2025

PATIENT TREATMENT PROTOCOLS

ON LINE MEDICAL CONSULT (OLMC)		
MRH	503-494-7333	
Mental Health Crisis Line	503-291-9111	
POLST Registry	503-494-7333	
AMBULANCE		
AMR Ambulance	503-239-0389	
AMR Supervisor-Multnomah County	503-736-3425	
AMR Supervisor-Clackamas County	503-659-1294	
AMR Supervisor-Washington County	971-450-4120	
Life Flight	503-678-4364	
Metro West Ambulance	503-648-6658	
DISPATCH		
AMR Dispatch	503-231-6300	
BOEC (Portland)	503-823-0911	
CCOM Dispatch	503-655-8911	
WCCCA (FireCom)	503-629-0111	
Life Flight	800-232-0911	
LO Comm Dispatch	503-636-5601	
Metro West Ambulance Dispatch	503-648-6656	
HOSPITALS		
Hillsboro Medical Center	503-681-1860	
Kaiser Sunnyside ED	503-571-9516	
Kaiser Westside ED	971-310-4509	
Legacy Emanuel ED	503-413-4121	
Legacy Good Sam ED	503-413-7711	
Legacy Meridian Park	503-692-7467	
Mt Hood Medical Center ED	503-674-1400	
OHSU ED	503-494-7551	
Poison Control	800-222-1222	
Portland Adventist Medical Center ED	503-251-6168	
Providence St Vincent ED	503-216-2444	
Providence Milwaukie ED	503-513-8311	
Providence Newberg ED	503-537-1785	
Providence Portland ED	503-215-6000	
Salmon Creek ED	360-487-1400	
SW Washington ED	360-514-2464	
Unity Center for Behavioral Health	503-944-7758	
VA Portland ED	503-721-7803	
Willamette Falls ED	503-657-6702	

2025 SUMMARY OF PROTOCOL UPDATES AND CHANGES

PROTOCOL TITLE	PAGE	SECTION	DESCRIPTION OF CHANGE
Scope of Practice	0.010	Preface	Updated for 2025; added naloxone for EMR's, levalbuterol for EMTs and EMT-A's, and benzodiazepines for EMT-I's
Medical Control for Medications and Procedures	0.040	Preface	Removed OLMC requirement for buprenorphine administration.
		Treatment	**All of the treatment protocols have been reformatted to a flow chart style wherever possible.**
Agitated Patient	10.015	Treatment	Added language to allow the use of diphenhydramine for pediatric patients with a history of autism or developmental delays.
Altered Mental Status	10.020	Treatment	Removed specific treatment language for hypoglycemia and added a note to reference the Diabetic Emergencies Protocol.
Cardiac Arrest	10.050	Treatment	The 3 rhythm specific cardiac arrest protocols (VF/pVT, Asystole, and PEA) have been combined into 1 protocol titled "Pulseless Arrest"
Cardiac Dysrhythmias (Bradycardia)	10.060	Treatment	Updated the language about the treatment of discomfort caused by TCP.
Fever Management	10.077	Treatment	Changed the temperature for treatment considerations to 38.0 C (100.4 F).

2025 SUMMARY OF PROTOCOL UPDATES AND CHANGES

PROTOCOL TITLE	PAGE	SECTION	DESCRIPTION OF CHANGE
Hyperthermia	10.080	Treatment	Renamed to "Hyperthermia/Heat Related Emergencies". Added language for cold water immersion cooling.
Obstetrical Emergencies and Childbirth	10.135	Treatment	This protocol has been separated into 2 protocols titled "Obstetrical-Childbirth" and "Obstetrical-Complications".
Pain Management	10.135	Treatment	Added nebulized ketamine for pain management for both adults and pediatrics. Added language for the use of breath actuated nebulizers for ketamine use. Increased age range for ketorolac.
Respiratory Distress	10.160	Treatment	This protocol has been separated into 3 protocols, titled "Respiratory Distress- CHF/Acute Pulmonary Edema", "Respiratory Distress- COPD/Asthma", and "Respiratory Distress- Pediatrics".
Seizures	10.170	Treatment	Added PediDOSE seizure dosing based on age for pediatrics.
Stroke/CVA	10.190	Treatment	Replaced PPSS with BEFAST.
Submerged Patient	10.200	Treatment	Expanded this protocol to include drowning information and changed the title of the protocol to "Submerged Patient/Drowning".
Buprenorphine	20.065	Medications	Removed OLMC requirement. Removed exclusion criteria regarding no history of opioid use disorder.

2025 SUMMARY OF PROTOCOL UPDATES AND CHANGES

PROTOCOL TITLE	PAGE	SECTION	DESCRIPTION OF CHANGE
Droperidol	20.102	Medications	Changed the age for OLMC requirement to ≤ 12
Epinephrine	20.110	Medications	Changed the dose of push dose epi to 10 - 20 mcg IV/IO every 1 - 5 minutes.
Ketamine	20.155	Medications	Added nebulized ketamine for pain management in both adults and pediatrics.
Ketorolac	20.157	Medications	Increased the age range for use to ≤ 80 years old.
Midazolam	20.190	Medications	Added PediDOSE seizure dosing based on age for pediatrics.
		Procedures	**The following protocols have been moved to the Reference Manuel: Airway Management, Intranasal Medication Administration, IV Access and Infusion, LVAD device specific instructions, LUCAS Chest Compression Device, , Modified Valsalva Maneuver, Pelvic Immobilization, XSTAT, and Zoll Autopulse**
Behavioral Health Emergencies (Transport to Unity Center)	30.025	Procedures	Added a weight exclusion for transport to Unity Center.
Breath Actuated Nebulizer	30.030	Procedures	New protocol.

2025 SUMMARY OF PROTOCOL UPDATES AND CHANGES

PROTOCOL TITLE	PAGE	SECTION	DESCRIPTION OF CHANGE
Endotracheal Intubation	30.040	Procedures	Definitions of Drug Assisted Airway Management (DAAM) have been added. Descision for proceeding with RSI or DSI left to provider preference and/or medical director direction.
Sports Equipment Removal	30.160	Procedures	Updated language for the removal of facemasks and equipment.
Taser Barb Removal	30.162	Procedures	Added language for the removal of taser barbs when Taser 7 tasers are deployed.
Transcutaneous Pacing	30.180	Procedures	Updated the language about the treatment of discomfort caused by TCP.
Death and Dying	50.025	Operations	Added pediatric termination of resuscitation criteria for non-traumatic cardiac arrest.
Refusals	50.117	Operations	Changed the language to suggest, rather than require, OLMC contact for certain high-risk refusals.
Trauma System Guidelines	60.100	Trauma System	Adopted new EMSAB (formerly ATAB) Trauma System Entry Guidelines. Expanded the protocol to be more in line with Multnomah County EMS protocols.
Opioid Withdrawal: Adult Medical Treatment Guideline	90.200	Clackamas County EMS Operations	New flow chart. Removed exclusion criteria regarding no history of opioid use disorder. Removed OLMC requirement for buprenorphine administration.

2025 SUMMARY OF PROTOCOL UPDATES AND CHANGES

PROTOCOL TITLE	PAGE	SECTION	DESCRIPTION OF CHANGE
Patient Treatment Protocol Aids	100.000		Moved entire section to the Protocol Reference Manual.

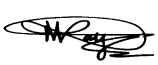
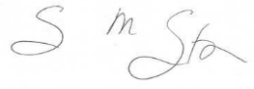
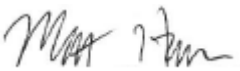
Introduction to Protocols

These patient care protocols will go into effect January 6th, 2025 for EMS providers of American Medical Response Clackamas and Washington Counties, Banks Fire District #13, Bay City Fire Department, Boardman Fire Rescue District, Clackamas Fire District #1, Central Oregon Coast Fire & Rescue, Confederated Tribes of Grand Ronde Department of Emergency Services, Colton Rural Fire Protection District #70, Cornelius Fire Department, Depoe Bay Fire District, Estacada Fire District #69, Forest Grove Fire & Rescue, Garibaldi Rural Fire District, Gaston Rural Fire District, Hillsboro Fire & Rescue, Hoodland Fire District #74, Lake Oswego Fire Department, Lincoln County Sheriff's Office, McMinnville Fire Department, Metro West Ambulance, Nehalem Bay Fire & Rescue, Nestucca Rural Fire Protection District, Netarts-Oceanside Fire District, Newport Fire Department, Rockaway Beach Volunteer Fire Department, Sandy Fire District #72, Seal Rock RFPD, Sheridan Fire District, Siletz RFPD, Southwest Polk Rural Fire Protection District, St. Paul Fire District, Tillamook Fire District, Toledo Fire Department, Tualatin Police, Tualatin Valley Fire & Rescue, and Washington County Sheriff's Office.

These protocols, we believe, are the best of their type. Where evidence has been available, the Protocol Development Committee has diligently evaluated the material and drafted protocols that will assist us in providing excellent patient care. Where evidence is lacking, we have relied on best practices, expert advice, and consensus to guide the development of the protocol or procedure. These protocols are reviewed on a regular basis and updated when necessary to reflect advances in the art and science pertaining to the care of the acutely ill and injured.

Remember that these protocols are guidelines. EMS is performed in a stressful environment with time-critical decisions and no specific patient care matrix can be developed that will cover every type of injury, illness, and complicating circumstance that EMT providers will encounter while providing on-scene care. It is our expectation that providers will use these protocols in conjunction with their training and experience to do what is best for each patient. From time to time, it is expected that circumstances will arise that are not covered within these protocols. In such instances, providers should function within their scope of practice and use all available resources (including OLMC) to provide the best possible patient care.

Thanks to everyone who has aided in protocol development and review. Anything that is complex and includes detail is prone to errors. Please review these protocols carefully and route any potential errors, unclear directions, or suggestions for improvement to your agency's EMS Office. Finally, we thank every one of you for your dedication and commitment every day to providing the best possible prehospital medical care to the citizens of our respective communities.

 Mohamud Daya, MD	 Michael Murray, MD	 Petter Overton-Harris, MD
 Ritu Sahni, MD	 Sean Stone, MD	 Matt Hansen, MD
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 George Apostolopoulos, MD	 Jesse Bohrer-Clancy, MD	 Matthew Neth, MD

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Scope of Practice

Medical Control for Medications and Procedures

• Scope of Practice (OAR Div 35. 847-035-0030)

EMERGENCY MEDICAL RESPONDER SCOPE OF PRACTICE

An Emergency Medical Responder may:

A. Conduct primary and secondary patient examinations;
B. Take and record vital signs;
C. Utilize noninvasive diagnostic devices in accordance with manufacturer's recommendation;
D. Open and maintain an airway by positioning the patient's head;
E. Provide external cardiopulmonary resuscitation and obstructed airway care for infants, children, and adults;
F. Provide care for musculoskeletal injuries;
G. Provide hemorrhage control;
H. Provide emergency moves for endangered patients;
I. Assist with prehospital childbirth;
J. Complete a clear and accurate prehospital emergency care report form on all patient contacts and provide a copy of that report to the senior emergency medical services provider with the transporting ambulance;
K. Administer medical oxygen;
L. Maintain an open airway through the use of:
    1. A nasopharyngeal airway device;
    2. An oropharyngeal airway device;
    3. A pharyngeal suctioning device;
M. Operate a bag mask ventilation device with reservoir;
N. Provide care for suspected medical emergencies, including administering liquid oral glucose for hypoglycemia;
O. Prepare and administer aspirin by mouth for suspected myocardial infarction (MI) in patients with no known history of allergy to aspirin or recent gastrointestinal bleed;
P. Prepare and administer epinephrine by automatic injection device for anaphylaxis;
Q. Administer and distribute short-acting opioid antagonist kit and distribute the necessary medical supplies to administer the short-acting opioid antagonist as provided in ORS 689.800;
R. Perform cardiac defibrillation with an automated external defibrillator; and
S. Perform other emergency tasks as requested if under the direct visual supervision of a physician and then only under the order of that physician.

• Scope of Practice (OAR Div 35. 847-035-0030)

EMERGENCY MEDICAL TECHNICIAN SCOPE OF PRACTICE

An EMT may:

A. Perform all procedures that an Emergency Medical Responder may perform;
B. Ventilate with a non-invasive manual or continuous positive pressure delivery device;
C. Insert a supraglottic airway device to facilitate ventilation through the glottic opening by displacing tissue and sealing of the laryngeal area;
D. Perform tracheobronchial tube suctioning;
E. Provide care for suspected shock;
F. Provide care for suspected medical emergencies, including:
    1. Obtain a capillary blood specimen for blood glucose monitoring;
    2. Prepare and administer epinephrine for anaphylaxis;
    3. Administer activated charcoal for poisonings; and
    4. Prepare and administer nebulized and metered dose albuterol or levalbuterol with or without ipratropium for known asthmatic and chronic obstructive pulmonary disease (COPD) patients suffering from suspected bronchospasm.
G. Transport stable patients with saline locks, heparin locks, foley catheters, or in-dwelling vascular devices;
H. Assist the on-scene Advanced EMT, EMT-Intermediate, or Paramedic by:
    1. Assembling and priming IV fluid administration sets; and
    2. Opening, assembling and uncapping preloaded medication syringes and vials;
I. Complete a clear and accurate prehospital emergency care report form on all patient contacts;
J. Assist a patient with administration of sublingual nitroglycerin tablets or spray and with metered dose inhalers that have been previously prescribed by that patient's personal physician and that are in the possession of the patient at the time the EMT is summoned to assist that patient;
K. In the event of a release of organophosphate agents, the EMT who has completed Authority-approved training may prepare and administer atropine sulfate and pralidoxime chloride by autoinjector, using protocols approved by the Authority and adopted by the supervising physician; and
L. In the event of a declared Mass Casualty Incident (MCI) as defined in the local Mass Casualty Incident plan, monitor patients who have isotonic intravenous fluids flowing
M. Administer over-the-counter medications in unit dose packaging for immediate use under specific written protocols authorized by the supervising physician or direct orders from a licensed physician.
N. Acquire and transmit cardiac monitoring and electrocardiogram (ECG).
O. Prepare and administer immunizations in the event of an outbreak or epidemic as declared by the Governor of the state of Oregon, the State Public Health Officer, or a county health officer, as part of an emergency immunization program, under the agency's supervising physician's standing order. Prior to vaccine administration, the EMT must be trained by the supervising physician or their designee. The EMT and the EMS agency or employer much maintain records or training;

P. Prepare and administer immunizations for seasonal and pandemic influenza vaccinations according to the CDC Advisory Committee on Immunization Practices (ACIP), and/or the Oregon State Public Health Officer's recommended immunization guidelines as directed by the agency's supervising physician's standing order. Prior to vaccine administration, the EMT must be trained by the supervising physician or their designee. The EMT and the EMS agency or employer much maintain records or training.

• Scope of Practice (OAR Div 35. 847-035-0030)

ADVANCED EMERGENCY MEDICAL TECHNICIAN SCOPE OF PRACTICE

Advanced Emergency Medical Technician (AEMT) may:

A. Perform all procedures that an EMT may perform;
B. Initiate and maintain peripheral intravenous (I.V.) lines;
C. Initiate saline or similar locks;
D. Obtain peripheral venous blood specimens;
E. Initiate and maintain an intraosseous infusion; and
F. Prepare and administer the following medications under specific written protocols authorized by the supervising physician or direct orders from a licensed physician:
    1. Analgesics for acute pain: nitrous oxide.
    2. Anaphylaxis: epinephrine;
    3. Hypoglycemia reversal agents:
        a. Hypertonic dextrose;
        b. Glucagon;
    4. Intraosseous infusion anesthetic: Lidocaine;
    5. Bronchodilators:
        a. Albuterol or levalbuterol;
        b. Ipratropium bromide;
    6. Vasodilators: nitroglycerin;
    7. Isotonic crystalloid solutions.
G. Distribute medications at the direction of the Oregon State Public Health Officer as a component of a mass distribution effort. The AEMT must be trained by the supervising physician or their designee. The AEMT and EMS agency or employer must maintain records of the training; and
H. Prepare and administer routine or emergency immunization and tuberculosis skin testing, as part of an EMS Agency's occupational health program, to the AEMT's EMS agency personnel, under the supervising physician's standing order. Prior to administration, the AEMT must be trained by the supervising physician or their designee. The AEMT and the EMS agency or employer must maintain records of training.

• Scope of Practice (OAR Div 35. 847-035-0030)

EMERGENCY MEDICAL TECHNICIAN – INTERMEDIATE SCOPE OF PRACTICE

An EMT-Intermediate may:

A. Perform all procedures that an Advanced EMT may perform;
B. Prepare and administer the following medications under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician:
    1. Vasoactive medications:
        a. Epinephrine;
        b. Vasopressin;
    2. Antiarrhythmics:
        a. Atropine sulfate;
        b. Lidocaine;
        c. Amiodarone;
    3. Analgesics for acute pain:
        a. Morphine;
        b. Ketorolac tromethamine;
        c. Fentanyl;
    4. Antihistamine: Diphenhydramine;
    5. Diuretic: Furosemide;
    6. Anti-Emetic: Ondansetron.
C. Insert an orogastric tube;
D. Maintain during transport any intravenous medication infusions or other procedures which were initiated in a medical facility, if clear and understandable written and verbal instructions for such maintenance have been provided by the physician, nurse practitioner or physician assistant at the sending medical facility;
E. Perform electrocardiographic rhythm interpretation; and
F. Perform cardiac defibrillation with a manual defibrillator.
G. Administer benzodiazepines for seizures or agitation. Prior to administration of benzodiazepines, the EMT-I must be trained by the supervising physician or their designee. The EMT-I and the EMS agency or employer must maintain records of training.

• Scope of Practice (OAR Div 35. 847-035-0030)

PARAMEDIC SCOPE OF PRACTICE

A Paramedic may:

A. Perform all procedures that an EMT-Intermediate may perform;
B. Initiate and maintain mechanical ventilation during transport if formally trained on the particular equipment and if acting under written protocols specific to the particular equipment.
C. Initiate the following airway management techniques:
    1. Endotracheal intubation;
    2. Cricothyrotomy; and
    3. Transtracheal jet insufflation which may be used when no other mechanism is available for establishing an airway;
D. Initiate a nasogastric tube;
E. Provide advanced life support in the resuscitation of patients in cardiac arrest;
F. Perform emergency cardioversion in the compromised patient;
G. Transcutaneous pacing of bradycardia that is causing hemodynamic compromise;
H. Initiate needle thoracostomy for tension pneumothorax;
I. Obtain peripheral arterial blood specimens under specific written protocols authorized by the supervising physician;
J. Access indwelling catheters and implanted central IV ports for fluid and medication administration;
K. Initiate and maintain urinary catheters under specific written protocols authorized by the supervising physician or under direct orders from a licensed physician; and
L. Prepare and initiate or administer any medications or blood products under specific written protocols authorized by the supervising physician or under direct orders from a licensed physician
M. Interpret electrocardiogram (ECG).

Medical Control for Medications & Procedures – 00.040

The following drugs and procedures are considered **CATEGORY A** and will be used at the EMT clinician's discretion in accordance with these EMS Treatment Protocols.

Drugs – Category A:

- Acetaminophen
- Activated Charcoal (aspirin or acetaminophen < 2 hrs post ingestion)
- Adenosine (Adenocard®)
- Albuterol (Ventolin®)
- Amiodarone (Cordarone®)
- Aspirin
- Atropine Sulfate
- Buprenorphine (Suboxone®)
- Calcium Gluconate
- Dexamethasone (Decadron®)
- Dextrose
- Diltiazem
- Diphenhydramine (Benadryl®)
- Dopamine (Intropin®)
- Droperidol (Inapsine®)
- DuoNeb (albuterol and ipratropium)
- Epinephrine
- Esmolol
- Etomidate (Amidate®)
- Fentanyl (Sublimaze®)
- Furosemide (Lasix®)
- Glucagon
- Glucose, Oral
- Haloperidol (Haldol®)
- Hydromorphone (Dilaudid®)
- Hydroxocobalamin (Cyanokit®)
- IV solutions
- Ibuprofen
- Ipratropium Bromide (Atrovent®)
- Ketamine Hydrochloride
- Ketorolac Tromethamine (Toradol®)
- Labetalol
- Lidocaine
- Lorazepam (Ativan®)
- Magnesium Sulfate (wide complex irregular tachycardia/torsades and adult asthma)
- Midazolam (Versed®)
- Morphine Sulfate
- Naloxone (Narcan®)
- Nitroglycerin
- Norepinephrine (Levophed®)
- Olanzapine (Zyprexa®)

Medical Control for Medications & Procedures – 00.040

Drugs – Category A (continued):

- Ondansetron (Zofran®)
- Oxygen
- Oxymetazoline Hydrochloride (Afrin®)
- Oxytocin (Pitocin®)
- Pralidoxime (Protopam® / 2-PAM®)
- Proparacaine (Alcaine®)
- Rocuronium (Zemuron®)
- Sodium Bicarbonate
- Succinylcholine
- Tranexamic Acid (TXA)
- Vecuronium (Norcuron®)
- Ziprasidone (Geodon®)

Procedures – Category A:

- Defibrillation in cardiac arrest (to include DSED)
- Drug Assisted Airway Management (DAAM)
- End-tidal CO_2 monitoring
- Endotracheal intubation
- Emergency cricothyrotomy
    - Needle cricothyrotomy
    - Per-Trach
    - Quick-Trach® (type device)
    - Surgical cricothyrotomy
- i-gel® Supraglottic Airway Device
- Induced hypothermia
- Intranasal medication administration
- Intraosseous access & infusion
- Intravenous access & infusion
- King LT-D/LTS-D Airway Device
- Left Ventricular Assist Device (LVAD) management
- Modified Valsalva Maneuver
- Non-invasive positive pressure ventilation
- Orogastric tube insertion and maintenance
- Patellar dislocation reduction
- Physical patient restraint
- PICC line access
- Pelvic immobilization with sling/wrap
- Pharmacological sedation of the agitated patient
- Positive end-expiratory pressure (PEEP)
- Sports equipment removal
- Suctioning
- Synchronized cardioversion
    - Unstable V-Tach, OR
    - SVT, unstable patient
- Taser barb removal
- Tension pneumothorax decompression

Medical Control for Medications & Procedures – 00.040

Procedures – Category A (continued):

- Tourniquet placement
- Transcutaneous pacing
- Ventilator management
- XSTAT

The following drugs and procedures are considered **CATEGORY B** and require On-line Medical Consult authorization. Confirmation of dosage or procedure will be obtained directly from a physician on duty at OLMC.

Drugs – Category B:

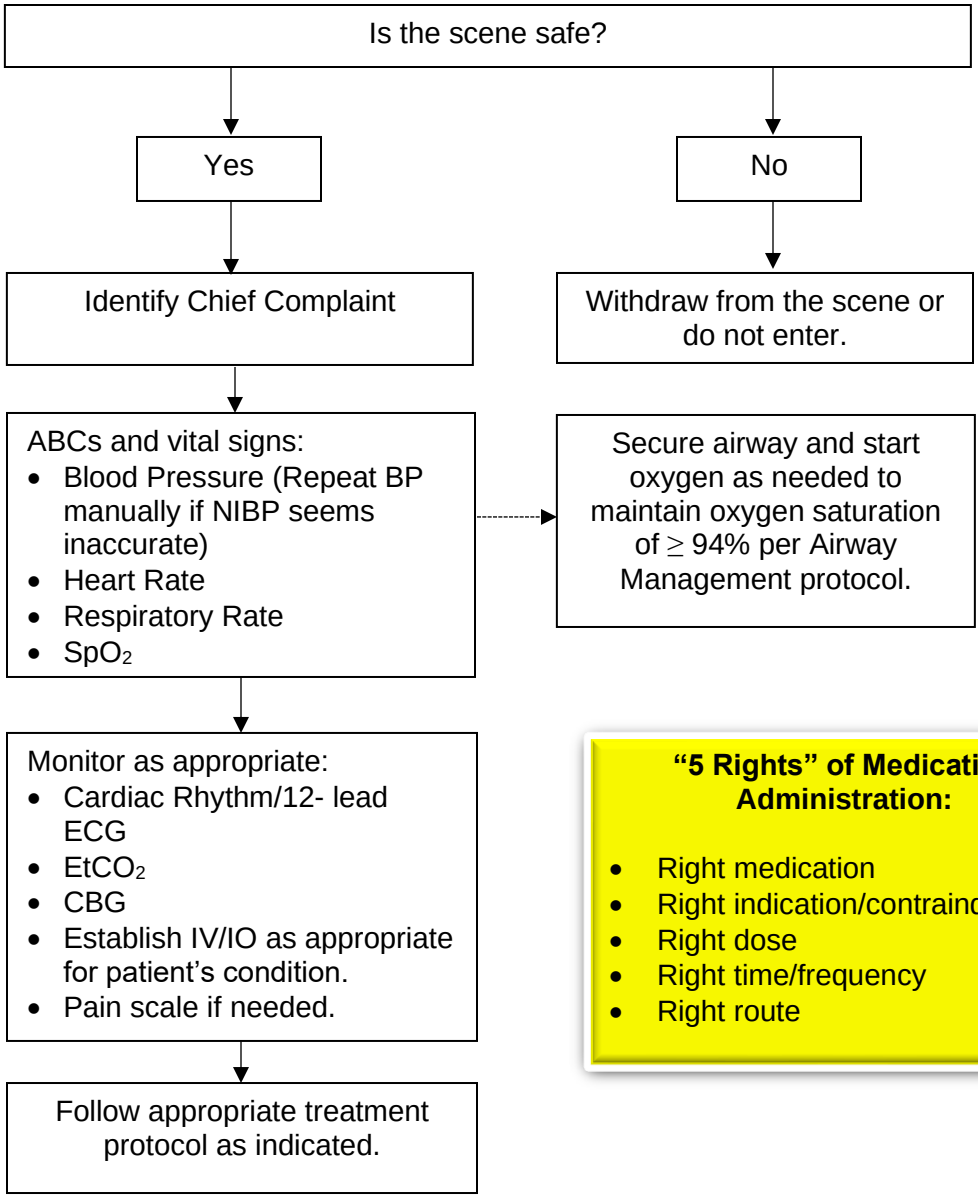
- Activated Charcoal (aspirin or acetaminophen > 2 hours post ingestion and all other poisons)
- Droperidol in patients ≤ 12
- Hydroxocobalamin (CYANOKIT®), repeat doses in pediatric patients
- Magnesium Sulfate (pediatric asthma **OR** seizures in eclampsia/pre-eclampsia)
- Ondansetron in patients < 6 months, except for children in spinal motion restriction or children receiving chemotherapy.
- Pralidoxime (2-Pam®), for IV use
- Sodium Bicarbonate for pediatric hyperkalemia and crush injuries
- Sodium Thiosulfate 25%

Procedures – Category B:

- Automatic Implantable Cardio-Defibrillator (AICD) deactivation with magnet.

