medical Advice."
 - Document statements made by the patient (or responsible party) indicating an understanding of your instructions and the potential consequences of refusing care.
 - Obtain patient signature in presence of a witness.
 - Obtain signature from a witness(es), ideally other than a member of the EMS crew (consider F&ES and/or LE).
 - If patient/guardian refuses to sign AMA, obtain two independent witnesses, if possible
 - When possible, leave the patient in the care of family, friends, or legal guardian(s).
 - Inform the patient/guardian that EMS should be requested again, if necessary.
 - **For patients who endorse (complain of, or report) SI/HI and refuse transport:**
 - Contact OLMC and LE to discuss detention for transport/medical evaluation based on local installation policy. Patients who present a threat to themselves or others require medical evaluation for organic etiologies of behavioral disorders.
- **Military Service Members Refusing Medical Care:**
 - Contact OLMC for discussions with the patient and developing an appropriate care plan. Service specific regulations may dictate additional considerations. If needed, consider contacting the patient's Commander or First Sergeant to discuss the requirement for medical care. Safety of the patient and mitigation of risk to the Service should be the goal of EMS personnel.

Special Circumstances:

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- **Minors:** If the patient is a minor, and the patient's guardian(s) refuses transport for a significant illness/injury, contact OLMC and consider contacting LE.
 - Abuse is one of the most common causes of parent refusal in pediatric patients with significant injuries
- **Diabetics:** See **B - 20, Diabetic Emergencies** or **E - 14, Diabetic Emergencies** for treatment; patient must meet ALL the below criteria for Patient Refusal:
 - ☐ History of insulin-dependent Diabetes Mellitus
 - ☐ Have not taken an oral hypoglycemic or long-acting insulin in the last 24 hours (pt. at risk of experiencing recurrent hypoglycemia)
 - ☐ If presenting with AMS, return to baseline mental status within 10 mins of Dextrose administration
 - ☐ Pre-treatment BGL of < 60 mg/dL
 - ☐ Post-treatment BGL of > 100 mg/dL
 - ☐ Ability to tolerate food by mouth
 - ☐ The patient has follow-up (or is able to coordinate) with a primary care physician
 - ☐ Normal VS post-treatment
 - ☐ Patient has competent adult present to monitor him/her who agrees to do so
- **Suspected /Accidental Overdose:** See **B - 24, Suspected Overdose** or **E - 15, Suspected Overdose**; if medical care is provided (naloxone) and the patient is GCS 15, demonstrates capacity, and refuses transport, contact OLMC. Patient must be left in the care of a competent adult capable and willing to supervise the patient before leaving the scene.



Combative Patients & Law Enforcement Restraint



Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care Protocol / Consult OLMC as needed• Provide life-saving interventions for all patients IAW certification level and applicable protocol• Contact Law Enforcement (LE) as needed• If suspected abuse or known assault, ensure LE is on-scene prior to arrival of EMS / F&ES personnel• See B - 18, Behavioral Emergencies for treatment & restraint options• Contact OLMC to discuss the necessity for medical transport
L	L	L	L	L	
1	2	3	4	5	

Additional Considerations

Installations should partner with MTF, F&ES, and SFS/MP leadership to develop local policies for the transport of combative patients, and/or patients in SFS/MP custody

- If the patient is combative, LE should assist in physical patient restraint. Ideally, five individuals should restrain the patient: one person for each extremity, and one for the patient's head.
- **Soft (physical) restraints** should be utilized, unless there is significant risk to the patient/crew, or the patient has previously been placed under arrest (handcuffs/zip-cuffs applied). Consider placing a face shield on the patient if they are spitting, etc.
- **If chemical restraints are utilized**, apply physical restraints to the patient once sedated.

Law Enforcement (LE) Restrained Patients

- Restraints applied by LE require an Officer remain present at the scene. If the patient is transported with LE restraints in place, an Officer with a key to remove the restraints should accompany the patient in the back of the ambulance for the duration of the transport.
- Patients should be handcuffed with their hands in front of them or to the side rails of the ambulance stretcher to ensure medical/LE access.
- If the patient is handcuffed and on-scene LE are unable to accompany the patient during transport to the receiving facility coordinate through Incident Commander (or dispatch if F&ES not on-scene) to request civilian LE support if available. If the patient has a life-threatening condition, do not delay transport. EMS personnel should proceed IAW their clinical judgement, while bearing in mind the safety of all EMS personnel and the patient. Contact the receiving facility ASAP to coordinate LE/security upon arrival. The goal is to return the ambulance to service as quickly and safely as possible for installation 911 response.
- If the patient is NOT under arrest and requires transport, transition to soft restraints if required.
- If a Conductive Electrical Weapon (CEW) or Taser® was used, see next page:

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Conducted Electrical Weapon (CEW) or Taser® Probe Removal

- This procedure is indicated when a patient has CEW / Taser® probes embedded in subcutaneous tissues and should be utilized by SL2 personnel or higher.

Probes may be considered evidence. Follow installation guidance or LE direction regarding evidence collection.

LE should remove the probes, if possible. If unable and probes are impeding patient care, follow below for removal:

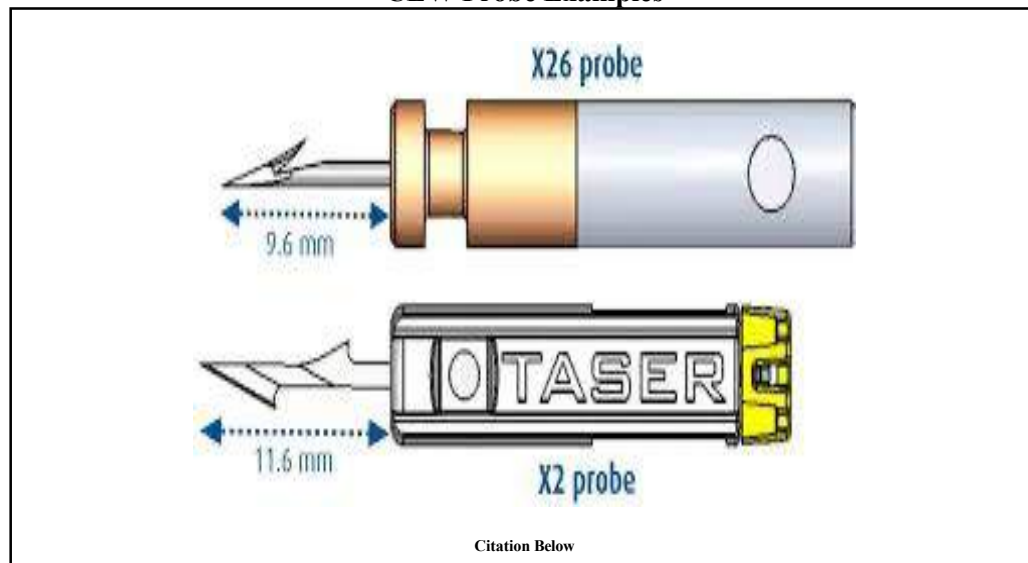
- **Contraindications:**

- Probes localized to the face; tissues above the level of the clavicles; the breast, groin, or hand.
- Suspicion that the probe may be embedded in a blood vessel, joint, or bone

- **Procedure:**

- 1) Ensure proper PPE and verify that the probe wires are disconnected from the weapon
- 2) Stabilize the skin around the probe(s) (with non-dominant hand)
- 3) Grasp the probe by the metal body (with dominant hand)
- 4) Remove probe in a single quick motion
- 5) Ensure Taser® probe is intact, and distal parts of the probe are not missing (see figure below)
- 6) Clean the wound(s) with anti-bacterial agent (chlorhexidine or alcohol pad) and apply dressing/band-aid
- 7) Probes are considered “sharps hazard” and should be disposed of if not collected for evidence purposes
- 8) Document time of probe(s) removal and condition of the probe(s) on ePCR
- 9) If probes are not easily extracted, allow them to remain in place and transport for removal

CEW Probe Examples



Citation Below

For informational purposes only, see the following video (Taser Probe Removal, 21 June 2016):

<https://www.youtube.com/watch?v=2tBsFtV2zXU>

Taser® Probe Pictured:

Payne-James, J., Sheridan, B. TASER®: Clinical effects and management of those subjected to TASER® discharge. Faculty of Forensic and Legal Medicine. December 2017. Review date Dec 2020.

General Protocols

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Non-Initiation of Resuscitation / Field Termination



Clinical Practice Guidelines

Non-Initiation of Resuscitation

Contact OLMC immediately to discuss non-initiation of resuscitation and have physician pronounce time of death if any of the following:

Universal Criteria (Skill Level 1 - 5)

- ☐ Situations where performing CPR would place the rescuers at risk
- ☐ Patient presentation incompatible with life (rigor mortis, decapitation, bodily transection, dependent lividity, body decomposition)
- ☐ A valid Advanced Directive (AD) or Do Not Resuscitate (DNR) order is present (may vary state-by-state; contact OLMC if there are any questions or concerns regarding AD or DNR)

Traumatic Non-Initiation Criteria (Skill Level 1 - 5)

- ☐ Injuries incompatible with life (decapitation, transection, incineration, etc.)
- ☐ Blunt/penetrating trauma with evidence of prolonged cardiac arrest (rigor, dependent lividity)
- ☐ Patient with penetrating trauma, absent signs of life, and found to be in asystole
- ☐ Patient in cardiac arrest secondary to blunt trauma with no organized cardiac rhythm

Known Stillborn Deliveries, see D - 4, Newborn Care. All fetal tissue/remains must be transported with mother. Place in biohazard bag or allow mother to hold, if requested.

****Must document: Time of death and name of OLMC, absent pulse, absent heart sounds, and indications for non-initiation. If equipped/trained, personnel must print rhythm strips from at least 3 different leads indicating asystole.****

****Follow local policies for notification of death (SFS/MP, Command Post, Coroner, Patient Admin, etc.)****

Field Resuscitation/Termination Principles:

- Adult & Pediatric Medical Arrests:
 - Will be worked on scene; the rapid initiation of on-scene resuscitation improves patient mortality. Transport efforts often result in delayed resuscitation measures, CPR is often ineffective/inconsistent in the back of a moving ambulance, and there should be no significant difference in resuscitation efforts prehospital compared to in-hospital. Transport should be considered in special circumstances after consultation with OLMC, such as inability to obtain adequate ventilation.
- Adult & Pediatric Traumatic Arrests:
 - Will be worked on scene. Transport should be considered in special circumstances, such as inability to obtain adequate ventilation, after consultation with OLMC. The survival rate for traumatic cardiac arrest is extremely low. Immediate airway (SGA vs cricothyrotomy), respiratory (chest decompression), and circulatory (fluid bolus and Epinephrine) interventions should be rapidly performed with a brief trial of CPR for patients without criteria for non-initiation of resuscitation.
- Resuscitation should NOT be terminated for pregnant women with a potentially viable fetus (> 20 weeks gestation;

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uterine fundus palpable at the umbilicus) without contacting OLMC first.

- There are very few reasons a patient will legitimately have an EtCO₂ value of 0 - 1mmHg, this is more likely to indicate equipment failure or failed placement of an advanced airway.

Field Termination Criteria

Patients with Medical Arrest:

- BLS Termination of Resuscitation (SL 1 - 5) (**ALL CRITERIA MUST BE MET**)

- ☐ Blood glucose is > 60 mg/dL
- ☐ EtCO₂ value is < 10 mmHg despite effective CPR
- ☐ Unwitnessed Arrest
- ☐ Airway has been effectively managed (BVM with OPA or NPA or SGA)
- ☐ At least 20 minutes of high-quality CPR have been performed
- ☐ 3 AED analyses have been performed **without shock advised**
- ☐ Medical Control approves termination of resuscitation and pronounces time of death

****If the patient was a witnessed arrest (EMS or bystander), but all other above criteria have been met, consider contacting OLMC for further instructions after 30 minutes of high-quality CPR****

Patients with Traumatic Arrest:

- BLS Termination of Resuscitation (SL 1 - 5) (**ALL CRITERIA MUST BE MET**)

- ☐ Blood glucose is > 60 mg/dL
- ☐ Airway has been effectively managed (BVM with OPA or NPA or SGA)
- ☐ 10 minutes of high-quality CPR without ROSC
- ☐ 2 AED analyses have been performed **without shock advised**
- ☐ Only if SL2+ Personnel On-Scene: Bilateral needle decompression was performed by SL2+ personnel without improvement in vital signs.
- ☐ Medical Control approves termination of resuscitation and pronounces time of death

Patients with Medical or Traumatic Arrest:

- Additional Criteria for ALS Personnel (SL 4 - 5) (**ALL BLS CRITERIA and below MUST BE MET**)

- ☐ Rhythm has remained asystole or PEA for at least the last 10 minutes of resuscitation.

****Must document: Time of death and name of OLMC, absent pulse, absent heart sounds, absent pupillary response, and indications for field termination. If equipped/trained, personnel must print rhythm strips from at least 3 different leads indicating asystole.****

****Follow local policies for notification of death (LE, Command Post, Medical Examiner, etc.)****



General Patient Care / Monitoring & Vascular Access



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE	Perform History and Physical Exam	Per Patient Chief Complaint(s)

					Clinical Practice Guidelines
S	S	S	S	S	<ul style="list-style-type: none">• Treat all patients with respect; ensure scene/crew safety, BSI/PPE precautions• Request ALS/additional resources as needed• Consult On-Line Medical Control (OLMC) as needed• Bring necessary equipment, medication, resources to patient's side. Primary Bag and Monitor/AED should be brought to ALL patient encounters.• Establish Level of Consciousness (LOC), manage Immediate Life Threats IAW appropriate protocol(s)• Complete initial assessment/patient history/physical exam as indicated by patient presentation• Treat illness/injury IAW applicable protocol or OLMC instruction• B - 2, Airway Management• Oxygen - Titrate SpO₂ ≥ 94% if respiratory distress/SOB, hypoxemia (SpO₂ < 90% or cyanosis)• Patient Monitoring / Vital Signs - Obtain initial HR, RR, BP, SpO₂, Pain (and below as applicable):<ul style="list-style-type: none">- SpO₂ - May also use ear, toe or scalp as needed- Temperature (°C or °F) - Obtain oral tympanic, temperature as patient condition/protocol requires- Blood Glucose Level (BGL) (mg/dL) - Obtain as patient condition or protocol requires- Carbon Monoxide (SpCO) - Monitor CO (if available) if suspected CO exposure, fires/smoke inhalation• Medication Administration: refer to medication reference, administer meds IAW protocol
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Transport to the most appropriate facility based on chief complaint, or complete AMA; A - 4, Patient Refusal /AMA• *EtCO₂ (Capnometry) - Monitor (if equipped) for all AMS/lethargy, hypotension, SOB, *trauma, or cardiac arrest (SL 2 / 3 will document RR and EtCO₂ [in mmHg] only)• *Cardiac Monitoring - Monitor (if equipped) for all AMS/lethargy, hypotension, CP/SOB, *trauma, or cardiac arrest (SL 2 / 3 will document rate ONLY, not complete interpretation)• 12-Lead EKG - If indicated/equipped, obtain 12-Lead / q 10 min serial EKGs (PRN) and transmit if able
					<ul style="list-style-type: none">• Vascular Access - As needed per protocol, see below and B - 29, Shock / Hypotension<ul style="list-style-type: none">- IV Access via single lumen (standard IV) when required (Saline Lock)- IV Access via dual lumen peripheal IV when required (limited access, multiple infusions)- IO Access - If IV access is unobtainable and/or life-threatening condition exists<ul style="list-style-type: none">- Infuse fluids with a pressure infusion bag- Blood/Fluid Warmers - use for all *Trauma/Hypovolemia & Hypothermic patients, if available- Use Blood Tubing if massive blood loss / expected blood transfusion

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LTC Nicholas M. Studer

		<ul style="list-style-type: none"> • Temperature - May utilize rectal monitoring (if available) PRN for *Trauma or *Hypo/*Hyperthermia
		<ul style="list-style-type: none"> • Vascular Access - As needed per protocol, see below and B - 29, Shock / Hypotension <ul style="list-style-type: none"> - External Jugular (EJ) as needed via single or double lumen IV or saline lock - IO with Alert/Verbal Patients: Lidocaine 2% 40mg IO for analgesia before fluid administration (Must use pre-filled syringe, NOT a multi-dose vial) - Medication Infusions: <ul style="list-style-type: none"> - Vasopressors should be given via IV placed in the AC, if able - Utilize infusion pumps, if available; mL/hr. = gtts/min (using 60gtt tubing) • Temperature - May utilize esophageal monitoring PRN for *Trauma or *Hypo/*Hyperthermia • EtCO2 (Capnography) - Monitor for all AMS/lethargy, hypotension, SOB, *trauma, or cardiac arrest. Document RR, EtCO2 (in mmHg) and capnogram • SpHb (Hemoglobin via) - If available; use for all trauma/anemia/blood loss (average range: 13.3 – 15.2)
		<ul style="list-style-type: none"> • Vascular Access - As needed per protocol, see below and B - 29, Shock / Hypotension <ul style="list-style-type: none"> - Tunneled central venous catheters (Hickman/Broviac and Groshong), PICC lines, subcutaneous ports: These may be accessed carefully and under sterile technique in lieu of attempts at IV access. In a critical patient, do not delay attempts at IO if immediate success is not obtained. Aspirate lumen to volume listed on catheter hub to remove any possible Heparin solution prior to infusion - Dialysis catheter: Access dialysis catheters (tunneled or non-tunneled) ONLY in pulseless or peri-arrest patients if IV/IO access is not obtainable. Care and sterile technique is required. Aspirate lumen to volume listed on catheter hub to remove any possible Heparin solution prior to infusion - Dialysis graft/shunt: Access dialysis graft/shunt ONLY in pulseless or peri-arrest patients if IV/IO access is not obtainable. Care and sterile technique is required • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

Additional Considerations

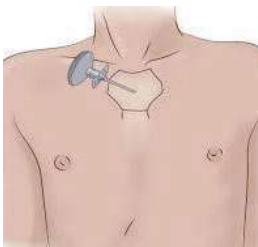
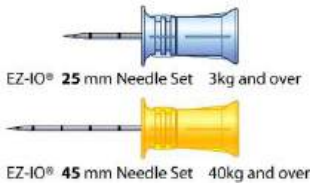
- Patient care should be a team effort by all personnel on-scene.
- ALS Services: After evaluating for life threats, SL4/SL5 personnel are encouraged to allow their SL2/SL3 partners to assume responsibility for lower-acuity calls unless the following conditions are present:
 - Patient requires or there is a high clinical suspicion that the patient will require ALS interventions.
 - An intervention was performed on the pt. requiring continuous monitoring that is beyond the SL2/SL3 scope.
 - Patient has received or will require the administration of a medication that is beyond the SL2/SL3 scope.
 - Any patient requiring a hospital alert (i.e. Stroke, STEMI, Trauma, Sepsis).
- *Legal liability for patient refusal/AMA resides with a licensed physician; AMA documentation **MUST** include the name of the physician contacted; see **A - 4, Patient Refusal / AMA**.
- Every patient evaluated by EMS must have a patient care report (PCR) completed by the individual who assumed medical lead for the patient.
- PCRs will be completed as soon as possible after completion of the call, but no later than the end of the primary provider's shift. All PCRs must be submitted for upload to the patient's electronic medical record prior to completion of the shift.
- When obtained during the call, copies of rhythm strips, EKGs and waveform capnography will be submitted with the PCR to the receiving facility for upload to the patient's electronic medical record.
- ***Trauma** – Moderate to major trauma, not for isolated extremity injuries (unless massive blood loss).
- ***Hypothermia** – Temperature < 35 °C or 95 °F; utilize tympanic/oral if bradycardic (reduce vagal stimulation).
- ***Hyperthermia** – Temperature > 38 °C or 100.4 °F
- ***Vital Signs** - MAP = [SBP + (2 × DBP)] / 3] ex. BP: 120/80; (120 + (2 x 80)) / 3 = MAP 93

Adult Medical Protocols

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Vascular Access

- Use Trauma Tubing if massive blood loss / expected blood transfusion
- If IV **extravasation** occurs:
 - Stop infusion.
 - Connect syringe to IV catheter and attempt to withdraw fluids.
 - Remove IV catheter, immobilize extremity, and elevate above the level of the heart.
 - Apply heat packs to the area.
 - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7431942/>
- If IV **infiltration** occurs:
 - Stop the infusion.
 - Remove the catheter.
- If IO **extravasation/infiltration** occurs:
 - Stop infusion
 - Secure in place; do **not** attempt to remove

<p>Proximal Humerus</p> 	<p>Sternal IO - FAST I or Talon IO (ADULTS ONLY)</p> <p>(Use ONLY if no other IV/IO Sites)</p> 	<p>TALON IO</p> 
<p>Proximal Tibia</p>  <p><small>Drawing courtesy of Vidiacare Corp, San Antonio, Texas.</small></p>	 <p>EZ-IO® 25 mm Needle Set 3kg and over</p> <p>EZ-IO® 45 mm Needle Set 40kg and over</p>	<p>Dual Lumen Peripheral IV : 16g (20g main/22g pigtail) & 18g (20g main/22g pigtail)</p> 

EZ-IO Pictures: <https://www.teleflex.com/usa/en/clinical-resources/ez-io/index>

Twin-Cath: <https://www.teleflex.com/usa/en/product-areas/vascular-access/peripheral-access/arrow-twin-cath-peripheral-catheter/>



Airway Management



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Previous Hx Airway Compromise Trauma/Dental Surgeries Asthma/COPD/Anaphylaxis	SOB/Abnormal Rate/Depth/Effort Use of Accessory Muscles Wheezing, Stridor, Rales, Rhonchi Hoarseness, Pallor or Cyanosis Altered Mental Status Hypoxemia/Hyper or Hypo-carbia	Head Injury/Stroke Drug OD or Airway Obstruction Pulmonary Edema/ARDS Cardiac Arrest or Inhalation Injury COPD/Asthma/Anaphylaxis

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• Open, Assess, Clear Airway - Finger sweeps (not blind), head-tilt/chin-lift or jaw thrust<ul style="list-style-type: none">- If obstructed, perform Abdominal or Chest thrusts five times and attempt to ventilate- Repeat until airway is cleared• Suction – Oral/nasal suction PRN; if conscious, consider giving patient suction to use PRN• BVM Ventilations - Adult normal rate 12 - 20, assist ventilations < 10 and > 30 as needed• NPA / OPA - Insert appropriate size as indicated after lubrication. Bilateral NPA with OPA may improve efficacy of ventilation. OPAs contraindicated with gag reflex• Oxygen – Titrate to SpO₂ ≥ 94% if respiratory distress/SOB, hypoxemia (SpO₂ < 90% or cyanosis)• High Flow Nasal Cannula - 15 - 25 LPM NC if SpO₂ is < 85%, 10 min max; may also be used in conjunction with BVM Ventilation, assisted ventilations / pre-oxygenation prior to SGA/ETT & CPRNote: HFNC may be used continuously during adult cardiac arrest at 15LPM
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Supraglottic Airway (SGA) - Insert SGA as needed (PRIMARY for Cardiac Arrest)• Suction: Perform suction of SGA/ETT/Cric//Trach PRN; for thick secretions, inject 10mL NS into tube prior to suction• EtCO₂ (Capnometry) - Any patient that is lethargic, altered, hypotensive, or w/SGA• Needle Thoracentesis - Suspected *tension pneumothorax (SL2/SL3 w/TCCC Tier 2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval). Lateral (4th ICS, AAL) site preferred• PEEP Valve - Use w/BVM f/hypoxia despite O₂/Airway, begin 5cmH₂O, titrate to 10cmH₂O max• *CPAP - If no contraindications initiate at 5cmH₂O w/severe respiratory distress/impending failure; increase incrementally to 15cmH₂O (max) if SpO₂ remains < 90%. Contact OLMC for further titration.
					<ul style="list-style-type: none">• Gastric Decompression: Insert OG tube after advanced airway placement if SGA is equipped• *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH₂O (IPAP) and 4cmH₂O (EPAP) w/severe respiratory distress/impending failure; increase IPAP incrementally to 15cmH₂O (max) and EPAP to 10cmH₂O (max) if SpO₂ remains < 90%. Contact OLMC for further titration.• If indicated, SGA is the primary method of airway management<ul style="list-style-type: none">- USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective• Cricothyrotomy - EMERGENCY means to secure airway if SGA ineffective or required by pt condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke)

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inhalation, etc)

- **Foreign body removal** – Utilize Magill forceps or finger sweep under direct visualization
- **EtCO₂ (Capnography)** - If lethargic, AMS, hypotensive, or w/SGA/ETT/Cric
- **Post-Advanced Airway Sedation and Pain Control (ETI, SGA, Cric):**
 - **Primary (any SBP):**
 - **Ketamine 2mg/kg IV/IO/IN**, repeat q 10 - 15 min PRN to sedation control/nystagmus
 - **Alternate (SBP > 100mmHg):**
 - **Midazolam 2.5 - 5mg IV/IO/IN**, repeat q 5 - 10 min PRN to max dose 10mg
 - Consider after discussion with OLMC: **Fentanyl 1mcg/kg IV/IO/IN** (max single dose 100mcg), repeat q 5 - 10 min PRN to 200mcg; may give with or in lieu of Midazolam
 - Patient must be placed on continuous cardiac, EtCO₂ and SpO₂ monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter

- **Endotracheal Intubation (ETI)** - If there are concerns for airway burns/inhalational injury or to allow for tracheal suctioning, utilize **Video Laryngoscopy (w/Bougie)** or **Direct Laryngoscopy (w/Bougie)**. May be considered if SGA is ineffective, ETI is preferred to Cricothyrotomy if technically feasible. Discuss with OLMC the potential benefit of intubation after first 10 minutes of cardiac arrest resuscitation prior to considering Field Termination.
- **Rapid Sequence Induction (RSI)** - For critically ill/injured patients who require immediate airway management but have an intact gag reflex, trismus, or other difficulties. This technique may be used with an SGA ("Rapid Sequence Airway"), ETI, or Cricothyrotomy in select circumstances. Requires a minimum three EMS personnel (at least one must be SL4 or above) in addition to an AP to proceed
 - **Primary Sedation (any SBP):**
 - **Ketamine 2mg/kg IV/IO/IN**
 - **Alternate Sedation (SBP > 100mmHg):**
 - **Midazolam 2.5 - 5mg IV/IO AND**
 - **Fentanyl 50-100mcg IV/IO**
 - **Primary Paralytic**
 - **Succinylcholine 1.5mg/kg IV/IO**
 - **Alternate Paralytic (Known hyperkalemia or hx of Muscular Dystrophy):**
 - ***Rocuronium 1.2mg/kg IV/IO**
 - Patient must be placed on continuous cardiac, EtCO₂ and SpO₂ monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter
- **Foreign body removal** – Utilize Magill forceps under direct or video laryngoscopy
- **Open Thoracostomy** - If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis if cardiac arrest.
- **Ventilator** – Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender

Supraglottic Airway Sizes			
Primary		Alternate	Contingency
iGel Size	Max NG Tube	King-LT / LTS-D	LMA
(3) 30-60kg: Small / Yellow	12F	4-5ft: Size 3 / Yellow	30-50kg: Size 3
(4) 50-90kg: Medium / Green	12F	5-6ft: Size 4 / Red	50-70kg: Size 4
(5) 90+kg: Large / Orange	14F	6+ft: Size 5 / Purple	70+kg: Size 5

Ketamine (500mg/10mL - 50mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
2mg/kg IV/IO	100mg	120mg	140mg	160mg	180mg	200mg	220mg	240mg
mL	2mL	2.4mL	2.8mL	3.2mL	3.6mL	4mL	4.4mL	4.8mL

*Ketamine (500mg/5mL - 100mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
*2mg/kg IV/IO	100mg	120mg	140mg	160mg	180mg	200mg	220mg	240mg
mL	1mL	1.2mL	1.4mL	1.6mL	1.8mL	2mL	2.2mL	2.4mL

Additional Considerations		
<p>*During initial BVM Ventilation, MATCH the patient's rate/volume (Minute Ventilation); Failure to do so may make patient decompensate faster*</p> <ul style="list-style-type: none"> SGA/ETT/Cric: Document size, depth and post-insertion EtCO₂ (MUST attach to run report). <p>If SGA is placed and adequately maintaining oxygenation/ventilation, keep it in place; do not remove to intubate unless discussed with OLMC.</p> <p>*Intubations are LIMITED to 30 seconds and NO MORE than two attempts*</p> <p>*CPAP Contraindications: Depressed mental status with inability to maintain airway, hypoventilation requiring ventilatory assistance, upper airway/facial trauma/burns or other abnormalities that would prevent the mask from sealing, open stoma or tracheostomy, severe cardio-respiratory instability, SBP < 100mmHg, and suspected tension pneumothorax.</p> <ul style="list-style-type: none"> Patients w/AMS, lethargy, increasing EtCO₂ / continued hypoxemia at risk for respiratory failure, treat aggressively. Initial EtCO₂ may decrease due to hyperventilation. As bronchoconstriction increases and affects ventilation, EtCO₂ will rise. If the bronchoconstriction becomes severe, the patient may have decreased perfusion causing a drop in EtCO₂ (often below 35mmHg). Effective treatment will increase EtCO₂ (if low) and decrease EtCO₂ (if high). High-Flow Nasal Cannula: Utilize portable O₂ tank if on-board O₂ regulator is unable to obtain 15-25 LPM. Switch to lowest LPM to SpO₂ (≥ 94%) once the airway is secure. Do not use longer than 10 minutes. Be vigilant w/positive pressure ventilation. Watch NIBP (MAP) f/decreasing trends, consider needle decompression. Unless otherwise indicated, ventilate patients with head up 15 - 30 degrees (increase effectiveness, decrease potential for gastric insufflation, especially with obese patients). Provider may loosen c-collar from chin prior to intubation as long as head is held in-line manually. Consider C-collar on patients to maintain in-line stabilization during transport to reduce risk of dislodgement. Portable suction should be brought to the patient's side for suspected airway compromise *In general, continued paralysis is not required after the airway procedure is complete. Excellent post-advanced airway sedation/analgesia will keep the patient comfortable. Succinylcholine is preferred due to rapid onset of paralysis, presence of fasciculations as evidence of onset, and short duration of action that allows for repeat neurological examination and evidence of patient discomfort. Repeat doses of paralytic may be required in patients with severe respiratory disease or other unique situations, consult OLMC. 		
DOPE (Change in condition, decreased SpO₂ / vent alarms): Dislodgement, Obstruction, Pneumothorax, Equipment	MOANS (Difficult BVM seal): Mask seal, Obesity/Obstruction, Age (> 55), No Teeth, Sleep Apnea/Stiff Lungs	RODS (Difficult Extraglottic Device): Restricted mouth opening, Obstruction, Disrupted/Distorted Airway, Still Lung/Cervical Spine
BURP (vocal cord view): Backwards, Upwards, Rightward Pressure	LEMON (Difficult Laryngoscopy, see below): Look, Evaluate (3-3-2), Mallampati, Obstruction/Obesity	SHORT (Difficult Cricothyroidotomy): Surgery/Scars (or other obstruction), Hematoma (or infection/abscess/mass),

Adult Medical Protocols

B - 2

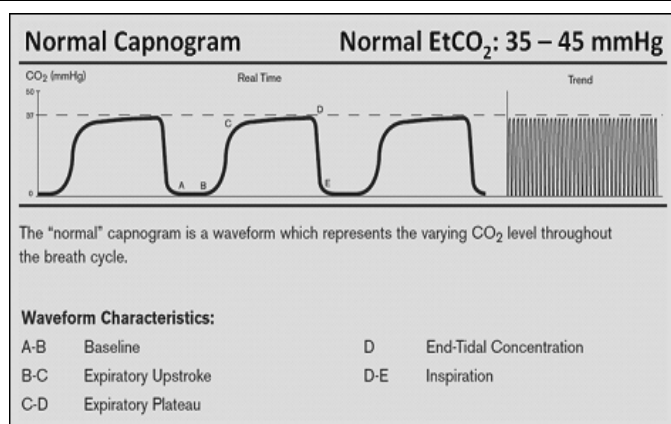
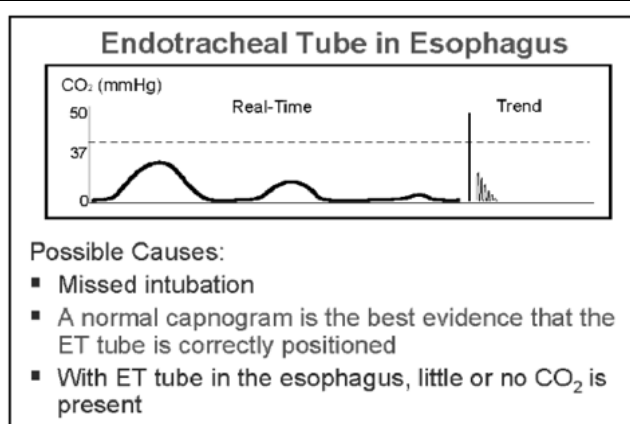
	Neck Rigidity	Obesity, Radiation distortion (and other deformity), Tumor
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Hypocapnia and Hypercapnia Causes

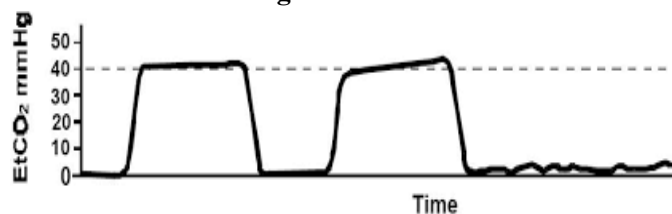
Physiologic Reason	Hypocapnia (<35mmHg)	Hypercapnia (>45mmHg)
CO2 Production:	Hypothermia, head injury, overdose, increased altitude	Fever, Sodium Bicarbonate, TQ release, Venous CO2 embolism, overfeeding
Pulmonary Perfusion:	Hypotension, Hypovolemia (trauma), pulmonary embolism, decreased cardiac output, cardiac arrest	Increased cardiac output or blood pressure
Alveolar Ventilation:	Hyperventilation, apnea, total airway obstruction or extubation	Hypoventilation, bronchial intubation, partial airway obstruction, rebreathing
Equipment Malfunction:	Circuit disconnect, leaks in sample tubing, vent malfunction	Exhausted CO2 absorber, Inadequate gas flow, leaks in tubing, vent malfunction

EtCO2 Waveforms

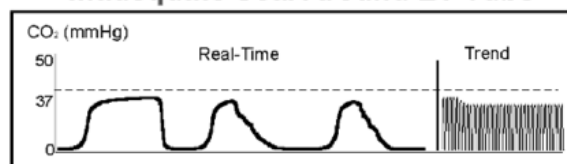
(<https://openairway.org/capnography/>)



Dislodged ET Tube



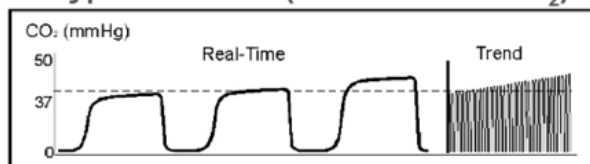
Inadequate Seal Around ET Tube



Possible Causes:

- Leaky or deflated endotracheal or tracheostomy cuff
- Artificial airway is too small for the patient

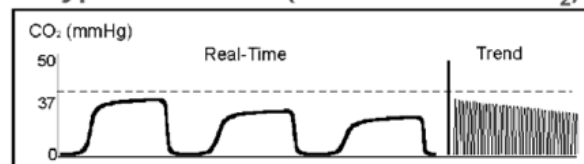
Hypoventilation (Increase in ETCO_2)



Possible Causes:

- Decrease in respiratory rate
- Decrease in tidal volume
- Increase in metabolic rate
- Rapid rise in body temperature (hyperthermia)

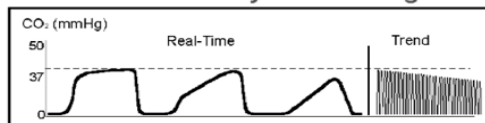
Hyperventilation (Decrease in ETCO_2)



Possible Causes:

- Increase in respiratory rate
- Increase in tidal volume
- Decrease in metabolic rate
- Fall in body temperature

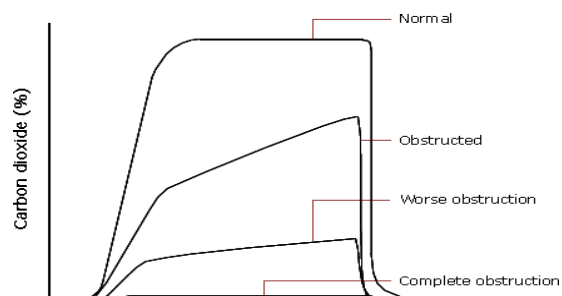
Obstruction in Airway or Breathing Circuit



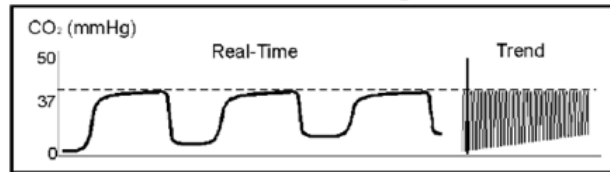
Possible Causes:

- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Obstruction in expiratory limb of breathing circuit
- Bronchospasm

Worsening Bronchospasm



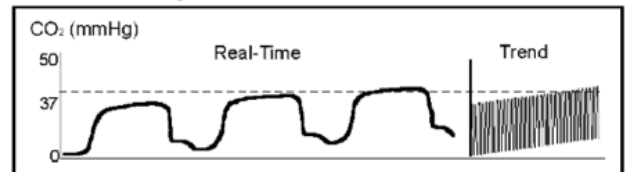
Rebreathing



Possible Causes:

- Faulty expiratory valve
- Inadequate inspiratory flow
- Insufficient expiratory time
- Malfunction of CO₂ absorber system

Faulty Ventilator Circuit Valve



- Baseline elevated
- Abnormal descending limb of capnogram
- Allows patient to rebreathe exhaled gas



Nausea & Vomiting



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE PMHx (a.fib, coronary artery disease, vascular disease, diabetes, colitis, Crohn's disease) Past SurgHx (abdominal surgeries) Females: LMP Blood in emesis or stool Recent Hospitalization Medications	Nausea and vomiting Abdominal Distention Constipation Diarrhea Anorexia	MI Ectopic/Intrauterine Pregnancy Pneumonia Appendicitis, Cholecystitis Diverticulitis, Bowel Obstruction Pyelonephritis, Mesenteric Ischemia Ischemic Colitis DKAA

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• Place in position of comfort, provide verbal reassurance to reduce anxiety• Nausea: Inhale Alcohol Pad vapor - open pad / allow patient to inhale vapor x 3 min, repeat PRN• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• If applicable, see B - 10, Chest Pain• Transport in the position of comfort
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension• Ondansetron 4mg IV/IO or ODT PO, repeat x 1 in 15 - 20 min PRN, max dose 8mg
					<ul style="list-style-type: none">• If Ondansetron is ineffective:<ul style="list-style-type: none">- Metoclopramide 5 - 10mg in 100mL NS IV/IO open to gravity, repeat x 1 in 20 - 30 min PRN, max dose 20mg- For dystonia/akathisia induced by Metoclopramide:<ul style="list-style-type: none">- Diphenhydramine 25 mg IV/IO; contact OLMC if additional doses are required

Additional Considerations
<ul style="list-style-type: none">• Ondansetron (Injection) may be administered PO at same dosing as ODT, if unavailable.

V5 For use After 01 October 2025	Adult Medical Protocols B - 3	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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Pain Management



Patient History	Defense and Veterans Pain Rating Scale (below)
OPQRST/SAMPLE, PMHx (narcotics), Medication Allergies	Mild: 0-4 Moderate: 5-6 Severe: 7-10

Clinical Practice Guidelines					
S L 1	S L 2	S L 3	S L 4	S L 5	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• Determine pain score using the DVPRS 1 - 10 or use Wong-Baker if needed• Place in position of comfort, apply ice packs/splints, provide verbal reassurance to reduce anxiety• See B - 3, Nausea / Vomiting as needed
					<ul style="list-style-type: none">• Cardiac Monitoring
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension• V/S (HR, RR, BP, SpO2, Pain Scale) & EtCO2 (Capnometry) for controlled substances<ul style="list-style-type: none">- Document q 5 min for the first 15 min after admin• *MILD Pain Control (May administer either medication or both together):<ul style="list-style-type: none">- Acetaminophen 1000mg PO X 1 AND/OR Meloxicam 15mg PO X 1• *MODERATE to SEVERE Pain from acute musculoskeletal injury:<ul style="list-style-type: none">- Acetaminophen 1000mg PO X 1 AND/OR Ketorolac 15mg IV/IM• *MODERATE to SEVERE Pain (SBP <u>must</u> be > 100mmHg and Naloxone readily available):<ul style="list-style-type: none">- Fentanyl 100mcg IN x 1• *MODERATE to SEVERE Pain (see add'l considerations for approved concentrations):<ul style="list-style-type: none">- *Ketamine 50mg IN, repeat q 20 min PRN x 1; max total dose 100mg• Slow Reversal of Opioid Pain Control:<ul style="list-style-type: none">- Naloxone (0.4mg/mL), add to 9mL NS flush (40mcg/mL), push 20mcg (0.5mL) IV/IO q 2 - 3 min PRN to RR > 8, ventilate with BVM as needed• Emergent Opioid Reversal:<ul style="list-style-type: none">- Naloxone 0.4mg IV/IO/IN/IM, repeat q 2 - 3 min PRN to RR > 8, assist ventilations PRN
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if controlled medications are administered• * MODERATE to SEVERE Pain:<ul style="list-style-type: none">- If not already given: Acetaminophen 1000mg IV/IO- For isolated extremity injuries, acute musculoskeletal pain: Ketorolac 15mg IV/IM• SEVERE Pain Control:<ul style="list-style-type: none">- Any SBP (ideal for hypotensive patients / must use approved concentration):<ul style="list-style-type: none">- *Ketamine 0.2mg/kg IV/IO, repeat q 5 - 10 min PRN to development of nystagmus- *Ketamine 0.5mg/kg IM/IN, repeat q 15 min PRN to development of nystagmus- SBP > 100mmHg:<ul style="list-style-type: none">- *Fentanyl 1mcg/kg IV/IO/IN/IM (100mcg max single dose), may repeat at 25 - 50mcg q 5 - 10 min PRN; max total dose 200mcg

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Ketamine (500mg/10mL - 50mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
*0.2mg/kg IV/IO	10mg	12mg	14mg	16mg	18mg	20mg	22mg	24mg
mL	0.2mL	0.24mL	0.28mL	0.32mL	0.36mL	0.4mL	0.44mL	0.48mL
0.5mg/kg IM/IN	25mg	30mg	35mg	40mg	45mg	50mg	55mg	60mg
mL	0.5mL	0.6mL	0.7mL	0.8mL	0.9mL	1mL	1.1mL	1.2mL

***MUST use 1mL syringe to draw up dose**

MUST use 1mL syringe to draw up dose Ketamine (500mg/5mL - 100mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
*0.2mg/kg IV/IO	10mg	12mg	14mg	16mg	18mg	20mg	22mg	24mg
mL	0.1mL	0.12mL	0.14mL	0.16mL	0.18mL	0.2mL	0.22mL	0.24mL
*0.5mg/kg IM/IN	25mg	30mg	35mg	40mg	45mg	50mg	55mg	60mg
mL	0.25mL	0.3mL	0.35mL	0.4mL	0.45mL	0.5mL	0.55mL	0.6mL

***MUST use 1mL syringe to draw up dose**

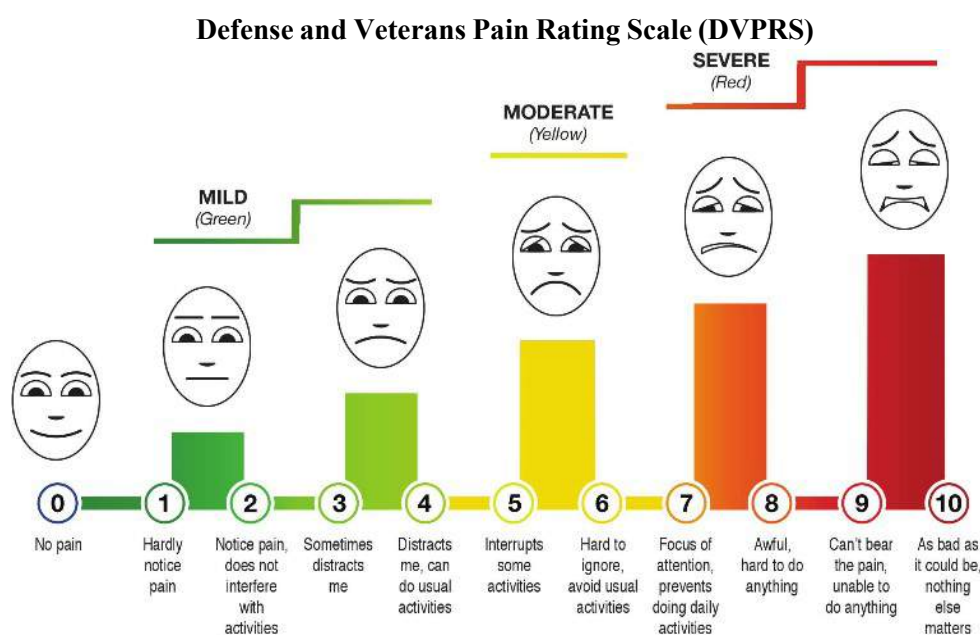


Table 3. Revised FLACC scale (r-FLACC)

	Score 0	Score 1	Score 2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Additional Considerations

- **Ketamine MUST use one of the following concentrations:**

(500mg/10mL): Ketamine 50mg = 1mL

-OR-

(500mg/5mL): Ketamine 50mg = 0.5mL

- Use caution when giving narcotic medications to elderly patients, narcotic naive patients, patients with head injuries, and those who are intoxicated – these individuals are at increased risk of CNS depression following narcotic administration.
- *Verify that the patient has not self-administered any pain medications prior to EMS arrival or is wearing a pain medication patch; consult OLMC as needed prior to administering additional pain medications
- In patients with a SBP < 90mmHg, Ketamine is the preferred analgesic
- In patients with a SBP < 90mmHg, Ketamine is the preferred analgesic
- Ketorolac and Meloxicam is not for use in patients with history of renal insufficiency or GI complaints (i.e. GI Bleed Nausea, or abdominal pain).
- *Fentanyl – may round to nearest 5mcg to allow for ease of administration.
- For Wong-Baker Pain Scale, see **E - 4, Pain Management (Peds)**

DVPRS

<https://www.dvcipm.org/clinical-resources/defense-veterans-pain-rating-scale-dvprs/>

FLACC

Voepel-Lewis T., Merkel S, Tait AR, Trzcinka A, Malviya S. The reliability and validity of the Face, Legs, Activity, Cry, Consolability observational tool as a measure of pain in children with cognitive impairment. Anesth Analg. 2002 Nov, 95(5): 1224-9
<https://www.grepmed.com/images/2711/postoperative-pediatrics-assessment-diagnosis-painscale-rflacc-peds>



Cardiac Arrest



Patient History	Signs and Symptoms	Differential
SAMPLE /OPQRST from bystanders Events leading up to arrest Estimated downtime / bystander CPR DNI/R or Living Will Hx: CP/SOB (Thrombosis: Pulmonary/MI or Tamponade) Hx: HTN/HLD (Thrombosis: Pulmonary/MI) Hx: Illicit Drug Use / Accidental OD (Tablets) Hx: Dialysis / Renal Failure (Hyperkalemia)	Unresponsive Pulseless Apnea/Agonal Respirations Absent heart sounds on auscultation	Rule out Hs & Ts (see Additional Considerations) AMS, Coma Hypothermia Myxedema coma (hypothyroidism)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">Establish pulselessness/apnea; call for ALS/additional resources as requiredEvaluate for non-initiation/termination criteria, see A - 6, Non-Initiation / Field TerminationInitiate high-quality CPR (30:2) / Apply AED, follow prompts, deliver shocks as indicatedAirway: BVM with 100% O₂ (consider HFNC in addition), place NPA and OPA see B -2, Airway ManagementSuspected Overdose: Naloxone 4mg (pre-measured) IN, repeat q 2 - 3 min PRN to RR > 8; see B - 24, Overdose / Toxic Ingestion f/additional causes/routesAssess patient for Hypothermia & BGLPregnant Patients: Perform all interventions/medications/defibrillation as neededROSC: see B - 6, ROSCAfter 20 min of high-quality CPR, contact OLMC to discuss termination of resuscitation
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">Capnometry (in line with BVM or SGA) - Maintain > 10mmHg (ideally > 20mmHg) to ensure high quality CPRSupraglottic Airway (SGA) - As soon as possible (without interrupting compressions or defibrillation)Needle Thoracentesis – Perform bilateral decompression for suspected tension pneumothorax (SL2/SL3 w/TCCC Tier 2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval)
					<ul style="list-style-type: none">*Vascular Access: Establish ASAP, then additional IV/IO (Consider dual lumen peripheral IV) when able<ul style="list-style-type: none">Immediately after access - Epinephrine (1mg/10mL) 1mg IV/IO, then q 3 - 5 min to ROSC/field terminationHypovolemia - LR 1000mL bolus, may repeat x 1 PRNBlood Glucose - < 60mg/dL: *Dextrose 10% (D10W pre-mixed bag), 250mL IV/IO over 2 min, repeat x 1 PRN in 3 - 5 min to BGL > 80mg/dL
					<ul style="list-style-type: none">EtCO₂ (Capnography) - Maintain > 10mmHg to ensure high quality CPRAirway Management - SGA is the primary method of airway management, cricothyrotomy if SGA ineffective or required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.)<ul style="list-style-type: none">USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may be considered if SGA is ineffectiveVF / Pulseless VT:<ul style="list-style-type: none">Defibrillate at 200J (biphasic) after each 2 min cycle / rhythm confirmation

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- After first shock & Epi has been administered as above:
 - **Amiodarone 300mg IV/IO in 20 mL NS x 1**; if no change in 5 min: **Amiodarone 150mg IV/IO in 20 mL NS x 1**
- **Torsades de Pointes** - **Magnesium Sulfate 2g in 10mL NS IV/IO** over 2 - 3 min x 1
- ***Hyperkalemia:**
 - **Calcium Gluconate 2g IV/IO** over 2 - 5 min, repeat x 1 in 10 min PRN; flush line between meds
 - **Sodium Bicarbonate 8.4% 100mEq IV/IO** over 2 - 5 min, may repeat x 1 in 10 min PRN
 - **Albuterol 15mg Nebulized** via in-line nebulizer
- **Endotracheal Intubation (ETI)** - If the SGA is not effective or patient requires ETT to allow for tracheal suctioning, utilize **Video Laryngoscopy w/ Bougie** or **Direct Laryngoscopy w/ Bougie**). Discuss with OLMC the potential benefit of intubation after first 10 minutes of cardiac arrest resuscitation prior to considering Field Termination
- **Open Thoracostomy** - If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis in cardiac arrest.
- **Point-of-Care Ultrasound** – Cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

Additional Considerations

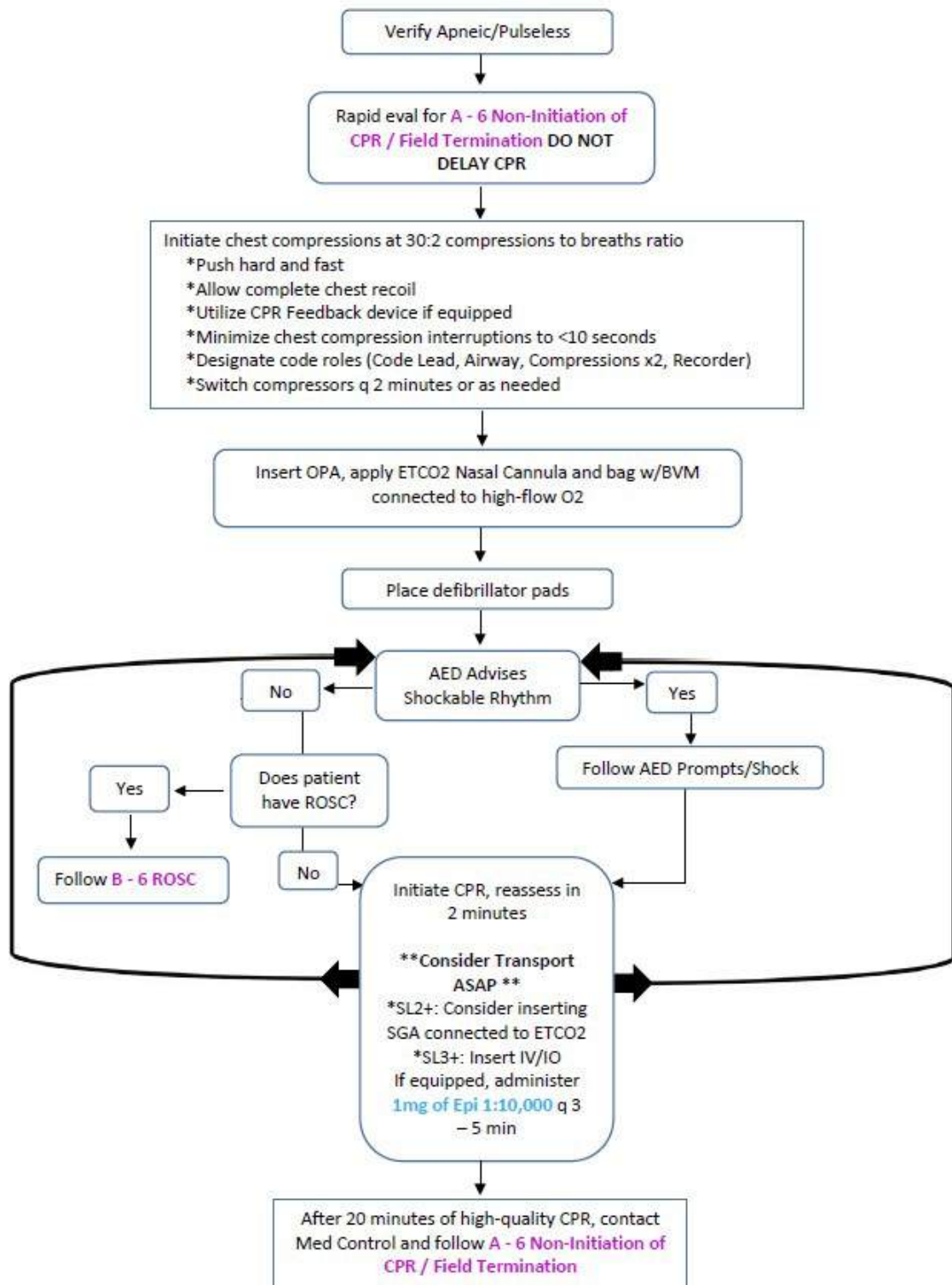
- **Cardiac arrest resuscitations will be performed on scene unless there is a danger to EMS personnel. In these scenarios, the rapid initiation of on scene resuscitation improves patient mortality.**
- Resuscitation should NOT be terminated for pregnant women with a potentially viable fetus (> 20 weeks gestation; uterine fundus palpable at the umbilicus) **without contacting OLMC first.**
- * IAW the 2020 AHA updates, IV access is the preferred medication administration route in cardiac arrest pts due to several studies demonstrating increased negative outcomes with IO use. IV access should be attempted, but it should not delay the administration of medications. Providers should gain IV access as soon as they are able.
- Mechanical chest compression devices have not been proven to improve outcomes. If such devices are used, every effort must be made to avoid interruption in chest compressions during application. The device must be closely monitored to ensure continued proper function and positioning.
- Patient must be transported to a facility capable of percutaneous coronary intervention (PCI), unless immediate airway intervention/stabilization is needed indicating the need for transport to the nearest hospital
- High-quality CPR consists of: pushing hard and fast, allowing complete recoil of the chest, minimizing chest compression interruptions to < 10 seconds, switching compressors q 2 min, and utilizing a CPR feedback device, if equipped, to ensure adequate rate/depth
- Perform continuous compressions in the presence of an advanced airway with breaths q 6 - 8 seconds.
NOTE: Rescuers may still need to perform 30:2 compressions to breaths with an SGA in place
- ***Dextrose 10%W (250mL)** - 10 or 15 gtt tubing should be used.
 - Dextrose 10% preparation if premixed bag is unavailable: Add 1 amp of **Dextrose 50% 25g to 250mL NS**
- Routine use of sodium bicarbonate in cardiac arrest is NOT recommended even in prolonged resuscitations; use should be limited to documented metabolic acidosis, suspected/known hyperkalemia, suspected tricyclic antidepressant overdoses or if a combative or agitated state preceded the cardiac arrest. Consult OLMC. see **B - 24 Overdose / Toxic Exposure**

Hs	Ts
<ul style="list-style-type: none"> - Hypovolemia: IV/IO Access, Fluids (B - 29, Shock / Hypotension) - Hypoxia: High-flow O2 (B - 2, Airway Management) - Hydrogen Ions (Acidosis): BVM Ventilation - Hyper/hypo-kalemia: Patient History (B - 25, Renal Failure) - Hypothermia: Exam / Temperature (B - 23, Hypothermia) 	<ul style="list-style-type: none"> - Toxins: Naloxone or other Tx (B - 24, Overdose / Toxic Exposure) - Tamponade, Cardiac/CVA: Trauma / Pt History - Tension Pneumothorax: Exam / Breath Sounds, Needle Decompression (C - 1, Trauma) - Thrombosis, Coronary: Patient History, EKG (B - 10, Chest Pain) - Thrombosis, Pulmonary: Patient History

Adult Medical Protocols

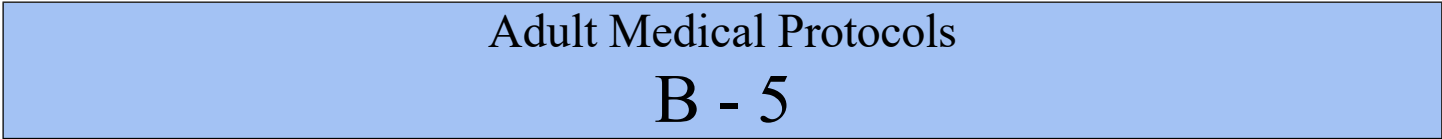
B - 5

Adult BLS CPR Algorithm



Hs and Ts

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





ROSC & Post-Arrest Care



BOLD and *Italicized* Text are “5Hs and 5Ts”

Patient History	Signs and Symptoms	Differential
SAMPLE /OPQRST from bystanders Events leading up to arrest Estimated downtime / DNI/R or Living Will Hx: CP/SOB (Thrombosis: Pulmonary/MI or Tamponade) HTN/HLD (Thrombosis: Pulmonary/MI) Illicit Drug Use / Accidental OD (Tablets) Dialysis / Renal Failure (Hyperkalemia)	Sudden increase in ETCO ₂ to >35 mmHg Return of pulse Return of normal respirations Patient has spontaneous movement	Rule out Hs & Ts (noted in Additional Considerations below)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B -1, General Patient Care / OLMC as needed• B -2, Airway Management (Hypoxia / Acidosis) / Oxygen• Hs and Ts: Treat underlying causes IAW relevant protocol• Suspected Overdose: Naloxone 4mg (pre-measured) IN, repeat q 2 - 3 min PRN to RR > 8; see B - 24, Overdose / Toxic Ingestion f/additional causes/routes• Assess/treat patient for Hypothermia• Blood Glucose Level (BGL) - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - Continuous monitoring• Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min and transmit if able
					<ul style="list-style-type: none">• Vascular Access - Ensure IV/IO x 2 (Consider dual lumen peripheral IV), see B - 29, Shock / Hypotension<ul style="list-style-type: none">- If SBP < 90mmHg or MAP < 65mmHg: 500mL LR IV/IO bolus, may repeat x3 PRN- Assess lung sounds after each bolus; if available, utilize Blood/Fluid Warmer
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be continuously monitored• Airway Management - If indicated, SGA is the primary method of airway management<ul style="list-style-type: none">- USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective• Persistent Hypotension Unresponsive to Fluid Bolus:<ul style="list-style-type: none">- May consider: Epinephrine 5 - 20mcg IV/IO q3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion.- *Norepinephrine 2 - 12mcg/min IV/IO titrated to SBP > 90mmHg or MAP > 65 (see below)- If no SBP/MAP improvement: Dexamethasone 10mg IV/IO x 1- If SBP remains less than 60mmHg after above, consider: 50 - 100mcg Epinephrine IV/IO q 3 min PRN (0.5 - 1mL of 1mg/10mL concentration “Cardiac” Epinephrine) in consultation with OLMC• Non-pregnant patient:<ul style="list-style-type: none">- If patient had at least one episode of VT/VF and did not receive amiodarone during resus<ul style="list-style-type: none">- Amiodarone 150mg IV/IO over 10 min, then drip at 1mg/min over 6 hrs. (below)- If patient received amiodarone during resuscitation:<ul style="list-style-type: none">- Consider Amiodarone drip at 1mg/min over 6 hrs. (chart below)• Transport to PCI capable hospital immediately, defibrillator pads should remain in place• Pregnant Patients If patient had at least one episode of VT during resuscitation:

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//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

		<ul style="list-style-type: none"> - Lidocaine 2% 100mg slow IV/IO over 2 min; repeat x 1 PRN q 5 min; max dose 3mg/kg
		<ul style="list-style-type: none"> • Post-Advanced Airway Sedation and Pain Control (ETI, SGA, Cric): <ul style="list-style-type: none"> - Primary (any SBP): <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN, repeat q 10 - 15 min PRN to sedation control/nystagmus - Alternate (SBP > 100mmHg): <ul style="list-style-type: none"> - Midazolam 2.5 - 5mg IV/IO/IN, repeat q 5 - 10 min PRN to max dose 10mg - Consider after discussion with OLMC: Fentanyl 1mcg/kg IV/IO/IN (max single dose 100mcg), repeat q 5 - 10 min PRN to 200mcg; may give with or in lieu of Midazolam - Patient must be placed on continuous cardiac, EtCO2 and SpO2 monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter
		<ul style="list-style-type: none"> • Ventilator – Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender • Persistent Hypotension (unresponsive to fluid boluses): <ul style="list-style-type: none"> - May consider: 5 - 20mcg Epinephrine IV/IO q3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion. • Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Drops / Min (mL/hr.)	8	15	22	30	38	46

Amiodarone Drip - 150mg/3mL (150mg vial x 1) in 100mL D5W or NS (1.5mg/mL) USE 60gtt Tubing or Infusion Pump		
Use 0.2 micron filter	1mg/min	0.5mg/min
	40 gtts/min (mL/hr.) over 6 hrs.	20 gtts/min (mL/hr.) over 18 hrs.

For transports greater than 90 min, consider the below concentration

Amiodarone Drip - 450mg/9mL (150mg vial x 3) in 250mL D5W or NS (1.8mg/mL) USE 60gtt Tubing or Infusion Pump		
450mg = 3 ampules (150mg) each Use 0.2 micron filter	1mg/min	0.5mg/min
	33 gtts/min (mL/hr.) over 6 hrs.	6 gtts/min (mL/hr.) over 18 hrs.

Ketamine (500mg/10mL - 50mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
2mg/kg IV/IO	100mg	120mg	140mg	160mg	180mg	200mg	220mg	240mg
mL	2mL	2.4mL	2.8mL	3.2mL	3.6mL	4mL	4.4mL	4.8mL

*Ketamine (500mg/5mL - 100mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
*2mg/kg IV/IO	100mg	120mg	140mg	160mg	180mg	200mg	220mg	240mg
mL	1mL	1.2mL	1.4mL	1.6mL	1.8mL	2mL	2.2mL	2.4mL

“Push Dose” Epinephrine	
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL	
-OR-	
Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL	

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Additional Considerations

- * Norepinephrine: **MUST** be administered with an infusion pump or 60gtt tubing.
- Pressors should be considered if the patient fails to respond to fluid boluses.
- Post-cardiac arrest arrhythmias are common and most self-resolve; it is not necessary to routinely treat these arrhythmias unless the patient is deteriorating.
- Post-Arrest rhythms requiring transcutaneous pacing: Continuously verify mechanical capture by palpating a pulse. Pacer spikes could mask a rhythm change and re-arrest.

ROSC Checklist

- ☐ Manage airway (NRB, BVM, SGA) and titrate SpO2 to $\geq 94\%$
 - ☐ EtCO2 to 35 - 45mmHg if ventilating with BVM (EtCO2 may take 10 - 15 min to meet normal levels, do NOT hyperventilate to rapidly decrease EtCO2)
 - ☐ Obtain full set of vitals to include blood glucose every 5 min (minimum)
 - ☐ Obtain serial 12 lead EKGs
 - ☐ Perform continuous cardiac monitoring
 - ☐ Treat hypotension
 - ☐ Consider vasopressor for persistent hypotension (MAP < 65mmHg)
 - ☐ Re-evaluate all interventions after any patient movement (airway, IV/IO access. etc.)
 - ☐ Transport to PCI capable hospital; bring additional personnel in case patient arrests for a second time
- **Targeted Temperature Management:** Current data has not demonstrated a morbidity or mortality benefit in the prehospital initiation of post-ROSC cooling. This should be deferred until the patient arrives at the receiving facility. 2015 ILCOR recommendations specifically advise against prehospital responders administering cold fluids to obtain targeted temperature management.

Hs	Ts
<ul style="list-style-type: none"> - Hypovolemia: IV/IO Access, Fluids (B - 29, Shock / Hypotension) - Hypoxia: High-flow O2 (B - 2, Airway Management) - Hydrogen Ions (Acidosis): BVM Ventilation - Hyper/hypo-kalemia: Patient History (B - 25, Renal Failure) - Hypothermia: Exam / Temperature (B - 23, Hypothermia) 	<ul style="list-style-type: none"> - Toxins: Naloxone or other Tx (B - 24, Overdose / Toxic Exposure) - Tamponade, Cardiac/CVA: Trauma / Pt History - Tension Pneumothorax: Exam / Breath Sounds, Needle Decompression (C - 1, Trauma) - Thrombosis, Coronary: Patient History, EKG (B - 10, Chest Pain) - Thrombosis, Pulmonary: Patient History



Bradycardia



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of HTN, hyperlipidemia, MI, renal disease, hypothyroidism Hx of syncope/near syncope Hx of beta-blockers, calcium channel blockers, digoxin Pacemaker	Heart Rate < 60 bpm Dizzy, lightheaded, syncope, chest pain, fatigue, SOB Acute CHF (Peripheral edema, pulmonary crackles/rales, hypoxia) Hypotension, Shock, AMS, pale/cyanotic	Pacemaker failure/malfunction Heart disease, MI, AV Block Head injury, Stroke Hypothermia or Hypovolemia Hypoxia, Overdose Hypothyroidism, Sepsis Athlete/normal for patient

Unstable (CHAPS): Chest Pain, Altered Mental Status, S/Sx of Shock, Hypotension, Pulmonary Edema

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• If an overdose is suspected, see B - 24, Overdose / Toxic Exposure
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Asymptomatic (no CHAPS above) - Closely monitor, no intervention is required• Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min; transmit to receiving facility• EtCO₂ (Capnometry) - Will be monitored at all times if lethargic, altered LOC, and/or hypotensive
					<ul style="list-style-type: none">• Vascular Access - IV/IO x 2 (Consider dual lumen peripheral IV); fluids per B - 29, Shock / Hypotension
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be monitored if lethargic, altered LOC and/or hypotensive• Stable and Symptomatic:<ul style="list-style-type: none">- Atropine 1mg IV/IO; may repeat q 3 - 5 min PRN; max dose 3mg• Unstable and Symptomatic (see CHAPS guidelines above):<ul style="list-style-type: none">- Transcutaneously Pace: Set HR to 70, increase mA to Electrical and Mechanical capture• Pacing Sedation: Consider ONE of the following if time allows:<ul style="list-style-type: none">- Any SBP (see add'l considerations for approved concentrations):<ul style="list-style-type: none">- Ketamine 20mg IV/IO may repeat q 15 min PRN- Ketamine 50mg IN may repeat q 15 min PRN- SBP > 100mmHg (Do not give with Ketamine)<ul style="list-style-type: none">- Midazolam 2.5 – 5mg IV/IO/IN may repeat in 10 min PRN to max dose of 10mg• Bradycardia Refractory to Pacing and/or Atropine:<ul style="list-style-type: none">- *Epinephrine Drip 2 - 10mcg/min IV/IO; titrate to SBP ≥ 90mmHg or MAP ≥ 65• Persistent Hypotension (unresponsive to fluid boluses):<ul style="list-style-type: none">- May consider: 5 - 20mcg Epinephrine IV/IO q3 min PRN ("Push Dose;" 0.5 - 2mL of "Cardiac" Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion.- *Norepinephrine 2 - 12mcg/min IV/IO; titrate to SBP ≥ 90mmHg or MAP ≥ 65- If no SBP/MAP improvement: Dexamethasone 10mg IV/IO x 1- If SBP remains less than 60mmHg after above, consider: 50 - 100mcg Epinephrine IV/IO q 3 min PRN (0.5 - 1mL of 1mg/10mL concentration "Cardiac" Epinephrine) in consultation with OLMC• Suspected Calcium Channel or Beta Blocker Overdose, see B - 24 Overdose / Toxic

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		<p>Ingestion</p> <ul style="list-style-type: none"> • 12-Lead EKG - Obtain immediately with rhythm change or pacing capture• If patient has a history of renal failure, there is concern for hyperkalemia based on EKG interpretation or are undergoing cancer radiation/chemotherapy treat, see B - 25, Renal Failure / Dialysis
		<ul style="list-style-type: none"> • Persistent Hypotension (unresponsive to fluid boluses): <ul style="list-style-type: none"> - May consider: 5 - 20mcg Epinephrine IV/IO q 3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion. • Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

Bradycardia Refractory to Pacing and/or Atropine

Epinephrine Drip – 2mg (1:1000) in 250mL NS (8mcg/mL) – MUST use 60gtt Tubing or Infusion Pump					
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg
Gtts/min (cc/hr.)	15	30	45	60	75

Persistent Hypotension (unresponsive to fluid boluses)

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – USE 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Gtts/min (cc/hr.)	8	15	22	30	38	46

“Push Dose” Epinephrine

Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL
 -OR-
 Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations

- **Ketamine MUST use one of the following concentrations:**
(500mg/10mL): Ketamine 20mg = 0.4mL; 50mg = 1mL
-OR-
(500mg/5mL): Ketamine 20mg = 0.2mL; 50mg = 0.5mL
- * Norepinephrine / Epinephrine: **MUST** be administered with an infusion pump, flow controller tubing, or 60gtt tubing
- Symptomatic/Unstable Bradycardia: Proceed directly to **transcutaneous pacing**; do not delay treatment to give Atropine. Ensure documentation of mechanical and electrical capture.
- Contact OLMC if initiating Epinephrine or Norepinephrine drip in a patient who remains hypotensive/unstable despite pacing.
- Consider treatable causes of bradycardia: Hypoxia, Hypothermia, Calcium Channel Overdose, Beta Blocker Overdose
- Second degree heart blocks, third degree heart blocks and denervated hearts (as in cardiac transplant) may not respond to Atropine. In these cases, proceed directly to transcutaneous pacing.



Tachycardia, Narrow Complex



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of WPW, A-Fib, cardiac ablations, HTN, hyperlipidemia, MI Hx of syncope/near syncope Hx of stimulant use (cocaine, caffeine, Ritalin, etc.)	Heart Rate $\geq$ 150 bpm Dizziness, lightheadedness, syncope, chest pain, fatigue, SOB Acute CHF (peripheral edema, pulmonary crackles/rales, hypoxia) Hypotension, Shock, AMS, pale/cyanotic, diaphoretic	Heart disease, MI, PE Sepsis (or infection) Substance Abuse / Overdose Medications Hyperthyroidism Electrolyte imbalance

Unstable (CHAPS): Chest Pain, Altered Mental Status, S/Sx of Shock, Hypotension, Pulmonary Edema

Clinical Practice Guidelines				
S L 1	S L 2	S L 3	S L 4	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • B - 2, Airway Management / Oxygen
				<ul style="list-style-type: none"> • Asymptomatic (no CHAPS criteria) - Closely monitor, no immediate intervention is required • EtCO₂ (Capnometry) - Will be monitored • Cardiac Monitoring 12-Lead EKG - Obtain serial EKGs q 10 min, transmit if able
				<ul style="list-style-type: none"> • Vascular Access - IV/IO x 2 (Consider dual lumen peripheral IV); fluids per B - 29, Shock / Hypotension
				<ul style="list-style-type: none"> • EtCO₂ (Capnography) - Will be monitored • Unstable and Symptomatic (CHAPS criteria present) - Synchronize Cardiovert: <ul style="list-style-type: none"> - Regular Rhythm: 50 - 100J, repeat q 2 - 3 min PRN - Irregular Rhythm: 120 - 200J, repeat q 2 - 3 min PRN • Obtain continuous rhythm strip in conjunction with each cardioversion attempt • Cardioversion Sedation: Consider ONE of the following if time allows: <ul style="list-style-type: none"> - Any SBP (see add'l considerations for approved concentrations): <ul style="list-style-type: none"> - Ketamine 20mg IV/IO may repeat q 15min PRN - Ketamine 50mg IN may repeat q 15 min PRN - SBP > 100mmHg (Do not give with Ketamine) <ul style="list-style-type: none"> - Midazolam 2.5 – 5mg IV/IO/IN may repeat in 10 min PRN to max dose of 10mg • Stable and Asymptomatic (HR $\geq$ 150, or failed electrical cardioversion): <ul style="list-style-type: none"> - Vagal Maneuvers if patient is able - Adenosine 6mg rapid IV/IO push, no change after 3 min may repeat at 12mg • If no conversion, contact OLMC to administer: <ul style="list-style-type: none"> - Metoprolol 5mg IV/IO over 2 min; may repeat x 2 PRN q 5 min; max dose 15mg • 12-Lead EKG - Obtain immediately with rhythm change or pacing capture

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Additional Considerations

- **Ketamine MUST use one of the following concentrations:**

(500mg/10mL): Ketamine 20mg = 0.4mL; 50mg = 1mL

-OR-

(500mg/5mL): Ketamine 20mg = 0.2mL; 50mg = 0.5mL

- **Vagal Maneuvers:** Ask patient to attempt to blow plunger out of a 10mL syringe for 5 - 10 seconds.
- Adenosine should be administered directly to the IV hub via a 3-way stopcock connected to Adenosine dose and a 10mL flush (or with a flush through a proximal port in IV tubing). Administer Adenosine rapidly followed immediately by saline flush. Half-life is < 10 seconds.
- Adenosine may not convert atrial fibrillation/flutter, but it is not shown to be harmful. Additionally, it may slow the rhythm enough to allow the provider to identify it.
- ** If trained/approved by local Medical Director, consider anterior and posterior pad placement for atrial fibrillation or SVT refractory to initial electrical cardioversion:

https://www.uptodate.com/contents/cardioversion-for-specific-arrhythmias?search=cardioversion-for-specific-arrhythmias&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H1172679957

**Knight B, Page B, Yeon S. Cardioversion for specific arrhythmias. Up To Date, Topic 983, Version 41.0. Jan 2021 (web address above)



Tachycardia, Wide Complex



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of WPW, A-Fib, cardiac ablations, HTN, hyperlipidemia, MI (Hx of syncope/near syncope) Hx of stimulant use (cocaine, caffeine, Ritalin, etc.)	Heart Rate $\geq$ 100 bpm Dizziness, lightheadedness, syncope, chest pain, fatigue, SOB Acute CHF (peripheral edema, pulmonary crackles/rales, hypoxia) Hypotension, Shock, AMS, pale/cyanotic, diaphoretic	Pacemaker failure/malfunction Heart disease, MI, PE Medications (QT prolonging) Stimulants Electrolyte imbalance

Unstable (CHAPS): Chest Pain, Altered Mental Status, S/Sx of Shock, Hypotension, Pulmonary Edema

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen <ul style="list-style-type: none">• Asymptomatic (no CHAPS criteria) - Closely monitor, no immediate intervention is required• EtCO₂ (Capnometry) - Will be monitored• Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min; transmit if able <ul style="list-style-type: none">• Vascular Access - IV/IO x 2 (Consider dual lumen peripheral IV); fluids per B - 29, Shock / Hypotension <ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be monitored• Polymorphic Wide Complex Tachycardia (Torsades de Pointes):<ul style="list-style-type: none">- Assess pulse; if pulseless, begin CPR and see B - 5, Cardiac Arrest- Magnesium 2g in 10mL NS IV/IO over 2 - 3 min x 1• Stable & Asymptomatic (Regular/Monomorphic Tachycardia):<ul style="list-style-type: none">- Non-Pregnant Patients:<ul style="list-style-type: none">- Adenosine 6mg rapid IV/IO push, no change after 3 min may repeat at 12mg- If not effective: Amiodarone 150mg IV/IO in 100mL NS over 10 min- If no conversion, repeat Amiodarone 150mg IV/IO in 100mL NS over 10 min- If patient develops SBP < 90mmHg, stop infusion and perform synchronized cardioversion- Pregnant Patients:<ul style="list-style-type: none">- Adenosine 6mg rapid IV/IO push, no change after 3 min may repeat at 12mg- If not effective: Lidocaine 2% 100mg slow IV/IO push over 2 min; max total dose 3mg/kg.- If no conversion, repeat Lidocaine 2% 100mg slow IV/IO push over 2 min; max total dose 3mg/kg.- If patient develops SBP < 90mmHg, stop infusion and perform synchronized cardioversion• Unstable & Symptomatic (see CHAPS above) Synchronized Cardioversion (biphasic):<ul style="list-style-type: none">- Wide Regular rhythm: 100J, repeat q 2 - 3 min PRN- Wide Irregular rhythm: 120 - 200J, repeat q 2 - 3 min PRN- Obtain continuous rhythm strip in conjunction with each attempt- If rhythm converts, immediately repeat 12-Lead EKG and:<ul style="list-style-type: none">- Non-Pregnant Patients: Amiodarone 150mg IV/IO in 100mL NS over 10 min
L	L	L	L	L	
1	2	3	4	5	

- Pregnant Patients: Contact OLMC
- Cardioversion Sedation: **Consider ONE of the following** if time allows:
 - **Any SBP (see add'l considerations for approved concentrations):**
 - **Ketamine 20mg IV/IO** may repeat q 15min PRN
 - **Ketamine 50mg IN** may repeat q 15 min PRN
 - **SBP > 100mmHg (Do not give with Ketamine)**
 - **Midazolam 2.5 – 5mg IV/IO/IN** may repeat in 10 min PRN to max dose 10mg
- If hyperkalemia is suspected, see **B - 25, Renal Failure / Dialysis**
- **12-Lead EKG** - Obtain immediately with rhythm change

Additional Considerations

- **Ketamine MUST use one of the following concentrations:**
(500mg/10mL): Ketamine 20mg = 0.4mL; 50mg = 1mL
-OR-
(500mg/5mL): Ketamine 20mg = 0.2mL; 50mg = 0.5mL
- S/Sx of unstable tachycardia (**CHAPS**): Chest Pain, Hypotension, Altered Mental Status, Pulmonary Edema (Wet Lung Sounds), S/Sx of Shock
- Due to the risk of fetal bradycardia, amiodarone must not be given to pregnant patients. Lidocaine is a suitable substitute.
- If Tricyclic Antidepressant overdose is suspected, see **B - 24 Overdose / Toxic Ingestion**.
- Adenosine should be administered directly to the IV hub via a 3-way stopcock connected to Adenosine dose and a 10mL flush (or with a flush through a proximal port in IV tubing). Administer Adenosine rapidly followed immediately by saline flush. Half-life is < 10 seconds.