Treatment

Universal Patient Care – 10.005



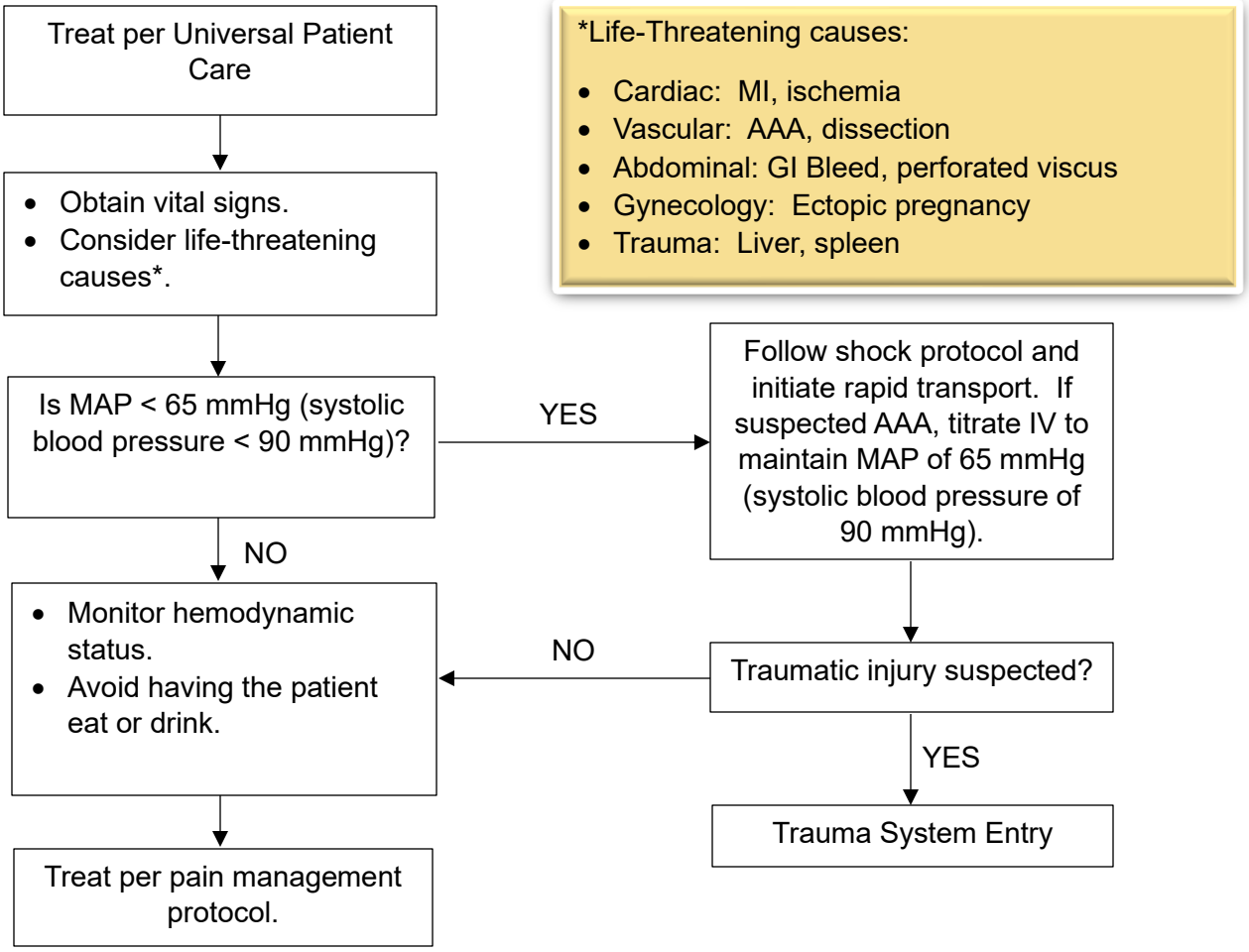
"5 Rights" of Medication Administration:

- Right medication
- Right indication/contraindication
- Right dose
- Right time/frequency
- Right route

NOTES & PRECAUTIONS

- If patient is unable to provide medical history, check for medical bracelets and necklaces, which can provide critical medical information and treatment.
- If any uncertainty exists about the gender of a patient, ask for and use preferred pronouns. In certain conditions such as abdominal pain, you may also need to ask about the menstrual history (e.g., female to male transgender). When obtaining a 12-lead ECG, use the sex assigned at birth for computerized interpretations.

Abdominal Pain – 10.010



NOTES & PRECAUTIONS:

- Abdominal pain may be the first sign of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscus, etc.).
- Monitor the patient closely for signs of shock.
- For transgender and non-binary patients, ask about the presence of intact reproductive organs and consider gynecological (i.e., pregnancy issues) or urological (i.e., testicular torsion) related complications in your differential diagnosis.

PEDIATRIC PATIENTS:

- Consider non-accidental trauma.
- Closely monitor vital signs; blood pressure may drop quickly.
- If systolic BP is inappropriate for age, treat per Shock protocol.

Lowest normal pediatric systolic blood pressure by age:

- Less than one month: > 60 mmHg.
- One month to 1 year: > 70 mmHg.
- Greater than 1 year: 70 + 2 x age in years.

Agitated Patient – 10.015

Treat per Universal Patient Care and determine threat assessment utilizing Broset Violence Assessment Checklist and Richmond Agitation Sedation Scale. **PROVIDER SAFETY IS TOP PRIORITY**

Broset 0-2 (low to moderate risk)

Preventative measures <u>recommended</u> (e.g., verbal de-escalation, appropriate physical restraint). Determine RASS.

Broset 3+ (high risk)

Preventative measures <u>required</u> (e.g., verbal de-escalation, appropriate level of physical restraint). Determine RASS.

Suspected etiology

- Head injury, other trauma
- Hypoxia
- Hypoglycemia
- Substance use
- Mental health

Treat as appropriate.

Use minimal level of physical restraint required to accomplish patient care and ensure safe transportation.

If combativeness is preventing treatment, consult Pharmacological Sedation Flow chart.

For pediatric and geriatric patients, refer to specific pediatric and geriatric section.

<u>Broset:</u> 1 point for each seen or witnessed in past 24 hours:

- Confusion
- Irritability
- Boisterousness
- Verbal threats
- Physical threats
- Attacks on objects

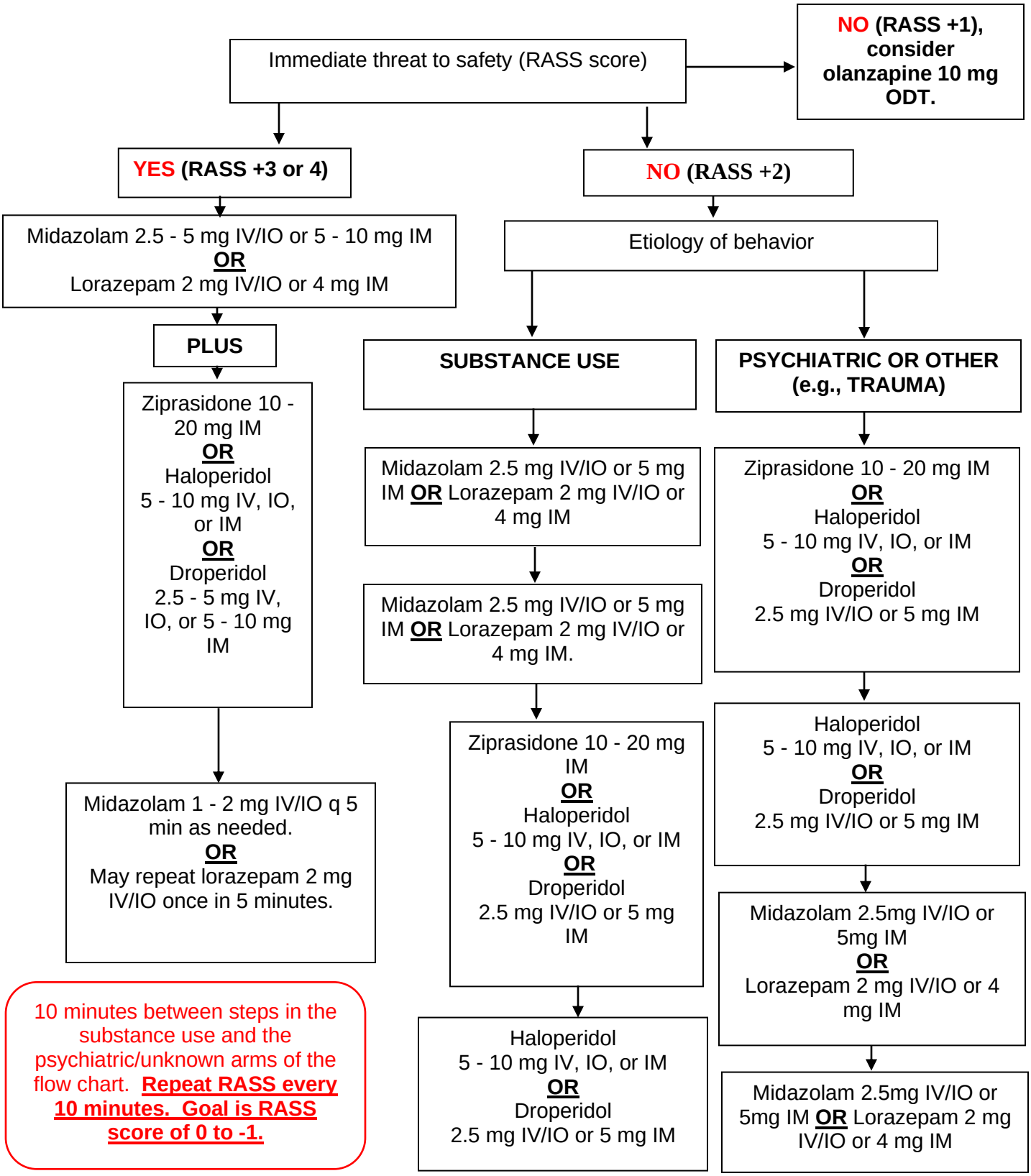
- Physical restraints should not be placed in such a way to preclude evaluation and treatment.
- Place patient supine, **NEVER PRONE.**
- Secure all extremities, typically legs first.
- Evaluate respiratory and cardiac status continually.
- **DO NOT** tighten chest straps.

- Continue to monitor cardiac rhythm, QTc interval and SpO_2.
- Continue to evaluate perfusion in extremities with restraints.

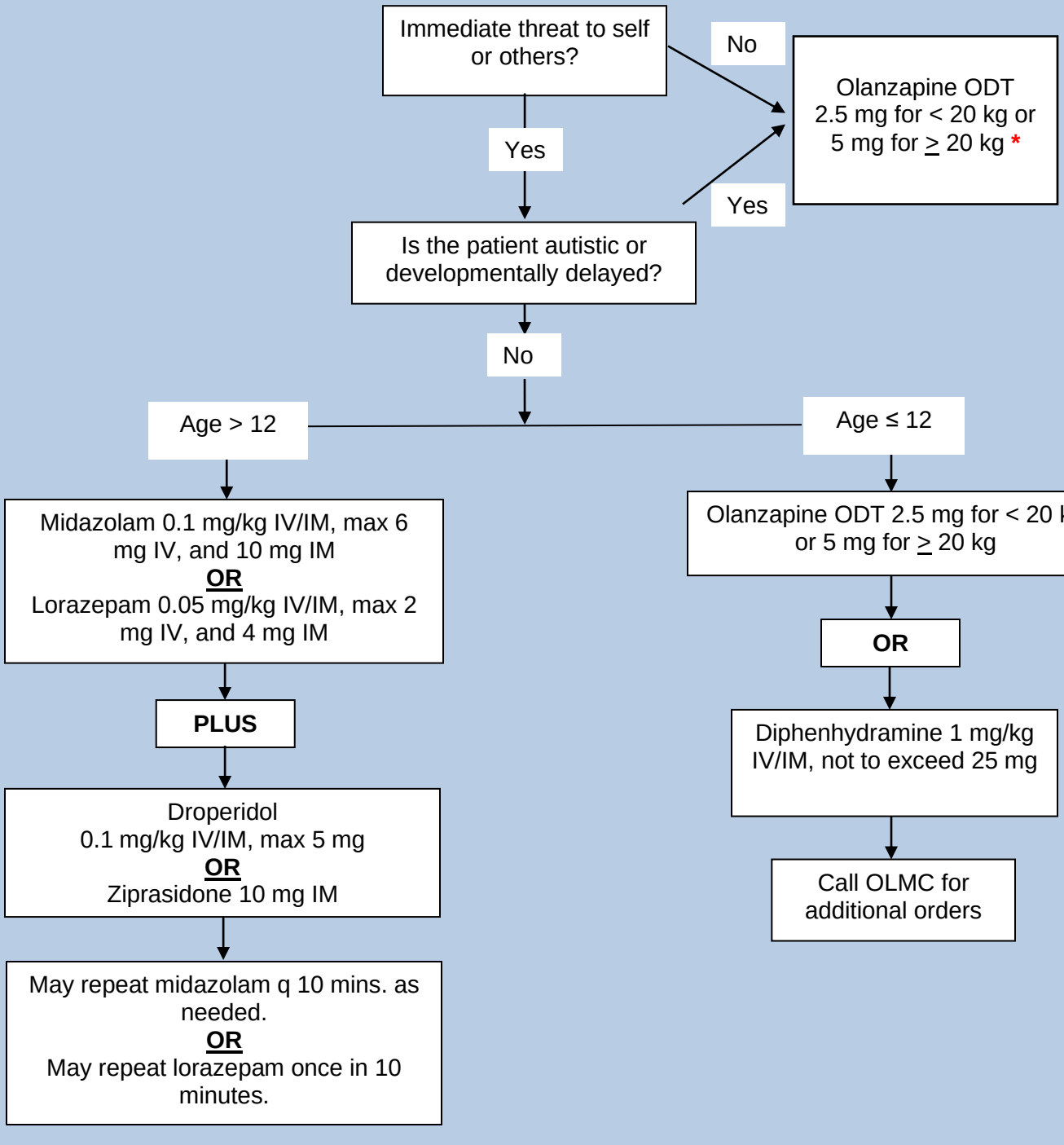
<u>Richmond Agitation Sedation Scale (RASS)</u>

Score	Term	Description
+4	Combative	Overtly combative and violent; immediate danger to EMS
+3	Very agitated	Aggressive; verbally and physically uncooperative towards EMS
+2	Agitated	Frequent non-purposeful movement; agitated when touched or moved
+1	Restless	Anxious but movements not aggressive or dangerous to EMS or self
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening (eye opening/eye contact) to voice (≥ 10 seconds)
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds)
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact)
-4	Deep sedation	No response to voice but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Adult Pharmacological Sedation Flow Chart



Pediatric Pharmacological Sedation Flow Chart



*For children with a history of autism or developmental delays, chances of paradoxical reactions to benzodiazepines and diphenhydramine are higher, however, if the patient is still agitated following olanzapine administration, diphenhydramine 1 mg/kg IV/IM not to exceed 25 mg may be used with this in mind.

Agitated Patient – 10.015

PEDIATRIC PATIENTS:

- Haloperidol should be avoided in children.
- Non-pharmacological considerations:
  - ✓ Clearly introduce yourself, assure patient that you are there to keep them safe.
  - ✓ Allow caregivers to take part (or remove them if they are inciting).
  - ✓ Set firm limits.
  - ✓ Minimize excessive interactions.
  - ✓ Offer choices in treatment.
  - ✓ Offer reward for calmer behavior.
  - ✓ Use distraction.

GERIATRIC PATIENTS (AGE > 65):

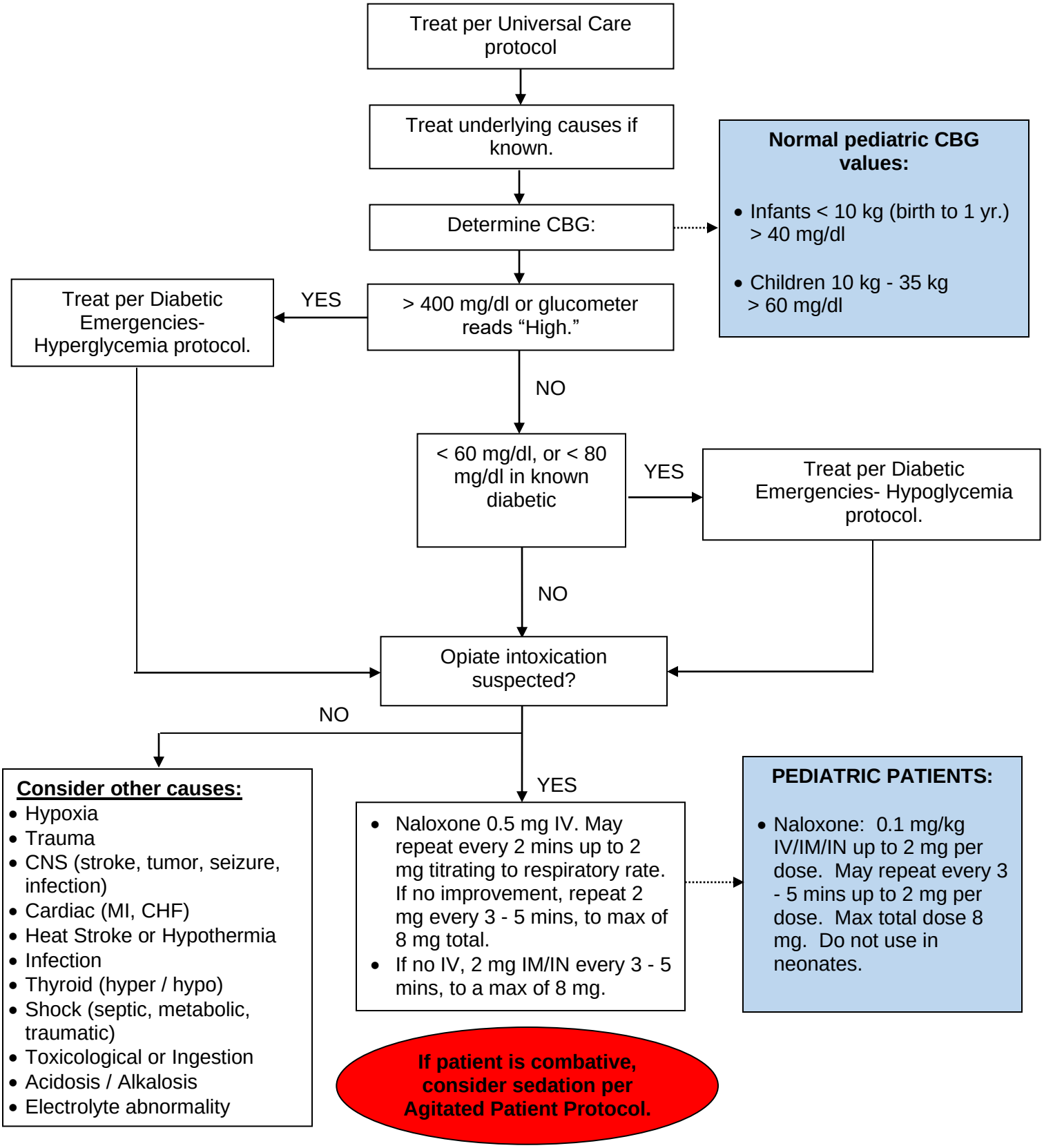
There is an increased risk of using anti-psychotic drugs for patients > 65 years of age, so drug dosing should be adjusted accordingly:

- Droperidol: 2.5 mg IV, IO. May repeat in 5 - 10 minutes. 2.5 – 5 mg IM. May repeat in 10 - 15 minutes.
- Haloperidol: 2 mg IV, IO. May repeat in 15 minutes. 2.5 mg IM. May repeat in 15 - 20 minutes.
- Olanzapine: 2.5 – 5 mg ODT.
- Ziprasidone: 10 mg IM.

NOTES & PRECAUTIONS:

- All patients who receive IV, IO, or IM pharmacological sedation must be fully monitored, when possible, with cardiac monitor, SpO_2, and $EtCO_2$.
- Side effects of droperidol, haloperidol, and ziprasidone may include hypotension, tachycardia, and acute dystonic reactions. If patient shows signs of acute dystonic reaction after receiving ziprasidone, droperidol, or haloperidol, give diphenhydramine 1 mg/kg IV or IM to a maximum of 50 mg.
- Droperidol, haloperidol, and ziprasidone may induce Torsades de Pointes in patients with history of prolonged QTc or patients taking QTc-prolonging drugs. Monitor patient's ECG, if possible. If prolonged QTc is present (> 500 msec.), administer 2 grams magnesium sulfate IV/IO.
- Droperidol, haloperidol, or ziprasidone are preferred for patients with known psychiatric disorders. Midazolam or lorazepam are preferred for patients who are known or suspected to be under the influence of stimulants or other intoxicants, who are in withdrawal, or who are postictal.
- If patient has Parkinson's Disease or takes dopamine agonist medications such as carbidopa-levodopa (Sinemet), pramipexole (Mirapex), or ropinirole (Requip), **do not use** droperidol or haloperidol. In these patients, use olanzapine first (2.5 - 5.0 mg ODT), then midazolam (5 mg IM or 2.5 mg IV/IO) or lorazepam (2 mg IV/IO or 4 mg IM) if needed.

Altered Mental Status & Coma – 10.020



Anaphylaxis and Allergic Reaction – 10.030

*Preferred location for IM administration is the mid-anterolateral aspect of thigh.

Treat per Universal Patient Care

Remove exposure to trigger if known (e.g. stinger, medication).

**Common side effects of epinephrine include anxiety, tremors, palpitations, tachycardia, and headache.

MILD (e.g., skin signs only)

Diphenhydramine 1 mg/kg IV/IM to a maximum of 50 mg.*

Consider dexamethasone 10 mg IV/IM/PO.

If patient's symptoms worsen, treat per appropriate algorithm branch.

MODERATE (e.g., advancing hives, respiratory distress)

- Epinephrine 1:1,000 0.3 - 0.5 mg IM. May repeat once in 5 - 15 minutes if needed. **
- Albuterol 2.5 mg via nebulizer.

Consider:

- Diphenhydramine 1 mg/kg IV/IM to a maximum of 50 mg.
- Dexamethasone 10 mg IV/IM/PO.

SEVERE (e.g., cardiovascular collapse, profound shock)

- Epinephrine 1:1,000 0.3 - 0.5 mg IM. Repeat once in 5 - 15 minutes if patient is still in extremis.
  Or, if IV established,
- Epinephrine 1:10,000, 0.1 mg boluses IV/IO every 5 minutes titrated to effect. Max dose 0.5 mg.
  OR
  Epinephrine infusion IV at 2 mcg/min (2 mcg/ml) titrated to effect.
- Treat with fluid challenge 500 – 1,000 ml. Repeat once if needed.

If time permits, consider:

- Albuterol 2.5 mg via nebulizer.
- Diphenhydramine 1 mg/kg IV/IM to a maximum of 50 mg.
- Dexamethasone 10 mg IV/IO/IM.

Consider OLMC contact.

PEDIATRIC PATIENTS (Treat with the following drug doses):

- **Albuterol:** 2.5 mg via nebulizer
- **Diphenhydramine:** 1 mg/kg IV/IM, max 50 mg
- **Dexamethasone:** 0.6 mg/kg IV/IO/IM/PO, max 10 mg
- **Epinephrine 1:1000:** 0.01 mg/kg IM to a max 0.5 mg. May repeat once in 5 - 15 minutes if needed.
- **Epinephrine 1:10,000:** 0.01 mg/kg IV/IO to max 0.1 mg, every 3 - 5 mins titrated to effect, max total dose 0.5 mg.
- **Epinephrine infusion:** 0.01 mcg/kg/min (2 mcg/ml) titrated to effect.
- **IV fluid Challenge**: 20 ml/kg. Repeat once if needed.

Lowest normal pediatric systolic BP by age:

- Less than one month: > 60 mmHg.
- One month to 1 year: > 70 mmHg.
- Greater than 1 year: 70 + 2 x age in years.

If epinephrine is ineffective in treating anaphylaxis in patients with beta-blockade, 1 mg IV/IM glucagon and isotonic volume expansion (up to several liters of crystalloid) may be necessary.

Brief Resolved Unexplained Event (BRUE) – 10.035

DEFINITION:

Event lasting <1 minute in an infant <1 year of age associated with at least one of the following:

- Cyanosis or pallor
- Absent, decreased, or irregular breathing
- Marked change in muscle tone (hypertonia or hypotonia)
- Altered level of responsiveness

Patient must appear well and be at baseline health.

↓

Follow appropriate airway and/or respiratory protocols.

↓

Obtain and document any complications of pregnancy, birth date and gestational age at birth, fever or recent infection, prior BRUE episodes, and underlying medical conditions.

↓

Obtain and document description of event including symptoms, inciting event, and any resuscitation attempts before EMS arrival.

↓

Obtain vital signs, CBG, and place on cardiac monitor and follow dysrhythmia protocol as needed.

↓

Transport to an emergency department **even** if the infant currently appears in no distress.

↓

Contact OLMC if parents or caregivers cannot be convinced to take the ambulance to the ED for evaluation.

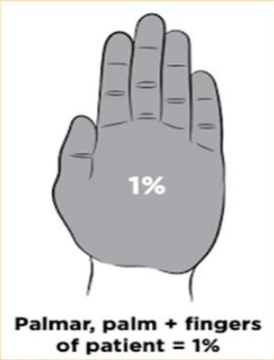
NOTES & PRECAUTIONS:

- BRUE is a group of symptoms, not a specific disease. BRUEs are most common in infants under one year of age but may occur up to two years of age.
- Many infants appear normal by the time EMS arrives.
- Consider non-accidental trauma.
- Serious underlying causes of BRUE can include pneumonia, bronchiolitis, seizures, sepsis, intracranial hemorrhage, and meningitis.
- BRUEs are more frequent in premature infants and infants with other health conditions such as cystic fibrosis, bronchiolitis, and congenital heart disease.

Burns – 10.040

Total Burn Surface Area (TBSA) only includes second and third degree burns and not superficial burns.

Determine TBSA utilizing the "Palm Method":



In patients with moderate to severe flame burns and with suspicion for inhalation injury, **carboxyhemoglobin levels should be checked***, and patients should be placed on high flow oxygen until carbon monoxide poisoning is ruled out.

Burn Center Transport Criteria:

- Partial thickness > 10% TBSA
- Full Thickness
- Burns with significant inhalation injuries
- Chemical burns
- Electrical or lightning strike injuries
- Burns to face, hands, feet, genitalia, perineum, major joints, or circumferential burns
- Burns to high-risk patients (peds, elderly, significant underlying cardiac or respiratory problems)
- Trauma system patients with burns meeting above criteria

Treat per Universal Patient Care

Remove jewelry or other constricting items and clothing that is smoldering or non-adherent to the patient. **Determine TBSA%**

- If MAP < 65 mmHg (systolic BP < 90 mmHg), follow Shock protocol, otherwise follow initial fluid administration rate:
  - ✓ ≤ 5 y/o @ 125 ml/hr
  - ✓ 6 -13 years of age @ 250 ml/hr
  - ✓ ≥ 14 y/o @ 500 ml/hr

Cool burned areas < 5 mins. Cover with clean, warm, and dry sheet or blanket, discontinue if shivering. Leave unbroken blisters intact.

Wound Care:

- Transport using clean, dry sheets or blankets.
- Do not wrap extremities individually.
- Do not use products such as Silvadene or burn gel.
- Do not pack burns with wet towels or do saline soaks.

Maintain patient's core body temperature.

Treat pain per Pain Management protocol

Chemical Burns:

- Consider HazMat Response.
- Protect yourself from contamination.
- Flush contaminated areas with copious amounts of water (carefully brush off first if chemical is dry).
- Do not use a neutralizer.

Electrical Burns:

- Apply Sterile dressings to entry and exit wounds.
- Treat any dysrhythmias.
- Early fluid infusion is important due to risk of rhabdomyolysis.
- Specify arc flash or contact and voltage if known.

If **cyanide toxicity** is suspected based on findings (*soot in mouth, nose, or oropharynx)* and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:

- Hydroxocobalamin 5 g IV/IO over 15 mins. Repeat once if needed. For cardiac arrest, administer as a rapid bolus. (**Peds**: 70 mg/kg not to exceed adult dose. Call OLMC for second dose)
- If hydroxocobalamin not available, Sodium Thiosulfate 50 ml of a 25% solution over 10 – 20 minutes. Do not administer Sodium Thiosulfate and Hydroxocobalamin together.
- Initiate emergent transport and treat other presenting symptoms.
- Notify receiving facility if either Hydroxocobalamin or Sodium Thiosulfate is administered due to changes in urine and blood color.

AIRWAY CONSIDERATIONS:

- Singed nasal hairs and facial burns alone are not indications for intubation.
- Mild inhalation injuries with normal SpO_2 and no signs of respiratory distress can be safely observed.
- Indications for early intubation:
  - ✓ Respiratory distress, stridor, accessor muscle use
  - ✓ New onset hoarseness
  - ✓ Blisters or edema of oropharynx
  - ✓ Deep burns to lower face or neck

PEDIATRICS:

- Consider non-accidental causes of trauma in children.
- If systolic BP is inappropriate for age, treat per Shock protocol.

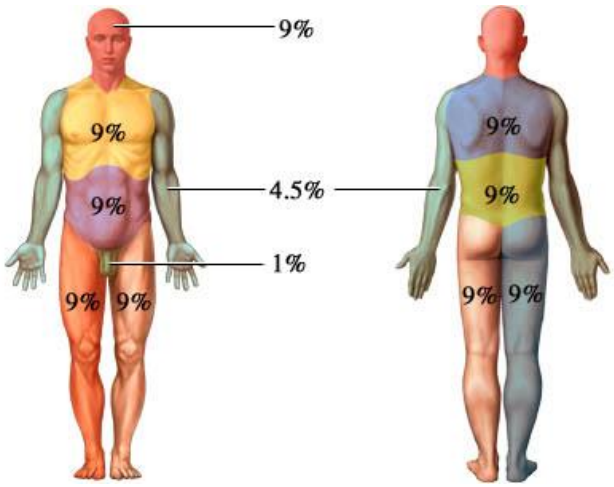
Lowest normal pediatric systolic blood pressure by age:

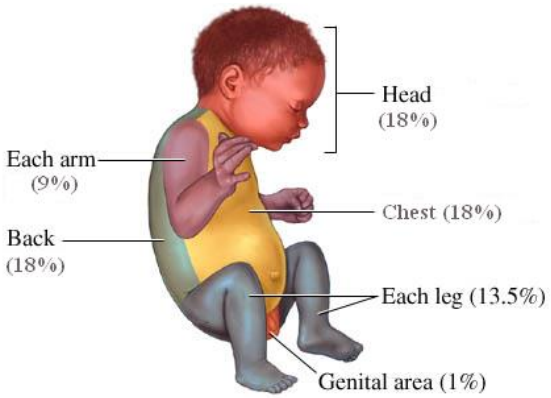
- Less than one month: > 60 mmHg.
- One month to 1 year: > 70 mmHg.
- Greater than 1 year: 70 + 2 x age in years.

NOTES & PRECAUTIONS:

- *Apply carbon monoxide monitor (e.g., Rad-57) if available.
- Remove rings or other constricting items immediately.
- Be prepared to use RSI/DSI early to control the airway.
- For firefighters, consider potential for traumatic injury or MI.

RULE OF NINES





Cardiac Arrest (AED/CPR) – 10.050

CPR GUIDELINES			
Component	Adults and Adolescents	Child 1 year to puberty	Infant under 1 year, excluding neonates
Airway	Head tilt-chin lift. Jaw thrust if suspected cervical trauma.		
Breathing: Without CPR	10 to 12 breaths/min (approximate)	1 breath every 2 - 3 seconds (20 -30 breaths/min) (approximate)	
Breathing: CPR with advanced airway	1 breath every 6 secs. (10 breaths/min) asynchronous with compressions. About 1 second per breath. Visible chest rise. Optional method 30:2 comp./vent. ratio with advanced airway until ROSC.	1 breath every 2 - 3 seconds (approximately 20 - 30 breaths/min) asynchronous with compressions. About 1 second per breath. Visible chest rise. Optional method, 15:2 compression/ventilation ratio with advanced airway until ROSC.	
Foreign Body – Conscious patient	Abdominal thrusts (*use chest thrusts in pregnant and obese patients or if abdominal thrusts are not effective*)		Back blows and chest thrusts
Compression landmarks	Lower half of sternum between nipples		Just below nipple line (lower half of sternum)
Hand Placement	Heel of one hand, other hand on top	As for adults (may use both hands or the heel of one hand depending on the size of patient and rescuer)	2 thumb-encircling hands preferred for two rescuers
Compression depth	At least 2 inches	Approximately one-third anterior/posterior depth of chest. (Approximately 2” in child and 1 ½” in infant)	
Compression rate	100 - 120 per minute		
Compression/Ventilation ratio w/o advanced airway	30:2 **or** 10:1 with continuous compressions	15:2	
AED GUIDELINES			
AED Defibrillation	Use Adult pads	Use pediatric dose-attenuator system for children and infants if available. Use pediatric pads. If unavailable, use adult pads	
NEONATAL GUIDELINES (LESS THAN 1 DAY OLD)			
Assisted ventilations should be delivered at a rate of 40 - 60 breaths/minute to achieve or maintain a heart rate > 100 bpm. The ratio of compressions to ventilations should 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.			

Cardiac Arrest- Guidelines – 10.050

COMPRESSIONS AND VENTILATIONS

- Use a pit crew approach to assign responders to positions.
- Initiate and maintain high quality chest compressions with limited interruptions (< 10 secs).
- CPR should be provided at a rate of 30:2 or continuous compressions with interposed ventilations every 6 seconds throughout resuscitation until ROSC is achieved or termination of resuscitation.
- There should be no interruptions to CPR when securing an airway. Consider early use of a supraglottic airway to minimize CPR interruptions or when ALS resources are limited.
- If mechanical CPR device is available, avoid extra or prolonged pauses in CPR when applying.

VASCULAR ACCESS

- Preferred order of vascular access in adults is:
  1. Upper extremity IV (or external jugular)
  2. Upper extremity IO
  3. Lower extremity IO
- Preferred access site for pediatrics is the proximal tibia or the distal femur. Humeral IO **not** recommended for infants and toddlers.
- Medications should be administered IV if multiple means of vascular access are established.

ROSC

If patient has return of spontaneous circulation, reassess vital signs to ensure stability before packaging for transport. Follow Cardiac Arrest Post-Resuscitation protocol to include targeted temperature management, obtaining a 12-lead ECG (ideally > 8 mins post ROSC), and managing blood pressure.

TRANSPORT

- In general, continue resuscitation for a minimum of 30 minutes.
- If persistent/refractory VF/pVT, consider early transport, especially if mechanical CPR is available.

EPINEPHRINE ADMINISTRATION

- For patients in a non-shockable rhythm, epinephrine should be administered as soon as feasible, ideally within 5 minutes of EMS arrival to patient side.
- For shockable rhythms, administer epinephrine as soon as feasible after the second defibrillation attempt has failed.

CPR INDUCED CONSCIOUSNESS

- With high quality CPR and the addition of mechanical CPR devices, a growing number of patients have been reported to experience “CPR Induced Consciousness”. Assess for signs of consciousness by checking for spontaneous eye opening, purposeful movement, or verbal response including moaning.
- If signs of CPR Induced Consciousness are present, treat as follows (repeat vital signs between medications):
  1. 50 mcg of fentanyl IV/IO, then
  2. 2.5 mg of midazolam IV/IO OR 1 mg lorazepam IV/IO
  3. May repeat as needed every 5 - 10 minutes. Max total dose for lorazepam is 4 mg.

TERMINATION OF RESUSCITATION

- For patients in whom the asystole protocol has been used throughout the resuscitation, refer to Death and Dying protocol for guidelines regarding termination of resuscitation prior to 30 minutes without OLMC contact.
- Survival from PEA is based on identifying and correcting the responsible factors; consider a broad differential diagnosis, with early and aggressive treatment of possible reversible causes.
- Death in the field for PEA may be determined with $EtCO_2 \leq 10$ after 30 minutes of attempted ACLS resuscitation. For patients with $EtCO_2 > 10$ continue resuscitation and contact OLMC to stop resuscitation.

Cardiac Arrest- Pulseless Arrest – 10.050

Start or continue CPR until monitor and defibrillator pads are attached. Initial pad placement should be A/P if feasible.

→ Analyze heart rhythm.

→ Shockable Rhythm?

Yes

VF/pVT*

- Shock then CPR X 2 mins.
- Establish vascular access
- Shock then CPR X 2 mins.
- Epinephrine 1 mg IV/IO
- Shock then CPR X 2 mins.
- Amiodarone 300 mg IV/IO **or** Lidocaine 1.5 mg/kg IV/IO
- Shock then CPR X 2 mins. *
- Epinephrine 1 mg IV/IO
- Shock then CPR X 2 mins. *
- Repeat same antidysrhythmic: Amiodarone 150 mg **or** Lidocaine 1.5 mg/kg.
- Shock then CPR X 2 mins. *
- Epinephrine 1 mg IV/IO **(Repeat every 3-5 mins)**
- Shock then CPR X 2 mins. *
- Esmolol 0.5 mg/kg IV/IO. Repeat once in 5 mins.

No

Asystole/PEA*

- Continue CPR, Start IV/IO
- Epinephrine 1 mg IV/IO **(Repeat every 3-5 mins)**
- Recheck rhythm every 2 mins.

For PEA, administer up to 2000 ml of a crystalloid solution. **Consider reversable causes for PEA and asystole.**

***If heart rhythm changes, move to appropriate arm of the algorithm.**

Calcium Gluconate and Sodium Bicarbonate

- If cause of arrest is suspected to be hyperkalemia, consider calcium gluconate 3 grams IV/IO push.
- Sodium Bicarbonate is not recommended for the routine cardiac arrest, but early use should be considered with suspected sodium channel blocker OD, suspected hyperkalemia, or pre-existing acidosis. Dose is 1 mEq/kg IV/IO. May repeat 0.5 mEq/kg every 10 mins.

Reversable Causes (H's & T's)

- Hypoxia
- Hypo/Hyperkalemia
- Hypo/Hyperthermia
- Hypovolemia
- Tension Pneumothorax
- Tamponade
- Thrombosis
- Toxins

Defibrillations

Analyze every 2 mins and shock if appropriate. * Following third unsuccessful shock, deliver double sequential external defibrillation (DSED) shocks. If second monitor unavailable, change pad vector.

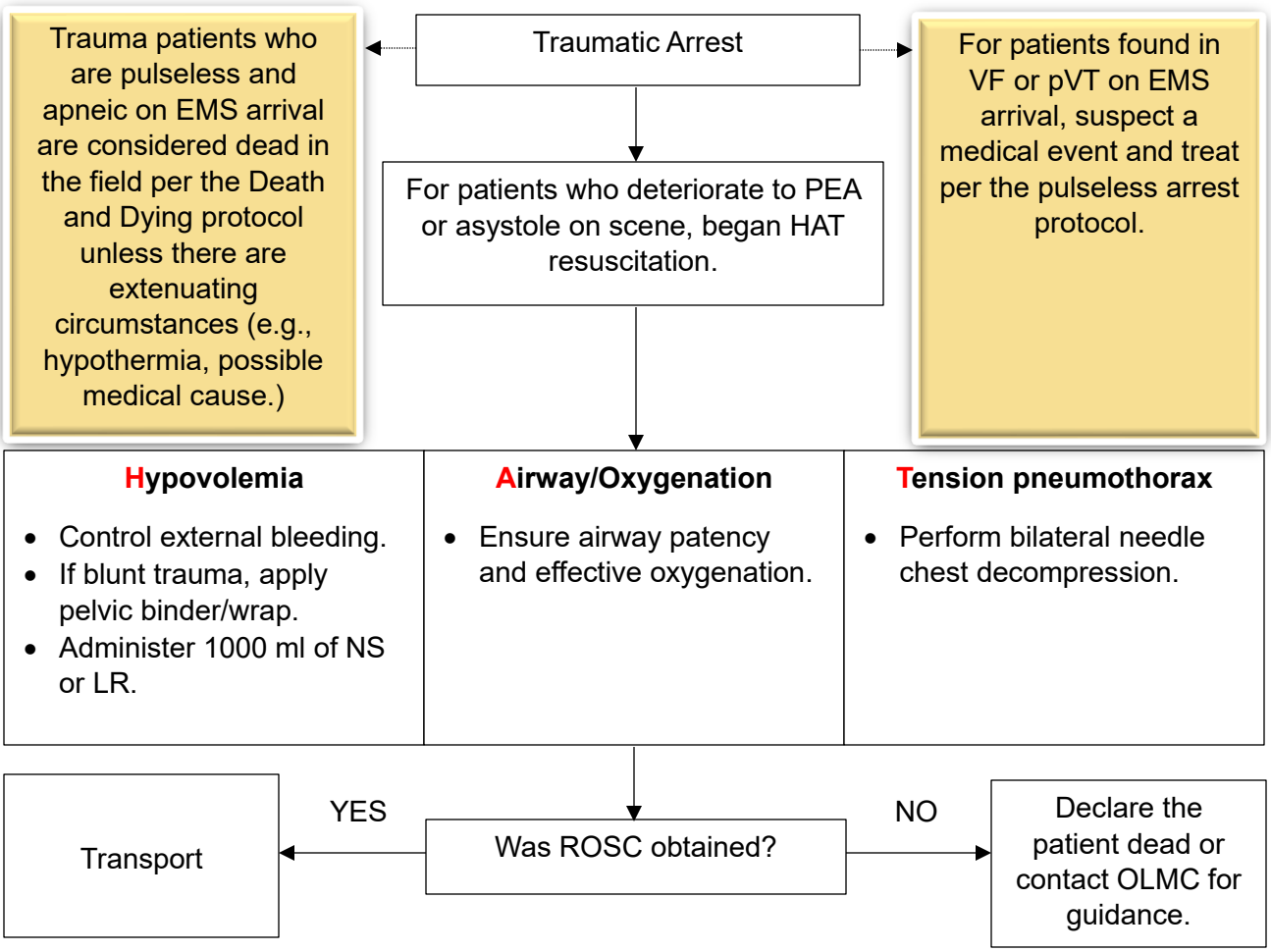
Joule settings:

LP15: 360J
Zoll: 200J

Pediatrics

- Follow adult algorithm with the following drug dosages:
- ✓ Epinephrine 1:10,000 - 0.01 mg/kg IV/IO. Repeat every 3 - 5 minutes.
- ✓ Amiodarone- 5 mg/kg IV/IO. Repeat once with 2.5 mg/kg IV/IO
- ✓ Lidocaine- Follow adult dose.
- ✓ Fluid bolus- 10 - 20 ml/kg
- Defibrillation at 4 j/kg. DSED not indicated for children < 18 but perform vector change after 3rd unsuccessful shock.

Cardiac Arrest (Trauma) – 10.050



For patients who arrest during transport:

- Initiate HAT resuscitation.
- If within 15 minutes of a trauma center, continue to the trauma center.
- If farther than 15 minutes to the trauma center, consider pulling over for crew safety and personnel resource reasons. If ROSC is not achieved, you may declare the patient dead or contact OLMC for guidance.

NOTES & PRECAUTIONS:

- If the mechanism of injury appears inconsistent with the patient's condition and not severe enough to induce traumatic arrest, consider a primary medical cause for the patient's cardiac arrest.
- If there is concern for a medical cause of the arrest, transport to the nearest cath lab capable facility if ROSC is achieved. If the patient is still in presumed medical cardiac arrest, then transport to the closest facility.
- Perform chest compressions in traumatic arrest, but DO NOT allow compressions to interfere with addressing the reversible causes of a traumatic arrest in the HAT resuscitation.
- Post-ROSC cooling in the traumatic arrest patient should be deferred to the hospital.

Cardiac Arrest with Pregnancy (> 22 weeks) – 10.050

Manage rhythm per Pulseless Arrest Protocol.

CPR with continuous manual left lateral uterine displacement using the two-handed method.

Ensure BVM ventilations are with high flow oxygen utilizing a two-handed technique to prevent gastric inflation. Suction should be readily available.

Early transport is preferable regardless of ROSC status. The gravid uterus must remain displaced during transport. Continue the two-handed technique for uterine displacement (except in the presence of mechanical CPR when the patient can be attached to a board and the board is lifted 30 degrees in left lateral decubitus position). If patient is in cardiac arrest, notify and transport to the closest facility.

IV/IO access should be above the diaphragm (humeral IO or external jugular access is preferred).

Intubation should be managed with an endotracheal tube if possible and be performed by the most experienced provider using VL if available. Consider using an endotracheal tube 1 - 2 sizes smaller than you would normally use.

NOTES & PRECAUTIONS:

- Consider early transport prior to achieving ROSC, especially if a mechanical CPR device is available.
- Alert the receiving facility early to have an OB team present upon arrival in the emergency department. If you have not achieved ROSC, go to the closest facility regardless of OB capabilities.
- If ROSC has been achieved and maintained prior to, or during transport, bypass to an OB and NICU capable facility.
- Lidocaine is preferable (Class B in Pregnancy) to amiodarone (Class C in Pregnancy) in the setting of ventricular fibrillation or pulseless ventricular tachycardia.
- In the setting of ventricular fibrillation or pulseless ventricular tachycardia, no adjustments need to be made to defibrillation energy settings. Immediately following defibrillation, resume the left lateral uterine displacement.
- If mechanical CPR is in place, continue the left lateral uterine displacement by tilting the backboard 30° to the left or by continuing manual displacement.
- If ROSC is achieved, continue left lateral uterine displacement by placing the patient in the left lateral decubitus position or by manually displacing the gravid uterus.
- High flow oxygen needs to be maintained in all peri-arrest patients.
- Consider OG placement when possible.

Cardiac Arrest Post Resuscitation – 10.050

Post Resuscitation Care:

- Following ROSC, several simultaneous and stepwise interventions must be performed to optimize care and maximize patient outcome.
- Survival and neurologic outcome worsen with fever, hypoxia, hypo/hypercapnia, and hypotension. Post-ROSC care should focus on prevention of these elements.
- Observe briefly to ensure stability before packaging for transport. Place LUCAS backplate prior to transport.

Optimize ventilation and oxygenation.

- Intubate as needed.
- Titrate oxygen to achieve an SpO_2 ≥ 94%.
- Monitor $EtCO_2$ (normal is 35 - 40 mmHg). **Do not hyperventilate** (ideal rate is 10 - 12 breaths/minute).

If hypotensive (MAP < 65 mmHg or systolic BP < 90 mmHg) follow Shock protocol. Goal is to maintain a mean arterial pressure (MAP) > 65 mmHg.

Hyperventilation reduces venous return and may cause hypotension. Additional causes of post-resuscitation hypotension include hypovolemia and pneumothorax, especially in the presence of positive pressure ventilation.

Perform 12-lead ECG (ideally no earlier than 8 minutes after ROSC). Use sex assigned at birth for 12-lead ECG computerized interpretation.

If patient meets criteria, consider cooling per Induced Hypothermia protocol for patients ≥ 13 years old.

Was the patient defibrillated during treatment?

NO

YES

Transport

All patients with ROSC should be transported to a hospital with emergent interventional capability.

If needed, provide analgesia with fentanyl and sedation with either midazolam or lorazepam.

If arrest reoccurs, treat per appropriate protocol.

If amiodarone was last:

Re-dose with amiodarone 30 minutes after ROSC with 150 mg over 10 minutes. Max total arrest/post-ROSC dose 450 mg.

If lidocaine was last:

Administer lidocaine 0.75 mg/kg every 10 minutes. Max total arrest/post-ROSC dose 3 mg/kg.

If no antidysrhythmic given, administer lidocaine 1.5 mg/kg. Re-bolus with 0.75 mg/kg every 10 minutes. Max total dose 3.0 mg/kg.

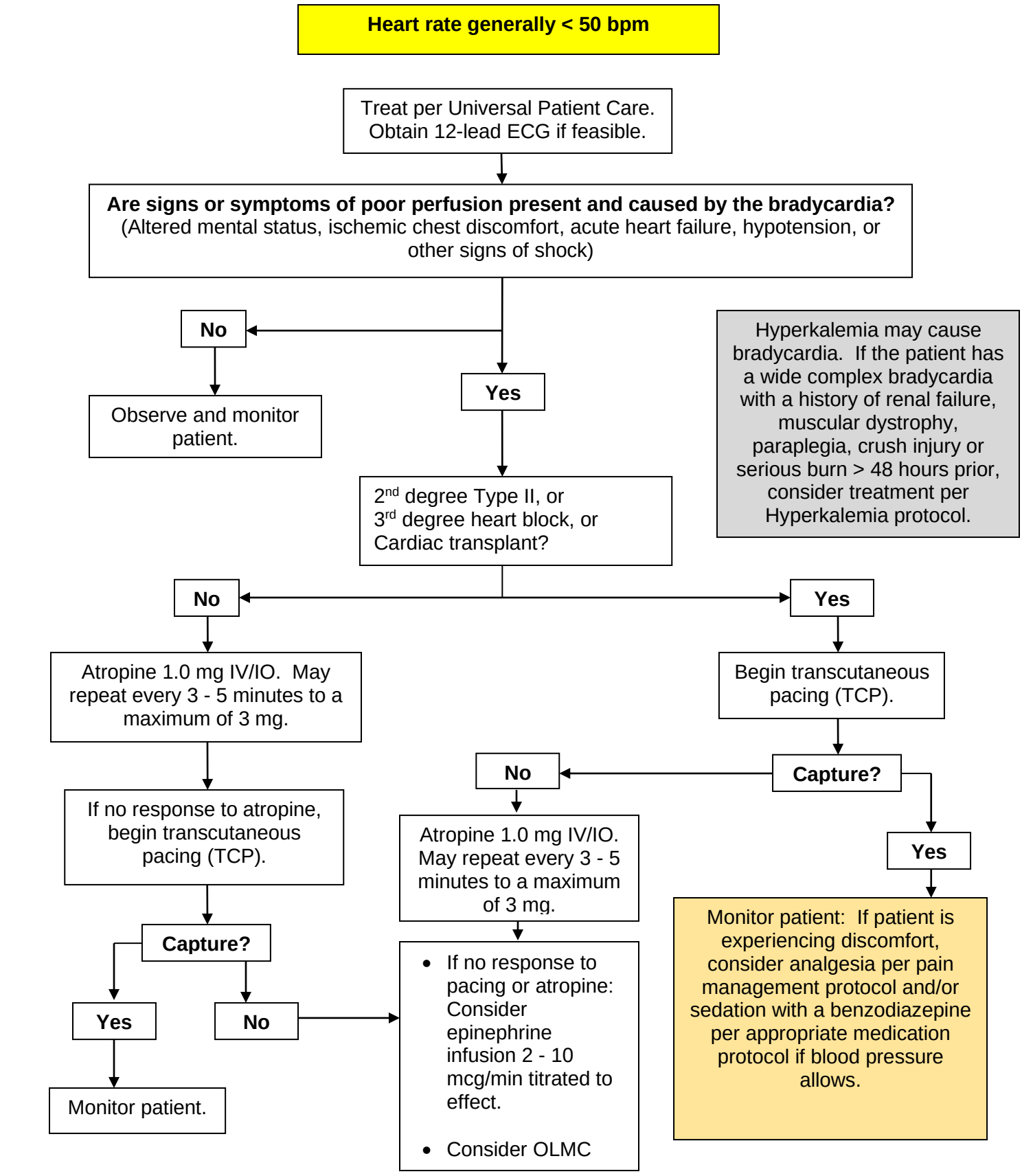
OR

Administer amiodarone 150 mg over 10 minutes.

Do not use amiodarone or lidocaine in perfusing patients without OLMC approval in the following situations:

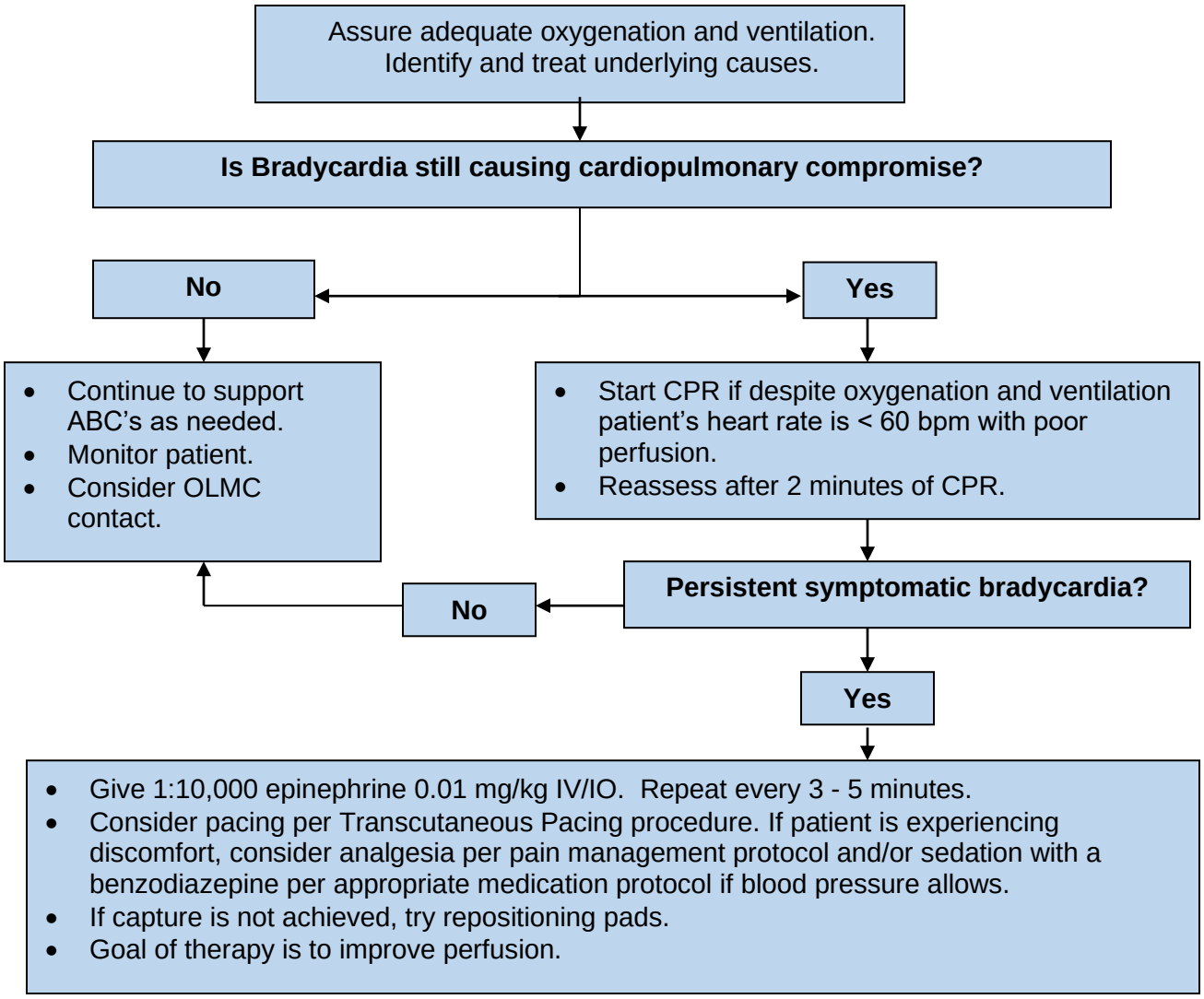
- ✓ Systolic BP is less than 90 mmHg.
- ✓ Heart rate is less than 50 beats per minute.
- ✓ Periods of sinus arrest are present.
- ✓ Second or third-degree heart block are present.

Cardiac Dysrhythmias (Bradycardia) – 10.060



PEDIATRIC PATIENTS:

BRADYCARDIA WITH A PULSE AND POOR PERFUSION



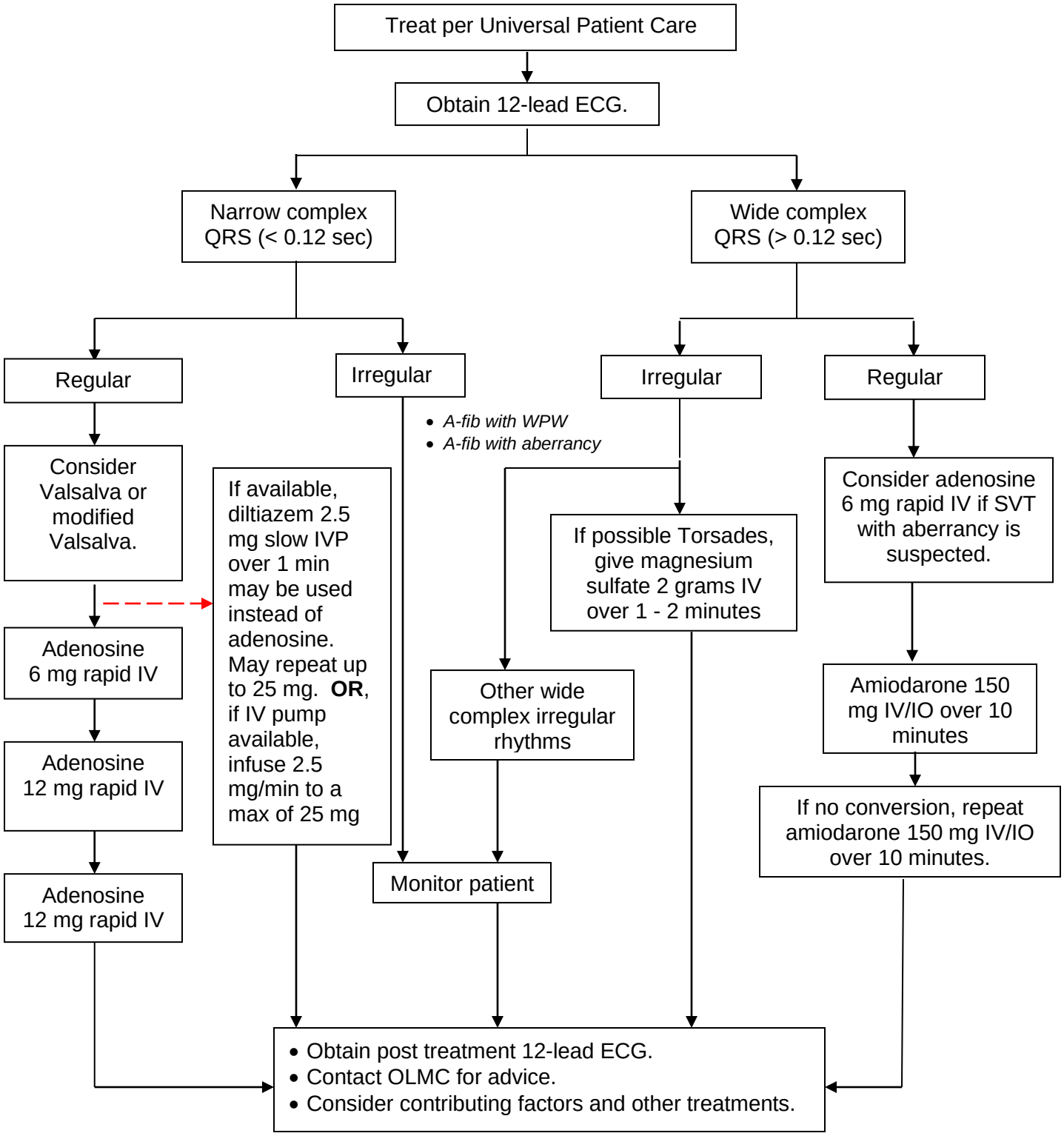
Cardiac Dysrhythmias (Bradycardia) – 10.060

NOTES & PRECAUTIONS:

- Hypoxia is a common cause of bradycardia.
- Bradycardia may be protective in the setting of cardiac ischemia and should only be treated if associated with serious signs and symptoms of hypoperfusion. Increasing heart rate may worsen ischemia or increase infarct size.
- Immediate TCP can be considered in unstable patients when vascular access is not available.
- TCP is at best a temporizing measure and is not useful in asystole.
- If TCP capture is not achieved, try repositioning pads.
- Atropine will likely be ineffective in heart transplant recipients because they lack vagal innervation.
- 3rd degree heart blocks with a wide complex QRS (>0.12 sec) are less likely to respond to atropine than those with a narrow complex.