Chest Pain



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx of HTN, hyperlipidemia, smoking, cardiac disease (self/family), obesity Hx of MI PE risk factors: post-surgery, cancer, birth control use	Pain/Pressure between umbilicus/ jaw/ shoulder Indigestion, Nausea, Vomiting or diaphoresis Difficulty Breathing S&S of Congestive Heart Failure Syncope or Weakness	Angina / AMI Thoracic or Abdominal Aortic Dissection PE or Pneumothorax Asthma or COPD Esophageal Rupture

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• Keep patient in position of comfort, do not allow to ambulate• Nausea/Vomiting, see B - 3, Nausea / Vomiting• Aspirin - 324mg (four 81mg tablets) chewed (cannot be enteric coated)
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min, transmit if able• If SBP $\geq$ 100mmHg, assist patient with their non-expired, prescribed Nitroglycerin Tablets SL NTG is Contraindicated if Right-Sided MI is suspected, SBP < 100mmHg or if Viagra® (sildenafil)/Levitra® (vardenafil) has been used in past 24 hrs. or Cialis® (tadalafil) in last 48 hrs.• Transport to a PCI capable facility; scene time should be < 10 min
					<ul style="list-style-type: none">• *Vascular Access – Administer fluids per B - 29, Shock / Hypotension
					<ul style="list-style-type: none">• Notify receiving facility ASAP if Acute MI is suspected; refer to STEMI ALERT below• Pain Management:<ul style="list-style-type: none">- Nitroglycerin 0.4mg SL q 3 – 5 min PRN if SBP > 100mmHg and right-sided MI is ruled out; max dose 1.2mg; contact OLMC for additional dosing- Pain unresolved by NTG (if SBP > 100mm Hg):<ul style="list-style-type: none">- Fentanyl 50 - 100mcg IV/IO, repeat q 15 - 20 min PRN; max dose 200mcg• If Chest Pain is suspected stimulant abuse/overdose (HTN & Tachycardia > 120 bpm):<ul style="list-style-type: none">- Midazolam 2.5 - 5mg IV/IO/IN/IM x 1, may repeat x 1 PRN to 5mg max

Additional Considerations
<ul style="list-style-type: none">• If a patient has a STEMI, do NOT delay transport to establish a second IV. Scene time should be < 10 min.• *12-Lead EKG: If hypotensive and/or changes in II, III and aVF, immediately perform R-side EKG (V4R -V6R).<ul style="list-style-type: none">- If ST elevation is present in the right-sided leads, nitroglycerin is contraindicated.- If ST Depression in V1-V4, immediately perform posterior EKG (V7 - V9).• *Vascular Access - Recommend one dual lumen peripheral IV and one saline lock. Place IO if unstable/delay in IV access. Access should be established prior to administering subsequent doses of Nitroglycerin.• Atypical or unusual S/Sx are more common in women, the elderly and diabetic patients.• May present with CHF, syncope and/or shock. <p>STEMI Alerts should be based on the patient's current condition, the EMS provider's judgement and should follow local hospital/regional guidelines.</p>

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STEMI Alert

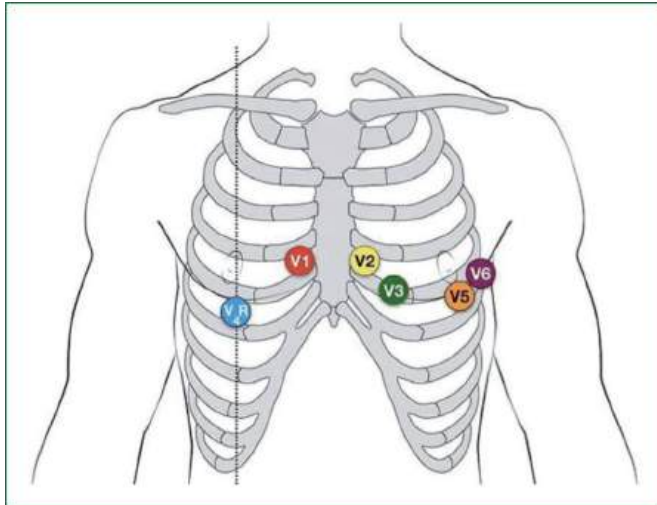
- The initial STEMI Alert should be made via phone or radio to the receiving facility immediately after analyzing the 12-Lead. A 12-Lead should be transmitted ASAP if able.
- EMS crews should call a “STEMI Alert” when a patient is symptomatic with presume cardiac related chest pain and new ST segment elevation $\geq 1\text{mm}$ in two (2) contiguous (anatomical) leads and does not have exclusion criteria as defined below:

STEMI Alert Exclusions

The EMS crews should **not** report a STEMI and should consult with the receiving facility when:

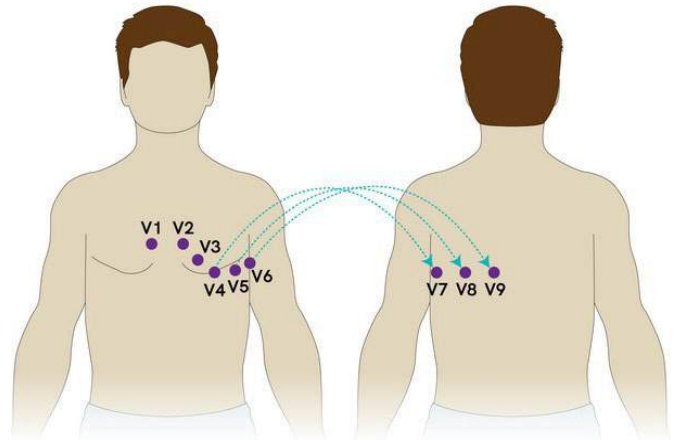
- The patient is asymptomatic for cardiac related chest pain but the 12-Lead is interpreted as a STEMI.
-OR-
- If the patient is symptomatic for cardiac chest pain and has evidence of isolated V1 and V2 elevation only, LVH, LBBB, Ventricular/Ventricular Paced, Early Repolarization, Diffuse ST Elevation, Non-Specific ST changes or poor quality EKGs.

Right Sided EKG:



<https://www.paramedicpractice.com/features/article/understanding-right-ventricular-myocardial-infarction-in-prehospital-care>

Posterior EKG:



<https://www.coreimpodcast.com/2018/12/27/active-chest-pain-trop-5-0/>



Difficulty Breathing

Asthma / COPD



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medication Hx (Albuterol, Atrovent, Singulair, steroids) Social Hx (tobacco use) Home oxygen therapy Hx of asthma/COPD exacerbation requiring hospitalization and/or intubation	Respiratory distress Bilateral wheezes/stridor Diminished breath sounds Accessory muscle use Chest tightness Cough Tachycardia	Anaphylaxis Aspiration/airway obstruction Pulmonary embolus MI/CHF (pulmonary edema) Pericarditis/Myocarditis Pneumonia or Toxic Inhalation Pneumothorax

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management - If BVM is required, ventilate at a rate of 6 - 8 breaths/min (permissive hypercapnia) / Oxygen: Consider HFNC if SpO₂ < 85%• If suspected Influenza / COVID-19, etc., see B - 14, Airborne Pathogens• *Severe Asthma - Assist with patient's prescribed Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 5 min PRN; max of 3 doses
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - Will be monitored• 12-Lead EKG - Obtain as clinically indicated• Cardiac Monitoring - Continuous monitoring• Wheezing/Respiratory Distress:<ul style="list-style-type: none">- *Albuterol 2.5mg/2.5mL nebulized, repeat q 10 min PRN; no max dose- *Ipratropium Bromide 0.5mg/3mL nebulized, repeat q 10 min PRN; max dose 1.5mg• If severe respiratory distress and no improvement with albuterol:<ul style="list-style-type: none">- Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 5 min PRN; max of 3 doses• Consider *CPAP - If no contraindications initiate at 5cmH₂O w/severe respiratory distress/impending failure; increase incrementally to 15cmH₂O (max) if SpO₂ remains < 90%. Contact OLMC for further titration.%• If using BVM, utilize PEEP Valve (especially in pts w/hypoxia despite O₂/airway); max 10cmH₂O
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension
					<ul style="list-style-type: none">• *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH₂O (IPAP) and 4cmH₂O (EPAP) w/severe distress/impending failure; increase IPAP incrementally to 15cmH₂O (max) and EPAP to 10cmH₂O SpO₂ remains < 90%. Contact OLMC for further titration.• EtCO₂ (Capnography) - Will be monitored<ul style="list-style-type: none">- May permit permissive hypercapnia (> 45mmHg) due to severity• Audible wheezing or obvious respiratory distress:<ul style="list-style-type: none">- Dexamethasone 10mg IV/IO/IM/PO x 1• If wheezing/respiratory distress is unimproved w/above treatment, consider:<ul style="list-style-type: none">- Epinephrine (1mg/mL) 0.3mg IM, repeat q 5 min PRN; max of 3 doses- Magnesium Sulfate 2g IV/IO diluted in 50mL NS over 5 - 10 min x 1- Ketamine 0.2mg/kg slow IV x 1 (for bronchodilation/bronchorrhea)• If no improvement in respiratory status despite above treatment consider:<ul style="list-style-type: none">- Epinephrine Drip 2 – 10mcg/min IV/IO, titrate to improved respiratory effort

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- If no improvement in respiratory status despite above treatment consider:
 - **Epinephrine 5 - 20mcg IV/IO** q 3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Epinephrine drip.

***Epinephrine Drip – 2mg (1mg/1mL 1:1000) in 250mL NS (8mcg/mL) – MUST use 60gtt Tubing or Infusion Pump**

Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg
Drops / Min (mL/hr.)	15	30	45	60	75

“Push Dose” Epinephrine

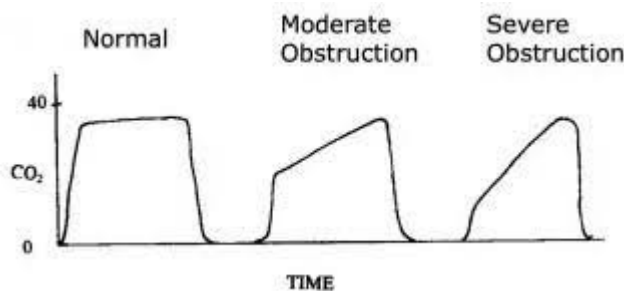
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL
-OR-

Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

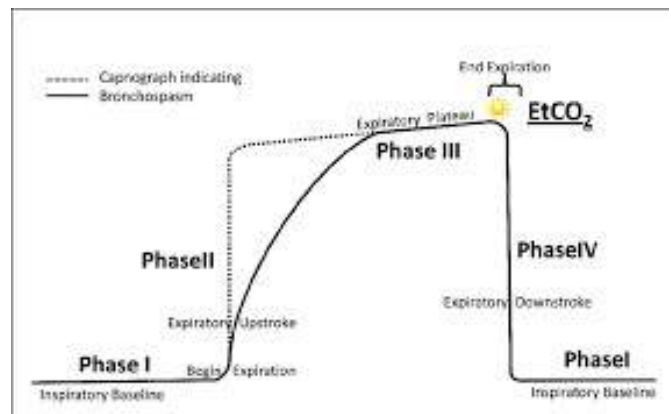
Additional Considerations

- * **Severe Asthma** - Symptoms may include the presence of inspiratory and expiratory wheezes, inability to speak in full sentences, tripodding, retractions, nasal flaring, hypoxia ($\text{SpO}_2 < 92\%$), and/or tachypnea.
- * **Albuterol/Ipratropium Bromide** - May combine meds in one nebulizer treatment; be prepared to switch to in-line therapy if advanced airway required. Continuous EtCO₂ nasal cannula is required for monitoring; if using nebulizer mask, place it over the EtCO₂ cannula (place under surgical mask for Influenza/COVID patients).
- Initial EtCO₂ may decrease due to hyperventilation. As bronchoconstriction increases and affects ventilation, EtCO₂ will rise. If the bronchoconstriction becomes severe, the patient may have decreased perfusion causing a drop in EtCO₂ (often below 35mmHg). Effective treatment will increase EtCO₂ (if low) and decrease EtCO₂ (if high).
- * **CPAP Contraindications:** Depressed mental status with inability to maintain airway, hypoventilation requiring ventilatory assistance, upper airway/facial trauma/burns or other abnormalities that would prevent the mask from sealing, open stoma or tracheostomy, severe cardio-respiratory instability, SBP < 100mmHg, and suspected tension pneumothorax.
- * **Waveform EtCO₂**
 - **Normal:** No change to waveform
 - **Mild:** No change or slightly decreased EtCO₂ due to mild hyperventilation.
 - **Moderate:** May begin to see plateau increase (shark tooth) due to bronchoconstriction, EtCO₂ may begin to rise.
 - **Severe:** EtCO₂ is elevated due to decreased ventilation; depending on patient severity, as presentation improves EtCO₂ may increase significantly as the lungs excrete retained CO₂.

“Shark Fin” EtCO₂



<https://www.nm.org/-/media/northwestern/resources/for-medical-professionals/ems-training/ems-education/ems-capnography-2024-ce.pdf>



Wampler D. Capnography as a Clinical Tool. EMS World, Issue Aug, 2011.
<https://www.emsworld.com/article/10287447/capnography-clinical-tool>



Difficulty Breathing

Congestive Heart Failure & Pulmonary Edema

Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medications (Beta blockers, nitroglycerin, Lasix, Digoxin, erectile dysfunction) Hx of MI, CHF, COPD, PE Hx of DM, HTN	Chest pain, SOB, orthopnea, JVD Paroxysmal nocturnal dyspnea Accessory muscle use, inability to speak in full sentences Rales/Rhonchi Pink/frothy sputum Peripheral edema, apprehension Hypotension, shock	MI COPD / Asthma Pneumonia PE, Pneumothorax Pericarditis Anaphylaxis Toxic Inhalation

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • B - 2, Airway Management / Oxygen - Consider HFNC if SpO2 < 85%
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none"> • Chest Pain, see B - 10, Chest Pain • Cardiac Monitoring & 12-Lead EKG - Obtain, transmit to receiving facility if able • EtCO2 (Capnometry) - Will be monitored • Consider *CPAP - If no contraindications initiate at 5cmH2O w/severe respiratory distress/impending failure; increase incrementally to 15cmH2O (max) if SpO2 remains < 90%. Contact OLMC for further titration. • If using BVM, consider PEEP Valve (especially w/hypoxia despite O2/Airway); max 10cmH2O
					<ul style="list-style-type: none"> • Vascular Access - Ensure IV/IO x 2 (Consider dual lumen peripheral IV), see B - 29, Shock / Hypotension
					<ul style="list-style-type: none"> • *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH2O (IPAP) and 4cmH2O (EPAP) w/severe distress/impending failure; increase IPAP incrementally to 15cmH2O (max) and EPAP to 10cmH2O SpO2 remains < 90%. Contact OLMC for further titration. • SBP > 100mmHg w/S/Sx of CHF AND respiratory distress (if no contraindications): <ul style="list-style-type: none"> - *Nitroglycerin 0.4mg SL; may repeat q 5 min PRN to relieve respiratory distress if SBP remains above 100mmHg; max total dose 1.2mg; contact OLMC for additional doses • EtCO2 (Capnography) - Will be monitored • SBP < 90mmHg despite Fluid Bolus: <ul style="list-style-type: none"> - *Norepinephrine 2 - 12mcg/min IV/IO, titrate to MAP > 65 or SBP > 90mmHg

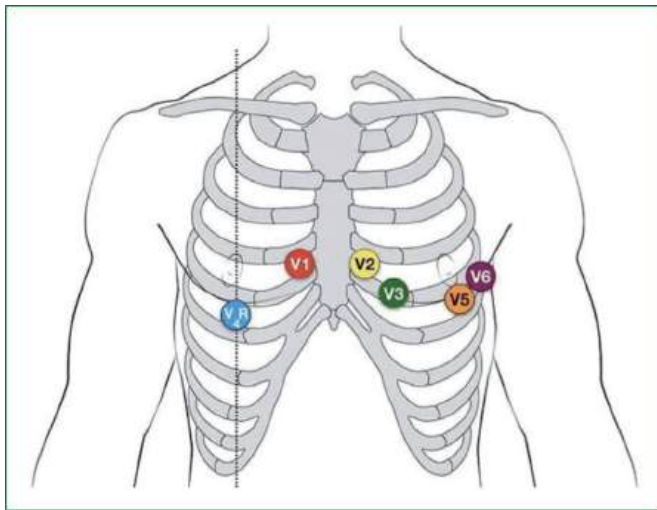
Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use Infusion Pump or 60gtt Tubing						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Gtts / Min (mL/hr.)	8	15	22	30	38	46

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Additional Considerations

- If the patient's EKG shows ST elevation in the inferior leads (II, III and aVF) complete a Right Sided EKG (V4R-V6R)
- * If ST elevation is present in the right-sided leads, nitroglycerin is contraindicated
- Allow patient to assume a position of comfort; placing patients supine may make symptoms worse (orthopnea)
- * Norepinephrine **MUST** be administered in a large vein with an infusion pump or 60gtt tubing.
- * **CPAP Contraindications:** Depressed mental status with inability to maintain airway, hypoventilation requiring ventilatory assistance, upper airway/facial trauma/burns or other abnormalities that would prevent the mask from sealing, open stoma or tracheostomy, severe cardio-respiratory instability, SBP < 100mmHg, and suspected tension pneumothorax.

Right Sided EKG:



<https://www.paramedicpractice.com/features/article/understanding-right-ventricular-myocardial-infarction-in-prehospital-care>



Stroke / CVA



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx of CVA/TIA Medications (Blood thinners) Hx of HTN, HLD, diabetes Hx of A-Fib, MI, blood clots Previous cardiac/vascular surgeries Hx of head trauma, intracranial bleed	AMS, Syncope, Dizziness Weakness/paralysis Vision or sensory loss Headache Seizure Hyper/hypotension Aphasia or Aphagia	Hypoglycemia Transient Ischemic Attack (TIA) Seizure Hypoxia, Tumor, Trauma Postictal (Todd's) paralysis Atypical migraine, Bell's palsy

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • B - 2, Airway Management / Oxygen • Establish onset of symptoms (last known time the patient was symptom free) • BGL - If < 60mg/dL treat IAW B - 20, Diabetic Emergencies • Perform Cincinnati Pre-Hospital Stroke Scale (CPSS): <ul style="list-style-type: none"> - Facial droop; Arm drift; Speech abnormality; Time of onset
L	L	L	L	L	<ul style="list-style-type: none"> • Minimize scene time to < 10 min • If CPSS exam positive, BGL > 60mg/dL, AND onset of symptoms within 6 hours: <ul style="list-style-type: none"> - Initiate "Stroke Alert" IAW local policy and transport to a Primary Stroke Center • If SBP > 110mmHg: Elevate head of stretcher 15 - 30°, maintain head/neck in neutral alignment • Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able
1	2	3	4	5	<ul style="list-style-type: none"> • Vascular Access - Recommend dual lumen peripheral IV (if equipped) plus one large bore IV <ul style="list-style-type: none"> - LR 500mL IV/IO, repeat x 3 PRN to maintain SBP > 110mmHg
					<ul style="list-style-type: none"> • Regardless of CPSS exam results, perform Large Vessel Occlusion (LVO) *VAN Stroke Exam: <ul style="list-style-type: none"> - If arm weakness + one of the following: vision deficit, aphasia, or neglect = LVO POSITIVE • If LVO exam positive, BGL > 60mg/dL, AND last known well time > 6 hours but < 24 hours prior, make patient NPO, transport to Comprehensive Stroke Center (mechanical thrombectomy capable) • Hypertension should NOT be treated in possible CVA patients (unknown hemorrhagic/ischemic) • If Hypotensive, see B - 29, Shock / Hypotension

Additional Considerations
<ul style="list-style-type: none"> • "Last Known Well Time" is critically important to obtain since it helps determine patient treatment options and direct patient transport. Document time of onset as opposed to "30 mins ago". If the patient woke up with symptoms, document the last time the patient was symptom free. • Whenever possible a family member should accompany the patient to the hospital to provide a history. • Minor, rapidly improving or completely resolved stroke-like symptoms could be indicative of a TIA; the patient must be transported for evaluation as TIAs often prelude CVAs. • Pediatric Strokes: <ul style="list-style-type: none"> - Rare condition - More common in children over the age of two with PMHX of sickle cell anemia and hypercoagulable diseases (Factor V Leiden) - Newborn Symptoms: Using only one side of the body

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- Children/Teenagers Symptoms: Severe headaches, dizziness, loss of coordination/balance
- **CPSS and LVO stroke exam are not validated in patients < 18 years of age; transport and notify receiving facility of your findings.**

Stroke Mimics:

• Postictal State:

- Altered state of consciousness lasting 5 - 30 mins post seizure
- Patients can present w/dizziness, confusion, hypertension, generalized weakness, fatigue
- Todd's Paralysis: Brief period of temporary unilateral paralysis immediately after a seizure (usually lasts 30 mins - 36 hrs.) and can also affect the patient's speech and vision. When in doubt, activate a Stroke Alert and transport the patient.

• Bell's Palsy:

- Affects a single facial nerve (usually viral in nature)
- More common with pregnant, diabetic and elderly patients
- Presents with unilateral facial weakness, facial droop, slurred speech, inability to "frown" their brow, may not be able to close their eyes (eyelid weakness). Does NOT cause AMS or paralysis of the extremities.
- **Consult with OLMC as needed; when in doubt, activate a Stroke Alert**

Cincinnati Prehospital Stroke Scale

Cincinnati Prehospital Stroke Scale (CPSS)			
Sign/Symptom	How tested	Normal	Abnormal
Facial Droop	Have the patient show their teeth or smile	Both sides of the face move equally	One side of the face does not move as well as the other
Arm Drift	The patient closes their eyes and extends both arms straight out for 10 seconds	Both arms move the same, or both do not move at all.	One arm either does not move, or one arm drifts downward compared to the other.
Speech	The patient repeats "The sky is blue in Cincinnati".	The patient says correct words with no slurring of words.	The patient slurs words, says the wrong words, or is unable to speak

<https://www.careercert.com/articles/stroke/stroke-examination-tools/>

Stroke Checklist

- ☐ Onset of symptoms $\leq$ 6 hrs.
- ☐ Blood glucose $>$ 60mg/dL
- ☐ Cincinnati Prehospital Stroke Screen:
 - Facial Droop
 - Arm Drift
 - Slurred Speech
- ☐ Declare STROKE ALERT
- ☐ Have historian/family meet EMS at the hospital if possible
- ☐ Scene time $<$ 10 min

VAN Stroke Scale

Assess for Weakness

- 1) Have the patient hold their arms straight out from their body, palms up for 10 seconds

Do the arms drift or fall before the end of 10 seconds?

☐ Yes: LVO positive; continue exam to determine other deficits ☐ No: LVO negative, stop exam

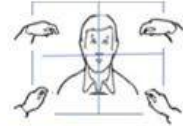
Vision

- 1) Evaluate all 4 fields of vision; hold various numbered fingers up in the LUQ, RUQ, LLQ and RLQ visual fields. Can the patient tell you how many fingers you are holding up in each field?

☐ Yes: Continue exam ☐ No: Document which fields the patient is unable to see, continue exam

- 2) Does the patient report any blurred vision, field cut or loss of vision?

☐ Yes: Continue exam ☐ No: Document the patient's deficit, continue exam



Aphasia

- 1) Can the patient name two common objects (hold up a pen, point to a watch)?

☐ Yes: Continue exam ☐ No: Document the patient's deficit, continue exam

- 2) Can the patient repeat a simple sentence you tell them? IE "Today is a sunny day"

☐ Yes: Continue exam ☐ No: Document the patient's deficit, continue exam

- 3) Can the patient follow two simple commands? IE Close your eyes, hold up two fingers

☐ Yes: Continue exam ☐ No: Document the patient's deficit, continue exam

Neglect

- 1) Can the patient track the tip of your pen with their eyes only (left, right, up, down)? Can they make eye contact with you or do their eyes track off to one side?

☐ Yes: Continue exam ☐ No: Document the patient's deficit, continue exam

- 2) Can the patient differentiate which arm you're touching? Have the patient close their eyes, touch their left arm and ask which arm you're touching. Repeat with the right arm. Finish by touching both arms simultaneously.

☐ Yes: Continue exam ☐ No: Document the patient's deficit

*If patient has arm weakness and at least one other deficit, notify nearest stroke center (ideally a comprehensive stroke center with mechanical thrombectomy capabilities) that patient is a possible large vessel occlusion and relay the deficits.

*If the patient does NOT have arm weakness, they cannot be LVO positive even if they have other deficits.

*** Patients with signs and symptoms of a LVO (LVO Stroke Exam positive)** benefit from catheter-directed clot lysis/removal up to 24 hours following the initial onset of symptoms. Patients screening positive for a LVO Stroke presenting > 6 hours but < 24 hours following symptom onset should be transported to a comprehensive stroke center capable of neurosurgery interventions. Contact OLMC for hospital destination guidance as required.
<https://www.heart.org/-/media/files/affiliates/swa/qi-files/van-assessment-for-lvo-detection--james-curry.pdf?la=en>



Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Recent Travel Known or suspected exposure Hx of asthma/COPD exacerbation requiring hospitalization and/or intubation	Respiratory distress Bilateral wheezes/stridor Diminished breath sounds Accessory muscle use Chest tightness / Cough Tachycardia	Other viral illness ARDS Pulmonary Edema Pneumonia Asthma

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines				
S	S	S	S	S
L	L	L	L	L
1	2	3	4	5
				<ul style="list-style-type: none"> • B – 1 / E – 1, General Patient Care / OLMC as needed • Ensure proper PPE (N95, Eye / Face protection, gown and gloves) <ul style="list-style-type: none"> - Limit exposed responders; if able, send in one crew member to evaluate the patient - Attempt to isolate other personnel/family members on scene - Minimize number of personnel • Apply surgical mask to patient • B – 2 / E – 2, Airway Management - If BVM is required, ventilate at a rate of 6 - 8 breaths/min (permissive hypercapnia); Use HEPA filter on BVM • Oxygen - Place surgical mask over NC or NRB; Consider HFNC at 15 LPM if SpO₂ < 85%
				<ul style="list-style-type: none"> • Using BVM, consider PEEP Valve (especially in pts w/hypoxia despite O₂/Airway); max 10cmH₂O • Airway Management - If SGA is indicated ensure HEPA filter is attached in-line or on BVM • If Wheezing/Respiratory Distress: <u>Do NOT utilize nebulized medications or CPAP</u> unless a HEPA filter can be attached on the exhaust (do not place in line) <ul style="list-style-type: none"> - Albuterol MDI with spacer/adaptor 8 puffs, repeat q 10 mins PRN; no max dose
				<p>Pediatrics: Albuterol MDI with spacer/adaptor 4 puffs, repeat q 10 mins PRN; no max dose</p>
				<ul style="list-style-type: none"> • Cardiac Monitoring & 12-Lead EKG - Obtain if no improvement in condition/clinically req'd • EtCO₂ (Capnometry) - If clinically indicated; may permit permissive hypercapnia (> 45mmHg)
				<ul style="list-style-type: none"> • Severe Wheezing/Respiratory Distress unimproved with Albuterol: <ul style="list-style-type: none"> - Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 5 min PRN; max dose 1.2mg
				<p>Pediatrics:</p> <ul style="list-style-type: none"> - < 30kg: Epinephrine Autoinjector 0.15mg IM to lateral thigh, repeat q 5 min PRN; max dose 0.45mg - > 30kg: Give Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 5 min PRN; max dose 0.9mg
				<ul style="list-style-type: none"> • Airway Management: If indicated, SGA is the primary method of airway management <ul style="list-style-type: none"> - USAF NRP's Only: ETI via video or direct laryngoscopy w/Bougie may be considered if SGA is ineffective

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Adult Medical Protocols
B - 14

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

- **EtCO₂ (Capnography)** - If clinically indicated may permit permissive hypercapnia (> 45mmHg)
- If Wheezing/Respiratory Distress:
 - **Epinephrine (1mg/1mL) 0.3mg IM**, repeat q 5 min PRN; max dose 1.2mg
 - **Dexamethasone 10mg IV/IO/IM/PO x 1**
- If no improvement despite above treatment:
 - ***Epinephrine Drip 2 - 10mcg/min IV/IO**, titrate to improved respiratory effort; max 10mcg/min

Pediatrics:

- **Dexamethasone 0.5mg/kg IV/IO/IM/PO x 1**; max dose 10mg
- **Epinephrine (1mg/1mL 1:1,000) 0.15mg IM**, repeat q 5 min PRN; max dose 0.45mg;
 - If > 30kg give 0.3mg adult dose

***Epinephrine Drip – 2mg (1mg/1mL) in 250mL NS (8mcg/mL) – MUST use 60gtt Tubing or Infusion Pump**

Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg
Drops / Min	15	30	45	60	75

Additional Considerations

- Consider wearing an N-95 mask when coming in contact with a patient suspected of having an airborne pathogen, even if it is not a confirmed diagnosis.
- Document patient's recent travel and any known sick contacts.



Abdominal Pain



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Past Medical History Past Surgical History Menstrual History (Pregnancies) Last bowel movement/emesis Travel History	Pain Nausea/Vomiting/Diarrhea Abdominal Distention Dysuria Constipation Vaginal Bleeding/Discharge Pregnancy Fever	Myocardial Infarction Abdominal Aortic Aneurysm (AAA) Mesenteric Ischemia Ruptured Ectopic Pregnancy Ovarian Torsion Appendicitis Kidney Stones

Clinical Practice Guidelines					
S L 1	S L 2	S L 3	S L 4	S L 5	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• Nausea/Vomiting - See B - 3 Nausea/Vomiting
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored at all times if lethargic, altered LOC, and/or hypotensive• 12-Lead EKG - Obtain as clinically indicated• Cardiac Monitoring - Continuous monitoring if clinically indicated
					<ul style="list-style-type: none">• Vascular Access - If hypotensive see B - 29, Shock / Hypotension; do not delay transport for access• Pain Management - See B - 4, Pain Management

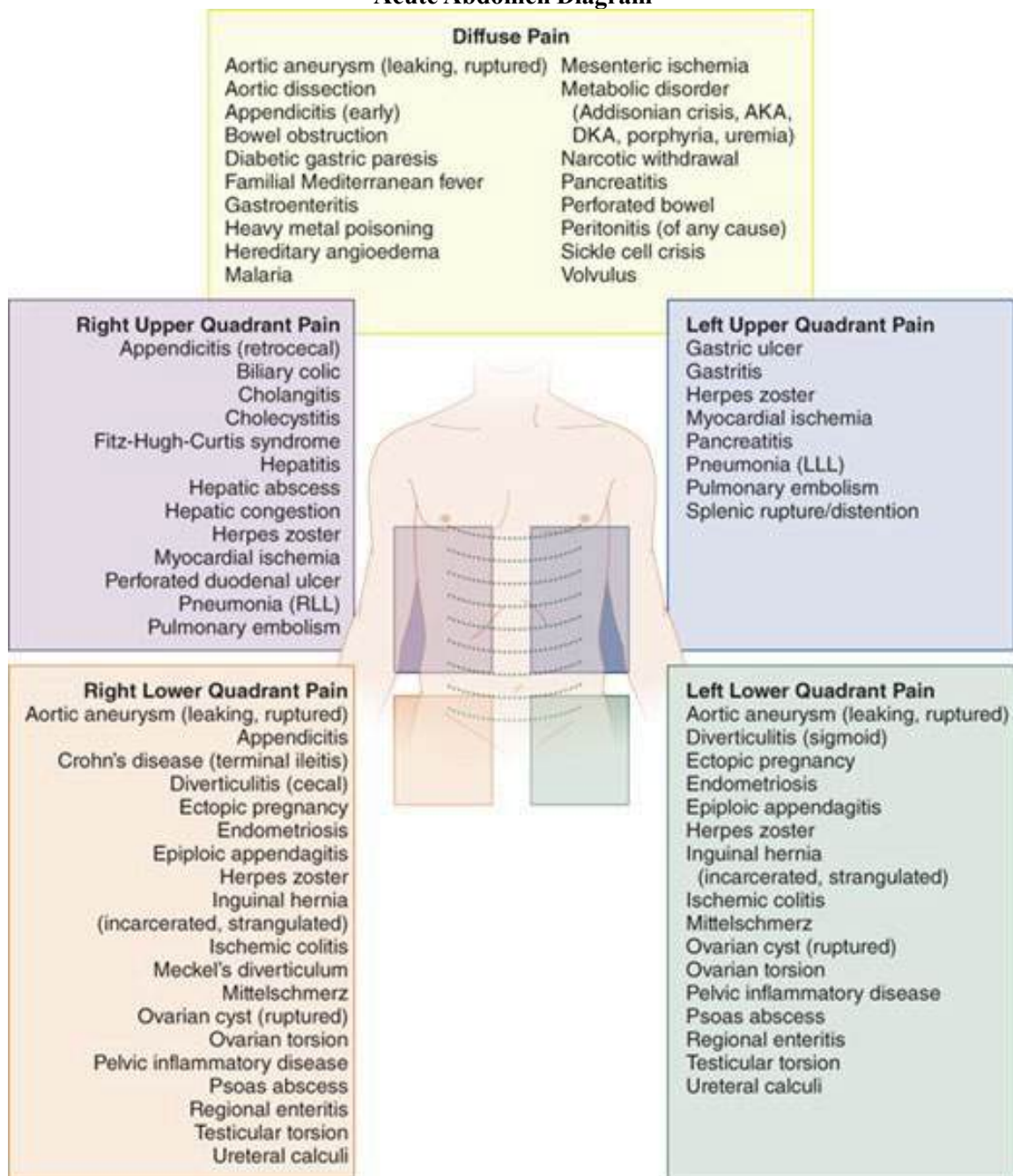
Additional Considerations
<ul style="list-style-type: none">• Consider cardiac etiology in patients > 50yo, diabetics, and/or females with upper abdominal complaints.• Pain medication is NOT contraindicated for patients with abdominal pain. Medications should be limited to parenteral medications and not by mouth (PO) to limit PO intake.• Abdominal pain in females of childbearing age should be treated as an ectopic pregnancy until proven otherwise.• AAAs should be considered with abdominal pain in patients > 50yo. Consider bilateral blood pressures.• Document last menstrual period (LMP) for all female patients and OB history (G#P#AB#). <p style="text-align: center;">Common Causes / Findings for Select Conditions</p> <p>Abdominal Aortic Aneurysm: Severe abdominal pain, flank pain, back pain, abdominal pulsatile mass, hypotension</p> <p>Acute MI: Chest “pressure”/epigastric pain (radiate to jaw/arm), diaphoresis, N/V, SOB, pallor, dysrhythmias, hypotension</p> <p>Appendicitis: N/V, RLQ/periumbilical pain, fever, anorexia</p> <p>Bowel Obstruction: N/V, inability to pass gas</p> <p>Cholecystitis: Acute onset RUQ pain / tenderness (may refer to right shoulder), associated with high-fat meal, N/V, anorexia, fever</p> <p>Diffuse Pain: Pancreatitis, peritonitis, gastroenteritis, dissecting/rupturing abdominal aortic aneurysm, diabetes, ischemic bowel or sickle cell crisis</p> <p>Ectopic Pregnancy: Missed period, pelvic pain, abnormal vaginal bleeding, dizziness, hypotension</p> <p>Food Poisoning: N/V, diffuse abd pain/cramping, diarrhea, fever, weakness,</p> <p>Hepatic Failure: Jaundice, confusion/coma, edema, bleeding/bruising, fever, anorexia or dehydration</p> <p>Kidney Stones: Constant or colicky severe flank pain, hematuria, N/V</p>

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Pancreatitis: Severe “sharp” epigastric or LUQ pain radiating to back, N/V, diaphoresis, abdominal distension, shock/fever

Ulcer: “Burning”/epigastric pain, N/V, hematemesis

Acute Abdomen Diagram



Source: J.E. Tintinalli, J.S. Stapczynski, O.J. Ma, D.M. Yealy, G.D. Meckler, D.M. Cline: Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 8th Edition
www.accessmedicine.com
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Tintinalli J, Stapczynski J, Ma O, Yealy D, Meckler G, Cline D. Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 8th Edition.
<https://aneskey.com/acute-abdominal-pain/>



Altered Mental Status



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Previous Hx of Diabetes (self/family) Previous Hx cardiac/stroke/seizure Previous Hx of Trauma Previous/Current illicit drug use or Toxic ingestion Recent illness	Decreased mental status Change in baseline mental status Bizarre behavior (hallucinations, delusions) Hypoglycemia (cool, diaphoretic, skin, seizure) Hyperglycemia (warm, dry skin; Kussmaul respirations)	*AEIOU-TIPS Head Trauma or Hypoxia CNS (stroke, tumor, seizure, infection) Cardiac (MI, CHF) Hypothermia/Hyperthermia Shock (septic, hypovolemic) Diabetes (hyper/hypo) Substance/ Alcohol/Drug OD

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• Crew/responder safety is the main priority, see B - 18, Behavioral Emergencies / Restraints• Check pupillary response; treat suspected overdose, see B - 24, Overdose / Toxic Ingestion• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies<ul style="list-style-type: none">- If minimal/no improvement in mental status, perform Cincinnati Pre-Hospital Stroke Screen (CPSS) and VAN Assessments, see B - 13, Stroke• Signs of Seizure - See B - 28, Seizures• Signs of Hyperthermia - See B - 22, Hyperthermia/Heat Exposure• Signs of Hypothermia - See B - 23, Hypothermia/Cold Exposure• Signs of Head Trauma - See C - 6, Head Trauma
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - Will be monitored• Chest Pain - See B - 10, Chest Pain protocol• Cardiac Monitor & 12-Lead EKG - Obtain and transmit if able; consider serial EKGs q 10 min
					<ul style="list-style-type: none">• Vascular Access – Do not delay transport for access; See B - 29, Shock / Hypotension• Signs of Fever/Sepsis - See B - 27, Sepsis & Septic Shock
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be monitored

Additional Considerations
<ul style="list-style-type: none">• *AEIOU-TIPS: Acidosis/Alkalosis/Alcohol, Epilepsy/Endocrine/Electrolytes, Infection, Overdose/Organophosphates, Uremia, Trauma/Tumor, Insulin/Intracranial Pressure, Psychosis/Poisoning, Stroke/Shock/Seizure• Contact OLMC at any time for advice, especially when the patient's level of agitation is such that transport may place EMS personnel and the patient at risk.• Any patient who is handcuffed or restrained by LE and transported by EMS must be accompanied by LE personnel in the ambulance see A - 5, Combative Patients / LE Considerations.• At no time should a restrained patient be placed in the prone (face down) position.• A violent patient may require chemical/physical restraint to ensure proper assessment and treatment, see B - 18, Behavioral Emergencies / Restraints.• Consider whether domestic violence or abuse is a factor for all patients presenting with trauma.• Hypoglycemic/hypoxic patients may present as irritable/violent.

V5 For use After 01 October 2025	Adult Medical Protocols B - 16	//Signed// Lt Col Christopher W. Hewitt MAJ Nicholas M. Studer
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Anaphylaxis & Allergic Reaction



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx of Anaphylaxis Known allergy/exposure (Insect sting or bite) Prescribed EpiPen Use of EpiPen prior to arrival Medical Comorbidities (cardiac, pulmonary)	Mild Reaction: Single system involvement (mucocutaneous, GI, etc.) Normal BP and O2 Saturation Moderate/Severe Reaction: Multi-System Involvement and/or resp distress: Integumentary Sx: Itching, Rash Respiratory Sx: Dyspnea, wheezing, stridor, hypoxia Mucocutaneous: Hoarseness, difficulty swallowing, angioedema GI Sx: Nausea/vomiting/diarrhea CVS Sx: Hypotension or shock	Asthma or COPD Aspiration/airway obstruction Angioedema (drug induced: lisinopril) Anxiety

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• *B - 2, Airway Management / Oxygen - Consider HFNC• Apply cold pack to insect bite or sting; remove stinger if present<ul style="list-style-type: none">- See B - 19, Bites and Envenomation as needed• Moderate/Severe Reaction - Assist with admin of pt.'s prescribed Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 3 - 5 min PRN; max of 3 total doses
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - If lethargic, hypoxic, altered LOC and/or hypotensive.• Cardiac Monitoring - Monitor heart rate• Moderate/Severe Reaction:<ul style="list-style-type: none">- Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 3 - 5 min PRN; max of 3 total doses• Wheezing/Respiratory Distress:<ul style="list-style-type: none">- *Albuterol 2.5mg/2.5mL nebulized, repeat q 10 min PRN; no max dose- *Ipratropium Bromide 0.5mg/3mL nebulized, repeat q 10 min PRN; max dose 1.5mg
					<ul style="list-style-type: none">• Vascular Access - If SBP < 90mmHg, see B - 29, Shock / Hypotension• Mild Reaction - Diphenhydramine 25mg IV/IO/IM, may repeat x 1 in 15 min PRN• Moderate/Severe Reaction - Diphenhydramine 50mg IV/IO/IM x 1; max patient dose 50mg in 4 hours
					<ul style="list-style-type: none">• EtCO2 (Capnography) - If lethargic, hypoxic, altered LOC and/or hypotensive. May permit permissive hypercapnia (> 45mmHg) due to severity• Moderate/Severe Reaction (if not previously administered):<ul style="list-style-type: none">- Epinephrine (1mg/1mL) 0.3mg IM (or Autoinjector), repeat q 3 - 5 min PRN; max patient dose 1.2mg- Dexamethasone 10mg IV/IO/IM/PO x 1• Unresponsive to above treatment AND patient is taking <u>beta-blocker medications</u>, consider:<ul style="list-style-type: none">- Glucagon 1mg slow IV push over 5 min, may repeat x 1 PRN<ul style="list-style-type: none">- May cause nausea/vomiting; see B - 3, Nausea / Vomiting• If all above meds have been administered and patient's SBP remains < 90mmHg:<ul style="list-style-type: none">- *Epinephrine Drip 2 - 10mcg/min IV/IO titrate to SBP > 90mmHg• If SBP remains less than 60mmHg after above, consider 50 - 100mcg Epinephrine IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration "Cardiac" Epinephrine) in consultation with OLMC

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- **Moderate/Severe Reaction** (if not previously administered):
 - May consider: **5 - 20mcg Epinephrine IV/IO** q 3 - 5 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10mcg/mL) as a bridge to Epinephrine drip.
- **Point-of-Care Ultrasound** – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

*Epinephrine Drip – 2mg (1mg/1mL 1:1000) in 250mL NS (8mcg/mL) – MUST use 60gtt Tubing or Infusion Pump					
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg
Drops / Min (mL/hr.)	15	30	45	60	75

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations
<p>*Albuterol/Ipratropium Bromide - May combine meds in one nebulizer treatment. Be prepared to switch to in-line therapy if advanced airway is required. Patient must be continuously monitored via EtCO₂ nasal cannula; if using a nebulizer mask, place it over the EtCO₂ cannula.</p> <ul style="list-style-type: none"> • When calculating max dosing consider Epinephrine Autoinjectors and Diphenhydramine that were self-administered by the patient prior to EMS arrival. • *Airway Management – Severe reactions may result in oropharyngeal or laryngeal edema that will limit effectiveness of SGA. If SGA ineffective, SL4/SL5 should have a low threshold to perform cricothyrotomy. • <p>Ventilation: Due to bronchoconstriction (difficulty ventilating), reducing ventilation rate may be required to decrease “auto-PEEP” or build-up of pressure below the restricted airway causing barotrauma; expect higher than normal EtCO₂ (above 45mmHg).</p> <ul style="list-style-type: none"> • Avoid positive pressure ventilations through BVM, PEEP valves, and CPAP in the presence of severe anaphylaxis due to the risk of circulatory compromise. Use may be required due to hypoxia or severe hypercarbia. • Allergic Reaction: Symptoms involving only one organ system (i.e. urticaria and pruritis). • Anaphylactic Reaction: Involves more than one organ system and/or causes respiratory compromise. <p>*Waveform EtCO₂, See B - 2, Airway Management or B - 11, Asthma / COPD</p> <ul style="list-style-type: none"> - Normal: No change to waveform. - Mild: No change or slightly decreased EtCO₂ due to mild hyperventilation. - Moderate: May begin to see plateau increase (shark tooth) due to bronchoconstriction, EtCO₂ may begin to rise. - Severe: EtCO₂ is elevated due to decreased ventilation; depending on patient severity, as presentation improves EtCO₂ may increase significantly as the body/lungs excrete built-up CO₂ followed by a steady decline.



Behavioral Emergencies



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Psychiatric illness/medications History of SI/HI Substance abuse/OD Diabetes	Anxiety, Agitation, Confusion Combative/Violent Tachycardia, tachypnea, diaphoresis Affect change, hallucinations Bizarre behavior Delusional thoughts, SI/HI Hyperthermia	Seizure/Postictal, Head Injury DKA or Infection Toxins, Withdrawal syndrome Excited Delirium Hypertensive Emergency Electrolyte Disturbances Bipolar, Schizophrenia

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• Call for additional resources; stage until scene is safe• B - 2, Airway Management / Oxygen• Physical Restraint If Indicated-<ul style="list-style-type: none">- If LE is on scene, ask to provide initial patient restraint- When/if able, place patient on the cot (with head elevated if able) and secure wrists with soft restraints ONLY- If needed, use a LSB to provide increased patient restraint and elevate the head***Never allow a restrained patient to be kept prone or face down at any time***- Utilize Restraint Checklist (below) and document physical restraints q 5 min• Cooling measures as needed (temp > 104°F); see B - 22, Hyperthermia• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• See B - 24, Overdose / Toxic Ingestion
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension• Combative patients (choose ONE of the following medications/routes):<ul style="list-style-type: none">- Ketamine 4mg/kg IM x 1-OR-- Midazolam 10mg IM/IN x 1 -OR- 5mg IV/IO x 1- If ≥ 65 yrs.: Midazolam 5mg IM/IN x 1 -OR- 2.5mg IV/IO x 1• Cardiac monitoring & capnography is required for all sedated patients• Be prepared to manage airway and ventilate patient as needed

Ketamine IM (500mg/10mL - 50mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
4mg/kg	200mg	240mg	280mg	320mg	360mg	400mg	440mg	480mg
mL	4mL	4.8mL	5.6mL	6.4mL	7.2mL	8mL	8.8mL	9.6mL

Ketamine IM (500mg/5mL - 100mg/mL)								
Dose / kg	50kg	60kg	70kg	80kg	90kg	100kg	110kg	120kg
4mg/kg	200mg	240mg	280mg	320mg	360mg	400mg	440mg	480mg
mL	2mL	2.4mL	2.8mL	3.2mL	3.6mL	4mL	4.4mL	4.8mL

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Additional Considerations

****Mental Status and Physical and/or Chemical restraints will be assessed every 5 mins (at a minimum)****

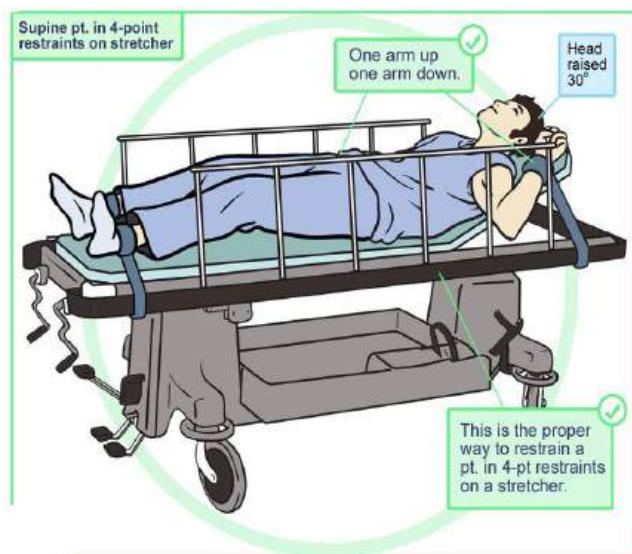
- Contact OLMC at any time, especially when the patient's level of agitation may place all parties at risk.
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, domestic violence or child abuse, etc.).
- Do not transport any restrained patient in a position that could impact the patient's respiratory/circulatory status.

Restraint Checklist (after all other calming attempts have failed or if patient is chemically sedated):

- ☐ Adequate personnel to effectively restrain the patient (consider SFS / MP and/or F&ES personnel)
- ☐ Place patient in supine position; restrain w/1 arm above head and 1 arm near side (unless contraindicated)
- ☐ Raise the head of the stretcher 15 - 30°
- ☐ If patient is spitting, consider placing face/surgical mask (or NRB) over patient's face
- ☐ SFS/MP must be immediately available if patient is handcuffed; see **A - 5, Combative Patients & Law Enforcement Restraint**
- ☐ EMS personnel remain in constant attendance
- ☐ NRP administered chemical sedation (if required for pt./crew safety or if physical restraints are inadequate)
- ☐ Continuous SpO2, EtCO2, Cardiac Monitor
- ☐ Obtain q 5 minute vital signs (to include temperature)
- ☐ Verify extremity neurovascular status (CSMs) q 5 min
- ☐ Adequate personnel for transport
- ☐ Excited Delirium considered

Documentation:

- ☐ De-escalation attempts made prior to restraint
- ☐ Time of restraint
- ☐ Medication & dose of chemical sedation **-or-** type of physical restraint
- ☐ Neurovascular status evaluation q 5 min (pulse, motor, sensation)



<https://emcrit.org/emcrit/human-bondage-chemical-takedown/>



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE	Rash, skin break, wound	Animal bite
Type of bite/sting	Hypotension or Shock	Human bite
Time/location of bite/sting	Allergic Reaction, hives, itching	Snake bite (poisonous)
Known allergy/anaphylaxis	Shortness of breath, wheezing	Spider bite (poisonous)
Immunocompromised Patient	Blood oozing from the bite wound	Insect sting/bite (bee, wasp, ant, tick)
Tetanus and Rabies Risk	Evidence of infection	Infection risk or cellulitis
Domestic vs Wild	Pain, soft tissue swelling, redness	Tetanus risk
Time, location, size of bite/sting	Snake Bite: Numbness/Paresthesia's	Rabies risk
Previous reaction to bite/sting		

Contact Poison Control at 1-800-222-1222 (knowledgeable in animal bites/stings) as needed

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S L 1	S L 2	S L 3	S L 4	S L 5	<ul style="list-style-type: none"> • B – 1 / E - 1, General Patient Care / OLMC as needed • B – 2 / E - 2, Airway Management / Oxygen • Call for additional resources if needed <ul style="list-style-type: none"> - Contact Animal Control / SFS/MP for on-installation bites IAW local protocol • See B – 17 / E - 11, Anaphylaxis / Allergic Reaction if needed • Identify the source of the bite or envenomation, if able • Provide general wound care procedures/irrigation as needed • Immobilize the injury/site; remove any constricting clothing, bands, and jewelry • Any Extremity Bite/Envenomation: Assess distal pulse, motor, sensory function q 5 min • Spider / Scorpion Bite or Bee / Wasp Sting: <ul style="list-style-type: none"> - Remove stinger if present • Snake Bite: <ul style="list-style-type: none"> - Outline margin of swelling/redness and indicate time - DO NOT apply ice • Mammal Bite: see C – 1 / F - 1, Trauma, General if indicated • Jellyfish, Sea Anemone, Man-O-War: <ul style="list-style-type: none"> - Lift tentacles away (do not rub or brush off) - Wash area with sea water or vinegar for ≥ 30 seconds DO NOT use fresh water or ice • Star Fish, Sea Urchin, Corals, Stingray, Lion Fish: <ul style="list-style-type: none"> - Splint barbs in place (do not remove) • Check BGL if altered LOC or hx of diabetes, see B – 20 / E - 14, Diabetic Emergencies
					<ul style="list-style-type: none"> • Vascular Access - Administer fluids per B – 29 / E - 18, Shock / Hypotension • Pain Management per B – 4 / E - 4, Pain Management
					<p>Adults:</p> <ul style="list-style-type: none"> • Spider / Scorpion Bite: If severe muscle spasms present & SBP > 100mmHg: <ul style="list-style-type: none"> - Midazolam 2.5mg IN/IM/IV/IO over 2 - 3 min, may repeat x 1 in 5 PRN; max dose 5mg

<p>V5</p> <p>For use After</p> <p>01 October 2025</p>	<p>Adult Medical Protocols</p> <p>B - 19</p>	<p>//Signed//</p> <p>Lt Col Christopher W. Hewitt</p> <p>LTC Nicholas M. Studer</p>
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Pediatrics:

- **Spider / Scorpion Bite:** If severe muscle spasms present & SBP > age specific hypotension:
 - **Midazolam 0.1mg/kg IV/IO** x1 (max single dose 5mg)
 - OR-
 - **Midazolam 0.2mg/kg IM/IN** x1 (max single dose 10mg)

Midazolam (0.5mg/mL) – 0.1mg/kg IV/IO

Using 10mL NS flush, waste 1mL and draw up 5mg/mL Midazolam; Yields 0.5mg/mL

0.1mg/kg	0.4mg	0.75mg	0.85mg	1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
mL	0.8mL	1.3mL	1.7mL	2mL	2.6mL	3.4mL	4.2mL	5.4mL	6.6mL

Midazolam (5mg/1mL) - 0.2mg/kg IN/IM

0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg
mL	0.16mL	0.26mL	0.34mL	0.42mL	0.52mL	0.66mL	0.84mL	1.1mL	1.3mL

Dilute dose as needed in 1mL NS to facilitate administration

Additional Considerations

- Do not put responders in danger attempting to capture an animal or insect for identification.
- Fever/Sepsis; see **B – 27 / E - 16, Sepsis & Septic Shock**
Evidence of infection include: Swelling, redness, drainage, fever, red streaks proximal to wound.

**DO NOT PLACE A TOURNIQUET FOR ANY SUSPECTED BITE OR ENVENOMATION:
TOURNIQUET PLACEMENT MAY WORSEN LOCAL TISSUE DAMAGE**

• **Spider:**

- Black Widow (black with red hourglass belly) - Tend to be minimally painful initially; patient may experience the development of muscular pain and severe abdominal pain a few hours after the bite.
- Brown Recluse (brown with fiddle shape on back) - Tend to be painless to minimally painful; tissue necrosis occurs a few days after the bite. A blister may form over hours – which later can turn into tissue necrosis. Abnormal vital signs in association with a brown recluse bite may symbolize systemic toxicity (loxoscelism).

• **Snake:** Identify common snake species in your local area and how to identify common signs and symptoms; it is NOT

necessary to transport the snake to the ED. Amount of envenomation from snake bites can be variable – assume all are lethal.

- **Pressure Immobilization: Only for neurotoxic species** with little local tissue damage (Krait/Sea snake/ Cobra/ Mamba/Coral): Avoid excessive movement of the affected limb/ensure bandage is firm / has similar tightness as for wrapping an ankle. DO NOT remove bandage until reaching medical treatment facility

• **Scorpion:** Review country environmental concerns before deployment or visitation.• **Dog/Cat/Carnivore:** All have risk of Rabies exposure; obtain rabies vaccination hx if able; cat bites infect rapidly due to bacteria (*Pasteurella multocida*). All should be considered rabid outside the U.S. until proven otherwise. This excludes rodents, which do not carry rabies.• **Human:** High infection rate due to normal mouth bacteria.• **Sea Anemone, Jelly Fish, Man-O-War:** applying fresh water or ice will result in increased pain, rubbing the site can cause residual nematocysts on the skin to fire even after the tentacle has been removed; Sx usually described as “stinging” that increases in intensity over time; area may be red/itchy, vesicles may form, the patient may experience increased oral secretions, nausea/vomiting, GI cramping, muscle spasms and in extreme cases may**Adult Medical Protocols**

develop respiratory and cardiovascular collapse.

- **Stingrays:** Usually release multiple barbs into the patient, venom is released when barb is broken; Sx described as immediate pain worsening over an hr.; patient may experience N/V, muscle spasms, increase secretions, hypotension, seizures and in extreme cases respiratory and cardiovascular collapse; irrigate wound with saline.



Diabetic Emergencies



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medications (Oral vs. Insulin) Presence of an Insulin Pump Dose alterations Missed doses Last meal Recent illness	Altered Mental Status, Confusion Combative Seizure Polyuria/polydipsia, dehydration Kussmaul Respirations (rapid rate) Nausea/Vomiting Diaphoresis, Pallor Tachypnea	Stroke / CNS Injury / Epilepsy ACS/STEMI Hypoxia / Head Trauma Overdose or toxic ingestion Infection / Sepsis Acidosis/Alkalosis/Electrolyte issues Hypo/Hyperthermia CO or Cyanide Poisoning

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• BGL - If < 60mg/dL and pt. can swallow (if no BGL capabilities, patient must have Hx of diabetes):<ul style="list-style-type: none">- *Oral Glucose 15g (1 tube) PO, repeat x 1 in 10 min PRN to BGL > 80mg/dL; max total dose 30g (2 tubes)
L	L	L	L	L	
1	2	3	4	5	<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension• BGL < 60mg/dL and unable to swallow or Altered Mental Status:<ul style="list-style-type: none">- *Dextrose 10% (D10W pre-mixed bag), 250mL IV/IO over 2 min, repeat x 1 PRN in 3 - 5 min to BGL > 80mg/dL or normal mentation; max dose 500mL• BGL < 60mg/dL, unable to swallow/Altered Mental Status and unable to obtain IV/IO:<ul style="list-style-type: none">- Glucagon 1 - 2mg IM repeat x 1 in 15 min PRN to BGL > 80mg/dL or normal mentation; max dose 4mg (Anticipate emesis following administration, see B - 3, Nausea / Vomiting)• BGL > 300mg/dL:<ul style="list-style-type: none">- LR 1000mL repeat x 1 PRN to max 2000mL; stop if pulmonary edema develops

Additional Considerations	
<ul style="list-style-type: none">• SL1 – SL5 Personnel:<ul style="list-style-type: none">- If patient has insulin pump and is hypoglycemic, remove the device from the SQ port or remove the SQ port entirely (DO NOT attempt to turn off device, an insulin bolus may be accidentally delivered).• Patients who take oral diabetic medications are at risk for additional hypoglycemic events due to the continuous slow absorption of the medication; patients should be transported for evaluation/monitoring.• *Oral Glucose - If not available, consider using fruit juice, cake icing, maple syrup, or other simple sugar.• *Dextrose 10%W (250mL) - 10 or 15 gtt tubing should be used.<ul style="list-style-type: none">- Dextrose 10% preparation if premixed bag is unavailable: Add 1 amp of Dextrose 50% 25g to 250mL NS• *Glucagon - If used, administer carbohydrates ASAP after the patient regains mentation/ability to swallow.• Vascular Access - Diabetics have reduced wound healing capability and increased risk of infection - be cautious with IV placement and only use IOs in emergent cases.• Patient Refusal/Treat and Release: See, A - 4, Patient Refusal / AMA.• If a patient has seizures and is hypoglycemic, provide dextrose prior to benzodiazepines; see B - 28, Seizures, Non Pregnant.	

V5 For use After 01 October 2025	Adult Medical Protocols B - 20	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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Hypertension (Non-Pregnant)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx HTN, CVA, intracranial bleed Medications (blood thinners, nitroglycerin, calcium channel blockers, beta blockers, erectile dysfunction therapies) Pregnancy (see D - 2, Seizures (Pregnancy))	HTN (BP > 140 / 90mmHg) HTN Emergencies: SBP > 220mmHg OR DBP > 120mmHg AND Signs of End Organ Damage: Neurological – AMS, Stroke-like Sx, severe headache Cardiovascular – Chest pain, MI, signs of CHF/ pulmonary edema, AAA Other – Decreased urine output, vision loss	CVA Intracranial Bleed Head Injury (see C - 6, Head Trauma) MI, CHF Aortic Dissection or Aneurysm Pre-Eclampsia / Eclampsia Toxins (Stimulants)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• B - 2, Airway Management / Oxygen• Asymptomatic HTN - No intervention is required; perform supportive care/prepare for transport• If applicable, see B - 3, Nausea / Vomiting
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit to receiving facility if able• Transport - With head of gurney raised to 30 degrees (if presentation allows)<ul style="list-style-type: none">- Suspected HTN Emergency: Notify receiving facility of concern
					<ul style="list-style-type: none">• Vascular Access

Additional Considerations
<ul style="list-style-type: none">• HTN is most often a sign of another clinical process, not the patient's primary problem. HTN Emergency is typically diagnosed after all other pathologies have been ruled out.• Aggressive treatment of HTN increases mortality; most patients require only supportive care.• Epistaxis is not associated with HTN: it should not be considered a sign of end-organ damage in the setting of HTN.

V5 For use After 01 October 2025	Adult Medical Protocols B - 21	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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Hyperthermia / Heat Injuries

(Adult / Peds)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Age Exposure increased temperature and/or humidity Time and duration of exposure Extreme exertion Medications (anticholinergics, anti-seizure medications, etc.) Toxic Ingestion/Substance Abuse	Mild Heat Related Illnesses: heat rash, heat edema, heat cramps, heat syncope, heat exhaustion (weakness, headache, dizziness, nausea, vomiting, abdominal pain) Severe Heat Related Illness: heat stroke (AMS, seizure, hyperthermia, dry skin or profuse sweating)	CVA, Encephalopathy Meningitis/Sepsis Head Trauma Toxic Ingestion Substance Abuse Hypoglycemia

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E – 1, General Patient Care / OLMC as needed• B – 2 / E – 2, Airway Management / Oxygen• Move patient to a cool environment• Obtain oral / tympanic temperature (<u>before</u> PO fluids) and monitor every 3 min• Encourage PO fluids if the patient will tolerate• Heat Exhaustion or Heat Stroke:<ul style="list-style-type: none">- Initiate active cooling measures via removal of clothing, ice sheets, collapsible/portable immersion system (e.g. Polar Life Pod® [or similar], water mist, fan, air conditioning, ice packs to neck, axilla and groin, etc.)- STOP active cooling when temperature reaches 102° F• BGL - If < 60mg/dL or > 300mg/dL, see B – 20 / E – 14, Diabetic Emergencies• If hyperthermia from suspected overdose, see B – 24 / E – 15, Overdose / Toxic Ingestion
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• If performing active cooling measures, perform initial core (rectal) measurement and monitor every 3 min• Cardiac Monitoring• 12-Lead EKG - Obtain as clinically indicated• EtCO2 (Capnometry) - Will be monitored at all times if lethargic, altered LOC, and/or hypotensive
					<ul style="list-style-type: none">• Vascular Access - If equipped with a temperature regulated cooler administer *cold fluids per B – 29 / E – 18, Shock / Hypotension• Temperature Monitoring - If able, utilize core (rectal or indwelling rectal) thermometer<ul style="list-style-type: none">- Monitor core temperature every 3 min
					<ul style="list-style-type: none">• EtCO2 (Capnography) – Monitor at all times if lethargic, altered LOC, and/or hypotensive
					Adults: <ul style="list-style-type: none">• If shivering occurs during cooling measures consider administering ONE of the following:<ul style="list-style-type: none">- Midazolam 2.5mg IV/IO x 1 over 2 - 3 min -OR-- Midazolam 5mg IM/IN x 1

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//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

Pediatrics:

- If shivering occurs during cooling measures consider administering **ONE** of the following:
-OR-
- **Midazolam 0.1mg/kg IV/IO** x1 (max single dose 5mg)
- **Midazolam 0.2mg/kg IM/IN** x1 (max single dose 10mg)

Midazolam (0.5mg/mL) – 0.1mg/kg IV/IO

Using 10mL NS flush, waste 1mL and draw up 5mg/mL Midazolam; Yields 0.5mg/mL

0.1mg/kg	0.4mg	0.75mg	0.85mg	1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
mL	0.8mL	1.3mL	1.7mL	2mL	2.6mL	3.4mL	4.2mL	5.4mL	6.6mL

Midazolam (5mg/1mL) - 0.2mg/kg IN/IM

0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg
mL	0.16mL	0.26mL	0.34mL	0.42mL	0.52mL	0.66mL	0.84mL	1.1mL	1.3mL

Dilute dose as needed in 1mL NS to facilitate administration

Additional Considerations

- *Ice Sheets (Sheets or blankets soaked in ice water).
- *Cold fluids: IV fluid (LR) stored in a commercial cooler at 4°C
- **Heat Cramps:** Consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion:** Consists of dehydration, salt deletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. VS usually consist of tachycardia, elevated temperature, possible hypotension.
- **Heat Stroke: Altered mental status,** elevated body temperature (commonly > 104° F), dehydration. Children and the elderly tend to exhibit dry, hot skin.
- **Exertional Heat Stroke:** Common in young athletes following a period of extreme exertion.
 - Rapid cooling takes precedence over transport as early cooling decreases morbidity and mortality; if available, immerse in an ice (preferred) or cool water bath or portable/collapsible immersion system for 5 - 10 min; monitor rectal temperature and remove the patient when core temperature reaches 102° F.
 - Continuous misting the body with cool water continuously is preferred if a cold tub is not accessible. Ice sheets may be more likely to be available.
- **Servicemembers only:** For mild heat related illnesses ONLY, Servicemembers may be considered for release to their Command after evaluation and treatment by EMS. Servicemembers must have a core temperature of less than 102° F, no prior history of heat injury, and the patient and Command must agree to follow TB MED 507 guidance. The pt must sign as a Refusal of Care.

For additional information, see TB MED 507 "Heat Stress Control and Heat Casualty Management."



Hypothermia / Cold Injuries

(Adult / Peds)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Exposure Temperature / Wind Chill Length of Exposure Drowning/submersion victim Toxic ingestion/Substance abuse Hx Hypothyroidism	AMS or Coma Stroke-like symptoms (slurred speech, gait ataxia) Arrhythmias Bradycardia and/or Hypotension Extremity pain, sensory abnormalities White / Waxy skin	CNS (stroke, head injury, spinal cord injury) Sepsis Hypothyroidism Hypoglycemia

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E – 1, General Patient Care / OLMC as needed• Suspected moderate to severe hypothermia: Handle patient gently, maintain in horizontal position• B – 2 / E – 2, Airway Management / Oxygen• Remove jewelry from affected extremity(ies)• Cardiac Arrest - See Additional Considerations and B - 5, Cardiac Arrest• Passive Warming - (Core temperature > 90°F (32°C)):<ul style="list-style-type: none">- Remove from cold environment and cut off wet clothing- Provide warm or reflective blankets / cover head of patient- Turn ambulance heater to “High”• Active Warming - (Core temperature < 90°F (32°C)):<ul style="list-style-type: none">- Place heat packs in the armpit / groin area. Do not place directly against the patient's skin- Utilize HPMK with heat packs- Utilize Blood / Fluid Warmer for all IV/IO fluids.• Cold Injuries - See Additional Considerations• BGL - If < 60mg/dL, see B – 20 / E – 14, Diabetic Emergencies (Hypoglycemia may failure to rewarm)
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• If performing active warming measures, perform initial core (rectal) measurement and monitor every 3 min• Cardiac Monitoring & 12-Lead EKG – Obtain and transmit if able• Pain Control; see B – 4 / E – 4, Pain Management
					<ul style="list-style-type: none">• Vascular Access - Do not delay transport for access; see B – 29 / E – 18, Shock / Hypotension as needed<ul style="list-style-type: none">- If temperature is < 90°F (32°C), utilize Blood/Fluid warmer for all fluids (if able)• Temperature Monitoring - If able, utilize core (rectal or indwelling rectal) thermometer<ul style="list-style-type: none">- Monitor core temperature every 3 min• Signs of Sepsis; see B – 27 / E – 16, Sepsis & Septic Shock

Additional Considerations
<ul style="list-style-type: none">• Oxygen should be warmed and humidified if possible.• Intubation can result in V-Fib. OPA/NPA or SGA should be used as primary airway management.• Cold Injuries/Frostbite:<ul style="list-style-type: none">- Perform general wound care, do not rub/massage area.- Splint frozen/cold extremity in the anatomical position to prevent manipulation.

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- **Frostbite:** Avoid rewarming of extremities until definitive care. If rewarming is feasible, use circulating warm water (98.6 - 102°F or 37 - 39°C) to rewarm the affected body part. Place clean, dry gauze between toes/fingers and wrap affected extremities loosely w/Kerlix or similar material.

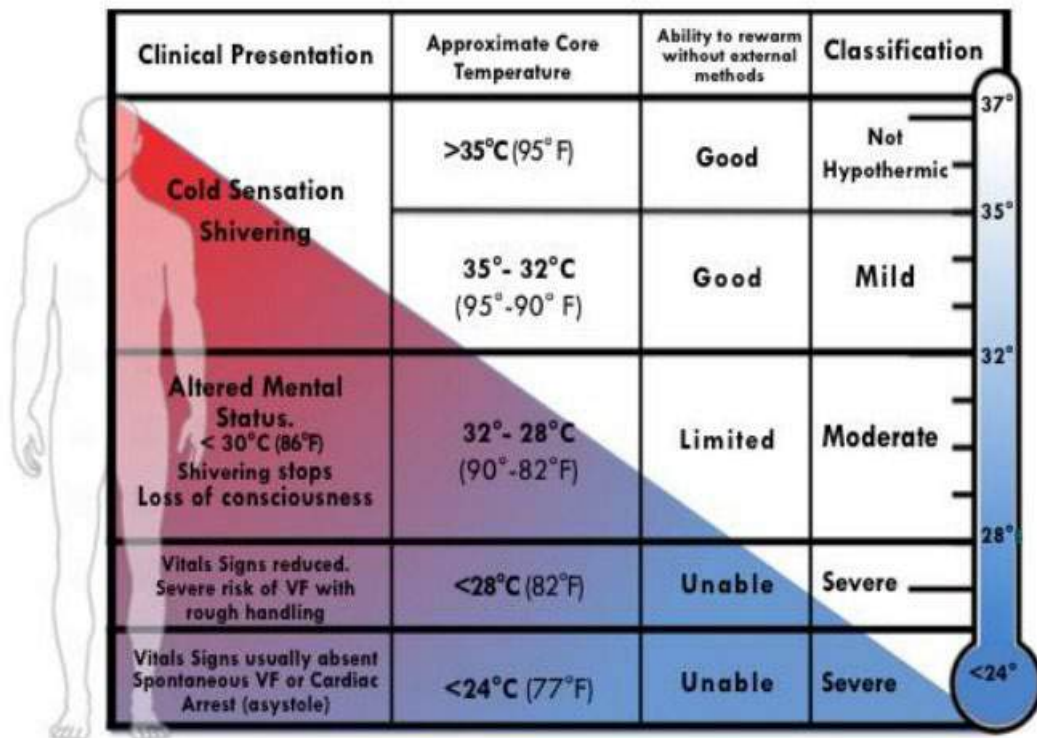
- **CPR/Cardiac Arrest:**

- Hypothermia may cause bradycardia; pulse should be assessed for 60 seconds if patient is not on a monitor.
- Gently handle patients with a core temp < 90°F to prevent sudden onset V-Fib.
- Patients with severe hypothermia and arrest may benefit from resuscitation even after a prolonged downtime; patients should not be considered deceased until aggressive rewarming has been attempted.
- **DO NOT administer IV cardiac medications if the patient's core temp is < 86°F**; increase medication interval if patient's temperature is between 87 - 95°F (e.g. epinephrine q 5 - 10 mins).
- Core temp < 86°F: Limit defibrillation to 3 attempts; subsequent defibrillations, even if indicated by patient's arrhythmia/AED do not improve mortality at these temperatures.
- **Contact OLMC:**
 - If core temp < 86°F to determine if additional shocks are warranted.
 - To determine if/when ACLS medications should be provided.

- **Contact OLMC to discuss Non-Initiation/Field Termination if one of the following conditions is present**

- Obvious fatal injuries (decapitation, etc.).
- The patient exhibits signs of being frozen (such as ice formation in the airway or chest wall rigidity that inhibits compressions).
- Danger exists to rescuers or rescuer exhaustion.