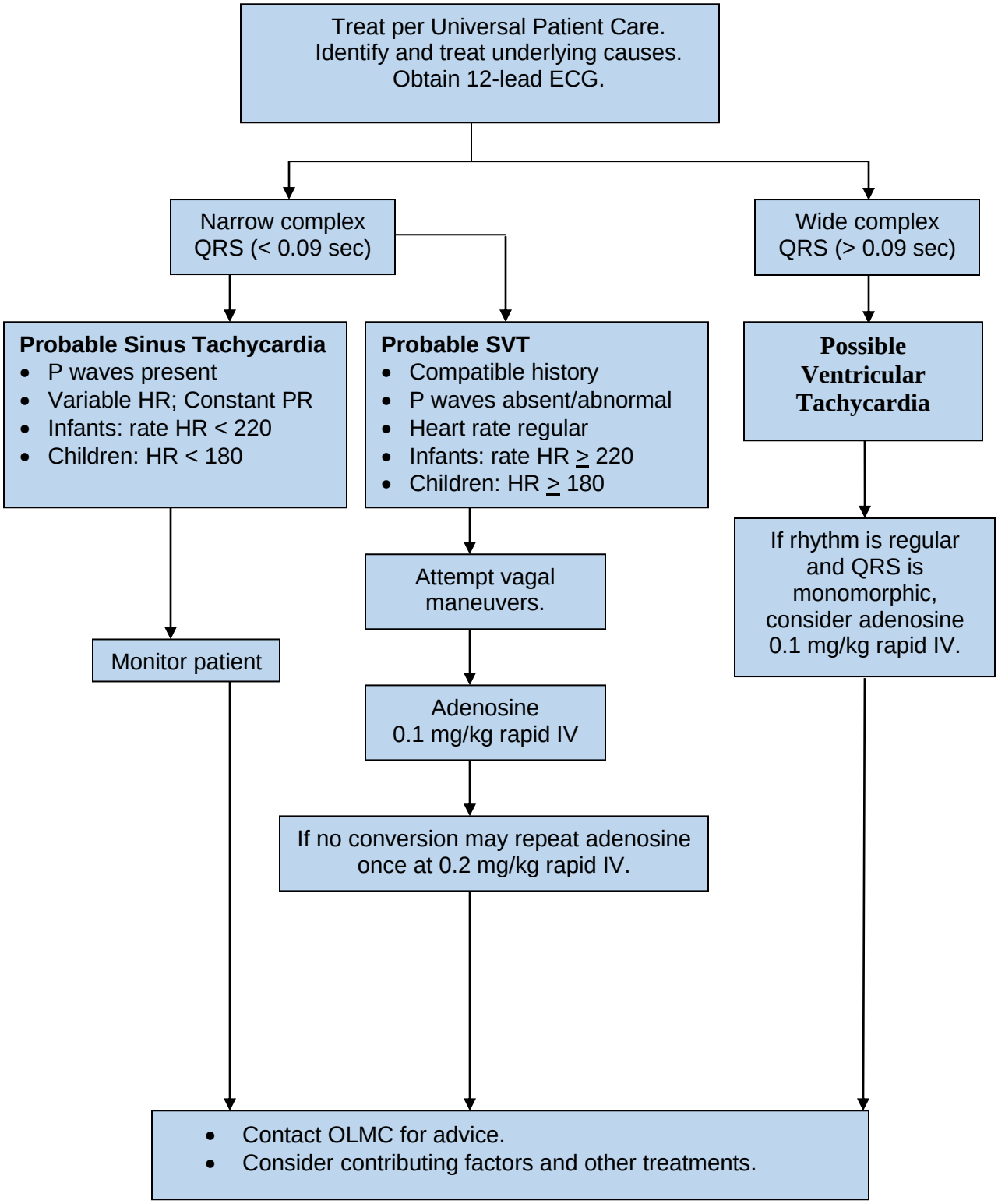
Cardiac Dysrhythmias (Tachycardia Stable) – 10.060

Patient **does not** have signs or symptoms of poor perfusion caused by the dysrhythmia.
(e.g., Altered mental status, ischemic chest discomfort, acute heart failure, hypotension, or other signs of shock)
Rate related symptoms uncommon if HR <150 bpm. Consider other causes.



Cardiac Dysrhythmias (Tachycardia Stable) – 10.060

PEDIATRIC PATIENTS:



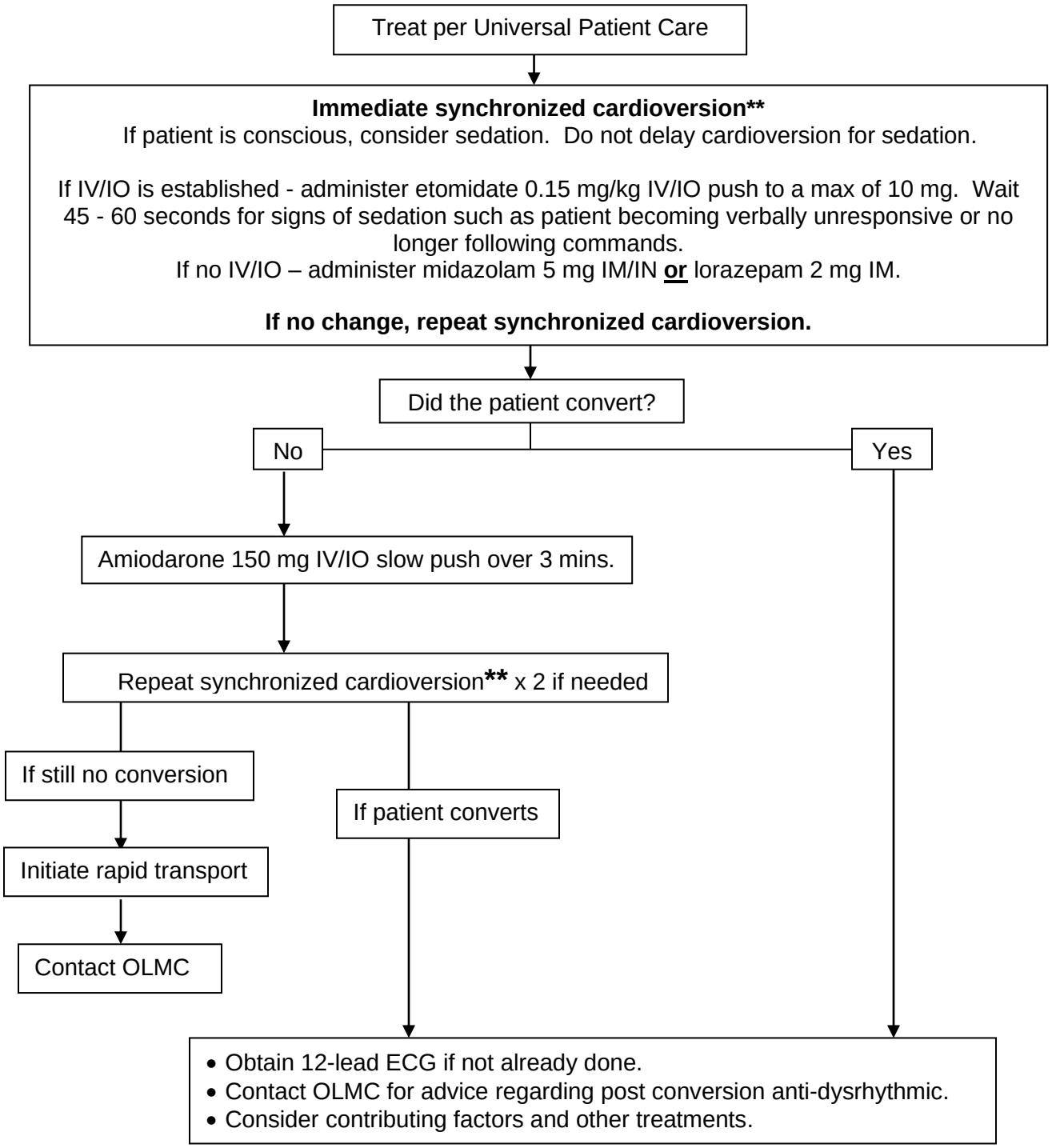
Cardiac Dysrhythmias (Tachycardia Stable) – 10.060

NOTES & PRECAUTIONS:

- In stable wide complex tachycardia, which is monomorphic, consider adenosine if SVT with aberrancy is suspected.
- If the patient is asymptomatic, tachycardia may not require treatment in the field. Continue to monitor the patient for changes during transport. The acceptable upper limit for heart rate for sinus tachycardia is 220 minus the patient's age.
- Other possible causes of tachycardia include:
  - ✓ Acidosis
  - ✓ Hypovolemia
  - ✓ Hyperthermia/fever
  - ✓ Hypoxia
  - ✓ Hypo/Hyperkalemia
  - ✓ Hypoglycemia
  - ✓ Infection
  - ✓ Pulmonary embolus
  - ✓ Tamponade
  - ✓ Toxic exposure
  - ✓ Tension pneumothorax
- If pulseless arrest develops, follow appropriate Cardiac Arrest protocol.
- All doses of adenosine should be reduced to one-half (50%) in the following clinical settings:
  - ✓ History of cardiac transplantation.
  - ✓ Patients who are on carbamazepine (Tegretol) and dipyridamole (Persantine, Aggrenox).
  - ✓ Administration through any central line.
- Adenosine may initiate atrial fibrillation with rapid ventricular response in patients with Wolff-Parkinson-White syndrome.
- Adenosine should be used with caution in patients with asthma as it may cause a reactive airway response in some cases.
- The Modified Valsalva Maneuver may increase the likelihood of converting SVT to sinus rhythm. Have the patient sit in an upright position. With the assistance of a 10 ml syringe, encourage the patient to strain for a full 15 seconds, trying to push out the plunger by forced expiration. Lay the patient flat and elevate their legs to 45-90 degrees for 15 seconds. Lay the patient's legs flat for 60 seconds. May repeat x1 if patient has not converted to sinus rhythm.
- Consider the following Valsalva techniques for pediatric patients:
  - ✓ For infants and toddlers, apply ice or chilled IV fluid to the patient's face.
  - ✓ For preschool age and up, have the patient blow on a syringe.

Cardiac Dysrhythmias (Tachycardia Unstable) – 10.060

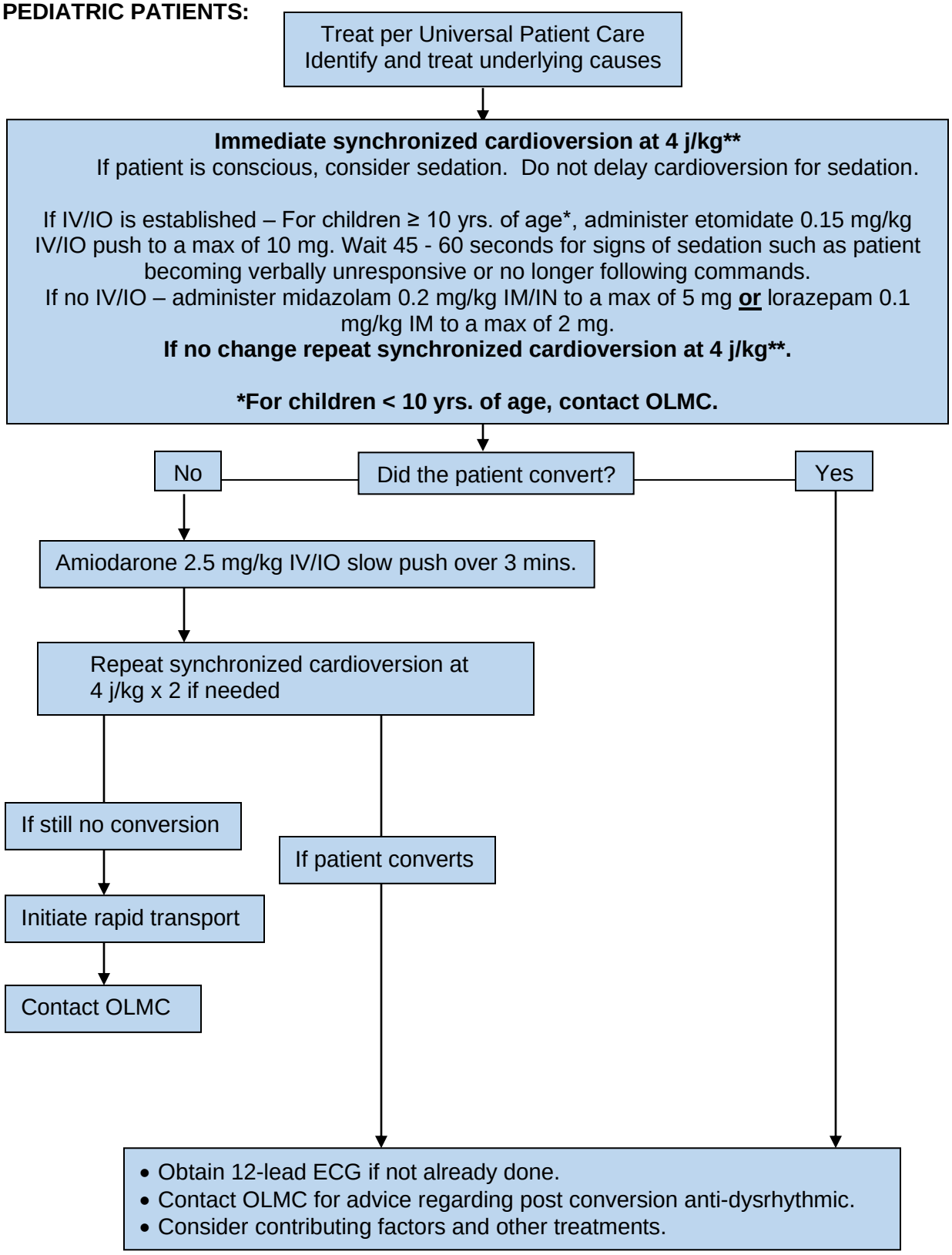
Patient **has** signs or symptoms of poor perfusion caused by the dysrhythmia
(e.g., Altered mental status, ischemic chest discomfort, acute heart failure, hypotension or other signs of shock).
Rate related symptoms uncommon if HR<150 bpm. Consider other causes.



****If patient is in a wide complex irregular tachycardia use defibrillation (un-synchronized).

Cardiac Dysrhythmias (Tachycardia Unstable) – 10.060

PEDIATRIC PATIENTS:



Cardiac Dysrhythmias (Tachycardia Unstable) – 10.060

NOTES & PRECAUTIONS:

- Possible causes of tachycardia include:
  - ✓ Acidosis
  - ✓ Hypovolemia
  - ✓ Hyperthermia/fever
  - ✓ Hypoxia
  - ✓ Hypo/Hyperkalemia
  - ✓ Hypoglycemia
  - ✓ Infection
  - ✓ Pulmonary embolus
  - ✓ Tamponade
  - ✓ Toxic exposure
  - ✓ Tension pneumothorax
- If pulseless arrest develops, follow Cardiac Arrest protocol.
- Defibrillation is recommended for wide complex irregular tachycardia.
- Etomidate may result in myotonic jerking, apnea and/or pain at the injection site.

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Heart Monitor Adult Synchronous Cardioversion Settings (Joules)	
Physio LifePak®	360 j
Zoll E/M Series®	200 j

Chest Pain/Acute Coronary Syndromes – 10.065

Life threatening causes of chest pain:

- Acute coronary syndrome (ACS)
  - ✓ Unstable angina
  - ✓ NSTEMI
  - ✓ STEMI
- Pulmonary embolism
- Thoracic aortic dissection
- Tension pneumothorax

Dysrhythmias and PVCs

- Treat any dysrhythmia per appropriate cardiac dysrhythmia protocol.
- Concerning PVCs **in <u>the setting of an acute ischemic event only</u>** may be treated with Amiodarone 150 mg IV/IO over 10 mins.
- Amiodarone should not be used if:
  - ✓BP < 90 mmHg
  - ✓HR < 50 bpm
  - ✓Periods of sinus arrest
  - ✓Presence of 2° or 3° AV block

Treat per Universal Patient Care

↓

Titrate oxygen to lowest level to achieve $SpO_2 \geq 94\%$. (Must have good waveform to ensure accuracy.)

↓

Consider life-threatening causes of chest pain.

↓

Obtain 12-lead ECG, done concurrently with other treatments. If inconclusive, consider repeating every 3-5 minutes.

↓

If STEMI/OMI suspected, notify receiving facility.

↓

Administer 324 mg ASA orally (chewable 81 mg X 4) if not contraindicated (allergy/sensitivity, active bleeding disorder, GI bleed or ulcer, or suspected aortic dissection.)

↓

If BP > 100 mmHg systolic, administer 0.4 mg NTG. Repeat every 5 minutes until chest pain relieved if BP remains > 100 mmHg systolic. *

↓

For pain unrelieved by 3 doses of NTG, consider opioid analgesia per Pain Management protocol. NTG may be continued as well for suspicion of ACS.

***Nitroglycerin Precautions**

- Establish vascular access prior to administration for patients having not previously taken NTG or who are at risk of hemodynamic instability.
- NTG can cause hypotension in 10% of patients.
- **Use with caution in patients with an inferior MI as profound hypotension can occur due to an associated right ventricular infarction (RVI can occur in up to 50% of inferior MIs).**
- 12-lead clues to RVI include STE in III > II or STE ≥ 1 mm in V_4R. Current guidelines recommend avoidance of NTG in RVI.
- Do not administer NTG without OLMC if patient has taken sildenafil (Viagra®), vardenafil (Levitra®) in last 24 hours or tadalafil (Cialis®) in last 48 hours, given risk of profound hypotension with concomitant administration.

ST Elevation MIs (STEMIs)

- STEMI is defined by:
  - ✓ At least 1 mm ST elevation in two contiguous leads (except V2 and V3) in the absence of a LBBB or paced rhythm.
  - ✓ For leads V2 and V3, ≥ 2.5 mm STE for men < 40, ≥ 2 mm in men ≥ 40, and ≥ 1.5 mm in woman of all ages.
- Field identified STEMI is a 12-lead ECG with:
  - ✓ Automatic ECG interpretation of "Acute MI", or
  - ✓ Paramedic concern for STEMI or OMI based on provider ECG review and clinical presentation.

Occlusive MIs (OMIs)

ECG findings concerning for an ongoing coronary occlusion also warrant cath lab activation. Findings consistent with OMI include:

- Hyperacute T waves
- DeWinter T waves
- Mild inferior STE with reciprocal depression in aVL
- Anterior ST depression in the absence of posterior STE
- LBBB or paced rhythm with Smith-Modified Sgarbossa Criteria
- Wellens syndrome: Deep inverted T waves in V2/V3
- Aslanger's Pattern: Inferior STE in Lead III only, ST depression in any V4-V6 with positive T-Wave, ST segment in V1 > V2.

STEMI/OMI Actions

- If possible, transmit 12-lead ECG to destination hospital.
- Early notification to receiving hospital of "STEMI activation" ideally within 5 mins of identification.
- **Apply defibrillation pads.**
- Rapid transport to destination with cardiac interventional capability.

For pediatrics, consider pleuritic causes or trauma. Contact OLMC for advice

Crush Injury / Entrapment – 10.070

Treat per Universal Patient Care

Spinal motion restriction if indicated and feasible.

Consider pain management.

Evaluate degree of entrapment and viability of extremities (absent pulse, blanched skin, capillary refill, diminished sensation, extremely cold to the touch).

- If one or more extremities are trapped for a prolonged period (> 2 - 4 hours.), and circulation is compromised or absent consider the placement of a tourniquet prior to extrication to reduce reperfusion injuries.
- If extrication of a limb will be prolonged and patient's condition is deteriorating, strongly consider calling Trauma Communications to arrange on-scene management.

During extrication, administer 1000 - 2000 cc NS or LR via IV bolus, then maintain at 500 cc/hr.

Monitor cardiac rhythm for signs of hyperkalemia including peaked T-waves, lowered P-wave amplitude or the loss of the P-wave, prolonged PR interval, second-degree AV block, and a widened QRS. If present, treat per Hyperkalemia protocol.

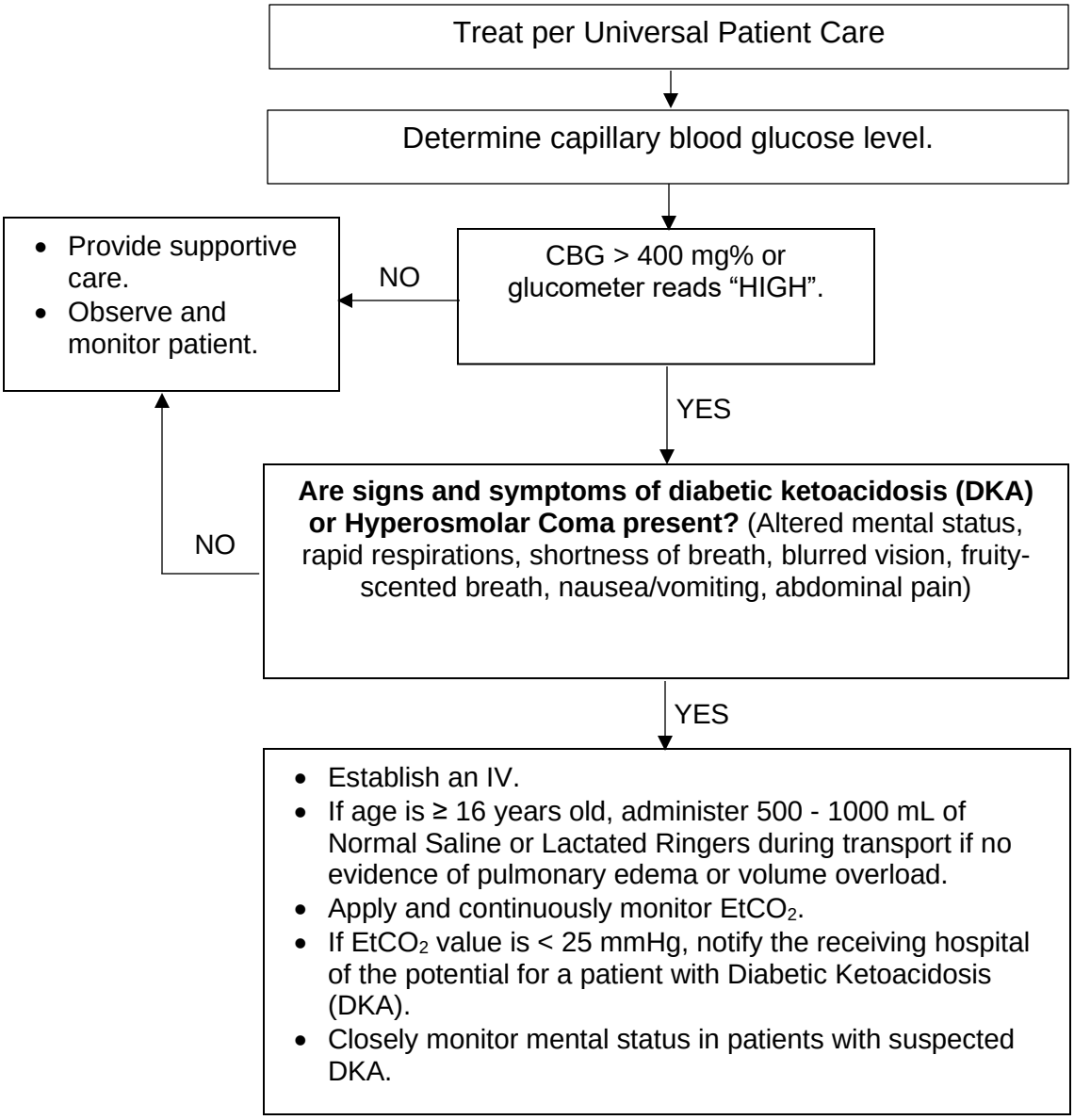
Wound Care

- Remove all restrictive dressings (clothing, jewelry, etc.).
- Monitor distal pulse, motor, and sensation in involved extremity.
- Bandage all open wounds (irrigate if needed).
- Stabilize all protruding foreign bodies (impaled objects).
- Splint/immobilize injured areas.
- For suspected pelvic crushing injuries, apply Pelvic Wrap if indicated.

NOTES & PRECAUTIONS:

- Crush injuries may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse, and shallow respirations.
- Plan extrication activities to allow for periodic patient assessment. Plan for occasional extrication equipment "shut down" to assess vital signs.
- Carefully track vital signs, IV fluids, cardiac rhythm, and medications during extrication.
- Protect patient from environment (rain, snow, direct sun, etc.). If needed, begin warming methods (warm blankets, heated air with blower, warm IV fluids) to prevent hypothermia.
- Carefully assess collateral injuries that may have occurred during event.
- If patient is trapped in a heavy dust environment, consider methods to provide filtered oxygen to the patient. If patient is in respiratory distress, consider dust impaction injuries and prepare to administer nebulized albuterol per OLMC direction.
- Do not allow any personnel into extrication area (inner circle) without proper protective equipment and thorough briefing including review of the evacuation signal.
- Notify the receiving Trauma Center through Trauma Communications early in the extrication process for additional recommendations if needed.

Diabetic Emergencies- Hyperglycemia – 10.072



PEDIATRIC PATIENTS:

- Follow adult algorithm.
- If age is < 16 years old, consider administration of 10 mL/kg of Normal Saline or Lactated Ringers during transport if no evidence of pulmonary edema or volume overload.

NOTES & PRECAUTIONS:

If concern for DKA, avoid intubation unless the patient cannot protect their airway or there is evidence of extreme fatigue with an inability to ventilate or oxygenate. If intubation becomes necessary, the ventilation goal should be to maintain pre-intubation $EtCO_2$ levels.

Diabetic Emergencies- Hypoglycemia – 10.072

Symptoms of hypoglycemia can include the following: Sweating, shakiness, nervousness, hunger, tiredness, dizziness, difficulty thinking, blurred vision, tingling sensation, or heart pounding.

Treat per Universal Patient Care

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Determine capillary blood glucose level.

↓

CBG < 60 mg%, or < 80 mg% in a known diabetic

↓

- If patient can protect their own airway, give oral glucose.
- If patient is unable to protect their own airway give:
  - ✓ Dextrose 10%, 10 - 25 grams (100 - 250 ml) IV/IO by infusion
    OR
  - ✓ Dextrose 50%, 25 grams (50 ml) in large vein

↓

Check CBG after 5 minutes and repeat treatment if blood sugar remains low and patient remains symptomatic.

↓

If no IV can be established, give glucagon 1 mg IM.

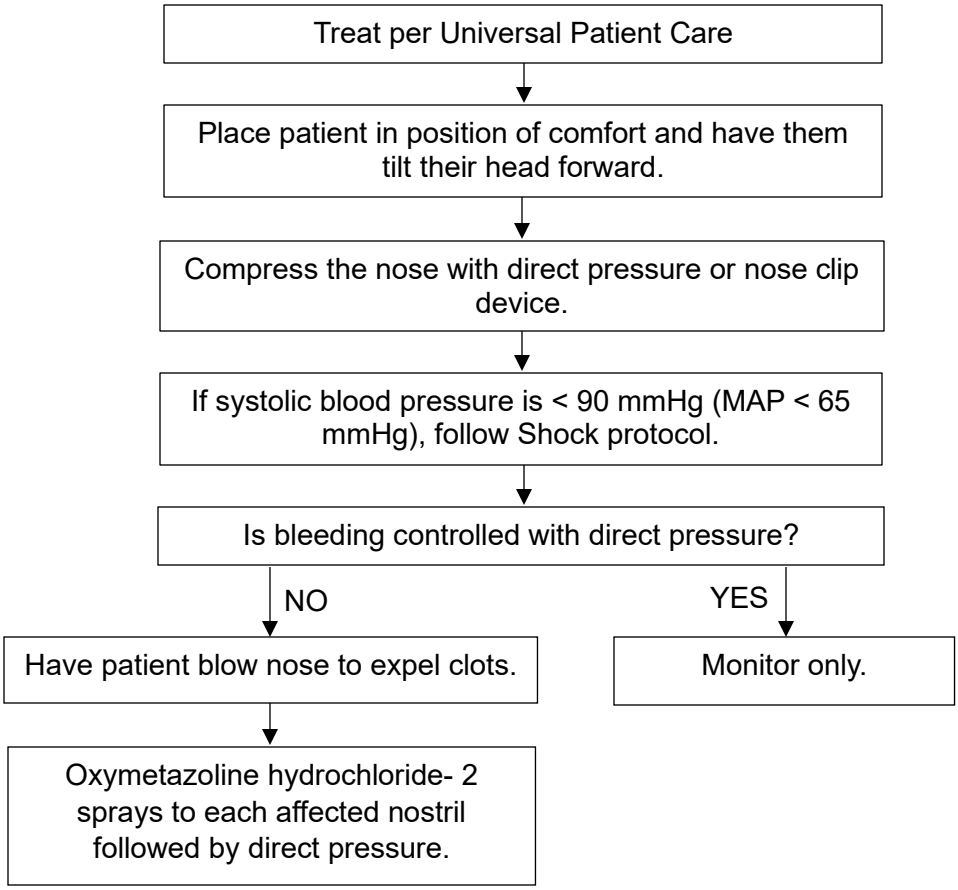
PEDIATRIC PATIENTS:

- For infants < 10 kg (birth to 1 year) with CBG < 40 mg% and children 10 kg - 35 kg with CBG < 60 mg% give:
  - ✓ Dextrose 10%: 5 ml/kg by infusion not to exceed 250 ml total. (Note: for D10% each 10 ml = 1 gram of dextrose), **OR**
  - ✓ Dextrose 12.5% (if diluting D50): 4 ml/kg by infusion not to exceed 200 ml total, **OR**
  - ✓ Glucagon: 0.02 mg/kg IM to a maximum of 1 mg if IV cannot be established.

NOTES & PRECAUTIONS:

- Hypoglycemic patients who receive glucose/dextrose/glucagon often refuse transport. This may be reasonable if **all** the following are present:
  - ✓ The patient's mental status has returned to normal.
  - ✓ There is a clear precipitating cause (e.g., took insulin but forgot to eat).
  - ✓ The patient can eat a meal.
  - ✓ The patient's recent blood sugar control has been otherwise stable.
  - ✓ The patient's blood glucose level is > 80mg%.
  - ✓ A reliable adult will be with the patient.
- Patients with recent evidence of poor glucose control and those who use oral hypoglycemic medications, particularly the sulfonylurea agents (e.g., glyburide, glipizide, glimepiride) are at high risk for recurrent hypoglycemia and should be transported. If these individuals refuse transport, contact OLMC for assistance.

Epistaxis – 10.075



PEDIATRIC PATIENTS:

- Follow adult algorithm.
- Oxymetazoline Hydrochloride should be avoided if child cannot follow instructions to blow their nose or are unable to tolerate the administration of a nasal medication.

NOTES & PRECAUTIONS:

- Blood loss in epistaxis can be hard to quantify.
- Bleeding may be also occurring posteriorly. Evaluate for posterior blood loss by examining the back of the throat.
- Posterior epistaxis may be an emergency and may require advanced ED techniques such as balloon tamponade or interventional radiology. Do not delay transport. Be prepared for potential airway issues.
- Detailed medication history should be obtained to assess for the use of agents such as NSAIDs, antiplatelet agents, or anticoagulant medications that may contribute to bleeding.
- For patients on home oxygen via nasal cannula, place the cannula in the patient's mouth while the nares are compressed for active bleeding.

Eye Emergencies – 10.076

Treat per Universal Patient Care

Treat specific injuries as follows:

Chemical Burns

- Administer proparacaine.
- Irrigate from the center of the eye towards the eyelid with lactated ringers (preferred), isotonic saline, or tap water for at least 30 minutes.
- Do not attempt to neutralize acids or bases.

Direct Trauma to Eye (Suspected Rupture/Penetration of Globe)

- Protect the affected eye and its contents with a hard shield or similar device and cover the other eye.
- Follow Pain Management protocol as indicated and consider ondansetron per Nausea and Vomiting protocol.

Foreign body on outer eye

- Do not wipe eye.
- Administer proparacaine.
- Consider irrigation.

PROPARACAINE ADMINISTRATION:

Instill one drop in the affected eye. If there is no effect within one minute, three additional drops may be instilled at one-minute intervals. For transports longer than 15 minutes, if eye pain returns, 1 - 4 additional drops may be instilled as needed to continue anesthetic effect.

NOTES & PRECAUTIONS:

- Unless contraindicated, patients should be transported in a seated position of at least 30 degrees in order to decrease intraocular pressure.
- Document new onset of blurring, double vision, perceived flashes of light, or other visual changes.
- Contact lenses should be removed, if possible.

Fever Management – 10.077

Treat per Universal Patient Care

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Document temperature before administration of antipyretics and provide written documentation of temperature to receiving facility.

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Remove heavy blankets or bundling but avoid shivering.

↓

If temperature > 100.4° F (38.0° C) consider, if available:

- Acetaminophen 325 - 1000 mg PO **or** 1000 mg IV slowly over 5 minutes. If given by infusion pump, can be administered over 10 -20 minutes.
  OR
- Ibuprofen 200 - 600 mg PO.

PEDIATRIC PATIENTS:

- **Acetaminophen-**

  15 mg/kg PO liquid only to a maximum of 1000 mg

- **Ibuprofen-**

  10 mg/kg PO liquid only to a maximum of 600 mg. **Do not give ibuprofen to children less than 6 months old or with signs of dehydration.**

NOTES AND PRECAUTIONS:

- There is no evidence that treating fever decreases the likelihood of febrile seizure or has other therapeutic benefit. Treatment of fever is to improve patient comfort and is optional.
- Do not give acetaminophen if known liver disease, alcohol abuse, acute intoxication, or has taken acetaminophen in last 4 hours.
- Do not give ibuprofen to infants under 6 months, or patients with known renal disease, dehydration, ulcer, GI bleeding, gastric reflux disease (heartburn), pregnancy, or if a NSAID has been taken within the last 6 hours.
- Antipyretics are not indicated for environmental hyperthermia.

Hyperkalemia – 10.078

Hyperkalemia Risk Factors:

- Dialysis patient.
- Chronic renal failure/insufficiency.
- Crush injury.
- Serious burns > 48 hours old.
- Muscular dystrophy.
- Paraplegia/quadriplegia.

Treat per Universal Patient Care

Suspicion of hyperkalemia is based on risk factors and physical findings.

ECG changes that may be present with hyperkalemia include:

- Peaked T waves.
- Lowered P wave amplitude or no P waves.
- Prolonged P-R interval (> 0.20 seconds).
- Second degree AV blocks.
- Widened QRS complex.

A 12- Lead ECG may be helpful to determine the presence of hyperkalemia.

If hyperkalemia is suspected based on history and physical findings:

- Administer 10% calcium gluconate 1 - 3 grams IV/IO slowly over 5 - 10 minutes in a proximal port.
- If no change in rhythm following calcium administration and transport time is prolonged, consider alternate therapy:
  - ✓ High dose albuterol (10 mg by nebulizer)
  - ✓ Sodium bicarbonate 50 mEq IV/IO

DO NOT mix sodium bicarbonate solutions with calcium preparations. Slowly flush remaining calcium gluconate from the catheter prior to administering sodium bicarbonate.

PEDIATRIC PATIENTS:

- Calcium gluconate- 0.6 ml/kg IV/IO slowly over 5-10 minutes. Max dose 10 ml.
- Albuterol-
  - ✓ < 25 kg, 2.5 mg via nebulizer
  - ✓ 25-50 kg, 5.0 mg via nebulizer
  - ✓ > 50 kg, 10 mg via nebulizer
- Call OLMC regarding the use of sodium bicarbonate.

Hyperthermia/Heat-Related Emergencies – 10.080

Treat per Universal Patient Care

Differentiate between heat cramps, heat exhaustion, and heat stroke.

Heat Cramps
- Normal or slightly elevated body temperature
- Warm, moist skin
- Generalized weakness
- Diffuse muscle cramping

Heat Exhaustion
- Elevated body temperature
- Cool, diaphoretic skin
- Tachypnea
- Generalized weakness
- Anxiety, headache
- Nausea/vomiting
- Possible syncope

Heat Stroke
- **Altered mental status**
- Very high body temperature
- Hot, dry skin
- Hypotension
- Seizure
- Coma

Remove clothing and begin cooling measures that maximize evaporation (spray bottle with tepid water, cools wipes, and fans). **If available** (such as at athletic events) measure rectal temperature and begin cold water immersion cooling immediately utilizing a tub or basin or by the TACO (Tarp Assisted Cooling with Oscillation) method. The TACO method involves placing a patient onto a tarp and pouring ice and cold water over the patient while simultaneously lifting the tarp and moving it back and forth. Athletic trainers are familiar with rectal temperature monitoring/TACO and can provide assistance.

If MAP < 65 mmHg (90 mmHg systolic), treat per Shock protocol.

NOTES & PRECAUTIONS:

- Heat stroke is a medical emergency. Be aware that heat exhaustion can progress to heat stroke.
- Wet sheets over a patient without good airflow will increase temperature and should be avoided.
- Suspect hyperthermia in patients with altered mental status or seizure on a hot, humid day.
- Consider sepsis and/or contagious disease. Examine patient closely for rashes and nuchal rigidity.

Hypothermia – 10.090

Treat per Universal Patient Care.

Assess ABC's. Allow up to 30 - 45 seconds to confirm respiratory arrest, pulseless cardiac arrest, or bradycardia that is profound enough to require CPR.

Gently remove wet clothes and protect patient from further environmental exposure.

Patient perfusing

Monitor ECG and pulse oximetry. Handle patient gently to avoid precipitating VF.

Warm patient as required:

- Heated blankets
- Warm environment
- Warm air
- Warm (109°F/42.8°C) IV fluids
- Warm packs

Patients with severe hypothermia (Temp < 86°F/30°C) may need internal rewarming. Contact OLMC early for direction.

Cardiac Arrest

VF/pVT/ASYSTOLE

- Begin CPR.
- Treat per Pulseless Arrest protocol.
- Contact OLMC for medication administration.

ORGANIZED RHYTYM

- Handle gently.
- Contact OLMC for direction regarding CPR and medication administration.

FROZEN TISSUE/LIFELESS

- Consider declaring death in the field. If in doubt, consult OLMC for directions.

NOTES & PRECAUTIONS:

- At-risks groups for hypothermia include trauma victims, alcohol and drug abuse patients, houseless persons, elderly, low-income families, infants and small children, and entrapped patients.
- Hypothermia may be preceded by other disorders (alcohol, trauma, OD, hypoglycemia) so look for and treat any underlying conditions while managing the hypothermia.
- The hypothermic heart may be unresponsive to cardiovascular medications, external cardiac pacing, or defibrillation.

Musculoskeletal Trauma – Extremity / Hemorrhage – 10.100

Treat per Universal Patient Care

For external bleeding, control with direct pressure/pressure dressing. If not effective or impractical, apply tourniquet. For wounds not amenable to tourniquet, apply topical hemostatic agent with direct pressure or use XSTAT device for junctional wounds to the groin or axilla.

FRACTURES/SPRAINS/DISLOCATIONS

- Check for pulses, movement, and sensation (PMS), distal to the injury site before and after immobilization.
- Splint fractures/dislocations in the position found. If PMS is compromised distal to fracture, consider applying axial traction to bring extremity into normal anatomical position. If patient complains of increase in pain or resistance is felt, stop, and immobilize. If PMS is compromised distal to dislocation, contact OLMC.
- If fracture/dislocation is open, place a moist sterile dressing over wound and cover with a dry dressing.
- Elevate and/or place cold packs over fracture site if time/injuries allow.
- Apply traction splint to femur shaft fractures.
- For suspected pelvic fractures, utilize pelvic sling and secure to backboard to minimize blood loss.
- Treat per Pain Management protocol.

AMPUTATIONS

- Cover stump or partial amputation with moist sterile dressing.
- Splint partial amputations in anatomical position to avoid torsion and angulation.
- Wrap amputated part in a sterile dressing, and place in a plastic bag to keep dry. Place bag in ice water if available.
- If transport time is prolonged (extended extrication, etc.) consider sending the amputated part ahead to be prepared for reimplantation.
- Treat per Pain Management protocol.

PEDIATRIC PATIENTS:

- Treat pain per Pain Management protocol.
- Consider non-accidental trauma.

NOTES & PRECAUTIONS:

- Use of tourniquet for extremity hemorrhage is strongly recommended if sustained direct pressure is ineffective or impractical; use a commercially produced, windlass, pneumatic, or ratcheting device, which has been demonstrated to occlude arterial flow and avoid narrow, elastic, or bungee-type devices. Utilize improvised tourniquets only if no commercial device is available. If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove the improvised tourniquet if operationally feasible. Time tourniquet was placed must be recorded.
- Apply a topical hemostatic agent, in combination with direct pressure, for wounds in anatomical areas where tourniquets cannot be applied, and sustained pressure alone is ineffective or impractical. Only apply topical hemostatic agents in a gauze format that supports wound packing.
- XSTAT is for the control of severe, life-threatening bleeding from junctional wounds in the groin or axilla that are not amenable to tourniquet applications in adults and adolescents. It should only be used for patients at high risk for immediate life-threatening bleeding from hemodynamically significant, non-compressible junctional wounds.

Musculoskeletal Trauma - Spinal Injury – 10.100

Treat per Universal Patient Care

Provide initial cervical spinal motion restriction (SMR) using manual in-line stabilization.

Does the patient have any of the following:

- Neck or spine pain/tenderness on palpation.
- Altered mental status or history of LOC.
- Drug or alcohol intoxication.
- Distracting injury (e.g., fracture, dislocation, any injury requiring pain medication), communication/language barrier, or emotional distress.
- New neurological deficit (e.g., numbness, tingling, weakness, or paralysis).

NO → If **NONE** of the criteria, and you do not think patient has a spinal injury, cervical collar and other SMR may be omitted.

YES

Apply cervical collar and move patient to stretcher while maintaining spinal motion restriction.

- Patient will remain flat on stretcher unless inclined positioning is necessary due to respiratory compromise or patient intolerance.
- A long spine board may be used to facilitate extrication and transfer to the stretcher; in cases of time sensitive injuries, the long spine board can be left in place.

Complete physical and serial neurological exams after spinal motion restriction. Treat per Pain Management protocol

PEDIATRIC PATIENTS:

- For spinal motion restriction, children may require extra padding under the upper torso to maintain neutral cervical alignment.
- Consider using an available child safety restraint device for immobilization (e.g., car seat, Pedi Mate® device).

NOTES & PRECAUTIONS:

- Decreasing the use of long spine boards does not imply eliminating the use of spinal motion restriction. Long spine boards can be an effective tool in selected circumstances.
- Have a very low threshold for placing patients over 65 years of age in spinal precautions, even with a minor mechanism of injury.
- If any spinal motion restriction techniques cause an increase in pain or neurological deficits, nausea, or respiratory distress, immobilize and transport the patient in the position found or position of greatest comfort.
- There is no role for spinal motion restriction in penetrating trauma.
- Patients in the third trimester of pregnancy should be positioned/tilted toward the left side to prevent compression of the vena cava during transport.
- If feasible, especially in prolonged scene transports, pad backboards.
- If sports injury, follow Sports Equipment Removal protocol.

Nausea & Vomiting – 10.110

Treat per Universal Patient Care

↓

Consider IV fluids in patients exhibiting signs of dehydration.

↓

Consider offering patient an isopropyl alcohol swab or other aroma therapy and allowing the patient to self-administer by inhalation. Emphasize slow deep inhalation. May be repeated up to 2 times (total of 3 administrations) but should not delay the administration of ondansetron.

↓

Give 8 mg ondansetron orally dissolving tablets (Zofran® ODT) or 4 mg ondansetron slow IV push over 2 minutes, or 4 mg IM.

↓

If nausea and/or vomiting are inadequately controlled after 10 minutes, consider:

- Repeating ondansetron **or**
- Administer droperidol 0.625 mg IV or haloperidol 1.25 mg IV/IM

↓

If patient continues to vomit, administer fluid challenge and consider other causes

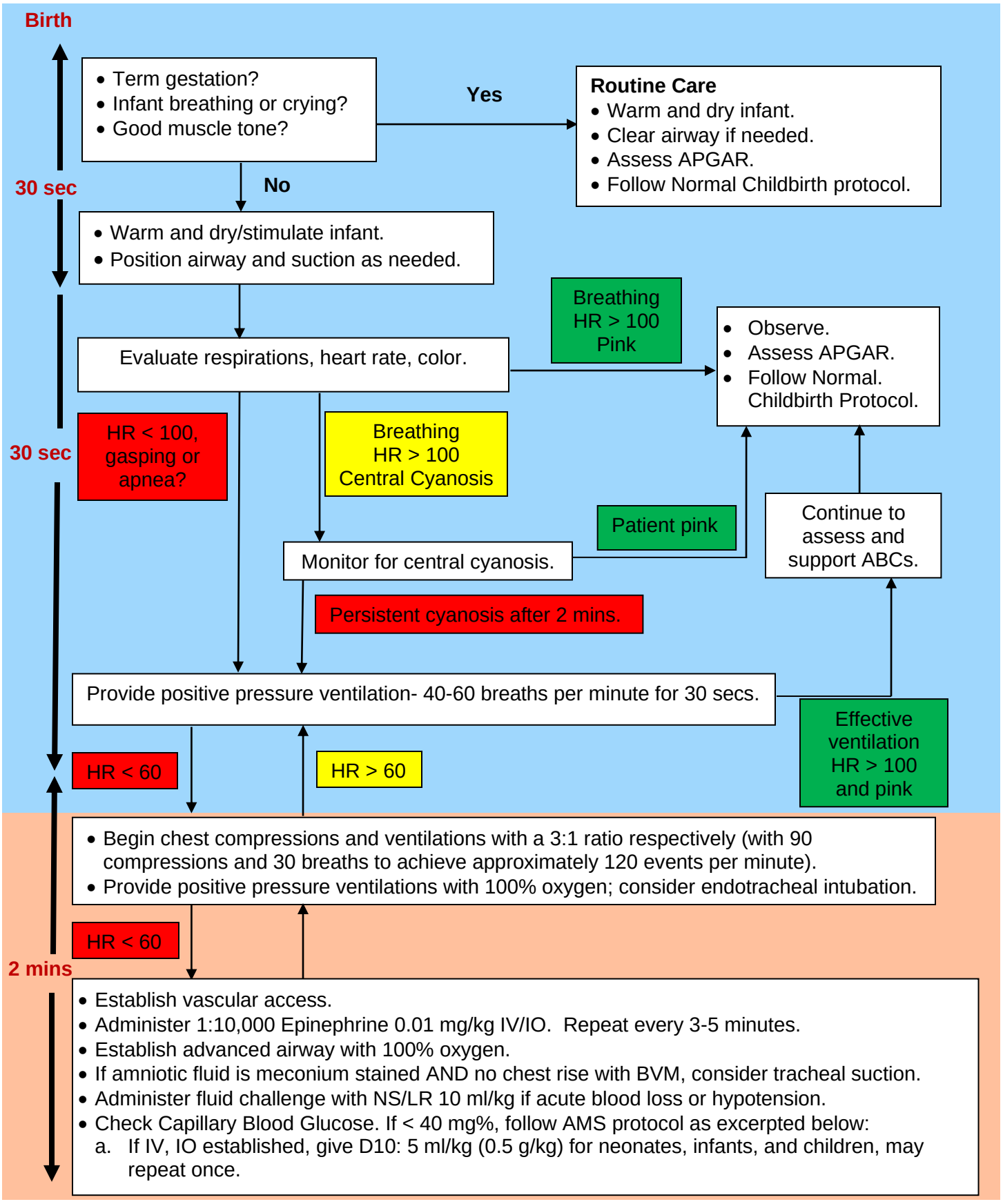
PEDIATRIC PATIENTS:

- Ondansetron use in patients under 6 months of age requires OLMC consultation except for children in spinal immobilization or children receiving chemotherapy.
- For children 6 months - 2 years of age, administer 2 mg ondansetron orally dissolving tablet (Zofran® ODT). For children 2 - 12 years of age, administer 4 mg ondansetron orally dissolving tablet (Zofran® ODT) or administer ondansetron 0.1mg/kg via slow IV push over 2 minutes up to a total maximum single IV dose of 4mg. Consider IM at same dose if unable to start IV and ODT tablet is contraindicated.

NOTES & PRECAUTIONS:

- Do not administer ondansetron (Zofran®) to patients with a hypersensitivity to the drug or other 5-HT_3 type serotonin receptor agonists (e.g., dolasetron, palonosetron, and granisetron.)
- Do not administer alkaline medications or preparations in the same IV as ondansetron as it may cause precipitation.

Neonatal Resuscitation – 10.120



POST RESUCITATION CARE:

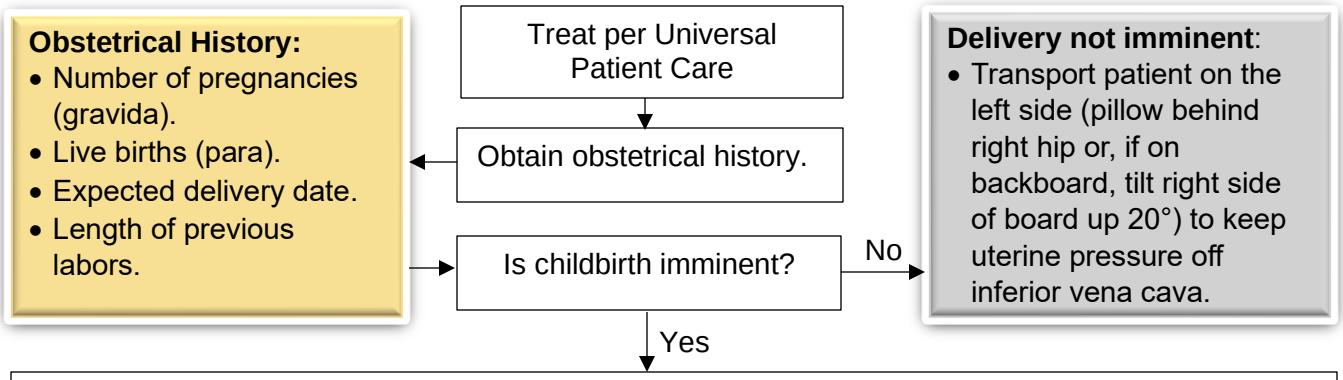
- Continue to provide assisted ventilations as needed.
- Closely monitor respiratory effort, heart rate, blood glucose, and pulse oximetry.
- **Keep newborn normothermic.** Hypothermia significantly increases risk of morbidity.
- Babies who required prolonged PPV, intubation and/or chest compressions are likely to have been severely stressed and are at risk for multi-organ dysfunction that may not be immediately apparent.

NOTES & PRECAUTIONS:

- Tracheal suctioning **is not** indicated in the vigorous infant born with meconium-stained fluid, whatever the consistency. Simply use a bulb syringe or large bore catheter to clear secretions from the mouth and nose as needed. However, if the newborn is having respiratory distress, then meconium aspiration should be performed per suctioning protocol.
- Volume expanders should not be given during resuscitation in the absence of a history or indirect evidence of acute blood loss. Giving a large volume load to a baby whose myocardial function is already compromised by hypoxia can decrease cardiac output. If fluid resuscitation is needed, administer 10 ml/kg NS over 5 - 10 minutes. Contact OLMC for repeat dosing.
- An electronic cardiac monitor is the preferred method for assessing heart rate.
- The ratio of compressions to ventilations should be 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.
- Pulse oximeter should be applied to the right hand preferentially.
- 100% oxygen should not be used to initiate resuscitation. Begin resuscitation with room air and add supplemental oxygen if infant remains cyanotic or oxygen saturation < 70% after 2 minutes.
- Expected oxygen saturation of full-term newborn:

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

Obstetrical- Childbirth – 10.130



Normal Childbirth Procedure:

- Ask if the patient has had prenatal ultrasound and the possibility of multiple births. If multiple, or abnormal birth, consider second transport unit.
- Use sterile or clean technique.
- Guide/control but do not retard or hurry delivery.
- Check for cord around neck and gently remove if found.
- After delivery, assess infant per Neonatal Resuscitation protocol. If no resuscitation is needed (term infant, breathing or crying, good muscle tone), proceed as below.
  - ✓ Administer 10 IU oxytocin IV/IM within one minute of delivery when feasible if the neonate is a singleton. For multiple births, administer oxytocin only after last neonate has delivered.
  - ✓ Do not suction infant's nose and mouth unless there is meconium present, **and** the infant is depressed; or there is a need to clear the airway.
- Briefly dry infant and place on mother's chest, in skin-to-skin contact. Cover both with a clean, dry blanket.
- Assess infant using APGAR at time of birth and five minutes later. (Documentation should describe the infant using criteria rather than giving a numerical score).
- At 30 - 60 seconds after delivery, clamp and cut the umbilical cord about 6 inches from infant after cord pulsations have ceased. If resuscitation is needed, cord may be clamped and cut as soon as necessary.
- Do not delay transport to deliver the placenta. After the placenta has delivered, gently externally massage uterus to encourage contractions and prevent bleeding.
- If mother has significant postpartum hemorrhage (> 500 ml), administer tranexamic acid 2 g slow IV push.
- Unless infant needs treatment, keep on mother's chest for transport.
- Monitor vital signs of mother and infant during transport.

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

Obstetrical- Complications – 10.130

Treat per Universal Patient Care

For all patients with obstetrical complications, do not delay, transport to the nearest appropriate hospital. Give receiving hospital earliest possible notification. Contact OLMC for advice.

If in third trimester, transport patient on the left side (pillow under right hip or, if on backboard, tilt right side of board up 20 degrees) to keep uterine pressure off inferior vena cava, unless delivery is imminent.

Start oxygen on all abnormal deliveries.

Vital signs may not be a reliable indicator of shock or respiratory distress in the pregnant patient.