****Fixed and dilated pupils by themselves are NOT a contraindication to starting CPR****



Clinical Presentation	Approximate Core Temperature	Ability to rewarm without external methods	Classification
Cold Sensation Shivering	>35°C (95°F)	Good	Not Hypothermic
	35° - 32°C (95° - 90°F)	Good	Mild
Altered Mental Status. < 30°C (86°F) Shivering stops Loss of consciousness	32° - 28°C (90° - 82°F)	Limited	Moderate
Vitals Signs reduced. Severe risk of VF with rough handling	<28°C (82°F)	Unable	Severe
Vitals Signs usually absent Spontaneous VF or Cardiac Arrest (asystole)	<24°C (77°F)	Unable	Severe

<http://dhss.alaska.gov/dph/emergency/documents/ems/documents/alaska%20dhss%20ems%20cold%20injuries%20guidelines%20june%202014.pdf>



Overdose / Toxic Ingestion



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Substance(s) (alcohol, illicit drugs, prescription drugs (TCAs, Beta-Blockers, Ca-Channel Blockers, Cholinergics, Anticholinergics, Depressants, etc.), over-the-counter medications) Quantity and route taken Time of ingestion Reason (suicide attempt, accidental, criminal) Hx of mental illness <u>Contact Poison Control</u> <u>1-800-222-1222</u>	AMS, Confusion Combative, Seizures Hypo/Hypertension Brady-/Tachypnea, Brady-/Tachycardia Hypoxia Dysrhythmias Environmental clues (bottles, needles, etc.) Medical alert necklace/bracelet *SLUDGE & DUMBELS	*AEIOU-TIPS Alcohol or Drug use Stroke / CNS Injury Hypoxia / Head Trauma Infection / Sepsis Hypo/Hyperthermia Acidosis/Alkalosis/ Electrolyte issues Hypoglycemia / Serotonin Syndrome

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • *Contact local Poison Control Center (1-800-222-1222) • Patients with SI/HI: Search patient prior to transport to ensure no weapons/medications concealed • B - 2, Airway Management / Oxygen • Suspected Opioid Overdose/AMS or respiratory rate < 8: <ul style="list-style-type: none"> - Naloxone Nasal Spray 4mg IN; repeat q 2 - 3 min to respiratory rate > 8 • Ensure full body sweep to locate analgesic patches (armpits, inner thighs, etc.) • If patient has seizures, see B - 28, Seizures, Non-Pregnant • If patient becomes agitated/violent, see B - 18, Behavioral Emergencies • *Suspected Organophosphate/Nerve agent Exposure, see G - 3a, Organophosphate Exposure • If patient is hyperthermic, see B - 22, Hyperthermia • BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none"> • EtCO2 (Capnometry) - If lethargic, altered LOC and/or hypotensive • Cardiac Monitoring & 12-Lead EKG - If no improvement in condition or if clinically indicated • Transport as soon as possible; if patient is suspected of taking Fentanyl or Carfentanyl transport ASAP and be prepared to aggressively manage Airway/Ventilate • Suspected Opioid Overdose/AMS or respiratory rate < 8: <ul style="list-style-type: none"> - Naloxone Autoinjector 2mg IM repeat q 2 - 3 min to respiratory rate > 8 • *If advised by Poison Control Center for toxic ingestion/oral overdose for alert patient with intact airway: Activated Charcoal 50g PO.
					<ul style="list-style-type: none"> • Vascular Access - IV/IO x 2 (Consider dual lumen peripheral IV); fluids per B - 29, Shock / Hypotension • Suspected Opioid Overdose/AMS or respiratory rate < 8: <ul style="list-style-type: none"> - Naloxone 0.4mg IV/IO; repeat q 2 - 3 min to respiratory rate > 8
					<ul style="list-style-type: none"> • EtCO2 (Capnography) - If lethargic, altered LOC and/or hypotensive • Suspected Opioid Overdose: <ul style="list-style-type: none"> - Naloxone 0.4mg in 10mL NS (40mcg/1mL), push 40mcg IV/IO/IN increments PRN q 2 - 3 min to RR > 8; ventilate with BVM as needed (EtCO2 may be initially elevated) • Suspected Dystonic Reaction: <ul style="list-style-type: none"> - Diphenhydramine 25mg IV x 1 • Suspected Tricyclic Antidepressant Overdose (QRS > 0.12 seconds): <ul style="list-style-type: none"> - Sodium Bicarbonate 8.4% 100mEq IV/IO over 2 - 5 min; may repeat x 1 in 10 min PRN; repeat EKG after administration

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- See **B - 9, Tachycardia, Wide Complex**
- **Suspected Beta Blocker -OR- Calcium Channel Blocker Overdose (bradycardic):**
 - **Calcium Gluconate 2g IV/IO** over 2 – 5 min; may repeat x1 in 10 min; repeat EKG after administration
 - **-AND-**
 - **Glucagon 3mg IV/IO**, repeat at 2mg in 5 - 10 min PRN
 - See **B - 7, Bradycardia**
- **Cocaine/Amphetamine OD or Anticholinergic Exposure with Agitation:**
 - **Midazolam 2.5mg - 5mg IM/IN/IV/IO x 1**, see **B - 18, Behavioral Emergencies**

Additional Considerations

- ***AEIOU-TIPS:** Acidosis/Alkalosis/Alcohol, Epilepsy/Endocrine/Electrolytes, Infection, Overdose/Organophosphates, Uremia, Trauma/Tumor, Insulin/Intracranial Pressure, Psychosis/Poisoning, Stroke/Shock/Seizure
- ***Early Poison Control Center** contact is required to ensure appropriate treatment and follow-up of the patient in both the prehospital setting and if transported to a hospital. Poison Control personnel will follow up on the patient in either situation. Moreover, Poison Control data is used to detect trends in overdose/poisoning and conduct research.
- **Dystonic Reactions:** Characterized by spasmodic or sustained contractions of the neck, face, thorax, pelvis, extremities or larynx. Patients will present with a variety of symptoms including fixed eye deviation, involuntary movements, extremity cramping, tongue protrusion, difficulty speaking/swallowing and clenched jaw. These reactions are usually precipitated by the ingestion of the following drug classes: antipsychotics, antiemetic's, antimalarial's, antidepressants and anticonvulsants.
- ***Suspected Organophosphate Exposure (Cholinergics / Insecticides)**, see **G - 3a, Organophosphate Exposure**
 - ***SLUDGE** (Salivation, Lacrimation, Urination, Defecation, GI Upset, Emesis)
 - ***DUMBBELS** (Diarrhea, Urination, Myosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation)
- **Tricyclic OD:** Seizures, dysrhythmias, hypotension, AMS/coma; rapid progression from alert to death
- **CNS Depressants:** Bradycardia, bradypnea, hypotension
- **Anticholinergic:** AMS, tachycardia, miosis, hyperthermia
(**Hot** as a hare, **Red** as a beet, **Dry** as a bone, **Blind** as a bat and **Mad** as a hatter)
- **Cardiac Meds:** Dysrhythmias, AMS, hypotension
- *** If the patient is altered, refuses to drink, or transport time is less than 15 minutes then it is acceptable to communicate the PCC recommendation upon handoff to the Emergency Physician. For any other issues or concerns with use, contact OLMC for further guidance.**
- ***Glucagon** – Anticipate patient nausea/vomiting w/high doses; see **B - 3, Nausea / Vomiting**
- **If possible, bring the item or picture of what the patient was exposed to (unless suspected to be hazardous to responders, contact appropriate specialist team.)**

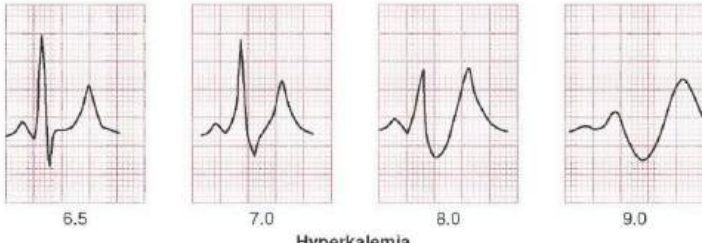


Renal Failure / Dialysis



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Peritoneal (PD) and/or hemodialysis Catheter/Shunt/Graft Dialysis schedule Hx of Graft/Shunt infection or revision Current vs normal urine output	Altered Mental Status, Confusion Chest Pain / SOB Dizziness/weakness Nausea/Vomiting/Fever Arrhythmia	CHF / AMI / COPD CVA Pericarditis /Pericardial Effusion Cardiac Tamponade Sepsis

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • B - 2, Airway Management / Oxygen • BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies
L	L	L	L	L	<ul style="list-style-type: none"> • EtCO2 (Capnometry) - If lethargic, altered LOC and/or hypotensive • Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able
1	2	3	4	5	<ul style="list-style-type: none"> • Vascular Access - Administer fluids per B - 29, Shock / Hypotension • If patient is past scheduled dialysis w/AMS, suspect hyperkalemia: <ul style="list-style-type: none"> - Albuterol 5mg Nebulized, repeat x 3 PRN to max dose of 15mg
					<ul style="list-style-type: none"> • EtCO2 (Capnography) - If lethargic, altered LOC and/or hypotension • If evidence of Hyperkalemia with EKG changes administer ALL of the following: <ul style="list-style-type: none"> - Continue Albuterol Nebs until below IV/IO medications are given - Calcium Gluconate 2g slow IV/IO push over 2 - 5 min, may repeat x 1 in 10 min if patient condition remains unchanged; max dose 4g - Sodium Bicarbonate 8.4% 100mEq IV/IO over 2 - 5 min, may repeat x 1 in 10 min if no change • If febrile, see B - 27, Sepsis / Septic Shock

Additional Considerations	
<ul style="list-style-type: none"> • ALWAYS consider hyperkalemia in renal/dialysis patients • Do not start an IV or take a blood pressure in an extremity with shunt/fistula. • Access shunt ONLY in pulseless or peri-arrest patients if IV/IO access is not obtainable (AP ONLY) • If possible, transport patient to a facility capable of performing dialysis. • If the patient undergoes peritoneal dialysis and complains of abdominal or back pain and fever, bring the PD bag with the patient for lab analysis. • Control any fistula bleeding with direct pressure. Only use a TQ if bleeding is unable to be controlled. 	 <p>Hypokalemia</p>  <p>Hyperkalemia</p>

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Serum potassium	Typical ECG appearance	Possible ECG abnormalities
Mild (5.5-6.5 mEq/L)		Peaked T waves Prolonged PR segment
Moderate (6.5-8.0 mEq/L)		Loss of P wave Prolonged QRS complex ST-segment elevation Ectopic beats and escape rhythms
Severe (>8.0 mEq/L)		Progressive widening of QRS complex Sine wave Ventricular fibrillation Asystole Axis deviations Bundle branch blocks Fascicular blocks

<http://epomedicine.com/emergency-medicine/ecg-changes-hyperkalemia/>

Hypo/Hyperkalemia picture: Lewin J. Hypokalemia. Merck Manual, Apr 2020. <https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypokalemia>



Drowning / Submersion

(Adult / Peds)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Submersion Duration of submersion/immersion Temperature of water Witnessed trauma (diving)	Unresponsive or AMS Decreased or absent VS Vomiting Apnea or coughing, wheezing, rales, rhonchi, stridor	Air Gas Embolism Nitrogen Narcosis Pulmonary barotrauma Cardiac arrest

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E – 1, General Patient Care / OLMC as needed• Call for ALS and/or additional resources• If indicated, see C - 7, Spinal Motion Restriction• B – 2 / E – 2, Airway Management / Oxygen• Suction: PRN; DO NOT waste time suctioning unless water / emesis are visible
L	L	L	L	L	
1	2	3	4	5	
					<div>Adult<ul style="list-style-type: none">• Conscious:<ul style="list-style-type: none">- Oxygen PRN, Maintain SpO2 > 94%- Consider CPAP if indicated and patient tolerates; see B - 2, Airway Management• Conscious with AMS: If able, administer 5 assisted breaths via BVM as tolerated<ul style="list-style-type: none">- If no improvement, begin BVM ventilation, 1 breath q 5 - 6 seconds as tolerated• Unresponsive:<ul style="list-style-type: none">- 5 breaths via BVM (anticipate difficulty; water in airway impedes alveolar expansion)- If no improvement following BVM breaths:<ul style="list-style-type: none">- With a pulse: BVM ventilation, 1 breath q 5 - 6 seconds- Without a pulse: Start CPR, follow B - 5, Cardiac Arrest</div>
					<div>Pediatric:<ul style="list-style-type: none">• Conscious: Oxygen PRN, Maintain SpO2 > 94%• Conscious with AMS: Age-appropriate breaths via BVM as tolerated• Unresponsive:<ul style="list-style-type: none">- 5 breaths via BVM (anticipate difficulty; water in airway impedes alveolar expansion)- If no improvement following BVM breaths:<ul style="list-style-type: none">- With a Pulse (≥ 60 bpm): Rescue breathing, 1 breath every 2 - 3 seconds- Without a Pulse (or < 60 bpm): Start CPR, follow E - 5, Cardiac Arrest</div>
					<ul style="list-style-type: none">• Remove wet clothing; dry/warm patient• If patient is hypothermic treat per B - 23, Hypothermia / Cold Injury• If suspected SCUBA or Diving Injury, see G – 1d, Decompression Illness (Diving)

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				<ul style="list-style-type: none"> • BGL if altered mental status, hx of diabetes, or cardiac arrest; see B – 20 / E – 14, Diabetic Emergencies
				<ul style="list-style-type: none"> • Respiration (Adult and Peds) - Bronchospasm with wheezing, rales, rhonchi: <ul style="list-style-type: none"> - *Albuterol 2.5mg/3mL nebulized, repeat q 10 min PRN, no max dose - *Ipratropium Bromide 0.5mg/2.5mL nebulized, repeat q 10 min PRN; max dose 1.5mg - *CPAP if refractory to Albuterol and Ipratropium, max 10cmH₂O; contact OLMC to increase • Cardiac Monitoring & 12 Lead EKG - If no change in patient condition or if clinically indicated
				<ul style="list-style-type: none"> • Vascular Access - Obtain & treat if hypotension is present, see B – 29 / E – 18, Shock / Hypotension

Additional Considerations				
<ul style="list-style-type: none"> • Regardless of water temperature, resuscitate all patients with known submersion time of < 30 mins; contact OLMC if additional guidance is required. • Due to the potential for subacute respiratory complications that may develop within 6 hours of a submersion injury, all patients experiencing a drowning or submersion injury should be transported for evaluation. Contact OLMC for patient refusals. <p>*CPAP Contraindications: Depressed mental status with inability to maintain airway, hypoventilation requiring ventilatory assistance, upper airway/facial trauma/burns or other abnormalities that would prevent the mask from sealing, open stoma or tracheostomy, severe cardio-respiratory instability, SBP < 100mmHg, and suspected tension pneumothorax.</p> <ul style="list-style-type: none"> • Hypothermia should be suspected in all drowning/submersion patients regardless of water temperature. • Cardiac arrest in drowning victims is most frequently due to hypoxia; airway and ventilation are equally as important as chest compressions in these patients. • *Albuterol/Ipratropium Bromide - May be combined in a nebulizer. An in-line nebulizer is required if patient is being ventilated via BVM/Mask or SGA/ETT/Cric. • If the water temperature is < than 43°F (6°C) and the patient has arrested: <ul style="list-style-type: none"> - Survival is possible for submersion time < 90 mins and resuscitative efforts should be initiated. - Survival is not likely for submersion time > 90 mins and providers may consider non-initiation or termination of resuscitation on-scene, contact OLMC. • If the water temperature is > 43°F (6°C) and the patient has arrested: <ul style="list-style-type: none"> - Survival is possible for submersion time < 30 mins and resuscitative efforts should be initiated. - Survival is not likely for submersion time > 30 mins and providers should contact OLMC for further guidance regarding resuscitation attempts. • Data does not support the initiation of CPR during initial rescue attempts (when removing the body from water). • Active efforts to remove water from the airway, by abdominal thrusts or other means, should be avoided as they delay resuscitative efforts and increase the potential for vomiting/aspiration. 				



Sepsis & Septic Shock



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Fever, known infection Immunosuppression (HIV, chemotherapy) Indwelling medical device Recent surgery/hospital stay Recent antibiotics or steroids Hx of adrenal insufficiency	Sepsis Guidelines Suspected or known infection, EtCO ₂ < 26 AND 2 or more of the following Temperature < 96.0°F OR > 100.4°F HR > 90 AND RR > 20 SBP < 90 mmHg Altered Mental Status (GCS < 15)	Stroke Pulmonary embolism Anaphylaxis Hyperthermia/Heat-related Illness Hypothermia/Cold-related Illness Substance abuse/Toxic Exposure Hypo-/Hyperthyroid Hypoglycemia

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• PPE - Consider increased PPE precautions• B - 2, Airway Management / Oxygen• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• Prevent hypothermia / treat per B - 23, Hypothermia
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Respiratory Distress: See B - 11, Asthma / COPD• EtCO₂ (Capnometry) - Will be monitored at all times• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able• Alert receiving facility if sepsis is suspected (see Sepsis Guidelines above)
					<ul style="list-style-type: none">• Vascular Access - IV/IO x 2 (Consider dual lumen peripheral IV)• Fluid Administration:<ul style="list-style-type: none">- LR 500mL IV/IO Bolus to maintain SBP ≥ 90mmHg or MAP ≥ 65; repeat PRN to max of 2L; utilize Blood/Fluid Warmer• Temperature >100.4°F and NO Acetaminophen in the previous 4 hours:<ul style="list-style-type: none">- Acetaminophen tablets 1000mg PO x 1 (or 650mg suppository PR x 1)
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be monitored at all times• If pulmonary edema develops and/or hypotension remains despite fluid resuscitation:<ul style="list-style-type: none">- May consider: Epinephrine 5 - 20mcg IV/IO q 3 - 5 min PRN ("Push Dose;" 0.5 - 2mL of "Cardiac" Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip.- *Norepinephrine 2 - 12mcg/min IV/IO, titrate to SBP ≥ 90mmHg or MAP ≥ 65; max 12mcg/min• *If no SBP/MAP improvement (refractory to fluids/vasopressors):<ul style="list-style-type: none">- Dexamethasone 10mg IV/IO x 1• If SBP remains less than 60mmHg after above, consider:<ul style="list-style-type: none">- Epinephrine 50 - 100mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration "Cardiac" Epinephrine) in consultation with OLMC
					<ul style="list-style-type: none">• Persistent Hypotension (unresponsive to fluid boluses):<ul style="list-style-type: none">- May consider: Epinephrine 5 - 20mcg IV/IO q 3 - 5 min PRN ("Push Dose;" 0.5 - 2mL of "Cardiac" Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip.• Refractory shock without evidence of hemorrhage: Consider Whole Blood 1 Unit IV/IO in consultation w/ OLMC; if administered, see C - 1, Trauma for Calcium Gluconate dosing• Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

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Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Gtts / Min (cc/hr.)	8	15	22	30	38	46

“Push Dose” Epinephrine

Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL
-OR-

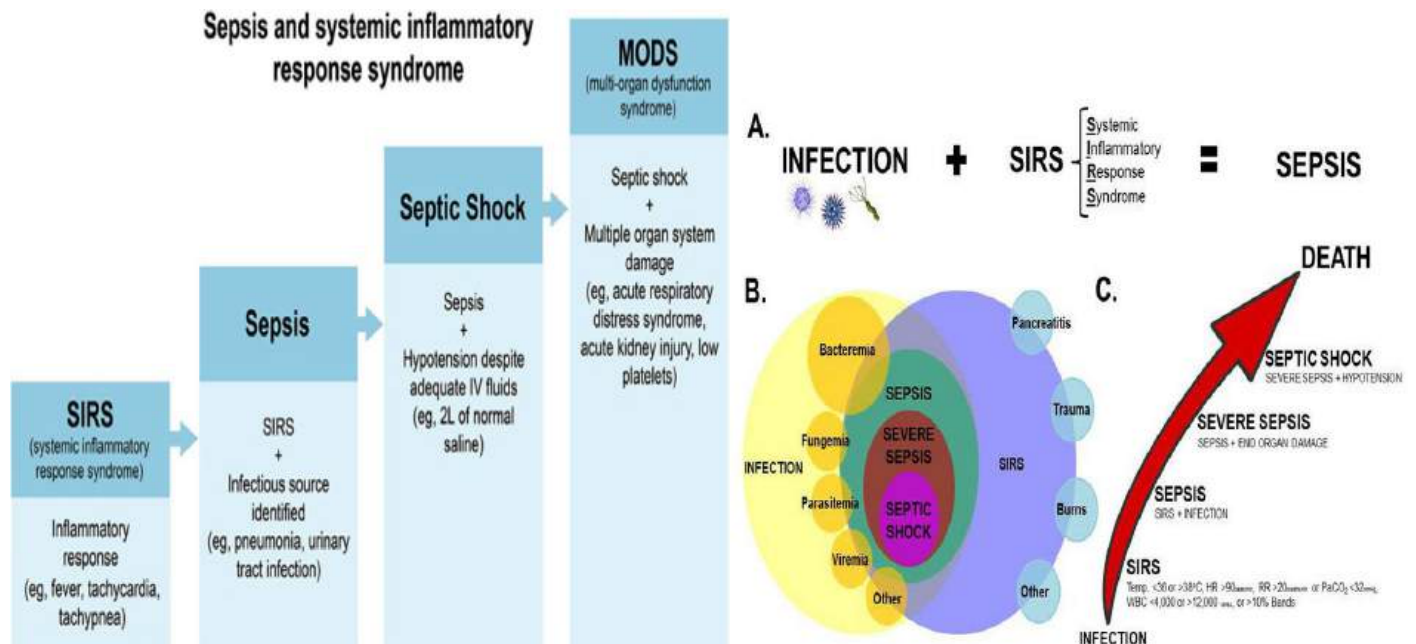
Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations

- * Norepinephrine: **MUST** be administered with an infusion pump, flow controller tubing, or 60gtt tubing. If administered via IV, **MUST** be infused in a peripheral large vein (e.g. AC).
- Aggressive IV fluid therapy is the most important prehospital treatment of sepsis; check for pulmonary edema frequently in patients receiving repeated fluid boluses; septic shock is shock refractory to fluid resuscitation.
- EtCO2 monitoring is vital for suspected Sepsis or Septic Shock patients and is considered the strongest predictor of sepsis in the prehospital environment.
- In a patient with presumed sepsis or septic shock presenting with a cardiac arrhythmia, consult OLMC to discuss therapy.
- Ensure potable water is on ambulance for PO medications.
- * Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.
- *If no improvement in patient condition following fluid resuscitation **AND** norepinephrine infusion, consider

Adrenal Insufficiency:

- **Risk factor:** History of autoimmune disease
- **Etiologies:** Withdrawal of long-term steroid therapy, AML, infection, surgery, sepsis, major trauma
- **Acute Presentation:** Hypotension, dehydration, weakness, abdominal pain, nausea/vomiting, lethargy, AMS
- **Treatment:** Obtain blood glucose – treat as appropriate; administer fluids and vasopressor as above.
- **Note:** Patients with a previous history of adrenal insufficiency may be prescribed “stress dose steroids.” Ask whether the patient has taken these meds, document the date/time and dose taken if applicable.



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Delano, Matthew & Ward, Peter. (2016). The immune system's role in sepsis progression, resolution, and long-term outcome. Immunological Reviews. 274. 330-353. 10.1111/imr.12499



Seizures (Non-Pregnant)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Number and duration of seizure(s) Head Trauma Hx Seizure or Status Epilepticus Medication Compliance/Dosage Anticoagulant Therapy Substance Abuse/Toxic Ingestion Fever LMP, Pregnancy	Altered Mental Status (Postictal) Observed Seizure Incontinence Head Trauma Fever / Rash / Nuchal Rigidity Incontinence	Hypoglycemia Stroke Intracranial Bleed/Head Trauma Hypoxia / Hypoventilation Infection / Sepsis / Fever Substance Abuse / Toxic Ingestion Hyperthermia Eclampsia Alcohol/Benzodiazepine Withdrawal

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• Place in Supine or Recovery Position as tolerated, keep patient warm• B - 2, Airway Management / Oxygen• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies<ul style="list-style-type: none">- Repeat when patient is post-seizure and/or postictal
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored if postictal or actively seizing• Cardiac Monitoring & 12-Lead EKG - Obtain if patient is post-seizure/postictal, transmit if able
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if postictal or actively seizing• Actively Seizing Patient (Choose <u>one</u> of the following routes):<ul style="list-style-type: none">- Midazolam 5mg IV/IO, repeat x 1 in 5 min PRN, max total dose 10mg; call OLMC for additional dosing- Midazolam 10mg IN/IM, x 1 call OLMC for additional dosing• If Eclampsia is suspected, see D - 2, Seizures (Pregnant)

Additional Considerations
<ul style="list-style-type: none">• Attempt to rule-out trauma related cause, drug/alcohol intoxication or withdrawal• Assisted ventilations may be required with higher doses of benzodiazepines, ensure EtCO2 is constantly monitored.• Postictal State:<ul style="list-style-type: none">- Altered state of consciousness lasting 5 - 30 min post seizure- Patients can present w/dizziness, confusion, generalized weakness, fatigue- Todd's Paralysis: brief period of temporary paralysis immediately following a seizure (usually lasts 30 mins - 36 hrs.); may affect speech and vision; when in doubt, activate Stroke Alert and transfer patient• Types of Seizures<ul style="list-style-type: none">- Status Epilepticus: seizure activity lasting > 5 mins without a return to baseline level of consciousness. Aggressively treat seizure activity. Anticipate the need for airway management. Transport ASAP.- Grand Mal (Generalized, Tonic Clonic): Patient is unconscious/unresponsive. Seizure activity manifests as violent muscle contractions, may see incontinence and/or oral trauma.- Petit Mal (Absence Seizure): More common in children; usually lasts < 15 seconds. Patients may suddenly stop talking, appear to stare off into space, have eyelid fluttering or make repetitive chewing motions.- Focal (Partial): Seizure activity is limited to one area of the brain. Patients often remain conscious; may present with abnormal smells (burning rubber), muscle contractions, abnormal body movements, or vision changes.

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For additional information, see below:

Study on Capnography in Seizures: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5391892/>

Management of seizures in the prehospital setting: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5391892/>



Shock & Hypotension (Non-Trauma)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Trauma Bleeding (GI or vaginal) MI, CHF Allergic Reaction Recent Illness (Sepsis) Medications Hx of Adrenal Insufficiency	AMS, confusion, agitation Weakness, Syncope Tachycardia, delayed capillary refill Pale, cool, or clammy skin Diaphoresis Respiratory Distress Black or Tarry stools Emesis (bright red or coffee-ground)	Trauma Infection / Sepsis Cardiac-related illnesses Anaphylaxis Ectopic pregnancy Toxic Ingestion Vomiting / Diarrhea Dehydration

Basic Management Principles
Hypovolemic Shock – Often due to blood loss: consider trauma; see C - 1, Trauma, General or C - 6, Head Injuries ; consider GI bleed, ruptured AAA, ectopic pregnancy
Septic Shock – Shock due to infection; see B - 27, Sepsis and Septic Shock
Anaphylactic Shock – Severe systemic allergic reaction; see B - 17, Anaphylaxis/Allergic Reaction
Neurogenic Shock – Spinal Cord Injury/infection; presents w/ hypotension & bradycardia, C - 1, Trauma, General
Cardiogenic Shock – Common from acute MI/PE/CHF, medications (calcium channel blockers, etc.), and cardiac tamponade, B - 10, Chest Pain or B - 12, CHF / Pulmonary Edema

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> B - 1, General Patient Care / OLMC as needed B - 2, Airway Management / Oxygen BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies Prevent hypothermia / treat per B - 23, Hypothermia / Cold Injuries
L	L	L	L	L	<ul style="list-style-type: none"> EtCO₂ (Capnometry) - Will be monitored at all times Cardiac Monitoring & 12-Lead EKG - Obtain EKG and transmit if able
1	2	3	4	5	<ul style="list-style-type: none"> Vascular Access - Ensure IV/IO x 2 (Consider Twin-Cath) Hypotension (SBP < 90mmHg or MAP < 65mmHg): <ul style="list-style-type: none"> Hypovolemic (non-trauma), Septic, Neurogenic, Anaphylactic Shock: <ul style="list-style-type: none"> LR 500mL IV/IO repeat PRN to max 2000mL titrate to SBP ≥ 90mmHg or MAP ≥ 65 Cardiogenic Shock <ul style="list-style-type: none"> LR 250mL IV/IO repeat PRN to max 1000mL; target titrate to SBP ≥ 90mmHg or MAP ≥ 65
					<ul style="list-style-type: none"> EtCO₂ (Capnography) - Will be monitored at all times Hypovolemic, Septic, Neurogenic, Anaphylactic Shock: <ul style="list-style-type: none"> May consider: Epinephrine 5 - 20mcg IV/IO q3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion. If condition unchanged following 2000mL fluid: *Norepinephrine 2 - 12mcg/min IV/IO titrate to SBP ≥ 90mmHg or MAP ≥ 65 Cardiogenic Shock: <ul style="list-style-type: none"> May consider: Epinephrine 5 - 20mcg IV/IO q3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Norepinephrine infusion. If condition unchanged following 1000mL fluid resuscitation: *Norepinephrine 2 - 12mcg/min IV/IO titrate to SBP ≥ 90mmHg or MAP ≥ 65

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	<ul style="list-style-type: none"> • *If no SBP/MAP improvement (refractory to fluids/pressors): Dexamethasone 10mg IV/IO x 1 • If SBP remains less than 60mmHg after above, consider Epinephrine 50 - 100mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration “Cardiac” Epinephrine) in consultation with OLMC
	<ul style="list-style-type: none"> • Persistent Hypotension (unresponsive to fluid boluses): <ul style="list-style-type: none"> - May consider: Epinephrine 5 - 20mcg IV/IO q 3 min PRN (“Push Dose;” 0.5 - 2mL of “Cardiac” Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip. • Hypovolemic (suspected to be hemorrhagic) shock: <ul style="list-style-type: none"> - 25% Albumin 100mL IV/IO repeat PRN to max 200 mL with LR as above. - Whole Blood 1 Unit IV/IO repeat PRN to max 4 Units, consult OLMC for additional infusion <ul style="list-style-type: none"> - With Blood Administration: Calcium Gluconate 2g IV/IO over 2 - 5 min, repeat x 1 per 4 Units WB transfused; flush line between meds. May give concurrently or after first unit of WB • Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) MUST use 60gtt Tubing, Flow Controller Tubing, or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Drops / Min (mL/hr.)	8	15	22	30	38	46

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations
<ul style="list-style-type: none"> • Mean Arterial Pressure (MAP) is calculated as: $(\text{Systolic} + 2(\text{Diastolic})) / 3$ Example: 120 / 80. $(120 + 2 (80)) / 3$ MAP = 93 Monitor: 120/80 (93) * Norepinephrine: MUST be administered with an infusion pump, flow controller tubing, or 60gtt tubing. • *If no improvement in patient condition following fluid resuscitation <u>AND</u> norepinephrine infusion, consider Adrenal Insufficiency: <ul style="list-style-type: none"> - Risk factor: History of autoimmune disease - Etiologies: Withdrawal of long-term steroid therapy, AML, infection, surgery, sepsis, major trauma - Acute Presentation: Hypotension, dehydration, weakness, abdominal pain, nausea/vomiting, lethargy, altered mental status - Treatment: Obtain blood glucose – treat as appropriate; administer fluids and vasopressor as above. - Note: Patients with a previous history of adrenal insufficiency may be prescribed “stress dose steroids.” Ask whether the patient has taken these meds, document the date/time and dose taken if applicable. • Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC for discussion.



Syncope / Dizziness / Weakness



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Activity prior to episode (exertion, urinating/defecating) True LOC Witnessed seizure / Seizure aura prior to the event Chest pain/SOB Trauma, Blood loss (GI, spontaneous abortion) / LMP Nausea, vomiting, diarrhea New medications/recent dose change Diabetes	LOC w/near immediate recovery Lightheaded/dizzy Hypotension Palpitations Irregular heart rate Bradycardia Tachycardia	Vasovagal Episode CVA / Seizure Shock/hypotension/orthostatic Cardiac arrhythmia/Pacemaker dysfunction CHF/MI Hypoglycemia Hypoxia Toxic ingestion Medication side effect

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / OLMC as needed• Consider the need for Spinal Motion Restriction; see C - 7, Spinal Motion Restriction• B - 2, Airway Management / Oxygen• Evaluate for and treat injuries IAW C - 1, Trauma, General• See B - 10, Chest Pain; B - 16, Altered Mental Status, B - 24, Overdose / Toxic Ingestion PRN• If patient appears postictal or exhibited signs of a seizure, see B - 28, Seizure• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - If lethargic, altered LOC and/or hypotensive• Perform Cincinnati Pre-Hospital Stroke Scale (CPSS); see B - 13, Stroke• Cardiac Monitoring & 12-Lead EKG - Obtain EKG and transmit if able
					<ul style="list-style-type: none">• Vascular Access - If SBP < 90mmHg, see B - 29, Shock/Hypotension• HR > 100bpm with normal SBP:<ul style="list-style-type: none">- LR 500mL IV/IO fluid bolus, repeat x 2 PRN if HR remains > 100bpm / no pulmonary edema
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - If lethargic, altered LOC and/or hypotensive• Perform VAN LVO Assessment; see B - 13, Stroke• Treat dysrhythmias IAW applicable protocol

Additional Considerations
<ul style="list-style-type: none">• Approximately 25% of geriatric syncopal episodes are related to cardiac dysrhythmias.• A detailed history regarding events leading up to the episode is important in determining the etiology. Dangerous causes of syncope/pre-syncope, dizziness/weakness include: cardiac arrhythmias, MI, aortic dissection, pulmonary embolus, stroke/ICH, medication overdose, toxic ingestion, infection/sepsis, hypoglycemia, hypotension, GI bleed, dehydration, anemia, ectopic pregnancy.• Patients reporting syncope/near syncope, dizziness/weakness should be transported for further evaluation.

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Medical Support Apparatus (Adult / Peds)



Key Concepts

- Adult and pediatric patients with complex medical needs are increasingly managed in the outpatient setting. While this may be less common in the Servicemember population, dependents and retirees in particular may present with complex medical histories and medical support apparatus that is malfunctioning or has had a complication.
- Some examples of medical support apparatus that EMS may encounter in these medically complex patients include tracheostomies, home ventilators and CPAP/Bilevel PAP machines, chest drains, Left Ventricular Assist Devices, defibrillator vests, indwelling vascular catheters, dialysis fistulas and grafts, nasally-placed feeding tubes, percutaneous feeding tubes, various surgical drains, urinary catheters, or negative-pressure wound devices.
- Tracheostomies are often placed when there is a long-term requirement for ventilatory support, as it eliminates the need for a tracheal tube to be placed through the mouth with the resultant discomfort and infection risks. Only rarely (generally in the case of laryngectomy for head and neck cancer) is the normal anatomy from the mouth into the trachea disrupted. Typical airway maneuvers can thus still be used.
- Home ventilators are generally used with tracheostomies. In some cases, ventilators or dedicated devices are used with a nasal or oronasal mask for CPAP/Bilevel CPAP. Like all ventilators - there is a risk of device malfunction, battery failure, disconnections of tubing/connections to the pt, or loss of oxygen source or its associated connections.
- Chest drains seen in the outpatient setting are typically small catheters placed for spontaneous pneumothorax. They are attached to a valve (e.g. Heimlich) to allow for air or fluid to exit the chest, but not allow air to enter.
- Ventricular Assist Devices (VAD) are highly complex implanted devices that augment cardiac output using a mechanical pump as a bridge to heart transplant or “destination therapy” where the VAD is used to extend the pts lifespan. These are typically placed in support of the left ventricle, but sometimes are used for the right ventricle. They are connected to an external battery pack and controller held on the pt’s body with a vest-like carrier.
- Defibrillator vests (e.g. Zoll LifeVest) are worn defibrillators used for pts at high risk for lethal arrhythmias who either cannot have an implanted defibrillator or have yet to have the procedure performed.
- Indwelling vascular catheters may be peripheral (such as Midline or Peripherally-inserted Central Catheter [PICC] lines) or placed in the central veins directly or via tunneling (e.g. Hickman, Broviac, or Groshong). Some lines have their access placed under the skin (e.g. Medi-Port) These lines are often used for long-term outpatient nutrition or antibiotics. Dialysis catheters may be directly placed or tunneled (e.g. Quinton), and are often used due to a new requirement for hemodialysis and either failure or lack of permanent dialysis access.
- Dialysis fistulas and grafts create an artificial arteriovenous fistula to allow high flow of blood for dialysis. They are often placed in the upper extremities but can also be placed in the lower extremities.
- Nasally-placed feeding tubes are small-diameter tubes that are placed into the stomach, duodenum, and/or jejunum used for feeding needs that are considered to be shorter-term..
- Percutaneous feeding tubes are surgically placed tubes that are terminate in the stomach, duodenum, and/or jejunum used for feeding needs that are considered to be long-term or permanent.
- Surgical drains include (but are not limited to) biliary drains, nephrostomy tubes, peritoneal dialysis catheters, or surgical cavity drains (e.g. Jackson-Pratt). All are used to drain fluids from the cavity they are placed in.
- Urinary catheters are commonly placed into the bladder through the urethra for short-term difficulty with urinary obstruction or incontinence, or may be surgically placed (suprapubic cystotomy) for long-term or permanent use.
- Negative-pressure wound therapy (“Wound Vac”) are used on wounds expected to produce significant exudate or which are poorly healing.

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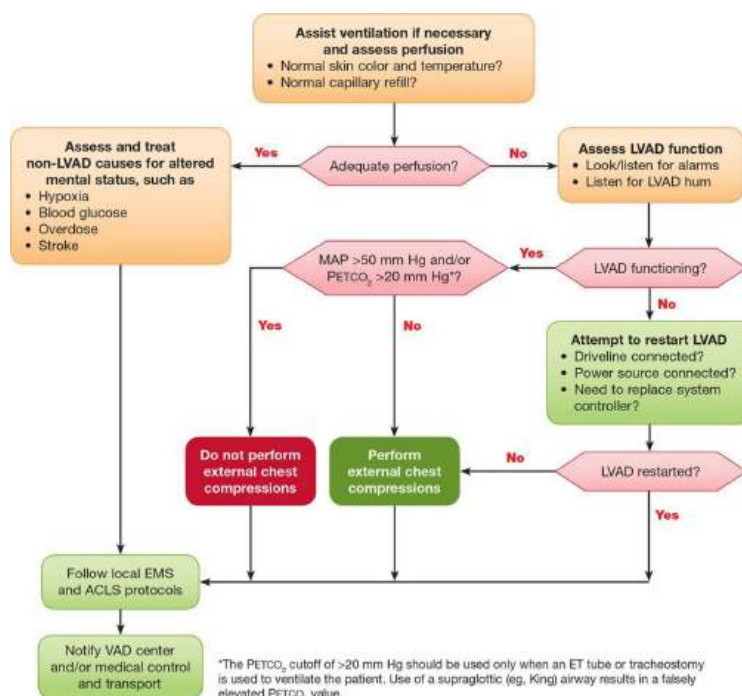
//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / OLMC as needed • B - 2, Airway Management / Oxygen • Tracheostomies – If removed or partially displaced – ask caregiver to reinsert if trained and the stoma is at least several weeks old. Otherwise, leave stoma open to air. Ventilation can be performed with an infant mask directly on the stoma site, if required. If difficulty in breathing with tube in place, ensure obturator and any speaking valve (e.g. Passy Muir) has been removed. • Home ventilators – If pt is not experiencing difficulty in breathing or in extremis, they may be continued on the home device if believed to be functioning properly. Document settings found. If ventilator is believed to be malfunctioning, immediately transition to bag-valve-mask ventilation. • Chest drains – If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. Cover tract with an occlusive dressing, control any bleeding with direct pressure. If tubing or collection bag is damaged or leaking, place inside biohazard bag for transport. Watch closely for development for signs and symptoms of tension pneumothorax and treat per B-2, Airway Management • Ventricular Assist Devices (VAD) – Central or peripheral pulses will generally not be felt, and manual sphygmomanometers cannot be used. Skin color, temperature, and level of consciousness should be used to determine perfusion status of the pt. If pt is unconscious and has signs of poor perfusion - CPR may be performed but there is concern for displacement of the device, see AHA algorithm for management. Do not fear handling the controller, the alarm silence button can be pressed any time without harming the pt. VAD coordinator contact information is typically held by pt or caregivers, contact should be made if any concern related to the device or pt is in extremis. • Defibrillator vests – If pt is not in extremis, the vest may be left in place with cardiac monitor leads placed in their usual locations. Monitor closely for voice commands similar to an AED. The time to shock is delayed compared to AEDs and manual defibrillation; they may also require button activation that personnel may not be familiar with. If pt is critically ill or has been defibrillated by the vest, remove from pt and apply defibrillator pads. Liquid defibrillation gel is typically released by the vest onto the chest just before defibrillation, remove with a towel/etc. before applying defibrillator pads. • Indwelling vascular catheters – If infusion is occurring during EMS arrival, ask caregiver what is infusing and for what purpose – discuss with OLMC whether to continue. If line is removed or partially displaced – ask caregiver to stop infusion. If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. Cover site with an occlusive dressing and control any bleeding with direct pressure. If damage to or leaking from the catheter, use hemostat with jaws wrapped in gauze to clamp between area of damage/leak to prevent air entry into the pt. If nutrition is being administered and stopped, closely monitor for hypoglycemia • Dialysis fistulas and grafts – Assess for and document the presence of a “thrill” over the site. If bleeding, direct pressure will typically be successful – the rapid flow of bleeding is not truly arterial bleeding. Use of a tourniquet should only be used if direct pressure has been unsuccessful as it may damage the graft/fistula even if well above the fistula/graft. • Nasally-placed feeding tubes – If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. If partially displaced, completely remove catheter if causing breathing difficulty. Control any nasal bleeding per C - 4, Epistaxis (Adult / Peds) • Percutaneous feeding tubes – If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. Cover tract with an occlusive dressing, control any bleeding with direct pressure. • Surgical drains – If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. Cover tract with an occlusive dressing, control any bleeding with direct pressure. If tubing or collection bag is damaged or leaking, place inside biohazard bag for transport.
L	L	L	L	L	
1	2	3	4	5	

- **Urinary catheters** – If partially displaced, do not attempt to reinsert. If removed, place in a biohazard bag and transport with pt. If a suprapubic cystostomy - cover tract with an occlusive dressing. Control any bleeding with direct pressure. If tubing or collection bag is damaged or leaking, place inside biohazard bag for transport.
- **Negative-pressure wound therapy** – Loss of vacuum is not considered dangerous, but will need to be assessed by appropriate wound care personnel. Control any bleeding with direct pressure. If tubing or collection bag is damaged or leaking, place inside biohazard bag for transport.
- **Tracheostomies** – Suction per **B - 2, Airway Management**
- **Home ventilators** – If ventilator is believed to be malfunctioning or pt is experiencing difficulty in breathing or hypoxia, and pt is on CPAP or BiLevel CPAP mode with a nasal or oronasal mask, may replace with EMS CPAP and titrate per **B - 2, Airway Management**
- **Ventricular Assist Devices (VAD)** – Use MAP from a Non-Invasive Blood Pressure function of cardiac monitor to further assess perfusion, usual range is 70-90mmHg.
- **Ventricular Assist Devices (VAD)** – If “Low Flow” alarm, MAP < 65mmHg, or other signs of decreased perfusion, treat per **B - 29, Shock / Hypotension** with the understanding pt is in known, severe heart failure. Contact VAD Coordinator and OLMC immediately.
- **Tracheostomies** – If removed or partially displaced – may reinsert same-size or smaller tracheostomy or endotracheal tube into stoma.
- **Home ventilators** – If ventilator is believed to be malfunctioning or pt is experiencing difficulty in breathing or hypoxia, and pt is on CPAP or BiLevel CPAP mode with a nasal or oronasal mask, may replace with EMS BiLevel CPAP and titrate per **B - 2, Airway Management**
- **Home ventilators** – If ventilator is believed to be malfunctioning or pt is experiencing difficulty in breathing or hypoxia, may choose to troubleshoot home ventilator or place on EMS ventilator
- **Indwelling vascular catheters** – access per **B - 1, General Patient Care**
- **Dialysis fistulas and grafts** – access per **B - 1, General Patient Care**

Unresponsive or Altered Mental Status VAD Pt Algorithm





Trauma, General



Key Concepts	MARCH-PAWS	Patient History
<p>Perform bilateral needle decompression (SL2+) for all trauma cardiac arrests</p> <p><u>Scene time should be < 10 min</u></p>	<p>M – Massive hemorrhage A – Airway / AVPU R – Respiration C – Circulation H – Hypothermia/Head Injury --- P – Pain A – Antibiotics W – Wounds S – Splints</p>	<p>OPQRST/SAMPLE / MOI MVC: restrained vs unrestrained, estimated speed, ejection, vehicle intrusion, prolonged extrication, passenger death Motorcycle Collision: estimated speed Falls: height of fall Medications (blood thinners) PPE worn See Field Trauma Triage</p>

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed / Scene Safety / PPE• Perform triage / life-saving interventions• Spinal Motion Restriction, see C - 7, Spinal Motion Restriction• Massive Hemorrhage - Apply approved TQs / hemostatic dressings/device & pressure dressing PRN• B - 2, Airway Management & Assess Mental Status (AVPU)• Oxygen - If significant facial injuries are present see C - 6, Head Injuries for special considerations• Respirations:<ul style="list-style-type: none">- Place occlusive dressings (vented preferred) on penetrating chest and/or abdominal wounds- Assess respiratory rate/eval f/tension pneumothorax; “burp” chest seal on end-exhalation PRN• Circulation - Re-check TQ placement and/or hemostatic dressings / Assess HR, BP and SpO2• Hypothermia - Remove wet clothing; utilize blankets, HPMK, reflective blanket or sleeping bag• Head Injury:<ul style="list-style-type: none">- Sit up or elevate head of cot (or LSB) 30° if able; see C - 6, Head Injuries- Eye Injuries: Perform gross visual acuity exam, apply rigid eye shield; see C - 5, Eye Injuries• Pain - Position of comfort if no spinal motion restrictions• Wounds:<ul style="list-style-type: none">- Secure penetrating objects w/bulky dressings, cover exposed injuries- Secure amputated body parts in biohazard bag prior to transport if time allows- Burns, see C - 2, Burn Management• Splint - Joints above and below suspected fracture; check CSM before and after splinting
L	L	L	L	L	
1	2	3	4	5	<ul style="list-style-type: none">• Declare Trauma Alert to receiving facility if injuries meet criteria, see A - 1, Trauma Criteria• Massive Hemorrhage - Junctional TQ if required/available<ul style="list-style-type: none">- Place Pelvic Binder if fracture is suspected -or- lower extremity amputation from blast injury• Airway - SGA PRN; in the setting of significant facial/neck trauma or airway burns/edema SGA devices may be ineffective.• Respirations:

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		<ul style="list-style-type: none"> - EtCO2 (Capnometry) – A low EtCO2 may suggest hypoperfusion / blood loss or hyperventilation - Suspected *Tension Pneumothorax (see add'l considerations): If no improvement w/ “burping” of occlusive dressing: <ul style="list-style-type: none"> - Perform Needle Thoracentesis (SL2/SL3 w/TCCC Tier2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval. Lateral site preferred (4th ICS, AAL) <p>• Circulation: Cardiac Monitoring & 12-Lead EKG (if chest trauma or altered LOC)</p> <p>• Obtain GCS when able</p>
		<p>• Circulation -</p> <ul style="list-style-type: none"> - Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed - Life threatening hemorrhage within 3 hrs. of initial injury: <ul style="list-style-type: none"> - *Tranexamic Acid (TXA) 2g IV/IO over 1 min - Fluid Resuscitation - <ul style="list-style-type: none"> - WITH Head Injury: LR minimum volume IV/IO to SBP 110mmHg; C - 6, Head Injuries - WITHOUT Head Injury: LR minimum volume IV/IO to SBP 80 - 90mmHg - Max total volume 2000mL LR - TQ Transition: Should be transitioned to a hemostatic/pressure dressing if injury occurred < 2 hours prior AND ALL BELOW criteria are met: <ul style="list-style-type: none"> - Not in shock, wound can be continuously monitored, TQ is not on amputated extremity <p>• Hypothermia - Utilize *Blood/Fluid Warmer if able</p> <p>• Pain - See, B - 4, Pain Management</p> <p>• *Antibiotics - Open wounds and anticipated > 60 min from time of injury to hospital; consider:</p> <ul style="list-style-type: none"> - Ertapenem (Invanz) 1g IV/IO in 100mL NS over 30 min - -OR- - Ertapenem (Invanz) 1g IM x 1 reconstitute in 3.2mL NS or 1% Lidocaine without Epi
		<p>• Airway - Consider Advanced Airway If indicated, SGA is the primary method of airway management</p> <ul style="list-style-type: none"> - Open Cricothyrotomy if severe facial/neck trauma or airway burns/edema - USAF NRP's Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries or if SGA is ineffective - Maintain sedation/analgesia following advanced airway, see B - 2, Airway Management <p>• Respirations - Monitor EtCO2 (Capnography)</p> <p>• Circulation: Consider vasopressor if bleeding controlled, no tension pneumothorax, and shock is refractory to appropriate volume resuscitation.</p> <ul style="list-style-type: none"> - WITH Head Injury: *Norepinephrine 2 - 12mcg/min IV/IO to SBP 110mmHg; see C - 6, Head Injuries - WITHOUT Head Injury: *Norepinephrine 2 - 12mcg/min IV/IO to SBP 90mmHg - If SBP remains less than 60mmHg after above, consider Epinephrine 50 - 100mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration “Cardiac” Epinephrine) in consultation with OLMC <p>• Splints - Consider pain management/sedation before performing</p>
		<p>• Airway - Consider Advanced Airway</p> <ul style="list-style-type: none"> - If technically feasible, endotracheal intubation (ETI) is preferred to Cricothyrotomy for airway burns/edema or failure of SGA - Rapid Sequence Induction if indicated to place ETI or another advanced airway, see B - 2, Airway Management <p>• Respirations</p> <ul style="list-style-type: none"> - Ventilator: Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender

Adult Trauma Protocols

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- **Open Thoracostomy:** If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis if cardiac arrest.
- **Circulation (ensure bleeding controlled and no tension pneumothorax):**
 - **WITH Head Injury:** **25% Albumin 100 - 200mL IV/IO** AND **LR minimum volume IV/IO** to SBP 110mmHg or MAP $\geq$ 80; **C - 6, Head Injuries**
 - **WITHOUT Head Injury:** **25% Albumin 100 - 200mL IV/IO** AND **LR minimum volume IV/IO** to SBP $\geq$ 90mmHg or MAP $\geq$ 65
 - **WITH Head Injury:** **Whole Blood 1 Unit IV/IO** repeat PRN to max volume of 4 Units; target SBP $\geq$ 110 mmHg or MAP $\geq$ 80; **C - 6, Head Injuries**
 - **WITHOUT Head Injury:** **Whole Blood 1 Unit IV/IO** repeat PRN to max volume of 4 Units; target SBP $\geq$ 90 mmHg or MAP $\geq$ 65
 - **With Blood Administration:** **Calcium Gluconate 2g IV/IO** over 2 - 5 min, repeat x 1 per 4 Units WB transfused; flush line between meds. May give concurrently or after first unit of WB
- **Point-of-Care Ultrasound** – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade
- **Escharotomy:** Perform if circumferentially burned chest with difficulty in ventilation in consultation with OLMC
- **Limb Amputation:** Perform only if immediate and real risk to the patient's life due to a scene safety emergency or a deteriorating patient physically trapped by a limb when they will almost certainly die during the time taken to secure extrication. May also be performed on dead patients whose limbs are blocking access to potentially live casualties. OLMC approval required for live patients.

Glasgow Coma Scale		
Eye Response	Open Spontaneously	4
	Open to Verbal Command	3
	Open to Pain	2
	No Eye Opening	1
Verbal Response	Oriented	5
	Confused	4
	Inappropriate Words	3
	Incomprehensible Sounds	2
	No Verbal Response	1
Motor Response	Obeys Commands	6
	Localizes Pain	5
	Withdraw from Pain	4
	Flexion to Pain	3
	Extension to Pain	2
	No Motor Response	1

Revised Trauma Score			
Trauma Score	GCS	SBP (mmHg)	Breaths/Min
4	13 - 15	$\geq$ 89	10 - 20
3	9 - 12	76 - 89	$>$ 29
2	6 - 8	50 - 75	6 - 9
1	4 - 5	1 - 49	1 - 5
0	3	0	0
Add GCS, SBP and RR			
Max Score: 12			
A score $\leq$ 11 indicates potential important trauma			

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Drops / Min (cc/hr.)	8	15	22	30	38	46

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL
-OR-
Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Adult Trauma Protocols

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Additional Considerations

- Transport the patient to a trauma facility unless patient is unstable and requires immediate stabilization/intervention.
- Frequently reevaluate mental status for decreasing LOC/GCS.
- If prolonged transport or delay in transport due to range operations or deployment considerations is expected, consider beginning the MACE Exam if trained.
- **Pregnant Patients:** Treat life threats IAW w/protocol above; contact OLMC to discuss medication administration; all pregnant patients should be transported for further eval, see appropriate OB/GYN protocols as needed.
- ***Tourniquets:** TQs (commercial and improvised) applied prior to EMS/F&ES arrival must be evaluated; if the injury requires a TQ, replace with a CoTCCC approved TQ; if the injury does not require a TQ and the applied TQ has been in place for < 4 hours, remove and replace with a pressure dressing.
- ***Tension Pneumothorax:** Patient must have MOI and any ONE of the following:
 - Progressive respiratory distress
 - Diminished/absent breath sounds
 - Tachypnea / SpO2 < 90%
 - Hypotension/shock or deviated trachea (very late sign)
 - Preferred: Lateral: 4 - 5 ICS, anterior-axillary line; repeat PRN. Alternate: Anterior: 2 - 3rd ICS, midclavicular line, repeat PRN
- May use either 14g or 10g for Needle Decompression
- LSBs and C-spine immobilization are not recommended for penetrating trauma
- Approved ***Hemostatic** dressings include Combat Gauze, ChitoGauze and the X-Stat. **Do not** place hemostatic dressings into the chest or abdomen; the X-Stat is approved for use by SL3 and above for narrow trajectory extremity and junctional injuries only.
- ***Blood/Fluid Warmer** - Use if available to prevent further hypothermia.
- *** Norepinephrine MUST** be administered with an infusion pump, flow controller tubing, or 60gtt tubing. Vasopressors are a last resort in the setting of severe hypotension, except in suspected Neurogenic Shock.
- **Neurogenic Shock:**
 - Mild - Moderate: Hypotension (may have widened pulse pressure), bradycardia, warm/flushed skin or priapism
 - Severe: Above plus SOB, chest pain, weakness, cyanosis, faint pulse or hypothermia
- ***Whole Blood** is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.



Burns, General

(Thermal, Chemical, Electrical / Lightning)

Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Source of burn Time of injury Time exposed (chemical) Associated trauma Inhalational Injury Loss of consciousness	Airway compromise (wheezing, singed nasal hairs, soot around mouth) Loss of consciousness Hypotension/shock Obvious skin burns or burned/melted clothing	1st Degree (Superficial) 2nd Degree (Partial thickness) 3rd Degree (Full thickness) Chemical burn Thermal burn / Blast injury Electrical burn / Lightning injury

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• STOP the burning (or smoldering) process ASAP• Treat Trauma and Immediate Life Threats before burns IAW w/applicable protocol• B - 2, Airway Management / Oxygen• Remove constricting items from the affected extremity (rings, watches, bracelets)• Estimate burn size (see chart in additional considerations)• Thermal Burn:<ul style="list-style-type: none">- < 10% TBSA: Irrigate the area w/fresh water or saline; cover with a dry, sterile dressing- > 10% TBSA: Cover patient with burn sheet or utilize dry, sterile dressings• Chemical Burn:<ul style="list-style-type: none">- Brush off any residual powder and remove clothing/expose patient- Flush exposed area with fresh water or saline for at least 15 mins- Eye involvement: See C - 5, Eye Injuries• *White Phosphorus Munition Burn:<ul style="list-style-type: none">- Remove clothing/expose patient, remove any visible fragments with forceps and irrigate- Cover with hydrogel or wet dressing (must be kept moist) to prevent continued injury• Electrical Burn / Lightning Strike:<ul style="list-style-type: none">- Ensure the source of the electricity has been turned off before touching the patient- Identify/document contact points (entrance/exit); dress wounds w/dry, sterile dressing- If patient is in cardiac arrest see B - 5, Cardiac Arrest• Monitor distal pulses in circumferentially burned extremities q 5 min; assess *6Ps• Keep patient warm, see B - 23, Hypothermia• If fire/smoke inhalation, see G - 1c, Carbon Monoxide Poisoning / Smoke Inhalation / Cyanide
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• See additional considerations for transport destinations• EtCO₂ (Capnometry) - Monitor if altered LOC, hypotensive, or suspected inhalation injury• If Inhalation injury, respiratory distress, wheezing:<ul style="list-style-type: none">- *Albuterol 2.5mg/2.5mL nebulized, repeat q 10 min PRN; no max dose- *Ipratropium Bromide 0.5mg/3mL nebulized, repeat q 10 min PRN; max dose 1.5mg- Consider CPAP - 5cmH₂O, increase incrementally to 10cmH₂O (max) if SpO₂ remains < 90%• Cardiac Monitor & 12-Lead EKG:<ul style="list-style-type: none">- Electrical/Lightning: Continuously monitor HR, obtain serial EKGs; transmit if able- Thermal/Chemical: If clinically indicated apply monitor and obtain EKG• Pain Management, see B - 4, Pain Management

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		<ul style="list-style-type: none"> • Vascular Access - If hypotensive due to trauma, see C – 1, Trauma, General <ul style="list-style-type: none"> - > 20% TBSA 2nd/3rd degree and/or pain management: Initiate 2 large bore IVs or IOs • Fluid Resuscitation > 20% TBSA Burn - ISR Rule of 10 (use blood/fluid warmer if available) <ul style="list-style-type: none"> - <u>Begin all adult patients at 300mL/hr. until TBSA and ISR Rule of 10s are calculated</u> - 40 - 80kg patient: % TBSA x 10mL/hr. = fluid / hr. using LR only - For every 10kg over 80kg increase rate by 100mL/hr.
		<ul style="list-style-type: none"> • EtCO2 (Capnography) - Monitor if altered LOC, hypotensive, or suspected inhalation injury • If suspected inhalation injury perform early airway management: <ul style="list-style-type: none"> - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie (8.0 ETT or larger if able) based on patient presentation or if transport time is > 60 minutes; see add'l considerations - Maintain sedation/analgesia following advanced airway, see B - 2, Airway Management
		<ul style="list-style-type: none"> • Suspected inhalation injury: <ul style="list-style-type: none"> - Early airway management – consider RSI, see add'l considerations • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade • Escharotomy: Perform if circumferentially burned extremities with evidence of compartment syndrome or circumferentially burned chest with difficulty in ventilation in consultation with OLMC

Total Body Surface Area / Rule of 9's	
<p>ISR Rule of 10s</p> <p><u>Do not include % of 1st degree burns when calculating TBSA for fluid resuscitation</u></p> <p>40 - 80kg patient: % TBSA x 10mL/hr. = fluid / hr.</p> <ul style="list-style-type: none"> - 70kg patient burned 40%; - 40% x 10mL/hr. = 400mL/hr. <p>For every 10kg over 80kg increase rate by 100mL/hr.</p> <ul style="list-style-type: none"> - 110kg patient burned 30%: - 30% x 10mL/hr. = 300mL/hr. - 30kg over 80kg = 300mL/hr. - Total 600mL/hr. <ul style="list-style-type: none"> • Burn occurring “hrs.” prior: Fluid resuscitation in the first hour should be “missed hrs.” plus current hour. ex. 90kg / 40%, two hrs. ago = 1000 + 500 first hr. • In a transport < 20 min, where the primary injury is trauma, fluid resuscitation is focused on trauma not burns; taking time to calculate burn % is NOT valuable if other trauma treatment is required. • Pre-hospital burn calculation will NOT be accurate; error on the side of conservative fluid resuscitation (ISR Rule of 10s); the hospital will obtain a more accurate %. 	

ISR Rule of 10s - Begin fluids at 300mL/hr. until calculation is made (infusion pump is preferred)

Total % Burned (2-3 degree)	Patient Weight (kg)						
	40 – 80kg	90kg	100kg	110kg	120kg	130kg	140kg
20%	200	300	400	500	600	700	800
30%	300	400	500	600	700	800	900
40%	400	500	600	700	800	900	1000
50%	500	600	700	800	900	1000	1100
60%	600	700	800	900	1000	1100	1200
70%	700	800	900	1000	1100	1200	1300
80%	800	900	1000	1100	1200	1300	1400
90%	900	1000	1100	1200	1300	1400	1500
100%	1000	1100	1200	1300	1400	1500	1600

{----- mL/Hr. (or mL/hr. using 60gtt tubing)----- }

Additional Considerations

- *Albuterol/Ipratropium Bromide** - May combine meds in one nebulizer treatment; be prepared to switch to in-line therapy if advanced airway required. Continuous EtCO₂ nasal cannula is required for monitoring; if using nebulizer mask, place it over the EtCO₂ cannula (place under surgical mask for Influenza/COVID patients).
- **Consider early cricothyrotomy or intubation** in burn patients with any signs of inhalation injury (Soot in the mouth or nares, facial burns / signed facial hair, hoarse voice / cough / stridor, wheezing or respiratory difficulty) if transport time is expected to be greater than 60 minutes. SGAs are by definition are positioned outside the trachea and will not prevent airway obstruction in this circumstance.
- Use the Rule of Nines to estimate the percent of body surface area burns (use the patient's hand as an estimate of 1% BSA for that patient):
 - Superficial Burn (1st degree): red and painful, similar to a sunburn; NOT included when calculating TBSA burned, but must still be documented in the patient's chart
 - Partial Thickness Burn (2nd degree): skin blistering
 - Full Thickness Burn (3rd degree): charred, leathery skin; painless
- **Burns WITH other significant Trauma, transport to a TRAUMA CENTER**
- **Burns ONLY - Transport directly to a burn center if:**
 - Inhalational injury
 - Partial thickness (2nd degree) burn is > 10% TBSA
 - Any size full thickness (3rd degree burn)
 - Partial/full thickness circumferential burn
 - Any size partial thickness burns to the face, hands, genitalia, feet, joints
 - Electrical / Lightning injury
 - Chemical burns
- Electrical burns can hide significant underlying soft tissue damage, despite the appearance of small superficial wounds; patients require transport for evaluation.
- Chemical burns require copious flushing (20L minimum); sterile water/saline/LR is preferred, but utilize tap water, garden hose, fire hose etc.; document the chemical and obtain SDS (MSDS) if available, do NOT delay transport.
- ***White Phosphorus Munition Burn:** Hydrogel dressings (e.g. "Water-Jel") may be useful in White Phosphorus munitions injury by eliminating the concern of evaporation of water from wet dressings over a prolonged transport. These dressings are generally not otherwise indicated for use.
- *6 P's of Compartment syndrome: Pain, Pulselessness, Pallor, Paresthesia, Paralysis, Poikilothermia (varying skin temperatures)
- Parenteral antibiotics are not indicated for burns, regardless of transport time.

Adult Trauma Protocols

C - 2



Crush Injuries



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE PMHx Mechanism of Injury Duration of entrapment	6 P's of Compartment syndrome: Pain, Pulselessness, Pallor, Paresthesia, Paralysis, Poikilothermia (varying skin temperatures) Hypotension Hypothermia Dysrhythmias	Trauma Compartment syndrome Hyperkalemia Dehydration

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Control obvious hemorrhage / address injuries IAW C - 1, Trauma, General• B - 2, Airway Management / Oxygen• If possible, remove constricting jewelry from entrapped extremity• Check BGL if altered LOC or hx of diabetes, see B - 20, Diabetic Emergencies• If extremity has been compressed for ≥ 2 hours upon arrival:<ul style="list-style-type: none">- Apply TWO Tourniquets above the injury BEFORE the pressure is released. If unable, place immediately AFTER release• Prevent / Treat Hypothermia; see B - 23, Hypothermia
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - Will be monitored if able• Cardiac Monitoring & 12-Lead EKG - Monitor HR & obtain EKG (if equipped); transmit if able
					<ul style="list-style-type: none">• If extremity has been compressed for ≥ 2 hours, before releasing crushed body part:<ul style="list-style-type: none">- Vascular Access - 2 large bore IVs or an IO- Begin bolus of LR 2000mL IV/IO before release of the crushed body part (if able)- After 2L bolus, begin maintenance infusion: LR 1000 mL/hr IV/IO• After release, monitor crushed extremity for signs of compartment syndrome (in S/Sx above)• Pain Management, see B - 4, Pain Management
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be monitored• Dysrhythmias are likely secondary to hyperkalemia; if present administer:<ul style="list-style-type: none">- Calcium Gluconate 2g IV/IO over 2 - 5 min; may repeat x 1 in 10 min PRN; obtain EKG after administration and flush line well between medications- Sodium Bicarbonate 8.4% 100mEq IV/IO over 2 - 5 min; may repeat x 1 in 10 min PRN; obtain EKG after administration and flush line well between medications- Albuterol 5mg (2.5mg/3mL) nebulized, repeat PRN to max of 15mg
					<ul style="list-style-type: none">• Limb Amputation:<ul style="list-style-type: none">- Perform only if immediate and real risk to the patient's life due to a scene safety emergency or a deteriorating patient physically trapped by a limb when they will almost certainly die during the time taken to secure extrication. May also be performed on dead patients whose limbs are blocking access to potentially live casualties. OLMC approval required for live patients.

Additional Considerations
<ul style="list-style-type: none">• Crush injuries usually occur with compression > 4 hours, but may occur in as little as 20 min.• Patients with crush injuries require large amounts of fluid PRIOR to extrication to prevent renal failure and death; establish IV access early and initiate fluid bolus ASAP.

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- Closely monitor elderly patients for fluid overload/pulmonary edema; do NOT withhold fluids, call OLMC as needed.
- Following extrication, patients with crush injuries frequently experience dysrhythmias, perform continuous cardiac monitoring.
- Document vital signs, including temperature and pulse, sensory, motor (PSM) in crush extremity q 5 min.
- Hyperkalemia: Peaked T waves, lengthening PR interval, QRS > 0.12 seconds, loss of P wave (see below)

Serum potassium	Typical ECG appearance	Possible ECG abnormalities
Mild (5.5-6.5 mEq/L)		Peaked T waves Prolonged PR segment
Moderate (6.5-8.0 mEq/L)		Loss of P wave Prolonged QRS complex ST-segment elevation Ectopic beats and escape rhythms
Severe (>8.0 mEq/L)		Progressive widening of QRS complex Sine wave Ventricular fibrillation Asystole Axis deviations Bundle branch blocks Fascicular blocks

See B-25 for reference



Epistaxis (Adult / Peds)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx of bleeding disorder Prescribed anticoagulants (Warfarin, Eliquis, Plavix) Nasal trauma / foreign body Use of nasal medications Recreational drug use Rhinotillexomania (Nose Picking)	Bleeding from the nose Blood in the mouth / spitting up blood	Bleeding from the oropharynx Dental Injury Hemoptysis (Bronchitis) Hematemesis (GI Bleed) Environmental

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E – 1, General Patient Care / Consult OLMC as needed• B – 2 / E – 2, Airway Management / Oxygen• See C – 1 / F – 1, Trauma, General or C – 6 / F – 3, Head Injuries needed• If actively bleeding upon arrival:<ul style="list-style-type: none">- Provide direct pressure by pinching the anterior portion of the nose (cartilaginous area under the nasal bone) with moderate force for 5 - 10 min continuously (tilt head forward)- Maintain pressure for at least 5 - 10 min prior to assessing for hemostasis- If unable to stop bleeding, have patient blow nose to remove poorly formed clots and begin direct pressure as above• Posterior bleeds commonly drain into the oropharynx; ensure suction is available• See B – 3 / E – 3, Nausea / Vomiting as needed
L	L	L	L	L	<ul style="list-style-type: none">• If bleeding continues despite above, have patient blow their nose and then administer:<ul style="list-style-type: none">- Only for use in Adults or Peds >6 y/o: Oxymetazoline (Afrin) 2 sprays in the affected nare(s) x 1
1	2	3	4	5	<ul style="list-style-type: none">• Vascular Access - Establish two large-bore IVs if bleeding is significant/uncontrolled• Fluid resuscitation as needed per B – 29 / E – 18, Shock / Hypotension

Additional Considerations

<ul style="list-style-type: none">• Encourage patients to spit out blood that pools in their mouth; swallowing blood may induce nausea & vomiting.• 90% of nosebleeds occur in the anterior portion of the nose are usually non-life threatening.• Posterior nosebleeds are difficult to control, can be life threatening, and require emergent treatment.• Applying ice has not been found to be efficacious in obtaining hemostasis; focus on applying continuous pressure.
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For use After
01 October 2025

Adult Trauma Protocols
C - 4

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer



Eye Injuries

(Adult / Peds)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Mechanism of Injury Associated Injuries Chemical Exposure / Type Contact Lenses Irrigation performed	Obvious trauma Loss of vision / impaired vision Photophobia Pain Redness/irritation Discharge or bleeding Tear drop shaped pupils	Minor Injuries: UV Burns (welding, snow, skiing) Corneal abrasion Major Injuries: Penetrating or blunt injuries Thermal or Chemical Burns Loss of vision

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E – 1, General Patient Care / Consult OLMC as needed• See C – 1 / F – 1, Trauma, General or C – 6 / F – 3, Head Injuries as needed• B – 2 / E – 2, Airway Management / Oxygen• Eye Trauma:<ul style="list-style-type: none">- *Assess for obvious trauma/penetrating injuries- Perform basic visual exam (identify # of fingers); document exam for both eyes- No penetrating object: apply rigid eye shield that only touches the orbital bones; do not apply pressure to the eye- Penetrating object: DO NOT remove; stabilize in place without adding pressure to the eye- It is NOT necessary to cover the unaffected eye- See below for Eye Irrigation*• Extruded eyeball:<ul style="list-style-type: none">- Place moist, sterile dressing atop; cover w/eye shield (or paper cup / bulky shield) to protect• Elevate the head of the stretcher to 30° to reduce intraocular pressure• See B – 3 / E – 3, Nausea / Vomiting as needed; vomiting can increase intraocular pressure
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Chemical burns only (to facilitate irrigation):<ul style="list-style-type: none">- Adults Only: Tetracaine 0.5% 2 drops in affected eye, may repeat q 10 - 15 min x 2• See B – 4 / E – 4, Pain Management

Additional Considerations
<ul style="list-style-type: none">* Evaluation should include assessing for blood in anterior chamber, teardrop shaped pupil, fluid leaking from the orbit, eyelid laceration, periorbital bruising or edema.* Ketamine does NOT increase intraocular pressure.* Eye Irrigation (debris and chemical burns), DO NOT irrigate penetrating injuries:<ul style="list-style-type: none">- SL 1: Irrigate with sterile water, NS, LR, or commercial eye wash solutions as needed to remove dirt/debris. If chemical burns, irrigate with at least 10L of fluid (using hose, tap water, etc.).- SL 2: Remove contact lenses (if able), irrigate as above & continue irrigation during transport.- SL 3/4/5: In the absence of penetrating trauma, Morgan Lens irrigation with LR preferred after gross irrigation (at least 1L) and removal of contacts (if able).

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Alkali - More Severe

- Penetrate rapidly (often less than one min)
- Results in disruption of cells and necrosis
- Necrosis of conjunctival blood vessels causing “cooked fish eye”



<http://www.oculist.net/downaton502/prof/ebook/duanes/pages/v4/v4c028.html>

Acid - Less Severe

- Quickly denature proteins which slows penetration
- Causes local damage due to coagulation effect



<https://www.slideshare.net/binnytyagi1/chemical-injury-to-eye>

Hyphema



<https://www.slideshare.net/binnytyagi1/chemical-injury-to-eye>

Subconjunctival Hemorrhage



https://www.merckmanuals.com/-/media/manual/home/images/c0284480-subconjunctival-hemorrhage-science-photo-library-high.jpg?thn=0&sc_lang=en



Head Injuries



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE & MOI Loss of consciousness Amnesia prior to/following event Helmet (if applicable) Medications (anticoagulants, Plavix, aspirin)	Altered Mental Status Seizure Visual or sensory disturbances Nausea/Vomiting	Stroke Other CNS illness/injury: Epidural / Subdural / Subarachnoid bleed Hypoxia Hypoglycemia

Basic Management Principles

DO NOT remove penetrating objects to the skull, neck, or eye. Support or stabilize in place.

General Head Injury Classifications

- **Mild (GCS 13-15):** Low energy injury, no loss of consciousness (LOC); may report mild headache and nausea (fall from standing with no LOC).
- **Moderate (GCS 9-12):** Moderate energy injury, may have loss of consciousness, confusion, dizziness, lethargy, vomiting (MVC, sports injuries, hit with a heavy/moderate velocity object).
- **Severe (GCS 3-8):** Moderate to high energy injury, may have seizures, prolonged loss of consciousness (High speed MVC, penetrating head injury)

It is outside of the scope of practice for EMS personnel to evaluate athletes for concussions and provide return to play recommendations, even when performed in consultation with OLMC

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• See C - 7, Spinal Motion Restriction as needed• Massive Hemorrhage control for wounds, see C - 1, Trauma, General• B - 2, Airway Management / Oxygen<ul style="list-style-type: none">- NPAs should NOT be used if significant facial trauma- Suspected TBI: Maintain SpO₂ ≥ 93%- For significant facial trauma, place upright (if able) to maintain airway and use blow by O₂ PRN; be prepared to manage airway with frequent suctioning• Hypothermia - Remove wet clothing, see B - 23, Hypothermia as needed• Elevate Head of stretcher 30° (LSB: reverse Trendelenburg; ensure feet are properly secured)<ul style="list-style-type: none">- If no requirement for SMR, allow patient to assume position of comfort to minimize pain• *Wounds:<ul style="list-style-type: none">- Dressings as needed / utilize bulky dressing to secure any penetrating objects in place- If significant nasal bleeding, see C - 4, Epistaxis• Eye Injuries: see C - 5, Eye Injuries• Avulsed Tooth:<ul style="list-style-type: none">- Avoid touching the root; do not scrub - rinse w/clean water/saline if dirty- Place in milk or saline and transport w/patient to the hospital• Unstable Mandible:<ul style="list-style-type: none">- Patient may be unable to close mouth, spit or swallow effectively; anticipate the need for suction. If conscious, consider giving patient suction to use PRN.- If C-spine is cleared, transport sitting upright with emesis basin• Nose/Ear Avulsion:<ul style="list-style-type: none">- Transport with tissue wrapped in sterile gauze, moistened with sterile NS
L	L	L	L	L	
1	2	3	4	5	

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					<ul style="list-style-type: none"> • Check BGL if altered LOC, confused or hx of diabetes see B - 20, Diabetic Emergencies • See B - 3, Nausea / Vomiting as needed
					<ul style="list-style-type: none"> • Obtain Glasgow Coma Scale (see add'l considerations) • Initiate Trauma Alert for any patient with a GCS < 13 or P (pain) or U (unresponsive) on AVPU • EtCO2 (Capnometry) - Will be monitored <ul style="list-style-type: none"> - If assisted ventilation, ventilate to EtCO2 35 - 40mmHg - Evidence of *herniation: Ventilate to EtCO2 30 - 35mmHg (20 breaths/min if no EtCO2)
					<ul style="list-style-type: none"> • Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed • Hypotension (SBP < 110mmHg or MAP < 80mmHg): <ul style="list-style-type: none"> - LR minimum volume IV/IO to SBP > 110mmHg or MAP > 80; max volume 2000mL • AMS or suspected *herniation: Consult OLMC to discuss Hypertonic Saline 3%, 250mL IV/IO; may repeat x1 with OLMC approval to a max dose of 500mL
					<ul style="list-style-type: none"> • Airway - Consider Advanced Airway <ul style="list-style-type: none"> - Cricothyrotomy: EMERGENCY means to secure airway if required by patient condition - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there is severe facial trauma or concern for airway burns/inhalation injuries - Maintain sedation/analgesia following advanced airway, see B - 2, Airway Management • EtCO2 (Capnography) - Will be monitored • If pulmonary edema develops and/or hypotension remains despite fluid resuscitation: <ul style="list-style-type: none"> - If condition unchanged following 2000mL fluid: *Norepinephrine 2 - 12mcg/min IV/IO titrate to SBP ≥ 110mmHg or MAP ≥ 80 • If SBP remains less than 60mmHg after above, consider: <ul style="list-style-type: none"> - Epinephrine 50 - 100mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration "Cardiac" Epinephrine) in consultation with OLMC • AMS or suspected *herniation If hypertonic saline has not been administered: Consult OLMC to discuss Sodium Bicarbonate 100mEq IV/IO over 1 minute; may repeat x 1 with OLMC approval to a max dose of 200mEq
					<ul style="list-style-type: none"> • Airway - Consider Advanced Airway <ul style="list-style-type: none"> - If technically feasible, endotracheal intubation (ETI) is preferred to Cricothyrotomy for airway burns/edema or failure of SGA - Rapid Sequence Induction if indicated to place ETI or other advanced airway, see B - 2, Airway Management • Ventilator: Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender • Refractory shock without evidence of hemorrhage: <ul style="list-style-type: none"> - 25% Albumin 100 - 200 mL IV/IO AND titrate LR IV/IO to a SBP ≥ 110mmHg or MAP ≥ 80 - Consider 1U Whole Blood IV/IO Bolus in consultation with OLMC if administered, see C - 1, Trauma for Calcium Gluconate dosing • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Drops / Min (mL/hr.)	8	15	22	30	38	46

"Push Dose" Epinephrine
Using 1mg/10mL Epinephrine ("Cardiac"), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

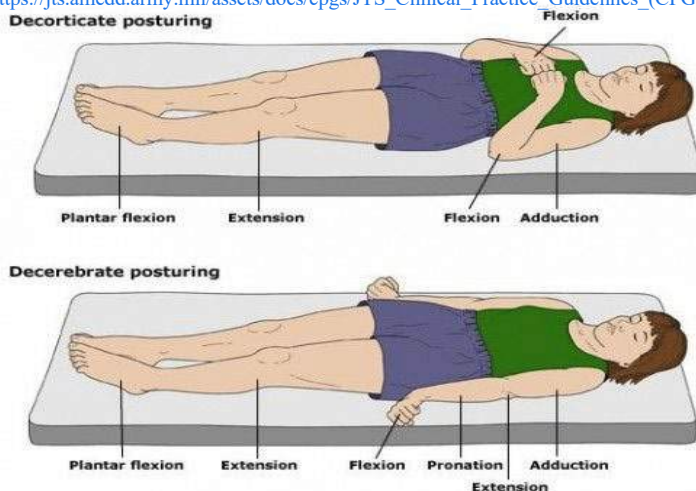
Adult Trauma Protocols

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Additional Considerations

- Scene time should be < 10 min; frequently reevaluate mental status for decreasing LOC/GCS.
- Football/Sports Injuries:
 - If possible, keep the patient's shoulder pads and helmet on; remove the face mask for easy airway access (trainers/coaches should have tools to facilitate this).
 - If responders are unable to safely manage the patient's injuries while keeping all gear on, and there is a high suspicion of a neck and spinal injury, both the helmet and shoulder pads must be removed to maintain spinal alignment.
- Patient w/Helmet in Place (excluding football helmet):
 - In cases of suspected c-spine injuries (in the absence of shoulder pads) the helmet (motorcycle, bicycle, etc) should be removed to facilitate neutral position of the c-spine.
- Inverted T-waves in precordial leads may suggest increased ICP.
- * Evidence of herniation:
 - **Cushing's Triad:** Bradycardia, Hypertension (Wide Pulse Pressure), Irregular Respiration.
 - Posturing (see below).
 - Rapid decline in mental status and/or pupil changes.
- Additional intracranial hemorrhage considerations (consider Stroke scale as needed):
 - **Epidural Hemorrhage:**
 - Injury followed by loss of consciousness, a period of alertness, and then rapid deterioration.
 - May have seizures, a headache (often severe) and/or pupil changes.
 - **Subdural Hemorrhage:**
 - Headache, confusion and/or dizziness.
 - Cognitive decline (may be over days to weeks).
 - Weakness.
 - **Subarachnoid Hemorrhage:**
 - Sudden onset of severe headache ("worst headache of my life"), may report neck stiffness.
 - Loss of consciousness and/or seizures.
 - Photophobia and/or blurred/double vision.
- Extrication From a Vehicle: see **C - 7, Spinal Motion Restriction**.
- Basilar Skull Fracture: battle signs "raccoon eyes" are late findings that do not typically present for 24 - 72 hours; immediate signs include clear fluid (CSF) leaking from nose/ears.
- Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.

[https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_\(CPGs\)/Traumatic_Brain_Injury_Severe_Head_Injury_02_Mar_2017_ID30.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_(CPGs)/Traumatic_Brain_Injury_Severe_Head_Injury_02_Mar_2017_ID30.pdf)



<http://prehospitalresearch.eu/?p=168>

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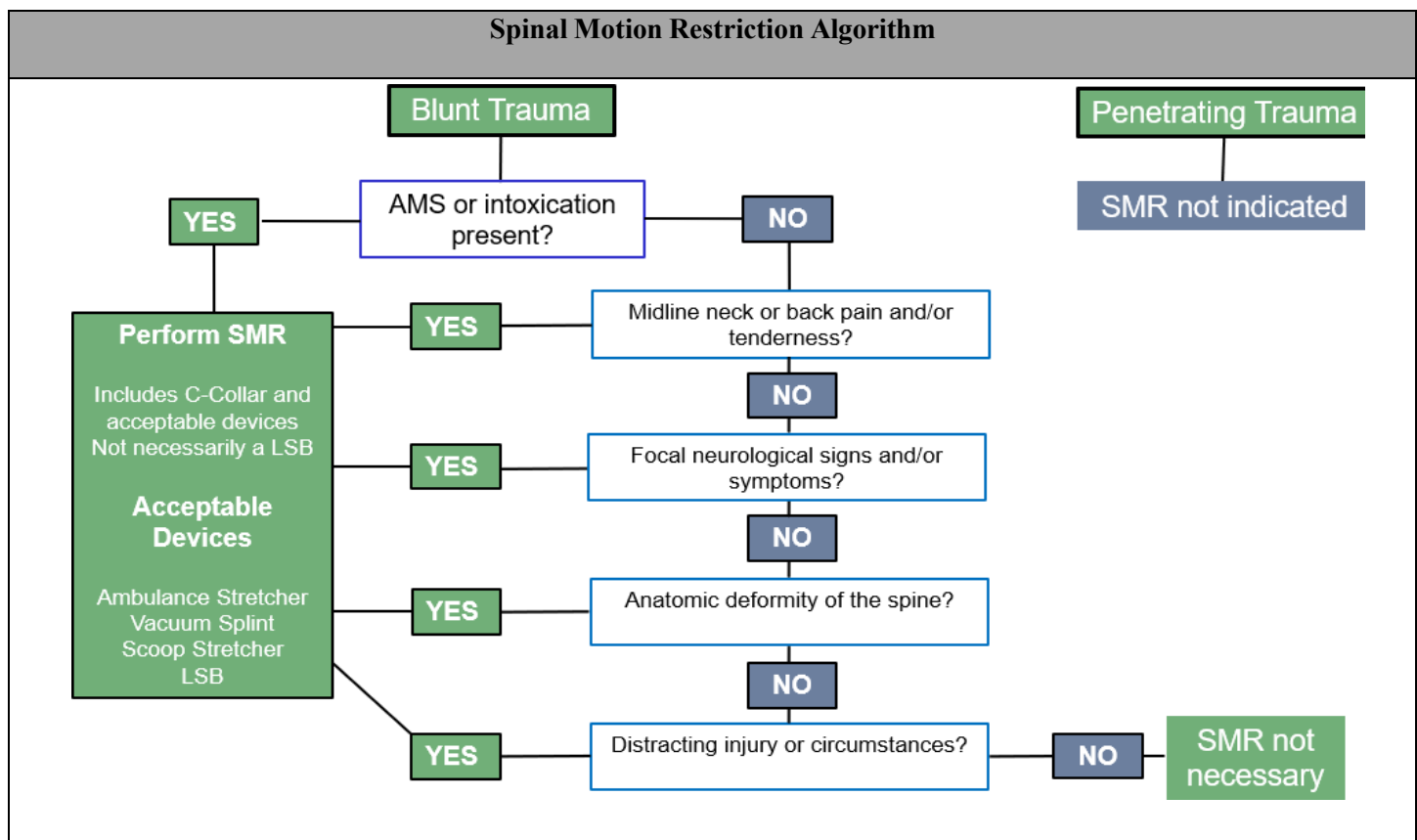


Spinal Motion Restriction (Adult & Peds)



Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">Utilize flowchart below to determine whether SMR is indicatedIf SMR indicated:<ul style="list-style-type: none">Manually stabilize the neck and back to prevent movement and place a rigid C-collarMove the patient to the ambulance stretcher (may use Scoop device or long spine board (LSB))Ambulatory patients: Assist patient in assuming a seated position, gently lower onto the stretcher, maintaining a neutral spinePlace in reverse Trendelenburg position, if possible (elevate up to 30 degrees)Prevent head movement with blocks/tape. Tape head and blocks in place to stretcherFasten stretcher seat belts
L	L	L	L	L	
1	2	3	4	5	<ul style="list-style-type: none">If indicated, SGA is the primary method of airway management<ul style="list-style-type: none">If endotracheal intubation or cricothyrotomy is required: Loosen C-Collar and maintain SMR by holding the head in a neutral position throughout the procedure; replace C-collar post procedure.

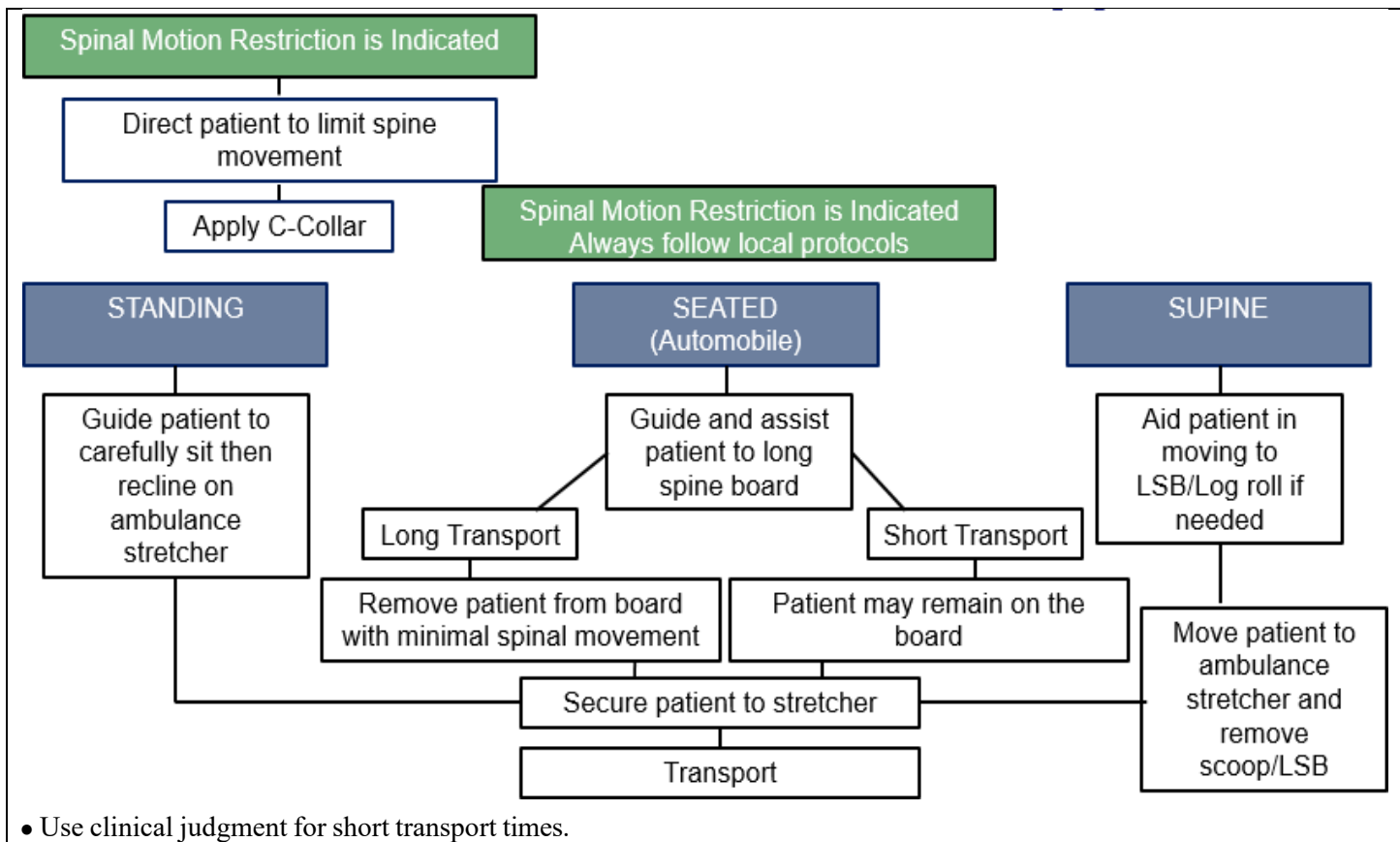
As with all medical procedures, patients demonstrating capacity may refuse any/all spinal immobilization procedures. The patient's GCS, orientation, and commentary regarding the risks and benefits of immobilization must be documented on the PCR.



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Assessment		
<ul style="list-style-type: none"> Spinal injury typically results from high energy impacts such as motor vehicle collisions, auto-pedestrian incidents, industrial accidents, and falls from height. Patients with suspicion of spinal injury require immediate immobilization. SMR may be achieved using the following devices: cervical collar (C-collar), foam head blocks/tape, safety belts, ambulance cot, Scoop device, Long Spine Board (LSB). The Scoop device and LSB are extrication tools. Patients should NOT be transported on the Scoop device or LSB given data demonstrating the propensity to interfere with oxygenation and ventilation and cause tissue injury. 		
Spinal motion restriction is not indicated in patients with penetrating trauma to the head, neck or torso.		
Indications for SMR following blunt trauma include: <ul style="list-style-type: none"> - Acutely altered level of consciousness (e.g. GCS <15, evidence of intoxication also for Pediatric) patients, agitation, apnea, hypopnea, somnolence) or transient LOC - Torticollis (patient is unable to move neck from “abnormal position” to “normal position”) - Midline neck or back pain and/or tenderness - Focal neurologic signs and/or symptoms (e.g. numbness or motor weakness) - Anatomic deformity of the spine - Distracting circumstances or injury (e.g. long bone fracture, de-gloving, or crush injuries, large burns, etc.) or any similar injury that impairs the patient’s ability to contribute to a reliable examination - Involvement in a high-risk motor vehicle collision, high impact diving injury - Communication barrier (emotional/language/cognitive impairment) 		SMR is NOT indicated in BLUNT TRAUMA patients who have: <ul style="list-style-type: none"> - Normal level of consciousness - No midline tenderness - No pain with movement - No distracting injury - No communication impairment - No neurologic abnormalities

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Vaginal Bleeding

(Other than Postpartum Hemorrhage)

Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Pregnancy/Date of LMP/Due date Gravida/Para and Hx pregnancy complications Prenatal care Smoking, alcohol, substance abuse (cocaine) Onset of bleeding Bleeding painful or painless / Trauma Medications (anticoagulants)	Tachycardia Hypotension AMS Abdominal pain Visible vaginal bleeding Signs of trauma/abuse	Ectopic pregnancy Placental abruption Placenta previa Uterine rupture Spontaneous abortion Postpartum hemorrhage Abdominal/pelvic trauma See additional considerations

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• B - 2, Airway Management / Oxygen (95 - 100% for fetal perfusion)• Evaluate patient:<ul style="list-style-type: none">- If pregnant and birth is imminent see D - 3, Childbirth / Labor- If pregnant patient is > 12 weeks gestation, monitor closely for fetal protrusion or delivery- If patient is not pregnant, provide supportive care• Check BGL if altered LOC or hx of diabetes, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - If lethargic, hypoxic, altered LOC, and/or hypotensive• Cardiac Monitoring & 12-Lead EKG - Obtain EKG if unstable and transmit if able• If patient is > 20 weeks gestation:<ul style="list-style-type: none">- Transport in left lateral position to a facility w/NICU capability if able
					<ul style="list-style-type: none">• Vascular Access – Two large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed• Life threatening bleeding (administer prior to fluids if only one IV/IO):<ul style="list-style-type: none">- Tranexamic Acid 1g in 10mL NS IV/IO slow push over 10 min; repeat x 1 after 30 min• Hypotension (SBP < 90mmHg or MAP < 65mmHg):<ul style="list-style-type: none">- LR IV/IO minimum volume to SBP ≥ 90mmHg or MAP ≥ 65- Max total volume 2000mL LR
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - If lethargic, hypoxic, altered LOC, and/or hypotensive.• Hypotension despite fluid resuscitation.<ul style="list-style-type: none">- *Norepinephrine 2 - 12mcg/min IV/IO to SBP ≥ 90mmHg or MAP ≥ 65- If SBP remains less than 60mmHg after above, consider Epinephrine 5 - 10mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration “Cardiac” Epinephrine) in consultation with OLMC• Pain Management - Consult OLMC
					<ul style="list-style-type: none">• Hypotension (SBP < 90mmHg or MAP < 65mmHg)<ul style="list-style-type: none">- 25% Albumin 100 - 200 mL IV/IO AND LR IV/IO minimum volume to SBP ≥ 90mmHg or MAP ≥ 65- Whole Blood 1 Unit IV/IO repeat PRN to max 4 Units; target SBP ≥ 90 mmHg or MAP ≥ 65<ul style="list-style-type: none">- With Blood Administration: Calcium Gluconate 2g IV/IO over 2 - 5 min, repeat x 1 per 4 Units WB transfused; flush line between meds. May give concurrently or after first unit of WB• Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

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Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg
Drops / Min (cc/hr.)	8	15	22	30	38	46

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations
<ul style="list-style-type: none"> • Serious causes of vaginal bleeding: <ul style="list-style-type: none"> - Ectopic pregnancy: May or may not present with associated abdominal pain and syncope. - Placental abruption: Frequently due to trauma; patients report severe abdominal pain and vaginal bleeding. - Placenta previa: Look for painless, bright red vaginal bleeding. - Uterine rupture: Rare but may occur in women w/hx of prior c-section delivery and/or gestation > 40 weeks; S/Sx include sudden severe abdominal pain that persists between contractions, and fetal parts palpable throughout the abdomen. - Spontaneous abortion: Death of a fetus prior to 20 week gestation, occurs in up to 20% of all pregnancies. - Postpartum hemorrhage: Loss of > 1L of blood or > 500mLs with S/Sx of hypotension, see D - 3, Childbirth / Labor - Uterine/endometrial cancer: Vaginal bleeding in a post-menopausal patient. - Abdominal/pelvic trauma • Pregnant patients > 24 weeks gestation (fetal viability) should be preferentially transported to a facility with NICU capabilities. • Spontaneous Abortion: Patients > 10 weeks pregnant who are suspected of having a spontaneous abortion may require a dilation and curettage to remove retained products of conception; if the patient is denying transport advise them to follow up with OB / PCM for additional testing / treatment. • In pregnant patients, fundal height may be utilized to estimate gestational age: <div> </div> <p>https://rphcm.allette.com.au/publication/cpm/Measuring_fundal_height.html</p> • * Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.



Seizures (Pregnant)



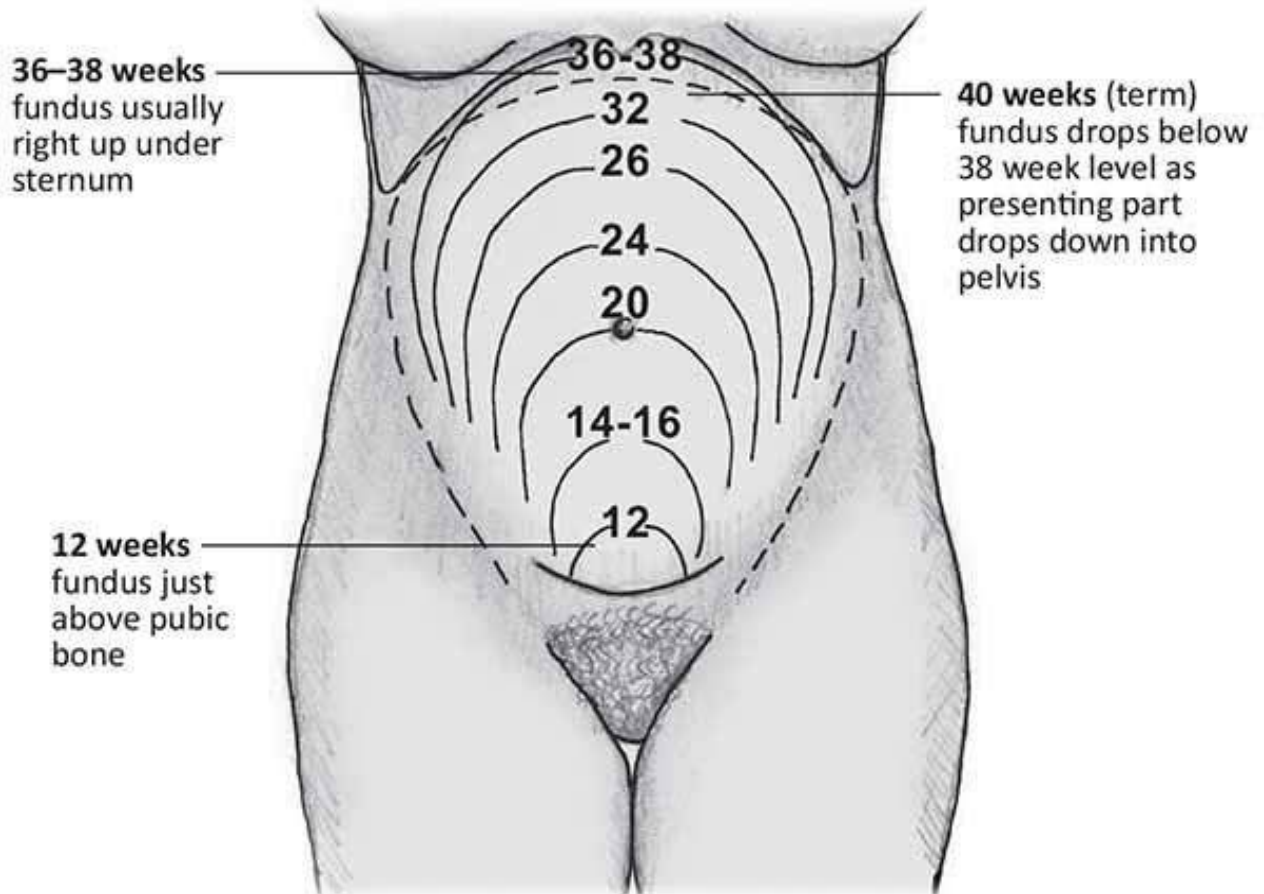
Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Pregnancy/Date of LMP Due date/Delivery date Gravida/Para and Hx of Pregnancy Complications Prenatal Care Smoking/Alcohol/Substance Abuse Hx of HTN or Known Pre-Eclampsia Epilepsy	SBP > 140mmHg or DBP > 90mmHg Tachycardia Headache/Visual Changes RUQ Abd pain/Nausea/Vomiting Altered Mental Status Peripheral Edema	Pre-eclampsia/Eclampsia Seizure Stroke Hypoglycemia Substance abuse/withdrawal

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• B - 2, Airway Management / Oxygen (95 - 100% for fetal perfusion)• Place in supine or left lateral recovery position as tolerated; keep patient warm• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• If applicable, B - 3, Nausea / Vomiting
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Establish fundal height if able (see add'l considerations)• Provide supportive care, transport rapidly to a facility w/NICU capability<ul style="list-style-type: none">- If > 20 weeks gestation and patient condition allows, transport in left lateral position• Cardiac Monitoring and EKG - Obtain and transmit if able• EtCO2 (Capnometry) - Will be monitored if postictal or actively seizing
					<ul style="list-style-type: none">• Vascular Access - Initiate 2 large bore IVs; administer fluids per B - 29, Shock / Hypotension
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if postictal or actively seizing• Suspected eclamptic seizure (actively seizing, seizure witnessed by bystanders or patient postictal):<ul style="list-style-type: none">- Magnesium Sulfate 4g in 100mL NS IV/IO over 10 min- If unable to obtain IV/IO access:<ul style="list-style-type: none">- Magnesium Sulfate 2g IM x 1- Administer additional 2g Magnesium Sulfate in 100mL NS over 10 min once IV/IO access is obtained• If Magnesium does not stop the seizure within 2 min, administer ONE of the following:<ul style="list-style-type: none">- Midazolam 5mg IV/IO, repeat x 1 in 5 min PRN, max total dose 10mg; call OLMC for additional dosing-OR-- Midazolam 10mg IN/IM, x 1 call OLMC for additional dosing- DO NOT stop the administration of Magnesium Sulfate• If patient is status epilepticus despite above treatment:<ul style="list-style-type: none">- Magnesium Sulfate 2g in 100mL NS IV/IO over 10 min (observe for hyporeflexia and respiratory depression)

Additional Considerations
<ul style="list-style-type: none">• Pre-eclampsia: SBP > 140mmHg or DBP > 90mmHg without active seizure; occurs in 6% of pregnancies.<ul style="list-style-type: none">- Risk factors: first pregnancy, hx of HTN, multiple gestation (twins), diabetes mellitus or gestational diabetes, obesity, family hx of preeclampsia, advanced maternal age.

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- Signs/Symptoms: RUQ pain, severe headache, vision changes, peripheral edema and hyperreflexia.
- **Must be confirmed via lab testing; do not proactively treat in the prehospital environment.**
- **Eclampsia:** SBP > 140mmHg or DBP > 90mmHg **with** active seizure; **may occur up to 6 weeks after delivery.**
 - Magnesium is the definitive treatment for eclamptic patients. Consider IM Magnesium if unable to immediately establish IV access. Magnesium may cause hypotension, respiratory depression and hypo-reflexia, monitor patients closely.
 - If bystanders witnessed the patient's seizure, but the seizure activity ceased prior to EMS arrival, administer magnesium as per protocol above.
- Verify whether the patient has a history of a seizure disorder, is currently taking seizure medications/is non-compliant with anti-seizure therapy, or if the patient has developed hypertension during the pregnancy. If the patient has a history of a seizure disorder and they are normotensive, consult with OLMC and treat IAW **B - 28, Seizure.**
- If unable to determine medical history, treat the patient as if the patient is eclamptic and contact OLMC if magnesium is ineffective.



https://rphcm.allette.com.au/publication/cpm/Measuring_fundal_height.html



Childbirth / Labor



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Maternal Medical Hx (gestational diabetes, preeclampsia) Previous pregnancies (Gravida/para) LMP, due date, multiple gestations Prenatal care Onset of contractions/frequency Leakage of amniotic fluid Vaginal bleeding Sensation of fetal activity	Spasmodic abdominal pain Urge to defecate Vaginal discharge or bleeding Vaginal crowning	Prolapsed cord Placenta previa Abruptio placenta Braxton Hicks Abnormal presentation: -Breech -Limb presentation

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• B - 2, Airway Management / Oxygen (Target SpO2 95 - 100% for fetal perfusion)<ul style="list-style-type: none">- 15L NRB for Prolapsed Umbilical Cord, Shoulder Dystocia or Breech Birth/Presenting Limb• Evaluate patient<ul style="list-style-type: none">- If no crowning, abnormal presentations, or blood, place in left lateral position and monitor- If bleeding, see D - 1, Vaginal Bleeding- If abnormal presentation, see additional considerations below• Imminent birth (crowning, urge to push):<ul style="list-style-type: none">- Support baby's head, control the delivery- Check for nuchal cord, if present, slip cord over the baby's head; if unable to free, double clamp the cord and cut the cord between the clamps- Deliver the anterior shoulder followed by the posterior shoulder- If baby is crying:<ul style="list-style-type: none">- Wrap in dry blanket, place on the mother's abdomen, delay clamping until cord pulsations cease (30 - 60 seconds); upon cessation - place 2 clamps 6" and 9" from abdomen and cut between; see D - 4, Newborn Care- If baby is unstable (absent cry, flaccid, and/or decreased/irregular/absent respirations):<ul style="list-style-type: none">- Immediately place 2 clamps 6" and 9" from abd and cut between; see D - 5, Newborn Resuscitation- If mother and baby are stable, allow baby to *nurse• Continued Care of Mother: Anticipate spontaneous placenta delivery within 30 min after birth<ul style="list-style-type: none">- Do NOT pull the umbilical cord to aid the placenta delivery- Place placenta/tissue in a biohazard bag and transport with the patient (hospital will inspect)- Perform fundal massage (see below) to promote uterine contractions/slow postpartum bleeding• Prolapsed Umbilical Cord<ul style="list-style-type: none">- Support presenting part- Place mother in knee-to-chest or hyperflexion position
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				<ul style="list-style-type: none"> - Insert gloved hand into vagina to displace presenting part from cord (continue during transport) - Protruding cord from vagina: manipulate as little as possible, cover with saline-soaked dressing - Assess cord for pulses frequently, readjust hand position/presenting part to maintain pulses <ul style="list-style-type: none"> • Shoulder Dystocia <ul style="list-style-type: none"> - Place mother in McRoberts Maneuver (see below) - Apply firm pressure above the pubic symphysis to attempt to dislodge shoulder - Contact OLMC for further guidance as needed • Breech Birth/Presenting Limb <ul style="list-style-type: none"> - Support presenting part - Place mother in knee-to-chest position or hyperflexion position - If head fails to deliver, place gloved hand into vagina; position fingers between the baby's face and the uterine wall to create an open airway (maintain until transfer of patient to hospital) • Mother w/AMS or hx of diabetes obtain BGL: <ul style="list-style-type: none"> - If < 60mg/dL or > 300mg/dL see B - 20, Diabetic Emergencies
				<ul style="list-style-type: none"> • Load and Transport <ul style="list-style-type: none"> - Notify receiving OB Team ASAP of current condition (especially prolapsed cord, shoulder dystocia or breech birth/limb) - Pre-term delivery at ≤ 32 weeks should be transported to a hospital with NICU; if emergent intervention is immediately required, transport to the nearest facility
				<ul style="list-style-type: none"> • Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed • After delivery of the placenta and to prevent postpartum hemorrhages: <ul style="list-style-type: none"> - Oxytocin 10 Units IM x 1 • Life threatening bleeding (administer prior to fluids if only one IV/IO): <ul style="list-style-type: none"> - Tranexamic Acid 1g in 10mL NS IV/IO slow push over 10 min; repeat x1 after 30 min • Hypotension (SBP < 90mmHg or MAP < 65mmHg): <ul style="list-style-type: none"> - LR IV/IO minimum volume to SBP ≥ 90mmHg or MAP ≥ 65 - Max total volume 2000mL LR
				<ul style="list-style-type: none"> • If significant vaginal bleeding despite above treatment: <ul style="list-style-type: none"> - Oxytocin 20 Units in 1000mL LR; bolus 250mL, then infuse at 250mL/hr. • Hypotension despite fluid resuscitation: <ul style="list-style-type: none"> - *Norepinephrine 2 - 12mcg/min IV/IO to SBP ≥ 90mmHg or MAP ≥ 65 - If SBP remains less than 60mmHg after above, consider Epinephrine 5 - 10mcg IV/IO q 3 - 5 min PRN (0.5 - 1mL of 1mg/10mL concentration "Cardiac" Epinephrine) in consultation with OLMC • Pain Management – Contraindicated prior to birth; MUST contact OLMC before administering
				<ul style="list-style-type: none"> • Hypotension (SBP < 90mmHg or MAP < 65mmHg) <ul style="list-style-type: none"> - 25% Albumin 100 - 200mL IV/IO AND LR IV/IO minimum volume to SBP ≥ 90mmHg or MAP ≥ 65 - Whole Blood 1 Unit IV/IO repeat PRN to max 4 Units; target SBP ≥ 90 mmHg or MAP ≥ 65 <ul style="list-style-type: none"> - With Blood Administration: Calcium Gluconate 2g IV/IO over 2 - 5 min, repeat x 1 per 4 Units WB transfused; flush line between meds. May give concurrently or after first unit of WB • Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

Norepinephrine Drip – 4mg/4mL in 250mL (16mcg/mL) – MUST use 60gtt Tubing or Infusion Pump						
Dose (mcg/min)	2mcg	4mcg	6mcg	8mcg	10mcg	12mcg

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Drops / Min (cc/hr.)	8	15	22	30	38	46
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“Push Dose” Epinephrine

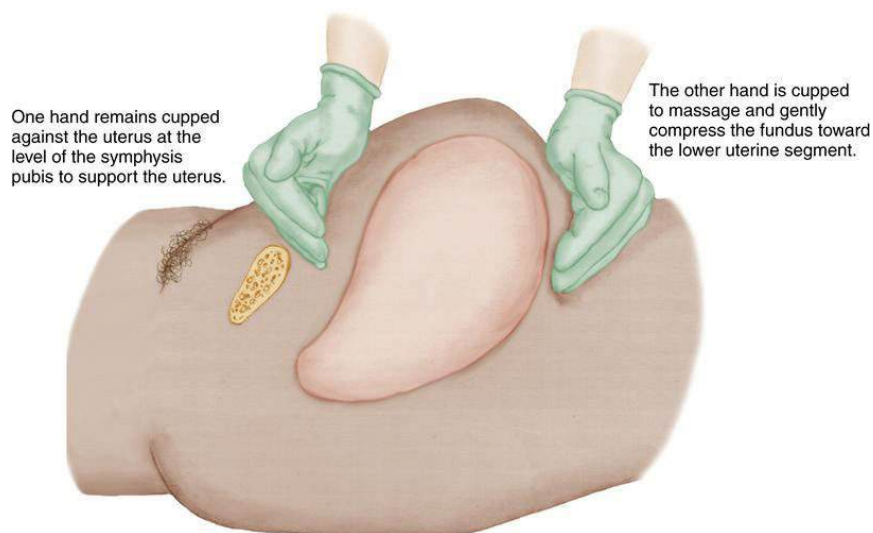
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL
-OR-

Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations

- Transport vs Delivery: It is preferable to transport the patient to the hospital as soon as possible; presence of crowning and the frequency of contractions may necessitate delivery on-scene.
- *Breastfeeding soon after delivery promotes the release of Oxytocin, aids in uterine contraction and reduces the risk of postpartum bleeding. Breastfeeding can also increase neonatal glucose levels.
- **Routine suctioning of the airway immediately after birth is no longer recommended.**
- Postpartum hemorrhage is defined as the loss of > 1L of blood or > 500mL with S/Sx of hypotension. Postpartum bleeding can occur up to 24 hours after delivery.
- Baby should be wrapped in dry blankets to maintain warmth; alternatively, the baby may be placed skin to skin with the mother who should then be wrapped in a blanket for warmth.
- **Uterine Rupture:** Rare, but may occur in women w/hx of c-section delivery and/or gestation > 40 weeks; S/Sx include sudden severe abdominal pain that persists between contractions and fetal parts palpable throughout the abdomen; see **D - 1, Vaginal Bleeding** and **B - 29, Shock / Hypotension** as needed; **transport rapidly.**
- Twin Births: If delivery is imminent, call for additional resources. Twins deliver around 34 weeks, the newborns are usually smaller, prone to hypothermia and hypoglycemia. Twins may share the same placenta, **do not delay cord clamping in these deliveries (immediately clamp and cut upon the first delivery).**
- Mothers who are diabetic or have gestational diabetes often deliver newborns who are large for their gestational age; cesarean births are more common; consider rapid transport for these patients.
- Braxton Hicks contractions are often described as “cramping” or abdominal tightening. These false labor pains are irregular in frequency and duration, and can be caused by dehydration or exercise. Braxton Hicks contractions may be relieved by hydration and positional changes. True contractions are painful, regular in frequency, and increase in intensity/duration overtime; when in doubt, transport the patient for evaluation.

Fundal Massage



<https://nursekey.com/the-woman-with-a-postpartum-complication/>

Knee to Chest (Gaskin Maneuver)

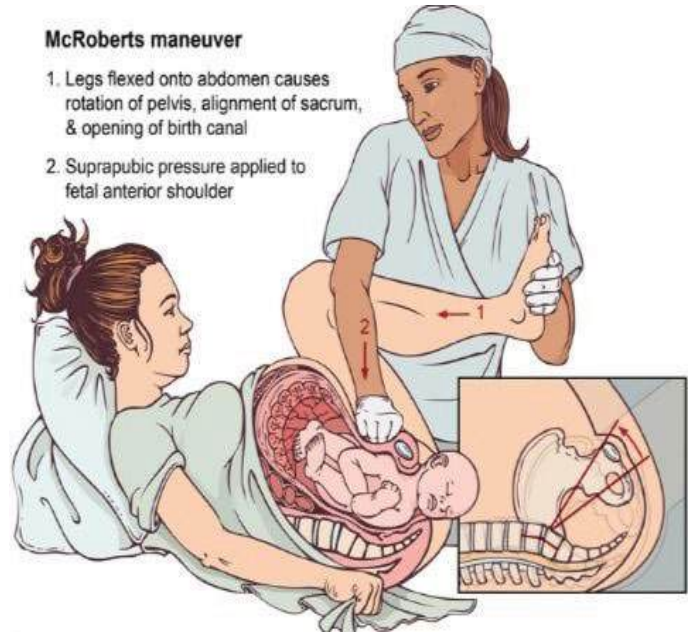


<https://www.semanticscholar.org/paper/Emergency-department-management-of-shoulder-Portal-Horn/352ef442bc0d1c6aa518e64772ef68c73efcbdd3>

McRoberts / Hyperflexion

McRoberts maneuver

1. Legs flexed onto abdomen causes rotation of pelvis, alignment of sacrum, & opening of birth canal
2. Suprapubic pressure applied to fetal anterior shoulder



https://www.stepwards.com/?page_id=10604



Newborn Care



Patient History	Signs and Symptoms	Differential
Known congenital abnormalities Time of birth and multiple gestations	Not applicable	Not Applicable

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • Term, tone, breathing or crying: <ul style="list-style-type: none"> - Warm, dry and stimulate the infant; turn heat to “high” in rear of ambulance • If any of the following is present, call for an add'l unit and see D - 5, Newborn Resuscitation: <ul style="list-style-type: none"> - Infant's HR is < 100bpm or is not adequately breathing - Infant is limp or APGAR < 7 - Meconium is present and infant has a weak cry • Airway Management - Not required if infant is crying; routine suctioning is NOT recommended • Obtain APGAR at 1 min and 5 min of life (see additional considerations) <ul style="list-style-type: none"> - If APGAR is 7 - 9, provide blow-by Oxygen - If no improvement after 5 min APGAR, see D - 5, Newborn Resuscitation • If infant is stable, place skin-to-skin with mother wrap both in a blanket & allow infant to *nurse • BGL - Not routinely recommended • Vascular Access - Not routinely recommended
L	L	L	L	L	
1	2	3	4	5	

Additional Considerations					
APGAR Scoring Chart					
Resuscitation efforts should not be delayed or halted to obtain an APGAR					
	Sign	0 Points	1 Point	2 Points	
A	Appearance (Skin Color)	Blue-gray, pale all over	Pink except for extremities	Pink over entire body	
P	Pulse	Absent	<100/min	>100/min	
G	Grimace (Reflex Irritability)	No response to stimuli	Grimaces in response to stimuli	Sneezes, coughs, pulls away	
A	Activity (Muscle Tone)	Absent, flaccid	Arms and legs flexed	Active movement	
R	Respiration	Absent	Slow, irregular	Good, crying	
10: Best possible condition 7 - 9: Slightly depressed 4 - 6: Moderately depressed 0 - 3: Severely depressed					
<ul style="list-style-type: none"> • Common for newborns to have scores between 7 – 9 • Acrocyanosis (blue and mottled hands/feet) is very common and may last 24 – 48 hours after birth • Central cyanosis (blue lips/tongue) can last up to 5 - 10 min after birth and may indicate a need for supplemental O2. SpO2, BP, BGL and temp are not standardly obtained in the prehospital setting unless the patient is unstable; see D - 5, Newborn Resuscitation 				Targeted SpO2 After Birth	
				1 minute of life	60-65%
				2 minutes of life	65-70%
				3 minutes of life	70-75%
				4 minutes of life	75-80%
				5 minutes of life	80-85%
				10 minutes of life	85-95%

V5 For use After 01 October 2025	OB/GYN & Neonatal Protocols D - 4	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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- * Breastfeeding soon after delivery promotes the release of Oxytocin, aids in uterine contraction and reduces the risk of postpartum bleeding. Breastfeeding can also increase neonatal glucose levels.
- Hypothermia is common in newborns and negatively impacts nearly all postnatal complications. The infant should be wrapped in dry blankets to maintain warmth, a newborn hat should be placed on the patient's head if available and the ambulance temperature should be set to "High". Alternatively, the infant can be placed skin to skin with the mother who should then be wrapped in a blanket to maintain both patient's warmth.
- The newborn is required to have their own PCR completed:
 - Must obtain/document the time of birth, infant's HR, respirations
 - APGAR scores as obtained at 1 min and 5 min of life
- Administration of narcotics to mother prior to birth can result in newborn sedation; contact OLMC for instructions regarding newborn Naloxone administration as needed.
- **Known Stillborn Delivery:** If mother informs you that intrauterine death has been previously established by a Medical Provider and the fetus is delivered, **DO NOT initiate resuscitation.** Clamp and cut the cord immediately, wrap the infant in a blanket and allow the mother to hold her baby if she chooses. Transport the fetus, products of conception and mother to the hospital, preferably one with OB capabilities.



Newborn Resuscitation

(Birth - 24 Hours of Life)



Patient History	Signs and Symptoms	Differential
Maternal PMHx and medications Risk factors (drug abuse, smoking) Pregnancy Hx (previous preterm labor, still birth, fetal malposition) Prenatal care Due date/gestational age Multiple gestations (twins) Known congenital disease Fetal position (known breech)	See Additional Considerations: APGAR 0 - 3: Suggests need for resuscitation	Hypoglycemia Hypothermia Meconium aspiration Congenital Infection Maternal medication effect (opioids) Congenital heart defect

Clinical Practice Guidelines							
S L 1	S L 2	S L 3	S L 4	S L 5	<ul style="list-style-type: none">• E - 1, General Patient Care (Peds) / Consult OLMC as needed• Term, tone, breathing or crying:<ul style="list-style-type: none">- See D - 4, Newborn Care• Call for additional resources if any one of the following is present:<ul style="list-style-type: none">- Baby’s HR is < 100bpm or is not adequately breathing- Baby is limp or APGAR < 7- Meconium is present and infant has a weak cry• Preterm, decreased tone, abnormal respirations or absent cry:<ul style="list-style-type: none">- Clear secretions, place airway in sniffing position, warm, dry, simulate- A folded towel should be placed under the newborn’s shoulders to maintain airway position.- Labored breathing or cyanosis: Provide blow-by Oxygen as needed- HR < 100bpm, gasping or apnea:<ul style="list-style-type: none">- BVM with room air 1 breath q 1 – 1.5 seconds (40 - 60 breaths/min)• Reassess after 30 seconds of good chest rise/fall:		
					<table><tr><td>HR < 100 but > 60bpm<ul style="list-style-type: none">- Perform ventilation corrective actions (MR SOPA; see add’l considerations)- Continue BVM ventilation if poor respiratory effort and/or until HR > 100bpm</td><td>HR < 60bpm<ul style="list-style-type: none">- Add supplemental Oxygen and initiate CPR (3 compressions to 1 breath); reassess every min- Discontinue CPR when HR > 60bpm- Continue BVM ventilation if poor respiratory effort and/or until HR > 100bpm</td></tr></table>	HR < 100 but > 60bpm <ul style="list-style-type: none">- Perform ventilation corrective actions (MR SOPA; see add’l considerations)- Continue BVM ventilation if poor respiratory effort and/or until HR > 100bpm	HR < 60bpm <ul style="list-style-type: none">- Add supplemental Oxygen and initiate CPR (3 compressions to 1 breath); reassess every min- Discontinue CPR when HR > 60bpm- Continue BVM ventilation if poor respiratory effort and/or until HR > 100bpm
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					<ul style="list-style-type: none">• Perform continuous SpO2 monitoring via the infant’s RIGHT wrist (see normal values below)• Follow Newborn Resuscitation algorithm in add’l considerations		
					<ul style="list-style-type: none">• Cardiac Monitoring – Place patient on monitor if HR < 100bpm• EtCO2 (Capnometry) - Will be monitored at all times if equipped• Airway Management:<ul style="list-style-type: none">- HR < 100 bpm with BVM ventilations: Consider placing SGA- HR < 60 bpm with BVM ventilations: Place SGA		
<ul style="list-style-type: none">• Vascular Access - IV/IO if performing BVM ventilation or CPR							
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored at all times if equipped• HR < 60bpm after BVM ventilations and 1 min of CPR:		

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	<ul style="list-style-type: none"> - Epinephrine (1mg/10mL) 0.01mg/kg (0.1 mL/kg) IV/IO repeat q 3 - 5 min if HR remains < 60bpm • Unresponsive to resuscitation AND known maternal OR neonatal hemorrhage: <ul style="list-style-type: none"> - LR 10mL/kg IV/IO, consult OLMC for repeat boluses • After 5 min of CPR without improvement in HR, obtain heel stick BGL <ul style="list-style-type: none"> - < 40mg/dL - D10W 2mL/kg IV/IO
	<ul style="list-style-type: none"> • Endotracheal intubation rarely required; generally discouraged unless inability to ventilate with BVM or SGA, consult OLMC for guidance. • Unresponsive to resuscitation AND known maternal OR neonatal hemorrhage: <ul style="list-style-type: none"> - *Whole Blood 10mL/kg IV/IO, consult OLMC for repeat boluses <ul style="list-style-type: none"> - With Blood Administration: Calcium Gluconate 60mg/kg IV/IO over 2 - 5 min (max single dose 2g), repeat x 1 after the 4th round of blood infusion; flush line between meds. May give concurrently or after first unit of WB.

Medication		Epinephrine 1mg/10mL 1:10,000 (0.1mg/mL)		LR	D10W
Color	Dose	0.01mg/kg	mL	10mL/kg	2mL/kg
Gray 3 - 5kg	4kg	0.04mg	0.4mL	40mL	8mL
Pink 6 - 7kg	6.5kg	0.06mg	0.6mL	65mL	13mL

APGAR Scoring Chart

Common score is 7 - 9; Acrocyanosis (cyanosis around the mouth, hands/feet) is very common and may last 24 - 48 hours after birth				
	Sign	0 Points	1 Point	2 Points
A	Appearance (Skin Color)	Blue-gray, pale all over	Pink except for extremities	Pink over entire body
P	Pulse	Absent	<100/min	>100/min
G	Grimace (Reflex Irritability)	No response to stimuli	Grimaces in response to stimuli	Sneezes, coughs, pulls away
A	Activity (Muscle Tone)	Absent, flaccid	Arms and legs flexed	Active movement
R	Respiration	Absent	Slow, irregular	Good, crying

APGAR Scores

10	Infant is in best possible condition	4 - 6	Infant is moderately depressed
7 - 9	Infant is slightly depressed, but near normal	0 - 3	Infant is severely depressed

Targeted SpO2 After Birth

1 minute of life	60-65%
2 minutes of life	65-70%
3 minutes of life	70-75%
4 minutes of life	75-80%
5 minutes of life	80-85%
10 minutes of life	85-95%

No improvement in HR w/30 seconds of positive pressure ventilations, consider MR SOPA:

M - Mask Seal/adjust mask

R - Reposition head/airway

-if not effective-

S - Suction mouth then nose

O - Open mouth and lift jaw forward

P - (Unable to perform pre-hospital)

A - Consider LMA insertion

Additional Considerations

- This protocol follows the recommendations outlined in the Neonatal Resuscitation Program. PALS is not appropriate for use in newborn patients.
- Less than 1% of resuscitations require CPR. Infants respond to airway support/positive pressure ventilation.
- Meconium: Routine intubation and deep tracheal suctioning is no longer recommended.
- **If powered suction is used, settings should not exceed 100mmHg.**

OB/GYN and Neonatal Protocols

D - 5

- Needle cricothyrotomy is technically very difficult and almost never required, consult OLMC
- BGLs in neonates should not be routinely obtained in the prehospital setting due to complex treatment algorithms that are based upon gestational age and weight. Breastfeeding will increase the blood sugar level in most neonates.
- Resuscitation efforts should not be delayed or halted to obtain APGAR scores.
- Naloxone is rarely indicated for newborns based solely on maternal opioid use. Administration should be avoided in infants born to mothers with chronic opioid use. Consult OLMC.
- Calcium Gluconate and Sodium Bicarbonate are not commonly used in neonatal resuscitation. Consult OLMC if indications exist.

Step 1: Simple Head Extension (no shoulder roll or headrest)

Check if secondary markers meet criteria



Step 2: Place a Shoulder Roll

Check if secondary markers meet criteria



Step 3: Add a Headrest until all criteria are met

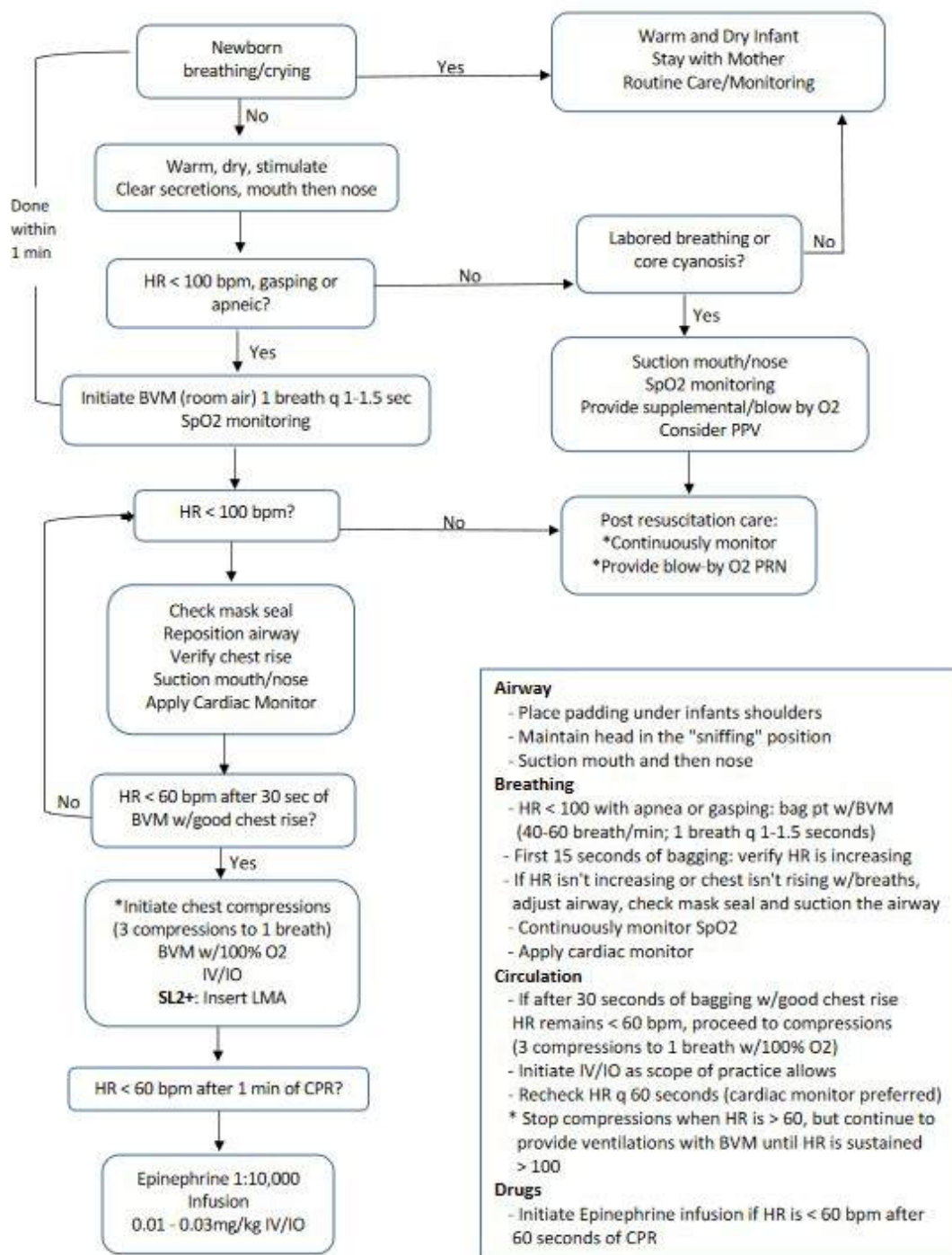
(may need to add or adjust the thickness of the shoulder roll)



Gestational Age in Weeks	Insertion Depth at the Lips (cm)	Uncuffed ET Tube Size
23-24	5.5	2.5
25-26	6.0	
27-29	6.5	3.0
30-32	7.0	
33-34	7.5	3.5
35-37	8.0	
38-40	8.5	
41-43	9.0	3.5-4.0

<https://www.maskinduction.com/positioning-infants-and-children-for-airway-management.html>

Neonatal Resuscitation





General Patient Care / Monitoring & Vascular Access (Pediatric)



Patient History	Basic Management Principles
OPQRST/SAMPLE Birth Hx Recent hospitalizations Last void/wet diaper Last oral intake	<ul style="list-style-type: none"> - Perform history and focused physical exam, use family members or bystanders f/history - Vital Signs – see below - Mental Status – AMS should alert you to a serious condition - Abdominal Exam & Hydration – wet diaper, moist oral cavity, diarrhea, skin turgor - Skin – cap refill, distal pulses, extremity temperature - Trauma

Pediatric Assessment Triangle (ABC)	
<ul style="list-style-type: none"> - Appearance: <ul style="list-style-type: none"> - Interactive, abnormal gaze/speech or cry, decreased tone - Work of Breathing: <ul style="list-style-type: none"> - Lung sounds: rales, wheezing; retractions, nasal flaring, grunting, tripod posture - Circulation to Skin: <ul style="list-style-type: none"> - Pallor, mottling, cyanosis, cool extremities <p>Note: Consider “toe-to-head” approach for stable patients to develop rapport</p>	

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • Treat all patients with respect; ensure scene/crew safety, BSI/PPE precautions • Request ALS/additional resources as needed • Consult On-Line Medical Control (OLMC) as needed • Signs of Puberty (axilla hair, breast development) or > 60 kg: see Applicable Adult Protocol • Bring necessary equipment, medication, resources to patient's side. Primary Bag and Monitor or AED should be brought to ALL patient encounters. • Establish Level of Consciousness (LOC), manage Immediate Life Threats IAW appropriate protocol(s) • Complete initial assessment/patient history/physical exam as indicated by patient presentation • Treat illness/injury IAW applicable protocol or OLMC instruction • E - 2, Airway Management • Oxygen - Titrate SpO2 ≥ 94% if respiratory distress/SOB, hypoxemia (SpO2 < 90% or cyanosis) • Patient Monitoring / Vital Signs - <u>Obtain initial HR, RR, BP, SpO2, Pain</u> (and below as applicable): <ul style="list-style-type: none"> - SpO2 - May also use ear, toe, or scalp as needed. Contact OLMC if parents recommend a lower SpO2 (i.e.75%) target due to an underlying condition - Temperature (°C or °F) - Obtain oral, tympanic temperature as patient age/condition requires - Blood Pressure - Obtain as condition/protocol requires - Blood Glucose Level (BGL) - Obtain as condition/protocol requires; E - 14, Diabetic Emergencies - Carbon Monoxide (SpCO) - If equipped, CO should be monitored per protocol guidance
L	L	L	L	L	
1	2	3	4	5	

V5 For use After 01 October 2025	Pediatric Medical Protocols E - 1	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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			<ul style="list-style-type: none"> • Medication Administration: Refer to medication reference, administer meds IAW protocol
			<ul style="list-style-type: none"> • Transport to the most appropriate facility based on chief complaint, or complete AMA; A - 4, Patient Refusal /AMA • *EtCO2 (Capnometry) - Monitor (if equipped) for all AMS/lethargy, hypotension, SOB, *trauma, or cardiac arrest (SL 2 / 3 will document RR and EtCO2 [in mmHg] only) • Cardiac Monitoring - Monitor (if equipped) for all AMS/lethargy, hypotension, CP/SOB, *trauma, or cardiac arrest (SL 2 / 3 will document rate ONLY, not complete interpretation) • 12-Lead EKG - If indicated/equipped, obtain 12-Lead / q 10 min serial EKGs (PRN) and transmit if able
			<ul style="list-style-type: none"> • Vascular Access - As needed per protocol, see below and E - 18, Shock / Hypotension <ul style="list-style-type: none"> - IV Access via single lumen (standard IV) when required (Saline Lock) - IV Access via dual lumen peripheral IV when required/if equipped (limited access, multiple infusions) - IO Access (PROXIMAL TIBIA ONLY) - If IV access is unobtainable and/or life-threatening condition exists - Blood/Fluid Warmers - Use for all *Trauma/Hypovolemia & Hypothermic patients, if available - Infuse fluids with a pressure infusion bag • Temperature - If equipped, may use rectal monitoring PRN for *Trauma/*Hypo/*Hyperthermia
			<ul style="list-style-type: none"> • Vascular Access - As needed per protocol, see below and E - 18, Shock / Hypotension <ul style="list-style-type: none"> - Medication Infusions: Utilize infusion pumps, if available; mL/hr. = gtts/min (using 60gtt tubing) - IO Access: May use distal femur if unable to use proximal tibia - IO with Alert/Verbal Patients: Lidocaine 2% 0.5mg/kg IO x 1 for analgesia before fluid administration, max dose 40mg. (Must use pre-filled syringe, NOT a multi-dose vial) - External Jugular (EJ): As needed via single or double lumen IV • Temperature - May utilize esophageal monitoring PRN for *Trauma or *Hypo/*Hyperthermia • EtCO2 (Capnography) - Monitor for all AMS/lethargy, hypotension, SOB, *trauma, or cardiac arrest. Document RR, EtCO2 (in mmHg) and capnogram
			<ul style="list-style-type: none"> • Vascular Access - As needed per protocol, see below and E - 18, Shock / Hypotension <ul style="list-style-type: none"> - Tunneled central venous catheters (Hickman/Broviac and Groshong), PICC lines, subcutaneous ports: These may be accessed carefully and under sterile technique in lieu of attempts at IV access. In a critical patient, do not delay attempts at IO if immediate success is not obtained. Aspirate lumen to volume listed on catheter hub to remove any possible Heparin solution prior to infusion - Dialysis catheter: Access dialysis catheters (tunneled or non-tunneled) ONLY in pulseless or peri-arrest patients if IV/IO access is not obtainable. Care and sterile technique is required. Aspirate lumen to volume listed on catheter hub to remove any possible Heparin solution prior to infusion - Dialysis graft/shunt: Access dialysis graft/shunt ONLY in pulseless or peri-arrest patients if IV/IO access is not obtainable. Care and sterile technique is required • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

Normal Heart Rate by Age (per minute)				
	Newborn - 3 months	3 months - 2 years	2 years - 10 years	> 10 years
Awake	85 - 205 bpm	100 - 190 bpm	60 - 140 bpm	60 - 100 bpm
Asleep	80 - 160 bpm	75 - 160 bpm	60 - 90 bpm	50 - 90bpm

Pediatric Medical Protocols

E - 1

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

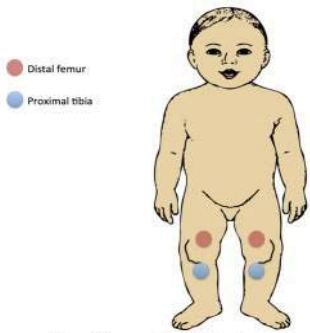
Additional Considerations
<ul style="list-style-type: none"> • Patient care should be a team effort by all personnel on-scene. • ALS Services: After evaluating for life threats, ALS personnel are encouraged to allow their SL2/SL3 partners to assume responsibility for BLS calls unless the following conditions are present: <ul style="list-style-type: none"> - Patient requires or there is a high clinical suspicion that the patient will require ALS interventions. - An intervention was performed on the pt. requiring continuous monitoring that is beyond the SL2/SL3 scope. - Patient has received or will require the administration of a medication that is beyond the SL2/SL3 scope. - Any patient requiring a hospital alert (i.e. Stroke, STEMI, Trauma, Sepsis). • AMA documentation MUST include the name of the physician contacted; see A - 4, Patient Refusal / AMA. • Every patient evaluated by EMS must have a patient care report (PCR) completed by the individual who assumed medical lead for the patient. • PCRs will be completed as soon as possible after completion of the call, but no later than the end of the medical lead's shift. All PCRs must be submitted for upload to the patient's electronic medical record prior to completion of the shift. • When obtained during the call, copies of rhythm strips, EKGs and waveform capnography will be submitted with the PCR to the receiving facility for upload to the patient's electronic medical record. • *Trauma – Moderate to major trauma, not for isolated extremity injuries (unless massive blood loss). • *Hypothermia – Temperature < 35 °C or 95 °F; utilize tympanic or oral if patient is bradycardic (reduce vagal stimulation). • *Hyperthermia – Temperature > 38 °C or 100.4 °F • *Vital Signs - MAP = [SBP + (2 × DBP)] / 3 ex. BP: 120/80; (120 + (2 x 80)) / 3 = MAP 93 • Record Vital Signs (minimum of 2 sets): CRITICAL patient q 5 min; NON - CRITICAL q 15 mins.

Lidocaine 2% 0.5mg/kg 100mg/5mL Prefilled Syringe									
Using 10mL NS flush, waste 1mL and draw up 1mL Lidocaine; Yields 2mg/mL									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
0.5mg/kg	2mg	3.25mg	4.25mg	5.25mg	6.5mg	8.25mg	10.5mg	13.25mg	16.25mg
mL	1mL	1.6mL	2mL	2.6mL	3.3mL	4.1mL	5.25mL	6.6mL	8mL

Vascular Access
<ul style="list-style-type: none"> • *Trauma does not include isolated extremity injury with limited blood loss. • Peds IO Access: Utilize 3-way stop-cock for rapid infusion using 60cc syringe, if infusion pump is not available. • If equipped, use Trauma Tubing if massive blood loss / expected blood transfusion • *Pediatric IV/IO Access: <ul style="list-style-type: none"> - Utilize 3-way stop-cock for rapid infusion using 60cc syringe, if infusion pump is not available. - Ensure IO is secured with bulky dressings • If extravasation occurs: <ul style="list-style-type: none"> - Stop infusion. - Connect syringe to IV catheter and attempt to withdraw fluids.

Pediatric Medical Protocols

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<p>Pediatric IO</p>  <p>● Distal femur ● Proximal tibia</p> <p><i>Figure 1: IO access sites in infants <1yo</i></p>	<p>Proximal Tibia</p>  <p>Growth Plate</p>	<p>Distal Femur</p>  <p>Growth Plate</p>
<p>Medication Admin Multi-Dose Syringe</p> 	 <p>EZ-IO® 25 mm Needle Set 3kg and over</p>  <p>EZ-IO® 45 mm Needle Set 40kg and over</p>	<p>Dual Lumen Peripheral IV: 16g (20g main/22g pigtail) & 18g (20g main/22g pigtail)</p> 



Airway Management (Pediatrics)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Previous Hx Airway Compromise, Asthma, Anaphylaxis Dental Surgeries Toddler/Preschool age child with sudden onset choking, coughing, respiratory difficulty	Altered Mental Status SOB/Abnormal rate/depth/effort Use of accessory muscles Head bobbing, retractions or abdominal breathing Wheezing, stridor, rales, rhonchi Hoarseness, pallor or cyanosis Hypoxemia/Hyper or Hypocarbica	Aspirated food (grapes, hot dogs, hard candy) Aspirated foreign bodies (coins, balloons, button, batteries) Croup/Epiglottitis/Peritonsillar abscess Asthma/Anaphylaxis Toxic Ingestion (laryngeal burns) Inhalational Injury

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • Allow patient to maintain position of comfort • Oxygen - Titrate SpO2 ≥ 94% if respiratory distress/SOB, hypoxemia (SpO2 < 90% or cyanosis) • Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 2, Airway Management • Open, Assess, Clear Airway - Finger sweeps (not blind), head-tilt/chin-lift or jaw thrust • Suction – Oral/nasal suction PRN; if conscious, consider giving patient suction to use PRN • NPA / OPA - Insert appropriate size as indicated; OPAs contraindicated with gag reflex • BVM Ventilations (see below, or refer to pediatric length-based tape): <ul style="list-style-type: none"> - Neonatal: See D - 5, Neonatal Resuscitation - 24 hours – 12 yrs old: 20 – 30 breaths/min (1 breath q 2 - 3 seconds) - > 12 yrs old: See B - 2, Airway Management - See add'l considerations for airway positioning techniques • Known / Suspected Choking or Foreign Body Obstruction: <ul style="list-style-type: none"> - > 1 yr of age: Heimlich maneuver or abdominal thrusts - < 1 yr of age: Chest thrusts/back blows (5:5) - Continue until foreign body expelled; if patient becomes unconscious start CPR and check airway for object q 2 min before administering breaths; see E - 5, Cardiac Arrest (Peds) • High Flow Nasal Cannula - 8 LPM NC if SpO2 is < 85%, 10 min max; may also be used in conjunction with BVM Ventilation, assisted ventilations / pre-oxygenation prior to SGA/ETT & CPR <ul style="list-style-type: none"> - Note: HFNC may be used continuously during pediatric cardiac arrest at 8 LPM
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none"> • Supraglottic Airway (SGA) - Insert as needed (PRIMARY for Cardiac Arrest) • EtCO2 (Capnometry) - Monitored continuously if hypoxic, lethargic, AMS, hypotensive, or w/SGA • Respirations - Suspected *Tension Pneumothorax (See Additional Considerations): <ul style="list-style-type: none"> - If no improvement w/"burping" of occlusive dressing perform Needle Thoracentesis using a 18 – 20G 1.5 inch IV catheter (SL2/SL3 w/TCCC Tier2+ AND OLMC approval; SL4/SL5 does NOT require OLMC approval). - 2nd ICS mid-clavicular is the preferred site in pediatric patients - Different needle gauges and lengths may be required based on the size of the patient; consult OLMC as needed • PEEP Valve - Use w/BVM f/hypoxia despite O2/Airway, begin 5cmH2O, titrate to 10cmH2O PRN (use caution with higher PEEP in newborns)

V5 For use After 01 October 2025	Pediatric Medical Protocols E - 2	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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		<ul style="list-style-type: none"> • • Consider *CPAP - If no contraindications initiate at 5cmH2O w/severe respiratory distress/impending failure; increase incrementally to 15cmH2O (max) if SpO2 remains < 90%. Contact OLMC for further titration.
		<ul style="list-style-type: none"> • Gastric Decompression: Insert OG tube after advanced airway placement if SGA is equipped
		<ul style="list-style-type: none"> • *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH2O (IPAP) and 4cmH2O (EPAP) w/severe distress/impending failure; increase IPAP incrementally to 15cmH2O (max) and EPAP to 10cmH2 if SpO2 remains < 90%. Contact OLMC for further titration. • If indicated, SGA is the primary method of airway management <ul style="list-style-type: none"> - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective • Cricothyrotomy - <u>EMERGENCY</u> means to secure airway if required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.) <ul style="list-style-type: none"> - > 8 yrs old: Surgical/open Cricothyroidotomy - < 8 yrs old: Needle Cricothyroidotomy • Post-Advanced Airway Sedation and Pain Control (ETI, SGA, Cric): <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN repeat q 10 min PRN to nystagmus or sedation • Suction: Perform suction of SGA/ETT/Cric/Trach PRN; for thick secretions, inject 10mL NS into tube prior to suction • Foreign body removal – Utilize Magill forceps or finger sweep under direct visualization • EtCO2 (Capnography) - If lethargic, AMS, hypotensive, or w/SGA/ETT/Cric
		<ul style="list-style-type: none"> • Endotracheal Intubation (ETI) - If the SGA is not effective or patient requires ETT to allow for tracheal suctioning, utilize Video Laryngoscopy w/ Bougie or Direct Laryngoscopy w/ Bougie. ETI is preferred to Cricothyrotomy if technically feasible. Discuss with OLMC the potential benefit of intubation after first 10 minutes of cardiac arrest resuscitation prior to considering Field Termination • Rapid Sequence Induction (RSI) - For critically ill/injured patients who require immediate airway management but have an intact gag reflex, trismus, or other difficulties. This technique may be used with an SGA (“Rapid Sequence Airway”), ETI, or Cricothyrotomy in select circumstances. Requires a minimum three EMS personnel in addition to AP to proceed, at least one must be SL4 or above <ul style="list-style-type: none"> - Primary Sedation (any SBP): <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN - Alternate Sedation (SBP > age-specific hypotension): <ul style="list-style-type: none"> - Midazolam 0.1mg/kg IV/IO (max single dose 5mg) AND - Fentanyl 1mcg/kg IV/IO (max single dose 100mcg) - Primary Paralytic <ul style="list-style-type: none"> - Succinylcholine 1.5mg/kg IV/IO - Alternate Paralytic (Known hyperkalemia or hx of Muscular Dystrophy): <ul style="list-style-type: none"> - Rocuronium 1.2mg/kg IV/IO - Patient must be placed on continuous cardiac, EtCO2 and SpO2 monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter • Foreign body removal – Utilize Magill forceps under direct or video laryngoscopy • Open Thoracostomy - If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis in cardiac arrest. • Ventilator – Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender

Airway								
Color / Dose	Avg Age	iGel / Max NG Size	King-LT	LMA	*ETT	Stylet	Bougee	
Gray 3-5kg	< 3 mo	1	n/a	0	1	3.5 U	6F	Neonatal

Pink 6-7kg	3 - 5 mo	1.5	10F	1	1.5	3.5 U	6F	Neonatal
Red 8-9kg	6 - 11 mo	1.5	10F	1	1.5	3.5 U	6F	Neonatal
Purple 10-11kg	12 - 24 mo	1.5	10F	1	2	4.0 U	6F	Peds
Yellow 12-14kg	2 yrs	2	12F	2	2	4.5 U	6F	Peds
White 15-18kg	3 - 4 yrs	2	12F	2	2	5.0 U	6F	Peds
Blue 19-23kg	5 - 6 yrs	2 - 2.5	12F	2	2 - 2.5	5.5 U	14F	Peds
Orange 24-29kg	7 - 9 yrs	2.5	12F	2.5	2.5	6.0 C	14F	Peds - Adult
Green 30-36kg	10 - 11 yrs	3	12F	2.5 - 3	3	6.5 C	14F	Adult

*U-Uncuffed; C-Cuffed

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Ketamine - 2mg/kg IV/IO/IN (Post-SGA/Intubation/Cric)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to NS vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to NS vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				

Additional Considerations
<p>*During initial BVM Ventilation, MATCH the patient's rate/volume (Minute Ventilation); Failure to do so may make patient decompensate faster*</p> <ul style="list-style-type: none"> • SGA/ETT/Cric: Document size, depth and post-insertion EtCO₂ (MUST attach to run report). • Patients w/AMS, lethargy, increasing EtCO₂ / continued hypoxemia at risk for respiratory failure, treat aggressively. • Initial EtCO₂ may decrease due to hyperventilation. As bronchoconstriction increases and affects ventilation, EtCO₂ will rise. If the bronchoconstriction becomes severe, the patient may have decreased perfusion causing a drop in EtCO₂ (often below 35mmHg). Effective treatment will increase EtCO₂ (if low) and decrease EtCO₂ (if high). • Unless otherwise indicated, ventilate patients with head up 15 - 30 degrees (increase effectiveness, decrease potential for gastric insufflation, especially with obese patients). • Provider may loosen c-collar from chin prior to intubation as long as head is held in-line. Consider C-collar on patients to maintain in-line stabilization during transport to reduce risk of dislodgement. • Portable suction should be brought to the patient's side for suspected airway compromise. • *In general, continued paralysis is not required after the airway procedure is complete. Excellent post-advanced airway sedation/analgesia will keep the patient comfortable Succinylcholine is preferred due to rapid onset of paralysis, presence of fasciculations as evidence of onset, and short duration of action that allows for repeat neurological examination and evidence of patient discomfort. Repeat doses of paralytic may be required in patients with severe respiratory disease or other unique situations, consult OLMC. • *Tension Pneumothorax: Patient must have MOI and any ONE of the following:

Pediatric Medical Protocols

- Progressive respiratory distress
- Diminished/absent breath sounds
- Tachypnea / SpO₂ < 90%
- Hypotension/shock or deviated trachea (very late sign)
- Preferred Site: Anterior: 2 - 3rd ICS, midclavicular line, repeat PRN; if ineffective, use the lateral site with caution

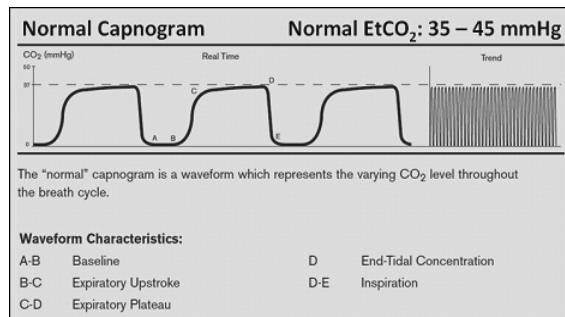
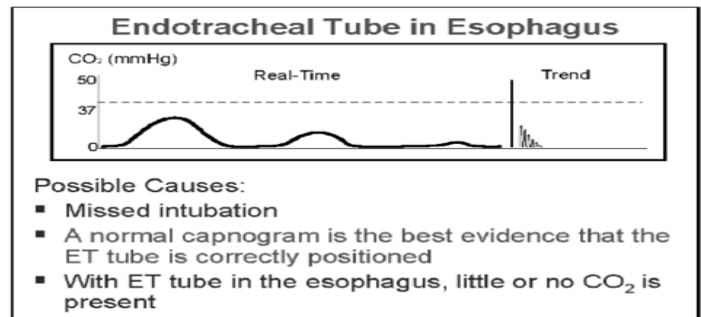
Mnemonics for Airway Issues

DOPE (Change in condition, decreased SpO₂ / vent alarms): Dislodgement, Obstruction, Pneumothorax, Equipment	MOANS (Difficult BVM seal): Mask seal, Obesity/Obstruction, Age (> 55), No Teeth, Sleep Apnea/Stiff Lungs	RODS (Difficult Extraglottic Device): Restricted mouth opening, Obstruction, Disrupted/Distorted Airway, Still Lung/Cervical Spine
BURP (vocal cord view): Backwards, Upwards, Rightward Pressure	LEMON (Difficult Laryngoscopy, see below): Look, Evaluate (3-3-2), Mallampati, Obstruction/Obesity Neck Rigidity	SHORT (Difficult Cricothyroidotomy): Surgery/Scars (or other obstruction), Hematoma (or infection/abscess/mass), Obesity, Radiation distortion (and other deformity), Tumor

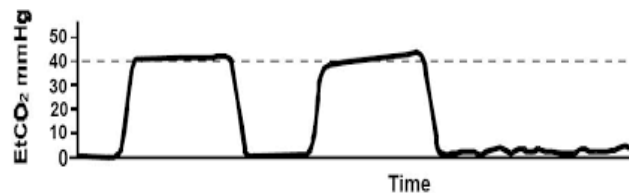
Hypocapnia and Hypercapnia Causes

Physiologic Reason	Hypocapnia (<35mmHg)	Hypercapnia (>45mmHg)
CO₂ Production:	Hypothermia, head injury, overdose, increased altitude	Fever, Sodium Bicarbonate, TQ release, Venous CO ₂ embolism, overfeeding
Pulmonary Perfusion:	Hypotension, Hypovolemia (trauma), pulmonary embolism, decreased cardiac output, cardiac arrest	Increased cardiac output or blood pressure
Alveolar Ventilation:	Hyperventilation, apnea, total airway obstruction or extubation	Hypoventilation, bronchial intubation, partial airway obstruction, rebreathing
Equipment Malfunction:	Circuit disconnect, leaks in sample tubing, vent malfunction	Exhausted CO ₂ absorber, Inadequate gas flow, leaks in tubing, vent malfunction

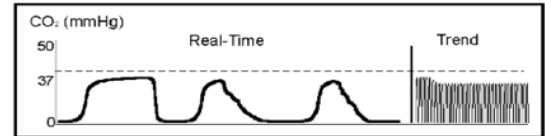
EtCO₂ Waveforms (<https://openairway.org/capnography/>)



Dislodged ET Tube



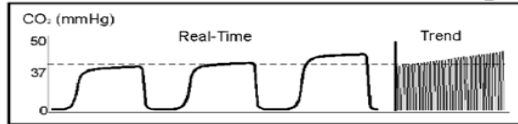
Inadequate Seal Around ET Tube



Possible Causes:

- Leaky or deflated endotracheal or tracheostomy cuff
- Artificial airway is too small for the patient

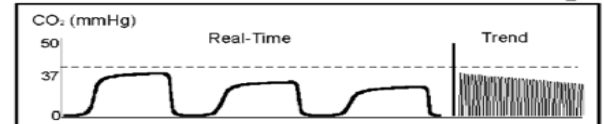
Hypoventilation (Increase in ETCO_2)



Possible Causes:

- Decrease in respiratory rate
- Decrease in tidal volume
- Increase in metabolic rate
- Rapid rise in body temperature (hyperthermia)

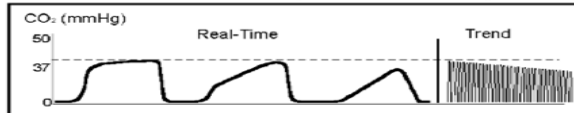
Hyperventilation (Decrease in ETCO_2)



Possible Causes:

- Increase in respiratory rate
- Increase in tidal volume
- Decrease in metabolic rate
- Fall in body temperature

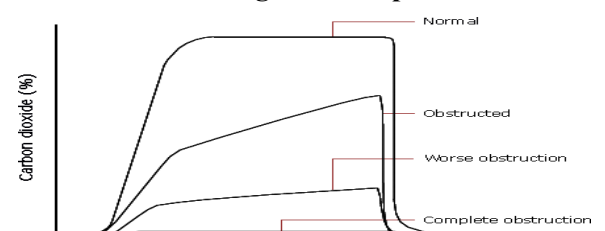
Obstruction in Airway or Breathing Circuit



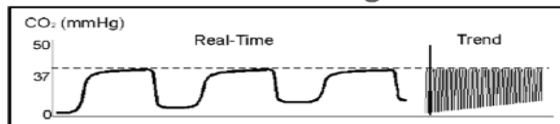
Possible Causes:

- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Obstruction in expiratory limb of breathing circuit
- Bronchospasm

Worsening Bronchospasm



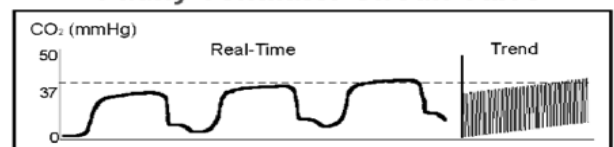
Rebreathing



Possible Causes:

- Faulty expiratory valve
- Inadequate inspiratory flow
- Insufficient expiratory time
- Malfunction of CO_2 absorber system

Faulty Ventilator Circuit Valve



- Baseline elevated
- Abnormal descending limb of capnogram
- Allows patient to rebreathe exhaled gas

Neonates, Infants and Toddlers

Step 1: Simple Head Extension (no shoulder roll or headrest)

Check if secondary markers meet criteria



Step 2: Place a Shoulder Roll

Check if secondary markers meet criteria



Step 3: Add a Headrest until all criteria are met (may need to add or adjust the thickness of the shoulder roll)



<https://www.maskinduction.com/positioning-infants-and-children-for-airway-management.html>

Pre-School and Above

Step 1: Simple Head Extension (no shoulder roll or headrest)



Step 2: Place a Shoulder Roll

Check if secondary markers meet criteria



Using a pillow to position a toddler into optimal "sniffing position"





Nausea / Vomiting & Abdominal Pain (Pediatric)



Patient History	Signs and Symptoms	Differential - See Add'l
OPQRST/SAMPLE PMHx Past Surgery Hx (abdominal surgeries) Medications / Fever Trauma Blood in emesis or stool Travel Hx Females: LMP	Nausea and vomiting Abdominal Distention/Pain Constipation Diarrhea or Anorexia Dysuria Vaginal bleeding/discharge Fever	Appendicitis Intussusception Meckel's Diverticulum/Volvulus DKA Urinary Tract Infection Toxic ingestion Food borne illness, Viral GI illness Trauma or Head Trauma

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen - Ensure suction readily available if patient is vomiting • Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 2, Nausea / Vomiting • Place in position of comfort, provide verbal reassurance to reduce anxiety • BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies
L	L	L	L	L	<ul style="list-style-type: none"> • Nausea/Vomiting: <ul style="list-style-type: none"> - 20 – 40kg: Ondansetron 2mg ODT PO (1/2 of 4mg ODT tablet), repeat x 1 in 15 – 20 min PRN - > 40kg: Ondansetron 4mg ODT PO, repeat x 1 in 15 – 20 min PRN • Vascular Access - Administer fluids per E - 18, Shock / Hypotension
1	2	3	4	5	<ul style="list-style-type: none"> • Pain Management - See E - 4, Pain Management • Nausea/Vomiting: <ul style="list-style-type: none"> - < 60kg: Ondansetron 0.1mg/kg IV/IO, max single dose 4mg; repeat x 1 in 15 - 20 min PRN, max dose 8mg - > 60kg: see B - 3, Nausea and Vomiting

Ondansetron - 0.1mg/kg IV/IO (4mg/2mL)									
Color	G	P	R	Purple 10 - 11kg	Yellow 12 - 14kg	White 15 - 18kg	Blue 19 - 23kg	Orange 24 - 29kg	Green 30 - 36kg
0.1mg/kg	---	---	---	1.1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
mL	---	---	---	0.5mL	0.7mL	0.8mL	1.1mL	1.3mL	1.6mL
Draw direct from vial; further dilute as needed.									

Additional Considerations
<ul style="list-style-type: none"> • Emergent causes of pediatric abdominal pain: <ul style="list-style-type: none"> - Appendicitis: Nausea/vomiting; begins as peri-umbilical pain or diffuse abdominal pain which localizes to the RLQ; patients may present with guarding or rebound. - Intussusception: Peak incidence at 6 months of age; intermittent episodes of crying during which the patient may flex legs to abdomen; associated with fever and lethargy - Meckel's Diverticulum: Similar to appendicitis but with lower GI bleeding - Volvulus: Presents within the first months of life; abdominal distention, vomiting/lower GI bleeding - Ectopic pregnancy: Consider for any female of child-bearing age; sudden onset of severe abdominal pain with may be associated with syncope; hypotension, tachycardia, and delayed capillary refill suggest shock

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- DKA: Nausea/ vomiting may result from DKA (possible manifestation of diabetes in the pediatric population)
- Non-Accidental Trauma: Search for evidence of trauma/abuse
- Ovarian or Testicular Torsion
- Ondansetron (Injection) may be administered PO at same dosing as ODT, if unavailable.



Pain Management (Pediatric)



Patient History	Wong-Baker Pain Scale
OPQRST/SAMPLE Pain Scale PMHx (narcotics) Medication Allergies	<div>Mild: 0-3 Moderate: 4-6 Severe: 7-10</div> <div>Wong-Baker FACES® Pain Rating Scale</div> <div></div> <div>0 2 4 6 8 10</div> <div>No Hurt Hurts Little Bit Hurts Little More Hurts Even More Hurts Whole Lot Hurts Worst</div> <div>https://wongbakerfaces.org/</div>

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• E - 2, Airway Management / Oxygen• Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 4, Pain Management• Determine pain score using the Numeric Rating Scale (NRS) 1 - 10 or Wong-Baker if needed• Place in position of comfort, apply ice packs/splints, provide verbal reassurance to reduce anxiety• See E - 3, Nausea / Vomiting & Abdominal Pain as needed
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring• Vascular Access - Administer fluids per E - 18, Shock / Hypotension• MILD Pain Control:<ul style="list-style-type: none">- Acetaminophen Suspension 15mg/kg PO x 1 (if not previously given in last 4 hrs.)• MODERATE to SEVERE Pain Control (Patient > 8 years old w/ OLMC approval):<ul style="list-style-type: none">- Ketamine 2mg/kg IN/IM ONLY, repeat q 10min to nystagmus or pain control• Administration of Controlled Substances:<ul style="list-style-type: none">- EtCO2 (Capnometry) - Will be monitored- V/S (HR, RR, BP, SpO2, Pain Scale) will be document q 5 min for the first 15 min after admin
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if lethargic, altered LOC, hypotensive or if controlled substances are administered• MODERATE to SEVERE Pain Control:<ul style="list-style-type: none">- If not already given: Acetaminophen 15mg/kg IV- For isolated extremity injuries, acute musculoskeletal pain: Ketorolac 0.5mg/kg IV/IM, max total dose 15mg- SBP > Age-specific hypotension, see chart below:<ul style="list-style-type: none">- *Fentanyl 1mcg/kg IV/IO/IM, repeat x 1 PRN in 5 min- Patient > 8 years old with any SBP (ideal if hypotensive, choose <u>ONE</u> of the routes):<ul style="list-style-type: none">- Ketamine 0.2mg/kg IV/IO, repeat q 10min to nystagmus or pain control- Ketamine 2mg/kg IN/IM ONLY, repeat q 10min to nystagmus or pain control

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	<ul style="list-style-type: none"> • Emergent Opioid Reversal: <ul style="list-style-type: none"> - Naloxone 0.4mg IV/IO, repeat q 2 - 3 min PRN to RR > age specific minimum assist ventilations PRN • Slow Reversal of Opioid Pain Control (to maintain pain control but increase RR): <ul style="list-style-type: none"> - Naloxone (0.4mg/mL), add to 9mL NS flush (40mcg/mL), push 20mcg (0.5mL) IV/IO/IN q 2 - 3 min PRN to RR > age specific minimum, ventilate with BVM PRN
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*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Additional Considerations	
<ul style="list-style-type: none"> • Use caution in giving medications to head injury patients. Consult OLMC as needed. • Record pain and vital signs before, q five (5) minutes and before care is transferred. • Do not administer opioids with benzodiazepines; the combination increases the risk of respiratory depression. • * Fentanyl – may round to nearest 5mcg to allow for ease of administration. 	

Acetaminophen 15mg/kg PO (160mg / 5mL)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
15mg/kg	60mg	97.5mg	127.5mg	157.5mg	195mg	247.5mg	315mg	344.5mg	487.5mg
mL	1.9mL	3mL	4mL	4.9mL	6.1mL	7.7mL	9.8mL	10.8mL	15.2mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Fentanyl - 1mcg/kg IV/IO									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
1mcg/kg	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.6mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
*Fentanyl (100mcg/2mL): Remove 2mL from 10mL NS Vial. Add Fentanyl 100mcg (2mL), yields 10mcg/mL LABEL all Vials with "Medication Added" sticker									

Ketamine - 0.2mg/kg IV/IO									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg
*mL	0.08mL	0.13mL	0.17mL	0.21mL	0.26mL	0.33mL	0.42mL	0.53mL	0.65mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
10mg/mL IV / IO	LABEL all Vials with “Medication Added” sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)					Ketamine Concentration 500mg/5mL (100mg/mL)			
	Remove 2mL from 10mL NS Vial Add 100mg (2mL) to vial (10mg/mL) IV/IO: IV slow push, follow with flush					Remove 1mL from 10mL NS Vial Add 100mg (1mL) to vial (10mg/mL) IV/IO: IV slow push, follow with flush			
LABEL all Vials with “Medication Added” sticker									

Ketamine - 2mg/kg Intranasal (IN/IM) Only									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to vial (20mg/mL) IN: administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to vial (20mg/mL) IN: administer ½ in each nostril w/atomizer				

FLACC Scale

	Score 0	Score 1	Score 2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Modified from: Voepel-Lewis T, Merkel S, Tait AR, Trzcinka A, Malviya S. The reliability and validity of the Face, Legs, Activity, Cry, Consolability observational tool as a measure of pain in children with cognitive impairment. Anesth Analg. 2002 Nov;95(5):1224-9.