Possible actions for specific complications below:

Pre-eclampsia and Eclampsia

- Acute onset severe hypertension in pregnant and postpartum women.
  - ✓ Includes all pregnant women and up to 6 weeks postpartum with symptoms.
  - ✓ Symptoms include headache, visual disturbances, chest discomfort, shortness of breath, confusion, or abdominal pain.
  - ✓ Notify receiving hospital of patients with a sustained elevation in BP ≥ 140 mmHg systolic and/or ≥ 100 mmHg diastolic that are present for at least 15 minutes or more.
  - ✓ Initiate treatment with labetalol (if available and feasible) if sustained elevation in BP ≥ 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either one or both) persists for at least 15 minutes or more.
    - ➢ Administer Labetalol 10 mg slow IV push over 1 - 2 minutes.
    - ➢ Target systolic BP 140 - 150 mmHg and diastolic BP 90 - 100 mmHg.
    - ➢ Labetalol may be repeated twice (up to 3 total doses) every 15 minutes doubling doses if needed depending on effect of preceding dose; (e.g., 1st dose – 10 mg, 2nd dose – 20 mg, 3rd dose – 40 mg). Maximum dose is 70 mg.
    - ➢ Stop administration if HR < 60 bpm or other adverse effects.
- Eclampsia is defined as the development of seizures in a patient with pre-eclampsia. Follow seizure protocol and contact OLMC for orders to administer magnesium sulfate.

Breech Delivery (buttocks first):

- If delivery is imminent, prepare the mother as usual and allow the buttocks and trunk to deliver spontaneously then support the body while the head is delivered.
- If the head does not deliver within three minutes, suffocation can occur.
  - ✓ Place a gloved hand into the vagina, with your palm toward the baby's face.
  - ✓ Form a "V" with your fingers on either side of the baby's nose and push the vaginal wall away from the baby's face to create airspace for breathing.
  - ✓ Assess for the presence of pulse in umbilical cord if able.

Limb Presentation

- The presentation of an arm or leg through the vagina is an indication for immediate transport to the hospital.
- Assess for presence of pulse in umbilical cord if presenting.

Prolapsed Cord

- Place the mother in left lateral Trendelenburg position.
- If the cord is visible, gently displace presenting part of baby off cord and maintain displacement. DO NOT pull or over-handle cord to prevent cord compression and spasm.

Abruptio Placenta

- Occurs in the third trimester of pregnancy when the placenta prematurely separates from the uterine wall leading to intrauterine bleeding.
- The patient experiences lower abdominal pain and the uterus often becomes rigid.
- Shock may develop without significant vaginal bleeding (concealed abruption).

Placenta Previa

- Occurs when the placenta covers the cervical opening, which can result in vaginal bleeding and prevents delivery of the infant through the vagina. The infant needs to be delivered via caesarian section.

Pain Management – 10.135

Treat per Universal Patient Care

- Consider and treat underlying causes of pain.
- Use non-pharmacological pain management (i.e., position of comfort, hot/cold pack, elevation, splinting, padding, wound care, and therapeutic calming and communication).

Determine location of pain and severity using numeric scale (1 - 10) or faces scale.

For mild pain, consider:

- **Acetaminophen** 325 - 1000 mg PO, or
- **Ibuprofen** 200 - 600 mg PO

Controlled medications (opioids and ketamine) are to be avoided in the following patients: Active labor, headache, non-traumatic neck or back pain, any chronic pain (head, neck, back, fibromyalgia, abdominal/pelvic pain), or dental pain. Contact OLMC

- Monitor SpO_2 and $EtCO_2$.
- Document vital signs, response to treatment and pain scale rating prior to and after each administration of pain medication.

Opioids and dissociative medications (ketamine) can be used in the same patient to achieve pain relieve if necessary.

For moderate to severe pain, consider:

Non-Opioid medications

- **Acetaminophen:** 1000 mg IV slow push over 5 minutes or over 10 - 20 mins if given by IV infusion.
- **Ketorolac (patients aged 2 - 80):** 30 mg IM or 15 mg IV. Do not repeat. Use for musculoskeletal pain or flank pain with suspected kidney stones.

Opioid medications

- **Fentanyl:** 50 - 100 mcg IV/IN/IM. May repeat with 25 - 50 mcg for IV/IN and 50 - 100 mcg for IM q 10 - 15 mins to max of 500 mcg. If BP < 100 mmHg or minor AMS or resp. depression, the first dose is 25 mcg all routes, repeating with 25 - 50 mcg q 10 - 15 mins, to max of 500 mcg. Monitor patient closely.
- **Hydromorphone**: 0.25 - 0.5 mg IV or 0.5 - 1.0 mg IM q 15 - 20 mins., to max of 2 mg. Do not administer if systolic BP < 100 mmHg.
- **Morphine:** 2 - 8 mg IV q 15 - 20 mins, to max of 20 mg. Or, 5 - 10 mg IM, repeating with 5 mg q 15 - 20 mins, to a max of 20 mg. Do not administer if systolic BP < 100 mmHg.

Dissociative medications

- **Ketamine:** 12.5 - 25 mg IV/IO slowly over 5 mins, or by IV infusion over 15 mins., or 25 - 50 mg IM. May repeat once in 30 mins., unless patient develops nystagmus, hallucinations, or other psychiatric symptoms. Must be diluted prior to IV or IO administration to a min. of 10 ml for slow IV push or 100 ml for IV infusion. Aternatively,1 mg/kg **VIA BREATH ACTUATED NEBULIZER (BAN)** MAY be used. Add saline for total volume of 5 ml.

PEDIATRIC PATIENTS:

- **Acetaminophen:** 15 mg/kg PO liquid only to a maximum of 1000 mg.
- **Ibuprofen:** 10 mg/kg PO liquid only to a maximum of 600 mg.
- **Ketorolac (age 2 - 16 years):** 1 mg/kg IM to a max of 30 mg or 0.5 mg/kg IV to a max of 15 mg. Do not repeat.
- **Fentanyl** (not to exceed adult dose):
  - ✓ 1 mcg/kg IV. May repeat with 0.5 - 1 mcg/kg every 10 - 15 minutes as needed to a maximum of 4 mcg/kg IV.
  - ✓ 2 mcg/kg IN. May repeat with 1 mcg/kg every 10 - 15 minutes as needed to a maximum of 4 mcg/kg IN.
  - ✓ If no IV/IN, may give fentanyl 1 - 2 mcg/kg IM. May repeat every 10 - 15 minutes to a max of 4 mcg/kg IM.
  - ✓ IN is preferred if no IV.
- **Hydromorphone:** For patients ≥ 12 months**:** 0.01 mg/kg IV/IM not to exceed the adult dose. May repeat every 15 - 20 minutes to a maximum of 2 mg. **Hydromorphone is not preferred in young infants and toddlers if fentanyl or morphine is available.**
- **Morphine:** 0.1 mg/kg IV or IM. (IM may repeat after 15 - 20 minutes). Do not exceed adult dosing.
- **Ketamine**: For children ≥ 15, dose is 0.3 mg/kg IV slow push over 5 minutes, up to a max of 25 mg. Dose must be diluted in normal saline prior to administration. Alternatively, for children ≥ 7, 1 mg/kg **VIA BREATH ACTUATED NEBULIZER (BAN)** MAY be used. Add saline for total volume of 5 ml.
- Do not administer fentanyl or morphine if patient's systolic blood pressure is lower than what is normal for child's age.

  Lowest normal pediatric systolic blood pressure by age:

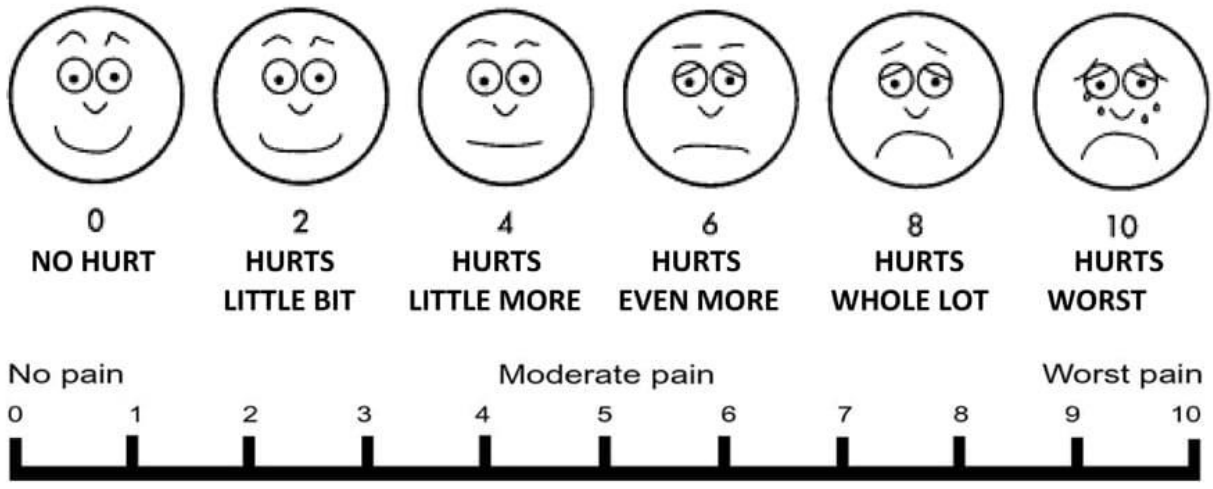
  - Less than one month: > 60 mmHg.
  - One month to 1 year: > 70 mmHg.
  - Greater than 1 year: 70 + 2 x age in years

NOTES AND PRECAUTIONS:

- Acetaminophen potentiates the analgesic effect of opioids, and they can be given together.
- Benzodiazepines do not have an analgesic effect. Their anxiolytic effects may potentiate the analgesic effect of opioids but also increase the likelihood of respiratory depression. OLMC consult is required for use of midazolam or lorazepam along with opioids for pain management.
- Do not give oral medication to patients with abdominal pain or open or obviously angulated fractures.
- Ketorolac should not be used in patients less than 2 or over 80.
- Do not administer ketamine to patients who are pregnant or have non-traumatic chest pain.
- Ketamine should not be given to patients with schizophrenia or history of psychosis due to the potential for exacerbating the mental health condition.

Pediatric Pain Scales:

FLACC Score			
CATEGORY	**0 POINTS**	**1 POINT**	**2 POINTS**
Face	Disinterested	Occasional grimace, withdrawn	Frequent frown, clenched jaw
Legs	No position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Normal position	Squirming, tense	Arched, rigid, or jerking
Cry	No crying	Moans or whimpers	Constant crying, screams or sobs
Consolability	Content, relaxed	Distractible	Inconsolable
SCORES ADD UP IN RANGE FROM 0–10			



Treat per Universal Patient Care

If systolic BP < 90 mmHg, follow Shock Protocol. Goal is to maintain a mean arterial pressure (MAP) ≥ 65 mmHg.

If unknown poison or overdose and the patient has a decreased LOC, treat per Altered Mental Status protocol. Manage airway per the Airway Management protocol. Contact OLMC and/or Poison Center (**1-800-222-1222**) for advice.

Treat specific **symptomatic** poisoning/overdose patient as outlined below. Strongly consider Haz-Mat Team activation when appropriate.

OVERDOSE/POISONING	TREATMENT
Aspirin and/or Acetaminophen	• Activated Charcoal 1 g/kg if < 2 hours since ingestion. Max dose 50 g. • If ingestion involves other substances, contact OLMC. • Avoid intubation for ASA ODs unless necessary. If intubation becomes necessary, the ventilation goal is to maintain pre-intubation $EtCO_2$ levels.
Beta Blockers	Treat bradycardia/hypotension with push dose epinephrine as bridge until an epinephrine drip at 2 - 10 mcg/min can be started. Titrate to effect.
Calcium Channel Blocker	Calcium gluconate, 1 - 3 g slow IV/IO over 5 - 10 minutes.
Carbon Monoxide	• Place all suspected CO poisoning patients on CPAP/BiPAP with high flow O_2. • Recommend NRB with nasal cannula if contraindications to or if patient does not tolerate CPAP/BiPAP. • Measure CO level with SpCO monitor when possible. • All symptomatic patients (e.g., headache, dizziness, nausea) or patients with an SpCO monitor reading ≥ 15% should be transported. Transport patients with severe symptoms (e.g., cardiac ischemia, coma, syncope, seizures, loss of consciousness) to a hyperbaric facility if available, or nearest facility if unavailable. • Treat symptoms per appropriate protocol (e.g., 12-lead ECG for suspected cardiac ischemia.) • If cyanide poisoning is also suspected, consider obtaining SpCO, if possible, before administration of CYANOKIT® since the latter will interfere with the carboxyhemoglobin monitor. • SpCO levels may be elevated in smokers. Levels can range from 3 - 10% depending on the number of packs smoked. • Pulse oximeter may provide a false reading in patients with elevated SpCO levels.

Chlorine Inhalation	Treat symptomatic patients with: • Albuterol- 2.5 mg nebulized. • Dexamethasone- 10 mg IV/IO/IM/PO. • Sodium bicarbonate 8.4%- 2.5 ml via nebulizer.
Cyanide	Hydroxocobalamin (CYANOKIT®) 5 g IV/IO over 15 minutes. Repeat once if needed. For cardiac arrest, hydroxocobalamin should be administered as a rapid bolus.
Hydrofluoric Acid	Dermal: Calcium gluconate 3 g mixed with 5 oz water soluble lubricant and applied to burn.
Organophosphate	• Prepare to handle copious secretions. • In mild to moderate poisonings (e.g., headache, mild bronchorrhea, nausea, vomiting, diarrhea but normal mentation), administer atropine 1 - 2 mg IV/IO/IM every 3 - 5 minutes until symptoms improve. • For severe poisoning (e.g., altered mental status, unconsciousness, seizures), administer atropine 3 - 5 mg IV/IO/IM every 3 - 5 minutes until symptoms begin to improve. • Treat seizures per seizure protocol. • See Haz-Mat Protocol for more specifics of treatment. • For large organophosphate poisonings, refer to HazMat protocol.
Sodium Channel Blocker (TCA, diphenhydramine, Type 1a and 1c antiarrhythmics)	• If patient exhibits arrhythmias or a widening QRS complex, administer sodium bicarbonate 1 mEq/kg IV/IO. • Treat hypotension per Shock protocol.
Do not neutralize acids or alkalis.	
If the patient exhibits extrapyramidal symptoms/Dystonia with a history of phenothiazine use, consider diphenhydramine.	

PEDIATRIC PATIENTS:

- Consider possibility of neglect or abuse.
- For organophosphate poisoning, atropine dose is 0.05 mg/kg IV/IO. Contact OLMC for frequency of dosing.
- Activated charcoal dose is 1 g/kg, max of 50 g.
- For children < 1-year, dilute sodium bicarbonate by one-half with normal saline prior to administration.
- Hydroxocobalamin for cyanide poisoning- 70 mg/kg IV/IO to a max of 5 g over 15 minutes. For cardiac arrest, hydroxocobalamin should be administered as a rapid bolus. Contact OLMC for advice regarding second dose.

TOXIDROME TABLE			
Toxidrome	**Examples**	**Clinical Features**	**Antidotes/Treatment**
Sympathomimetic	Cocaine Methamphetamine Ecstasy/MDMA	Agitation Hyperthermia Diaphoresis Dilated pupils HTN Tachycardia	Midazolam or lorazepam (OLMC)
Opioid	Heroin/Fentanyl Hydromorphone Methadone Oxycodone	Depressed mental status Hypoventilation Constricted pupils	Naloxone
Cholinergic (Anti-cholinesterase)	Pesticides • Carbamates • Organophosphates Nerve agents	Muscarinic* Nicotinic** Central***	Atropine Pralidoxime (2-Pam) Midazolam (Hazmat, OLMC)
Sedative-Hypnotic	Barbiturates Benzodiazepines GHB	Depressed mental status Hypotension Hypothermia	Supportive care
Cardiotoxic drugs	Beta-blockers Calcium channel blockers	Bradycardia Conduction issues Hypotension	Epinephrine Calcium (OLMC)
Anticholinergic	Atropine Jimson Weed Scopolamine Diphenhydramine	Delirium Hyperthermia Tachycardia Warm, dry skin	Supportive treatment Physostigmine (ED)
Sodium channel blockade	Tricyclic antidepressants Antiarrhythmics • Type 1A – quinidine, procainamide • Type 1C – flecainide, propafenone	Altered mental status Hypotension Seizures Wide complex tachycardia	Sodium Bicarbonate (OLMC)
Methemoglobinemia (nitrate/nitrite poisoning)	Contaminated well water (nitrates) Inhalation injuries Topical anesthetics (benzocaine, lidocaine) Amyl Nitrites (poppers)	Cyanosis SpO_2 75-85% despite supp. O_2 Headache Weakness Seizures/Coma Dysrhythmias Chocolate brown blood	Supportive Care O_2 administration Methylene blue (ED)

***Muscarinic:** Diarrhea, urination, miosis, bradycardia, bronchospasm, bronchorrhea, emesis, lacrimation salivation, sweating.
****Nicotinic:** Mydriasis, tachycardia, weakness, hypertension, hyperglycemia, fasciculations.
*****Central:** Confusion, convulsions, coma.

CO Clinical Presentation Transport Matrix				
Carbon Monoxide (Symptomatic or SpCO > 15%)	Yes	Yes	Yes	Yes
Burns	No	Yes	No	Yes
Trauma	No	No	Yes	Yes
Destination	Nearest facility or Hyperbaric Center if available	Burn Center	Trauma Center	Trauma Center

Respiratory Distress- CHF/Pulmonary Edema – 10.160

Treat per Universal Patient Care

Decompensated Heart Failure

Sit patient upright.

Systolic BP > 100 mmHg

YES

Nitroglycerin 0.4 mg SL; repeat every 3 - 5 minutes. *

Consider albuterol 2.5 mg by nebulizer. May repeat as needed.

If the patient remains in respiratory distress, consider CPAP/BiPAP if available.

Furosemide (If systolic BP > 100 and fluid overload state with JVD, edema (peripheral, sacral, abdominal), recent weight gain):

- If patient is not currently taking furosemide, give 20 mg IV.
- If the patient is taking furosemide, give 40 mg IV.

NO

Treat for possible cardiogenic shock per Shock protocol.

"SCAPE" - Sympathetic Crashing Acute Pulmonary Edema (Rapid onset, extreme respiratory distress, diaphoresis markedly elevated systolic blood pressure > 160, tachycardia, decreased oxygen saturation)

Nitroglycerin 0.4 mg SL; repeat every 3 - 5 minutes. *

If the patient remains in severe respiratory distress (e.g., unable to speak more than 1 - 2 words, low SpO_2 (< 90%), respiratory rate > 40), start CPAP/BiPAP if available. (**CPAP/BiPAP can be started prior to SL NTG being given. Once started, do not break the seal of the mask when possible. If CPAP/BiPAP is in place prior to SL nitroglycerin, you can proceed to push dose nitroglycerin directly.)**

Push dose nitroglycerin 1 mg IV, if respiratory distress persists and SBP remains > 160 mmHg systolic. May repeat once in 5 minutes.

- Aggressive management, including early intubation, is appropriate for the patient who does not respond to treatment or is rapidly deteriorating.
- The best indicator for the cause of respiratory distress is the patient's history. If a person has had COPD or CHF in the past, it is likely the person has worsening of the same condition again.
- ***Do not administer nitroglycerin without OLMC approval if patient has taken sildenafil (Viagra®), vardenafil (Levitra®) or other similar drugs in the last 24 hours, or tadalafil (Cialis®) within the last 48 hours.**

Respiratory Distress- COPD/Asthma – 10.160

Treat per Universal Patient Care

Presentation: Wheezing, prolong expiratory phase, decreased breath sounds, accessory muscle use, history of asthma/COPD. **The best indicator for etiology of respiratory distress is the patient's history.**

DuoNeb (albuterol 3 mg / ipratropium 0.5 mg) by nebulizer. Repeat DuoNeb as needed X 2. Do not administer more than three total DuoNeb treatments.

If additional bronchodilator needed after DuoNeb, repeat albuterol only, 2.5 mg by nebulizer as needed.

If patient has moderate to severe respiratory distress based on Severity Assessment Guide, administer dexamethasone 10 mg IV/IO/IM/PO.

Asthma

If patient is deteriorating, give epinephrine 1:1000 0.3 - 0.5 mg IM. May repeat once in 5 - 15 minutes if patient is still in extremis. Consider using lower dose (0.3 mg) for patients > 40 years old or known coronary artery disease.

If transport time is long and asthma is severe, consider magnesium sulfate 2 grams over 10 - 20 minutes.

Consider CPAP/BiPAP if non-responsive to interventions or impending respiratory failure.

COPD

Consider CPAP/BiPAP if available.

In cases of tachypnea consider causes such as pulmonary embolus, hypoxia, cardiac causes, infection, acidosis (DKA, sepsis), and trauma. Apparent hyperventilation may be a response to a medical problem and should only be considered after these other causes have been excluded. Do not treat hyperventilation by rebreathing CO_2. Reassurance and oxygen via mask are appropriate.

NOTES & PRECAUTIONS:

- Aggressive management, including early intubation, is appropriate for the patient who does not respond to treatment or is rapidly deteriorating.
- COPD and asthma patients receiving CPAP/BiPAP need to be monitored closely due to the higher risk of secondary pneumothorax from positive pressure ventilation.

ASTHMA SEVERITY ASSESSMENT GUIDE			
	MILD	**MODERATE**	**SEVERE**
Short of breath	Walking	Talking	At rest
Able to speak	In sentences	In phrases	In words
Heart rate	< 100	100 - 120	> 120
Respiratory rate	Elevated	Elevated	> 30
Lung sounds	End expiratory wheezes	Full expiratory wheezes	Wheezes both phases or absent
Accessory muscle use	Not usually	Common	Usually
Alertness	Possibly agitated	Usually agitated	Usually agitated
$EtCO_2$	20 - 30	30 - 40	> 50

Respiratory Distress- Pediatrics – 10.160

Upper Airway (Croup, epiglottitis, laryngeal edema)

In patients 6 months to 6 years of age with audible stridor at rest, administer 5 ml (5 mg) epinephrine 1:1000 via nebulizer, **or** 0.5 ml (11.25 mg) of racepinephrine diluted with 2.5 ml of normal saline via nebulizer. May repeat once in 10 minutes if necessary. Contact OLMC for additional dosing.

- The usual cause of respiratory arrest in children with croup, epiglottitis, or laryngeal edema is exhaustion, not airway obstruction.
  - ✓ If suspected croup, administer dexamethasone 0.6 mg/kg IV/IO/IM/PO up to 10 mg.
  - ✓ If the child deteriorates, ventilate with a BVM.
  - ✓ If you cannot effectively ventilate with BVM, perform intubation.

If complete obstruction is present and you cannot effectively BVM ventilate the patient and the patient is deteriorating, consider needle cricothyrotomy.

Asthma

- Consider asthma in the following setting:
  - ✓ Prior history of wheezing.
  - ✓ History of eczema and allergies.
  - ✓ Family history of asthma.
  - ✓ Home use of bronchodilator.

- DuoNeb (albuterol 3 mg / ipratropium 0.5 mg) by nebulizer. Repeat DuoNeb as needed X 2. Do not administer more than three total DuoNeb treatments.
- If additional bronchodilator needed, administer albuterol only 2.5 mg by nebulizer as needed.

- If patient is deteriorating give 1:1000 epinephrine 0.01 mg/kg IM (max dose 0.5 mg). Contact OLMC for additional doses.

If patient has moderate to severe asthma and is not improving with treatment, consider dexamethasone 0.6 mg/kg IV/IO/IM/PO up to 10 mg.

If transport time is long and asthma is severe, contact OLMC for consideration of magnesium sulfate.

Acute Bronchiolitis (< 2 years old)

If upper airway symptoms such as stridor, dysphagia, unusual drooling, follow upper airway arm of flow chart

Give oxygen via blow-by, nasal cannula or mask to keep SpO_2 > 92%. Monitor $EtCO_2$ if available.

If nasal secretions and/or congestion, use nasal suction with adapter if available. If secretions are thick, may use saline to loosen.

If still wheezing, give albuterol 2.5 mg via nebulizer. If improvement may use every 10 minutes. Discontinue if patient's heart rate is > 200.

If unable to keep SpO_2 > 92% with oxygen or patient has continued significant work of breathing despite treatment, administer 1 lpm/kg of oxygen up to 15 lpm as starting setting (max at 2 lpm/kg or 20 lpm) by High Flow Nasal Cannula (pediatric) oxygen ($HFNCO_2$).

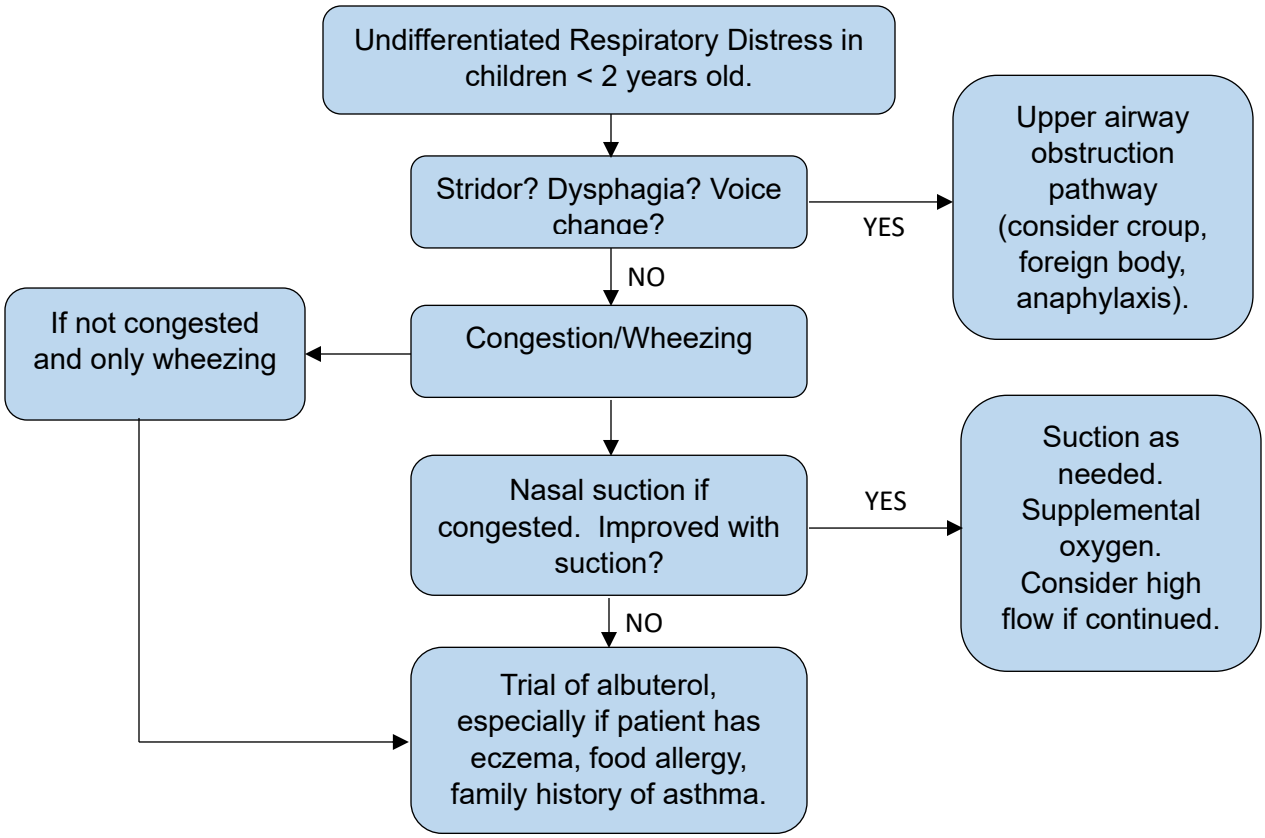
Severe respiratory distress (see Infant Respiratory Distress table below)

- Suction nares as described above.
- Initiate high flow nasal cannula oxygen as described above with $EtCO_2$ monitoring.
- If wheezing, give albuterol 2.5 mg via nebulizer. If improvement, may use every 10 minutes. Discontinue if patient's heart rate is > 200.
- Prepare for positive pressure ventilation with BVM and intubation for apnea, $EtCO_2$ > 55, or inability to maintain SpO_2 > 85%.

Treat anaphylaxis and foreign body obstruction per adult guidelines. Remove object using direct laryngoscopy if complete obstruction exists

Respiratory Distress- Pediatrics – 10.160

INFANT RESPIRATORY DISTRESS ASSESSMENT GUIDE			
	MILD	**MODERATE**	**SEVERE**
Respiratory Rate			
≤ 2 months	≤ 60	61 - 69	≥ 70
2 - 12 months	≤50	51 - 59	≥ 60
1 - 2 years	≤ 40	41 - 44	≥ 45
Retractions	Subcostal or intercostal	2 of: subcostal, intercostal, substernal retractions, OR nasal flaring	3 of: subcostal, intercostal, substernal, suprasternal, supraclavicular retractions, OR nasal flaring, OR head bobbing
Dyspnea	1 of: difficulty feeding, decreased vocalization or agitation	2 of: difficulty feeding, decreased vocalization or agitation	Stops feeding, no vocalization OR drowsy and confused
Auscultation	End-expiratory wheeze only	Expiratory wheeze only	Inspiratory and expiratory wheezing OR diminished breath sounds OR both



Seizures – 10.170

Treat per Universal Patient Care

Actively seizing upon EMS arrival or having repetitive seizures without regaining consciousness?