Cardiac Arrest (Pediatric)



BOLD / Italicized Text are “5Hs and 5Ts”

Patient History	Signs and Symptoms	Differential
SAMPLE /OPQRST from bystanders Events leading up to arrest Estimated downtime / DNI/R or Living Will Hx: CP/SOB (Thrombosis: Pulmonary/MI or Tamponade) Cardiac Issues (Thrombosis: Pulmonary/MI) Accidental OD (Tablets) Dialysis / Renal Failure (Hyperkalemia)	Unresponsive Pulseless Apnea/Agonal Respirations Absent heart sounds on auscultation	Respiratory failure Airway foreign body Congenital heart disease Rule out H's & T's (see Additional Considerations)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">Establish pulselessness/apnea; call for ALS/additional resources as requiredSee A - 6, Non-Initiation / Field Termination for non-initiation criteria or DNR/IInitiate high-quality CPR at a ratio of 15:2 (2-rescuer), apply AED and follow prompts (use Peds pads if able)E - 2, Airway Management / OxygenSigns of Puberty (axilla hair, breast development) or > 60kg: see B – 5, Cardiac ArrestSuspected Overdose: Naloxone 4mg (pre-measured) IN, repeat q 2 - 3 min PRN; see E - 15, Overdose / Toxic IngestionAssess patient for BGL & Hypothermia, see B - 23, HypothermiaH's and T's: Treat underlying causes IAW relevant protocolROSC: See E - 6, ROSCAfter 20 min of high-quality CPR, contact OLMC to discuss termination of resuscitation
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">Capnometry (inline with BVM or SGA) - Maintain > 10mmHg to ensure high quality CPRSGA - As soon as possible (without interrupting compressions or defibrillation)
					<ul style="list-style-type: none">*Vascular Access: Establish access ASAP, then additional IV/IO (Consider dual lumen peripheral IV) when able:<ul style="list-style-type: none">Immediately after access - Epinephrine (1mg/10mL) 0.01mg/kg IV/IO, then q 3 - 5 min to ROSC/field terminationHypovolemia - LR 20mL/kg IV/IO, may repeat x 2 PRN to a max of 60mL/kgBGL < 60 mg/dL (< 45 mg/dL for under 2 months):<ul style="list-style-type: none">*Dextrose 10% (D10W pre-mixed bag) 5mL/kg IV/IO, repeat x 1 in 3 - 5 min PRN to BGL > 70mg/dL
					<ul style="list-style-type: none">EtCO2 Monitoring (Capnography) - Maintain > 10mmHg to ensure high quality CPRAirway Management - SGA is the primary method of airway management, cricothyrotomy if SGA ineffective or required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.)<ul style="list-style-type: none">USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may be considered if SGA is ineffectiveVF / Pulseless VT:<ul style="list-style-type: none">Defibrillate at 2 J/kg (initial) and 4 J/kg (biphasic) after each 2 min cycle / rhythm confirmationAfter first shock & Epi has been administered as above:

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	<ul style="list-style-type: none"> - Amiodarone 5mg/kg IV/IO, may repeat q 5 min x 2 PRN • Torsades de Pointes - Magnesium Sulfate 25 - 50mg/kg in 10mL NS IV/IO pushed over 2 - 5 min x 1; max dose 2g • Hyperkalemia: <ul style="list-style-type: none"> - Calcium Gluconate 60mg/kg IV/IO over 2 - 5 min, max single dose 2g, repeat x 1 in 10 min PRN; flush line between meds - Sodium Bicarbonate 8.4% - 1mEq/kg IV/IO over 2 - 5 min, max single dose 100mEq, repeat x 1 in 10 min PRN; flush line between meds - Albuterol 10mg Nebulized via in-line nebulizer
	<ul style="list-style-type: none"> • Endotracheal Intubation (ETI) - If the SGA is not effective or patient requires ETT to allow for tracheal suctioning, utilize Video Laryngoscopy w/Bougie or Direct Laryngoscopy w/ Bougie. Discuss with OLMC the potential benefit of intubation after first 10 minutes of cardiac arrest resuscitation prior to considering Field Termination • Open Thoracostomy - If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis in cardiac arrest. • Point-of-Care Ultrasound – Cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

Defibrillation									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Initial - 2J	6 - 10J	12 - 14J	16 - 18J	20 - 22J	24 - 28J	30 - 36J	38 - 46J	48 - 58J	60 - 72J
4J	12 - 20J	24 - 28J	32 - 36J	40 - 44J	48 - 56J	60 - 72J	72 - 92J	92 - 116J	120-144J

Fluid Resuscitation										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg	mL	80	130	170	210	260	330	420	530	650
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

First Line Cardiac Arrest Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Epinephrine (1mg/10mL) - 0.01mg/kg IV/IO									
0.01mg/kg	0.04mg	0.07mg	0.09mg	0.11mg	0.13mg	0.17mg	0.21mg	0.27mg	0.33mg
mL	0.4mL	0.7mL	0.9mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Amiodarone - 5mg/kg (150mg/3mL)									
5mg/kg	20mg	32.5mg	42.5mg	52.5mg	65mg	82.5mg	105mg	132.5mg	162.5mg
mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Magnesium Sulfate - 25mg/kg (5g/10mL)									
25mg/kg	100mg	163mg	212mg	262mg	325mg	412mg	525mg	662mg	812mg
mL	0.2mL	0.3mL	0.4mL	0.5mL	0.7mL	0.8mL	1.1mL	1.3mL	1.6mL
Draw Magnesium direct from Bristojet/Vial and dilute to 10mL and administer over 5 min									

Hypoglycemia / Overdose Cardiac Arrest Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg

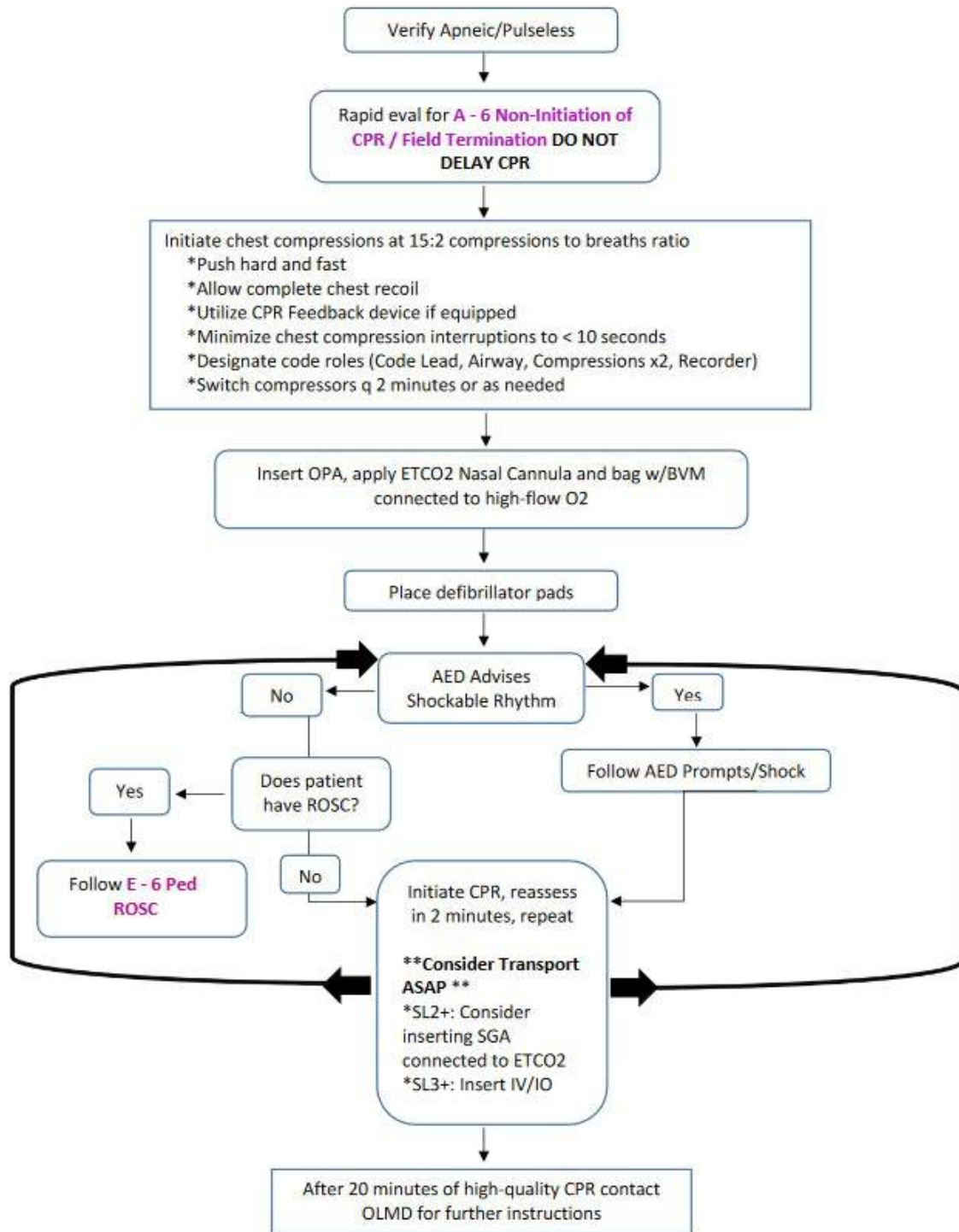
Pediatric Medical Protocols

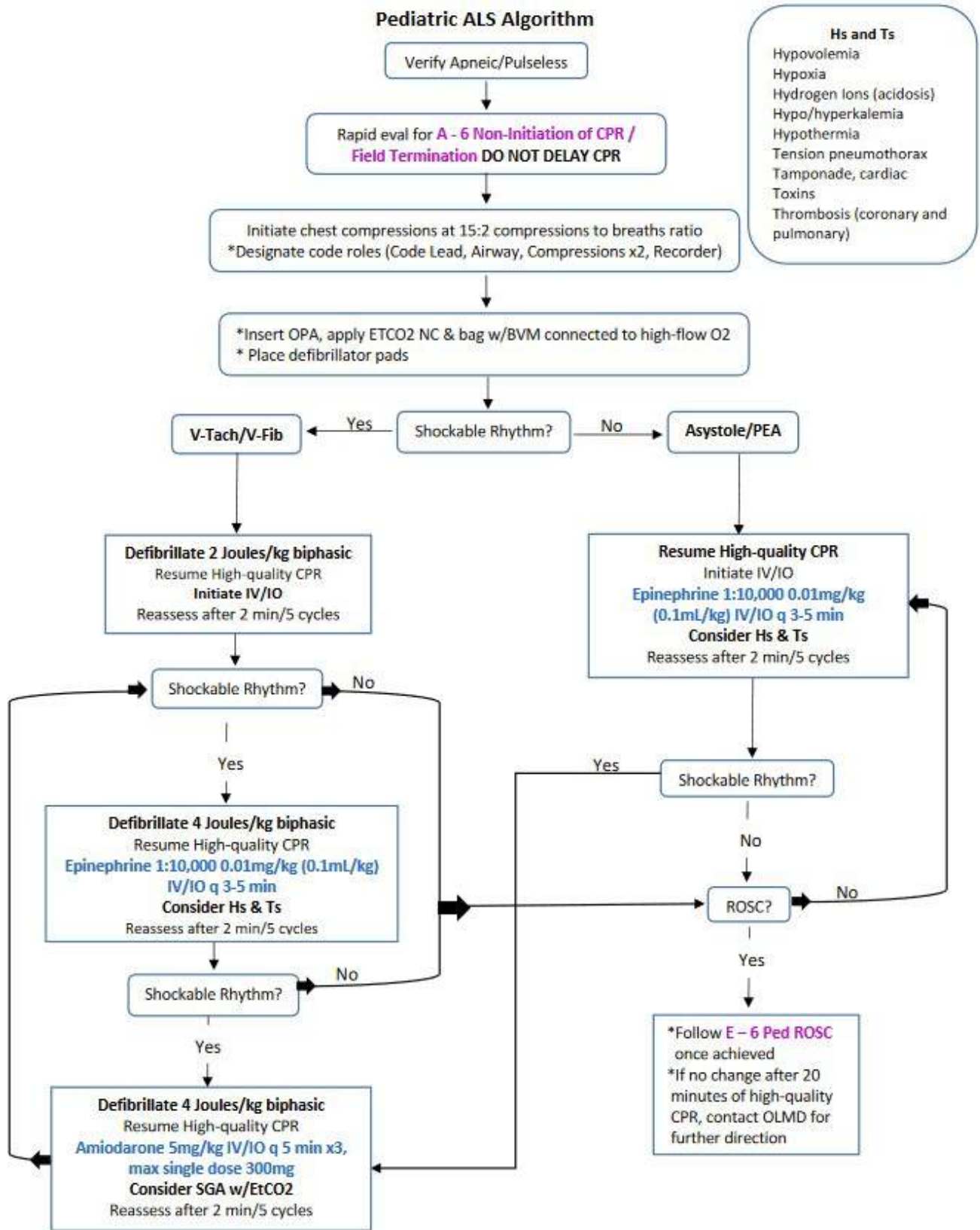
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
D10W (250mL) - Use Syringe or Burette to administer									
5mL/kg	2g	3.3g	4.3g	5.3g	6.5g	8.3g	10.5g	13.5g	16.3g
mL	20mL	32.5mL	42.5mL	52.5mL	65mL	82.5mL	105mL	132.5mL	162.5mL

Hyperkalemia Treatment									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Calcium Gluconate (100mg/1mL) 60mg/kg									
60mg/kg	240mg	390mg	510mg	630mg	780mg	990mg	1260mg	1590mg	1950mg
mL	2.4mL	3.9mL	5.1mL	6.3mL	7.8mL	9.9mL	12.6mL	15.9mL	19.5mL
Sodium Bicarbonate 8.4% - 1mEq/kg									
1mEq/kg	4mEq	6.5mEq	8.5mEq	10.5mEq	13mEq	16.5mEq	21mEq	26.5mEq	32.5mEq
mL	4mL	6.5mL	8.5mL	10.5mL	13mL	16.5mL	21mL	26.5mL	32.5mL

Additional Considerations	
<ul style="list-style-type: none"> • Cardiac arrest resuscitations will be performed on scene unless there is a danger to EMS personnel. In these scenarios the rapid initiation of on scene resuscitation improves patient mortality. * IAW the 2020 AHA updates, IV access is the preferred medication administration route in cardiac arrest pts due to several studies demonstrating increased negative outcomes with IO use. IV access should be attempted, but it should not delay the administration of medications. Providers should gain IV access as soon as they are able. • *Dextrose 10% preparation if premixed bag is unavailable: <ul style="list-style-type: none"> - Fill burette to 200mL and add 50mL D50. -OR- - Waste 50mL from 250mL NS IV bag and add Dextrose 50% 25g (50mLs); yields 10% Dextrose (10g/100mL). • Majority of pediatric arrests occur secondary to a respiratory issue; early/aggressive airway management is necessary. • High-quality CPR consists of: pushing hard and fast, allowing complete recoil of the chest, utilizing CPR feedback device if equipped to ensure adequate rate/depth (100 - 120/min / > 1/3rd depth of the chest), minimizing chest compression interruptions to < 10 seconds, switching compressors every 2 min or as needed. • Perform continuous compressions in the presence of an advanced airway with breaths q 2 - 3 seconds. <p>NOTE: Rescuers may still need to perform 15:2 compressions to breaths with an SGA in place.</p>	
<p style="text-align: center;">Hs</p> <ul style="list-style-type: none"> - Hypovolemia: IV/IO Access, Fluids (E - 18, Shock / Hypotension) - Hypoxia: High-flow O2 (E - 2, Airway Management) - Hydrogen Ions (Acidosis): BVM Ventilation - Hyper/hypo-kalemia: Patient History - Hypothermia: Exam / Temperature (B - 23, Hypothermia) 	<p style="text-align: center;">Ts</p> <ul style="list-style-type: none"> - Toxins: Naloxone or other Tx (E - 15, Overdose / Toxic Exposure) - Tamponade, Cardiac/CVA: Trauma / Pt History - Tension Pneumothorax: Exam / Breath Sounds - Thrombosis, Coronary: Patient History, EKG - Thrombosis, Pulmonary: Patient History

Ped BLS Algorithm







ROSC & Post-Arrest Care (Pediatric)



Patient History	Signs and Symptoms	Differential
SAMPLE /OPQRST from bystanders Events leading up to arrest Estimated downtime / DNI/R or Living Will Hx: CP/SOB (Thrombosis: Pulmonary/MI or Tamponade) HTN/HLD (Thrombosis: Pulmonary/MI) Illicit Drug Use / Accidental OD (Tablets) Dialysis / Renal Failure (Hyperkalemia)	Sudden increase in ET _{CO2} to >35 mmHg Return of patient's pulse Return of normal respirations Patient has spontaneous movement	Rule out Hs & Ts (noted in Additional Considerations below)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• E - 2, Airway Management / Oxygen (Hypoxia / Acidosis)• H's and T's: Treat underlying causes IAW relevant protocol• Suspected Overdose; see E - 15, Overdose / Toxic Ingestion for additional causes/routes• Assess/treat patient for Hypothermia• BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - Will be continuously monitored• 12-Lead EKG - Obtain serial EKGs q 10 min and transmit if able• Cardiac Monitoring - Continuous monitoring
					<ul style="list-style-type: none">• Vascular Access - Ensure IV/IO x 2 (Consider dual lumen peripheral IV), see E - 18, Shock / Hypotension<ul style="list-style-type: none">- 20mL/kg LR IV/IO, max dose 60mL/kg; if available, utilize Blood/Fluid Warmer- Assess lung sounds after each bolus
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - Will be continuously monitored• Airway Management: If indicated, SGA is the primary method of airway management, cricothyrotomy if SGA ineffective or required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.)<ul style="list-style-type: none">- USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective• Post-Advanced Airway Sedation/Pain Management:<ul style="list-style-type: none">- Ketamine 2mg/kg IV/IO/IN, repeat q 10 min PRN to nystagmus, sedation or pain control• If pulmonary edema develops and/or hypotension remains despite fluid resuscitation, choose <u>ONE</u> of the following:<ul style="list-style-type: none">- Must administer using infusion pump, flow controller tubing, or 60gtt buretrol- *Epinephrine Drip 0.1 - 1mcg/kg/min IV/IO; start infusion at 0.1mcg/kg/min, titrate to SBP > age-specific hypotension (see below); max dose 10mcg/min- -OR-- Norepinephrine 0.1 - 2mcg/kg/min IV/IO titrated to SBP > greater than age minimum Transport to PCI capable hospital immediately, defibrillator pads should remain in place
					<ul style="list-style-type: none">• If pulmonary edema develops and/or hypotension remains despite fluid resuscitation:<ul style="list-style-type: none">- May consider: Epinephrine 5 - 10mcg IV/IO q 3 min PRN ("Push Dose;" 0.5 - 1mL of "Cardiac" Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip.• Point-of-Care Ultrasound - E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

V5 For use After 01 October 2025	Pediatric Medical Protocols E - 6	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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ROSC Checklist

- ☐ Manage airway (NRB, BVM, SGA) and titrate O₂ to $\geq 94\%$
- ☐ EtCO₂ to 35 - 45mmHg if ventilating with BVM (EtCO₂ may take 10 - 15 min to meet normal levels, do NOT hyperventilate to rapidly decrease EtCO₂)
- ☐ Obtain full set of vitals to include blood glucose every 5 min (minimum)
- ☐ Obtain serial 12 lead EKGs
- ☐ Perform continuous cardiac monitoring
- ☐ Treat hypotension
- ☐ Consider vasopressor for persistent hypotension
- ☐ Re-evaluate all interventions after any patient movement (airway, IV/IV access. etc.)
- ☐ Transport to pediatric hospital if possible; bring additional personnel in case patient arrests for a second time

*Hypotension is SBP less than:

1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)

Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Fluid Resuscitation

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg mL	80	130	170	210	260	330	420	530	650
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Ketamine - 2mg/kg IV/IO/IN (Post-SGA/Intubation/Cric)

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: administer ½ in each nostril w/atomizer				

Epinephrine Drip - 1mg/1mL in 100mL NS (10mcg/mL) - MUST use 60gtt buretrol or Infusion Pump						
Color / Dose	0.1mcg/kg/min	gtts/min (cc/hr.)	0.3mcg/kg/min	gtts/min (cc/hr.)	1mcg/kg/min	gtts/min (cc/hr.)
Gray 3-5kg	0.4mcg	3	1.2mcg	9	4mcg	30
Pink 6-7kg	0.6mcg	4	1.8mcg	12	6mcg	40
Red 8-9kg	0.8mcg	5	2.4mcg	15	8mcg	50
Purple 10-11kg	1.0mcg	6	3mcg	18	10mcg	60
Yellow 12-14kg	1.3mcg	8	3.9mcg	24	13mcg	80
White 15-18kg	1.6mcg	10	4.8mcg	30	16mcg	100
Blue 19-23kg	2.1mcg	13	6.1mcg	39	21mcg	130
Orange 24-29kg	2.7mcg	16	8.1mcg	48	27mcg	160
Green 30-36kg	3.3mcg	20	9.9mcg	60	33mcg	200

Norepinephrine (4mg in 250mL NS) Dose is avg of length/weight (MUST use Infusion Pump, Flow Controller Tubing, or 60gtt Burette)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.1 mcg/kg/min	0.4mcg	0.65mcg	0.85mcg	1.05 mcg	1.3mcg	1.65mcg	2.1mcg	2.65mcg	3.25mcg
mL/hr. (gtts/min)	1.5	2.4	3.2	3.9	4.9	6.2	7.9	9.9	12.2
0.2 mcg/kg/min	0.8mcg	1.3mcg	1.7mcg	2.1mcg	2.6mcg	3.3mcg	4.2mcg	5.3mcg	6.5mcg
mL/hr. (gtts/min)	3	4.9	6.4	7.9	9.8	12.4	15.8	19.9	24.4
0.3 mcg/kg/min	1.2mcg	1.95mcg	2.55mcg	3.15mcg	3.9mcg	4.95mcg	6.3mcg	7.95mcg	9.75mcg
mL/hr. (gtts/min)	4.5	7.3	9.6	11.8	14.6	18.6	23.6	29.8	36.6
0.4 mcg/kg/min	1.2mcg	2.6mcg	3.4mcg	4.2mcg	5.2mcg	6.6mcg	8.4mcg	10.6mcg	13mcg
mL/hr. (gtts/min)	6	9.8	12.8	15.8	19.5	24.8	31.5	39.8	48.8
0.5 mcg/kg/min	2mcg	3.25mcg	4.25mcg	5.25mcg	6.5mcg	8.25mcg	10.5mcg	13.25 mcg	16.25 mcg
mL/hr. (gtts/min)	7.5	12.2	15.9	19.7	24.4	30.9	39.4	49.7	60.9
1 mcg/kg/min	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
mL/hr. (gtts/min)	15	24.4	31.9	39.4	48.8	61.9	78.8	99.4	121.9
1.5 mcg/kg/min	6mcg	9.75mcg	12.75 mcg	15.75 mcg	19.5mcg	24.75 mcg	31.5mcg	39.75 mcg	48.75 mcg
mL/hr. (gtts/min)	22.5	36.6	47.8	59.1	73.1	92.8	118.1	149.1	182.8
2 mcg/kg/min	4mcg	13mcg	17mcg	21mcg	26mcg	33mcg	42mcg	53mcg	65mcg
mL/hr. (gtts/min)	30	48.8	63.8	78.8	97.5	123.8	157.5	198.7	243.8
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

*0.1 - 0.5mcg/kg/min is most common dosing; above 1mcg/kg/min is a very critical patient

"Push Dose" Epinephrine
Using 1mg/10mL Epinephrine ("Cardiac"), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations

- Post-cardiac arrest arrhythmias are common and most self-resolve; it is not necessary to routinely treat these arrhythmias unless the patient is deteriorating.
- Post-Arrest rhythms requiring transcutaneous pacing: Continuously verify mechanical capture by palpating a pulse. Pacer spikes could mask a rhythm change and re-arrest.
- **Targeted Temperature Management:** Current data has not demonstrated a morbidity or mortality benefit in the prehospital initiation of post-ROSC cooling. This should be deferred until the patient arrives at the receiving facility. 2015 ILCOR recommendations specifically advise against prehospital responders administering cold fluids to obtain targeted temperature management.
- Pressors should be considered if the patient fails to respond to fluid boluses.

Hs	Ts
<ul style="list-style-type: none"> - Hypovolemia: IV/IO Access, Fluids (E - 18, Shock / Hypotension) - Hypoxia: High-flow O2 (E - 2, Airway Management) - Hydrogen Ions (Acidosis): BVM Ventilation - Hyper/hypo-kalemia: Patient History - Hypothermia: Exam / Temperature (B - 23, Hypothermia) 	<ul style="list-style-type: none"> - Toxins: Naloxone or other Tx (E - 15, Overdose / Toxic Exposure) - Tamponade, Cardiac/CVA: Trauma / Pt History - Tension Pneumothorax: Exam / Breath Sounds - Thrombosis, Coronary: Patient History, EKG - Thrombosis, Pulmonary: Patient History



Bradycardia (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of congenital heart disease, prolonged QT syndrome, Kawasaki Disease Respiratory distress/failure Non-accidental trauma (intracranial bleeding) Toxic Ingestion (Beta blockers, Calcium channel blockers, digitalis)	Hypotension, Shock, AMS SOB, respiratory distress, cyanosis Signs of pulmonary edema (crackles/rales) Prolonged capillary refill Pallor	Respiratory failure, hypoxia Heart disease (congenital/ cardiomyopathy) Head injury, trauma Sepsis/Infection, Hypothermia Toxic Ingestion/Overdose Hypothyroidism, hypoglycemia Athlete/normal for patient

Clinical Practice Guidelines					
S L 1	S L 2	S L 3	S L 4	S L 5	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• E - 2, Airway Management / Oxygen• Signs of Puberty (axilla hair, breast development) or > 60kg: see B – 7, Bradycardia• HR < 60 bpm, symptomatic and poor perfusion/shock despite oxygenation/ventilation:<ul style="list-style-type: none">- Begin CPR at 15:2 rate, recheck pulse q 2 min; once pulse > 60 bpm stop CPR• BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies• Obtain patient's weight using a color-coded length-based resuscitation tape
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be continuously monitored• Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min and transmit if able
	S L 3	S L 4	S L 5	S L 6	<ul style="list-style-type: none">• Vascular Access - If hypotensive administer fluids per E - 18, Shock / Hypotension• If heart rate remains < 60 bpm despite 2 min CPR:<ul style="list-style-type: none">- Epinephrine (1mg/10mL) 0.01mg/kg IV/IO q 3 - 5 min
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored• Increased Vagal Tone, AV Block or Cholinergic Drug Toxicity:<ul style="list-style-type: none">- Atropine 0.02mg/kg IV/IO (min dose 0.1mg, max single 0.5mg) repeat x 1 PRN in 3 min• *Transcutaneous Pacing (if hypotensive/poor perfusion or no improvement with Epi and Atropine) - Set to 100 bpm, stop CPR, begin pacing / ensure electrical and mechanical capture. If no capture in 15 seconds, resume CPR• Transcutaneous Pacing Sedation (if time allows):<ul style="list-style-type: none">- Patients > 3 months old with any SBP: Ketamine 1mg/kg IV/IO repeat x 1 PRN in 10 min• Suspected Calcium Channel or Beta Blocker Overdose, see E - 15 Overdose / Toxic Ingestion• If patient has a history of renal failure, is undergoing cancer radiation or chemotherapy, or there is concern for hyperkalemia based on EKG interpretation administer all of the following:<ul style="list-style-type: none">- Calcium Gluconate 60mg/kg IV/IO over 2 - 5 min max single dose 2g; repeat x 1 in 10 min PRN; flush line between meds- Sodium Bicarbonate 8.4% 1mEq/kg IV/IO over 2 - 5 min, repeat x 1 in 10 min PRN; flush line between meds- Albuterol 10mg Nebulized• 12-Lead EKG - Obtain immediately with rhythm change or pacing capture
	S L 4	S L 5	S L 6	S L 7	

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*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Bradycardia Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Epinephrine (1mg/10mL 1:10,000) - 0.01mg/kg IV/IO									
0.01mg/kg	0.04mg	0.07mg	0.09mg	0.11mg	0.13mg	0.17mg	0.21mg	0.27mg	0.33mg
mL	0.4mL	0.7mL	0.9mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Atropine - 0.02mg/kg (1mg/10mL)									
1mg/kg	0.1mg	0.13mg	0.17mg	0.21mg	0.26mg	0.33mg	0.42mg	0.5mg	0.5mg
mL	0.1mL	1.3mL	1.7mL	2.1mL	2.6mL	3.3mL	4.2mL	5ml	5ml

Ketamine - 1mg/kg IV/IO (Sedation for Pacing)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
1mg/kg	4mg	6.5mg	8.5mg	10.5mg	13mg	16.5mg	21mg	26.5mg	32.5mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
10mg/mL IV / IO / IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 2mL from 10mL NS Vial Add 100mg (2mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush				Remove 1mL from 10mL NS Vial Add 100mg (1mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush				

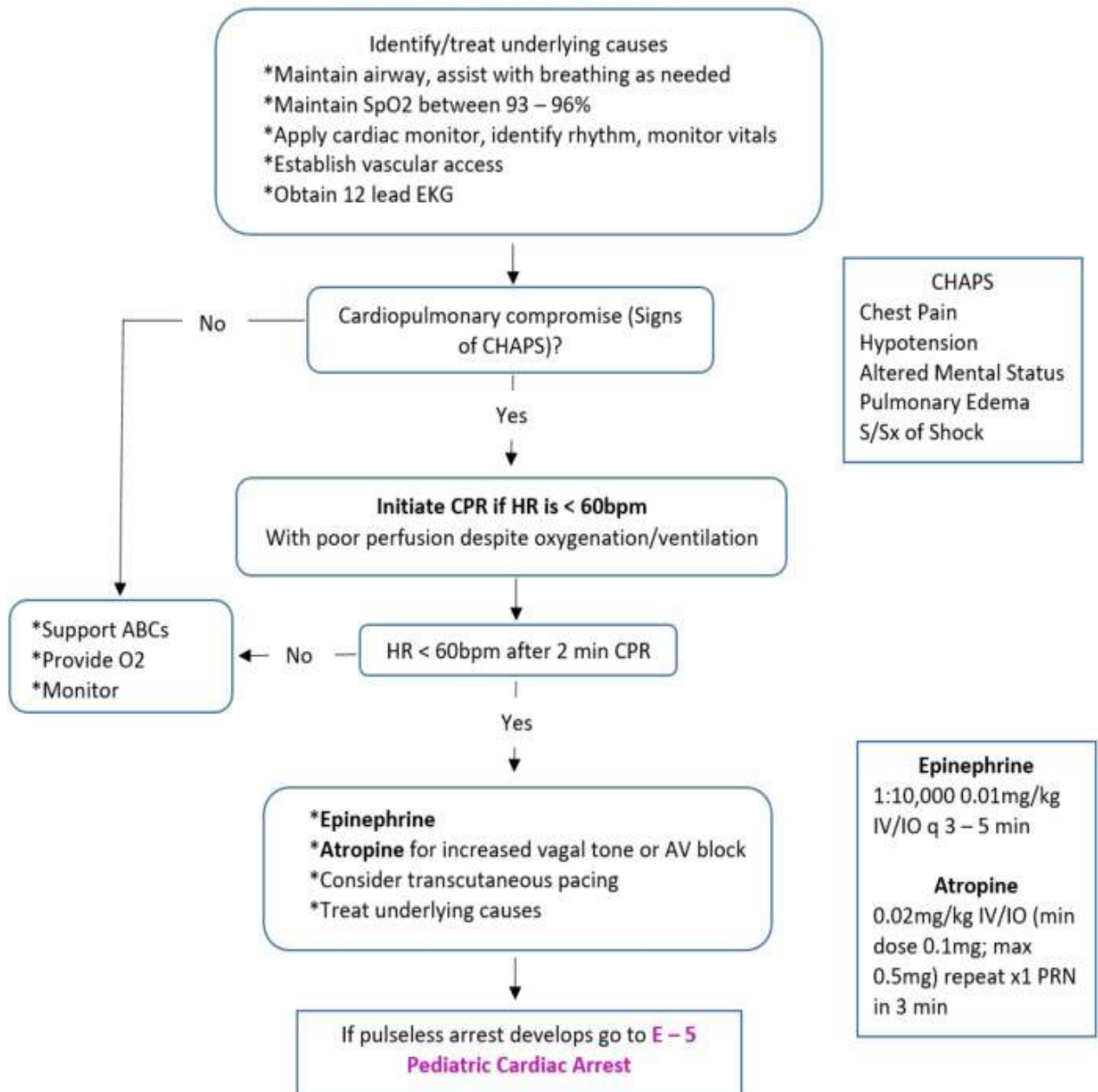
Bradycardia / Overdose Treatment									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Calcium Gluconate (100mg/1mL) 60mg/kg									
60mg/kg	240mg	390mg	510mg	630mg	780mg	990mg	1260mg	1590mg	1950mg
mL	2.4mL	3.9mL	5.1mL	6.3mL	7.8mL	9.9mL	12.6mL	15.9mL	19.5mL
Sodium Bicarbonate 8.4% - 1mEq/kg									
1mEq/kg	4mEq	6.5mEq	8.5mEq	10.5mEq	13mEq	16.5mEq	21mEq	26.5mEq	32.5mEq
mL	4mL	6.5mL	8.5mL	10.5mL	13mL	16.5mL	21mL	26.5mL	32.5mL
Glucagon - 0.05mg/kg (1mg/mL)									
0.05mg/kg	< 20kg = 0.5mg (0.5mL)						> 20kg = 1mg (1mL)		
mL									

Pediatric Medical Protocols

Additional Considerations

- Hypoxia is the leading cause of bradycardia. Oxygenation/ventilation should be immediately established.
- Consider treatable causes of bradycardia: Hypoxia, Tension Pneumo, Toxic Ingestion, Hyperkalemia, Hypothermia.
- Obtain continuous rhythm strip in conjunction with each chemical / electrical cardioversion attempt.

Pediatric Bradycardia Algorithm





Tachycardia, Narrow Complex (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of WPW, prolonged QT syndrome, cardiac ablations, congenital heart disease, diabetes Medications Trauma Toxic ingestion Infection/Fever	Infants < 1 yr: HR > 220 bpm Children > 1 yr: HR > 180 bpm AMS, hypotension, shock Dizziness, lightheadedness, syncope, chest pain, fatigue, SOB, palpitations Sinus tachycardia Supraventricular arrhythmias	Respiratory failure, hypoxia, PE Congenital heart disease Toxic ingestion Hyperthyroidism Hyperglycemia (DKA) Infection, sepsis Hypovolemia (trauma, dehydration) Pneumothorax Anxiety, exertion, fear

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen • Asymptomatic - Closely monitor, no intervention is required • If signs of puberty present (axilla hair, breast development) or > 60kg see B - 8, Tachycardia, Narrow Complex • If Tachycardic - Search for/treat causes IAW applicable protocol; closely monitor • BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies
L	L	L	L	L	<ul style="list-style-type: none"> • Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min, transmit if able • EtCO2 (Capnometry) - Will be monitored
1	2	3	4	5	<ul style="list-style-type: none"> • Vascular Access - If hypotensive, administer fluids per E - 18, Shock / Hypotension • EtCO2 (Capnography) - Will be monitored • Unstable/Symptomatic (Most commonly presents as hypotension or AMS): <ul style="list-style-type: none"> - Synchronized Cardioversion: 0.5 - 1 J/kg; if ineffective, increase to 2 J/kg; repeat q 2 - 3 min PRN - Cardioversion Sedation (if time allows): <ul style="list-style-type: none"> - Patients > 3 months old with any SBP: <ul style="list-style-type: none"> - Ketamine 1mg/kg IV/IO may repeat x 1 PRN in 10 min • Stable SVT (see rates in S/Sx, or failed electrical cardioversion): <ul style="list-style-type: none"> - Attempt *Vagal Maneuvers - 20mL/kg LR bolus IV/IO - Adenosine 0.1mg/kg rapid IV/IO push; max dose 6mg - If no rhythm change after 3 min: Adenosine 0.2mg/kg rapid IV/IO push; max dose 12mg - If Adenosine is ineffective, consider synchronized cardioversion as above • 12-Lead EKG - Obtain immediately with rhythm change

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

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Fluid Resuscitation										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg	mL	80	130	170	210	260	330	420	530	650
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Narrow Tachycardia WITH Pulse Medications										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Adenosine (6mg/2mL) 1st Dose: 0.1mg/kg										
0.1mg/kg	0.4mg	0.65mg	0.85mg	1.1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg	
mL	0.13mL	0.22mL	0.28mL	0.35mL	0.43mL	0.55mL	0.7mL	0.9mL	1.1mL	
Adenosine (6mg/2mL) 2nd Dose: 0.2mg/kg										
0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg	
mL	0.3mL	0.4mL	0.6mL	0.7mL	0.9mL	1.1mL	1.4mL	1.8mL	2.2mL	

Ketamine - 1mg/kg IV/IO (Sedation for Pacing)										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
1mg/kg		4mg	6.5mg	8.5mg	10.5mg	13mg	16.5mg	21mg	26.5mg	32.5mg
*mL		0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
10mg/mL IV / IO / IN	LABEL all Vials with "Medication Added" sticker									
	Ketamine Concentration 500mg/10mL (50mg/mL)					Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 2mL from 10mL NS Vial Add 100mg (2mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush					Remove 1mL from 10mL NS Vial Add 100mg (1mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush				

Additional Considerations										
<ul style="list-style-type: none"> • CHAPS is less common in pediatric patients; unstable patients will normally present with hypotension and/or AMS. • *Vagal Maneuvers: Direct the child to attempt to blow the plunger out of a syringe. For infants, place a bag of slushy ice across the forehead/bridge of the nose and eyes for 10 seconds. Note: Chemical ice packs may not be cold enough to be effective. • Obtain continuous rhythm strip in conjunction with each chemical / electrical cardioversion attempt. • Sinus Tachycardia: P waves present and upright in leads I, II; Variable R-R interval; constant PR interval. <ul style="list-style-type: none"> - Infants (< 1yrs old): HR usually < 220 bpm - Child (1 yr – puberty): HR usually < 180 bpm • Supraventricular Tachycardia: P waves absent or altered morphology. <ul style="list-style-type: none"> - Infants (< 1 yrs old): HR usually > than 220 bpm - Child (1 yr – puberty): HR usually > 180 bpm • Consider underlying causes of tachycardia: hypoxia, dehydration, hyperthermia, medications, toxic ingestion, pain. • Separating the child from their parent/caregiver may increase anxiety and worsen the condition. • Adenosine should be administered directly to the IV/IO hub via a 3-way stopcock connected to Adenosine dose and a 5 - 10mL flush (5mL for infants, 10mL for child). Administer Adenosine rapidly followed immediately by saline flush. Half-life is < 10 seconds. 										

Pediatric Medical Protocols



Tachycardia, Wide Complex (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of WPW, prolonged QT, cardiac ablations, congenital heart disease Medications / Toxic Ingestion	AMS, hypotension, shock, syncope Dizziness, lightheadedness, chest pain/SOB, palpitations Arrhythmias / fatigue	Respiratory failure Hypoxia Pulmonary embolism Congenital heart disease Toxic ingestion

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen • Signs of Puberty (axilla hair, breast development) or > 60 kg: see B - 9, Tachycardia, Wide Complex • BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies • Obtain patient's weight using a color-coded length-based resuscitation tape
L	L	L	L	L	<ul style="list-style-type: none"> • EtCO2 (Capnometry) - Will be continuously monitored • Cardiac Monitoring & 12-Lead EKG - Obtain serial EKGs q 10 min and transmit if able • Vascular Access - If hypotensive per age - 20mL/kg LR bolus IV/IO; repeat x 1 PRN
1	2	3	4	5	<ul style="list-style-type: none"> • EtCO2 (Capnography) - Will be monitored • Unstable/Symptomatic (Most commonly presents as hypotension or AMS): <ul style="list-style-type: none"> - Synchronized Cardioversion: 0.5 - 1 J/kg; if ineffective, increase to 2 J/kg - Cardioversion Sedation (if time allows): <ul style="list-style-type: none"> - Patients > 3 months old with any SBP: <ul style="list-style-type: none"> - Ketamine 1mg/kg IV/IO, repeat x 1 PRN in 10 min • Stable/Asymptomatic w/ Regular/Monomorphic QRS: <ul style="list-style-type: none"> - Place defib pads and consult OLMC prior to administering below meds: - Adenosine 0.1mg/kg rapid IV/IO push x 1 max dose of 6mg - If no rhythm change after 3 min: Adenosine 0.2mg/kg IV/IO x 1 max dose of 12mg • Torsades de Pointes: <ul style="list-style-type: none"> - If pulseless begin CPR and see E - 5, Cardiac Arrest - Magnesium Sulfate 25 - 50mg/kg IV/IO in 10mL NS pushed over 2 - 5 min x 1; max dose 2g • If patient has a history of renal failure, is undergoing cancer radiation or chemotherapy, or there is concern for hyperkalemia based on EKG interpretation administer all of the following: <ul style="list-style-type: none"> - Calcium Gluconate 60mg/kg IV/IO over 2 - 5 min, max single dose 2g; repeat x 1 in 10 min PRN; flush line between meds - Sodium Bicarbonate 8.4% 1mEq/kg IV/IO over 2 - 5 min, repeat x 1 in 10 min PRN; flush line between meds - Albuterol 10mg Nebulized • 12-Lead EKG - Obtain immediately with rhythm change

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

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Fluid Resuscitation										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg	mL	80	130	170	210	260	330	420	530	650
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Wide Tachycardia WITH Pulse Medications										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Adenosine (6mg/2mL) 1st Dose: 0.1mg/kg										
0.1mg/kg	0.4mg	0.65mg	0.85mg	1.1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg	
mL	0.13mL	0.22mL	0.28mL	0.35mL	0.43mL	0.55mL	0.7mL	0.9mL	1.1mL	

Adenosine (6mg/2mL) 2nd Dose: 0.2mg/kg										
0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg	
mL	0.3mL	0.4mL	0.6mL	0.7mL	0.9mL	1.1mL	1.4mL	1.8mL	2.2mL	

Amiodarone - 5mg/kg (150mg/3mL)										
5mg/kg	20mg	32.5mg	42.5mg	52.5mg	65mg	82.5mg	105mg	132.5mg	162.5mg	
mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL	

*Amiodarone Drip over 10min (300gtts/min = 300mL/hr. if using an infusion pump)

Buretrol (60gtt): Fill buretrol to 20mL, inject medication, fill to 50mL & infuse at 300gtts/min (5gtts/second)

50mL NS/60gtt tubing: Withdraw mL of NS equivalent to dose. Inject Amiodarone (mL above) and mix. * Infuse as above

Magnesium Sulfate - 25mg/kg (5g/10mL)										
25mg/kg	100mg	163mg	212mg	262mg	325mg	412mg	525mg	662mg	812mg	
mL	0.2mL	0.3mL	0.4mL	0.5mL	0.7mL	0.8mL	1.1mL	1.3mL	1.6mL	

Draw Magnesium direct from Bristojet/Vial and dilute to 10mL and administer over 5 min

Ketamine - 1mg/kg IV/IO (Sedation for Pacing)										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
1mg/kg		4mg	6.5mg	8.5mg	10.5mg	13mg	16.5mg	21mg	26.5mg	32.5mg
*mL		0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL

LABEL all Vials with "Medication Added" sticker

10mg/mL IV / IO / IN	Ketamine Concentration 500mg/10mL (50mg/mL)					Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 2mL from 10mL NS Vial Add 100mg (2mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush					Remove 1mL from 10mL NS Vial Add 100mg (1mL) to NS Vial (10mg/mL) IV/IO: IV slow push, follow with flush				

Hyperkalemia Treatment									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Calcium Gluconate (100mg/1mL) 60mg/kg									
60mg/kg	240mg	390mg	510mg	630mg	780mg	990mg	1260mg	1590mg	1950mg
mL	2.4mL	3.9mL	5.1mL	6.3mL	7.8mL	9.9mL	12.6mL	15.9mL	19.5mL
Sodium Bicarbonate 8.4% - 1mEq/kg									
1mEq/kg	4mEq	6.5mEq	8.5mEq	10.5mEq	13mEq	16.5mEq	21mEq	26.5mEq	32.5mEq
mL	4mL	6.5mL	8.5mL	10.5mL	13mL	16.5mL	21mL	26.5mL	32.5mL

Additional Considerations									
<ul style="list-style-type: none"> • CHAPS is less common in pediatric patients; unstable patients will normally present with hypotension and/or AMS. • Obtain continuous rhythm strip in conjunction with each chemical / electrical cardioversion attempt. • V-Tach is uncommon in children. HR varies from normal rate to > 200 bpm; children presenting with V-Tach usually have an underlying heart disease, hx of cardiac surgery, prolonged QT syndrome, or cardiomyopathy. • Adenosine should be administered directly to the IV hub via a 3-way stopcock connected to Adenosine dose and a 5 - 10mL flush (or with a flush through a proximal port in IV tubing). Administer Adenosine rapidly followed immediately by saline flush. Half-life is < 10 seconds. • When treating hyperkalemia, ensure IV line is flushed prior to administration of additional medications. • Consider treatable causes of tachycardia: medication overdose, dehydration, pain, hyperthermia, hypoxia. • Separating the child from their parent/caregiver may increase anxiety and worsen the condition. 									



Altered Mental Status / *BRUE (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Previous Hx of Diabetes (self/family) Previous Hx cardiac/stroke/seizure Previous Hx of Trauma Toxic Ingestion Recent Illness	Decreased Mental Status Change in Baseline Mental Status Irritability / Changes in Sleeping Changes in Feeding Bizarre Behavior (hallucinations, delusions) Hypoglycemia (cool, diaphoretic, skin, seizure) Hyperglycemia (warm, dry skin; Kussmaul respirations)	*AEIOU-TIPS Head Trauma or Hypoxia CNS (seizure, infection) Cardiac Hypothermia/Hyperthermia Shock (septic, hypovolemic) Diabetes (hyper/hypo) Substance Abuse History of Endocrine / Metabolic Disorder

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• Crew/responder safety is the main priority; see B - 18, Behavioral Emergencies / Restraints• E - 2, Airway Management / Oxygen• Check pupillary response, treat suspected overdose, see E - 15, Overdose / Toxic Ingestion• Seizure/Postictal, see E - 17, Seizures• Head Trauma, see F - 1, General Trauma• BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit to receiving facility if capable• Vascular Access - If hypotensive, administer fluids per E - 18, Shock / Hypotension• EtCO2 (Capnography) - Will be monitored

Additional Considerations	
<ul style="list-style-type: none">• Patients ages 0 - 6 months presenting with lethargy, decreased feeding, and decreased wet diapers should be evaluated for AMS. Assess for signs of trauma, infection, hypo/hyperthermia, hypoglycemia, hypotension and tachycardia.• Toddlers should be evaluated for reduced PO intake and/or vomiting/diarrhea as a cause of AMS.• Suspected *Brief Resolved Unexplained Event (BRUE): An event observed by a bystander in an infant who is < 1 year of age, which has no obvious explanation. Events are usually sudden/brief (less than 1 min) and have completely resolved upon EMS arrival. BRUEs may include one of the following:<ul style="list-style-type: none">- Absent, decreased, or irregular breathing- Color change (central cyanosis or pallor)- Marked change in muscle tone (hyper- or hypotonia)- Altered level of responsiveness <p>A PATIENT THOUGHT TO HAVE EXPERIENCED A BRUE SHOULD BE TRANSPORTED. CASES OF SERIOUS UNDERLYING PATHOLOGY HAVE RESULTED IN DEATH.</p> <ul style="list-style-type: none">• Evaluate for serious etiologies that may be mistaken for a BRUE:<ul style="list-style-type: none">- Change in tone associated with choking or feeding (cardiac pathology)- Seizure (eye deviation, nystagmus, tonic-clonic activity)- History or exam concerning for child abuse or neglect- Hypo/hyperglycemia	

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Anaphylaxis & Allergic Reaction (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Hx of Anaphylaxis Known allergy/exposure (Insect sting or bite) Prescribed EpiPen Use of EpiPen prior to arrival New clothing, soap, detergent	Mild Reaction: Single system involvement (mucocutaneous, GI, etc.) Normal BP and O2 Saturation Moderate/Severe Reaction: Multi-System Involvement and/or resp distress Itching, Rash, Respiratory Sx (dyspnea, wheezing, stridor, hypoxia), Hoarseness/difficulty swallowing, Angioedema, Nausea/vomiting/diarrhea Hypotension or shock	Asthma or COPD Aspiration/airway obstruction Angioedema (drug induced: lisinopril) Anxiety

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen - Use BVM as required • Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 17, Anaphylaxis & Allergic Reaction • Remove stinger if present / Apply cold pack to insect bite/sting, see B - 19, Bites / Envenomations • Moderate/Severe Reaction - Assist with patient's prescribed Epinephrine Autoinjector IM, (lateral thigh), repeat q 5 min PRN; max of 3 doses
L	L	L	L	L	<ul style="list-style-type: none"> • EtCO2 (Capnometry) - Will be continuously monitored • 12-Lead EKG - Obtain as clinically indicated • Cardiac Monitoring - Continuous monitoring • Moderate/Severe Reaction (Respiratory Distress / Multi System Involvement) <ul style="list-style-type: none"> - Epinephrine Autoinjector 0.15mg IM (lateral thigh), repeat q 5 min PRN; max of 3 doses - If > than 30kg - See B - 17, Anaphylaxis / Allergic Reaction • Wheezing/Respiratory Distress: <ul style="list-style-type: none"> - *Albuterol 2.5mg/2.5mL nebulized, repeat q 10 min PRN; no max dose - *Ipratropium Bromide 0.5mg/3mL nebulized, repeat q 10 min PRN; max dose 1.5mg
1	2	3	4	5	<ul style="list-style-type: none"> • Mild Reaction (Urticaria/Pruritus): <ul style="list-style-type: none"> - Diphenhydramine 1mg/kg IV/IO/IM/PO x 1, max dose 50mg in 4 hours • Vascular Access - If hypotensive based on age see E - 18, Shock / Hypotension
					<ul style="list-style-type: none"> • EtCO2 (Capnography) - May permit permissive hypercapnia (> 45mmHg) due to severity • Moderate/Severe Reaction - If not previously administered, give ALL of the following: <ul style="list-style-type: none"> - Diphenhydramine 2mg/kg IV/IO/IM x 1; max dose 50mg in 4 hours - If < than 30kg - Epinephrine (1mg/1mL) 0.15mg IM, repeat q 5 min PRN x 2; max total dose 0.45mg - If > than 30kg - See B - 17, Anaphylaxis / Allergic Reaction • Audible wheezing or obvious respiratory distress unimproved with above treatment: <ul style="list-style-type: none"> - Dexamethasone 0.5mg/kg IV/IO/IM/PO x 1 (max dose 10mg) • If patient remains hypotensive despite above treatment and two fluid boluses: <ul style="list-style-type: none"> - *Epinephrine Drip 0.1 - 1mcg/kg/min IV/IO; start infusion at 0.1mcg/kg/min, titrate to SBP > age-specific hypotension (see below); must use infusion pump, flow controller

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	tubing, or 60gtt burette set; max dose 10mcg/min
	<ul style="list-style-type: none"> If patient remains hypotensive despite above treatment and two fluid boluses <ul style="list-style-type: none"> May consider: Epinephrine 5 - 10mcg IV/IO q 3 min PRN (“Push Dose;” 0.5 - 1mL of “Cardiac” Epinephrine diluted to 10 mcg/mL) as a bridge to Epinephrine drip.

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

*Hypotension is SBP less than:			
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs

Allergic Reaction / Anaphylaxis Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Epinephrine (1mg/1mL 1:1000) - 0.01mg/kg IM									
0.01mg/kg	0.04mg	0.07mg	0.09mg	0.1mg	0.13mg	0.17mg	0.21mg	0.27mg	0.33mg
mL	0.04mL	0.07mL	0.09mL	0.1mL	0.13mL	0.17mL	0.21mL	0.27mL	0.33mL
Diphenhydramine - 1mg/kg (50mg/mL)									
1mg/kg	4mg	6.5mg	8.5mg	11mg	13mg	17mg	21mg	26.5mg	32.5mg
mL	0.08mL	0.13mL	0.17mL	0.21mL	0.26mL	0.33mL	0.42mL	0.53mL	0.65mL
Dexamethasone - 0.5mg/kg (4mg/mL)									
0.5mg/kg	2mg	3.25mg	4.25mg	5.25mg	6.5mg	8.25mg	10.5mg	13.25mg	16.25mg
mL	0.5mL	0.8mL	1.1mL	1.3mL	1.6mL	2.1mL	2.7mL	3.3mL	4.1mL

Epinephrine Drip - 1mg in 100mL NS (10mcg/mL) USE 60gtt Burette, Flow Controller, or Infusion Pump							
Color / Dose	Avg Wt	0.1mcg/kg/min	gtts/min (mL/hr.)	0.3mcg/kg/min	gtts/min (mL/hr.)	1mcg/kg/min	gtts/min (mL/hr.)
Gray 3-5kg	4kg	0.4mcg	3	1.2mcg	9	4mcg	30
Pink 6-7kg	6.5kg	0.6mcg	4	1.8mcg	12	6mcg	40
Red 8-9kg	8.5kg	0.8mcg	5	2.4mcg	15	8mcg	50
Purple 10-11kg	10.5kg	1.0mcg	6	3mcg	18	10mcg	60
Yellow 12-14kg	13kg	1.3mcg	8	3.9mcg	24	13mcg	80
White 15-18kg	16.5kg	1.6mcg	10	4.8mcg	30	16mcg	100
Blue 19-23kg	21kg	2.1mcg	13	6.1mcg	39	21mcg	130
Orange 24-29kg	26.5kg	2.7mcg	16	8.1mcg	48	27mcg	160
Green 30-36kg	32.5kg	3.3mcg	20	9.9mcg	60	33mcg	200

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations

- ***Airway Management:** Due to bronchoconstriction (difficulty ventilating), reducing ventilation rate may be required to reduce “auto-PEEP” or build-up of pressure below the restricted airway causing barotrauma; expect higher than normal EtCO₂ (above 45mmHg)
- ***Epinephrine drip:** To minimize large fluid volumes add 1mg Epinephrine to 100mL NS for 10mcg/mL
- **Allergic Reaction:** Symptoms involving only one organ system (i.e. urticaria and pruritis)
- **Anaphylactic Reaction:** Involves more than one organ system **and/or** causes respiratory compromise
- ***Waveform EtCO₂:** See **B - 2, Adult Airway** for capnograms
 - **Mild:** No change or slightly decreased EtCO₂ due to mild hyperventilation
 - **Moderate:** May begin to see plateau increase (shark tooth) due to bronchoconstriction, EtCO₂ may begin to rise
 - **Severe:** EtCO₂ is elevated due to decreased ventilation; depending on patient severity, as presentation improves EtCO₂ may increase significantly as the body/lungs excrete built-up CO₂ followed by a steady decline



Asthma / Reactive Airway Disease (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medication Hx (Albuterol, Atrovent, Singulair, steroids) Social Hx (second-hand smoke) Home oxygen therapy Hx of asthma exacerbation requiring hospitalization Hx of asthma exacerbation requiring intubation	Agitation/anxiety Respiratory distress Bilateral wheezes/stridor Diminished breath sounds Accessory muscle use Chest tightness / Cough Tachycardia	Anaphylaxis Aspiration/airway obstruction Pulmonary embolus Pericarditis/Myocarditis Pneumonia Pneumothorax Toxic Inhalation

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen • If suspected influenza / COVID-19, etc., see B - 14, Airborne Illness • Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 11, Difficulty Breathing Asthma / COPD • *Severe Asthma - Assist with patient's prescribed Epinephrine Autoinjector IM to lateral thigh, repeat q 5 min PRN; max of 3 doses
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none"> • EtCO₂ (Capnometry) - Will be monitored • 12-Lead EKG - Obtain as clinically indicated • Cardiac Monitoring - Continuous monitoring • Wheezing/Respiratory Distress: <ul style="list-style-type: none"> - *Albuterol 2.5mg/3mL nebulized, repeat q 10 min PRN; no max dose - *Ipratropium Bromide 0.5mg/2.5mL nebulized, repeat q 10 min PRN; max dose 1.5mg • If severe respiratory distress or no improvement with nebulizer treatment, consider: <ul style="list-style-type: none"> - Epinephrine Autoinjector 0.15mg IM to lateral thigh, repeat q 5 min PRN; max of 3 doses - If > than 30kg - Epinephrine Autoinjector 0.3mg IM to lateral thigh, repeat q 5 min PRN; max of 3 doses • Consider *CPAP - If no contraindications initiate at 5cmH₂O w/severe respiratory distress/impending failure; increase incrementally to 15cmH₂O (max) if SpO₂ remains < 90%. Contact OLMC for further titration. • If using BVM, consider PEEP Valve (especially w/hypoxia despite O₂/Airway); max 10cmH₂O
					<ul style="list-style-type: none"> • Vascular Access - If hypotensive administer fluids per E - 18, Shock / Hypotension (Peds)
					<ul style="list-style-type: none"> • *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH₂O (IPAP) and 4cmH₂O (EPAP) w/severe distress/impending failure; increase IPAP incrementally to 15cmH₂O (max) and EPAP to 10cmH₂O if SpO₂ remains < 90%. Contact OLMC for further titration. • EtCO₂ (Capnography) - Will be monitored <ul style="list-style-type: none"> - May permit permissive hypercapnia (> 45mmHg) due to severity • Audible wheezing or obvious respiratory distress unimproved with above treatment: <ul style="list-style-type: none"> - Dexamethasone 0.5mg/kg IV/IO/IM/PO x 1 (max dose 10mg) • If wheezing/respiratory distress is severe or unimproved with nebulizer treatment, consider: <ul style="list-style-type: none"> - Epinephrine (1mg/1mL) 0.15mg IM, repeat q 5 min PRN; max of 3 doses - Magnesium Sulfate 40mg/kg IV/IO diluted in 50mL NS over 10 - 20 mins, max dose 2g • If no improvement in respiratory status despite above treatment consider:

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	<ul style="list-style-type: none"> - Epinephrine Drip 0.1 - 1mcg/kg/min IV/IO IV/IO, titrate to improved respiratory effort; must use infusion pump, flow controller tubing, or 60gtt burette; max dose 10mcg/min
	<ul style="list-style-type: none"> • If no improvement in respiratory status despite above treatment consider: <ul style="list-style-type: none"> - Epinephrine 5 - 10mcg IV/IO q 3 min PRN (“Push Dose;” 0.5 - 1mL of “Cardiac” Epinephrine diluted to 10mcg/mL) as a bridge to Epinephrine drip.

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Asthma / RAD Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Dexamethasone - 0.5mg/kg (4mg/mL)									
1mg/kg	2mg	3.25mg	4.25mg	5.25mg	6.5mg	8.25mg	10.5mg	13.25mg	16.25mg
mL	0.5mL	0.8mL	1.1mL	1.3mL	1.6mL	2.1mL	2.7mL	3.3mL	4.1mL
Magnesium Sulfate - 40mg/kg (5g/10mL)									
40mg/kg	160mg	260mg	340mg	420mg	520mg	660mg	840mg	1060mg	1300mg
mL	0.32mL	0.52mL	0.68mL	0.84mL	1.1mL	1.3mL	1.7mL	2.1mL	2.6mL
Draw Magnesium direct from Bristojet/Vial and dilute to 10mL and administer over 5 min									

Epinephrine Drip - 1mg in 100mL NS (10mcg/mL) USE 60gtt Burette, Flow Controller, or Infusion Pump							
Color / Dose	Avg Wt	0.1mcg/kg/min	gtts/min (mL/hr.)	0.3mcg/kg/min	gtts/min (mL/hr.)	1mcg/kg/min	gtts/min (mL/hr.)
Gray 3-5kg	4kg	0.4mcg	3	1.2mcg	9	4mcg	30
Pink 6-7kg	6.5kg	0.6mcg	4	1.8mcg	12	6mcg	40
Red 8-9kg	8.5kg	0.8mcg	5	2.4mcg	15	8mcg	50
Purple 10-11kg	10.5kg	1.0mcg	6	3mcg	18	10mcg	60
Yellow 12-14kg	13kg	1.3mcg	8	3.9mcg	24	13mcg	80
White 15-18kg	16.5kg	1.6mcg	10	4.8mcg	30	16mcg	100
Blue 19-23kg	21kg	2.1mcg	13	6.1mcg	39	21mcg	130
Orange 24-29kg	26.5kg	2.7mcg	16	8.1mcg	48	27mcg	160
Green 30-36kg	32.5kg	3.3mcg	20	9.9mcg	60	33mcg	200

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations
* Severe Asthma - Symptoms may include the presence of inspiratory and expiratory wheezes, inability to speak in full sentences, tripodding, retractions, nasal flaring, hypoxia (SpO2 < 92%), and/or tachypnea.
* Albuterol / Ipratropium Bromide - May combine meds in one nebulizer treatment; be prepared to switch to in-line therapy if advanced airway is required. Continuous EtCO2 nasal cannula is required for monitoring; if using nebulizer

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mask, place it over the EtCO₂ cannula.

- Initial EtCO₂ may decrease due to hyperventilation. As bronchoconstriction increases and affects ventilation, EtCO₂ will rise. If the bronchoconstriction becomes severe, the patient may have decreased perfusion causing a drop in EtCO₂ (often below 35mmHg). Effective treatment will increase EtCO₂ (if low) and decrease EtCO₂ (if high).

***CPAP Contraindications:** Depressed mental status with inability to maintain airway, hypoventilation requiring ventilatory assistance, upper airway/facial trauma/burns or other abnormalities that would prevent the mask from sealing, open stoma or tracheostomy, severe cardio-respiratory instability, SBP < 100mmHg, and suspected tension pneumothorax.

***Waveform EtCO₂:** See **B - 2, Adult Airway** for capnograms

- **Normal:** No change to waveform
- **Mild:** No change or slightly decreased EtCO₂ due to mild hyperventilation.
- **Moderate:** May begin to see plateau increase (shark tooth) due to bronchoconstriction, EtCO₂ may begin to rise.
- **Severe:** EtCO₂ is elevated due to decreased ventilation; depending on patient severity, as presentation improves EtCO₂ may increase significantly as the lungs excrete retained CO₂.



Croup / Epiglottitis / Bronchiolitis (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medication Hx (Albuterol, Atrovent, Singulair, steroids) Social Hx (tobacco use) Home oxygen therapy Hx of asthma exacerbation requiring hospitalization Hx of asthma exacerbation requiring intubation	Respiratory distress Hoarseness/drooling Bilateral wheezes/stridor Diminished breath sounds Accessory muscle use Chest tightness Barking Cough Tachycardia	Asthma / Anaphylaxis Aspiration/airway obstruction Pulmonary embolus Pericarditis/Myocarditis Pneumonia Pneumothorax Toxic Inhalation Neck/chest trauma

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • E - 2, Airway Management / Oxygen - <u>Minimize stimulation, keep child calm</u> <ul style="list-style-type: none"> - Consider blow-by oxygen held by a guardian if patient is more comfortable • If COVID-19/Influenza is suspected, see B - 14, Airborne Illness
L	L	L	L	L	<ul style="list-style-type: none"> • Cardiac Monitoring - Monitor heart rate if patient tolerates • Stridor or barking cough: <ul style="list-style-type: none"> - 3mL NS 0.9% nebulized, repeat PRN, no max dose - Humidified Oxygen may be used with NC/NRB PRN • If wheezing or respiratory distress is present: <ul style="list-style-type: none"> - *Albuterol 2.5mg/3mL nebulized, repeat q 10 min PRN; no max dose - *Ipratropium Bromide 0.5mg/2.5mL nebulized, repeat q 10 min PRN; max dose 1.5mg • *Suspected Epiglottitis: <ul style="list-style-type: none"> - Supportive care ONLY; administer Albuterol/Ipratropium ONLY if assisting ventilations w/ BVM
1	2	3	4	5	<ul style="list-style-type: none"> • Vascular Access - Do not routinely start IVs
					<ul style="list-style-type: none"> • If unresponsive to nebulized saline: <ul style="list-style-type: none"> - Epinephrine 3mg/3mL (3 vials of 1mg/1mL) nebulized, consult OLMC for repeat dose • Suspected Croup consider: <ul style="list-style-type: none"> - Dexamethasone 0.5mg/kg IV/IO/IM/PO x 1 (max dose 10mg); may administer IV formulation orally

Dexamethasone - 0.5mg/kg (4mg/mL) IV/IO/IM/PO									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
0.5mg/kg	2mg	3.25mg	4.25mg	5.25mg	6.5mg	8.1mg	10mg	10mg	10mg
mL	0.5mL	0.8mL	1mL	1.3mL	1.6mL	2mL	2.5mL	2.5mL	2.5mL

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Additional Considerations

- IV/IM meds should be avoided in children with suspected epiglottitis. Minimize procedures that cause agitation/anxiety.
- Upper airway obstructions (croup, epiglottitis) are classically identified by inspiratory stridor.
- *Epiglottitis: Infection typically presents with sudden onset of fever, drooling, and sore throat. Symptoms may progress rapidly to the point that the child is unable to tolerate oral secretions. Children may appear anxious and may assume the tripod or sniffing position with the neck hyper-extended. **These patients should be allowed to assume a position of comfort and all medical interventions should be limited. Alert the receiving facility as soon as possible. Continuously monitor the patient's SpO2 and be prepared to intervene. Advanced airway/surgical airway equipment should be pre-positioned as patients can deteriorate rapidly.**
- Croup: History of “seal-bark” cough is the classical indication of croup. Suction the nose and mouth if excessive secretions are present. Foreign bodies can also mimic croup; ensure the patient is not choking.
- Bronchiolitis: History of concurrent symptoms such as a fever, cough, sick contacts.



Diabetic Emergencies (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Medications (Oral vs. Insulin) Presence of an Insulin Pump Dose alterations Missed doses Last meal Recent illness	Altered Mental Status, Confusion Combative Seizure Polyuria/polydipsia, dehydration Kussmaul respirations Nausea/Vomiting Diaphoresis, Pallor Tachypnea	Stroke / CNS Injury / Epilepsy ACS/STEMI Hypoxia / Head Trauma Overdose or toxic ingestion Infection / Sepsis Acidosis/Alkalosis/Electrolyte issues Hypo/Hyperthermia CO or Cyanide Poisoning

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• E - 2, Airway Management / Oxygen• Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 20, Diabetic Emergencies• Obtain BGL:<ul style="list-style-type: none">- If < 24 hours old, see D - 5, Newborn Resuscitation- Normal BGL:<ul style="list-style-type: none">- Age 24 hours - 2 months: BGL > 45mg/dL- Age > 2 months: BGL > 60mg/dL• If hypoglycemic and patient can swallow:<ul style="list-style-type: none">- *Oral Glucose 15g (1 tube) PO, repeat x 1 PRN in 10 min if BGL remains < normal limits; max total dose 2 tubes• If a patient has seizures, see E - 17, Seizures (Peds); treat hypoglycemia first
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored if lethargic, altered LOC, or hypotensive
					<ul style="list-style-type: none">• Vascular Access - Obtain access if clinically indicated• Hypoglycemia (If unable to swallow/maintain airway):<ul style="list-style-type: none">- < 50kg:<ul style="list-style-type: none">- *Dextrose 10% (D10W pre-mixed bag), 5mL/kg IV/IO over 2 min, may repeat x 1 in 3 - 5 min PRN to BGL > 70mg/dL or normal mentation *MUST use infusion pump, flow controller tubing, or 60gtt burette set.- > 50kg:<ul style="list-style-type: none">- *Dextrose 10% (D10W pre-mixed bag), 250mL IV/IO over 2 min, titrate to BGL > 70mg/dL or normal mentation, repeat x 1 PRN to max total of 500mL• BGL > 300mg/dL: LR 10mL/kg, repeat x 1 PRN to max 1000mL
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if lethargic, altered LOC, or hypotensive• Hypoglycemia, unable to swallow/Altered Mental Status and unable to obtain IV/IO:<ul style="list-style-type: none">- < 20kg:<ul style="list-style-type: none">- Glucagon 0.5mg IM repeat x 1 PRN in 15 min if BGL remains < 70mg/dL; max 1mg- > 20kg:<ul style="list-style-type: none">- Glucagon 1mg IM repeat x 1 PRN in 15 min if BGL remains < 70mg/dL, max 2mg- Anticipate emesis following administration, see E - 3, Nausea / Vomiting (Peds)

Fluid Resuscitation										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
10mL/kg	mL	40	65	85	105	130	165	210	265	325
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Diabetic Emergencies Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
*D10W (250mL) - Use 60gtt burette set, Infusion Pump or flow controller tubing to administer									
5mL/kg	2g	3.3g	4.3g	5.3g	6.5g	8.3g	10.5g	13.5g	16.3g
mL	20mL	32.5mL	42.5mL	52.5mL	65mL	82.5mL	105mL	132.5mL	162.5mL
Volume is equal to 5mL Fluid Bolus									
Glucagon - 0.05mg/kg (1mg/mL)									
0.05mg/kg	< 20kg = 0.5mg (0.5mL)						> 20kg =1mg (1mL)		
mL									

Additional Considerations	
<ul style="list-style-type: none"> • SL1 – SL5: If patient has insulin pump and is hypoglycemic, remove the device from the sub-q port or remove the sub-q port entirely (DO NOT attempt to turn off device, an insulin bolus may be accidentally delivered) • *Dextrose 10% preparation if premixed bag is unavailable: <ul style="list-style-type: none"> - Fill Burette to 200mL and add 50mL D50. -OR- - Waste 50mL from 250mL NS IV bag and add Dextrose 50% 25g (50mLs); yields 10% Dextrose (10g/100mL). • *Oral Glucose – If unavailable, consider fruit juice, cake icing, maple syrup, or other simple sugar. • *Glucagon – If used, administer carbohydrates ASAP once the patient regains mentation/ability to swallow. • Patients who take oral diabetic medications are at risk of additional hypoglycemic events due to the continuous slow absorption of the medication; patients should be transported for evaluation/monitoring. • Pediatric patients with no history of diabetes who present as hyperglycemic may be having their first episode of DKA. These patients require SLOW IV fluid resuscitation as rapid or excessive fluid replacement can cause cerebral edema. Monitor EtCO2 to evaluate for metabolic acidosis. • Patient Refusal/Non-Removal: See A - 4, Patient Refusal / AMA. 	



Overdose / Toxic Ingestion (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Substance(s) (alcohol, illicit drugs, prescription drugs (TCAs, Beta-Blockers, Ca-Channel Blockers, Cholinergics, Anticholinergics, Depressants, etc....), over-the-counter medications) Quantity and route taken Time of ingestion Reason (suicide attempt, accidental, criminal) Hx of mental illness <u>Contact Poison Control</u> 1-800-222-1222	AMS, Confusion Combative, Seizures Hypo/Hypertension Brady-/Tachypnea, Brady-/Tachycardia Hypoxia Dysrhythmias Environmental clues (bottles, needles) Medical alert necklaces/bracelets *SLUDGE & DUMBELS	*AEIOU-TIPS Alcohol or Drug use Stroke / CNS Injury Hypoxia / Head Trauma Infection / Sepsis Hypo/Hyperthermia Acidosis/Alkalosis/ Electrolyte issues Hypoglycemia / Serotonin Syndrome

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• *Contact local Poison Control Center (1-800-222-1222)• Patients with SI/HI: Pat down prior to transport to ensure no weapons/medications concealed• E - 2, Airway Management / Oxygen• Signs of Puberty (axilla hair, breast development) or > 60 kg: see B - 24, Overdose / Toxic Ingestion• Suspected Opioid Overdose with altered mental status or respiratory rate < age low limit:<ul style="list-style-type: none">- Naloxone Nasal Spray 4mg IN; repeat q 2 - 3 min PRN to RR > age specific minimum, ventilate with BVM as needed- Ensure full body sweep to locate any analgesic patches (armpits, inner thighs, etc.)• *Suspected Organophosphate/Nerve agent Exposure, see G - 3a, Organophosphate Exposure• BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored if lethargic, altered LOC, or hypotensive• 12-Lead EKG & Cardiac Monitoring - Obtain if no improvement in condition or if indicated• Transport as soon as possible; if patient is suspected of taking Fentanyl or Carfentanyl, transport ASAP and be prepared to aggressively manage Airway/Ventilate• Suspected Opioid Overdose with altered mental status or respiratory rate < age low limit:<ul style="list-style-type: none">- Naloxone 0.4mg or 2mg IM auto-injector, repeat q 2 - 3 min PRN to RR > age specific min• If available and advised by Poison Control Center for toxic ingestion/oral overdose for alert patient with intact airway: Activated Charcoal 1g/kg PO
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per E - 18, Shock / Hypotension• Suspected Opioid Overdose:<ul style="list-style-type: none">- < 5 yrs old or < 20kg: Naloxone 0.1mg/kg IV/IO (max single dose 2mg) repeat q 2 - 3 min PRN to RR > age specific minimum- ≥ 5 yrs old or ≥ 20kg: Naloxone 2mg IV/IO repeat q 2 - 3 min PRN to RR > age specific minimum
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored if lethargic, altered LOC, or hypotensive• *Slow Reversal of Opioid:

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- **Naloxone (0.4mg/mL), add to 9mL NS flush (40mcg/mL), push 20mcg (0.5mL) IV/IO**
q 2 - 3 min PRN to RR > age specific minimum, ventilate with BVM as needed
- **Suspected Tricyclic Antidepressant Overdose (QRS > 0.12 seconds):**
 - **Sodium Bicarbonate 8.4% 1mEq/kg IV/IO** over 2 - 5 min; max single dose 100mEq, repeat x 1 in 10 min PRN; obtain EKG following admin; flush line between meds
 - See **E - 9, Tachycardia, Wide Complex**
- **Suspected Beta Blocker -OR- Calcium Channel Blocker Overdose (bradycardic):**
 - **Calcium Gluconate 60mg/kg IV/IO** over 2 - 5 min; max single dose 2g; repeat x 1 in 10 min PRN; obtain EKG following admin; flush line between meds
 - **Glucagon 0.05mg/kg IV/IO**, repeat x 1 in 5 - 10 mins PRN
 - See **B - 7, Bradycardia**
- **Cocaine/Amphetamine OD or Anticholinergic Exposure with Agitation (choose one):**
 - **Midazolam 0.1mg/kg IV/IO** x1 (max single dose 5mg) -OR-
 - **Midazolam 0.2mg/kg IM/IN** x1 (max single dose 10mg)

Respiratory Rate by Age (per minute)

Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Overdose Medications

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Calcium Gluconate (100mg/1mL) 60mg/kg

60mg/kg	240mg	390mg	510mg	630mg	780mg	990mg	1260mg	1590mg	1950mg
mL	2.4mL	3.9mL	5.1mL	6.3mL	7.8mL	9.9mL	12.6mL	15.9mL	19.5mL

Sodium Bicarbonate 8.4% - 1mEq/kg

1mEq/kg	4mEq	6.5mEq	8.5mEq	10.5mEq	13mEq	16.5mEq	21mEq	26.5mEq	32.5mEq
mL	4mL	6.5mL	8.5mL	10.5mL	13mL	16.5mL	21mL	26.5mL	32.5mL

Glucagon - 0.05mg/kg (1mg/mL)

0.05mg/kg	< 20kg = 0.5mg (0.5mL)						> 20kg = 1mg (1mL)		
mL									

Midazolam (0.5mg/mL) – 0.1mg/kg IV/IO

Using 10mL NS flush, waste 1mL and draw up 5mg/mL Midazolam; Yields 0.5mg/mL

0.1mg/kg	0.4mg	0.75mg	0.85mg	1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
mL	0.8mL	1.3mL	1.7mL	2mL	2.6mL	3.4mL	4.2mL	5.4mL	6.6mL

Midazolam (5mg/1mL) - 0.2mg/kg IN/IM

0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg
mL	0.16mL	0.26mL	0.34mL	0.42mL	0.52mL	0.66mL	0.84mL	1.1mL	1.3mL

Dilute dose as needed in 1mL NS to facilitate administration

Additional Considerations

- AEIOU-TIPS (Alcohol, Epilepsy/Electrolytes/Environmental, Insulin, Overdose/Organophosphate, Uremia, Trauma, Infection, Psychosis, Stroke/Sepsis)
- *Early Poison Control Center contact is required to ensure appropriate treatment and follow-up of the patient in both the prehospital setting and if transported to a hospital. Poison Control personnel will follow up on the patient in either situation. Moreover, Poison Control data is used to detect trends in overdose/poisoning and conduct research.
- ***Suspected Organophosphate Exposure (Cholinergics / Insecticides)**, see **G – 3a, Organophosphate Exposure**
 - *SLUDGE (Salivation, Lacrimation, Urination, Defecation, GI Upset, Emesis)
 - *DUMBBELS (**D**iarrhea, **U**rination, **M**yosis, **B**radycardia, **B**ronchorrhea, **E**mesis, **L**acrimation, **S**alivation)
- **Tricyclic OD**: Seizures, dysrhythmias, hypotension, AMS/coma; rapid progression from alert to death
- **CNS Depressants**: Bradycardia, bradypnea, hypotension
- **Anticholinergic**: AMS, tachycardia, miosis, hyperthermia
(**H**ot as a hare, **R**ed as a beet, **D**ry as a bone, **B**lind as a bat and **M**ad as a hatter)
- **Cardiac Meds**: Dysrhythmias, AMS, hypotension
- * If the patient is altered, refuses to drink, or transport time is less than 15 minutes then it is acceptable to communicate the PCC recommendation upon handoff to the Emergency Physician. For any other issues or concerns with use, contact OLMC for further guidance.
- ***Glucagon** – Anticipate patient nausea/vomiting w/high doses; see **E - 3, Nausea / Vomiting**
- If possible, bring the item the patient was exposed to (unless suspected to be toxic, contact appropriate specialist team)



Sepsis & Septic Shock (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Birth Hx Medical Hx (risk factors for Immunosuppression) Medications (steroids) Fever, known infection Recent surgery or hospitalization	AMS, Lethargy Tachycardia or Bradycardia Systolic Hypotension by Age Tachypnea Poor peripheral perfusion (decreased cap refill, cool extremities, pale skin) See SIRS Chart Below	Anaphylaxis Heat Illness Hypo/Hyper-thermia Hypo/Hyper-glycemia Drug Overdose / Med reaction Hypovolemia Hyperthyroid

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> E - 1, General Patient Care / Consult OLMC as needed E - 2, Airway Management / Oxygen Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 27, Sepsis & Septic Shock BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies Prevent hypothermia / treat per B - 23, Hypothermia / Cold Injury
L	L	L	L	L	<ul style="list-style-type: none"> Respiratory Distress: See E - 12, Asthma / SOB EtCO2 (Capnometry) - Will be monitored at all times Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able, monitor heart rate Alert receiving facility if sepsis is suspected (SIRS Chart below)
1	2	3	4	5	<ul style="list-style-type: none"> Vascular Access – IV/IO x 2 (Consider dual lumen peripheral IV) Temperature >100.4°F and NO Acetaminophen in the previous 4 hours: <ul style="list-style-type: none"> Acetaminophen 15mg/kg PO SBP < age-specific hypotension (see chart below): <ul style="list-style-type: none"> LR 20mL/kg IV/IO, repeat PRN to max 60mL/kg; utilize blood/fluid warmer if equipped Assess lung sounds after each bolus
					<ul style="list-style-type: none"> EtCO2 (Capnography) - Will be monitored at all times If pulmonary edema develops and/or hypotension remains despite fluid resuscitation: <ul style="list-style-type: none"> Norepinephrine 0.1 – 2mcg/kg/min IV/IO titrated to SBP > greater than age minimum; Must administer using infusion pump, flow controller tubing, or 60gtt burette
					<ul style="list-style-type: none"> If pulmonary edema develops and/or hypotension remains despite fluid resuscitation: <ul style="list-style-type: none"> May consider: Epinephrine 5 - 10mcg IV/IO q 3 min PRN (“Push Dose;” 0.5 - 1mL of “Cardiac” Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip. Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

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Systemic Inflammatory Response Syndrome (SIRS) Criteria

Age Group	Heart Rate		Respiratory Rate	SBP (mmHg)
	Tachycardia	Bradycardia		
Newborn (0 days - 1 wk)	> 180	< 100	> 50	< 59
Neonate (1wk - 1mo)	> 180	< 100	> 40	< 79
Infant (1mo - 1yr)	> 180	< 90	> 34	< 75
Toddler (>1yr - 5yrs)	> 140	N/A	> 22	< 74
School Age (>5 - 12yrs)	> 130	N/A	> 18	< 83
Adolescent (12 - 18yrs)	> 110	N/A	> 14	< 90

Acetaminophen 15mg/kg PO (160mg / 5mL)

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
15mg/kg	60mg	97.5mg	127.5mg	157.5mg	195mg	247.5mg	315mg	344.5mg	487.5mg
mL	1.9mL	3mL	4mL	4.9mL	6.1mL	7.7mL	9.8mL	10.8mL	15.2mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Fluid Resuscitation

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg mL	80	130	170	210	260	330	420	530	650
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Norepinephrine (4mg in 250mL NS) Dose is avg of length/weight (MUST use Infusion Pump, Flow Controller Tubing, or 60gtt burette)

Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.1 mcg/kg/min	0.4mcg	0.65mcg	0.85mcg	1.05 mcg	1.3mcg	1.65mcg	2.1mcg	2.65mcg	3.25mcg
mL/hr. (gtts/min)	1.5	2.4	3.2	3.9	4.9	6.2	7.9	9.9	12.2
0.2 mcg/kg/min	0.8mcg	1.3mcg	1.7mcg	2.1mcg	2.6mcg	3.3mcg	4.2mcg	5.3mcg	6.5mcg
mL/hr. (gtts/min)	3	4.9	6.4	7.9	9.8	12.4	15.8	19.9	24.4
0.3 mcg/kg/min	1.2mcg	1.95mcg	2.55mcg	3.15mcg	3.9mcg	4.95mcg	6.3mcg	7.95mcg	9.75mcg
mL/hr. (gtts/min)	4.5	7.3	9.6	11.8	14.6	18.6	23.6	29.8	36.6
0.4 mcg/kg/min	1.2mcg	2.6mcg	3.4mcg	4.2mcg	5.2mcg	6.6mcg	8.4mcg	10.6mcg	13mcg
mL/hr. (gtts/min)	6	9.8	12.8	15.8	19.5	24.8	31.5	39.8	48.8
0.5 mcg/kg/min	2mcg	3.25mcg	4.25mcg	5.25mcg	6.5mcg	8.25mcg	10.5mcg	13.25mcg	16.25 mcg
mL/hr. (gtts/min)	7.5	12.2	15.9	19.7	24.4	30.9	39.4	49.7	60.9
1 mcg/kg/min	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
mL/hr. (gtts/min)	15	24.4	31.9	39.4	48.8	61.9	78.8	99.4	121.9
1.5 mcg/kg/min	6mcg	9.75mcg	12.75mcg	15.75mcg	19.5mcg	24.75mcg	31.5mcg	39.75mcg	48.75 mcg
mL/hr. (gtts/min)	22.5	36.6	47.8	59.1	73.1	92.8	118.1	149.1	182.8
2 mcg/kg/min	4mcg	13mcg	17mcg	21mcg	26mcg	33mcg	42mcg	53mcg	65mcg
mL/hr. (gtts/min)	30	48.8	63.8	78.8	97.5	123.8	157.5	198.7	243.8
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

*0.1 - 0.5mcg/kg/min is most common dosing; above 1mcg/kg/min is a very critical patient

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Additional Considerations
<ul style="list-style-type: none">• Aggressive IV fluid therapy is the most important prehospital treatment of sepsis; check for pulmonary edema frequently in patients receiving repeated fluid boluses.• EtCO₂ monitoring is vital for suspected Sepsis or Septic Shock patients and is considered the strongest predictor of sepsis in the prehospital environment.• * Norepinephrine: <u>MUST</u> be administered with an infusion pump, flow controller tubing, or burette. If administered via IV, <u>MUST</u> be infused in a peripheral large vein (e.g. AC).• With presumed sepsis/septic shock, consult w/ OLMC if there is consideration for treating cardiac arrhythmias.• Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.



Seizures & Post-Seizure Management (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Number and Duration of seizure(s) Head Trauma Hx of Status Epilepticus or known seizure disorder Medication Compliance/Dosage Fever Recent vaccination	Altered Mental Status (Postictal) Observed Seizure Incontinence Head Trauma Fever /Rash/Nuchal Rigidity	Hypoglycemia Head Trauma Non-Accidental Trauma Hypoxia / Hypoventilation Infection/Sepsis/Fever Toxic Ingestion Hyperthermia Electrolyte Derangement

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none"> • E - 1, General Patient Care / Consult OLMC as needed • Place in Supine or Recovery Position, as tolerated, keep patient warm • E - 2, Airway Management / Oxygen • Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 28, Seizures, Non-Pregnant • BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies <ul style="list-style-type: none"> - Repeat when patient is post-seizure and/or postictal
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none"> • EtCO2 (Capnometry) - Will be monitored if postictal or actively seizing • Cardiac Monitoring & 12-Lead EKG - Obtain if pt is post-seizure / postictal, transmit if able • Vascular Access - If hypotensive, administer fluids per E - 18, Shock / Hypotension • Witnessed Seizure & Temp > 100.4 F° (38 C°): <ul style="list-style-type: none"> - If patient can follow commands/swallow and has not had acetaminophen in last 4 hrs.: <ul style="list-style-type: none"> - Acetaminophen 15mg/kg PO • EtCO2 (Capnography) - Will be monitored if postictal or actively seizing • Actively Seizing choose ONE of the following routes: <ul style="list-style-type: none"> - Midazolam 0.1mg/kg IV/IO (max single dose 5mg), repeat x 1 in 5 min PRN, max total dose 10mg; call OLMC for additional dosing - Midazolam 0.2mg/kg IN/IM (max single dose 10mg), repeat x 1 in 5 min PRN, max total dose 20mg; call OLMC for additional dosing

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

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Seizure Medications									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
Midazolam (0.5mg/mL) – 0.1mg/kg IV/IO									
Using 10mL NS flush, waste 1mL and draw up 5mg/mL Midazolam; Yields 0.5mg/mL									
0.1mg/kg	0.4mg	0.75mg	0.85mg	1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
mL	0.8mL	1.3mL	1.7mL	2mL	2.6mL	3.4mL	4.2mL	5.4mL	6.6mL
Midazolam (5mg/1mL) - 0.2mg/kg IN/IM									
0.2mg/kg	0.8mg	1.3mg	1.7mg	2.1mg	2.6mg	3.3mg	4.2mg	5.3mg	6.5mg
mL	0.16mL	0.26mL	0.34mL	0.42mL	0.52mL	0.66mL	0.84mL	1.1mL	1.3mL
Dilute dose as needed in 1mL NS to facilitate administration									
Acetaminophen 15mg/kg PO (160mg / 5mL)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
15mg/kg	60mg	97.5mg	127.5mg	157.5mg	195mg	247.5mg	315mg	344.5mg	487.5mg
mL	1.9mL	3mL	4mL	4.9mL	6.1mL	7.7mL	9.8mL	10.8mL	15.2mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Additional Considerations	
<ul style="list-style-type: none"> • Attempt to rule-out trauma related etiology and toxic ingestion. • Seizure disorders often present in childhood; seizure S/Sx in children > 6 years old are typically the same as adults; children < 6 years old usually present with focal seizures which may be difficult to diagnose (impaired awareness, repetitive motor movements (e.g. blinking, tongue rolling, etc.)) • *Febrile seizures are common and usually present in children from 6 mo - 5 yrs old. A family/personal Hx of febrile seizures are risk factors; relevant hx recent viral illness, vaccinations in the previous 2 weeks, and hx of seizure can be causative factors. • Assisted ventilations may be required following administration of benzodiazepines, ensure EtCO₂ is monitored. • Postictal State: <ul style="list-style-type: none"> - Altered state of consciousness lasting 5 - 30 min post seizure. - Patients can present w/dizziness, confusion, generalized weakness, fatigue. - Todd's Paralysis: brief period of temporary paralysis immediately following a seizure (usually lasts 30 mins - 36 hrs.); may affect speech and vision; when in doubt, activate Stroke Alert and transfer patient. • Types of Seizures <ul style="list-style-type: none"> - Status Epilepticus: seizure activity lasting > 5 mins without a return to baseline level of consciousness. Aggressively treat seizure activity. Anticipate the need for airway management. Transport ASAP. - Grand Mal (Generalized, Tonic Clonic): Patient is unconscious/unresponsive. Seizure activity manifests as violent muscle contractions, may see incontinence and/or oral trauma. - Petit Mal (Absence Seizure): More common in children; usually lasts < 15 seconds. Patients may suddenly stop talking, appear to stare off into space, have eyelid fluttering or make repetitive chewing motions. - Focal (Partial): seizure activity is limited to one area of the brain. Patients often remain conscious; may present with abnormal smells (burning rubber), muscle contractions, abnormal body movements, or vision changes. <p>For additional information on Capnography in Seizures: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5391892/</p>	



Shock & Hypotension (Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Birth Hx Medical Hx Medications Fever, known infection Recent surgery or hospitalization	AMS Lethargy Tachycardia Hypotension Tachypnea Poor peripheral perfusion (decreased cap refill, cool extremities, pale skin)	Anaphylaxis Heat Illness Hypo/Hyperthermia Hypo/Hyperglycemia Toxic Ingestion Hypovolemia Bacterial Sepsis Adrenal Insufficiency Cardiogenic (CHD, carditis)

Basic Management Principles
Hypovolemic Shock – Often blood loss, consider trauma; see F - 1, Trauma or F- 3, Head & Facial Injuries
Septic Shock – Shock due to infection; see E- 16, Sepsis & Septic Shock
Anaphylactic Shock – Due to severe systemic allergic reaction; see E - 11, Anaphylaxis/Allergic Reaction
Neurogenic Shock – Due to injury to or infection of the spinal cord; presents with hypotension and bradycardia
Cardiogenic Shock – Usually due to congenital heart disease or cardiomyopathy; may also result from PE, medications (calcium channel blockers, etc.), and cardiac tamponade

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• E - 2, Airway Management / Oxygen• Signs of Puberty (axilla hair, breast development) or > 60kg: see B - 29, Shock & Hypotension• BGL - If < 60mg/dL or > 300mg/dL, see E - 14, Diabetic Emergencies• Prevent hypothermia / treat per B - 23, Hypothermia / Cold Injury
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO2 (Capnometry) - Will be monitored at all times• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able
					<ul style="list-style-type: none">• EtCO2 (Capnography) - Will be monitored at all times• Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed• SBP < age-specific hypotension (see chart below) must use infusion pump, flow controller tubing, or 60gtt burette set; utilize Blood/Fluid Warmer if able<ul style="list-style-type: none">- Hypovolemic (non-trauma), Septic, Neurogenic, Anaphylactic Shock:<ul style="list-style-type: none">- LR 20mL/kg IV/IO, repeat PRN to a max of 60mL/kg- Suspected Cardiogenic Shock<ul style="list-style-type: none">- LR 10mL/kg IV/IO repeat PRN to a max of 30mL/kg
					<ul style="list-style-type: none">• If pulmonary edema develops and/or hypotension remains despite fluid resuscitation, choose <u>ONE</u> of the following:<ul style="list-style-type: none">- Must administer using infusion pump, flow controller tubing, or 60gtt burette- *Epinephrine Drip 0.1 - 1mcg/kg/min IV/IO; start infusion at 0.1mcg/kg/min, titrate to SBP > age-specific hypotension (see below); max dose 10mcg/min-OR-- Norepinephrine 0.1 – 2mcg/kg/min IV/IO titrated to SBP > greater than age minimum

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- If pulmonary edema develops and/or hypotension remains despite fluid resuscitation:
 - May consider: **Epinephrine 5 - 10mcg IV/IO** q 3 min PRN (“Push Dose;” 0.5 - 1mL of “Cardiac” Epinephrine diluted to 10mcg/mL) as a bridge to Norepinephrine drip
- Hypovolemic (suspected to be hemorrhagic) shock:
 - **25% Albumin 4mL/kg IV/IO** repeat PRN to max 8mL/kg with **LR** as above
 - **Whole Blood 10mL/kg IV/IO** repeat PRN to max 40mL/kg, consult OLMC for additional infusion. Use Blood/Fluid warmer
 - **With Blood Administration: Calcium Gluconate 60mg/kg IV/IO** over 2 - 5 min (max single dose 2g), repeat x 1 after the 4th round of blood infusion; flush line between meds. May give concurrently or after first unit of WB.
- Point-of-Care Ultrasound – E-FAST and Limited Cardiac Ultrasound examinations may be useful in guiding therapy

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Fluid Resuscitation										
Color / Dose		Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
20mL/kg	mL	80	130	170	210	260	330	420	530	650
10mL/kg	mL	40	65	85	105	130	165	210	265	325
Avg Weight		4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Epinephrine Drip - 1mg/1mL in 100mL NS (10mcg/mL)						
Color / Dose	0.1mcg/kg/min	gtts/min (cc/hr.)	0.3mcg/kg/min	gtts/min (cc/hr.)	1mcg/kg/min	gtts/min (cc/hr.)
Gray 3-5kg	0.4mcg	3	1.2mcg	9	4mcg	30
Pink 6-7kg	0.6mcg	4	1.8mcg	12	6mcg	40
Red 8-9kg	0.8mcg	5	2.4mcg	15	8mcg	50
Purple 10-11kg	1.0mcg	6	3mcg	18	10mcg	60
Yellow 12-14kg	1.3mcg	8	3.9mcg	24	13mcg	80
White 15-18kg	1.6mcg	10	4.8mcg	30	16mcg	100
Blue 19-23kg	2.1mcg	13	6.1mcg	39	21mcg	130
Orange 24-29kg	2.7mcg	16	8.1mcg	48	27mcg	160
Green 30-36kg	3.3mcg	20	9.9mcg	60	33mcg	200

“Push Dose” Epinephrine
Using 1mg/10mL Epinephrine (“Cardiac”), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Norepinephrine (4mg in 250mL NS) Dose is avg of length/weight									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.1 mcg/kg/min	0.4mcg	0.65mcg	0.85mcg	1.05 mcg	1.3mcg	1.65mcg	2.1mcg	2.65mcg	3.25mcg
mL/hr. (gtts/min)	1.5	2.4	3.2	3.9	4.9	6.2	7.9	9.9	12.2
0.2 mcg/kg/min	0.8mcg	1.3mcg	1.7mcg	2.1mcg	2.6mcg	3.3mcg	4.2mcg	5.3mcg	6.5mcg
mL/hr. (gtts/min)	3	4.9	6.4	7.9	9.8	12.4	15.8	19.9	24.4
0.3 mcg/kg/min	1.2mcg	1.95mcg	2.55mcg	3.15mcg	3.9mcg	4.95mcg	6.3mcg	7.95mcg	9.75mcg
mL/hr. (gtts/min)	4.5	7.3	9.6	11.8	14.6	18.6	23.6	29.8	36.6
0.4 mcg/kg/min	1.2mcg	2.6mcg	3.4mcg	4.2mcg	5.2mcg	6.6mcg	8.4mcg	10.6mcg	13mcg
mL/hr. (gtts/min)	6	9.8	12.8	15.8	19.5	24.8	31.5	39.8	48.8
0.5 mcg/kg/min	2mcg	3.25mcg	4.25mcg	5.25mcg	6.5mcg	8.25mcg	10.5mcg	13.25 mcg	16.25 mcg
mL/hr. (gtts/min)	7.5	12.2	15.9	19.7	24.4	30.9	39.4	49.7	60.9
1 mcg/kg/min	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
mL/hr. (gtts/min)	15	24.4	31.9	39.4	48.8	61.9	78.8	99.4	121.9
1.5 mcg/kg/min	6mcg	9.75mcg	12.75 mcg	15.75 mcg	19.5mcg	24.75 mcg	31.5mcg	39.75 mcg	48.75 mcg
mL/hr. (gtts/min)	22.5	36.6	47.8	59.1	73.1	92.8	118.1	149.1	182.8
2 mcg/kg/min	4mcg	13mcg	17mcg	21mcg	26mcg	33mcg	42mcg	53mcg	65mcg
mL/hr. (gtts/min)	30	48.8	63.8	78.8	97.5	123.8	157.5	198.7	243.8
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

*0.1 - 0.5mcg/kg/min is most common dosing; **above 1mcg/kg/min is a very critical patient**

Additional Considerations
<ul style="list-style-type: none"> • If no improvement following fluid resuscitation <u>AND</u> norepinephrine infusion, consider Adrenal Insufficiency: <ul style="list-style-type: none"> - Risk factor: History of autoimmune disease - Etiologies: Withdrawal of long-term steroid therapy, AMI, infection, surgery, sepsis, major trauma - Acute Presentation: Hypotension, dehydration, weakness, abdominal pain, nausea/vomiting, lethargy, AMS - Treatment: Obtain blood glucose – treat as appropriate; administer fluids and pressor as above. - Note: Patients with a previous history of adrenal insufficiency may be prescribed “stress dose steroids.” Ask whether the patient has taken these meds, document the date/time and dose taken if applicable. • Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.



Trauma, General (Pediatric)



Key Concepts	MARCH-PAWS	Patient History
<p>Perform bilateral needle decompression (SL2+) for all trauma cardiac arrests</p> <p><u>Scene time should be < 10 min</u></p>	<p>M – Massive hemorrhage A – Airway R – Respiration C – Circulation H – Hypothermia/Head Injury --- P – Pain A – Antibiotics W – Wounds S – Splints</p>	<p>OPQRST/SAMPLE / MOI MVC: restrained vs unrestrained, estimated speed, ejection, vehicle intrusion, prolonged extrication, passenger death Motorcycle Collision: estimated speed Falls: height of fall Medications (blood thinners) PPE worn See Field Trauma Triage</p>

Trauma Management Combines NREMT and TCCC (MARCH-PAWS)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed / Scene Safety / PPE• Perform triage / life-saving interventions• Spinal Motion Restriction, see C - 7, Spinal Motion Restriction• Massive Hemorrhage - Apply approved TQs / pack hemostatic agent(s) as needed, annotate time• E - 2, Airway Management / assess mental status (AVPU)• Oxygen - NRB blow-by should be utilized in the setting of significant facial trauma, apply SpO2• Respirations:<ul style="list-style-type: none">- Place *occlusive dressings on penetrating wounds in abdomen and chest- Assess RR / observe f/Tension Pneumothorax; “burp” chest seal on end-exhalation PRN• Circulation - Assess HR and BP, re-check TQ placement and / or hemostatic dressings• Hypothermia - Remove wet clothing; utilize blankets, HPMK or another reflective blanket• Head Injury:<ul style="list-style-type: none">- Allow patient to sit up or elevate head of stretcher to 30° if able (if on LSB, ensure feet are secured); see F - 3, Head and Facial Injuries- Eye Injuries: Perform gross visual acuity exam, apply rigid eye shield; see C - 5, Eye Injuries• Pain - Place in position of comfort, if able (absent spinal motion restrictions), to minimize pain• Wounds:<ul style="list-style-type: none">- Secure penetrating objects w/bulky dressings, cover exposed injuries- Secure amputated body parts in bio bag prior to transport if time allows- Burns, see F - 2, Burns• Splint - Joints above and below suspected fracture; check CSM before and after splinting
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Declare Trauma Alert to receiving facility if injuries meet trauma criteria• Massive Hemorrhage:<ul style="list-style-type: none">- Place CoTCCC approved Junctional TQ if required / available- Place *Pelvic Binder if fracture is suspected -or- lower extremity amputation from blast• Airway - SGA PRN; contraindicated in the presence of severe facial trauma

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//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

		<ul style="list-style-type: none"> • Respirations - Suspected *Tension Pneumothorax (See Additional Considerations): <ul style="list-style-type: none"> - If no improvement w/"burping" of occlusive dressing perform Needle Thoracentesis using a 18 – 20G 1.5 inch IV catheter (SL2/SL3 w/TCCC Tier2+ AND OLMC approval; SL4/SL5 does NOT require OLMC approval. - 2nd ICS mid-clavicular is the preferred site in pediatric patients - Different needle gauges and lengths may be required based on the size of the patient; consult OLMC as needed • EtCO2 (Capnometry) - A low EtCO2 may suggest hypoperfusion/blood loss or hyperventilation • Circulation - Cardiac Monitoring (if fast/slow HR) & 12-Lead EKG (if chest trauma) • Obtain GCS when able, do not delay transport (chart in add'l comments)
		<ul style="list-style-type: none"> • Circulation: <ul style="list-style-type: none"> - Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed - Fluid Resuscitation: <ul style="list-style-type: none"> - WITH Head Injury: LR IV/IO minimum volume to SBP > 10mmHg above hypotension, max volume 60mL/kg; see F - 3, Head and Facial Injuries - WITHOUT Head Injury: LR IV/IO minimum volume to SBP > age-specific hypotension; max volume 60mL/kg - TQ Transition: Should be transitioned to a hemostatic/pressure dressing if injury occurred < 2 hours prior AND ALL BELOW criteria are met: <ul style="list-style-type: none"> - Not in shock, wound can be continuously monitored, TQ is not on amputated extremity • Hypothermia - Utilize *Blood/Fluid Warmer if able • Pain - See E - 4, Pain Management
		<ul style="list-style-type: none"> • If indicated, SGA is the primary method of airway management <ul style="list-style-type: none"> - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective • Cricothyrotomy - EMERGENCY means to secure airway if required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.) <ul style="list-style-type: none"> - > 8 yrs old: Surgical/open Cricothyroidotomy - < 8 yrs old: Needle Cricothyroidotomy • Post-Advanced Airway Sedation and Pain Control (ETI, SGA, Cric): <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN repeat q 10 min PRN to nystagmus or sedation • Respirations - Monitor EtCO2 (Capnography) • Circulation: Consider vasopressor if bleeding controlled, no tension pneumothorax, and shock is refractory to appropriate volume resuscitation: <ul style="list-style-type: none"> - WITH Head Injury: *Norepinephrine 0.1 - 2mcg/kg/min IV/IO to SBP > 10mmHg above age-specific hypotension, see F - 3, Head and Facial Injuries - WITHOUT Head Injury: *Norepinephrine 0.1 - 2mcg/kg/min IV/IO to SBP > age-specific hypotension, max dose 12 mcg/min - Must use infusion pump, flow controller tubing, or 60gtt burette • Splints - Consider pain management/sedation before performing
		<ul style="list-style-type: none"> • Airway - Consider Endotracheal Intubation <ul style="list-style-type: none"> - If technically feasible, endotracheal intubation (ETI) is preferred to Cricothyrotomy for airway burns/edema or failure of SGA - Rapid Sequence Induction if indicated to place ETI or another advanced airway, see E - 2, Airway Management • Respirations <ul style="list-style-type: none"> - Ventilator: Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender - Open Thoracostomy: If tension pneumothorax or significant hemothorax is suspected. Preferred to needle thoracentesis if cardiac arrest.

- **Circulation (ensure bleeding controlled and no tension pneumothorax):**
 - **WITH Head Injury:**
 - **25% Albumin 4 - 8mL/kg IV/IO AND LR IV/IO minimum volume** to SBP > 10mmHg above hypotension,
 - **Whole Blood 10mL/kg IV/IO** to SBP > 10mmHg above hypotension, max volume 40mL/kg; see **F - 3, Head and Facial Injuries**
 - **WITHOUT Head Injury:**
 - **25% Albumin 4 - 8mL/kg IV/IO AND LR IV/IO minimum volume** to SBP > age-specific hypotension
 - **Whole Blood 10mL/kg IV/IO** to SBP > age-specific hypotension; max volume 40mL/kg
- **With Blood Administration: Calcium Gluconate 60mg/kg IV/IO** over 2 - 5 min (max single dose 2g), repeat x 1 after the 4th round of blood infusion; flush line between meds. May give concurrently or after first unit of WB.
- **If SBP remains severely depressed after above, consider:**
 - **Epinephrine 1 mcg/kg IV/IO** (max 50 mcg) q 3 - 5 min PRN in consultation with OLMC
- **Point-of-Care Ultrasound** – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade
- **Escharotomy:** Perform if circumferentially burned chest with difficulty in ventilation in consultation with OLMC
- **Limb Amputation:** Perform only if immediate and real risk to the patient's life due to a scene safety emergency or a deteriorating patient physically trapped by a limb when they will almost certainly die during the time taken to secure extrication. May also be performed on dead patients whose limbs are blocking access to potentially live casualties. OLMC approval required for live patients.

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Ketamine - 2mg/kg IV/IO/IN (Post-SGA/Intubation/Cric)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to NS vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to NS vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				

"Push Dose" Epinephrine
Using 1mg/10mL Epinephrine ("Cardiac"), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR-

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Norepinephrine (4mg in 250mL NS) Dose is avg of length/weight									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.1 mcg/kg/min	0.4mcg	0.65mcg	0.85mcg	1.05 mcg	1.3mcg	1.65mcg	2.1mcg	2.65mcg	3.25mcg
mL/hr. (gtts/min)	1.5	2.4	3.2	3.9	4.9	6.2	7.9	9.9	12.2
0.2 mcg/kg/min	0.8mcg	1.3mcg	1.7mcg	2.1mcg	2.6mcg	3.3mcg	4.2mcg	5.3mcg	6.5mcg
mL/hr. (gtts/min)	3	4.9	6.4	7.9	9.8	12.4	15.8	19.9	24.4
0.3 mcg/kg/min	1.2mcg	1.95mcg	2.55mcg	3.15mcg	3.9mcg	4.95mcg	6.3mcg	7.95mcg	9.75mcg
mL/hr. (gtts/min)	4.5	7.3	9.6	11.8	14.6	18.6	23.6	29.8	36.6
0.4 mcg/kg/min	1.2mcg	2.6mcg	3.4mcg	4.2mcg	5.2mcg	6.6mcg	8.4mcg	10.6mcg	13mcg
mL/hr. (gtts/min)	6	9.8	12.8	15.8	19.5	24.8	31.5	39.8	48.8
0.5 mcg/kg/min	2mcg	3.25mcg	4.25mcg	5.25mcg	6.5mcg	8.25mcg	10.5mcg	13.25 mcg	16.25 mcg
mL/hr. (gtts/min)	7.5	12.2	15.9	19.7	24.4	30.9	39.4	49.7	60.9
1 mcg/kg/min	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
mL/hr. (gtts/min)	15	24.4	31.9	39.4	48.8	61.9	78.8	99.4	121.9
1.5 mcg/kg/min	6mcg	9.75mcg	12.75 mcg	15.75 mcg	19.5mcg	24.75 mcg	31.5mcg	39.75 mcg	48.75 mcg
mL/hr. (gtts/min)	22.5	36.6	47.8	59.1	73.1	92.8	118.1	149.1	182.8
2 mcg/kg/min	4mcg	13mcg	17mcg	21mcg	26mcg	33mcg	42mcg	53mcg	65mcg
mL/hr. (gtts/min)	30	48.8	63.8	78.8	97.5	123.8	157.5	198.7	243.8
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

*0.1 - 0.5mcg/kg/min is most common dosing; above 1mcg/kg/min is a very critical patient

Additional Considerations

PEDIATRIC GLASGOW COMA SCALE (PGCS)			
	> 1 Year	< 1 Year	Score
EYE OPENING	Spontaneously	Spontaneously	4
	To verbal command	To shout	3
	To pain	To pain	2
	No response	No response	1
MOTOR RESPONSE	Obeys	Spontaneous	6
	Localizes pain	Localizes pain	5
	Flexion-withdrawal	Flexion-withdrawal	4
	Flexion-abnormal (decorticate rigidity)	Flexion-abnormal (decorticate rigidity)	3
	Extension (decerebrate rigidity)	Extension (decerebrate rigidity)	2
	No response	No response	1
VERBAL RESPONSE	> 5 Years	2-5 Years	0-23 months
	Oriented	Appropriate words/phrases	Smiles/coos appropriately
	Disoriented/confused	Inappropriate words	Cries and is consolable
	Inappropriate words	Persistent cries and screams	Persistent inappropriate crying and/or screaming
	Incomprehensible sounds	Grunts	Grunts, agitated, and restless
	No response	No response	No response
TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15):			

<https://boneandspine.com/pediatric-glasgow-coma-scale/>

- LSBs and C-spine immobilization are not recommended for penetrating trauma.
- ***Tourniquets** - Improvised TQs prior to EMS arrival must be evaluated; if the injury requires a TQ, replace with a

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CoTCCC approved TQ. If the injury does not require a TQ, and the applied TQ has been in place for < 6 hours, remove the TQ and replace with a pressure dressing.

- Approved ***Hemostatic** dressings include CombatGauze, ChitoGauze and the X-Stat. **Do not** place hemostatic dressings into the chest or abdomen. The X-Stat is approved for use by Tier 3 and above for narrow trajectory extremity and junctional injuries only.
- ***Tension Pneumothorax:** Patient must have MOI and any ONE of the following:
 - Progressive respiratory distress
 - Diminished/absent breath sounds
 - Tachypnea / SpO2 < 90%
 - Hypotension/shock or deviated trachea (very late sign)
 - Preferred Site: Anterior: 2 - 3rd ICS, midclavicular line, repeat PRN; if ineffective, use the lateral site with caution
- Needle Thoracentesis – Products used for adults may be too long for safe use in smaller children and infants, where 18gx1.25” may be adequate. Consult OLMC for guidance if needed.
- ***Blood/Fluid Warmer** - Use if available to prevent further hypothermia.
- ***Occlusive Dressings** - Vented chest seals are the preferred. If vented are not available, use non-vented occlusive dressings.
- Pelvic **Binder** - use sheet or head portion of KED board as needed
- ***Neurogenic Shock:**
 - Mild to Moderate: Hypotension (widened pulse pressure), bradycardia, warm/ flushed skin, may see priapism
 - Severe: Above plus SOB and Chest pain, weakness, cyanosis, faint pulse or hypothermia
- Transport the patient to a trauma facility unless patient is unstable and requires immediate stabilization/intervention.
- Frequently reevaluate mental status for decreasing LOC/GCS.
- If prolonged transport or delay in transport due to range operations or deployment considerations is expected, consider beginning the MACE Exam if trained.



Burns

(Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Source of burn Time of injury Time exposed (chemical) Associated trauma Inhalational Injury	Airway compromise (wheezing, singed nasal hairs, soot around mouth) Loss of consciousness Hypotension/shock Obvious burns Loss of consciousness	Superficial (1st Degree) Partial thickness (2nd Degree) Full thickness (3rd Degree) Chemical burn Thermal burn / Blast injury Electrical burn / Lightning injury

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• STOP the burning (or smoldering) process ASAP• Treat Trauma and Immediate Life Threats before burns IAW w/applicable protocol• E - 2, Airway Management / Oxygen• Remove constricting items from the affected extremity (rings, watches, bracelets)• Estimate burn size (see chart in add'l considerations)• Thermal Burn:<ul style="list-style-type: none">- < 10% TBSA: Irrigate the area w/fresh water or saline; cover with a dry, sterile dressing- > 10% TBSA: Cover patient with burn sheet or utilize dry, sterile dressings• Chemical Burn:<ul style="list-style-type: none">- Brush off any residual powder and remove clothing/expose patient- Flush exposed area with fresh water or saline for at least 15 mins- Eye involvement: See C - 5, Eye Injury• *White Phosphorus Munition Burn:<ul style="list-style-type: none">- Remove clothing/expose patient, remove any visible fragments with forceps and irrigate- Cover with hydrogel or wet dressing (must be kept moist) to prevent continued injury• Electrical Burn / Lightning Strike:<ul style="list-style-type: none">- Ensure the source of the electricity has been turned off before touching the patient- Identify/document contact points (entrance/exit); dress wounds w/dry, sterile dressing- If patient is in cardiac arrest see E - 5, Cardiac Arrest• Monitor distal pulses in circumferentially burned extremities q 5 min; assess *6P's• Keep patient warm, see B - 23, Hypothermia• If fire/smoke inhalation, see G - 1c, CO Poisoning / Smoke Inhalation / Cyanide
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• See add'l considerations for transport destinations• EtCO2 (Capnometry) - Monitor if altered LOC, hypotensive, or suspected inhalation injury• If Inhalation injury, respiratory distress, wheezing:<ul style="list-style-type: none">- *Albuterol 2.5mg/3mL nebulized, repeat q 10 min PRN; no max dose- *Ipratropium Bromide 0.5mg/2.5mL nebulized, repeat q 10 min PRN; max dose 1.5mg- If equipped: Consider CPAP - 5cmH2O, increase incrementally to 10cmH2O (max) if SpO2 remains < 90%• Cardiac Monitor & 12-Lead EKG:<ul style="list-style-type: none">- Electrical/Lightning: Continuously monitor HR, obtain serial EKGs; transmit if able- Thermal/Chemical: If clinically indicated apply monitor and obtain EKG
					<ul style="list-style-type: none">• Pain Management, see E - 4, Pain Management• Vascular Access - If hypotensive due to trauma, see F - 1, Trauma<ul style="list-style-type: none">- > 20% TBSA 2nd/3rd degree and/or pain management: Initiate 2 large bore IVs or IOs• Fluid Resuscitation:

V5 For use After 01 October 2025	Pediatric Trauma Protocols F - 2	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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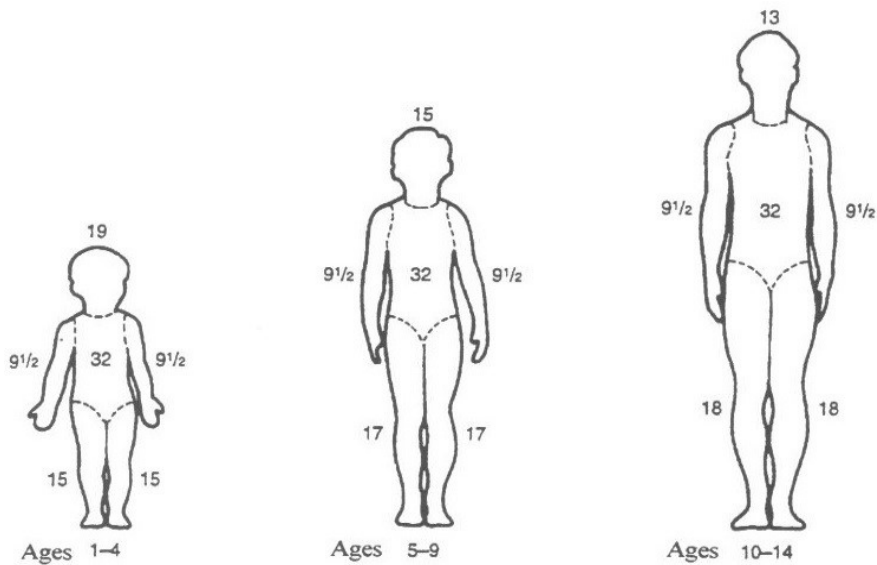
		<ul style="list-style-type: none"> - < 20% 2nd/3rd TBSA Burn - Fluid resuscitation not indicated - > 20% 2nd/3rd TBSA Burn: <ul style="list-style-type: none"> - Utilize *Modified Brooke Formula chart below - Measure pt. with weight-based tape, begin color coded fluid resuscitation at 30% TBSA until actual TBSA can be determined
		<ul style="list-style-type: none"> • EtCO2 (Capnography) - Monitor if altered LOC, hypotensive, or suspected inhalation injury • Suspected inhalation injury: <ul style="list-style-type: none"> - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective • Cricothyrotomy - EMERGENCY means to secure airway if required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from inhalation injury, etc.) <ul style="list-style-type: none"> - > 8 yrs old: Surgical/open Cricothyroidotomy - < 8 yrs old: Needle Cricothyroidotomy • Post-Intubation (SGA/ETI/Cric) Sedation: <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN repeat q 10 min PRN to nystagmus or sedation
		<ul style="list-style-type: none"> • Suspected inhalation injury: <ul style="list-style-type: none"> - Early airway management – consider RSI, see add'l considerations • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade • Escharotomy: Perform if circumferentially burned chest with difficulty in ventilation in consultation with OLMC

Modified Brooke Formula (2mL x kg x %TBSA) / 2 / 8-first hrs.)
mL / hr. is calculated average of each color category to a MAX of 8 hours

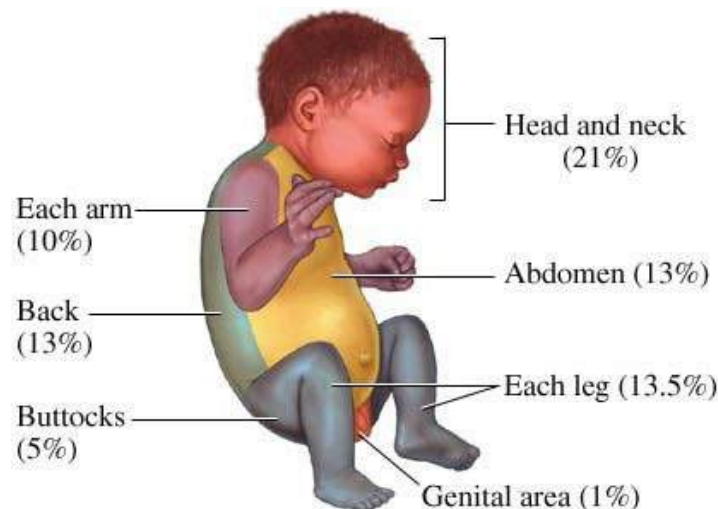
Burn Fluid Resuscitation (mL / hr. with infusion pump -or- gtts/min with 60gtt buretrol)									
Color / %TBSA	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
10%	5	8	11	13	16	21	26	33	41
20%	10	16	21	26	33	41	53	66	83
30%	15	24	32	39	49	62	79	99	124
40%	20	33	43	53	65	83	105	133	165
50%	25	41	53	66	81	103	131	166	206
60%	30	49	64	79	98	124	158	199	248
70%	35	57	74	92	114	144	184	232	289
80%	40	65	85	105	130	165	210	265	330
90%	45	73	96	118	146	186	236	298	371
100%	50	81	106	131	163	206	263	331	413

(-----mL / hr. (or mL/hr. using 60gtt tubing)-----)

Ketamine - 2mg/kg IV/IO/IN (Post-SGA/Intubation/Cric)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				



<https://www.health.state.mn.us/communities/ep/surge/burn/tbsa.html>



<https://www.health.state.mn.us/communities/ep/surge/burn/tbsa.html>

Additional Considerations

- ***Albuterol/Ipratropium Bromide** - May combine meds in one nebulizer treatment; be prepared to switch to in-line therapy if advanced airway required. Continuous EtCO₂ nasal cannula is required for monitoring; if using nebulizer mask, place it over the EtCO₂ cannula (place under surgical mask for Influenza/COVID patients).
- **Consider early cricothyrotomy or intubation** in burn patients with any signs of inhalation injury (Soot in the mouth or nares, facial burns / singed facial hair, hoarse voice / cough / stridor, wheezing or respiratory difficulty) if transport time is expected to be greater than 60 minutes. SGAs are by definition positioned outside the trachea and will not prevent airway obstruction in this circumstance.
- Use the Rule of Nines to estimate the percent of body surface area burns (use the patient's hand as an estimate of 1% BSA for that patient):
 - Superficial Burn (1st degree): red and painful, similar to a sunburn; NOT included when calculating TBSA burned, but must still be documented in the patient's chart.
 - Partial Thickness Burn (2nd degree): skin blistering.
 - Full Thickness Burn (3rd degree): charred, leathery skin; painless.
- ***Avoid placing an IV/IO in a burned extremity if possible.**
- **Burns WITH other significant Trauma, go to TRAUMA CENTER**
- **Burns ONLY - Transport directly to a burn center if:**
 - Inhalational injury
 - Partial thickness (2nd degree) burn is > 10% TBSA
 - Any size full thickness (3rd degree burn)
 - Partial/full thickness circumferential burn
 - Any size partial thickness burns to the face, hands, genitalia, feet, joints
 - Electrical / Lightning injury
 - Chemical burns
- Electrical burns can hide significant underlying soft tissue damage, despite the appearance of small superficial wounds; patients require transport for evaluation.
- Chemical burns require copious flushing (20L minimum); sterile water/saline is preferred, but utilize tap water, garden hose, fire hose etc.; document the chemical and obtain SDS (MSDS) if available, do NOT delay transport.
- *** White Phosphorus Munition Burn:** Hydrogel dressings (e.g. "Water-Jel") may be useful in White Phosphorus munitions injury by eliminating the concern of evaporation of water from wet dressings over a prolonged transport.

Pediatric Trauma Protocols

F - 2

- ***6 Ps:** Pain, Pulselessness, Pallor, Paresthesia, Paralysis, Poikilothermia, see **C - 3, Crush Injuries.**
- Modified Brooke Formula at 2mL/kg plus maintenance fluids **AVOID over resuscitation.**
- Pre-hospital burn calculation will NOT be accurate; error on the side of conservative fluid resuscitation (Modified Parkland (2mL)); the hospital will obtain a more accurate %.
- Fluids are **PER HOUR** (mL/hr.), not in a 20 min transport.
- In a transport < 20 min, where the primary injury is trauma, fluid resuscitation is focused on trauma not burns; taking time to calculate burn % is NOT valuable if other trauma treatment is required.



Head & Facial Injuries

(Pediatric)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE & MOI Loss of consciousness Amnesia prior to/following event Helmet (if applicable) Medications (anticoagulants, Plavix, aspirin)	Altered Mental Status Seizure Visual or sensory disturbances Nausea/Vomiting	Stroke Other CNS illness/injury: Epidural, Subdural or Subarachnoid hemorrhage

Basic Management Principals

DO NOT remove penetrating objects to the skull, neck, or eye. Support or stabilize in place.

Head Injury Classification

- **Mild (GCS 13 - 15):** Low energy injury, no loss of consciousness (LOC); may report mild headache and nausea (fall from standing with no LOC).
- **Moderate (GCS 9 - 12):** Moderate energy injury, may have loss of consciousness, confusion, dizziness, lethargy, vomiting (MVC, sports injuries, hit with a heavy/moderate velocity object).
- **Severe (GCS 3 - 8):** Moderate to high energy injury, may have seizures, prolonged loss of consciousness (High speed MVC, penetrating head injury)

It is outside of the scope of prehospital personnel to evaluate athletes for concussions and provide return to play recommendations, even when performed in consultation with OLMD

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">• E - 1, General Patient Care / Consult OLMC as needed• Spinal Motion Restriction - See C - 7, Spinal Motion Restriction as needed• Massive Hemorrhage control for wounds, see F - 1, General Trauma<ul style="list-style-type: none">- If significant nose bleed, see C - 4, Epistaxis• E - 2, Airway Management / Oxygen<ul style="list-style-type: none">- NPAs should NOT be used if significant facial trauma- For significant facial trauma, place upright (if able) to maintain airway and use blow by O2 PRN; be prepared to manage airway with frequent suctioning• Hypothermia - Remove wet clothing, see B - 23, Hypothermia as needed• Elevate Head of stretcher 30°<ul style="list-style-type: none">- If no requirement for SMR, allow patient to assume the position of comfort to reduce pain• *Wounds:<ul style="list-style-type: none">- Dressings as needed / utilize bulky dressing to secure any penetrating objects in place- If significant nose bleed, see C - 4, Epistaxis• Eye Injuries: see C - 5, Eye Injuries• Avulsed Tooth:<ul style="list-style-type: none">- Avoid touching the root; do not scrub - rinse w/clean water/saline if dirty- Place in milk or saline and transport w/patient to the hospital• Unstable Mandible:<ul style="list-style-type: none">- Patient may be unable to close mouth, spit or swallow effectively; anticipate the need for suction. If conscious, consider giving patient suction to use PRN.- If C-spine is cleared, transport sitting upright with emesis basin• Nose/Ear Avulsion:<ul style="list-style-type: none">- Transport with tissue wrapped in sterile gauze, moistened with sterile NS
L	L	L	L	L	
1	2	3	4	5	

V5
For use After
01 October 2025

Pediatric Trauma Protocols
F - 3

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

			<ul style="list-style-type: none"> • Check BGL if altered LOC, confused or hx of diabetes see E-14, Diabetic Emergencies • See E - 3, Nausea / Vomiting as needed
			<ul style="list-style-type: none"> • Obtain Glasgow Coma Scale (see add'l considerations) • Initiate Trauma Alert for any pt with a GCS < 13 or is P (pain) or U (unresponsive) on AVPU • Airway - SGA PRN; contraindicated in the presence of severe facial trauma • EtCO2 (Capnometry) - Will be monitored <ul style="list-style-type: none"> - Evidence of *herniation: Ventilate to EtCO2 30 - 35mmHg (20 breaths/min if no EtCO2)
			<ul style="list-style-type: none"> • Vascular Access - 2 large bore IVs (may use dual lumen peripheral IV for one IV) or IOs as needed • Age-Specific Hypotension: <ul style="list-style-type: none"> - LR IV/IO minimum volume to SBP > 10mmHg above age specific minimum; max volume 60mL/kg;
			<ul style="list-style-type: none"> • If indicated, SGA is the primary method of airway management <ul style="list-style-type: none"> - USAF NRPs Only: ETI via video or direct laryngoscopy w/Bougie is advised if there are concerns for airway burns/inhalation injuries; may also be considered if SGA is ineffective • Cricothyrotomy - EMERGENCY means to secure airway if required by patient condition (severe maxillofacial trauma, severe airway edema, airway burns from smoke inhalation, etc.) <ul style="list-style-type: none"> - > 8 yrs old: Surgical/open Cricothyroidotomy - < 8 yrs old: Needle Cricothyroidotomy • Post-Advanced Airway Sedation and Pain Control (ETI, SGA, Cric): <ul style="list-style-type: none"> - Ketamine 2mg/kg IV/IO/IN repeat q 10 min PRN to nystagmus or sedation • EtCO2 (Capnography) - Will be monitored • If pulmonary edema develops and/or hypotension remains despite fluid resuscitation, choose <u>ONE</u> of the following: <ul style="list-style-type: none"> - Must administer using infusion pump, flow controller tubing, or 60gtt buretrol - *Epinephrine Drip 0.1 - 1mcg/kg/min IV/IO; start infusion at 0.1mcg/kg/min, titrate to SBP > age-specific hypotension (see below); max dose 10mcg/min - -OR- - Norepinephrine 0.1 – 2mcg/kg/min IV/IO titrated to SBP > greater than age minimum
			<ul style="list-style-type: none"> • Airway - Consider Endotracheal Intubation <ul style="list-style-type: none"> - If technically feasible, endotracheal intubation (ETI) is preferred to Cricothyrotomy for airway burns/edema or failure of SGA - Rapid Sequence Induction if indicated to place ETI or another advanced airway, see E - 2, Airway Management • Ventilator: Consider if advanced airway is in place; utilize appropriate ventilator settings for height and gender • Age-Specific Hypotension: <ul style="list-style-type: none"> - 25% Albumin 4 - 8mL/kg IV/IO AND LR minimum volume IV/IO (max volume 60mL/kg) to SBP > 10mmHg above hypotension, - Whole Blood 10mL/kg IV/IO to SBP > 10mmHg above hypotension; max volume 40mL/kg <ul style="list-style-type: none"> - With Blood Administration: Calcium Gluconate 60mg/kg IV/IO over 2 - 5 min (max single dose 2g); flush line between meds. May give concurrently or after first unit of WB. • If SBP remains severely depressed after above, consider: <ul style="list-style-type: none"> - Epinephrine 1 mcg/kg IV/IO (max 50 mcg) q 3 - 5 min PRN in consultation with OLMC • Point-of-Care Ultrasound – Perform E-FAST for severe trauma, cardiac views may be useful in cardiac arrest to determine if there is cardiac activity or pericardial tamponade

*Hypotension is SBP less than:			
1 - 30 days old	1 mo - 1 yr old	1 - 10 yrs	> 10 yrs
60mmHg	70mmHg	70 + (Age in Yrs x 2)	90mmHg

Pediatric Trauma Protocols

F - 3

Respiratory Rate by Age (per minute)				
Infant (< 1yr)	Toddler (1 - 3yr)	Preschool (3 - 6yr)	School-age (6 - 12yr)	Adolescent (12+yr)
30 - 60	24 - 40	22 - 34	18 - 30	12 - 16

Ketamine - 2mg/kg IV/IO/IN (Post-SGA/Intubation/Cric)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
2mg/kg	8mg	13mg	17mg	21mg	26mg	33mg	42mg	53mg	65mg
*mL	0.4mL	0.65mL	0.85mL	1.1mL	1.3mL	1.7mL	2.1mL	2.7mL	3.3mL
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg
20mg/mL IV/IO/IN	LABEL all Vials with "Medication Added" sticker								
	Ketamine Concentration 500mg/10mL (50mg/mL)				Ketamine Concentration 500mg/5mL (100mg/mL)				
	Remove 4mL from 10mL NS Vial Add 200mg (4mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				Remove 2mL from 10mL NS Vial Add 200mg (2mL) to NS Vial (20mg/mL) IV/IO: IV slow push, follow with flush IN: Administer ½ in each nostril w/atomizer				

"Push Dose" Epinephrine
Using 1mg/10mL Epinephrine ("Cardiac"), waste 9mL of Epi and draw up 9mL NS; Yields 10mcg/mL -OR- Using 1mg/mL Ampule/Vial Epinephrine, draw up 0.1mL and add to 10mL NS Vial; Yields 10mcg/mL

Epinephrine Drip - 1mg/1mL in 100mL NS (10mcg/mL) - MUST use 60gtt buretrol or Infusion Pump						
Color / Dose	0.1mcg/kg/min	gtts/min (cc/hr.)	0.3mcg/kg/min	gtts/min (cc/hr.)	1mcg/kg/min	gtts/min (cc/hr.)
Gray 3-5kg	0.4mcg	3	1.2mcg	9	4mcg	30
Pink 6-7kg	0.6mcg	4	1.8mcg	12	6mcg	40
Red 8-9kg	0.8mcg	5	2.4mcg	15	8mcg	50
Purple 10-11kg	1.0mcg	6	3mcg	18	10mcg	60
Yellow 12-14kg	1.3mcg	8	3.9mcg	24	13mcg	80
White 15-18kg	1.6mcg	10	4.8mcg	30	16mcg	100
Blue 19-23kg	2.1mcg	13	6.1mcg	39	21mcg	130
Orange 24-29kg	2.7mcg	16	8.1mcg	48	27mcg	160
Green 30-36kg	3.3mcg	20	9.9mcg	60	33mcg	200

Norepinephrine (4mg in 250mL NS) Dose is avg of length/weight (MUST use Infusion Pump or 60gtt buretrol)									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
0.1 mcg/kg/min	0.4mcg	0.65mcg	0.85mcg	1.05 mcg	1.3mcg	1.65mcg	2.1mcg	2.65mcg	3.25mcg
mL/hr. (gtts/min)	1.5	2.4	3.2	3.9	4.9	6.2	7.9	9.9	12.2
0.2 mcg/kg/min	0.8mcg	1.3mcg	1.7mcg	2.1mcg	2.6mcg	3.3mcg	4.2mcg	5.3mcg	6.5mcg
mL/hr. (gtts/min)	3	4.9	6.4	7.9	9.8	12.4	15.8	19.9	24.4
0.3 mcg/kg/min	1.2mcg	1.95mcg	2.55mcg	3.15mcg	3.9mcg	4.95mcg	6.3mcg	7.95mcg	9.75mcg
mL/hr. (gtts/min)	4.5	7.3	9.6	11.8	14.6	18.6	23.6	29.8	36.6
0.4 mcg/kg/min	1.2mcg	2.6mcg	3.4mcg	4.2mcg	5.2mcg	6.6mcg	8.4mcg	10.6mcg	13mcg
mL/hr. (gtts/min)	6	9.8	12.8	15.8	19.5	24.8	31.5	39.8	48.8
0.5 mcg/kg/min	2mcg	3.25mcg	4.25mcg	5.25mcg	6.5mcg	8.25mcg	10.5mcg	13.25 mcg	16.25 mcg
mL/hr. (gtts/min)	7.5	12.2	15.9	19.7	24.4	30.9	39.4	49.7	60.9

1 mcg/kg/min	4mcg	6.5mcg	8.5mcg	10.5mcg	13mcg	16.5mcg	21mcg	26.5mcg	32.5mcg
mL/hr. (gtts/min)	15	24.4	31.9	39.4	48.8	61.9	78.8	99.4	121.9
1.5 mcg/kg/min	6mcg	9.75mcg	12.75 mcg	15.75 mcg	19.5mcg	24.75 mcg	31.5mcg	39.75 mcg	48.75 mcg
mL/hr. (gtts/min)	22.5	36.6	47.8	59.1	73.1	92.8	118.1	149.1	182.8
2 mcg/kg/min	4mcg	13mcg	17mcg	21mcg	26mcg	33mcg	42mcg	53mcg	65mcg
mL/hr. (gtts/min)	30	48.8	63.8	78.8	97.5	123.8	157.5	198.7	243.8
Avg Weight	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

Additional Considerations

- Scene time should be < 10 min; frequently reevaluate mental status for decreasing LOC/GCS.
- Football/Sports Injuries:
 - If possible, keep the patient's shoulder pads and helmet on; remove the face mask for easy airway access (trainers/coaches should have tools to facilitate this).
 - If responders are unable to safely manage the patient's injuries while keeping all gear on, and there is a high suspicion of a neck and spinal injury, both the helmet and shoulder pads must be removed to maintain spinal alignment.
- Patient w/Helmet in Place (excluding football helmet):
 - In cases of suspected c-spine injuries (in the absence of shoulder pads) the helmet (motorcycle, bicycle, etc) should be removed to facilitate neutral position of the c-spine.
- Inverted T-waves in precordial leads may suggest increased ICP.
- * Evidence of herniation:
 - **Cushing's Triad:** Bradycardia, Hypertension (Wide Pulse Pressure), Irregular Respiration.
 - Posturing (see below).
 - Rapid decline in mental status and/or pupil changes.
- Additional intracranial hemorrhage considerations: (consider Stroke scale as needed):
 - **Epidural Hemorrhage:**
 - Injury followed by loss of consciousness, a period of alertness, and then rapid deterioration.
 - May have seizures, a headache (often severe) and/or pupil changes.
 - **Subdural Hemorrhage:**
 - Headache, confusion and/or dizziness.
 - Cognitive decline (may be over days to weeks).
 - Weakness.
 - **Subarachnoid Hemorrhage:**
 - Sudden onset of severe headache ("worst headache of my life"), may report neck stiffness.
 - Loss of consciousness and/or seizures.
 - Photophobia and/or blurred/double vision.
- Extrication from a Vehicle: see **C - 7, Spinal Motion Restriction**.
- Basilar Skull Fracture: Battle signs/raccoon eyes are late findings that do not typically present for 24 - 72 hours; immediate signs include CSF leaking from nose/ears.
- Whole Blood is the preferred resuscitative fluid for hemorrhagic shock (blood loss). When available, use in lieu of 25% Albumin and LR. Additionally, Whole Blood may be efficacious in treating shock refractory to all other means, consult OLMC.

[https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_\(CPGs\)/Traumatic_Brain_Injury_Severe_Head_Injury_02_Mar_2017_ID30.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_(CPGs)/Traumatic_Brain_Injury_Severe_Head_Injury_02_Mar_2017_ID30.pdf)



Altitude Illness (Adult)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Current altitude Rate of ascent Time at altitude Hx of altitude illness Prophylaxis/treatment for altitude illness	Headache / Fatigue Neurological deficits Ataxia Confusion Seizure Nausea/vomiting Cough/shortness of breath	CVA Acute Mountain Sickness (AMS) High-Altitude Pulmonary Edema (HAPE) High-Altitude Cerebral Edema (HACE) MI, CHF Pneumonia or Sepsis

This protocol is generally for personnel conducting EMS at above 8000 feet in elevation or Health Service Support in austere or operational environments (i.e. range coverage)

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Begin Descent Immediately (Symptoms often begin to resolve with descent)• B - 2, Airway Management / Oxygen• Severe respiratory distress with S/Sx of pulmonary edema:<ul style="list-style-type: none">- Start NC at 4 LPM, titrate to maintain SpO₂ > 94%- Support ventilation and keep head at 30° if able• Evaluate for and treat injuries IAW C - 1, Trauma, General• BGL - If < 60mg/dL or > 300mg/dL, see B - 20, Diabetic Emergencies• See B - 3, Nausea / Vomiting if applicable
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• EtCO₂ (Capnometry) - If lethargic, hypoxic, altered LOC and/or hypotensive• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able• Suspected HAPE (see additional considerations):<ul style="list-style-type: none">- Consider CPAP - If no contraindications initiate at 5cmH₂O w/severe respiratory distress/impending failure; increase incrementally to 15cmH₂O (max) if SpO₂ remains < 90%. Contact OLMC for further titration.- If required, support ventilations with BVM and PEEP valve at 5cmH₂O (max 10cmH₂O)
					<ul style="list-style-type: none">• Vascular Access - Administer fluids per B - 29, Shock / Hypotension• Suspected Acute Mountain Sickness (see additional considerations):<ul style="list-style-type: none">- Normal SBP, but HR > 100bpm:<ul style="list-style-type: none">- LR 500mL IV/IO, repeat x 3 PRN if HR remains > 100bpm and no S/Sx of pulmonary edema- With Headache and Normal Mentation (if altered, see HACE):<ul style="list-style-type: none">- Acetazolamide IR tablet 250mg PO x 1, may repeat in 12 hrs- Dexamethasone 4mg IV/IO/PO q 4 - 6 hrs PRN• Suspected HACE (see additional considerations):<ul style="list-style-type: none">- LR 500mL IV/IO, repeat x 2 as needed to maintain SBP > 110mmHg- Dexamethasone 10mg IV/IO/IM/PO x 1, then Dexamethasone 4mg IV/IO/IM/PO q 4 - 6 hrs PRN• Suspected HAPE (see additional considerations):<ul style="list-style-type: none">- SBP < 90mmHg: 500mL LR IV/IO x 1- SBP > 100mmHg: Nifedipine 30mg ER tablet PO, repeat q 4 - 6 hrs. PRN
					<ul style="list-style-type: none">• BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH₂O (IPAP) and 4cmH₂O (EPAP) w/severe

V5 For use After 01 October 2025	Specialty Protocols G - 1a	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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distress/impending failure; increase IPAP incrementally to 15cmH₂O (max) and EPAP to 10cmH₂O
SpO₂ remains < 90%. Contact OLMC for further titration.

- **EtCO₂ (Capnography)** - If lethargic, hypoxic, altered LOC and/or hypotensive

Additional Considerations

- No medication has been found as effective in treating altitude related illnesses as decent and oxygen; rescuers should primarily focus on evacuating the patient to a lower altitude.
- Chronic medical conditions are often exacerbated at altitude.
- Most altitude illnesses occur at elevations > 8,000 feet; rapid rate of ascent can cause mild illness at lower altitudes.
- Acute Mountain Sickness (AMS): Most common altitude illness, affects up to 50% of travelers. Symptoms include headache and one or more of the following: anorexia, nausea/vomiting, fatigue, weakness, dizziness, lightheadedness or difficulty sleeping. These symptoms must occur in the setting of recent arrival to high altitude (generally, 5,000 - 7,000 feet). Treat dehydration symptoms (normal SBP and HR > 100bpm) with fluids.
 - Symptoms are similar to other conditions. Also consider carbon monoxide poisoning, dehydration, exhaustion, hypoglycemia, or hyponatremia.
- High-Altitude Cerebral Edema (HACE): Symptoms begin as Acute Mountain Sickness and progress to altered mental status, ataxia, stupor, seizures or coma. HACE is generally seen at altitudes > 8,000 feet. Symptoms of HACE and a stroke can be similar. If patient's symptoms do not resolve/improve with reduced altitude, perform Cincinnati Prehospital Stroke Scale and VAN assessment; see **B - 13, Stroke**.
- High-Altitude Pulmonary Edema (HAPE): Rare, but most lethal. Patients may or may not exhibit signs of Acute Mountain Sickness prior to developing HAPE. HAPE is characterized by progressive dyspnea, cough, hypoxia, central cyanosis, crackles/rales, tachycardia, tachypnea and weakness at altitudes > 8,000 feet.

Specialty Protocols

G - 1a



CO Poisoning / Smoke Inhalation & Cyanide Toxicity



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Smoke inhalation Industrial exposure Space heaters Suicide attempt (vehicle exhaust) Time/Duration of exposure Eating large quantity of pit fruits	Coma, Seizure Loss of Consciousness Altered mental status Stroke-like symptoms Chest Pain/Respiratory distress, Tachypnea Arrhythmias Headache, nausea, vomiting Reddened skin	CVA or MI Infection Toxic ingestion Altered Mental Status Acute intoxication Flu/GI illness Neurological event Acute cardiac event Effects of other toxic fire byproducts

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Ensure scene safety for responders; immediately remove the patient from exposure• Airway Management - May require aggressive airway management, see C - 2, Burns• Oxygen - Provide 100% O2 via NRB regardless of SpO2 level with known/suspected CO poisoning, smoke inhalation, or cyanide toxicity• Determine *SpCO if equipped:<ul style="list-style-type: none">- SpCO 0% to 3%: No further evaluation of SpCO or treatment required; remove NRB if previously applied- SpCO 4% or above: With S/Sx, history of CO exposure, asthma, COPD, or cardiac: 100% O2 via NRB• See G - 2e, Scene Rehabilitation for care of personnel involved in fire suppression
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able; if moderate/severe CO poisoning obtain EKGs q 10 min• EtCO2 (Capnometry) - Will be monitored if SpCO > 4% or with suspected smoke inhalation• *SpCO:<ul style="list-style-type: none">- 4 - 11%:<ul style="list-style-type: none">- With S/Sx OR history of exposure: Treat with 100% O2 via NRB; contact OLMC- <u>No</u> S/Sx or <u>no</u> history of exposure: Observe only (smokers may have levels of 7 - 12%)- > 12%:<ul style="list-style-type: none">- With S/Sx OR history of exposure: Treat w/100% O2 via NRB and transport- No S/Sx or no history of exposure: Treat w/100% O2 via NRB and contact OLMC• Consider *CPAP - If no contraindications initiate at 5cmH2O w/severe respiratory distress/impending failure; increase incrementally to 15cmH2O (max) if SpO2 remains < 90%. Contact OLMC for further titration.• Using BVM, consider PEEP Valve (especially in pts w/hypoxia despite O2/Airway); max 10cmH2O

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Specialty Protocols
G - 1b

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

		<ul style="list-style-type: none"> • Vascular Access - Administer fluids per B - 29, Shock / Hypotension • *BiLevel CPAP (BiPAP) - if equipped initiate at 8cmH2O (IPAP) and 4cmH2O (EPAP) w/severe distress/impending failure; increase IPAP incrementally to 15cmH2O (max) and EPAP to 10cmH2O if SpO2 remains < 90%. Contact OLMC for further titration. • EtCO2 (Capnography) - Will be monitored if SpCO > 4% or with suspected smoke inhalation • *If a high clinical suspicion exists for cyanide toxicity (dosing is the same for adults and peds): <ul style="list-style-type: none"> - Hydroxocobalamin 70mg/kg IV/IO x 1 over 15 min; max dose 5g (Adult / Peds below) - If in Cardiac Arrest, administer rapid IV/IO push
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ADULT - Hydroxocobalamin (Cyanokit - 5g/200mL) and 250mL 0.9% NS							
Wt	45kg	50kg	55kg	60kg	65kg	70kg	72kg +
70mg/kg	3.15g	3.5g	3.85g	4.2g	4.44g	4.9g	5g
*mL	126	140	154	168	182	196	200
mL/hr.	504	560	616	672	728	784	800

*mL to infuse

<https://www.cyanokit.com/treatment-with-cyanokit#administer>

PEDIATRIC Hydroxocobalamin (Cyanokit - 5g/200mL) & 250mL 0.9% NS- Use Burette / Pump									
Color / Dose	Gray 3-5kg	Pink 6-7kg	Red 8-9kg	Purple 10-11kg	Yellow 12-14kg	White 15-18kg	Blue 19-23kg	Orange 24-29kg	Green 30-36kg
70mg/kg	280mg	455mg	595mg	735mg	910mg	1,155mg	1,470mg	1,855mg	2,275mg
*mL	11.2	18.2	23.8	29.4	36.4	46.2	58.8	74.2	91
mL/hr.	44.8	72.8	95.2	117.6	145.6	184.8	235.2	296.8	364
Avg Wt	4kg	6.5kg	8.5kg	10.5kg	13kg	16.5kg	21kg	26.5kg	32.5kg

*mL to infuse

<https://www.cyanokit.com/treatment-with-cyanokit#administer>

Additional Considerations	
<ul style="list-style-type: none"> • *Cyanide toxicity S/Sx: AMS, seizure, cardiovascular collapse, respiratory distress <ul style="list-style-type: none"> - If suspected, remove contaminated clothing prior to transport. - Carbon Monoxide and Cyanide poisoning should be considered whenever there is a combustion. • *Continuous Cardiac Monitoring and Serial EKGs: nearly 1/3rd of moderate/severe CO-poisoned patients experience myocardial ischemia; see B - 10, Chest Pain as applicable. • All smoke inhalation patients should be considered to have Carbon Monoxide poisoning and be monitored as such. • If possible, have F&ES/CES personnel obtain a PPM CO reading inside the building/area where the patient was exposed, document results in the patient chart. • Pregnant Patients: all patients confirmed or suspected to be pregnant w/CO exposure should be transported for evaluation: fetal hemoglobin has a higher affinity for CO than maternal hemoglobin. • Regardless of ability/inability to obtain SpCO, symptomatic patients with known exposure should be transported. <p>*SpCO Levels (in %, not PPM) obtained from commercial device (i.e. RAD-57 or cardiac monitor) if equipped:</p> <ul style="list-style-type: none"> • Consider transporting to hospitals with Hyperbaric Chambers for the following: <ul style="list-style-type: none"> - Adults (SpCO level 25% +) - Pregnant (SpCO 15% +) - Peds (SpCO 15% +) 	

Specialty Protocols

G – 1b



Decompression Illness (Aerospace)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Known altitude of decompression Time descent began after decompression Time to descend to lower altitude Altitude maintained after descent Oxygen use	AMS, Confusion and/or hypoxia Combative, Seizures Dizziness, Headache Joint Pain, Tingling and/or numbness Extremity weakness Skin rash	Stroke CNS Injury Hypoxia Hypoglycemia

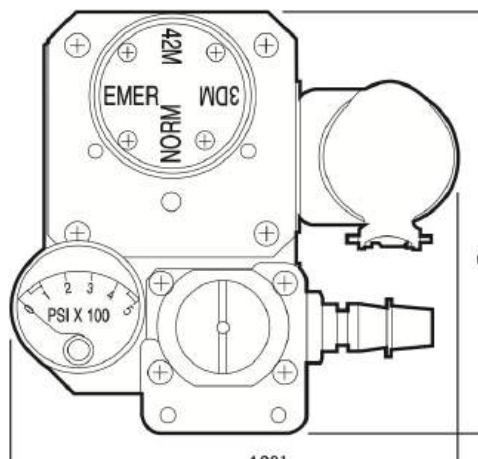
Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• B - 2, Airway Management / Oxygen<ul style="list-style-type: none">- 15L NRB until patient can be placed on Aviator's Mask or CPAP- *If SpO₂ is < 90% after 3 min, consider HFNC at 15 - 25LPM for up to 10 min• Contact OLMC to discuss transport to Hyperbaric Treatment Facility (if available) and notify on call Flight Surgeon ASAP. Do not delay transport or treatment.• Check BGL if altered mental status or hx of diabetes, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring and 12-Lead EKG - Obtain/transmit if able• EtCO₂ (Capnometry) - any patient that is lethargic, altered, hypotensive, or w/SGA• Aviator's Mask/Portable Bottle:<ul style="list-style-type: none">- If patient is using Aviator's Mask, transition O₂ from aircraft to portable bottle.- *If SpO₂ < 90%, set regulator to "EMERG" otherwise, keep at "NORMAL"- If patient not using mask and found to be hypoxic, place Aviator's Mask and set at "EMERG"• Aviator's Mask/Ambulance Regulator:<ul style="list-style-type: none">- *Pressure is not adjustable, if SpO₂ remains < 90%, transition to CPAP• *CPAP - If an Aviator's Mask is unavailable or the portable tank runs out, use CPAP starting at 5cmH₂O (if on "NORMAL") or 10cmH₂O (if on "EMERG")• Needle Thoracentesis – Suspected tension pneumothorax (SL2/SL3 w/TCCC Tier 2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval). Lateral (4th ICS, AAL) site preferred.
					<ul style="list-style-type: none">• Cardiac Monitoring - If clinically indicated or no improvement in patient condition• Vascular Access - Obtain & treat hypotension if present, see B - 29, Shock/Hypotension
					<ul style="list-style-type: none">• EtCO₂ (Capnography) - if lethargic, AMS, hypotensive, or w/SGA/ETT/Cric

Additional Considerations
<ul style="list-style-type: none">• Decompression Illness (DCI) occurs when nitrogen bubbles come out of solution within the bloodstream. The nervous and musculoskeletal systems are most commonly affected. DCI could occur if an aircraft loses pressurization at altitudes greater than the cabin pressure level. It can also be seen following hypobaric (altitude) chamber training. Symptoms can occur anytime within 72 hours following an event, but are most common within the first 24 hours.• *Hypoxia is not a common event in pts with DCI. The purpose of high-concentration oxygen is to create a concentration gradient that allows for "denitrification" to rapidly decrease the amount of nitrogen in the body and therefore reduce bubbles. An Aviator's Mask and CPAP will likely provide a higher concentration of oxygen than NRB and will be used preferentially. Demand Valve Resuscitator/Inhalator units (sometimes known as Flow-Restricted Oxygen Powered Ventilatory Devices) are commonly used in diving medical support and are preferred if available.

V5 For use After 01 October 2025	Specialty Protocols G – 1c	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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- DCS Type I:
 - “The Bends”: most common presentation of DCS. Pain in/around one or major joints (shoulder and elbow most common)
 - “Skin Bends”: less common; mottled skin/pruritic rash.
 - “Lymphatic Bends”: swelling of the lymph nodes (usually in the upper chest/axilla).
- DCS Type II (Less common, but severe/life threatening)
 - “The Chokes”: burning chest pain worse w/inhalation, cough, SOB, tachypnea, cyanosis
 - Vestibular DCS (“The Stagers”): vertigo, tinnitus, deafness, nausea/vomiting
 - Neurological DCS: If the brain is involved the patient may have AMS, ataxia, and vision loss. Spinal Cord DCS is infrequent, it typically presents as numbness/paralysis in the lower extremities, low back pain, and rarely the loss of rectal/urethral sphincter control.
- Installations should pre-plan access to hyperbaric treatment facilities and plan for Flight Surgeon involvement in Aerospace DCI. Patients should be transported for evaluation regardless of the presence of symptoms; if the patient is stable, coordinate the transport destination with OLMC and/or on-call Flight Surgeon. OLMC/on-call Flight Surgeon should consider consultation with predesignated on-call Undersea and Hyperbaric Medicine Service or Divers Alert Network (+1-919-684-9111).
- If a patient is transported by air, cabin altitude should be restricted (< 1000ft AGL / 1000ft MSL).

Flight Medicine Aviator Mask Regulator





Decompression Illness (Diving)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Witnessed trauma, time submersed, water temperature Greatest depth achieved Descent / Ascent Rate Air utilized (compressed air, Nitrox, etc.) Date / time of previous dive Divers Alert Network +1-919-684-9111	Altered Mental Status Stroke-like symptoms Seizure Chest Pain / Coughing Respiratory Distress, SOB Hypoxia, Cyanosis Headache, Malaise Joint Pain Hypothermia	Trauma Stroke / CNS Injury ACS/STEMI Overdose / toxic ingestion Hypothermia Acidosis/Alkalosis/Electrolyte *Arterial Gas Embolism (AGE) see below

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• B - 2, Airway Management / Oxygen<ul style="list-style-type: none">- *Decompression Sickness (DCS) or AGE suspected: Initiate 15L NRB (regardless of SpO2)- *If SpO2 is < 90% after 3 min, consider HFNC at 15 - 25LPM for up to 10 min• Spinal Immobilization as indicated• Patients should be placed in the supine position• Contact OLMC to discuss transport to Hyperbaric Treatment Facility (if available)• Hypothermia Prevention - See B - 23, Hypothermia / Cold Exposure• Check BGL if altered mental status or hx of diabetes, see B - 20, Diabetic Emergencies
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Cardiac Monitoring & 12-Lead EKG - Obtain/transmit if able• EtCO2 (Capnometry) - any patient that is lethargic, altered, hypotensive, or w/SGA• CPAP – May provide a higher oxygen concentration than NRB. Do NOT use if pulmonary barotrauma is suspected• Needle Thoracentesis – Suspected tension pneumothorax (SL2/SL3 w/TCCC Tier 2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval). Lateral (4th ICS, AAL) site preferred.
					<ul style="list-style-type: none">• Vascular Access - Obtain & treat hypotension if present, see B - 29, Shock/Hypotension• EtCO2 (Capnography) - if lethargic, AMS, hypotensive, or w/SGA/ETT/Cric

Additional Considerations
<ul style="list-style-type: none">• Decompression Illness occurs when nitrogen bubbles come out of solution within the bloodstream. Arterial Gas Embolism (AGE) and Decompression Sickness (DCS) are two primary presentations. The nervous and musculoskeletal systems are most commonly affected. Symptoms can occur anytime within 72 hours following completion of a dive, but are most common within the first 24 hours.• *Hypoxia is not a common event in pts with DCI. Discussions The purpose of high-concentration oxygen is to create a concentration gradient that allows for “denitrification” to rapidly decrease the amount of nitrogen in the body and therefore reduce bubbles. Aviator’s Mask and CPAP will likely provide a higher concentration of oxygen than NRB and will be used preferentially. Demand Valve Resuscitator/Inhalator units (sometimes known as Flow-Restricted Oxygen Powered Ventilatory Devices) are commonly used in diving medical support and are preferred if available.• Arterial Gas Embolism (AGE) usually appears within 10 minutes of surfacing.<ul style="list-style-type: none">- Result of breath holding upon ascent.

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- May present as: LOC during ascent or within 10 minutes of surfacing, AMS, seizure, CVA, MI, PE, pneumothorax. May rapidly progress to death.
- DCS Type I:
 - “The Bends”: most common presentation of DCS. Pain in/around one or major joints (shoulder and elbow most common)
 - “Skin Bends”: less common; mottled skin/pruritic rash.
 - “Lymphatic Bends”: swelling of the lymph nodes (usually in the upper chest/axilla).
- DCS Type II (Less common, but severe/life threatening)
 - “The Chokes”: burning chest pain worse w/inhalation, cough, SOB, tachypnea, cyanosis
 - Vestibular DCS (“The Staggers”): vertigo, tinnitus, deafness, nausea/vomiting
 - Neurological DCS: If the brain is involved the patient may have AMS, ataxia, and vision loss. Spinal Cord DCS is infrequent, it typically presents as numbness/paralysis in the lower extremities, low back pain, and rarely the loss of rectal/urethral sphincter control.
- Ear Barotrauma: failure of pressure equalization (Valsalva): dizziness and vertigo; severe cases may result in a ruptured eardrum/bleeding.
- Paranasal Sinus Trauma: caused by the blood vessels in the sinus enlarging and rupturing; usually occurs as a result of failing to equalize during descent; common signs include nose bleeds and blood in the patient’s mask.
- Installations should pre-plan access to hyperbaric treatment facilities; all patients should be transported for evaluation as symptoms often progress. OLMC should consider consultation with predesignated on-call Undersea and Hyperbaric Medicine Service or Divers Alert Network (+1-919-684-9111).
- If a patient is transported by air, cabin altitude should be restricted (< 1000ft AGL / 1000ft MSL).



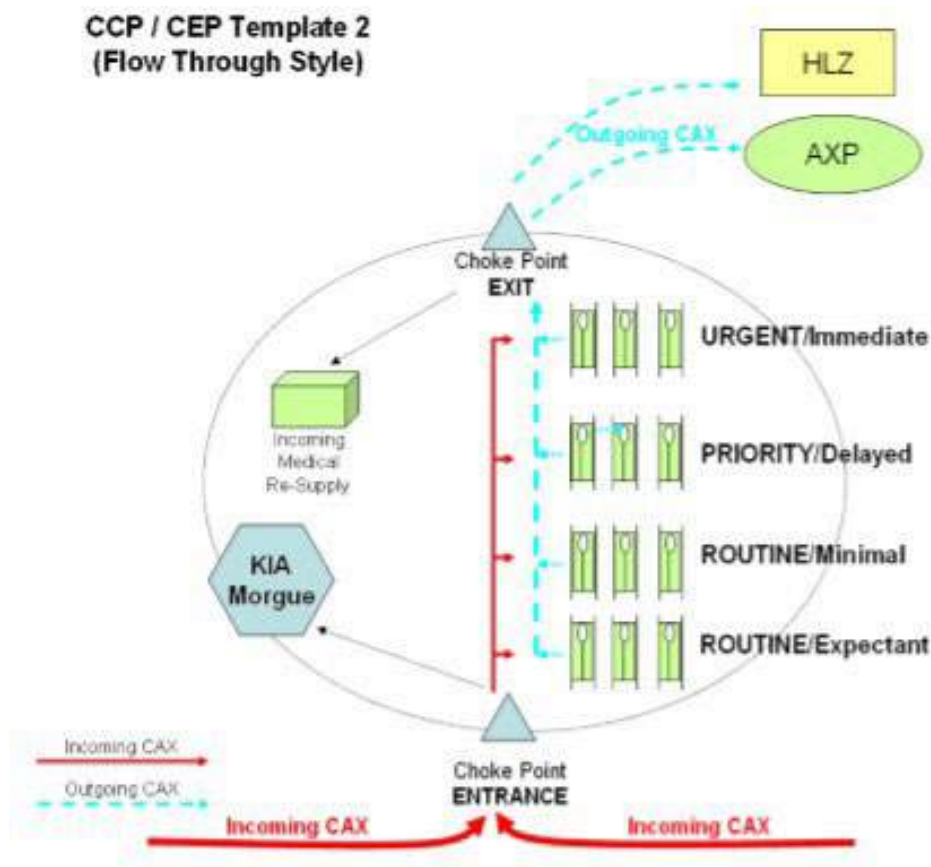
Mass Casualty Incidents (MCI)



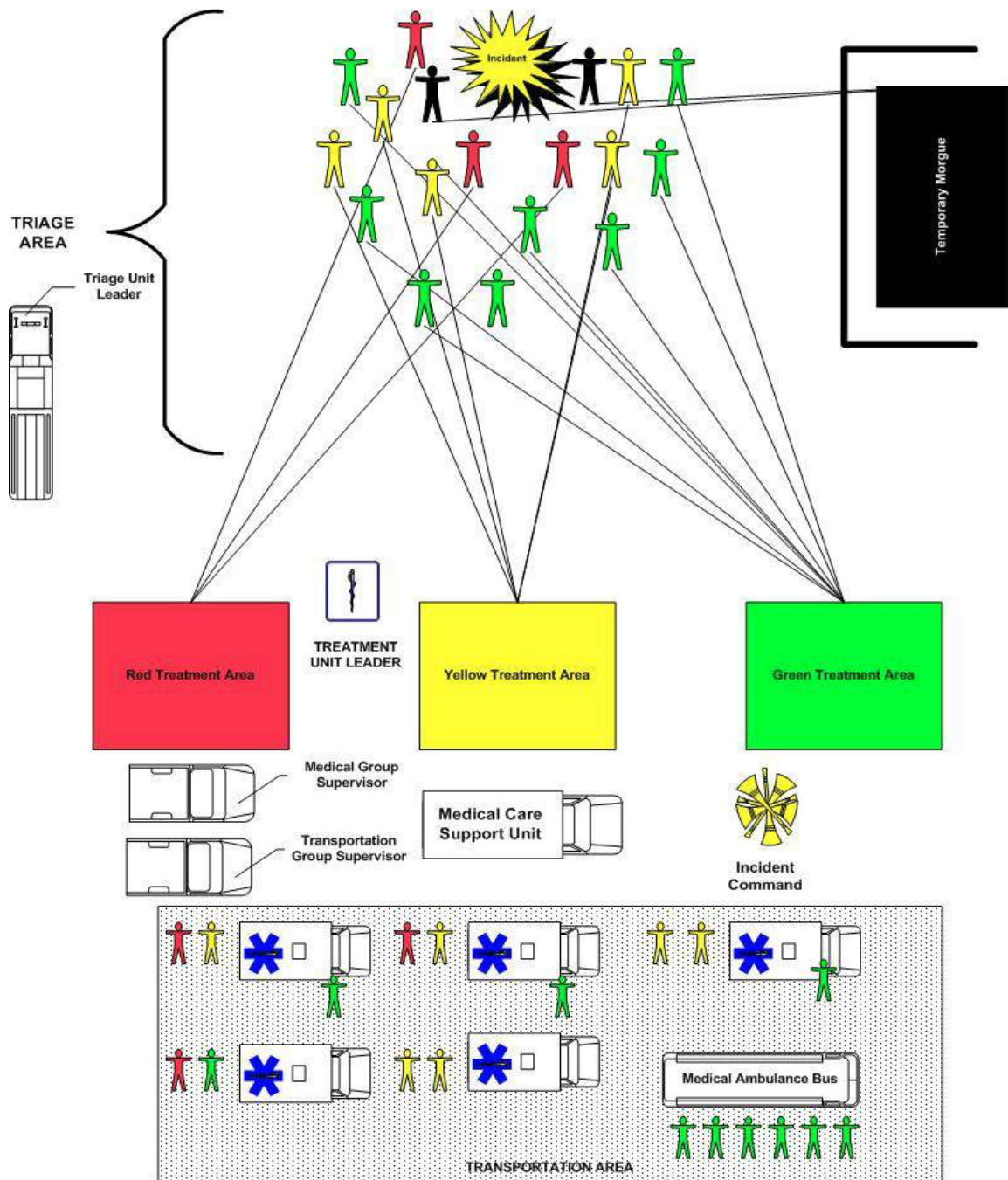
MCI Guidance

- **Follow local / installation guidance**
- Initial responders should focus on initial triage once the scene is secured
- MCI triage may be dependent on installation policy.
 - SALT is for adults only and focuses on treatment in conjunction with triage (should be PRIMARY triage in deployed environments)
 - START is commonly used in civilian EMS/FDs / JumpSTART is for pediatrics ONLY
 - Regardless of the systems used, initial triage and movement to the casualty collection point (CCP) or Treatment Area is priority
- Incident Command (IC) is the lead on ALL MCIs
- Once patients are triaged, move to CCP/Treatment area and re-triage at the entry control point (ECP)
- Patients should be constantly re-triaged. If a patient needs to move from one triage area to another, ensure the Triage POC is notified for updated accountability and patient management.
- If triage tags are utilized and a patient is re-triaged, add a new triage tag with the appropriate triage level and put a line through the old tag. Do not remove the old tag.