Yes

If no IV:

Midazolam 10 mg IM/IN. Repeat every 5 minutes until seizure stops.

OR

Lorazepam 4 mg IM. Repeat once in 10 minutes if seizure continues. Max 8 mg.

If IV already established:

Midazolam 2.5 - 5 mg IV/IO. Repeat q 5 minutes until seizure stops.

OR

Lorazepam 2 mg IV/IO. Repeat q 5 minutes until seizure stops to max of 8 mg.

Check CBG after first dose of either midazolam or lorazepam. Treat per AMS protocol. Monitor respiratory status closely after medication administration.

If seizure does not stop after two doses of midazolam or lorazepam, transport to closest hospital.

No

- Check pulse and reassess ABCs.
- Provide supplemental oxygen to maintain $SpO_2 \geq 94\%$.
- Check CBG.

Transport may be unnecessary if patient becomes fully oriented, is taking anti-seizure medication as prescribed, has a health care provider, and this is a typical seizure for the patient.

All first-time seizure patients require medical evaluation and should be transported. Contact OLMC if patient refuses.

PEDIATRIC PATIENTS:

- If patient is actively seizing upon EMS arrival or having repetitive seizures without regaining consciousness:
  - ✓ **0 - 11 months** (16 - 29", 0 - 8 kg) **or patient is extremely small for age**: Follow pediatric guide and administer midazolam 0.3 mg/kg IM/IN to a max of 10 mg. Repeat every 5 minutes until seizure stops.
  - ✓ **12 months - 13 years old** (use reported age; if unknown, measure patient and use corresponding length in inches to determine dose):
    - ➢ 12 - 16 months (29.5 - 31.5", 9 kg): 0.25 ml (= 1.25 mg) IM/IN
    - ➢ 17 months - 5 years (32 - 43", 10 - 19 kg): 0.5 ml (= 2.5 mg) IM/IN
    - ➢ 6 - 11 years (43.5 - 56.5", 20 - 37 kg): 1 ml (= 5 mg) IM/IN
    - ➢ 12 - 13 years (≥ 57", ≥ 38 kg): 2 ml (= 10 mg) IM/IN

    Repeat every 5 minutes until seizure stops.
- If an IV/IO is already available, follow pediatric guide and administer midazolam 0.1 mg/kg IV/IO to a max of 5 mg. Repeat every 5 minutes until seizure stops.
- **If midazolam unavailable**, administer lorazepam 0.2 mg/kg IM, max single dose 4 mg. Repeat q 10 mins until seizure stops to a total max of 8 mg, or 0.1 mg/kg IV/IO, max single dose 2 mg. Repeat q 5 minutes until seizure stops, max total dose 8 mg.
- If seizure does not stop after two doses of midazolam or lorazepam, transport to closest hospital. Transport to a non-pediatric hospital may be necessary to get alternative antiepileptics.
- If on arrival, the patient is not actively seizing (post-ictal), an IV is not required.
- All hypoglycemic or first-time pediatric seizures patients should be transported.
- Febrile seizures are typically found between the ages of 6 months - 6 yrs. and are usually brief.

NOTES & PRECAUTIONS:

- Seizures in patients > 50 years of age can be caused by dysrhythmias. Monitor rhythm and treat per appropriate protocol. Remember to check a pulse once a seizure stops.
- The longer status seizure lasts, the more difficult it is to control. Seizures that aren't responsive to midazolam or lorazepam may require alternative antiepileptic agents in a timely manner.
- New onset of seizures in a pregnant patient, especially in the third trimester, may indicate eclampsia. Contact OLMC for consideration of magnesium sulfate. Normal dose is 4 grams IV over 15 - 20 minutes.

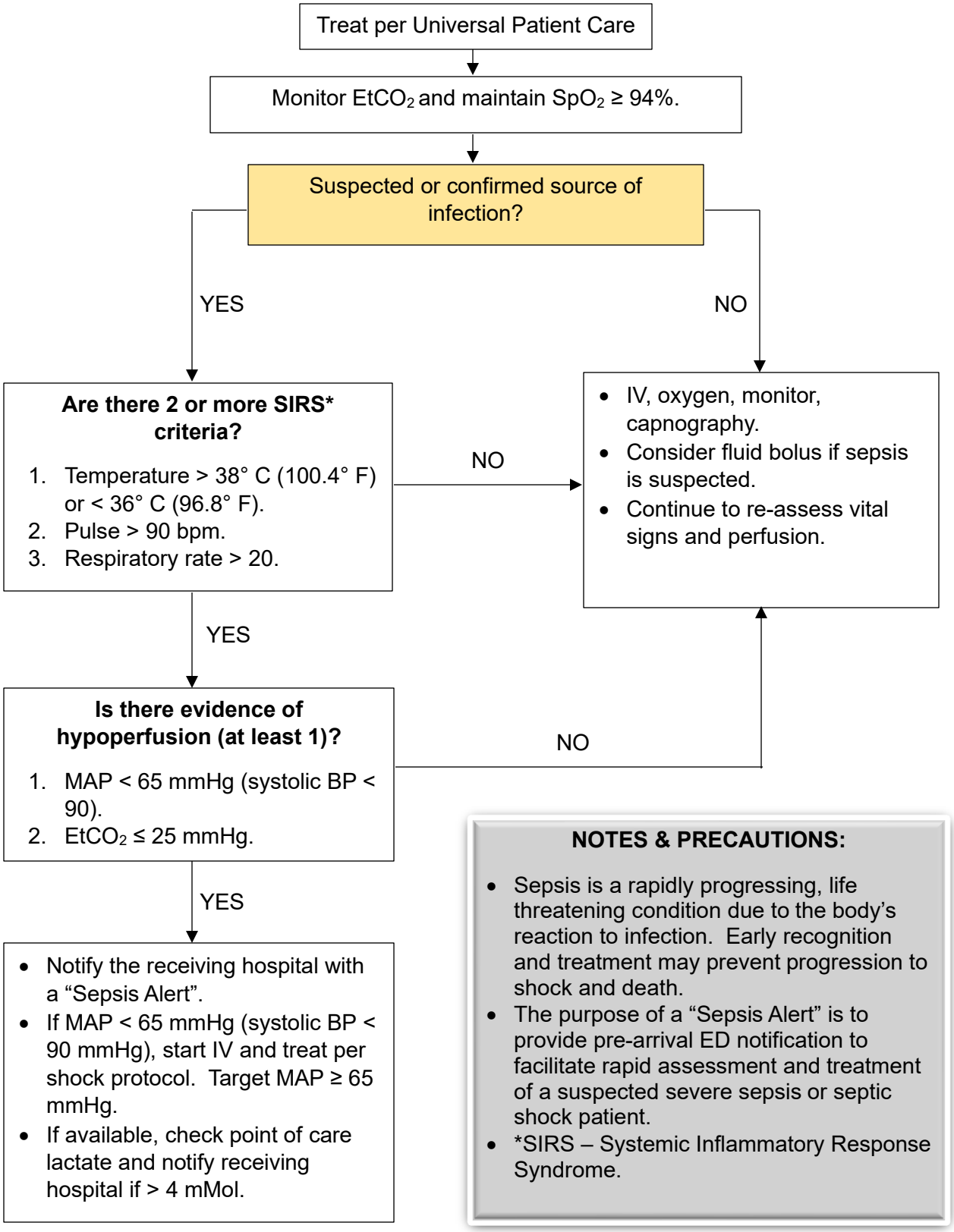
PediDOSE

- Enrollment criteria:
  - ✓ Age ≥ 6 months to ≤ 13 years **AND**
  - ✓ Had a paramedic -witnessed seizure **AND**
  - ✓ Require transport to any hospital
- Exclusion criteria:
  - ✓ A prior history of a benzodiazepine allergy; **OR**
  - ✓ Known or presumed pregnancy; **OR**
  - ✓ Severe growth restriction based on the paramedic's assessment
- If the patient's family has questions about PediDOSE please provide them with the following phone number for them to reach out to the study staff:

503-494-4777

- Following enrollment into the PediDOSE study (enrollment does not require medication to have been administered, but may include self-terminating seizures, if witnessed by a paramedic), scan the QR code below and complete the paramedic self-report:

Sepsis – 10.175



Shock – 10.180

Treat per Universal Patient Care and prepare for rapid transport

↓

Determine type of shock and treat as follows:

↓

Hypovolemic or Hemorrhagic Shock	Obstructive Shock (Tamponade, Pneumothorax, PE)
• Control external bleeding with direct pressure, elevation, tourniquet, and/or hemostatic dressing. • Administer 500 - 1000 ml fluid challenge to maintain MAP > 65 mmHg (SBP > 90 mmHg). Repeat fluid boluses if continued signs of shock and no pulmonary edema. • For shock secondary to trauma or suspect AAA do not over resuscitate. MAP 55 - 65 mmHg (Goal is SBP 70 - 90 mmHg). • If hemorrhagic shock with blunt or penetrating trauma **and** MAP < 50 mmHg (SBP < 70 mmHg), administer 2 grams TXA slow IV/IO push. • Contact OLMC for advice.	• If tension pneumothorax is suspected, decompress per the Tension Pneumothorax Decompression procedure protocol. • Administer 500 - 1000 ml fluid challenge to maintain MAP > 65 mmHg (SBP > 90 mmHg). Repeat fluid boluses if continued signs of shock and no pulmonary edema. • If **not** responding to fluid administration begin norepinephrine infusion at 4 mcg/min. If no response, increase every 5 minutes in 4 mcg/min increments to max of 24 mcg/min. Goal is MAP > 65 mmHg (SBP > 90 mmHg). • While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support. • Contact OLMC for advice.
Cardiogenic Shock (STEMI, cardiomyopathy)	**Distributive Shock (septic, neurogenic, anaphylactic) or unknown type of shock**
• If suspected cardiac event, follow Chest Pain protocol. • Monitor cardiac rhythm and follow Cardiac Dysrhythmia protocol. • Administer 250 - 500 ml fluid challenge to maintain MAP > 65 mmHg (SBP > 90 mmHg). May repeat once if continued signs of shock and no pulmonary edema/volume overload. Max of 1000 ml. • If **not** responding to fluid administration, begin norepinephrine infusion at 4 mcg/min. If no response, increase every 5 minutes in 4 mcg/min increments to max of 24 mcg/min. Goal is MAP > 65 mmHg (SBP > 90 mmHg). • While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support. • Contact OLMC for advice.	• **If anaphylaxis is suspected,** follow Anaphylaxis and Allergic Reaction protocol. • Administer 500 - 1000 ml fluid challenge to maintain MAP > 65 mmHg (SBP > 90 mmHg). Repeat once if continued signs of shock and no pulmonary edema. • If **not** responding to fluid administration, begin norepinephrine infusion at 4 mcg/min. If no response, increase every 5 minutes in 4 mcg/min increments to max of 24 mcg/min. Goal is MAP > 65 mmHg (SBP > 90 mmHg). • While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support. • Contact OLMC for advice.

Shock – 10.180

PEDIATRIC PATIENTS:

Treat per Universal Patient Care and prepare for rapid transport

↓

Determine type of shock and treat as follows:

↓

Hypovolemic or Hemorrhagic Shock

- Control external bleeding with direct pressure, elevation, tourniquet, and/or hemostatic dressing.
- Administer 20 ml/kg fluid challenge (10 ml/kg in neonates) to maintain age appropriate SBP. Repeat twice if continued signs of shock and no pulmonary edema to a max of 60 ml/kg (30 ml/kg in neonates)
- Contact OLMC for advice.

Lowest normal pediatric systolic blood pressure by age:

- Less than one month: > 60 mmHg.
- One month to 1 year: > 70 mmHg.
- Greater than 1 year: 70 + 2 x age in years.

Obstructive Shock (Tamponade, Pneumothorax, PE)

- If tension pneumothorax is suspected, decompress per the Tension Pneumothorax Decompression procedure protocol.
- Administer 20 ml/kg fluid challenge (10 ml/kg in neonates) to maintain age appropriate SBP. Repeat twice if continued signs of shock and no pulmonary edema to a max of 60 ml/kg (30 ml/kg in neonates)
- If **not** responding to fluid administration begin norepinephrine infusion at 0.1 mcg/kg/min. If no response, in 5 minutes, increase to 0.2 mcg/kg/min. If still no response after 5 more minutes, may increase to 0.4 mcg/kg/min. Goal is age appropriate SBP.
- While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support.
- Contact OLMC for advice.

Cardiogenic Shock (STEMI, cardiomyopathy)

- If suspected cardiac event, follow Chest Pain protocol.
- Monitor cardiac rhythm and follow Cardiac Dysrhythmia protocol.
- Administer 20 ml/kg fluid challenge (10 ml/kg in neonates) to maintain age appropriate SBP. Repeat twice if continued signs of shock and no pulmonary edema to a max of 60 ml/kg (30 ml/kg in neonates).
- If blood pressure remains low, begin norepinephrine infusion at 0.1 mcg/kg/min. If no response in 5 minutes, increase to 0.2 mcg/kg/min. If still no response after 5 more minutes, may increase to 0.4 mcg/kg/min. Goal is age appropriate SBP.
- While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support.
- Contact OLMC for advice.

Distributive Shock (septic, neurogenic, anaphylactic) or unknown type of shock

- **If anaphylaxis is suspected**, follow Anaphylaxis and Allergic Reaction protocol.
- Administer 20 ml/kg fluid challenge (10 ml/kg in neonates) to maintain age appropriate SBP. Repeat twice if continued signs of shock and no pulmonary edema.
- If blood pressure remains low, begin norepinephrine infusion at 0.1 mcg/kg/min. If no response in 5 minutes, increase to 0.2 mcg/kg/min. If still no response after 5 more minutes, may increase to 0.4 mcg/kg/min. Goal is age appropriate SBP.
- While drip is being set up, consider push dose epinephrine, per epinephrine protocol, for temporary hemodynamic support.
- Contact OLMC for advice.

NOTES & PRECAUTIONS:

- Closely monitor patient's respiratory status and vital signs. Avoid fluid overload.
- Mean Arterial Pressure targets:
  - ✓ Uncontrolled traumatic hemorrhagic shock without TBI or suspected AAA, target MAP is 55 - 65 mmHg (SBP 70 - 90).
  - ✓ Uncontrolled traumatic hemorrhagic shock with TBI or shock from all other causes, target MAP is ≥ 65 mmHg (SBP ≥ 90).
- For patients in shock with known or suspected adrenal insufficiency (AI) consider administration of dexamethasone 10 mg (0.6 mg/kg for pediatric patients) in addition to fluids and/or norepinephrine.
- If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove the improvised tourniquet if operationally feasible.

Treat per Universal Patient Care

- Apply cardiac monitor as soon as possible and continuously assess rhythm.
- Place 18g IV or larger in AC when possible.
- Check CBG: If low, treat per Diabetic Emergencies-Hypoglycemia protocol.
- **No oxygen if SpO_2 ≥ 94% with good waveform.**

Complete the **BEFAST stroke assessment** if last known well time is ≤ 24 hours ago.

1 BEFAST STROKE SCREEN

Neurological examination	Normal	Abnormal (any positive)
Balance Symptoms: • Acute loss of balance, coordination, trouble walking Test: • Perform bilateral index finger-to-nose test (FTN test) • Have the patient walk if normally able to (walk next to them in case of gait instability) • If patient unable to walk, have the patient sit up (truncal stability test) Positive findings: • Patient overshoots or undershoots intended target (FTN test) • Patient falls over to one side (truncal instability) • Unsteady gait (shuffling, wide based gait, falling to one side) that the patient reports is acutely abnormal	Normal	Abnormal
Eyes Symptoms: • Acute onset of vision loss, double vision, or part of vision loss (visual field cut) Test: • Ask the patient if they have double vision or loss of vision in one or both eyes • Make sure the patient can move their eyes all the way from left to right up and down (extraocular movements) Positive findings: • Trouble seeing out of one or both eyes or acute onset of double vision or visual field cut • Eyes are deviated together to the left or to the right or are unable to perform full movement	Normal	Abnormal

Neurological examination	Normal	Abnormal (any positive)	
Face Symptoms: • Acute onset facial droop Test: • Ask the patient to smile or show their teeth Positive findings: • The patient's face looks uneven, is drooping, or has numbness on one side	Normal	Right	Left
Arms/Legs Symptoms: • Acute onset numbness or weakness of the arm/leg on one side of the body Test: • Ask the patient to raise and extend both arms with their palms up for 10 seconds, then close their eyes • Ask the patient to raise one leg at a time for 5 seconds • Touch each side of the patient's extremities and ask if they feel each equally Positive finding: • One arm or leg drifts downward • Unequal extremity sensation	Normal	Right	Left
Speech Symptoms: • Acute onset slurred speech, trouble speaking, or understanding Test: • Ask the patient to repeat the phrase, "The sky is blue." • Ask the patient to (1) squeeze *AND* let go of your hand (2) open *AND* close their eyes • Ask the patient to name common objects (e.g., glove, pen, watch) Positive findings: • Slurred speech, trouble finding words, unintelligible words • Patient is unable to follow simple commands • Patient is unable to recognize common objects	Normal	Abnormal	
Time • What time was the patient last known well (i.e., last appear normal)?	Last Known Well Time: _____		

If BEFAST is positive (at least 1 of the neurological examination findings are **ABNORMAL**), the patient is considered to have a **POSITIVE** stroke screen. Continue to **Cincinnati – Stroke Triage Assessment Tool (C-STAT)** to screen for a large vessel occlusion (LVO) stroke.

2 C-STAT – CINCINNATI STROKE TRIAGE ASSESSMENT TOOL

	Points	
Conjugate Gaze Deviation – Eyes are deviated together to the left or to the right or are unable to perform full movement.		
Absent	0	
Present	2	
Arm Weakness - Cannot hold up one arm for 10 seconds		
Absent	0	
Present	1	
Level of Consciousness - Incorrectly answers at least one of two LOC questions (1) what is your name? (2) what is the month? **AND** does *NOT* follow at least one of two commands (1) squeeze *AND* let go of your hand (2) open *AND* close their eyes.		
Absent	0	
Present	1	

******* POSITIVE C-STAT SCORE IS ≥ 2 *******

POSITIVE C-STAT stroke patients should be transported to the nearest interventional stroke center

- If **BEFAST** and C-STAT positive **(≥ 2**), transport to the **nearest interventional stroke center** *AND* notify the receiving facility of acute stroke alert as soon as feasible.
- If **BEFAST** positive and C-STAT negative, transport to the **nearest stroke center** *AND* notify the receiving facility of acute stroke alert as soon as feasible.
- If **BEFAST** is negative, transport to any receiving facility.
- Notify the receiving facility if the patient is either C-STAT positive or negative.

Transport patient with head elevated at least 30 degrees.

Document serial neurologic examinations.

NOTES & PRECAUTIONS:

- Do not treat hypertension or give aspirin.
- All potential stroke patients should be transported to a stroke center.

Submerged Patient/Drowning– 10.200

Treat per Universal Patient Care

Spinal Motion Restriction is indicated **only** if circumstances suggest possible spinal injury.

Assess mental status.

Awake and alert

Remove wet garments, dry, and insulate patient.

- Transport, even if initial assessment normal.
- Monitor ABCs, vitals, mental status.
- If respiratory distress develops, consider CPAP as delayed pulmonary edema may occur.

Awake but altered LOC

Remove wet garments, dry, and insulate patient.

- Suction as needed.
- Start IV, check CBG, give oxygen if SpO_2 < 94%.
- Transport.
- Monitor ABCs, vitals, mental status.
- Monitor cardiac rhythm.

Comatose or unresponsive

Pulse Present

NO

- CPR (starts with ventilations first). *
- Remove wet garments and dry patient.
- Attach monitor.
- Treat per Pulseless Arrest protocol.
- Handle gently.
- Start IV with warm IV fluids if available.
- Insulate patient.
- Consider advanced airway especially for suspected pulmonary edema.
- Monitor cardiac rhythm, waveform. capnography

Be prepared to manage vomiting.

On-boat CPR may be delivered if rescuers trained in this technique determine that it is feasible and safe to attempt resuscitation. In-water resuscitation (ventilations only) may be delivered if rescuers trained in this technique determine that it is feasible and safe with the equipment available and the distance to shore warrants its use.

YES

- Remove wet garments, dry, and insulate patient.
- Consider all causes of altered mental status.
- Suction as needed.
- Start IV, check CBG and give oxygen if SpO_2 < 94%.
- Monitor ABCs, vitals, mental status, cardiac rhythm, waveform capnography.
- Consider advanced airway especially for suspected pulmonary edema.

***Do not attempt resuscitation if patient has been submerged for more than 30 minutes, with the following exceptions:**

Resuscitation may be initiated if the patient is recovered within 60 minutes if:

- Children < 6 years of age and water temperature at recovery depth of < 40° F.
- Patients who may have been trapped in an underwater air pocket.
- Water temperature at recovery depth is < 40° F and information suggests that patient may have been swimming on the surface for at least 15 minutes prior to becoming submerged.
- Paramedic discretion (contact OLMC).

Traumatic Brain Injury – 10.300

Treat per Universal Patient Care.

Determine GCS to categorize injury severity.

- Mild: GCS 13 - 15
- Moderate: GCS 9 - 12
- Severe: GCS ≤ 8

Place a non-rebreather facemask on ALL patients with potential TBI. **Avoid Hypoxia at all times.**

Prevent hypotension: Goal MAP ≥ 80 mmHg (SBP ≥ 110) **for isolated traumatic brain injuries only**.

- Initiate a bolus of normal saline or lactated ringers.
- Continue fluid boluses to maintain the MAP ≥ 80 mmHg (SBP ≥ 110 mmHg).

AIRWAY CONSIDERATIONS:

- If patient is unable to maintain airway, consider oral airway (nasal airways should not be used in the presence of significant facial injury or possible basal skull fracture).
- Place an advanced airway (oral endotracheal intubation, supraglottic device, surgical airway) if BVM ventilation ineffective in maintaining oxygenation or if airway is continually compromised. Nasal intubation should not be attempted.
- If the patient has an airway placed (oral or advanced), carefully manage ventilations to minimize hyperventilation.
  - ✓ Monitor $EtCO_2$ with goal of $EtCO_2$ of 40 mmHg.
  - ✓ If available, use a pressure-controlled bag (PCB) and ventilation rate timer (VRT).
  - ✓ If a transport ventilator is available, begin with the following settings:
    - ➢ Tidal volume of 7ml/kg,
    - ➢ Rate of 10 BPM. Adjust rate to keep $EtCO_2$ within target range.

If there are signs of herniation, then MILD hyperventilation to an $EtCO_2$ of 35 mmHg may be performed. Signs of herniation include:

- Blown pupil
- Posturing

For moderate to severe blunt or penetrating head trauma: **If available**, administer 2 grams Tranexamic acid (TXA) slow IV/IO push if **both** of the following indications are met:

- Age ≥ 15 (or ≥ 50 kg if age unknown).
- GCS between 3 and 12, with a reactive pupil.

Contraindications to TXA:

- Time of head injury > 2 hours.
- GCS of 3 with no reactive pupil.
- EMS chest compressions at any time (manual or mechanical).
- Patients with a clinical concern for: Epilepsy, seizures, MI, stroke, PE, DVT, renal failure dialysis.
- Known or suspected pregnancy.
- Drowning, hanging, or burns > 20% TBSA.

Consider and treat reversible causes of AMS including hypoxia, hypoglycemia, and overdose.

PEDIATRIC PATIENTS (follow adult flow chart with the following considerations):

- Manage blood pressure. **Avoid hypotension.**
  - ✓ Initiate a 20 ml/kg bolus of normal saline or lactated ringers.
  - ✓ Continue fluid boluses to maintain SBP goals:
    - ➢ Infants/children age < 10: 70 mmHg + (age X 2).
    - ➢ Children age ≥ 10: 110 mmHg (same as adults).

- Pediatric ventilatory rates:
  - ✓ Infants: (age 0 - 24 months): 25 breaths per minute (bpm);
  - ✓ Children: (age 2 - 14): 20 bpm;
  - ✓ 15 years: 10 bpm (same as adults).

NOTES & PRECAUTIONS:

- The main goal is to address the three H's that increase mortality with isolated TBI:
  - ✓ Avoid **H**ypoxia.
  - ✓ Avoid **H**yperventilation.
  - ✓ Avoid **H**ypotension.
- A single episode of hypoxia is independently associated with DOUBLING of the mortality rate.
- Hyperventilation is independently associated with a mortality rate that is between TWO and SIX times higher. Inadvertent hyperventilation happens reliably if not meticulously prevented by proper external means.
- A single episode of hypotension is independently associated with DOUBLING of the mortality rate and persistent hypotension is independently associated with a mortality rate that is eight times higher.

Medications

Acetaminophen – 20.005

OLMC REQUIRED: No

SUPPLIED:
160 mg/5 mL liquid; 325 mg and 500 mg tablets, capsules, gel, suppositories; 10 mg/ml, 100 ml vial; 10 mg/ml, 100 ml pre-mixed bag

PHARMACOLCOGY AND ACTIONS:
Acetaminophen (paracetamol) targets the cyclooxygenase enzymes that produce prostaglandins responsible for pain and fever. It has little anti-inflammatory effect. It is metabolized into toxic and non-toxic products in the liver by:

- Glucuronidation (45 - 55%)
- Sulfate conjugation (20 - 30%)
- N-hydroxylation and dehydration, then GSH conjugation (less than 15%)

All three pathways yield final products that are non-toxic. In the third pathway, however, the intermediate product NAPQI is toxic. At usual doses, NAPQI is quickly detoxified by conjugation with glutathione. In overdose, glutathione is used up and the toxic metabolite can cause potentially fatal liver damage. It is metabolized by the liver and is hepatotoxic. Toxicity is multiplied when combined with alcoholic drinks, and very likely in chronic alcoholics or patients with liver damage.

INIDCATIONS:

A. Mild to moderate pain.
B. Fever.

CONTRAINDICATIONS

A. Known liver disease.
B. Current alcohol abuse.
C. Acute intoxication.
D. Has taken acetaminophen in last 4 hours.

ADULT DOSING:

Pain and Fever-

650 - 1000 mg PO **or** 1000 mg IV slowly over 5 minutes. If given by infusion pump, can be administered over 10 -20 minutes.

PEDIATRIC DOSING:

Pain and Fever-

15 mg/kg PO liquid only to a maximum of 1000 mg

Approximate dosing using 160 mg/5 mL liquid.

Weight	Dose	Volume
11 lbs./5kg	80 mg	2.5 mL
22 lbs./10 kg	160 mg	5 mL
44 lbs./20 kg	320 mg	10 mL
66 lbs./30 kg	480 mg	15 mL
88 lbs./40 kg	640 mg	20 mL

Activated Charcoal – 20.010

OLMC REQUIRED:

A. Aspirin and acetaminophen with time of ingestion > 2 hours.
B. All other poisons or ingestions regardless of time from ingestion.

SUPPLIED: 25 grams / 120 ml bottle.

PHARMACOLOGY AND ACTIONS:

Activated charcoal adsorbs toxic substances ingested and inhibits GI adsorption by forming an effective barrier between the particulate material and the gastrointestinal mucosa. The effect is greatest if used within one hour of ingestion.

INDICATIONS:

Management of poisoning or overdose of many substances.

CONTRAINDICATIONS:

A. Patients with altered mental status or the inability to maintain their own airway.
B. Patients who have aspirated or with a potential for aspiration.

PRECAUTIONS:

A. Activated charcoal may be ineffective in some ingestions.
B. Milk, ice cream, and other dairy products will decrease the adsorption capacity substantially.

SIDE EFFECTS AND NOTES:

May cause nausea, vomiting, and constipation.

ADULT DOSING:

Poisoning & overdose -

1 gram / kg PO or OG to a max of 50 grams.

PEDIATRIC DOSING:

Same as adult.