Below are examples of CCPs. CCP layout is based on number of casualties and area available:



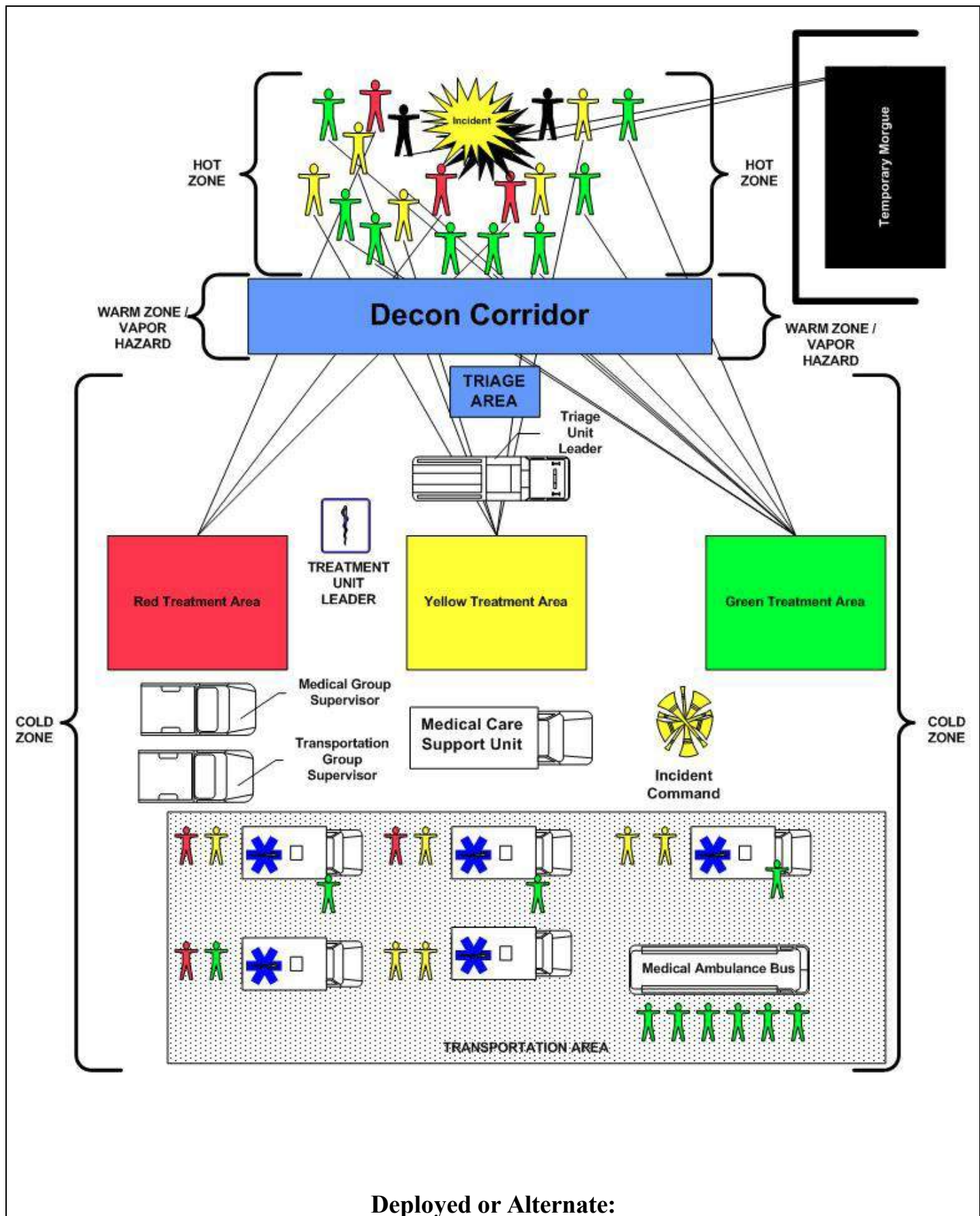
No known Hazards



Hazards or Contamination

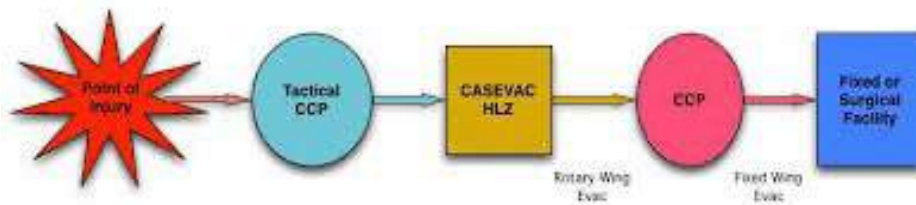
Specialty Protocols

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Deployed or Alternate:

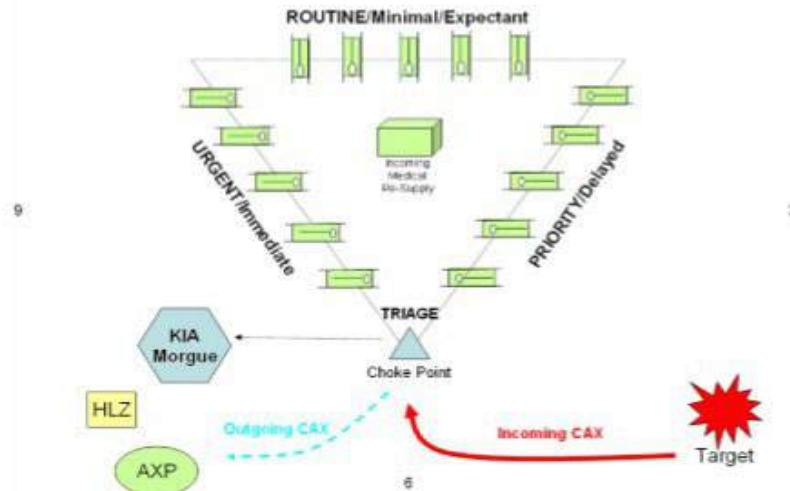
Specialty Protocols
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Casualty flow from target to hospitalization.

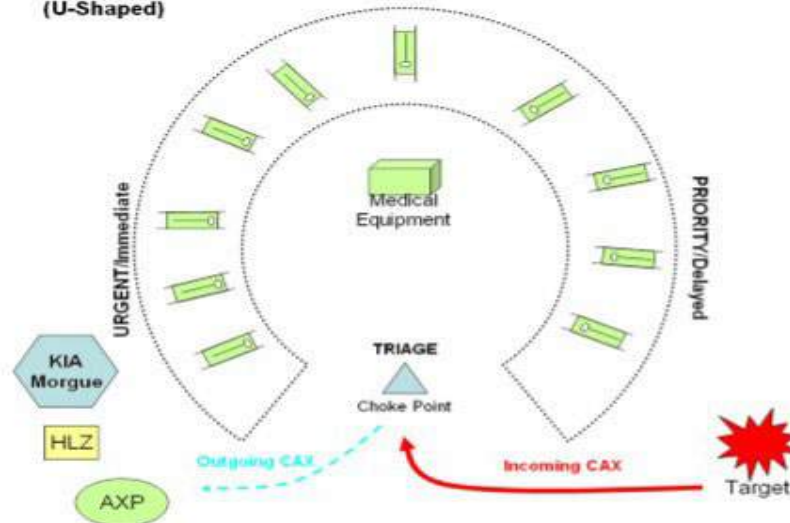
CCP / CEP Template 5
(Open Area / Field)

12



CCP / CEP Template 6
(U-Shaped)

ROUTINE/Minimal/Expectant



<https://safe.menlosecurity.com/doc/docview/viewer/docNB7D931A05CEF08666005a49602bda09058d0546e94db0170fbd0fb2ce17a8c0885f021eac56>
https://www.novaregion.org/DocumentCenter/View/1901/MCIM_Final?bidId=

Specialty Protocols

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Triage (SALT)

Adults Only



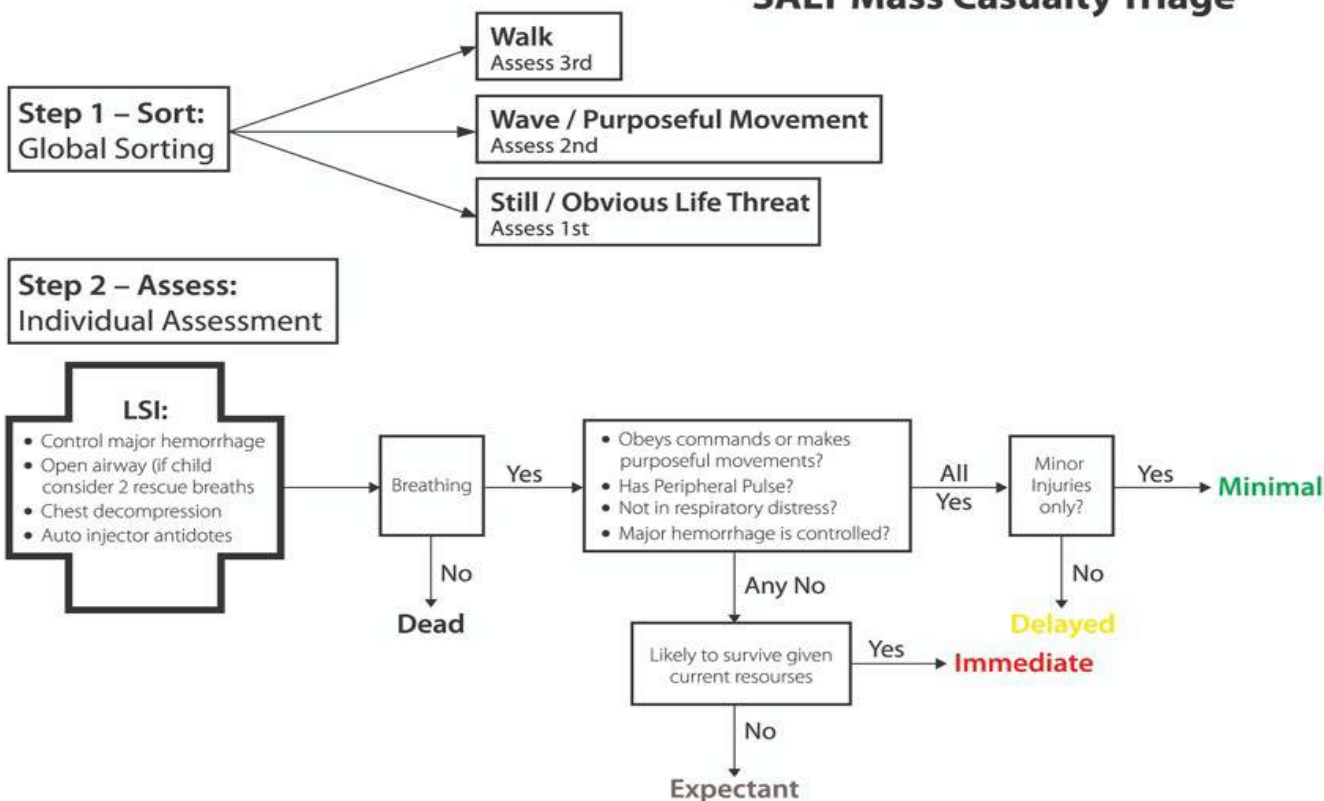
Application

Developed by the Centers for Disease Control and Prevention as an all-hazards mass casualty initial triage standard for adult and pediatric patients. Follow local guidance.

SALT Triage

Sort, Assess, Life-Saving Interventions (LSI), Transport

SALT Mass Casualty Triage



<https://chemm.nlm.nih.gov/salttriage.htm>

Clinical Practice Guidelines

S	S	S	S	S	• Life Saving Interventions (LSI): - Tourniquet (TQ) (to include hemostatic packing of junctional wounds, and Junctional TQ placement as time allows) - Open airway, if breathing, insert NPA or OPA; deliver two rescue breaths for pediatric patients - Auto-Injector Antidotes • Refer to C - 1, Trauma and F - 1, Trauma when able • Needle Decompression (SL2 and above ONLY with TCCC Tier 2 or above)
L	L	L	L	L	
1	2	3	4	5	

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//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

Additional Considerations

- The goal of mass casualty triage in the prehospital setting is to prioritize patients for treatment and/or transport.
- Field triage is a continuous process. Resources should be targeted to address Immediate patients. As these individuals are stabilized, Delayed patients should be re-assessed and resuscitations efforts directed accordingly.
- If possible, Expectant patients should be separated from Immediate, Delayed, and Minimal patients to minimize psychiatric trauma.

In a mass casualty, patients are commonly assigned to one of five categories:

- Immediate (**Red tag**): Patients who require immediate medical attention. Includes: patients with AMS, respiratory distress, uncontrolled hemorrhage, sucking chest wounds, unilateral absent breath sounds, junctional injury with associated significant hemorrhage, cyanosis, or a weak/rapid pulse.
- Delayed (**Yellow tag**): Patients in need of definitive medical care, but are not likely to decompensate rapidly if care is delayed. Examples of patients in this group include those with deep lacerations, open fractures, injury where tourniquet is effectively controlling the bleeding, abdominal injuries with stable vital signs, and head injuries with an intact airway.
- Minimal (**Green tag**): Patients have self-limited injuries and can tolerate extended delays in treatment without increasing their risk of mortality. Patients have stable vital signs and minor injuries such as abrasions, contusions, and small lacerations.
- Expectant (**Gray tag**): Individuals who have little or no chance for survival despite maximum therapy. Initial resources should not be directed at this group as they will be needed for patients who will be more likely to survive. As resources are available, comfort care should be provided.
- Deceased (**Black tag**): If/when possible, a field morgue should be established with at least one person acting as a sentinel.



Triage (START / JumpSTART)



The **START (Adult)** & **JumpSTART (Pediatric)** triage methods are currently the most widely used methods of mass casualty triage among first responders in the U.S. These algorithms are based on respiratory function, quality of perfusion, and mental status. Clinical practice guidelines below are to be implemented following patient assessment and sorting into Immediate, Delayed, Minimal (Minor), and Expectant Categories.

Clinical Practice Guidelines

S	S	S	S	S	<ul style="list-style-type: none">Life Saving Interventions (LSI):<ul style="list-style-type: none">Tourniquet (TQ) (to include hemostatic packing of junctional wounds, and Junctional TQ placement as time allows)Open airway, if breathing, insert NPA or OPA; deliver five rescue breaths for pediatric ptsAuto-Injector AntidotesRefer to C - 1, Trauma and F - 1, Trauma when able
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">Needle Thoracentesis – Suspected tension pneumothorax (SL2/SL3 w/TCCC Tier 2+ AND OLMC approval. SL4/SL5 does NOT require OLMC approval). Lateral (4th ICS, AAL) site Preferred for adults.

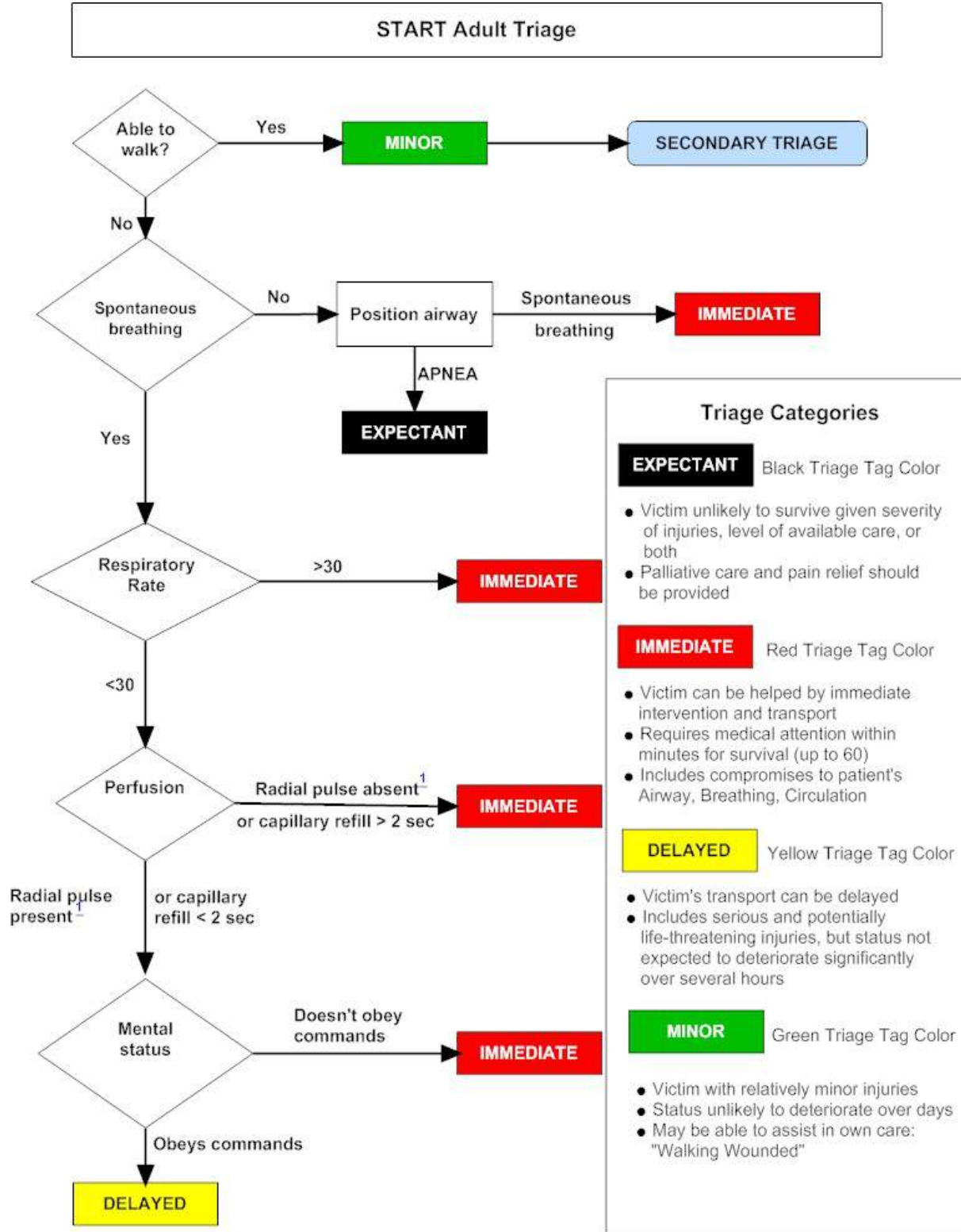
Additional Considerations

- The goal of mass casualty triage in the prehospital setting is to prioritize patients for treatment and/or transport.
- Field triage is a continuous process. Resources should be targeted to address Immediate patients. As these individuals are stabilized, Delayed patients should be re-assessed and resuscitations efforts directed accordingly.
- If possible, Expectant patients should be separated from Immediate, Delayed, and Minimal patients to minimize psychiatric trauma.

In a mass casualty, patients are commonly assigned to one of five categories:

- Immediate (Red tag):** Patients who require immediate medical attention. Includes: patients with AMS, respiratory distress, uncontrolled hemorrhage, sucking chest wounds, unilateral absent breath sounds, junctional injury with associated significant hemorrhage, cyanosis, or a weak/rapid pulse.
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- Minimal (Green tag):** Patients have self-limited injuries and can tolerate extended delays in treatment without increasing their risk of mortality. Patients have stable vital signs and minor injuries such as abrasions, contusions, and small lacerations.
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- Expectant (Black tag):** If/when possible, a field morgue should be established with at least one person acting as a sentinel.

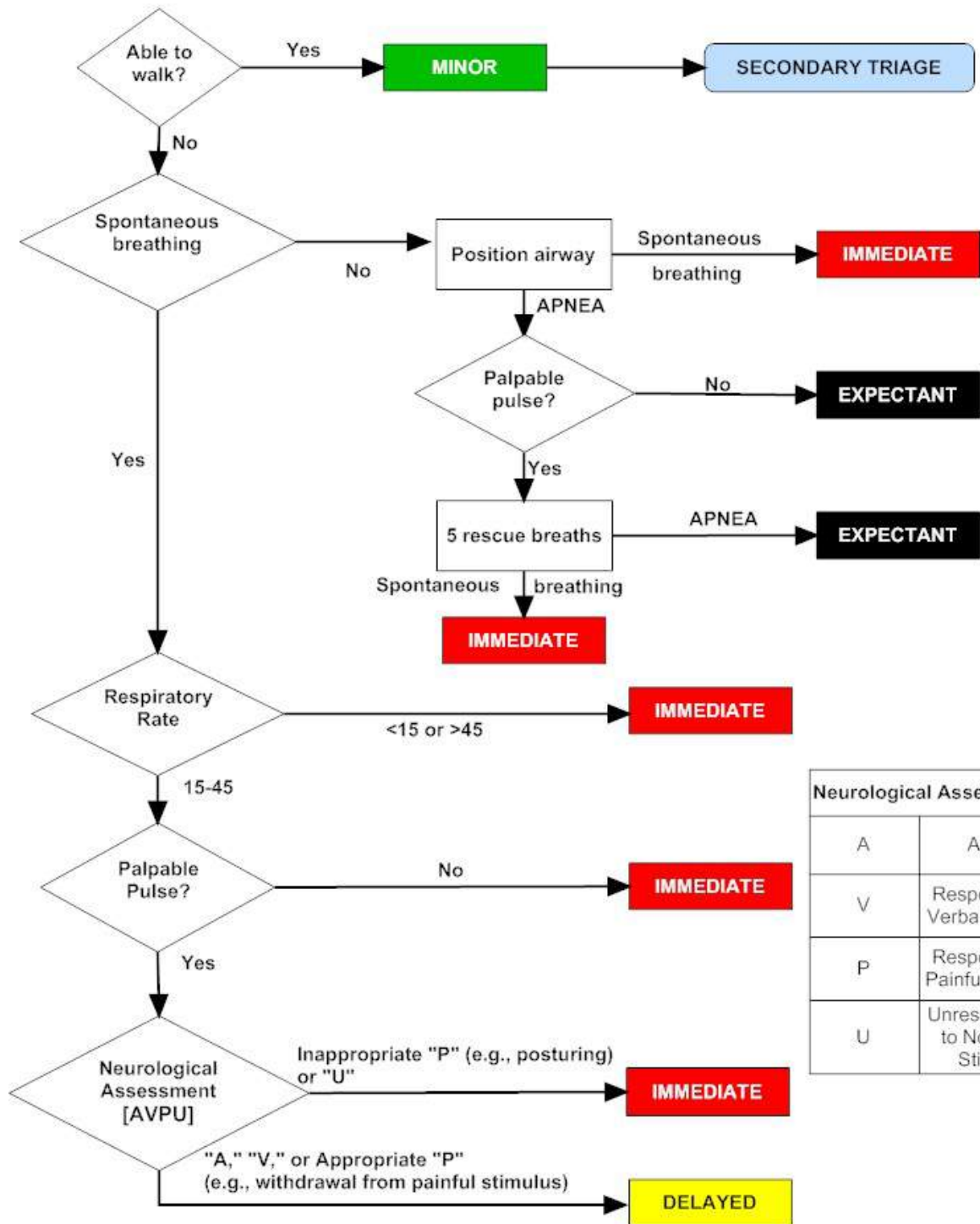
START Triage - Simple Triage and Rapid Treatment (ADULTS)



<https://chemm.nlm.nih.gov/startadult.htm>

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JumpSTART Pediatric Multiple Casualty Incident Triage



Use JumpSTART if the Patient appears to be a child.

Use an adult system, such as START, if the patient appears to be a young adult.

<https://chemm.nlm.nih.gov/startpediatric.htm>

Specialty Protocols

G - 2c



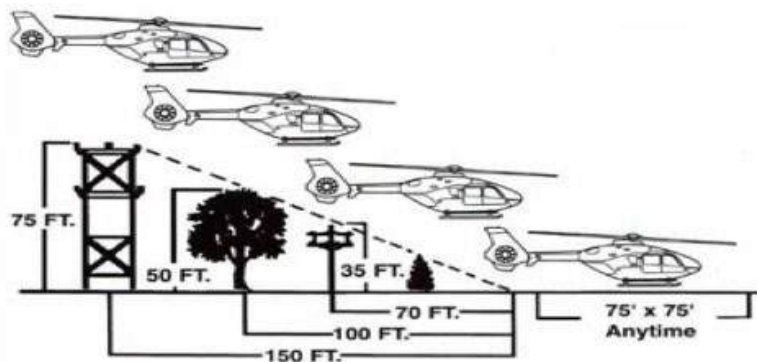
Helicopter Landing Zone (HLZ) Operations



HLZ Ground Operations

LZ COORDINATOR RESPONSIBILITIES:

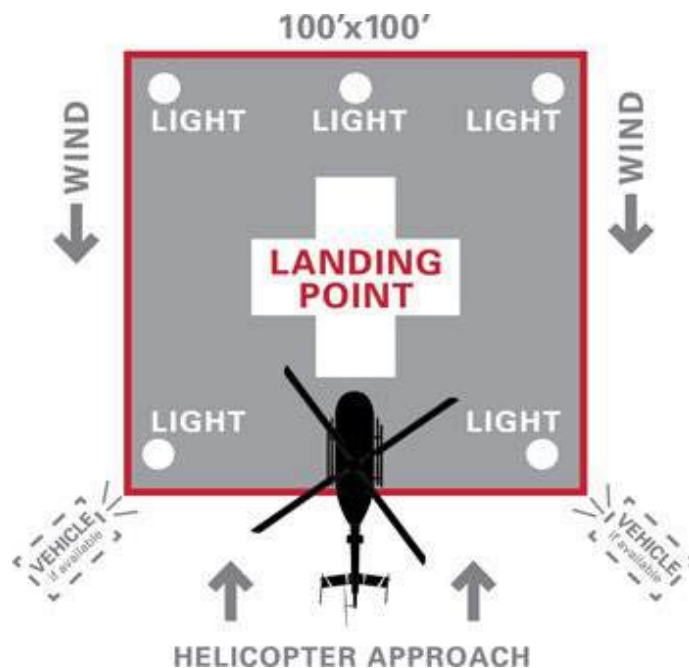
- Command and secure the LZ
- ***Establish radio contact with aircraft**
 - 1) Assist pilot in locating the LZ
 - 2) Describe LZ ground conditions
 - 3) Describe obstacles within 150ft radius
 - 4) Determine ground wind speed/direction
- Keep all bystanders 100' away from the LZ
- Keep everyone away from the tail rotor
- Contact pilot after landing to determine any safety issues



HELICOPTER SAFETY:

The pilot and/or aircrew control all activity around the aircraft

- Approach/depart aircraft from the side or as directed by the aircrew
- Never walk around the tail rotor
- Shield eyes from rotor wash during landing and takeoff
- Do not carry anything above your head
- Do not approach the helicopter while blades are turning unless instructed by the crew
- Do not run towards aircraft, approach in a calm and slow manner
- Ensure all monitoring equipment, blankets, etc. are properly secured under safety belts



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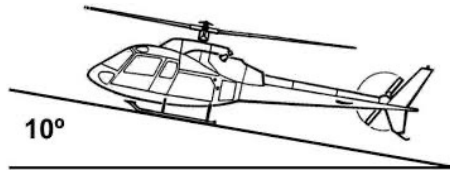
Specialty Protocols
G - 2d

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

Additional Considerations

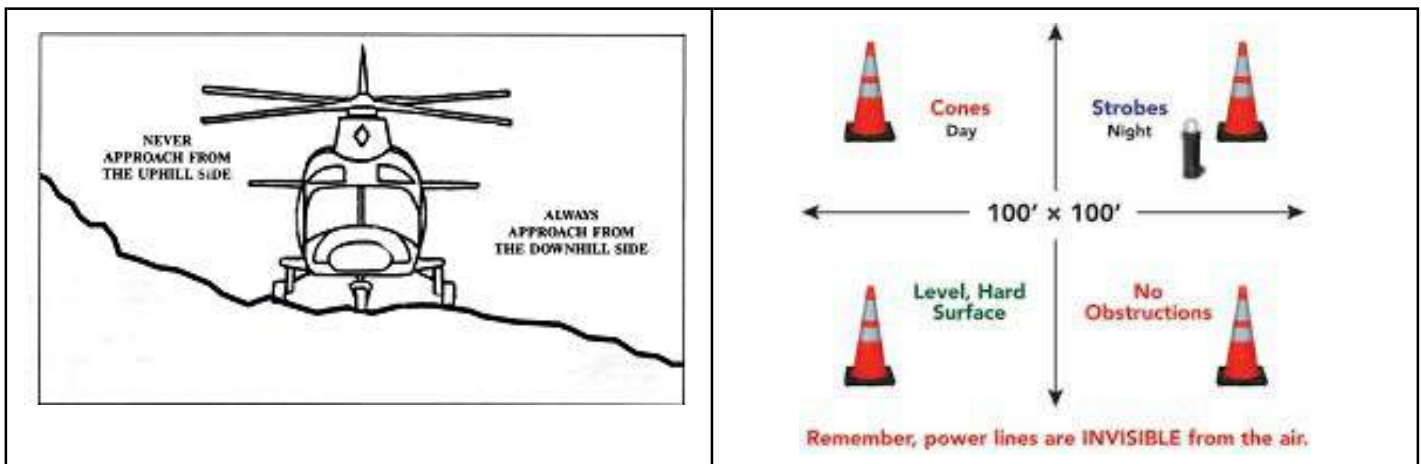
If able, establish radio contact with aircraft

- 1) **Assist pilot in locating the LZ** - Provide GPS coordinates (in aircrew preferred format)
- 2) **Describe LZ ground conditions** - Ground should be as flat as possible. If there is a slope/grade, estimate degree and report to aircraft. Some cannot land with a certain degree slope (see below picture)



- 3) **Describe obstacles within 150ft radius** - Adequately describe surrounding obstacles and location (power lines, comm towers, water towers, buildings, etc.)
- 4) **Determine ground wind speed/direction** - Provide estimated ground wind speed and direction

- Installations should develop local guidance outlining a **PACE** plan for HLZ operations (ex. **Primary** - Ramp on flight line; **Alternate** - Helo pad at hospital; **Contingency** - Parking lot outside of BX; **Emergency** - Closest appropriate location for HLZ (may be on a range, etc.)



- Eye and Ear Protection should be provided to patients as required (do NOT place "foamies" in patients with head injuries); Note: aircrew should provide these.

<https://www.beaconhealthsystem.org/beacon-medical-transport/landing-zone-preparation-and-safety/>

<https://www.careflight.org/landingzone.aspx>

<https://www.fireengineering.com/apparatus-equipment/safety-medevac-landing-zone/>

Specialty Protocols

G - 2d

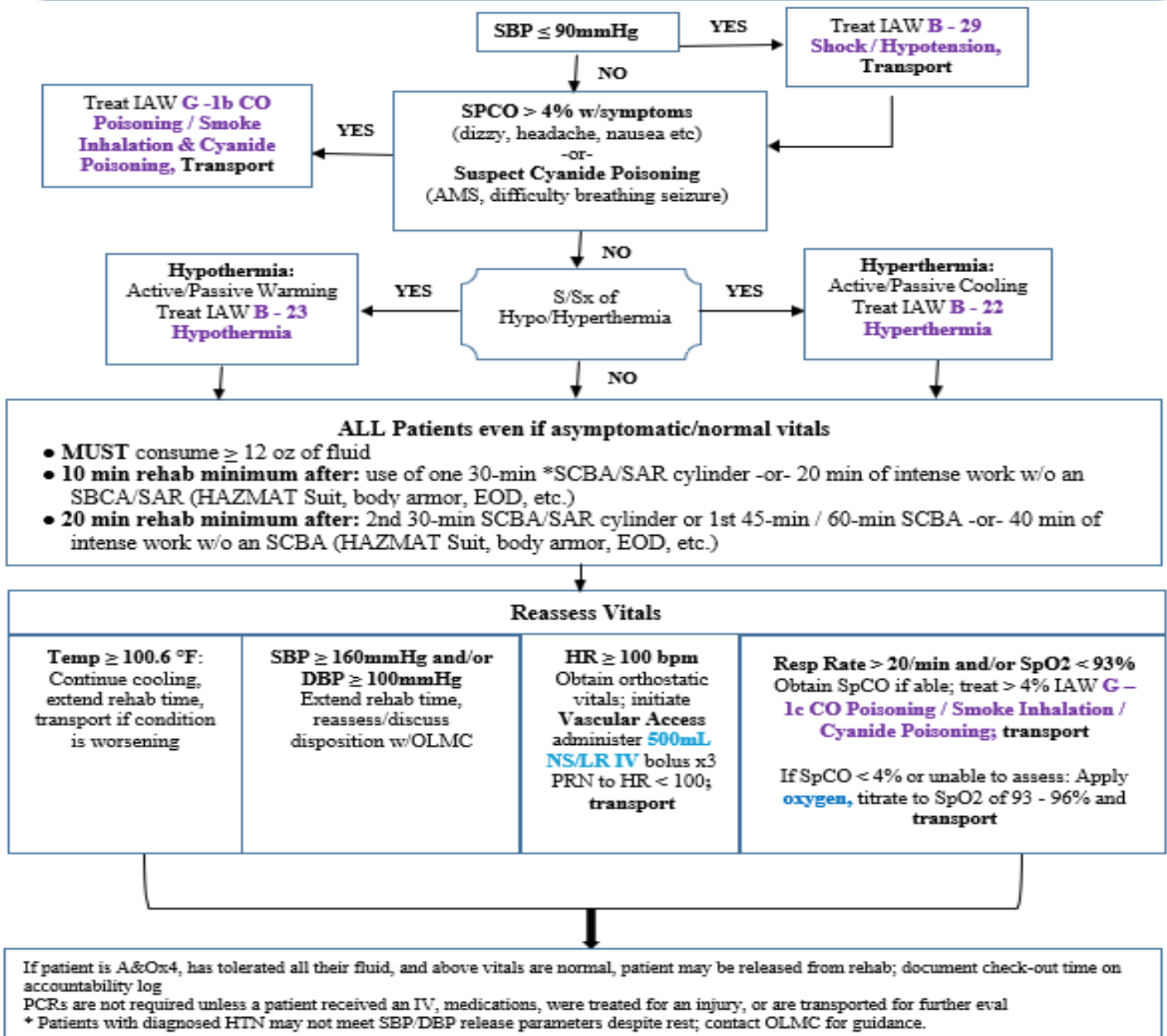


Scene Rehabilitation

(F&ES, BEE, HAZMAT, EOD, Police)

Patient Care

- 1) If patient is stable, complete decon, remove turnout gear, HAZMAT suit, body armor prior to entering rehab area
- 2) Immediately treat life threats IAW applicable protocol (Trauma, Cardiac Arrest, Chest Pain, etc.)
- 3) Check-in all patients on a locally developed accountability log (at a minimum include name, rank, time-in, unit assigned and baseline vitals (HR, BP, Resp, SpO₂, temp (if fire incident and equipped, obtain SpCO)))



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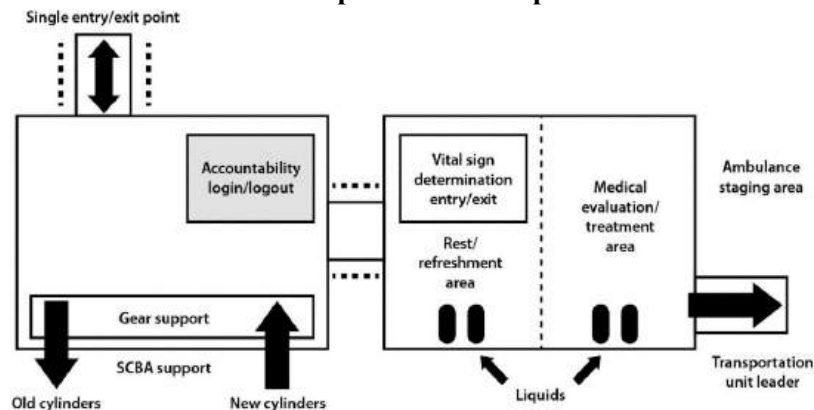
Specialty Protocols
G - 2e

//Signed//
Lt Col Christopher W. Hewitt
LTC Nicholas M. Studer

Additional Considerations

- * This protocol does not supersede local Operating Instructions, it is meant to establish minimum guidelines.
- Nausea/vomiting is a sign of dehydration, patients must drink/tolerate all their required fluids before being released.
- EMS must remain on-scene to facilitate rehab until released by Incident Command; if a patient requires hospital evaluation, an alternate unit must be called to the scene to conduct the transport or assume rehab responsibilities. In large scale incidents 2 EMS crews should be on-scene (1 for rehab and another standing by to transport).
- Studies have demonstrated > 1L of fluid loss during 20 min of firefighting; hydration regardless of thirst is critical.
- Patients shall not be allowed to use tobacco products or consume energy drinks while they are in the rehab area or on the emergency scene.
- EMS personnel may need to complete rehab if their operations are rigorous (MASCAL with many patients, etc.).
- Rehab Goals:
 - Rest (physical/psychological/emotional), hydration, recovery
 - Relief from heat/cold climate
 - Active and/or passive warming or cooling
 - Decrease likelihood of on-scene injury or death
- **Rehab Establishment:** The Incident Commander (IC) will determine where and when Rehab should be established:
 - A Rehab Officer is generally appointed to oversee operations; ideally this should be a firefighter trained in rehab Procedures; EMS may fill this role if required (MTF and F&ES should ensure properly trained)
 - Rehab site should be a safe distance from the incident; shelter from environmental conditions must be provided
 - Coordinate with IC Logistics Officer to secure water/electrolyte replacement drinks, snacks, fans, chairs, etc.
 - Create sign-in log (patient's name, apparatus call sign, time-in, time-out, rehab disposition (cleared to return, transported, etc.))
 - EMS crew should obtain vitals, treat patients IAW applicable protocols, request additional med resources as needed
 - EMS personnel and/or the incident Safety Officer have the authority to prolong rehab time for patients based upon vital signs, symptoms, and presentation and/or request transport as indicated
- Carcinogens can be found in soot; baby wipes or similar should be available for those exposed to smoke/fire to clean their hands, neck, faces, etc.

Sample Rehab Set-up



Sample Layout of a Rehabilitation and Treatment Sector. (Source: Dickinson, E. T., and Wieder, M. A., *Emergency Incident Rehabilitation*, 2nd edition. Pearson Education, Upper Saddle River, NJ, 2004.)



Exposure / Gross Decontamination (Hydrazine / POL & OC / OS Spray)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE & MOI Traumatic Injury Asthma History Drug / Substance Abuse	Trauma Chemical Burn or Pain Altered Mental Status Shortness of Breath / Wheezing	Traumatic Injury / Head Injury Agitated Delirium (psychiatric or substance) Asthma exacerbation

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Coordinate with dispatch / F&ES Incident Command regarding staging procedures if indicated• Coordinate decontamination prior to initiating patient contact• Remove contaminated clothing• Blot off remaining contaminant prior to irrigation• B - 2, Airway Management / Oxygen• POL Exposure:<ul style="list-style-type: none">- Eyes: If applicable/able remove contacts, flush with water or saline for at least 15 min- Skin: If exposed to liquid, flush exposed hair/skin w/ 2 - 3 min of water, wash with soap if able; use Chemical Agent wipes (Sudecon) if available; flushing is not required for vapor exposure- Ingestion: Supportive care, do NOT induce vomiting• OC/OS Spray Exposure:<ul style="list-style-type: none">- Eyes: If applicable/able remove contacts, flush with water or saline for at least 15 min- Skin: Blot away any residual spray, flush exposed skin w/ 15 min of water, wash with soap if able- Ingestion: Supportive care• Hydrazine Exposure:<ul style="list-style-type: none">- Eyes: If applicable/able remove contacts, flush with water or saline for at least 15 min- Skin: If exposed to liquid, flush exposed skin w/ 15 min of water, wash with soap if able; flushing is not required for vapor exposure- Treat symptoms IAW applicable protocol and provide supportive care• See C - 5, Eye Injuries as needed• Shortness of Breath / Wheezing, see B - 11, Difficulty Breathing Asthma / COPD
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Do NOT transport until the patient has been adequately decontaminated• POL and Hydrazine Exposure:<ul style="list-style-type: none">- Transport for eval; severe symptoms may take several hours to present• Significant Hydrazine exposure - Be prepared to treat seizures see, B - 28, Seizures (Non-Pregnant)

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Additional Considerations

- Patients exposed to chemical irritants (with or without Hx of asthma, COPD, etc.) may develop shortness of breath/ wheezing up to 20 - 30 minutes post exposure.

POL / Fuel

- Gasoline / Jet Fuel Exposure: The severity of reaction is based on the amount and duration of exposure. Regardless of route low level exposure can cause flushing of the skin, unsteadiness, headache, slurred speech and confusion.
 - Lungs: Hydrocarbons in gasoline are easily absorbed by the lungs. Vapors are heavier than air and can cause asphyxiation in enclosed areas that are poorly ventilated.
 - Skin: Prolonged skin exposure over several hours may result in first or second-degree burns to the skin. Corneal injury can result if the eyes are exposed.

OC / OS Spray

- Oleoresin Capsicum (Pepper Spray):
 - Immediate effects include redness, a burning sensation to the areas of skin/mucous membranes that were exposed, coughing, wheezing, shortness of breath and sneezing. Swallowing contaminated saliva can lead to epigastric pain, nausea and vomiting.
 - Shortness of breath/wheezing can occur up to 20 - 30 minutes post exposure. The risk of a severe respiratory reaction is higher in patients with a history of a chronic respiratory illness.
 - Studies have not shown a reduction in pain when using water vs soap vs milk for flushing of the skin.
 - Example of Chemical Agent Wipe:



<https://foxlabs.com/sudecon/>

Hydrazine

- Hydrazine:
 - Liquid used to fuel Emergency Power Units (EPU) in F-16s, NASA Space Vehicles, and the U-2.
 - Personnel can be exposed during inadvertent ground firing by pilot/maintenance or at an aircraft crash site.
 - Neurotoxin, caustic, smells like ammonia and is rapidly absorbed through the skin. The most common presentation following a serious exposure is seizures. Treat seizures IAW **B - 28 Seizures (Non-Pregnant)**. Significant or prolonged exposure can cause coma or death.
 - Can cause headaches, dizziness, nausea/vomiting, irritation or burns to exposed skin/eyes, burns to the mouth, nose or respiratory tract, pulmonary edema/pneumonitis.
 - Pulmonary edema/pneumonitis can be delayed by up to 4 - 8 hours after exposure.
 - The liver is the primary organ affected if Hydrazine is primarily absorbed through the skin, symptoms may be delayed by several days.



Interfacility Transports (IFT)



Key Concepts

- The mission of EMS is prehospital emergency medical response (9-1-1) on the installation. Once a patient has arrived at a Military Treatment Facility (MTF) capable of definitive care, the patient is no longer considered an EMS patient. The responsibility for IFT from definitive care MTFs is the MTF and the Defense Health Agency, not EMS or the Military Departments. Definitive care for this Protocol is defined as an Emergency Department or inpatient unit.
- Non-emergency IFT will not be performed by EMS, except in time of disaster (e.g. MTF evacuation).
- Approved EMS transport destinations for IFTs are Emergency Departments, Intensive Care Units, Operating Rooms (including Pre-Op), and Cardiac or Interventional Radiology Catheterization Suites. IFT to other locations (e.g. Medical/Surgical or Intermediate Care Units, psychiatric facilities, etc.) represent non-emergency IFT by default.
- EMS will not perform an IFT unless it is a time-sensitive issue of life, limb, or eyesight **AND** the MTF's established processes for IFT have been attempted and cannot support transfer in the appropriate timeframe to prevent clear harm to the patient. Such a determination represents a failure of the MTF's Healthcare Delivery mission and exposed the patient to undue risk. Creation of a report within the Joint Patient Safety Reporting System (JPSRS) will be requested of MTF staff to allow the EMS Coordinator and MTF Director to work towards solutions to limit this circumstance.
- Response to MTFs with outpatient clinic capabilities (e.g. Family Medicine) only are generally considered within the EMS mission. However, EMS will only transport to approved transport destinations listed above. If such a non-definitive care MTF has an activity expected to routinely generate transfers to definitive care (e.g. Outpatient Surgery Center, Acute/Urgent Care Clinic, Behavioral Health Clinic) – the EMS Coordinator will work with MTF leadership to add provisions that will prevent EMS from being the primary response asset to activities that invite transfers.
- EMS dispatch and assignment will occur through the installation Emergency Dispatch Center (using 9-1-1 number), no other means of activation (e.g. direct communication with crews, non-emergency numbers, etc.) is authorized.
- EMS must not allow any IFT to compromise the ability for EMS to perform the mission of installation response.
- EMS personnel are not specifically trained or equipped for critical care, obstetric, pediatric/neonatal, and other Specialty Care Transport (SCT) service. The Joint Prehospital Emergency Care Protocols (JPECP) are aimed at initial care of a patient and are not designed for use after physician evaluation and treatment has been initiated.
- Policies should be created outlining the local process for requesting an IFT, the EMS approval authority, and how EMS and MTF leadership will review each case. Local policies may not override the provisions of this Protocol.

Clinical Practice Guidelines

S	S	S	S	<ul style="list-style-type: none"> • B - 1, General Patient Care / Consult OLMC as needed • The sending physician, in consultation with OLMC, will determine the level of care required for the pt: BLS, ALS, or SCT (e.g. critical care, obstetric, pediatric/neonatal) as well as appropriate mode of transportation (Ground or Air Ambulance) • If EMS is unable to support the transport due to installation response needs, unavailable level of service required (e.g. SCT, etc.), or mode of transportation (Air Ambulance) – EMS will assist with coordination of transport by alternate means • All IFTs will be conducted by a minimum of two EMS personnel at SL2 or higher who have completed local ambulance orientation <ul style="list-style-type: none"> - Add'l personnel (Physician, Nurse, Respiratory Therapist, etc.) may accompany the pt based on their condition, but these members may not replace required EMS team members • EMS personnel will not monitor or administer a procedure outside of their scope of practice, as defined by the JPECP • The sending physician or the pt's nurse will provide a report to the EMS team that includes the pt's medical hx, diagnosis, reason for transfer, the name of the receiving hospital, and the name/phone
L	L	L	L	
2	3	4	5	

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LTC Nicholas M. Studer

- number of the receiving nurse and/or physician
- The EMS team will confirm that physician and nursing report from the sending facility to the receiving facility has been called
- Medications:
 - All medications should be administered by the sending facility prior to pt transfer.
 - If the pt is receiving an IV infusion:
 - EMS personnel may only transfer pts on infusions that are within their scope as defined by -JPECP
 - If applicable, adjustments to infusion rates should be made prior to accepting the pt.
 - A written order (SF 600 or similar) must be obtained by the sending physician and include the name of the physician, their signature, the name of the medication, the concentration, the infusion rate, the amount to be infused (e.g. continuous vs set amount), and any specific indications relating to the discontinuation of the medication
 - EMS personnel may not titrate an IV/IO infusion unless it is listed within their skill level in the JPECP (e.g. Norepinephrine for SL4); specific titration information must be included on the written order
 - If medication titration is required, and the medication is NOT listed in JPECP, a nurse or physician from the transferring facility must accompany the pt
 - All IV/IO infusions (with the exception of crystalloids) will be administered via a mechanical infusion pump
- Prior to transfer:
 - Ensure all pt belongings and medical records (charts, labs, radiographs) are secured with the pt
 - Ensure all IVs/IOs are patent and secure.
 - Obtain a full set of vital signs / EKG as indicated
- Patients who have an SGA, ETT, Tracheostomy, or Cricothyrotomy in place:
 - Will be transported by a minimum of three personnel
 - If the pt is on continuous infusions for sedation, a nurse or physician must accompany the pt to manage these infusions
 - Will be on a cardiac monitor, capnometry and/or capnography, and have q5 vitals
 - Should be accompanied by an RT when at all possible
 - When a transport ventilator is unavailable:
 - The pt may be ventilated via a bag-valve-mask with a PEEP valve
 - When a Respiratory Therapist is unavailable:
 - If a transport ventilator is available:
 - SL5 personnel who have documented training on that specific equipment in their training record may operate the ventilator
 - A physician or nurse trained in ventilator operations may accompany the pt
- Medical Emergencies Enroute:
 - Will be managed IAW applicable section of the JPECP
 - Notify the sending and receiving facility of the change in status as soon as feasible
 - Based on the clinical judgment of EMS personnel, if the pt's condition requires, divert immediately to the closest hospital and notify the sending/original receiving facility when able
- Documentation:
 - A PCR will be generated during each transfer and uploaded to the pt's medical record
 - The EMS team lead will accomplish the PCR
 - Will include: the name of the sending physician and who gave report to the EMS transfer team, the pt's medical hx, diagnosis, reason for transfer, the name of the receiving hospital, and the name/phone number of the receiving nurse and/or physician
 - Assessments and vital signs will be documented based on the pt condition in accordance with the Joint Prehospital Emergency Care Protocols
 - Any interventions performed enroute
 - Copies of rhythm strips or EKGs accomplished by EMS will be maintained with the PCR

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- Copies of written orders (e.g. SF 600s) will be maintained with the PCR
- The name/licensure level of the individual the pt was handed off to
- The name/licensure level of the individual who took control of the pt's personal belongings and medical records
- The JPSRS report number created by the sending MTF staff (may be obtained post-transport) will not be documented in the PCR, but provided to the EMS Coordinator for follow-up.

Additional Considerations

• Interfacility Transfer Checklist:

- ☐ EMS response will not be impacted unless life/limb/eyesight are threatened and the standard IFT processes cannot support response in an appropriate timeframe
- ☐ Determination made regarding level of care (BLS, ALS, SCT) and mode of transportation (Ground or Air)
- ☐ EMS team received report from sending nurse and/or physician
- ☐ Transferring unit has called report to the receiving facility
- ☐ Obtain copies of the patient's chart, labs, and radiographs if they will be sent with the patient
- ☐ Secure all patient belongings
- ☐ All medications have been administered by the sending unit
- ☐ Medication infusions are within the scope of EMS personnel as defined by the JPECP
- ☐ If applicable, obtain a written order for all medication infusions by the sending physician
- ☐ Medication infusions are within the scope of practice of EMS personnel as defined by the JPECP; personnel may not titrate any medication that is not outlined within their skill level as defined by the JPECP
-
- ☐ All infusions (except crystalloids) are managed on an infusion pump
- ☐ Pre-Transport: Obtain a full set of vitals, EKG if indicated, validate all IVs/IOs are patent, confirm the hospital/unit/name of gaining RN/physician
- ☐ En-route: Obtain vitals as dictated by patient condition, follow applicable Joint Prehospital Emergency Care Protocols for any medical emergencies that may occur
- ☐ At Receiving Facility: Transfer patient, all belongings and medical records to receiving personnel; obtain name and licensure level of personnel who assumed responsibility
- ☐ Documentation: As above
- ☐ Provide copy of PCR to receiving facility; ensure a copy is uploaded to the patient's medical record per local policy
- ☐ EMS ensures a Joint Patient Safety Reporting System report has been completed by the MTF

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Law Enforcement Transport of Psychiatric Patients



Key Concepts

- This Protocol applies primarily to installations that have an existing agreement with installation and/or local Law Enforcement (LE) to transport a pt. with a mental health crisis to an appropriate facility.
- The criteria located below may also be utilized to guide the assessment of persons in LE custody that LE has requested EMS evaluation prior to transport to a detention facility, but may not be considered a replacement for a pre-confinement physical if required

Clinical Practice Guidelines

- | S | S | S | S |
|---|---|---|--|
| L | L | L | L |
| 2 | 3 | 4 | 5 |
| | | | <ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Assess patient vital signs• Refer to appropriate protocol and/or consult with OLMC if any of the following are present:<ul style="list-style-type: none">☐ Patient with heart rate > 120bpm☐ Patient with SBP $\leq$ 90mmHg☐ Patient with respiratory rate > 30☐ Blood Glucose < 60mg/dL or > 200mg/dL• EMS will transport patient to appropriate ER if clinically indicated |

Additional Considerations

- LE Transport of a patient with a mental health crisis not requiring sedation or medical intervention allows the pt to be transported safely to a hospital or psychiatric facility. LE personnel are more experienced in physical restraint and have a more secure vehicle if a pt. attempts to exit while the vehicle is in motion.
- If EMS has determined medical stability of a pt. with mental health crisis for LE transport, the officer will need to know if patient is eligible for transport to Freestanding Psychiatric Facility (if local agreements allow) or if pt will need to go to a General Hospital with Psychiatric Services
- Do not hesitate to consult OLMC for determination of medical stability of a pt. or if there are any concerns beyond those addressed in this guideline
- EMS will not transport patients to Freestanding Psychiatric Facilities, LE Transport is appropriate
- The four most common reasons pts with mental health crisis cannot go directly to a freestanding psychiatric facility include: alcohol ingestion, drug ingestion, trauma, and medical comorbidities (Including but not limited to: wheelchair dependence, oxygen dependence, Foley catheter, liver failure, alcohol dependence, etc.)
- Freestanding psychiatric facilities may have no medical capabilities and be unable to care for a patient with injuries or additional medical needs. When in doubt, ensure the facility is capable of managing the pt.

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LTC Nicholas M. Studer



Medical Care of Military Working Animals and Non-Affiliated Animals



Key Concepts

- Care of Military Working Animals (MWA) are primarily Military Working Dogs (MWDs), but also horses, marine mammals, etc. EMS is limited to circumstances in which the animal is too unstable to transport to a Veterinary Treatment Facility (VTF) or transport is not possible due to weather or mission constraints. Care is limited to what is necessary to preserve life, limb, eyesight or to limit suffering when veterinary personnel are not available.
- EMS will not respond to calls for service that are solely for that of a service animal, family pet, stray animal, etc. However, EMS may perform basic interventions (bandaging, oxygen, etc.) on a non-DoD animal at the scene of a fire or other emergency as a courtesy. **EMS will not transport non-DoD animals under any circumstance.**

Clinical Practice Guidelines

- | S | S | S | S | S |
|---|---|---|---|---|
| L | L | L | L | L |
| 1 | 2 | 3 | 4 | 5 |
| | | | | <ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Assure safety and muzzle pt using gauze or purpose-built device. If pt is a MWA, utilize handler to perform restraint if possible.• Assess pt vital signs, understanding that non-human vital signs vary from human normal ranges• Oxygen – may use standard human masks or purpose-designed animal oxygen masks.• Treat illness/injury IAW applicable protocol or OLMC instruction to the fullest extent of Skill Level, experience/comfort by EMS with non-human pts is expected to further limit care.• EMS will transport MWA pts to an appropriate VTF if clinically indicated. |

Additional Considerations

- Working dogs operated by allied military forces and DoD contractors may be presented for medical care by EMS. Established agreements permit EMS to provide necessary emergency care, just as if these dogs were MWAs.
- MWAs are unpredictable and potentially dangerous animals, especially when ill, injured, or stressed, and especially when not under the control of a trained handler. Safety of responding personnel is the highest priority for EMS.
- A Patient Care Report must be completed for MWA pts. Information concerning MWAs (e.g., unit of assignment, operating location, illness or injury data, functional status) should be considered confidential and treated as such.
- The overarching goal when managing injured MWAs is return to normal function and duty (RTD). Within reason, however, consider the adoption potential for dogs. Adoption of MWDs no longer fit for duty is authorized. Many MWDs with career-ending injuries have been successfully managed and ultimately adopted, some suffering these injuries while deployed. Consider emergency care, even if RTD is not likely but adoption is possible.
- EMS should arrange for initial and recurring training with VTF personnel on care of MWAs and other working animals located on the installation. VTF transport destinations should be documented in the installation EMS Plan.
- Reference: JTS Clinical Practice Guideline for Military Working Dogs (12DEC2018):
https://jts.amedd.army.mil/assets/docs/cpgs/Military_Working_Dog_CPG_12_Dec_2018_ID16.pdf

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Organophosphate / Nerve Agent Exposure (Adult / Ped)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE Substance, quantity and route exposed Time of contact Ensure dispatch contacts BEE <u>Contact Poison Control</u> 1-800-222-1222 as needed	*SLUDGE or *DUMBBELS AMS, Confusion and/or hypoxia Combative, Seizures Hypo/Hypertension Brady/Tachy-pnea Brady/Tachy-cardia Dysrhythmias Environmental clues (bottles, spray)	Substance Abuse / Toxic Ingestion Stroke / CNS Injury Hypoxia Infection / Sepsis Hypo/Hyperthermia Acidosis/Alkalosis/Electrolyte issues Hypoglycemia

Pediatrics: See associated pediatric protocols as needed

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B – 1 / E - 1, General Patient Care / Consult OLMC as needed• Ensure patient removes clothing and is fully decontaminated ASAP• B – 2 / E - 2, Airway Management / Oxygen• If patient becomes agitated / violent, see B - 18, Behavioral Emergencies / Restraints• *Suspected Organophosphate Exposure (SLUDGE/DUMBBELS):<ul style="list-style-type: none">- See charts below; administer auto-injectors based on age and severity of symptoms, repeat as needed up to 3 total of each medication (Pralidoxime Chloride and Atropine)• If patient has seizures:<ul style="list-style-type: none">- Adult:<ul style="list-style-type: none">- Ensure all three ATNAA/ NAAK / Individual auto-injectors are administered- Then administer: 1 CANA (Convulsant Antidote for Nerve Agent - Diazepam 10mg)- See B - 28, Seizures (Non Pregnant) for additional treatment
L	L	L	L	L	
1	2	3	4	5	
					Pediatrics: See below chart for auto-injector dosing <ul style="list-style-type: none">- See E - 17, Seizures for additional treatment (or other specific protocols)
					<ul style="list-style-type: none">• Transport as soon as possible after decontamination; be prepared f/additional Airway Management• Cardiac Monitoring & 12-Lead EKG - Obtain and transmit if able
					<ul style="list-style-type: none">• If available or no additional auto-injectors, draw up Medication dose and administer IM (chart below)• Vascular Access - Contact OLMC prior to administering IV fluid; organophosphates cause pulmonary edema
					<ul style="list-style-type: none">• If HR remains < 60bpm: Administer Atropine 2mg IV/IO q 5 - 10 min PRN to decreased secretions and a normal respiratory rate

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LTC Nicholas M. Studer

Additional Considerations

- ***Suspected Organophosphate Exposure (Cholinergics / Insecticides):**
 - ***SLUDGE** (Salivation, Lacrimation, Urination, Defecation, GI Upset, Emesis)
 - ***DUMBBELS** (Diarrhea, Urination, Myosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation)
- Patient decontamination is crucial and required before ambulance transport:
 - Remove patient's clothing/DECON skin w/ soap/water (this should be accomplished by F&ES/BEE IAW with installation policy).
 - PPE in IAW BEE recommendations based on agent
- If possible, **bring a picture of the item** the patient was exposed to (DO NOT bring the suspected material /substance)
- **Atropine** is the antidote for Acetylcholinesterase Inhibitors (AChEI) poisoning; for organophosphate or severe AChEI exposure the required dose of atropine necessary to dry secretions and improve respiratory status is likely to exceed 20mg when ingestion has occurred. For inhalation injury typically no more than 6mg of Atropine is required.

Mild AChEI Agent Exposure

Patient (Age/Weight)	Atropine Dose Auto-injector (all SLs) or IM (SL 4 only)
Infant: 0 - 2yrs	0.05mg/kg or via 0.25 and/or 0.5mg auto-injector repeat x 2 PRN to HR > 60bpm
Child: 3 - 7yrs (13 - 25kg)	1mg IM or via auto-injector repeat x 2 PRN to HR > 60bpm (e.g. one 1mg -or- two 0.5mg auto-injectors)
> 8yrs or > 26kg	2mg IM or via auto-injector repeat x 2 PRN to HR > 60bpm (e.g. one 2mg -or- two 1mg auto-injectors)
Geriatric/Frail	1mg IM -or- via auto-injector repeat x 2 PRN to HR > 60bpm

Mild to Moderate AChEI Agent Exposure

Patient (Age/Weight)	Atropine Dose Auto-injector (all SLs) or IM (SL 4 only)	Pralidoxime Chloride Dose Auto-injector (all SLs) or IM (SL 4 only)	NAAK -or- ATNAA
Infant: 0 - 2yrs	0.05mg/kg or via 0.25 or 0.5mg auto-injector repeat x 2 PRN to HR > 60bpm	15mg/kg IM (no auto-injector)	Not approved for use
Child: 3 - 7yrs (13 - 25kg)	1mg IM or via two 0.5mg auto-injector repeat x 2 PRN to HR > 60bpm	15mg/kg IM -or- one 600mg auto-injector	Not approved for use
Child: 8 - 14yrs (26 - 50kg)	2mg IM or via auto-injector repeat x 2 PRN to HR > 60bpm	15mg/kg IM -or- one 600mg auto-injector	One of either auto-injectors repeat PRN x 3 to HR > 60bpm
> 14yrs	2 - 4mg IM -or- via auto-injector repeat x 2 PRN to HR > 60bpm	600mg IM -or- via auto-injector	One of either auto-injectors repeat PRN x 3 to HR > 60bpm
Geriatric/Frail	2mg IM -or- via auto-injector repeat x 2 PRN to HR > 60bpm	10mg/kg IM -or- one 600mg auto-injector	One of either auto-injectors repeat PRN x 3 to HR > 60bpm

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Severe AChEI Agent Exposure

Patient (Age/Weight)	Atropine Dose Auto-injector (all SLs) or IM (SL 4 only)	Pralidoxime Chloride Dose Auto-injector (all SLs) or IM (SL 4 only)	NAAK -or- ATNAA
Infant: 0 - 2yrs	0.1mg/kg or via 0.25 or 0.5mg auto-injector repeat x 2 PRN to HR > 60bpm	45mg/kg IM (no auto-injector)	Not approved for use
Child: 3 - 7yrs (13 - 25kg)	0.1mg/kg -or- 2mg auto-injector repeat x 2 PRN to HR > 60bpm	45mg/kg IM -or- one 600mg auto-injector	Not approved for use
Child: 8 - 14yrs (26 - 50kg)	4mg IM or via auto-injector repeat x 2 PRN to HR > 60bpm	45mg/kg IM -or- two 600mg auto-injectors	Two of either auto-injectors
> 14yrs	6mg IM or via auto-injectors repeat x 2 PRN to HR > 60bpm	1800mg IM -or- three 600mg auto-injectors	Three of either auto-injectors
Geriatric/Frail	2 - 4mg IM or via auto-injector repeat x 2 PRN to HR > 60bpm	25mg/kg -or- two to three 600mg auto-injectors	Two of either auto-injectors

ATNAA/Duo-Dote

MARK I (NAAK)

CANA (Diazepam 10mg)

DuoDote™ Has Replaced the Mark I™ Kit Delivers the same protection in a single auto-injector

Product Name:	DuoDote™ Auto-Injector ¹	Mark I™ Kit ^{2,3}
Active Ingredients:	<ul style="list-style-type: none"> 2.1 mg atropine 600 mg pralidoxime chloride 	<ul style="list-style-type: none"> 2 mg atropine 600 mg pralidoxime chloride
Delivery Mechanism:	1 auto-injector featuring dual-chamber technology	2 auto-injectors, each with a single traditional chamber
Steps to Administer:	Simple administration with just 1 injection	Additional steps required – 2 separate injections
Overall Dimensions:	6" x 1" x 1"	6" x 1.5" x 1"
Shelf Life:	4 years	5 years
Packaging:	Chemically hardened pouch	Foam pouch



<https://www.meridianmeds.com/products/duodote>



https://chemm.nlm.nih.gov/antidote_nerveagents.htm

Specialty Protocols

G - 3a



Exposure / Decontamination (Ionizing Radiation)



Patient History	Signs and Symptoms	Differential
OPQRST/SAMPLE & MOI Time to first emesis Dosimetry values (if known) Contact AFRRI MRAT 301-295-0530 as needed	Trauma Thermal/Radiation Burn or Pain Altered Mental Status Nausea/Vomiting Seizures	Traumatic Injury / Head Injury Simultaneous toxic agent exposures Anxiety

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• B - 1, General Patient Care / Consult OLMC as needed• Refer to G – 2a, Mass Casualty Incidents (MCI) as needed• Coordinate with dispatch / F&ES Incident Command regarding staging procedures if indicated• Coordinate decontamination prior to initiating patient contact• Remove patients from high dose rate environments immediately• Do not delay treatment of life-threatening injuries for contamination surveys or decontamination.• Remove contaminated clothing at earliest practical opportunity• B - 2, Airway Management / Oxygen• See B – 3 Nausea & Vomiting as needed
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Do NOT transport until the patient has been adequately decontaminated, unless life-threatening injuries cannot be mitigated on scene. Wrap patient in sheet and notify receiving hospital personnel.• Massive radiation exposure (>2000 REM) - Be prepared to treat seizures see, B - 28, Seizures (Non-Pregnant)

Additional Considerations
<ul style="list-style-type: none">• Ionizing radiation includes alpha, beta, gamma, and neutron radiation (emitted by radioactive materials or nuclear reactions) as well as X-rays (emitted by imaging and industrial devices). Microwaves, radar, ultraviolet light, and radiofrequency waves are non-ionizing radiation, and while potentially harmful - they do not have the same effects.• The risks of ionizing radiation exposure to personnel include acute/short-term effects (Acute Radiation Syndrome) and chronic/long-term effects (potential increased risk of cancer). EMS personnel should not speculate about potential chronic effects (in particular) and instead direct patients and others to discuss with qualified Health Physics personnel.• Personnel are most likely to be exposed to ionizing radiation doses of acute clinical concern by nuclear weapons detonation and major nuclear accidents (e.g. personnel on-site during criticality events at nuclear fuel facilities, nuclear reactors, etc. Radiological dispersal device (“dirty bomb”) detonations are unlikely to result in such doses.• Patients must rapidly receive a significant (>600 REM) whole body dose of radiation for nausea/vomiting on scene to be a symptom of Acute Radiation Syndrome. Such doses are highly unlikely outside of incidents involving nuclear weapons employment or a serious incident on-site at facilities involving substantial radioactive materials.• Protection from ionizing radiation is through limiting time of exposure, increasing distance from the source, and shielding from the source (e.g. shelter). Various countermeasure agents exist to either help eliminate ingested/inhaled radioactive materials or stimulate suppressed bone marrow. None are typically indicated in the prehospital environment.• Potassium Iodide is a prophylactic agent that saturates the thyroid with iodine and prevents the uptake of radioiodine, which is present in fallout from nuclear detonations and reactor accidents. Use may be indicated prior to responders entering contaminated areas. Discuss use with supporting Health Physicists.• It may not be possible to completely decontaminate wounds of embedded radioactive material at the scene. Dress the wound to limit spread of contamination and notify receiving hospital personnel.

V5 For use After 01 October 2025	Specialty Protocols G – 3b	//Signed// Lt Col Christopher W. Hewitt LTC Nicholas M. Studer
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- Local Poison Control Centers are unlikely to be helpful with radiological patient concerns. Expert “reachback” support for EMS and hospital personnel is available from: **Primary:** Medical Radiobiology Advisory Team, Armed Forces Radiobiology Research Institute, COM: 301-295-0530. **Alternate:** Radiation Emergency Assistance Center, U.S. Department of Energy, COM: 865-576-3131 (Duty Hours), 865-576-1005 (After-hours, ask for REAC/TS).
- Radiological/Nuclear emergencies, medical effects, and protective measures are not covered adequately in typical EMS training. Specialized training is available from multiple venues, including Distance Learning (e.g. AWR-140-W)

Prehospital Radiological Triage Algorithm

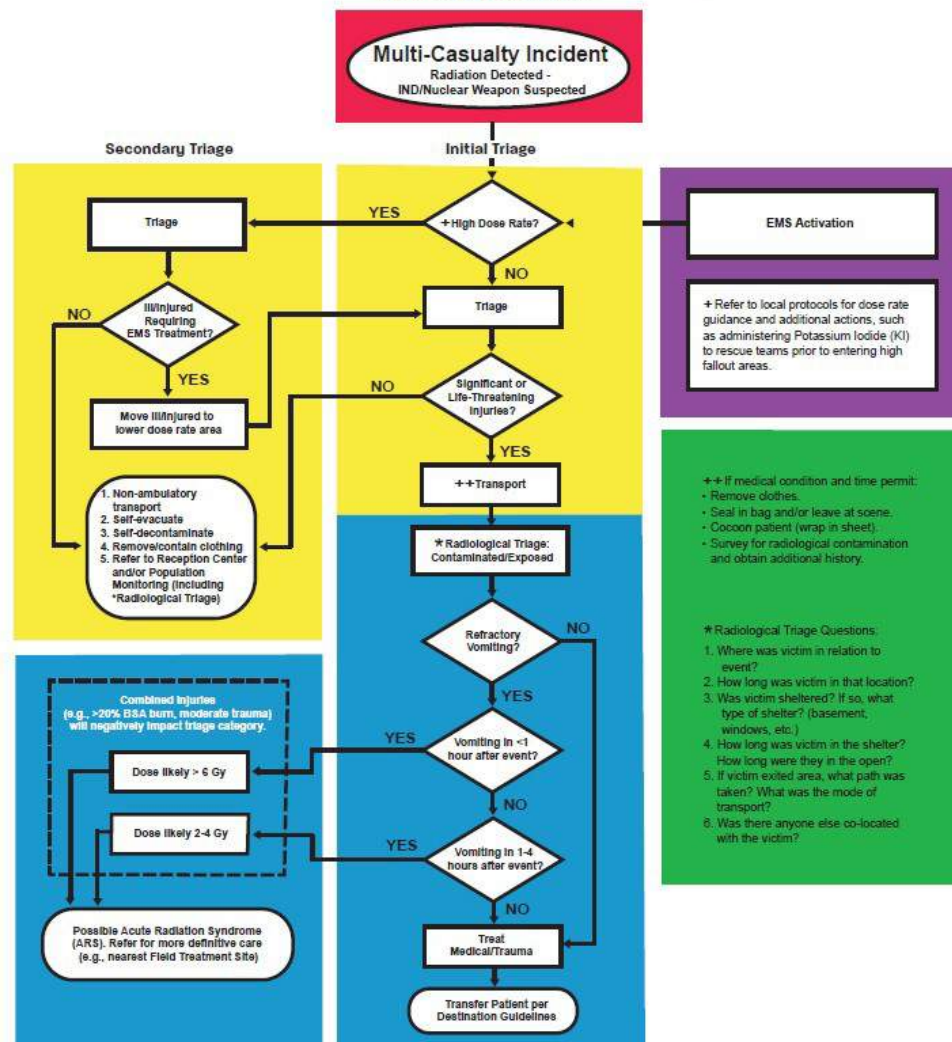


REAC/TS

Radiation Emergency
Assistance Center/Training Site

Prehospital Radiological Triage

Version 1.1, March 2020



Radiation Emergency Assistance Center/Training Site (REAC/TS)
After Hours Emergency Assistance
US Department of Energy Oak Ridge Operations Center: 865.576.1005
Phone: 865.576.3131 • orise.ornl.gov/reacts

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Specialty Protocols
G – 3b

Whole-body Irradiation from Whole Body Gamma Dose

Phase of Syndrome	Survivability	Highly Survivable		Survivable to Lethal		Lethal	
	Degree of ARS		Mild	Moderate to severe	Very severe	Lethal	
	Dose range (cGy)	0-100	100-200	200-600	600-800	800-3000	>3000
Initial or Prodromal	Vomiting: Time of onset: Duration:		5-50% 3-6 hours <24 hours	50-100% 1-6 hours <24 hours	75-100% <2 hours <48 hours	98-100% <1 hour <48 hours	100% <1 hour <48 hours
	Lymphocyte count (cells/mm ³)		<1400 at 4 days	<1400 at 48 hours	<1000 at 24 hours	<800 at 24 hours	
	CNS function	No impairment	No impairment	Routine task performance; cognitive impairment for 6-20 hours	Simple & routine task performance; cognitive impairment for >24 hours	Transient incapacitation	
Latent	Duration	N/A	7-15 days	0-21 days	0-2 days	0-2 days	
Manifest (obvious) Illness	Signs and symptoms	None	Moderate leukopenia	Severe leukopenia, purpura, hemorrhage, pneumonia, hair loss after 300 rad (cGy)		Severe diarrhea, fever, electrolyte disturbance	Convulsions, ataxia, tremor, lethargy
	Time of onset		>2 weeks	2 days-2 weeks		0-2 days	
	Critical period		None	4-6 weeks		5-14 days	1-48 hours
	Principal organ system	None	Hematopoietic	Hematopoietic and gastrointestinal		Gastrointestinal (mucosal surfaces)	CNS
Hospitalization	%	0	<5%	90%	100%	100%	100%
	Duration		45-60 days	60-90 days	90+ days	2 weeks	2 days
Fatality		0%	0%	0-80%	80-100%	98-100%	
Time of Death				3-12 weeks		1-2 weeks	1-2 days

*Adapted from TM 8-125, Nuclear Handbook for Medical Service Personnel, US Army, 1969. Tabulated data for fatality incidence assumes no treatment.

Common Radiological Unit Conversions

Gy = gray Sv = sievert Bq = Becquerel Ci = curie dpm = disintegrations per minute		
$p = \text{pico} = 10^{-12}$ $n = \text{nano} = 10^{-9}$ $\mu = \text{micro} = 10^{-6}$ $m = \text{milli} = 10^{-3}$ $c = \text{centi} = 10^{-2}$ $M = \text{mega} = 10^6$ $G = \text{giga} = 10^9$		
1 Bq = 60 dpm = 27 pCi 37 GBq = 1 Ci 37 MBq = 1 mCi 37 Bq = 1 nCi	1 Gy = 100 rad 1 cGy = 1 rad 10 µGy = 1 mrad 10 nGy = 1 µrad	1 Sv = 100 rem 1 cSv = 1 rem 10 µSv = 1 mrem 10 nSv = 1 µrem

Radiological Emergency Training Resources

- AWR-140-W - Introduction to Radiological/Nuclear WMD Operations (DL): <https://www.ctosnnsa.org/>
- Medical Effects of Ionizing Radiation Course (Resident, abbreviated DL version available): <https://afrii.usuhs.edu/meir-course>
- Radiation Emergency Medicine Course (Resident only): <https://orise.orau.gov/reacts/continuing-medical-education/radiation-emergency-medicine.html>

Specialty Protocols

G – 3b



Protocol Template - Title

Protocol clarification (if needed) – adult, pediatric, etc.



- Utilize this template for your protocol submission. Delete all instruction text above the first table prior to submission.
- Submit to usaf.jbsa.afmoa.mbx.ems-program-manager@health.mil or usarmy.jbsa.medcom.mbx.medcom-emergency-program-ops@health.mil depending on your Service.
- All sections below may not be needed based on the protocol
- Ensure submitted protocols utilize this template and flow similarly as approved protocols
- EMS Medical Director must digitally sign the lower left box in the footer.

Patient History	Signs and Symptoms	Differential
OPQRST / SAMPLE Hx of applicable conditions, diagnosis, family Hx, etc.	Place S&S and parameters here	Place potential differentials here

Clinical Practice Guidelines					
S	S	S	S	S	<ul style="list-style-type: none">• Use this area to list all actions that should be taken/noted per skill level• Link to any applicable approved protocols• List all appropriate parameters and interventions
L	L	L	L	L	
1	2	3	4	5	
					<ul style="list-style-type: none">• Continue to list all actions that should be noted per each skill level
					<ul style="list-style-type: none">• Continue to list all actions that should be noted per each skill level
					<ul style="list-style-type: none">• Continue to list all actions that should be noted per each skill level
					<ul style="list-style-type: none">• Continue to list all actions that should be noted per each skill level

List any applicable equipment settings, sizes, etc.			
Primary		Alternate	Contingency

List medication name does, route, etc.							
Dose / kg							

Additional Considerations
** Protocol has been approved for use ONLY at [installation name] by the EMS Medical Director at _____ MDG or USA MEDDAC -

Installation EMS Medical Director Digital Signature	Protocol Title H - 1	EMS Consultant to the Surgeon General Digital Signature
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FY26 Joint Prehospital Emergency Care Medication Reference Guide

Version 5
October 2025

This guide is designed as a reference to supplement the information found in the Joint EMS Protocols. All members MUST administer medications IAW the dosing located in the protocols themselves.

Reference:

Lexicomp. (2022). Retrieved from <https://online.lexi.com/lco/action/home>.

Abbreviations

AMS – Altered Mental Status
BGL – Blood Glucose
bpm – Beats per Minute
CNS – Central Nervous System
CVS – Cardiovascular System
g – Gram
GI – Gastrointestinal
HR – Heart Rate
IO – Intraosseous
IM – Intramuscular
IN – Intranasal
IU – International Unit
IV – Intravenous
Kg – Kilogram
MAOI – Monoamine Oxidase Inhibitors
mcg – Microgram
MDI – Metered Dose Inhaler
mg – Milligram
min – Minute
Misc – Miscellaneous
mL – Milliliter
NTG – Nitroglycerin
NS – Normal Saline
OLMC – Online Medical Control
OTFC – Oral Transmucosal Fentanyl Citrate
PO – By Mouth
PR – Per Rectum
PRN – As Needed
q – Every
Resp – Respiratory
SL 1 – EMR
SL 2 – F&ES EMT
SL 3 – AEMT / 68W EMT / 4N EMT
SL 4 – NRP
SL 5 – Army Paramedic Supervisor
TBSA – Total Body Surface Area
TCA – Tricyclic Antidepressant
x – Times

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Drug Profile for ACETAMINOPHEN

GENERIC NAME: ACETAMINOPHEN

CLASS: Analgesics

Mechanism of Action:

- Thought to inhibit peripheral pain impulses
- Antipyretic actions secondary to the inhibition of prostaglandins in the brain

Onset: 30 – 45 minutes

Duration: 4 – 6 hours

Indications for Use:

- Fever
- Mild Pain

Contraindications:

- May not exceed 4g of acetaminophen per day
- Do not administer if patient has taken acetaminophen in the last 4 hours

Side Effects:

- Rare

Precautions:

- No significant interactions published.

Adult Dosage Per Protocol:

1. **B – 4 Pain Management**
2. **B – 27 Sepsis & Septic Shock**

Pediatric Dosage Per Protocol (Acetaminophen Suspension):

1. **E – 4 Pain Management**
2. **E – 16 Sepsis & Septic Shock**
3. **E – 17 Seizures & Post-Seizure Management**

Special Considerations:

- Verify the patient has not taken any other medications that contain acetaminophen, such as cold and narcotic pain medications, prior to administration.
- Maximum daily dose of acetaminophen may not to exceed 4 grams.

Drug Profile for ACETAZOLAMIDE

GENERIC NAME: ACETAZOLAMIDE

CLASS: Carbonic Anhydrase Inhibitor

Mechanism of Action:

- Inhibits carbon anhydrase which reduces hydrogen ion secretion in the urine and facilitates the excretion of bicarbonate
- Acid retention counteracts respiratory alkalosis associated with increased elevation

Onset: 1 – 1.5 hours

Duration: 8 – 12 hours

Indications for Use:

- Suspected Acute Mountain Sickness

Contraindications:

- Allergy to sulfa (sulfonamides) medications (relative)
- Known sickle cell anemia
- Known renal or liver disease/insufficiency
- Adrenocortical insufficiency

Side Effects:

- CNS: Confusion, dizziness, drowsiness, excitement, headache, ataxia
- CVS: Flushing
- Endocrine: Hyperglycemia, hypoglycemia, hypokalemia, hyponatremia, metabolic acidosis
- GI: Nausea, vomiting, diarrhea
- Misc: Tinnitus, blurred vision, fever, change in taste

Precautions:

- Patients known to have a sulfonamide allergy to antibiotics are rarely reactive to non-antibiotic sulfonamides, however, you should monitor the patient closely.
- Monitor glucose levels in diabetic or pre-diabetic patients, Acetazolamide may impact glucose control.

Adult Dosage Per Protocol:

1. **G – 1a Altitude Illness**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Studies have shown Acetazolamide causes decreased cerebrovascular resistance in patients with sickle cell anemia; administration could lead to an ischemic event.

Drug Profile for ACTIVATED CHARCOAL

GENERIC NAME: ACTIVATED CHARCOAL

CLASS: Adsorbent, Antidote

Mechanism of Action:

- Adsorbs ingested toxins within the gastrointestinal tract preventing the systemic absorption
- Only adsorbs toxins that are in the dissolved liquid phase via direct contact

Onset: < 30 MIN

Duration: 3 hours

Indications for Use:

- Poison Control advises administration after suspected toxic ingestion
- Toxin ingestion occurs within 1 hour of administration

Contraindications:

- Patient is unable to swallow or control their own airway
- Ingestion of a corrosive substance
- Ingestion occurred > 60 minutes prior (relative)
- GI perforation or hemorrhage

Side Effects:

- GI: Nausea, vomiting, constipation
- Resp: Aspiration
- Misc: Mouth discoloration, fecal discoloration

Precautions:

- Anticipate that the patient will vomit; this is more common if the Activated Charcoal contains sorbitol.

Adult Dosage Per Protocol:

1. **B – 24 Overdose / Toxic Ingestion**

Pediatric Dosage Per protocol:

1. **E – 15 Overdose / Toxic Ingestion**

Special Considerations:

- Not effective in absorbing low molecular weight substances such as ethanol, cyanide, lithium, menthol, etc.
- May also absorb other non-absorbed medications located in the GI tract.

Drug Profile for ADENOSINE

GENERIC NAME: ADENOSINE

CLASS: Antiarrhythmic

Mechanism of Action:

- Slows conduction time through AV node; can interrupt re-entrant pathways through the AV node

Onset: Seconds

Duration: 10 – 12 seconds

Indications for Use:

- SVT (Narrow Complex Tachycardia)
- Wide Complex Tachycardia

Contraindications:

- Sick sinus syndrome, 2nd or 3rd degree AV blocks except in patients with a functioning ventricular pacemaker
- Use cautiously in patients with known asthma (has precipitated acute bronchospasm)
- Known WPW, symptomatic bradycardia

Side Effects:

- CNS: Lightheadedness, headache, dizziness
- CVS: Transient dysrhythmias (asystole, bradycardia, PVCs), AV blocks, palpitations, chest pressure, hypotension, ST depression
- Resp: Dyspnea, hyperventilation, tightness in throat, bronchospasm
- GI: Nausea, metallic taste
- Misc: Neck/jaw/upper extremity pain, facial flushing, sweating

Precautions:

- Administering Adenosine to a patient with WPW or atrial fibrillation may cause ventricular fibrillation.
- Theophylline and related Methylxanthines (caffeine and theobromine-xanthine) in therapeutic concentrations decrease effectiveness.
- Dipyridamole (Persantine) & Carbamazepine (Tegretol, Atretol) block uptake and potentiate effects.
- Patients who are status post cardiac transplant may be more sensitive to Adenosine.

Adult Dosage Per Protocol:

1. **B – 8 Tachycardia, Narrow Complex**
2. **B – 9 Tachycardia, Wide Complex**

Pediatric Dosage Per Protocol:

1. **E – 8 Tachycardia, Narrow Complex**
2. **E – 8 Tachycardia, Wide Complex**

Special Considerations:

- Dysrhythmias may reoccur (short half-life).
- Special administration procedures: Follow medication administration immediately with a 10mL normal saline flush. The recommended IV site is the antecubital fossa (close to central circulation); use injection port nearest the hub of the IV catheter. Consider utilizing a 3-way stopcock.
- During administration dysrhythmias appear in 55% of patients. These dysrhythmias typically last for a few seconds, and they usually do not require intervention.
- Check for crystallization in cold climates prior to administration.
- Patient must be on cardiac monitor; continuous rhythm strip should be obtained, immediately prior to administration until after duration of medication/conversion of rhythm.

Drug Profile for ALBUMIN 25%

GENERIC NAME: ALBUMIN 25%

CLASS: Colloid, Plasma Volume Expander

Mechanism of Action:

- Increases intravascular pressure
- Facilitates movement of fluids from the interstitial space into the intravascular space

Onset: Aprox. 30 min

Duration: 12 – 24 hours

Indications for Use:

- Hypovolemia Secondary to Hemorrhagic Shock

Contraindications:

- No significant contraindications when used as indicated

Side Effects:

- CNS: Chills, headache
- CVS: Edema, hyper/hypotension, tachycardia
- Resp: Bronchospasm, pulmonary edema
- GI: Nausea, vomiting, abdominal pain
- Misc: Fever

Precautions:

- Packaging may contain natural latex
- Monitor continuously for signs of fluid overload, fever, tachycardia, and dyspnea

Adult Dosage Per Protocol:

1. **B – 29 Shock & Hypotension (Non-Trauma)**
2. **C – 1 Trauma, General**
3. **C – 6 Head Injuries**
4. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
5. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

1. **E – 18 Shock & Hypotension**
2. **F – 1 Trauma, General**
3. **F – 3 Head & Facial Injuries**

Special Considerations:

- In well hydrated patients, Albumin 25% will draw approximately 3.5 times the administered fluid volume from the interstitial space into the intravascular space within 15 minutes of administration; the degree and duration of blood volume expansion is directly dependent on the patient's initial blood volume.

Drug Profile for ALBUTEROL SULFATE

GENERIC NAME: ALBUTEROL SULFATE

CLASS: Beta₂ Agonist

Mechanism of Action:

- Relaxes bronchial smooth muscle resulting in bronchodilation
- Has some systemic effects resulting in uterine and vascular smooth muscle relaxation; may result in peripheral vasodilation and thus reduced diastolic blood pressures

Onset: < 5 minutes

Duration: 3 – 6 hours

Indications for Use:

- Wheezing, Respiratory Distress, Bronchospasms, Inhalation Injury
- Hyperkalemia

Side Effects:

- CNS: Tremors, nervousness, headache, dizziness
- CVS: Dysrhythmias, tachycardia, hypertension, chest pain, edema, palpitations
- Resp: Paradoxical bronchospasm, pharyngitis
- Endocrine: Hyperglycemia
- GI: Nausea, vomiting

Precautions:

- Increased risk of ventricular arrhythmias/hypertension when administered to a patient concurrently taking TCA's and MAOIs.
- Potentiates effects of other sympathomimetics. May not be as effective in patients concurrently taking beta- blockers.
- May exacerbate underlying cardiovascular disease or known ischemia.
- Paradoxical bronchospasm is a rare, but serious complication. If patient's bronchospasm significantly worsens after initiating the nebulizer, stop administration and call OLMC.
- Tachycardia with associated underlying heart condition.

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 11 Difficulty Breathing Asthma / COPD**
3. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)**
4. **B – 17 Anaphylaxis & Allergic Reaction**
5. **B – 25 Renal Failure / Dialysis**
6. **B – 26 Drowning / Submersion (Adult / Peds)**
7. **C – 2 Burns (Thermal, Chemical, Electrical / Lightning)**
8. **C – 3 Crush Injuries**

Pediatric Dosage Per Protocol:

1. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)**
2. **B – 26 Drowning / Submersion (Adult / Peds)**
3. **E – 5 Cardiac Arrest**
4. **E – 7 Bradycardia**
5. **E – 9 Tachycardia, Wide Complex**
6. **E – 11 Anaphylaxis & Allergic Reaction**
7. **E – 12 Asthma / Reactive Airway Disease**
8. **E – 13 Croup / Epiglottitis / Bronchiolitis**
9. **F – 2 Burns**

Special Considerations:

- Beta agonists may cause prolonged-QT, ST depression and a flattening of the T wave.
- Most side effects are dosage and frequency related.

Drug Profile for ALCOHOL PAD

GENERIC NAME: ALCOHOL PAD

CLASS: Antiemetic

Mechanism of Action:

- Unknown

Onset: Minutes

Duration: Varies

Indications for Use:

- Nausea

Contraindications:

- Pediatric patients; studies have not evaluated effectiveness in children

Side Effects:

- None published

Precautions:

- Not applicable with single dose therapy

Adult Dosage Per Protocol:

1. **B – 3 Nausea & Vomiting**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Multiple studies show decreased nausea severity 50% faster than oral Ondansetron.

Drug Profile for AMIODARONE

GENERIC NAME: AMIODARONE

CLASS: Antiarrhythmic Agent

Mechanism of Action:

- Multiple effects on sodium, potassium and calcium channels causing prolonged refractory periods and suppressed automaticity ultimately resulting in reduced AV conduction/SA node function.
- Also has alpha and beta blocking properties that can cause hypotension.

Onset: Rapid

Duration: Up to 3 weeks

Indications for Use:

- Pulseless VT/VF
- ROSC/Post Cardioversion Infusion
- Wide Complex Tachycardia

Contraindications:

- Bradycardia
- Second or third-degree heart block unless a functioning pacemaker is present
- Cardiogenic shock, congestive heart failure
- SBP < 90mmHg
- Iodine allergy

Side Effects:

- CNS: Fatigue, abnormal gait, dizziness, involuntary body movements/tremors, headache
- CVS: Bradycardia, hypotension, AV block, asystole/cardiac arrest, prolonged-QT, torsade's de pointes, congestive heart failure, edema
- GI: Nausea/vomiting, abdominal pain
- Local: Extravasation (vesicant)
- Misc: Blurred vision, photophobia, Stevens-Johnson syndrome, toxic epidermal necrolysis

Precautions:

- Deemed safe for use in patients with a shellfish allergy, but monitor patient closely.
- May have additive bradycardic/hypotensive effect when given to patients concurrently taking beta blockers, calcium channel blockers and other antiarrhythmics; stop infusion if hypotension develops.
- May have additive QT prolonging effect when given to patients concurrently taking other medications known to have a QT prolonging side effect.
- Amiodarone precipitates at certain concentrations when mixed at a Y-site with sodium bicarbonate, furosemide and heparin. Flush the IV line well between medication administrations.

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 6 ROSC & Post-Arrest Care**
3. **B – 9 Tachycardia, Wide Complex**

Pediatric Dosage Per Protocol:

1. **E – 5 Cardiac Arrest**

Special Considerations:

- Amiodarone is mixed in a soap-like vehicle in glass or special plastic and is subject to excessive foaming. Draw slowly from ampule with at least an 18G needle. Mix with 20-30mL of 0.9% NS prior to administration. Infusions should be hung utilizing tubing with an in-line filter.
- Due to its vasodilator properties, in a cardiac arrest scenario amiodarone administration should only occur after a vasopressor such as Epinephrine. Providers should wait for 2 complete cycles of CPR to

Drug Profile for AMIODARONE

- be completed prior to administration.
- Patient will have continuous cardiac monitoring and have q 5 minute vitals taken during infusions.
 - Continuous infusions must be administered via an IV pump whenever possible.
 - Special polyolefin bag is required for maintenance infusion. Regular bags will absorb Amiodarone

Drug Profile for ASPIRIN

GENERIC NAME: ASPIRIN, ACETYLSALICYLIC ACID, ASA

CLASS: Analgesic, anti-inflammatory

Mechanism of Action:

- In small doses aspirin blocks thromboxane A₂, a potent platelet aggregate and vasoconstrictor; also has antipyretic and analgesic characteristics

Onset: < 1 hour

Duration: 4 – 6 hours

Indications for Use:

- Chest Pain

Contraindications:

- Children and adolescents
- Bleeding ulcer, hemorrhagic states
- Known hypersensitivity to salicylates or other non-steroidal anti-inflammatories that has led to hypotension and/or bronchospasm
- Hx of Asthma (relative)

Side Effects:

- GI: Gastritis, nausea/vomiting, upper GI bleed
- Misc: Increased bleeding

Precautions:

- Use caution in patients with known bleeding disorder

Adult Dosage Per Protocol:

1. **B – 5 Chest Pain**

Pediatric Dosage Per Protocol:

- Not approved for use in pediatric patients

Special Considerations:

- Several over-the-counter medications contain aspirin; verify patient's current medications before administration. If applicable, administer medication to total of 324mg (e.g. patient takes baby aspirin daily, EMS would administer 3 additional 81mg tablets to equal dose of 324mg total).
- Baby ASA is heat and light sensitive. A vinegar-like smell indicates degradation of the product.

Drug Profile for ATROPINE SULFATE

GENERIC NAME: ATROPINE SULFATE

CLASS: Anticholinergic agent, antidote

Mechanism of Action:

- Blocks the action of acetylcholine at muscarinic receptor sites in smooth muscles, secretory glands and the CNS
- Blocks parasympathetic response allowing sympathetic response to take over, ultimately resulting in increased cardiac output and drying of secretions

Onset: Immediate

Duration: 4 hours

Indications for Use:

- Symptomatic Bradycardia
- Bradycardia Secondary to Organophosphate / Nerve Agent Exposure
- Pediatric Bradycardia Secondary to Increased Vagal Tone, AV Block, Cholinergic Drugs

Contraindications:

- No absolute contradictions in the presence of symptomatic bradycardia

Side Effects:

- CNS: Confusion
- CVS: Cardiac arrhythmia, paradoxical bradycardia, chest pain, hypotension, ectopic beats, sinus tachycardia
- Resp: Decreased mucus production
- Misc: Hyperthermia, mydriasis (pupillary dilation); decreased sweat production; flushing

Precautions:

- Ineffective in high degree AV blocks (second-degree type II or third-degree) and cardiac transplant patients.
- Do not treat bradycardia in the presence of an acute MI unless the patient is hemodynamically unstable. Chest pain by itself is not an indication of instability in these patients because it could be due to the MI or poor perfusion from bradycardia. Atropine increases the myocardial oxygen demand and can worsen underlying ischemia.
- May have additive anticholinergic side effects (dry mouth, blurred vision, constipation) if patient is concurrently taking other anticholinergics or psychotropics.
- Acetylcholinesterase inhibitors may decrease the levels/effects of Atropine.

Adult Dosage Per Protocol:

1. **B – 7 Bradycardia**
2. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Pediatric Dosage Per Protocol:

1. **E – 7 Bradycardia**
2. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Special Considerations:

- Not effective for bradycardia that is secondary to hypothermia.
- IV - Administer undiluted by rapid IV injection; slow injection may result in paradoxical bradycardia. Doses < 0.5mg may increase vagal tone resulting in paradoxical bradycardia.
- Consider Atropine before pacing in mildly symptomatic patients, but do not delay pacing in unstable patients. Hemodynamically unstable and clinically deteriorating patients require immediate pacing.
- Consider hyperkalemia in patients with wide complex bradycardia.

Drug Profile for ATROPINE/PRALIDOXIME (ATNAA / NAAK)

GENERIC NAME: ATROPINE/PRALIDOXIME (ATNAA / NAAK)

CLASS: Anticholinergic, Antidote

Mechanism of Action:

Atropine:

- Blocks the effects of acetylcholine due to organophosphate poisoning at muscarinic cholinergic receptors. Pralidoxime:

- Reactivates cholinesterase that was previously inactivated by organophosphate poisoning. Leads to a breakdown of accumulated acetylcholine that enables return to normal function of the neuromuscular junctions.

Onset/Duration: Not published

Indications for Use:

- Suspected Nerve Agent/Organophosphate Poisoning

Contraindications:

- None when patient is suspected of suffering from a nerve agent or organophosphate poisoning

Side Effects:

- CNS: Hypertonia (muscle tightness at injection site), dizziness
- CVS: Increased blood pressure, tachycardia, palpitations
- GI: Urinary retention, constipation, nausea, vomiting
- Misc: Dry mouth, blurred vision

Precautions:

- Not relevant in the case of a suspected nerve agent or organophosphate poisoning

Adult Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Pediatric Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Special Considerations:

- None

Drug Profile for CALCIUM GLUCONATE

GENERIC NAME: Calcium GLUCONATE

Gluconate CLASS: Electrolyte

Mechanism of Action:

- Moderates nerve and muscle activity via action potential threshold regulation
- Increases extracellular and intracellular calcium levels

Onset: 3 minutes

Duration: 20 – 60 minutes

Indications for Use:

- Calcium Channel Blocker Overdose
- Beta Blocker Overdose
- Hyperkalemia

Contraindications:

- Sarcoidosis
- Hypercalcemia
- Renal failure

Side Effects:

- CVS: (Most often associated with rapid IV pushes) bradycardia, shortened QT interval, dysrhythmias, cardiac arrest, hypotension
- GI: Nausea, vomiting, chalky taste
- Local: Extravasation (vesicant), tingling sensation

Precautions:

- Increased risk of metabolic acidosis in patients taking Thiazide Diuretics

Incompatibilities:

- Calcium binds with ceftriaxone and creates microparticles; flush the IV line well between administrations

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 24 Overdose / Toxic Ingestion**
3. **B – 25 Renal Failure / Dialysis**
4. **B – 27 Sepsis & Septic Shock**
5. **B – 29 Shock & Hypotension (Non-Trauma)**
6. **C – 3 Crush Injuries**
7. **C – 6 Head Injuries**
8. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
9. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

1. **D – 5 Newborn Resuscitation**
2. **E – 5 Cardiac Arrest**
3. **E – 7 Bradycardia**
4. **E – 9 Tachycardia, Wide Complex**
5. **E – 15 Overdose / Toxic Ingestion**
6. **E – 18 Shock & Hypotension**
7. **F – 1 Trauma, General**
8. **F – 3 Head & Facial Injuries**

Special Considerations:

- Due to the risk of extravasation, calcium gluconate must be administered in a large vein; if extravasation occurs, stop the infusion immediately and contact OLMC.

Drug Profile for DEXAMETHASONE

GENERIC NAME: DEXAMETHASONE

CLASS: Glucocorticoid

Mechanism of Action:

- Long acting corticosteroid
- Decreases inflammation
- Suppresses normal immune response

Onset: 5 – 15 minutes

Duration: Dose dependent (may persist for 4 hours after admin)

Indications for Use:

- Moderate/Severe Allergic Reaction
- Wheezing/Respiratory Distress
- Croup
- Hypotension Due to Adrenal Insufficiency
- Acute Mountain Sickness
- High Altitude Cerebral Edema

Contraindications:

- Hypersensitivity to Dexamethasone or sulfites
- Systemic fungal infections

Side Effects:

- CNS: Flushing, sweating, dysrhythmias, cardiac arrest, decreased blood pressure, syncope
- CVS: Hypertension
- GI: Diarrhea, nausea, abdominal distention
- Endocrine: May lead to hyperglycemia in diabetic patients
- Local: Perineal tingling/itching sensation, fluid retention

Precautions:

- May enhance the anticoagulant effect of Warfarin
- If given with Midazolam, flush the IV between deliveries; Dexamethasone reduces the potency of Midazolam
- Use cautiously in patients with:
 - Myasthenia gravis: Hydrocortisone use is known to exacerbate symptoms
 - Seizure disorders: May cause a seizure when the patient is in adrenal crisis
 - Recent acute MI: Potential for myocardial rupture
 - Diabetic patients: Monitor blood glucose, can cause hyperglycemia

Adult Dosage Per Protocol:

1. **B – 5 ROSC & Post-Arrest Care**
2. **B – 7 Bradycardia**
3. **B – 11 Difficulty Breathing Asthma / COPD**
4. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)**
5. **B – 17 Anaphylaxis & Allergic Reaction**
6. **B – 27 Sepsis & Septic Shock**
7. **B – 29 Shock & Hypotension (Non-Trauma)**
8. **G – 1a Altitude Illness**

Pediatric Dosage Per Protocol:

1. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)**
2. **E – 11 Anaphylaxis & Allergic Reaction**
3. **E – 12 Asthma / Reactive Airway Disease**
4. **E – 13 Croup / Epiglottitis / Bronchiolitis**

Drug Profile for DEXAMETHASONE

Special Considerations:

- Itching/tingling sensation can be minimized by pushing medication slowly over 2 full minutes.
- It is safe to administer the IV formulation of Dexamethasone orally.

Drug Profile for DEXTROSE 10%

GENERIC NAME: DEXTROSE 10%

CLASS: Carbohydrate

Mechanism of Action:

- Rapidly increases serum blood glucose levels reversing effects of hypoglycemia

Onset: Seconds

Duration: Varies

Indications for Use:

- Hypoglycemia

Contraindications:

- Intracranial hemorrhage
- Use caution in administering to patients with acute alcoholism

Side Effects:

- CNS: Worsens elevated ICP & cerebral edema
- Endocrine: Dehydration, hyperglycemia
- Local: Extravasation (vesicant), phlebitis, vein thrombosis

Precautions:

- No significant interactions published

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 20 Diabetic Emergencies**

Pediatric Dosage Per Protocol:

1. **D – 5 Newborn Resuscitation**
2. **E – 5 Cardiac Arrest**
3. **E – 14 Diabetic Emergencies**

Special Considerations:

- D10 Preparation: Dilute D50 containing 25g of Dextrose to a 1:4 solution. Obtain 250mL bag of saline, waste 50mL and add 1 amp (50mL) of D50. Resulting concentration is 10gm/100mL (D10).

Drug Profile for DIAZEPAM (CANA)

GENERIC NAME: DIAZEPAM (CANA)

CLASS: Benzodiazepine

Mechanism of Action:

- Acts on the limbic system, thalamus and hypothalamus to induce a calming effect.
- Increases GABA affinity for GABA receptor sites thereby opening chloride channels and causing a hyperpolarized cell membrane that prevents further excitation of the cell.

Onset: 15 – 30 minutes (IM)

Duration: Up to 60 minutes

Indications for Use:

- Never Agent Anticonvulsant

Contraindications:

- Acute narrow angle glaucoma
- Severe respiratory depression
- Use cautiously in patients with history of asthma, sleep apnea, COPD, or currently taking narcotics

Side Effects:

- CVS: Hypotension, bradycardia, drowsiness
- Resp: Respiratory depression
- Local: Phlebitis if pushed too rapidly

Adult Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Pediatric Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Special Considerations:

- May cause respiratory depression in individuals taking depressant medications such as opioids, other benzodiazepines, barbiturates and alcohol.

Drug Profile for DIPHENHYDRAMINE

GENERIC NAME: DIPHENHYDRAMINE

CLASS: Antihistamine

Mechanism of Action:

- Competitively blocks H1 receptor sites
- Results in reduced bronchoconstriction, vasodilation and cellular permeability (urticaria)
- Has some anticholinergic effects

Onset: Minutes

Duration: 3 - 6 hours

Indications for Use:

- Allergic Reaction
- Dystonic Reaction

Contraindications:

- Narrow Angle Glaucoma
- Breast-Feeding Mothers (relative)

Side Effects:

- CNS: Dizziness, drowsiness, euphoria, blurred vision
- CVS: Hypotension, palpitations, tachycardia
- GI: Nausea, vomiting, dry mouth
- Local: Phlebitis if pushed too rapidly
- Children: May cause excitation; overdose may cause seizures, hallucinations

Precautions:

- May increase the effects of other depressant medications (alcohol, illicit drugs, benzodiazepines, opioids) and anticholinergics
- Verify whether the patient took over-the-counter Diphenhydramine prior to EMS arrival; patient may not exceed 50mg in 4 hours

Adult Dosage Per Protocol:

1. **B – 3 Nausea & Vomiting**
2. **B – 17 Anaphylaxis & Allergic Reaction**
3. **B – 24 Overdose / Toxic Ingestion**

Pediatric Dosage Per Protocol:

1. **E – 11 Anaphylaxis & Allergic Reaction**

Special Considerations:

- Epinephrine is the primary treatment for anaphylaxis; do not delay treatment to give Diphenhydramine.

Drug Profile for EPINEPHRINE

GENERIC NAME: EPINEPHRINE

CLASS: Alpha/Beta Agonist, Sympathomimetic

Mechanism of Action:

- Stimulates Alpha, Beta₁ and Beta₂ receptors
- Alpha Effects: peripheral vasoconstriction
- Beta₁ Effects: positive inotropic/chronotropic effects
- Beta₂ Effects: Bronchial smooth muscle relaxer, reduces bronchospasms

Onset: Minutes

Duration: 3 - 6 hours

Indications for Use:

- Cardiac Arrest: Pulseless VT/VF, Asystole, PEA
- Bradycardia Refractory to Pacing/Atropine
- Moderate/Severe Allergic Reaction
- Wheezing/Respiratory Distress/Croup/Bronchiolitis
- Pediatric/Newborn Bradycardia

Contraindications:

- None in the setting of an anaphylaxis/allergic reaction
- Narrow angle glaucoma (relative)
- Breast-feeding mothers (relative)

Side Effects:

- CNS: Anxiety, headache, restlessness, dizziness
- CVS: Angina, arrhythmias, hypertension, AMI
- Resp: Dyspnea
- Endocrine: Hyperglycemia
- GI: Nausea, vomiting
- Local: Extravasation (vesicant)

Precautions:

- Should be used cautiously in patients > 65 years old and those with a history of cardiac disease
- IM injections: If multiple doses are required, alternate between left and right thigh due to vasoconstriction qualities that could lead to necrosis
- Potentiates other sympathomimetics (may lead to hypertension, increased tachycardia)
- TCAs/MAOIs: Vasopressor effect enhanced; monitor the patient closely
- Reduced effects when given to a patient concurrently taking Beta-adrenergic blockers

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 6 ROSC & Post-Arrest Care**
3. **B – 7 Bradycardia**
4. **B – 11 Difficulty Breathing Asthma / COPD**
5. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.)**
6. **B – 17 Anaphylaxis & Allergic Reaction**
7. **B – 27 Sepsis & Septic Shock**
8. **B – 29 Shock & Hypotension (Non-Trauma)**
9. **C – 1 Trauma, General**
10. **C – 6 Head Injuries**
11. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
12. **D – 3 Childbirth / Labor**

Drug Profile for EPINEPHRINE

Pediatric Dosage Per Protocol:

1. **B – 14 Airborne Pathogens (Adult / Peds) (COVID, Influenza, SARS, MERS, TB, etc.**
2. **D – 5 Newborn Resuscitation**
3. **E – 5 Cardiac Arrest**
4. **E – 6 ROSC & Post-Arrest Care**
5. **E – 7 Bradycardia**
6. **E – 11 Anaphylaxis & Allergic Reaction**
7. **E – 12 Asthma / Reactive Airway Disease**
8. **E – 13 Croup / Epiglottitis / Bronchiolitis**
9. **E – 16 Sepsis & Septic Shock**
10. **E – 18 Shock & Hypotension**
11. **F – 1 Trauma, General**
12. **F – 3 Head & Facial Injuries**

Special Considerations:

- Hypotension/Bradycardia: Attempt to correct with fluids prior to initiating Epinephrine infusion.
- IV: Due to the risk of extravasation, Epinephrine should be administered in a large vein; if extravasation occurs, stop the infusion immediately and contact OLMC. Administer via an IV pump whenever possible; in the absence of a pump, the medication **MUST** be hung utilizing micro drip or flow controlled tubing.
- IM: Accidental injection into the hands or feet may result in tissue loss to the area; patient should seek medical attention.
- Patients who receive Epinephrine **MUST** be continuously cardiac monitored.

Drug Profile for ERTAPENEM

GENERIC NAME: ERTAPENEM

CLASS: Antibiotic

Mechanism of Action:

- Prevents bacterial cell wall synthesis leading to cell lyse

Onset: Immediate

Duration: 24 hours

Indications for Use:

- Open Traumatic Wounds

Contraindications:

- Do not reconstitute with Lidocaine if patient has a known allergy
- Allergy to beta-lactam antibiotics (penicillin, cephalosporins (cefazolin, ceftriaxone, etc.))

Side Effects:

- CNS: Headache, altered mental status, dizziness
- GI: Nausea, vomiting, diarrhea, abdominal pain
- Local: Infusion site pain/redness

Precautions:

- Ertapenem falls under the carbapenem class of antibiotics which have been associated with altered mental status and seizures. These side effects are more common in individuals with underlying CNS disorders such as epilepsy and brain lesions.

Adult Dosage Per Protocol:

1. **C – 1 Trauma, General**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- IM administration must be into a large muscle (ventrogluteal or lateral thigh).
- IM injection will cause discomfort; this can be minimized by reconstituting with Lidocaine instead of NS.
- Must be > 60 min from time of injury to projected arrival at the hospital.

Drug Profile for FENTANYL

GENERIC NAME: FENTANYL

CLASS: Opioid Agonist

Mechanism of Action:

- Causes pain relief by stimulating mu receptors in the CNS inhibiting pain pathways
- Depresses brain stem respiratory center and CNS, affects response to changes in PaCO₂
- Vasodilator

Onset: Immediate

Duration: 30 minutes – 1 hour

Indications for Use:

- Pain Control
- Post Advanced Airway Sedation / Pain Control
- Rapid Sequence Induction Sedation Agent

Contraindications:

- SBP < 100mmHg
- Respiratory depression / Hx of severe asthma
- Moderate – severe TBI

Side Effects:

- CNS: Dizziness, drowsiness, sedation, headache, hallucinations, miosis
- CVS: Hypotension, bradycardia, cardiac arrhythmias
- Resp: Respiratory depression
- GI: Nausea, vomiting
- Misc: Chest wall rigidity (most frequently occurs when administered too quickly)

Precautions:

- 100 times stronger than Morphine
- Airway equipment should be readily available in case of respiratory depression
- Can cause severe hypotension; ensure patient's SBP is >100mmHg before administration
- Chest wall rigidity may occur if med is administered too quickly; give over 1 – 2 minutes

Adult Dosage Per Protocol:

1. **B - 2, Airway Management**
2. **B - 4 Pain Management**
3. **B - 6 ROSC & Post-Arrest Care**
4. **B - 5 Chest Pain**

Pediatric Dosage Per Protocol:

1. **E - 2 Airway Management**
2. **E - 4 Pain Management**

Special Considerations:

- Respiratory depression/sedation can be reversed with Naloxone; see **B - 24 or E - 15 Overdose / Toxic Ingestion**
- Treat any hypotension that develops with fluids; see **B - 29 or E - 18 Shock & Hypotension**
- Treat any associated nausea / vomiting IAW **B - 3 or E - 3 Nausea / Vomiting**
- **Post Intubation Sedation:** Must place EtCO₂, SpO₂, and cardiac monitor prior to administration; document vitals/BP q 5 min for first 15 min then q 15 min thereafter.

Drug Profile for GLUCAGON

GENERIC NAME: GLUCAGON

CLASS: Antidote, Hypoglycemia Agent

Mechanism of Action:

- Promotes glycogenesis and glycogenolysis (turns hepatic glycogen stores to glucose), GI smooth muscle relaxer
- As a beta-blocker overdose antidote: has inotropic and chronotropic effects; improves atrioventricular conduction

Onset: 10 minutes

Duration: 60 – 90 minutes

Indications for Use:

- Hypoglycemia
- Beta or Calcium Channel Blocker Overdose
- Moderate/Severe Allergic Reaction

Contraindications:

- Hypoglycemia: should not be used unless unable to obtain IV access
- Pheochromocytoma
- Inadequate glycogen stores (starvation, fasting, chronic hypoglycemia, adrenal insufficiency)

Side Effects:

- CVS: Hypertension, tachycardia, palpitations
- Resp: Dyspnea
- GI: Nausea, vomiting (worse with rapid IV administration)

Precautions:

- Hypoglycemia: Glucagon is short acting; patient **MUST** eat or an IV must be established to provide additional glucose/maintain glucose levels.
- Anticipate nausea/vomiting after administration.

Adult Dosage Per Protocol:

1. **B – 17 Anaphylaxis & Allergic Reaction**
2. **B – 20 Diabetic Emergencies**
3. **B – 24 Overdose / Toxic Ingestion**

Pediatric Dosage Per Protocol:

1. **E – 14 Diabetic Emergencies**
2. **E – 15 Overdose / Toxic Ingestion**

Special Considerations:

- Must be reconstituted prior to use.
- Anaphylaxis: May not be given unless patient is currently taking beta-blockers and has not improved after standard treatment.
- Hypoglycemia: Blood sugar must be obtained/documented prior to administration. Hypoglycemia is a medical emergency, if IV access is delayed administer Glucagon immediately. After administration the patient's glycogen stores will be depleted. If the patient is not immediately provided supplemental glucose, recurrent hypoglycemia will be worse than before the Glucagon administration.

Drug Profile for HYDROXOCOBALAMIN

GENERIC NAME: HYDROXOCOBALAMIN

CLASS: Antidote

Mechanism of Action:

- When used for cyanide poisoning, Hydroxocobalamin can bind to a cyanide molecule allowing its hydroxo element to be replaced by cyanide; this ultimately results in the excretion of the newly formed cyanocobalamin in the urine.

Onset: Immediate

Duration: Unknown

Indications for Use:

- Suspected Cyanide Toxicity

Contraindications:

- None in the presence of suspected cyanide toxicity

Side Effects:

- CVS: Hypertension, headache
- GI: Urine discoloration (red, purple)
- Misc: Light sensitivity, reddening of skin/mucous membranes, rash

Precautions:

- Hypertension (> 180mmHg systolic or > 110mmHg diastolic) may occur. Blood pressure changes usually self- resolve within 4 hours; monitor BP closely.

Adult Dosage Per Protocol:

1. **G – 1b CO Poisoning / Smoke Inhalation & Cyanide Toxicity**

Pediatric Dosage Per Protocol:

1. **G – 1b CO Poisoning / Smoke Inhalation & Cyanide Toxicity**

Special Considerations:

- May cause reddening of the skin; attempt to establish TBSA prior to administering to prevent miscalculation of burn size.
- Due to the risk of renal injury, patients may require continuous lab work monitoring or hemodialysis; transport all patients for evaluation.

Drug Profile for HYPERTONIC SALINE (SODIUM CHLORIDE 3%)

GENERIC NAME: HYPERTONIC SALINE (SODIUM CHLORIDE 3%)

CLASS: Electrolyte

Mechanism of Action:

- By principles of osmosis, hypertonic saline draws water from interstitial space into the intravascular space. This increases intravascular volume resulting in increased cerebral perfusion pressure and blood flow to the brain.

Onset: 10 minutes

Duration: 1 hour

Indications for Use:

- Head Injury w/ AMS or Suspected Herniation

Contraindications:

- None in the presence of impending herniation

Side Effects:

- CVS: Hypervolemia
- Endocrine: Hypernatremia
- Local: Phlebitis/irritation at infusion site

Precautions:

- Should not be administered in the same line as blood products

Adult Dosage Per Protocol:

1. **C – 6 Head Injuries**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Hypertonic saline is a bridge to temporarily manage increased intracranial pressure pending definitive surgical intervention.
- Due to the risk of extravasation, hypertonic saline must be administered in a large vein; if extravasation occurs, stop the infusion immediately and contact OLMC.

Drug Profile for IPRATROPIUM BROMIDE

GENERIC NAME: IPRATROPIUM BROMIDE

CLASS: Anticholinergic

Mechanism of Action:

- Acetylcholine antagonists; competes for binding sites at the parasympathetic sites in the lungs causing bronchodilation.

Onset: Within 15 minutes

Duration: > 2 hours

Indications for Use:

- Wheezing, Respiratory Distress, Bronchospasm, Inhalation Injury
- Moderate/Severe Allergic Reaction

Contraindications:

- Should be used with caution in patients with narrow-angle glaucoma (may increase intraocular pressure)

Side Effects:

- Resp: Cough, throat irritation
- CNS: Dizziness, blurred vision

Precautions:

- While rare, in some patients have been found to have paradoxical bronchospasm after administration; if the patient suddenly worsens after beginning nebulizer treatment, immediately discontinue and call OLMC.

Adult Dosage Per Protocol:

1. **B – 11 Difficulty Breathing Asthma / COPD**
2. **B – 17 Anaphylaxis & Allergic Reaction**
3. **B – 26 Drowning / Submersion (Adult / Peds)**
4. **C – 2 Burns (Thermal, Chemical, Electrical / Lightning)**

Pediatric Dosage Per Protocol:

1. **B – 26 Drowning / Submersion (Adult / Peds)**
2. **E – 11 Anaphylaxis & Allergic Reaction**
3. **E – 12 Asthma / Reactive Airway Disease**
4. **E – 13 Croup / Epiglottitis / Bronchiolitis**
5. **F – 2 Burns**

Special Considerations:

- Albuterol and Ipratropium Bromide may be combined and administered together in one nebulizer treatment.
- Ipratropium Bromide produces bronchodilation of the larger airways while beta agonists (Albuterol) have a greater effect on the smaller airways.
- Has minimal effect on heart rate.

Drug Profile for KETAMINE

GENERIC NAME: KETAMINE

CLASS: General Anesthetic; Dissociative

Mechanism of Action:

- Acts on the cortex and limbic system to produce a dissociative effect.
- Low doses produce pain relief; higher doses produce sedation effects.
- Stimulates sympathetic nervous system resulting in the release of catecholamine which results in increased cardiac output, blood pressure, tachycardia, smooth muscle relaxation and bronchodilation.

Onset: Seconds

Duration: 10 minutes

Indications for Use:

- Post-Intubation Sedation
- Rapid Sequence Induction Sedation Agent
- Transcutaneous Pacing/Cardioversion Sedation
- Combative Patients
- Pain Management
- Wheezing/Respiratory Distress

Contraindications:

- Cardiac ischemia/AMI
- Use cautiously in patients with schizophrenia
- Use cautiously in patients with an open eye injury
- Use cautiously in chronic alcoholics or intoxicated individuals
- Less than 3 months old

Side Effects:

- CNS: Confusion, hallucinations, irrational behavior, dystonic reaction, hypertonia
- CVS: Hypertension, headache, tachycardia
- Resp: Respiratory depression, laryngeal spasm
- GI: Nausea
- Misc: Hypersalivation, nystagmus, mydriasis

Precautions:

- Emergence Reactions: More common at doses higher than those authorized in the protocols; patient may have hallucinations, be irrational/delirious. Treatment is a benzodiazepine; call OLMC for approval/dosing.
- Rapid IV administration may result in respiratory depression or apnea; administer SLOWLY over 1 - 2 minutes; have airway equipment prepared before administration.

Adult Dosage Per Protocol:

1. **B - 2, Airway Management**
2. **B - 4 Pain Management**
3. **B - 6 ROSC & Post-Arrest Care**
4. **B - 7 Bradycardia**
5. **B - 8 Tachycardia, Narrow Complex**
6. **B - 9 Tachycardia, Wide Complex**
7. **B - 11 Difficulty Breathing Asthma / COPD**
8. **B - 18 Behavioral Emergencies**

Drug Profile for KETAMINE

Pediatric Dosage Per Protocol:

1. E – 2 Airway Management
2. E – 4 Pain Management
3. E – 6 ROSC & Post-Arrest Care
4. E – 7 Bradycardia
5. E – 8 Tachycardia, Narrow Complex
6. E – 9 Tachycardia, Wide Complex
7. F – 1 Trauma, General
8. F – 2 Burns
9. F – 3 Head & Facial Injuries

Special Considerations:

- **MUST use 500mg/10mL (50mg/mL) or 500mg/5mL (100mg/mL) Concentration**
- Ketamine used to be contraindicated in patients with a significant TBI due to the belief that it caused increased intracranial pressure. Multiple recent studies have disproven this and actually show that cerebral perfusion is improved with the use of Ketamine.
- If the patient experiences hypersalivation after administration, it may lead to laryngeal spasms; if hypersalivation is severe, contact OLMC for approval to administer 0.5mg Atropine.
- Studies have shown that Ketamine is a bronchodilator. When it used in the presence of a severe asthma attack, it can reduce the chances of the patient requiring mechanical ventilation.

Drug Profile for KETOROLAC

GENERIC NAME: TORADOL

CLASS: Nonsteroidal anti-inflammatory drug (NSAID)

Mechanism of Action:

- Inhibits the bodies synthesis of hormones and chemicals that cause inflammation and pain

Onset: 10 minutes

Duration: 6 – 8 hours

Indications for Use:

- Acute extremity injuries
- Acute musculoskeletal pain
- Isolated back pain

Contraindications:

- Adults > 65 years old
- Children < 18 years old.
- NSAID use in the past 6 hours.
- Hypotension (Adult SBP < 90 mmHg).
- Bleeding traumatic injury.
- Chronic kidney disease.
- Current pregnancy.
- History of Gastrointestinal bleeding, ulcers, and renal insufficiency.
- Currently taking anticoagulants (e.g., Xarelto, Coumadin, Eliquis).
- Cardiac chest pain.
- Hypersensitivity.

Side Effects:

- CNS: Headache
- CVS: Flushing, edema
- GI: Nausea
- Misc Anaphylaxis from hypersensitivity, rash

Precautions:

- Not indicated for the treatment of abdominal or non-traumatic chest pain.

Adult Dosage Per Protocol:

1. **B – 4 Pain Management**

Pediatric Dosage Per Protocol:

1. **E – 4 Pain Management**

Special Considerations:

- Verify the patient has not taken any other medications that contain acetaminophen, such as cold and narcotic pain medications, prior to administration.
- Maximum daily dose of acetaminophen may not to exceed 4 grams

Drug Profile for LIDOCAINE (2% Cardiac, 1% without Epinephrine)

GENERIC NAME: LIDOCAINE (2% Cardiac, 1% without Epinephrine)

CLASS: Anesthetic, Antiarrhythmic

Mechanism of Action:

- Anesthetic/Local: Blocks initiation/conduction of nerve impulses by reducing the nerves permeability to sodium ions
- Systemic: Decreases permeability to sodium ions thereby increasing the electrical stimulation threshold of ventricular myocardial cells and reducing spontaneous depolarization during diastole

Onset: 45 – 90 seconds

Duration: 10 – 20 minutes

Indications for Use:

- IO Analgesia
- Reconstitution for IM Ertapenem
- Ventricular Tachycardia in Pregnant Patients

Contraindications:

- Allergy to any local anesthetic
- IV/IO: WPW, high AV blocks (unless the pt has a pacemaker)

Side Effects:

- o CVS: Bradycardia, arrhythmias, heart blocks, edema, flushing, hypotension
- o CNS: Anxiety, AMS, dizziness, lethargy, hallucinations, seizures, twitching, slurred speech, hyper/hypoesthesia
- o GI: Nausea, vomiting
- o Resp: Bronchospasm, respiratory depression
- o Local: Numbness

Precautions:

- IV/IO: Severe liver dysfunction (may cause lidocaine toxicity)

Adult Dosage Per Protocol:

1. **B – 1 General Patient Care / Monitoring & Vascular Access**
2. **B – 6 ROSC & Post-Arrest Care**
3. **B – 9 Tachycardia, Wide Complex**
4. **C – 1 Trauma, General**

Pediatric Dosage Per Protocol:

1. **E – 1 General Patient Care / Monitoring & Vascular Access**

Special Considerations:

- IO must be placed in an intact (unbroken) bone; verify patency/monitor for infiltration.
- **Do not** use a Lidocaine multi-dose vial for IO Analgesia or ventricular tachycardia; members must use Cardiac Lidocaine.
- If using Lidocaine for stable/asymptomatic cardioversion and the patient develops SBP < 90mmHg, stop the infusion and perform synchronized cardioversion.

Drug Profile for MAGNESIUM SULFATE

GENERIC NAME: MAGNESIUM SULFATE

CLASS: Electrolyte

Mechanism of Action:

- Slows SA node, prolongs conduction time; stabilizes cellular membranes resulting in reduced myocardial irritability
- Produces anticonvulsant effects by blocking peripheral neuromuscular transmission
- Inhibits cellular uptake of calcium in smooth muscle reducing bronchial/vascular constriction

Onset: Immediate

Duration: 30 minutes

Indications for Use:

- Torsades de Pointes
- Wheezing/Respiratory Distress
- Eclamptic Seizure

Contraindications:

- 2nd or 3rd Degree heart block (unless a functioning pacemaker is present)
- Acute MI (relative)
- Renal impairment (relative)
- Use caution in patients with a hx of myasthenia gravis or other neuromuscular disease (MS, ALS, etc.)

Side Effects:

- CNS: Drowsiness, depressed reflexes, cramping
- CVS: Flushing, hypotension, bradycardia, heart block, asystole
- Resp: Respiratory depression
- GI: Nausea, vomiting

Precautions:

- Even at low doses neuromuscular function may be inhibited in patients with neuromuscular diseases; be prepared to secure patient's airway.
- Rapid administration increases the risk of the patient developing bradycardia, hypotension and respiratory depression. Vitals must be obtained q 5 minutes, patient must be placed on a cardiac monitor and equipment to manage the patient's airway must be readily available.
- CNS and respiratory depression are signs of magnesium toxicity, but calcium administration will reverse these symptoms. Discontinue the infusion if the patient's respirations fall below 12/min. If toxicity is suspected, contact OLMC for calcium chloride dosing and permission to administer.
- Concurrent use of magnesium with other CNS depressants (barbiturates, narcotics, benzodiazepines, etc.) may have a compounding effect.
- Patients taking calcium channel blockers are at increased risk of developing hypotensive effects.

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 9 Tachycardia, Wide Complex**
3. **B – 11 Difficulty Breathing Asthma / COPD**
4. **D – 2 Seizures (Pregnant)**

Pediatric Dosage Per Protocol:

1. **E – 5 Cardiac Arrest**
2. **E – 9 Tachycardia, Wide Complex**
3. **E – 12 Asthma / Reactive Airway Disease**

Special Considerations:

- Eclampsia During Pregnancy: Magnesium toxicity can result in fetal distress; monitor patient closely

Drug Profile for MAGNESIUM SULFATE

- and verify medication dosing prior to administration.
- Torsade de Pointes: Hypomagnesemia patients are also frequently hypokalemic and hypercalcemic resulting in significant cardiac irritability. Magnesium may be ineffective in reversing Torsade de Pointes; place pads and be prepared to defibrillate.
- Infusions should be administer via an IV pump. In the absence of an IV pump microdrip or flow controller tubing **must** be utilized.
- Patients must be continuously monitored for increasing PR and QRS intervals during administration.

Drug Profile for MELOXICAM

GENERIC NAME: MELOXICAM

CLASS: Nonsteroidal Anti-Inflammatory (NSAID), Analgesic

Mechanism of Action:

- Inhibits the synthesis of prostaglandin resulting in decreased inflammation; also has antipyretic and analgesic properties

Onset: 30 minutes

Duration: 4 – 6 hours

Indications for Use:

- Mild Pain

Contraindications:

- Patient has taken an NSAID in the last 6 hours
- History of moderate to severe renal insufficiency
- History of asthma exacerbation after taking other NSAIDs or aspirin (relative)

Side Effects:

- o GI: Nausea, abdominal pain

Precautions:

- None

Adult Dosage Per Protocol:

1. **B – 4 Pain Management**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Meloxicam may compound the anticoagulation properties of blood thinners, however, this is rare in single dose therapy.

Drug Profile for METOCLOPRAMIDE

GENERIC NAME: METOCLOPRAMIDE

CLASS: Antiemetic

Mechanism of Action:

- Dopamine receptor antagonist resulting in antiemetic effects
- Stimulates GI smooth muscle increasing GI motility

Onset: 1 – 3 minutes

Duration: 1 - 2 hours

Indications for Use:

- Nausea / Vomiting

Contraindications:

- Known allergy to procainamide (structurally similar)
- Suspected/known GI bleed, obstruction, perforation
- Patients with known congestive heart failure or pheochromocytoma
- History of Parkinson's, seizure disorders or currently taking medications with extrapyramidal side effects (usually antipsychotics like haloperidol)

Side Effects:

- CNS: Drowsiness, dystonic reaction, dizziness, restlessness, headache
- CVS: Hypertension,
- GI: Nausea, hyperglycemia

Precautions:

- May cause psychosis; prevalence is higher in patients with previously diagnosed psychiatric disorders

Adult Dosage Per Protocol:

1. **B – 3 Nausea & Vomiting**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- On rare occasions, Metoclopramide has been known to cause extrapyramidal/dystonic reactions when administered at higher doses. Risk is low at the dosages outlined above, however, if these symptoms present, see **B – 24 Overdose / Toxic Ingestion**

Drug Profile for METOPROLOL

GENERIC NAME: METOPROLOL

CLASS: Beta agonist

Mechanism of Action:

- Inhibits response to beta₁-adrenergic stimulation thereby reducing cardiac output, AV node conduction and heart rate.

Onset: 5 minutes

Duration: 5 - 8 hours

Indications for Use:

- Narrow Complex Tachycardia

Contraindications:

- Known allergy to other beta-blockers
- Bradycardia or WPW
- 2nd or 3rd Degree heart block (unless a functioning pacemaker is present)
- Hypotension, cardiogenic shock or pronounced CHF

Side Effects:

- CNS: Drowsiness, dizziness, headache
- CVS: Bradycardia, heart block
- GI: Nausea
- Endo: Hypokalemia

Precautions:

- May enhance the hypotensive effects in patients taking calcium channel blockers, Amiodarone, other beta-blockers or other medications to treat HTN
- Additive bradycardic effects when given to patient taking Diltiazem
- May enhance sedation effects of benzodiazepines
- Patients with a first-degree heart block

Adult Dosage Per Protocol:

1. **B – 8 Tachycardia, Narrow Complex**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Patient's with a first-degree block, a history of a conduction disorder, or sinus node dysfunction are at increased risk of developing severe side effects.
- Vitals must be obtained q 5 minutes and the patient must be placed on a cardiac monitor prior to administration.
- 3. Allergic Reaction: Beta-blockers such as Metoprolol may reduce the therapeutic effect of Epinephrine. If the patient develops symptoms of an allergic reaction, and the standard treatment fails, consider administering Glucagon IAW **B – 7 Bradycardia**.

Drug Profile for MIDAZOLAM

GENERIC NAME: MIDAZOLAM

CLASS: Benzodiazepine

Mechanism of Action:

- Binds with GABA receptors enhancing the inhibitory effect; causes a chloride ion shift that results in cells becoming hyperpolarized and therefore less excitable and more stabilized.
- Impacts several sites within the CNS to include the limbic system and reticular formation centers producing sedation and anticonvulsant effects.

Onset: 3 - 5 minutes

Duration: < 2 hours

Indications for Use:

- Seizures
- Sedation
 - Post-Intubation, Transcutaneous Pacing, Cardioversion
- Rapid Sequence Induction Sedation Agent
- Combative Patients
- Muscle Spasm Secondary to a Bite/Envenomation
- Shivering Secondary to Hyperthermia Cooling
- Chest Pain Associated with Stimulant Abuse/Overdose or Anticholinergic Overdose

Contraindications:

- Narrow angle glaucoma (relative)
- Respiratory depression
- SBP < 100mmHg

Side Effects:

- CNS: Drowsiness, headache
- CVS: Hypotension
- Resp: Respiratory depression/arrest, reduced tidal volume

Precautions:

- Paradoxical reactions have been reported (patient becomes hyperactive or aggressive). Reactions usually occur when the medication is administered to pediatric, geriatric, or patients with a history of a psychiatric disorders.
- May compound CNS/respiratory depression effects if given to a patient who has consumed alcohol or opioids.
- Risk of hypotension increases with rapid administration; deliver medication over 1 – 2 minutes.

Adult Dosage Per Protocol:

1. **B - 2, Airway Management**
2. **B - 6 ROSC & Post-Arrest Care**
3. **B - 7 Bradycardia**
4. **B - 8 Tachycardia, Narrow Complex**
5. **B - 9 Tachycardia, Wide Complex**
6. **B - 5 Chest Pain**
7. **B - 18 Behavioral Emergencies**
8. **B - 19 Bites & Envenomations (Adults / Peds)**
9. **B - 22 Hyperthermia / Heat Injuries (Adult / Peds)**
10. **B - 24 Overdose / Toxic Ingestion**
11. **B - 28 Seizures (Non-Pregnant)**
12. **D - 2 Seizures (Pregnant)**

Drug Profile for MIDAZOLAM

Pediatric Dosage:

1. **B – 19 Bites & Envenomations (Adults / Peds)**
2. **B – 22 Hyperthermia / Heat Injuries (Adult / Peds)**
3. **E – 2 Airway Management**
4. **E – 15 Overdose / Toxic Ingestion**
5. **E – 17 Seizures & Post-Seizure Management**

Special Considerations:

- Midazolam causes significant anterograde amnesia which is why it is often recommended for sedation prior to procedures.
- The manufacture approves the dilution of the 5mg/mL concentration if Normal Saline is used.
- Midazolam is 3 – 4 times more potent than Diazepam and has a more rapid onset / quicker recovery time.
- Vitals must be obtained q 5 minutes, patient must be placed on a cardiac monitor/EtCO2 prior to administration, and equipment to manage the patient's airway must be readily available.

Drug Profile for NALOXONE

GENERIC NAME: NALOXONE

CLASS: Antidote, Opioid Antagonist

Mechanism of Action:

- Competitive antagonist; displaces/replaces opioids at receptor sites
- Does not remove opioids from circulation, only blocks receptor sites

Onset: IV: 2 min; IM: 2 – 5 min; IN: 8 – 13 min

Duration: 30 – 120 min

Indications for Use:

- Opioid Overdose

Contraindications:

- None in an emergency situation

Side Effects:

- CNS: Agitation, pain, confusion/disorientation, dizziness, headache, withdrawal syndrome
- CVS: Hypertension, hypotension, flushing, tachycardia, cardiac arrest
- GI: Abdominal cramping, nausea/vomiting

Precautions:

- May cause acute withdrawal symptoms: tachycardia, diaphoresis, hypertension, nausea/vomiting, irritability and agitation. Symptoms are more common in chronic opioid users. Titrate medication slowly with the goal of reversing hypoventilation as opposed to waking patient completely.
- Abrupt opioid reversal in patients with a history of cardiac disease may result in pulmonary edema or cardiac arrest.

Adult Dosage Per Protocol:

1. **B – 4 Pain Management**
2. **B – 5 Cardiac Arrest**
3. **B – 6 ROSC & Post-Arrest Care**
4. **B – 24 Overdose / Toxic Ingestion**

Pediatric Dosage Per Protocol:

1. **E – 4 Pain Management**
2. **E – 5 Cardiac Arrest**
3. **E – 15 Overdose / Toxic Ingestion**

Special Considerations:

- Patient should not be allowed to sign refusal/AMA after administration due the possibility that they may require additional doses for long-acting opioids. Call OLMC if patient is refusing transport.
- Synthetic opioids may require up to 10mg of Naloxone before clinical response is seen.
- Be prepared for the patient to become combative.
- Naloxone may cause miosis (pupillary constriction) in patients who do not have opioids in their system.

Drug Profile for NIFEDIPINE

GENERIC NAME: NIFEDIPINE

CLASS: Calcium Channel Blocker

Mechanism of Action:

- Reduces pulmonary vascular resistance and pulmonary artery pressure

Onset: 20 minutes

Duration: 4 – 6 hours

Indications for Use:

- High Altitude Pulmonary Edema

Contraindications:

- Known or suspected myocardial infarction
- SBP < 100mmHg

Side Effects:

- CNS: Dizziness, headache, anxiety
- CVS: Flushing, peripheral edema, palpitations, hypotension
- Resp: Dyspnea, respiratory depression
- GI: Nausea, heartburn
- Misc: Muscle cramps

Precautions:

- Concurrent use with antifungal medications may enhance the adverse side effects
- Concurrent use with Beta-Blockers or other Calcium Channel Blockers may increase the hypotensive effect

Adult Dosage Per Protocol:

1. **G – 1a Altitude Illness**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Has **not** been proven as effective in the treatment of HAPE as descent and oxygen administration. Do NOT delay descent to administer.

Drug Profile for NITROGLYCERIN

GENERIC NAME: NITROGLYCERIN

CLASS: Vasodilator, Antianginal

Mechanism of Action:

- Smooth muscle relaxer that effects veins and arteries producing a vasodilator effect
- Reduces myocardial oxygen demand by reducing the preload and afterload
- Coronary artery dilator causing improved blood flow to ischemic areas of the heart

Onset: 1 - 3 minutes

Duration: 25 minutes

Indications for Use:

- Chest Pain
- CHF/Pulmonary Edema

Contraindications:

- SBP < 90 mmHg
- HR < 60bpm or > 120bpm
- Suspected severe head injury (increased ICP)
- Use of Viagra (sildenafil)/Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the last 48 hours
- Suspected right-sided MI
- Suspected inferior MI (relative)

Side Effects:

- CNS: Headache, dizziness, syncope withdrawal syndrome
- CVS: Hypotension, paradoxical bradycardia
- GI: Abdominal pain, nausea/vomiting
- Resp: Dyspnea, pharyngitis
- Misc: Weakness, diaphoresis, burning sensation under the tongue

Precautions:

- Right-sided MI should be considered when patient presents with ST elevation in inferior leads (II, III, aVF), when there are other cardiac symptoms with isolated ST elevation in V1 (more specific with associated ST depression in V2), and when ST elevation in lead III > II.
- Severe hypotension or shock may develop even with small doses. Have an IV established and fluids ready prior to administration if possible.
- Side effects may be worse in patients currently taking blood pressure medication, those who have recently consumed alcohol and those taking antipsychotic medications.

Adult Dosage Per Protocol:

1. **B – 5 Chest Pain**
2. **B – 12 Difficulty Breathing Congestive Heart Failure & Pulmonary Edema**

Pediatric Dosage Per Protocol:

Not authorized for use in pediatric patients

Special Considerations:

- Nitroglycerin is light and temperature sensitive.
- Studies have shown a minimal/clinically insignificant decrease in mortality rates of those administered nitroglycerin versus those who were not. Administration often results in pain relief without a significant impact on clinical outcome. Consider withholding administration and providing alternate analgesia if unable to obtain IV access or if the clinical impression is concerning.

Drug Profile for NOREPINEPHRINE

GENERIC NAME: NOREPINEPHRINE

CLASS: Alpha / Beta Agonist

Mechanism of Action:

- Alpha/Beta adrenergic receptor agonist causing vasoconstriction, chronotropic and inotropic effects; results in increased blood pressure and coronary perfusion
- Vasoconstriction effects are greater than chronotropic/inotropic effects

Onset: Immediate

Duration: 1 - 2 minutes

Indications for Use:

- Persistent Hypotension
- Shock

Contraindications:

- Hypotension that is related to hypovolemia (unless it is being used in the interim while volume is being replaced)
- Known mesenteric or peripheral thrombosis (not a contraindication in an emergency)

Side Effects:

- CNS: Headache, anxiety
- CVS: Bradycardia, hypertension, arrhythmia
- Resp: Dyspnea
- Local: Extravasation (vesicant)

Precautions:

- Use cautiously in patients with pronounced hypoxia/hypercarbia; norepinephrine may result in the patient developing ventricular tachycardia or fibrillation.
- May not simultaneously administer other medications/fluids in the same IV as norepinephrine.
- May enhance vasoconstriction effects of MAOIs/TCAs; use cautiously in patients taking these medications.

Adult Dosage Per Protocol:

1. **B – 6 ROSC & Post-Arrest Care**
2. **B – 7 Bradycardia**
3. **B – 12 Difficulty Breathing Congestive Heart Failure & Pulmonary Edema**
4. **B – 27 Sepsis & Septic Shock**
5. **B – 29 Shock & Hypotension (Non-Trauma)**
6. **C – 1 Trauma, General**
7. **C – 6 Head Injuries**
8. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
9. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

1. **E – 6 ROSC & Post-Arrest Care**
2. **E – 16 Sepsis & Septic Shock**
3. **E – 18 Shock & Hypotension**
4. **F – 1 Trauma, General**
5. **F – 3 Head & Facial Injuries**

Special Considerations:

- Due to the risk of extravasation, Norepinephrine should be administered in a large vein; if extravasation occurs, stop the infusion immediately and contact OLMC. Administer via an IV pump whenever possible; in the absence of a pump, the medication **MUST** be hung utilizing micro drip or flow controller tubing.
- The manufacture recommends NOT diluting Norepinephrine in normal saline if possible due to a risk of oxidation. Although studies have indicated there are no adverse effects, when able, dilute

Drug Profile for NOREPINEPHRINE

- Norepinephrine in D5W.
- Patient **MUST** be continuously monitored on cardiac monitor and have q 5 minute vitals taken/documented.

Drug Profile for ONDANSETRON

GENERIC NAME: ONDANSETRON

CLASS: Antiemetic

Mechanism of Action:

- Select 5-HT₃ receptor agonist. Blocks serotonin in the peripheral nervous system, vagus nerve and the chemoreceptor trigger zone in the brain.

Onset: 30 minutes

Duration: 2 – 3 hours

Indications for Use:

- Nausea / Vomiting

Contraindications:

- Prolonged QT (> 0.44 seconds)
- Severe hepatic impairment (pending liver transplant)

Side Effects:

- CNS: Headache, fatigue, sedation, dizziness, anxiety/agitation
- CVS: Prolonged-QT (rare at protocol dosing levels)
- Resp: Hypoxia
- Local: Burning with administration

Precautions:

- **Rare at protocol dosing levels:** Low risk of causing serotonin syndrome if patient is concurrently taking other serotonergic agents (Fentanyl, SSRIs, MAOIs, Lithium, Tramadol, Methylene Blue). Symptoms include AMS (hallucinations, delirium, agitation), tachycardia, hyperthermia, dizziness, diaphoresis, tremors, incoordination, and seizures. If these symptoms emerge, provide supportive care and transport.
- Prolonged-QT effects may be compounded when given to a patient taking other medications known to cause prolonged-QT (Amiodarone, SSRIs, MAOIs, quinolone antibiotics, etc.).

Adult Dosage Per Protocol:

1. **B – 3 Nausea & Vomiting**

Pediatric Dosage Per Protocol:

2. **E – 3 Nausea / Vomiting & Abdominal Pain**

Special Considerations:

- Unlike other antiemetics, Ondansetron does not have any effects on dopamine receptors and therefore does not cause extrapyramidal effects.
- Medication should be stored between 36°F and 86°F; IV vials should be protected from light.
- Ondansetron (Injection) may be administered PO if ODT is unavailable; 4mg PO, repeat x1 in 15 – 20 min PRN; max dose 8mg.

Drug Profile for ORAL GLUCOSE

GENERIC NAME: ORAL GLUCOSE

CLASS: Carbohydrate

Mechanism of Action:

- Primary carbohydrate used for energy; also used by cells in ATP production

Onset: 5 – 10 minutes

Duration: 40 minutes

Indications for Use:

- Hypoglycemia

Contraindications:

- Unconscious, inability to swallow or maintain own airway

Side Effects:

- o Rare

Precautions:

- Administer Glucagon or IV Dextrose in place of oral glucose in patients who are at risk of aspiration

Adult Dosage Per Protocol:

2. **B – 20 Diabetic Emergencies**

Pediatric Dosage Per Protocol:

2. **E – 14 Diabetic Emergencies**

Special Considerations:

- Document finger stick blood glucose level prior to administration; reassess and document post administration levels.

Drug Profile for OXYMETAZOLINE

GENERIC NAME: OXYMETAZOLINE (Afrin®)

CLASS: Adrenergic Agonist

Mechanism of Action:

- Causes arteriole vasoconstriction of the nasal mucosal by stimulating alpha-adrenergic receptors.

Onset: 10 minutes

Duration: $\leq$ 12 hours

Indications for Use:

- Epistaxis

Contraindications:

- None in the presence of significant nasal bleeding

Side Effects:

- o Local: Nasal irritation (burning, stinging, sneezing), nasal discharge, dry nose

Precautions:

- Although Alpha1-Blockers can cause increased blood pressure, studies have NOT shown a significant increase in patients taking Oxymetazoline. If the patient presents with elevated blood pressure or has a history of HTN, consider monitoring blood pressures when administering.

Adult Dosage Per Protocol:

1. **C – 3 Epistaxis (Adult / Peds)**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Afrin may not work as effectively in patients concurrently taking Alpha1-Blockers such as those used to control hypertension (generic name generally ends in “sin”).

Drug Profile for OXYTOCIN

GENERIC NAME: OXYTOCIN

CLASS: Oxytocic Agent

Mechanism of Action:

- Increases intracellular calcium levels in uterine cells resulting in increased uterine contractions

Onset: 1 minute

Duration: 1 hour

Indications for Use:

- Prevention of Postpartum Hemorrhage
- Postpartum Hemorrhage

Contraindications:

- No significant contraindications when given postpartum

Side Effects:

- CVS: Arrhythmias, hypertensive crisis, hypotension, tachycardia, PVCs
- GI: Nausea, vomiting

Precautions:

- Use cautiously in patients with cardiovascular disease and those who are hemodynamically stable

Adult Dosage Per Protocol:

1. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

Not authorized for use in pediatric patients

Special Considerations:

- Due to the mechanism of action, IV Pitocin should be administered before TXA in postpartum hemorrhage.
- Studies have shown reduction in SBPs of up to 30mmHg after Oxytocin IV boluses; effect is rare when delivered via IM injection.

Drug Profile for PRALIDOXIME CHLORIDE (2PAM)

GENERIC NAME: PRALIDOXIME CHLORIDE (2PAM)

CLASS: Antidote

Mechanism of Action:

- Cholinesterase reactivator after patient has been exposed to organophosphates or cholinesterase-inhibiting nerve agents. Cholinesterase is responsible for the breakdown of acetylcholine; when inhibited, acetylcholine builds activating nicotinic and muscarinic receptors. This results in bradycardia, increased secretions (bronchial, salivation, lacrimation) and weakness/muscle contractions.

Onset: 10 - 20 minutes

Duration: ~1 hour

Indications for Use:

- Suspected Nerve Agent/Organophosphate Poisoning

Contraindications:

- None in an emergency

Side Effects:

- CNS: Dizziness, drowsiness, headache, seizure, paralysis, blurred vision
- CVS: Cardiac arrest, hypertension, tachycardia
- Resp: Apnea, hyperventilation
- GI: Nausea/vomiting
- Local: Pain at injection site

Precautions:

- Verify scene safety and patient decontamination. Once safe, administration should not be delayed in patients with a high suspicion of exposure based on presentation.

Adult Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Pediatric Dosage Per Protocol:

1. **G – 3a Organophosphate / Nerve Agent Exposure (Adult / Ped)**

Special Considerations:

- Must be given concurrently with Atropine or it could worsen the patient's symptoms.
- Organophosphates are often effective in crossing the blood brain barrier whereas Pralidoxime is not. If a patient is presenting with CNS symptoms (tremors, anxiety, seizures, coma), Pralidoxime may not be effective in reducing these.

Drug Profile for ROCURONIUM

GENERIC NAME: ROCURONIUM

CLASS: Neuromuscular Blocker Agent

Mechanism of Action:

- Antagonizes acetylcholine receptors on motor endplate resulting in neuromuscular blockade

Onset: 1 – 2 minutes

Duration: 30 minutes

Indications for Use:

- Rapid Sequence Induction
 - Requires a minimum 3 EMS personnel (at least one must be SL4 or above) in addition to an AP to proceed

Contraindications:

- Known allergy

Side Effects:

- CVS: tachycardia (more frequently seen in children), hypertension, transient hypotension

Precautions:

- Similar in structure to other neuromuscular blockers, therefore, if the patient is allergic to a different neuromuscular blocker (e.g. Rocuronium) closely monitor for allergic reactions.
- The following conditions may antagonize the neuromuscular blockade and cause decreased paralysis: Respiratory alkalosis and hypercalcemia.
- The following conditions may potentiate the neuromuscular blockade and cause prolonged paralysis: Severe hypocalcemia, hypokalemia or hypermagnesemia, neuromuscular disorders, metabolic acidosis, respiratory acidosis, or myasthenia gravis.
- May worsen right heart failure in patients with a Hx of pulmonary hypertension
- Effects and duration are more variable in elderly patients and those with severe renal or hepatic impairment

Adult Dosage Per Protocol:

1. **B – 2 Airway Management**

Pediatric Dosage Per Protocol:

1. **E – 2 Airway Management**

Special Considerations:

- Patient must be placed on continuous cardiac, EtCO₂ and SpO₂ monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter
- Must be refrigerated. The length of time the medication may remain at room temperature varies, but is usually 60 days. Consult Pharmacy or the manufacture.
- Numerous medications can compound the neuromuscular-blocking effects. These include calcium channel blockers, systemic corticosteroids, Lithium, Quinidine, and many types of antibiotics.

Drug Profile for SODIUM BICARBONATE 8.4%

GENERIC NAME: SODIUM BICARBONATE 8.4%

CLASS: Alkalizing Agent

Mechanism of Action:

- Naturally occurring buffer that binds to hydrogen forming a carbonic acid that is broken down into CO₂ and H₂O and excreted by the body; increases blood pH

Onset: Rapid

Duration: 8 – 10 minutes

Indications for Use:

- Tricyclic Antidepressant Overdose
- Hyperkalemia
- Suspected Herniation

Contraindications:

- Pulmonary edema
- Alkalosis

Side Effects:

- CNS: Cerebral hemorrhage
- CVS: Edema
- Resp: Pulmonary edema
- Endocrine: Hyponatremia, hypocalcemia, hypokalemia, alkalosis, paradoxical acidosis
- Local: Extravasation (vesicant)

Precautions:

- Additive effect may occur when given to a patient taking antidysrhythmics, medications that cause hypotension/prolonged-QT or anticholinergics
- Stop infusion and contact OLMC if prolonged-QT, any AV block (to include 1st degree), hypotension, bradycardia or widened QRS occurs
- Consider lower dosage in elderly patients or those with renal clearance issues; contact OLMC

Adult Dosage Per Protocol:

1. **B – 5 Cardiac Arrest**
2. **B – 24 Overdose / Toxic Ingestion**
3. **B – 25 Renal Failure / Dialysis**
4. **C – 3 Crush Injuries**
5. **C – 6 Head Injuries**

Pediatric Dosage Per Protocol:

1. **E – 5 Cardiac Arrest**
2. **E – 7 Bradycardia**
3. **E – 9 Tachycardia, Wide Complex**
4. **E – 15 Overdose / Toxic Ingestion**

Special Considerations:

- Sodium bicarbonate precipitates and interacts with many medications. Do not give or mix with other medications. Ensure the line is flushed well immediately after completion of the infusion.
- Due to the risk of extravasation, sodium bicarbonate must be administered in a large vein; if extravasation occurs, stop the infusion immediately and contact OLMC.
- Routine use in cardiac arrest is NOT recommended even in prolonged resuscitations; use in cardiac arrest is only indicated if patient has known/suspected hyperkalemia, documented metabolic acidosis, suspected tricyclic antidepressant overdoses or if excited delirium preceded the cardiac arrest.

Drug Profile for SUCCINYLCHOLINE

GENERIC NAME: SUCCINYLCHOLINE

CLASS: Neuromuscular Blocker Agent

Mechanism of Action:

- Produces a similar effect as acetylcholine; depolarizes the myoneural junction endplate resulting in flaccid skeletal muscle paralysis

Onset: < 60 seconds

Duration: 4 – 10 minutes

Indications for Use:

- Rapid Sequence Induction
 - Requires a minimum 3 EMS personnel (at least one must be SL4 or above) in addition to an AP to proceed

Contraindications:

- Personal or family history of malignant hyperthermia
- Known neuromuscular disorder (e.g. Muscular Dystrophy, Multiple Sclerosis, Guillain-Barre, etc.)
- Known or suspected hyperkalemia

Side Effects:

- CVS: Peaked T-waves, asystole, bradycardia, hyper/hypotension, tachycardia, ventricular arrhythmia
- CNS: Malignant hyperthermia
- Resp: Apnea, respiratory depression
- Endocrine: Hyperkalemia
- Neuromuscular: Fasciculations, jaw tightness, rhabdomyolysis

Precautions:

- It is generally safe to administer Succinylcholine in the first 24 hours of injury after a patient has suffered a major burn, multiple trauma, a CNS injury causing paralysis, or prolonged crush injury. If administered > 24 hours after the initial trauma the risk of the patient developing hyperkalemia is higher.
- Similar in structure to other neuromuscular blockers, therefore, if the patient is allergic to a different neuromuscular blocker (e.g. Rocuronium) closely monitor for allergic reactions.
- May stimulate cardiac muscarinic receptors causing bradycardia
- Acute rhabdomyolysis and hyperkalemia followed by cardiac arrest has occurred after administration in pediatric patients with undiagnosed skeletal muscle myopathy; if a pediatric patient suddenly develops cardiac arrest after administration, contact OLMC and treat hyperkalemia IAW the guidance located in **E – 10 Tachycardia, Wide Complex**

Adult Dosage Per Protocol:

1. **B - 2, Airway Management**

Pediatric Dosage Per Protocol:

1. **E – 2 Airway Management**

Special Considerations:

- Compared to other neuromuscular agents, Succinylcholine has the fastest onset of action and the shortest duration of action.
- Patient must be placed on continuous cardiac, EtCO₂ and SpO₂ monitoring; document vitals/BP q 5 min for the first 15 min then q 15 min thereafter
- Must be refrigerated; the length of time the medication may remain at room temperature varies; consult Pharmacy or the manufacture.

Malignant Hyperthermia: Earliest indicator is a sudden increase in EtCO₂ > 55mmHg despite effective ventilations. Other signs include sinus tachycardia and muscle rigidity. An increase in body temperature > 102°F is a late sign.

Drug Profile for SUCCINYLCHOLINE

- o Management includes discontinuing the triggering agent, rapid cooling, and managing acidosis. Call OLMC for guidance.
- Numerous medications can compound the neuromuscular-blocking effects of Succinylcholine. These include beta-blockers, Lithium, and Quinidine.

Drug Profile for TETRACAINE 0.5%

GENERIC NAME: TETRACAINE 0.5%

CLASS: Local Anesthetic

Mechanism of Action:

- Impacts neurons permeability to sodium and potassium thereby preventing depolarization and blocking the initiation/conduction of nerve impulses

Onset: 30 seconds

Duration: 10 – 20 minutes

Indications for Use:

- Ocular Chemical Burns

Contraindications:

- None

Side Effects:

- o Local: lacrimation, transient burning/stinging, photophobia, redness

Precautions:

- Remove contact lenses before administering

Adult Dosage Per Protocol:

1. **C – 5 Eye Injuries (Adult / Peds)**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Tetracaine belongs to the ester group of anesthetics whereas the majority of the other “caines” belong to the amide group. Due to the differing chemical makeups between the two groups, there is very little risk someone allergic to an amide anesthetic (lidocaine, bupivacaine, prilocaine, etc.) also having a reaction to tetracaine.

Drug Profile for TRANEXAMIC ACID (TXA)

GENERIC NAME: TRANEXAMIC ACID (TXA)

CLASS: Antifibrinolytic

Mechanism of Action:

- Inhibits fibrinolysis thus preventing the breakdown of clots

Onset: 5 – 15 minutes

Duration: 3 hours

Indications for Use:

- Life Threatening Hemorrhage

Contraindications:

- > 3 hours since original injury
- Isolated closed head injury / suspected subarachnoid hemorrhage

Side Effects:

- CNS: Altered mental status, seizures, headache, fatigue, dizziness
- CVS: Hypotension (if given too rapidly), PE
- GI: Abdominal pain, nausea/vomiting
- Misc: Thrombosis

Precautions:

- Do not administer in the same IV as blood products
- TXA administered greater than 3 hours after injury has shown to be detrimental to patient outcomes
- Currently ONLY FDA approved to be administered via IV/IO

Adult Dosage Per Protocol:

1. **C – 1 Trauma, General**
2. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
3. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

Not approved for use in pediatric patients

Special Considerations:

- Life threatening hemorrhage for postpartum patients is defined as blood loss > 1000mL or > 500mL with signs of shock.

Drug Profile for WHOLE BLOOD

GENERIC NAME: WHOLE BLOOD

CLASS: Blood Components

Mechanism of Action:

- Increases blood volume and clotting factors

Onset: Variable based on previous blood loss **Duration:** Variable based on injury

Indications for Use:

- Life Threatening Hemorrhage
- Hemorrhagic Shock

Contraindications:

- None when indicated

Side Effects:

- Allergic or Anaphylactic Reaction
- Transfusion Reactions; see Precautions below

Precautions:

- **Acute Hemolytic Reactions**
 - Fever, chills, rigors, nausea, vomiting, dyspnea, hypotension, pain at the infusion site, chest/back and/or abdominal pain
- **Transfusion Related Lung Injury (TRALI)**
 - Sudden, acute respiratory distress usually occurring within 1-2 hours of a blood transfusion
- **Transfusion Associated Circulatory Overload (TACO)**
 - Presents as dyspnea and edema; more common in elderly or chronically anemic patients
- **Febrile Transfusion Reaction**
 - 1 degree rise in body temperature; may have associated chills

Adult Dosage Per Protocol:

1. **B – 27 Sepsis & Septic Shock**
2. **B – 29 Shock & Hypotension (Non-Trauma)**
3. **C – 1 Trauma, General**
4. **C – 6 Head Injuries**
5. **D – 1 Vaginal Bleeding (Other than Postpartum Hemorrhage)**
6. **D – 3 Childbirth / Labor**

Pediatric Dosage Per Protocol:

1. **D – 5 Newborn Resuscitation**
2. **E – 18 Shock & Hypotension**
3. **F – 1 Trauma, General**
4. **F – 3 Head & Facial Injuries**

Special Considerations:

- Serious transfusions reactions occur in approximately 1% of whole blood transfusions.
- Anaphylactic, transfusion-related acute lung injury and hypotensive reactions occur in less than 0.1% of all whole blood transfusions.

- Transfusion reactions can occur within minutes of administration up to 30 days later.