Adenosine (Adenocard®) – 20.020

OLMC REQUIRED: No

SUPPLIED: 6 mg / 2 ml and 12 mg / 4 ml pre-filled syringes

PHARMACOLOGY AND ACTIONS:
Adenosine is a naturally occurring nucleoside that can slow conduction through the AV node. Since most cases of PSVT involve AV nodal re-entry, adenosine can interrupt the AV nodal circuit and stopping the tachycardia, restoring normal sinus rhythm. It is eliminated from the circulation rapidly and has a half-life in the blood of < 10 seconds.

INDICATIONS:
To convert narrow complex, regular SVT to a normal sinus rhythm.

CONTRAINDICATIONS:
- **A. Second- or third-degree heart block.**
- **B. Sick Sinus Syndrome.**
- **C. Known hypersensitivity.**
- **D. Atrial fibrillation.**

PRECAUTIONS:
- A. When doses larger than 12 mg are given by injection, there may be a decrease in blood pressure secondary to a decrease in vascular resistance.
- B. The effects of adenosine are antagonized by methylxanthines such as theophylline and caffeine. Larger doses of adenosine may be required.
- C. Adenosine effects are potentiated by dipyridamole (Persantine) resulting in prolonged asystole.
- D. In the presence of carbamazepine (Tegretol), high degree heart block may occur.
- E. Adenosine is not effective in converting atrial fibrillation, atrial flutter, or ventricular tachycardia.
- F. All doses of adenosine should be reduced to one-half (50%) in the following clinical settings:
  1. History of cardiac transplantation.
  2. Patients who are on carbamazepine (Tegretol) and dipyridamole (Persantine).
  3. Administration through any central line.
- G. Adenosine should be used with caution in patients with asthma as it may cause a reactive airway response in some cases.
- H. Adenosine should not be used in patients with suspected Wolff-Parkinson White syndrome (WPW) presenting with irregular SVT.

SIDE EFFECTS AND NOTES:
May cause facial flushing, shortness of breath, chest pressure, nausea, headache, and lightheadedness.

ADULT DOSING:
6 mg rapid IV. May repeat with 12 mg IV x 2 if patient fails to convert after 6 mg dose. Use a large proximal IV site with fluid bolus flush.

PEDIATRIC DOSING:
0.1 mg/kg rapid IV. May repeat with 0.2 mg/kg once if patient fails to convert after first dose. Use a large proximal IV site with fluid bolus flush.

Albuterol (Ventolin®) – 20.030

OLMC REQUIRED: None

SUPPLIED: 2.5 mg / 3 ml vial individually or 3 mg packaged with 0.5 mg ipratropium (Duo-Neb).

PHARMACOLOGY AND ACTIONS:
Albuterol is a potent, relatively selective beta-2 adrenergic bronchodilator and is associated with relaxation of bronchial smooth muscle and inhibition of release of mediators of immediate sensitivity from cells, especially MAST cells. The onset of improvement in pulmonary function is within 2 - 15 minutes after the initiation of treatment and the duration of action is from 4 - 6 hours. Albuterol has occasional beta-1 overlap with clinically significant cardiac effects.

INDICATIONS:
A. To treat bronchial asthma and reversible bronchial spasm that occurs with chronic obstructive pulmonary disease.
B. To treat hyperkalemia.
C. Chlorine Inhalation.

CONTRAINDICATIONS:
None in the prehospital setting.

PRECAUTIONS:
A. The patient's rhythm should be observed for arrhythmias. Stop treatment if frequent PVCs develop or any tachyarrhythmias other than sinus tachycardia appears or if heart rate increases by more than 20 beats/minute.
B. Paradoxical bronchospasm may occur with excessive administration.

SIDE EFFECTS AND NOTES:
Clinically significant arrhythmias may occur, especially in patients with underlying cardiovascular disorders such as coronary insufficiency and hypertension.

ADULT DOSING:
Respiratory distress -
3.0 ml DuoNeb (3.0 mg albuterol/0.5 mg ipratropium) via nebulizer. Repeat DuoNeb as needed X 2. Do not administer more than three total treatments.
If no response to DuoNeb, continue with Albuterol only at 2.5 mg via nebulizer. May repeat as needed.
Hyperkalemia (including secondary to crush injury) -
10 mg via nebulizer.
Chlorine Inhalation-
2.5 mg via nebulizer.

PEDIATRIC DOSING:
Same as adult except in hyperkalemia.

Hyperkalemia-
< 25 kg, 2.5 mg via nebulizer.
25 - 50 kg, 5.0 mg via nebulizer.
> 50 kg, 10 mg via nebulizer.

Amiodarone (Cordarone®) – 20.040

OLMC REQUIRED: See contraindications.

SUPPLIED: 150 mg / 3 ml pre-filled syringe or vial or 450 mg / 9 ml multiuse vial

PHARMACOLOGY AND ACTIONS:
Amiodarone depresses automaticity of the SA node. It slows conduction and increases refractoriness of the AV node. Amiodarone increases atrial and ventricular refractory period and prolongs the QTc interval. When given IV it is rapidly distributed. No dosage adjustments are needed for patients with renal, liver, heart failure, or advanced age.

INDICATIONS:
A. Ventricular fibrillation.
B. Ventricular tachycardia with pulses.
C. Post resuscitation anti-dysrhythmic.
D. PVCs in the setting of an acute ischemic event.

CONTRAINDICATIONS:
A. None in cardiac arrest.
B. Do not use in perfusing patients in the following situations without OLMC approval:
1. Systolic BP is less than 90 mmHg.
2. Heart rate is less than 50 beats per minute.
3. Periods of sinus arrest are present.
4. Second or third-degree heart blocks are present.

PRECAUTIONS:
A. In high concentrations (> 3 mg/ml), amiodarone can cause phlebitis. Infusion concentrations should not exceed 2 mg/ml.
B. Amiodarone will precipitate if administered in the same IV line as sodium bicarbonate or heparin.

SIDE EFFECTS AND NOTES:
A. In perfusing patients, amiodarone may cause hypotension, prolonged QTc interval, pro-arrhythmic effects (Torsades and ventricular fibrillation), severe bradycardia, and atrioventricular block.
B. Non-cardiac toxicities are usually related to chronic administration and include pulmonary infiltrates, hepatic and/or thyroid dysfunction, and peripheral neuropathy.

ADULT DOSING:
V Fib, pulseless V Tach - 300 mg IV/IO. May repeat once with 150 mg.
Unstable V Tach with a pulse (After unsuccessful cardioversion X 2) - 150 mg IV/IO slow IV push over 3 minutes.
Stable V Tach with a pulse - 150 mg IV/IO. Mix with 100 ml of NS (in Buretrol or 100 ml bag) and infuse over 10 minutes via drip or pump. May repeat once if no conversion.
Post resuscitation from VF/pVT - 150 mg IV/IO. Mix with 100 ml of NS (in Buretrol or 100 ml bag) and infuse over 10 minutes via drip or pump. (If amiodarone was last anti-dysrhythmic given prior to ROSC, wait 30 minutes after ROSC to re-dose). Max total arrest/post-ROSC dose is 450 mg.
PVCs (In the setting of an acute ischemic event) – 150 mg IV/IO over 10 minutes.

Amiodarone (Cordarone®) – 20.040

PEDIATRIC DOSING:

V Fib, pulseless V Tach - 5 mg/kg IV/IO. May repeat once with 2.5 mg/kg.

Unstable V Tach with a pulse (After unsuccessful cardioversion X 2) - 2.5 mg/kg IV/IO slow IV push over 3 minutes.

Aspirin – 20.050

OLMC REQUIRED: No

SUPPLIED: 81 mg chewable tablets (Children's aspirin)

PHARMACOLOGY AND ACTIONS:
Aspirin inhibits prostaglandins and disrupts platelet function for the life of the platelet. It is also a mild analgesic and anti-inflammatory agent.

INDICATIONS:
In unstable angina and acute myocardial infarction, aspirin has been shown to lower mortality and is indicated in patients with suspected ischemic chest pain.

CONTRAINDICATIONS:

A. Allergy to aspirin or aspirin induced asthma.
B. History of bleeding disorder (e.g., hemophilia).
C. Current ulcer or GI bleeding.
D. Suspected aortic dissection.

SIDE EFFECTS AND NOTES:

A. High doses of aspirin can cause ringing in the ears.
B. May cause heartburn, nausea, and vomiting.

ADULT DOSING:

Chest pain (acute myocardial infarction) -
324 mg orally.

PEDIATRIC DOSING:

Not indicated for pediatric patients

Atropine Sulfate – 20.060

OLMC REQUIRED: No

SUPPLIED: 1 mg / 10 ml pre-filled syringe, 2 mg / 0.7 ml autoinjector, 8 mg / 20 ml vial

PHARMACOLOGY AND ACTIONS:
Atropine is a muscarinic-cholinergic blocking agent. As such, it has the following effects:

A. Increases heart rate (by blocking vagal influences).
B. Increases conduction through the AV node.
C. Reduces motility and tone of the GI tract.
D. Reduces action and tone of the urinary bladder (may cause urinary retention).
E. Dilates pupils.

INDICATIONS:

A. To increase the heart rate in bradycardia or pacemaker failure.
B. To improve conduction in second- and third-degree heart block.
C. As an antidote for some insecticide exposures (e.g., anti-cholinesterase, organophosphates) and nerve gases.
D. To counteract excessive vagal influences causing some brady-systolic and asystole arrests.
E. For bradycardia not due to hypoxia when using succinylcholine.

CONTRAINDICATIONS:

A. Atrial fibrillation and atrial flutter because increased conduction may speed ventricular rate excessively.
B. Not used in neonatal resuscitation.

PRECAUTIONS:
Bradycardia in the setting of an acute myocardial infarction is common and probably beneficial. Do not treat unless there are signs of poor perfusion (e.g., low blood pressure, mental confusion).

SIDE EFFECTS AND NOTES:

A. Atropine blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal.
B. Remember in cardiac arrest situations, atropine dilates pupils.

ADULT DOSING:

Bradycardia (cardiac) -
1.0 mg IV/IO. May repeat every 3 - 5 minutes to max of 3 mg.

Bradycardia secondary to RSI/DSI -
0.5 mg IV/IO.

Organophosphate poisoning -
For mild to moderate poisoning (Headache, mild bronchorrhea, nausea, vomiting, diarrhea, but normal mentation): 1 - 2 mg IV/IO/IM every 3 - 5 minutes until symptoms improve (e.g., decreased secretions).
For severe poisoning (Altered mental status, unconsciousness, seizures): 3 - 5 mg IV/IO/IM every 3 - 5 minutes until symptoms improve (e.g., decreased secretions, ease of ventilation).

Atropine Sulfate – 20.060

PEDIATRIC DOSING:

Bradycardia secondary to RSI/DSI -

0.02 mg/kg IV/IO. Minimum dose 0.1 mg. Do not exceed adult dose.

Organophosphate poisoning -

0.05 mg/kg IV/IO/IM. Contact OLMC for frequency of dosing.

Buprenorphine (Suboxone®) – 20.065

OLMC REQUIRED: No – Optional to contact Oregon Poison Center Buprenorphine Physician for clinical support if needed.

SUPPLIED: 8 mg/2 mg Buprenorphine/Naloxone sublingual film or sublingual tab

PHARMACOLCOGY AND ACTIONS: Buprenorphine is a partial agonist and antagonist at the opioid receptor. It is used in the acute and chronic setting to treat opioid withdrawal symptoms, including GI symptoms, restlessness/anxiety/irritability, aches, sweating, tachycardia. It blocks effects of other opioids including fentanyl, morphine, oxycodone, hydromorphone, and heroin. Onset of action 10 - 15 minutes, peak effect is at 1 - 4 hours, and effects can last for 24 - 36 hours.

INDICATIONS:
Opioid Withdrawal Symptoms with Clinical Opioid Withdrawal Scale (COWS) Score ≥ 7.

CONTRAINDICATIONS

A. Known allergy to buprenorphine.
B. COWS score < 7.
C. Any methadone in the last 7 days.
D. Altered mental status or unable to consent.
E. Concurrent severe medical illness (sepsis, respiratory distress, etc.).
F. Currently pregnant.
G. Patients less than 18 years old.

PRECAUTIONS:

A. Buprenorphine can cause worsened opiate withdrawal symptoms if given to patients who are not in withdrawal. If opioid withdrawal symptoms are not improved or worsened with buprenorphine, additional buprenorphine and other medications are typically needed.
B. Buprenorphine rarely causes respiratory depression in patients who are not opioid naïve.
C. Buprenorphine is a schedule III-controlled substance. Follow your agency's controlled substance policy for control and monitoring of use.

SIDE-EFFECTS AND NOTES:
Like all opioids, buprenorphine administered to a patient without a history of opioid use disorder may cause somnolence and respiratory depression.

ADULT DOSING:

Opioid Withdrawal with COWS Score ≥ 7

Give a small amount of water to moisten mucous membranes.
Administer 16 mg buprenorphine sublingual.
May repeat after 10 minutes with additional 8 mg dose (24 mg max)

PEDIATRIC DOSING:

Not indicated in patients < 18 years old

Calcium Gluconate – 20.070

OLMC REQUIRED: None

SUPPLIED: 1 gram / 10 ml vial or 5 gram / 50 ml vial (vial size and concentration may vary depending on availability).

PHARMACOLOGY AND ACTIONS:
Calcium is the most common cation in the human body. The majority of the body stores of calcium are located in bone. It plays an important role in many physiologic functions and is essential for proper nerve and muscle function.

INDICATIONS:
A. Suspected calcium channel blocker overdose.
B. Hyperkalemia.
C. Cardiac arrest from suspected hyperkalemia.
D. Dermal hydrofluoric acid burn.

CONTRAINDICATIONS:
A. Hypercalcemia and hypercalciuria (hyperthyroidism, Vitamin D overdose, bone metastases).
B. Patients on digoxin.

PRECAUTIONS:
A. Extravasation of calcium salts will cause necrosis of tissue. The IV should be secured and free blood return into the syringe should be checked 2 - 3 times during administration. If extravasation does occur, immediately stop administration.
B. Administer slowly (no faster than 2 ml/min) and stop if patient complains of distress. Inject using a small needle in a large vein.
C. Calcium gluconate will precipitate if mixed with sodium bicarbonate. Flush catheter completely before administering one medication after another.

SIDE EFFECTS AND NOTES:
A. Rapid injection of calcium gluconate may cause vasodilatation, decreased blood pressure, bradycardia, cardiac arrhythmias, syncope, and cardiac arrest.
B. One 10 ml vial of calcium gluconate 10% contains 1 gram of calcium gluconate salt (= 93 mg elemental calcium or 4.65 mEq calcium or 2.3 mmol calcium).

ADULT DOSING:
Hyperkalemia -
1 - 3 grams slow IV/IO over 5 - 10 minutes. Use a proximal port.
Calcium channel blocker overdose (symptomatic) -
1 - 3 grams slow IV/IO over 5 - 10 minutes. Use a proximal port.
Cardiac arrest from suspected hyperkalemia (e.g., dialysis patient) -
3 gram IV/IO push.
Dermal hydrofluoric acid burn -
3 grams mixed with 5 oz. water soluble lubricant applied directly to burn.

PEDIATRIC DOSING:
Hyperkalemia, calcium channel blocker overdose -
0.6 ml/kg slow IV/IO over 5 - 10 minutes. Use a proximal port. Max dose 10 ml.

Dexamethasone (Decadron®) – 20.075

OLMC REQUIRED: No

SUPPLIED: 10 mg / 1 ml vial

PHARMACOLOGY AND ACTIONS:
Dexamethasone is a synthetic steroid that suppresses acute and chronic inflammation. In addition, it potentiates vascular smooth muscle relaxation by beta-adrenergic agonists and may alter airway hyperactivity.

INDICATIONS:
A. Moderate to severe asthma/COPD.
B. Severe allergic reaction.
C. Croup.
D. Chlorine Inhalation.

CONTRAINDICATIONS:
Do not use in patients with known hypersensitivity to corticosteroids.

PRECAUTIONS:
May cause hypertension and hyperglycemia.

SIDE EFFECTS AND NOTES:
May cause nausea, vomiting, headache, or dizziness.

ADULT DOSING:
Respiratory distress, severe allergic reaction, anaphylaxis -
10 mg IV/IO/IM/PO. Flavoring may be used if available for oral dosing.
Chlorine Inhalation-
10 mg IV/IO/IM/PO.

PEDIATRIC DOSING:
Respiratory distress, severe allergic reaction, anaphylaxis, croup -
0.6 mg/kg IV/IO/IM/PO to a max of 10 mg. Flavoring may be used if available for oral dosing.

Dextrose - 20.080

OLMC REQUIRED: No

SUPPLIED: 25 grams/50 ml pre-filled syringe 50%. 25 grams/250 ml bag 10%

PHARMACOLOGY AND ACTIONS:
Glucose is the body's basic fuel. It produces most of the body's quick energy. Its use is regulated by insulin which stimulates storage of excess glucose outside the bloodstream, and glucagon, which mobilizes stored glucose into the bloodstream.

INDICATIONS:
A. Hypoglycemia.
B. Unconscious patient when history is unobtainable.

CONTRAINDICATIONS:
None

PRECAUTIONS:
A. Extravasation of dextrose may cause necrosis of tissue and the patency of the IV should be secured during administration. If extravasation does occur, immediately stop administration.
B. Report any extravasation to receiving hospital personnel and document on the Prehospital Care Report.

SIDE EFFECTS AND NOTES:
Hyperglycemia may complicate or worsen a number of medical conditions (e.g., myocardial infarction and stroke). Dextrose should be given whenever hypoglycemia is documented by blood glucose meters. If these findings are not available, the EMS Clinician should use judgement based on signs and history.

ADULT DOSING:
Hypoglycemia/Altered mental status -
10 - 25 grams slow IV/IO.

PEDIATRIC DOSING –
For infants < 10 kg (birth to 1 year) with CBG < 40 mg% and children 10 kg - 35 kg with CBG < 60 mg% give:

Dextrose 10% - 5 ml/kg IV by infusion to a maximum dose of 250 ml.

Dextrose 12.5% - 4 ml/kg by infusion to a maximum dose of 200 ml.
(if diluting D50)

Diltiazem– 20.095

OLMC REQUIRED: No

SUPPLIED: 5 mg / ml in 5 ml vial

PHARMACOLOGY AND ACTIONS:
Diltiazem is a calcium channel blocker. It slows conduction through the sinoatrial and AV node; thus, slows ventricular response to the stimuli of rapid atrial fibrillation and atrial flutter. IV diltiazem is used primarily for ventricular rate control in atrial fibrillation and atrial flutter. Conversion to normal sinus rhythm often occurs.

INDICATIONS:
As a secondary medication to adenosine in the setting of SVT if the patient has a contraindication to adenosine use, or the patient wishes not to receive adenosine based on past experience.

CONTRAINDICATIONS:

A. Hypotension (systolic BP < 120).
B. Wide complex tachycardia of uncertain origin.
C. WPW.
D. Left ventricular dysfunction/heart failure.
E. Sick Sinus Syndrome.
F. AV block without pacemaker.
G. Patient already taking a beta blocker.

PRECAUTIONS:

A. Slow administration is required to avoid hypotension.
B. Dosing should be reduced by one half in setting of impaired hepatic or renal functions, the elderly, and debilitated patients.
C. Monitor for cardiac dysrhythmias.
D. Monitor for hyperthermia.
E. Be prepared to treat seizures.

SIDE EFFECTS AND NOTES:
May produce hypotension, bradycardia, and decreased left ventricular activity

ADULT DOSING:
2.5 mg slow IV push over 1 min. May repeat up to 25 mg in 1-minute increments
Or
2.5 mg/min IV infusion to a max of 25 mg

PEDIATRIC DOSING:
Not indicated for pediatric patients

Diphenhydramine (Benadryl ®) – 20.097

OLMC REQUIRED: No

SUPPLIED: 50 mg/ml vial

PHARMACOLOGY AND ACTIONS:
Diphenhydramine is an antihistamine which blocks the action of histamines released from cells during an allergic reaction. It has direct CNS effects, which may be a stimulant, or more commonly a depressant, depending on individual variation. Diphenhydramine also has an anticholinergic and antiparkinsonian effect which is used to treat acute dystonic reactions to antipsychotic and anti-nausea medications (e.g., Haldol®, Thorazine®, Compazine®, Inapsine®, Reglan®). These reactions include oculogyric crisis, acute torticollis, and facial grimacing.

INDICATIONS:
A. The second-line drug in anaphylaxis and severe allergic reactions (after epinephrine).
B. To counteract acute dystonic and dysphoric reactions to anti-psychotic and anti-emetic medications.
C. Pharmacological sedation for patients ≤ 12 years old.

CONTRAINDICATIONS:
None

PRECAUTIONS:
A. May have an additive effect with alcohol or other CNS depressants.
B. Although useful in acute dystonic reactions, it is not an antidote for anti-psychotic toxicity or overdose.
C. May cause hypotension when given IV.

SIDE EFFECTS AND NOTES:
Diphenhydramine is not the first-line drug for allergic reactions but may be useful for longer transports.

ADULT DOSING:
Anaphylaxis, extrapyramidal symptoms -
1 mg/kg IV/IM to a max of 50 mg.

PEDIATRIC DOSING:
Anaphylaxis, extrapyramidal symptoms -
1 mg/kg IV/IM to a max of 50 mg.

Pharmacological Sedation (For patients ≤ 12 years) -
1 mg/kg IV/IM, not to exceed 25 mg.

Dopamine (Intropin®) – 20.100

OLMC REQUIRED: No

SUPPLIED: 800 mg / 10 ml vial or 400 mg / 10 ml vial

PHARMACOLOGY AND ACTIONS:
Dopamine is the chemical precursor of norepinephrine which occurs naturally in humans, and which has both alpha and beta receptor stimulating actions. Its actions differ with the dosage given:

- 1 - 2 mcg/kg/min – Dilates renal and mesenteric blood vessels. No effect on heart rate or blood pressure.
- 2 - 10 mcg/kg/min – Beta effects on the heart, which usually increases cardiac output without increasing heart rate or blood pressure.
- 10 - 20 mcg/kg/min – Alpha peripheral effects cause peripheral vasoconstriction and increased blood pressure.

INDICATIONS:

A. Primary indication is cardiogenic shock.
B. May be useful in other forms of shock, except hypovolemic.

CONTRAINDICATIONS:
Hypovolemic shock.

PRECAUTIONS:

A. May induce tachyarrhythmias, in which case infusion should be decreased or stopped.
B. High doses may cause extreme peripheral vasoconstriction. Conversely, low doses may cause a decreased blood pressure due to peripheral dilatation.
C. Should not be added to sodium bicarbonate or other alkaline solutions since dopamine will be inactivated in alkaline solutions.

SIDE EFFECTS AND NOTES:

A. The most common side effects include ectopic beats, nausea, and vomiting.
B. Angina has been reported following treatment.
C. Tachycardia and arrhythmias are less likely than with other catecholamines.
D. Can precipitate hypertensive crisis in susceptible individuals (i.e., patients on MAO inhibitors such as Parnate, Nardil, or Marplan).
E. Consider hypovolemia and treat this with appropriate fluids before administration of dopamine.
F. Dopamine is best administered by infusion pump if available. Monitor closely.

ADULT DOSING:

Bradycardia -
Begin at 2 mcg/kg/min and increase as needed to a maximum of 10 mcg/kg/min titrating to desired effect.

Cardiogenic shock -
5 mcg/kg/min IV drip. Increase by 5 mcg/kg/min every 5 minutes to max of 20 mcg/kg/min or until MAP is ≥ 65 mmHg (≥ 90 mmHg systolic) and signs of shock have been alleviated.

PEDIATRIC DOSING: Same as adult.

Droperidol (Inapsine®) – 20.102

OLMC REQUIRED: Patients ≤ 12 years old

SUPPLIED: 5 mg / 2 ml vial and ampule

PHARMACOLOGY AND ACTIONS:
Droperidol is an antipsychotic that may be used for pharmacological sedation. It also provides a state of mental detachment and indifference while maintaining a state of reflex alertness. Droperidol may potentiate the effects of other CNS depressants. It also causes mild alpha-adrenergic blockade which can lead to peripheral vasodilatation and hypotension, as well as a reduction of the pressor effect of catecholamines. It is also a very effective anti-emetic. Onset of action is from 3 - 10 minutes following administration and peak effect may not be apparent for up to 30 minutes. Duration is generally 2 - 4 hours.

INDICATIONS:
A. Pharmacological sedation of agitated and combative patients.
B. Nausea and vomiting refractory to ondansetron.

CONTRAINDICATIONS:
Unless directed by OLMC, do not administer droperidol in the following situations:
A. Systolic BP < 90.
B. Known allergy or prior reaction to droperidol.
C. Pregnancy.
D. Known Parkinson's disease or use of dopamine agonists medications like carbidopa-levodopa (Sinemet), Pramipexole (Mirapex), or ropinirole (Requip).

PRECAUTIONS:
A. Use caution when administering droperidol to patients who have taken other CNS depressant drugs (barbiturates, benzodiazepines, alcohol)
B. Droperidol can prolong the QT interval leading to Torsade De Pointes. Continuously monitor the patient's ECG Q-T interval following use.
C. Use with caution in patients with a seizure disorder or a condition that causes seizures; droperidol and haloperidol are known to lower the seizure threshold. Consider use of midazolam or lorazepam instead.

SIDE EFFECTS AND NOTES:
A. The most common side effects are hypotension and tachycardia which usually respond to a fluid bolus.
B. Akathisia (restlessness) and dystonic reactions have been reported following administration. These symptoms can be treated with the administration of diphenhydramine.

ADULT DOSING:
Nausea & vomiting unresponsive to ondansetron -
0.625 mg IV. (0.625 mg = 0.25 ml based on a 5 mg/ 2 ml package)

Pharmacological sedation -

2.5 mg IV/IO or 5 mg IM. May repeat once in 10 minutes.
For immediate threat (RASS +3 or +4, see Agitated Patient protocol 10.015):
2.5 - 5 mg IV/IO or 5 - 10 mg IM in addition to midazolam or lorazepam.
For patients > 65 years of age: 2.5 mg IV, IO. May repeat in 5 - 10 minutes.
OR 2.5 mg - 5 mg IM. May repeat in 10 - 15 minutes.

PEDIATRIC DOSING:

Nausea & vomiting unresponsive to ondansetron –
Contact OLMC for patients < 14 years old.

Pharmacological sedation -
0.1 mg /kg IV/IM, max 5 mg. **Age > 12 only.** See Pediatric Pharmacological Sedation Flow Chart in Agitated Patient protocol.

Epinephrine – 20.110

OLMC REQUIRED: No

SUPPLIED: 1:10,000 – 1 mg / 10 ml pre-filled syringe; 1:1000 – 30 mg / 30 ml vial or 1 mg/ml vials; racepinephrine 11.25 mg / 0.5 ml

PHARMACOLOGY AND ACTIONS:
Epinephrine is a catecholamine with both alpha and beta effects. In general, the following cardiovascular responses can be expected: Increased heart rate, increased myocardial contractile force, increased systemic vascular resistance, increased arterial blood pressure, increased myocardial oxygen consumption, and increased automaticity. Epinephrine is also a potent bronchodilator.

INDICATIONS:
Epinephrine is indicated in the following situations: Ventricular fibrillation, asystole, pulseless electrical activity, symptomatic bradycardia, anaphylaxis, severe asthma, and nebulized in suspected croup (audible stridor at rest in children 6 months to 6 years).

CONTRAINDICATIONS:
None

PRECAUTIONS:

A. Epinephrine increases cardiac workload and can precipitate angina, MI, or major dysrhythmias in individuals with ischemic heart disease.
B. Wheezing in an elderly person is pulmonary edema or pulmonary embolus until proved otherwise.

SIDE EFFECTS AND NOTES:

A. May cause anxiety, tremor, or headache.
B. Cardiac side effects include tachycardia, PVC's, angina, and hypertension.

ADULT DOSING:

V Fib, Pulseless V-Tach, asystole, PEA -
1 mg 1:10,000 IV/IO every 3 - 5 minutes.

Asthma -
0.3 mg - 0.5 mg 1:1000 IM. May repeat once if patient is still in extremis. (Consider using lower doses (0.1 - 0.3 mg) for patients > 40 years old or known coronary artery disease).

Anaphylaxis -

- 1:1000, 0.3 - 0.5 mg IM. Repeat once in 5 - 15 minutes if patient is still in extremis. **Or, if IV established**,
- 1:10,000, 0.1 mg boluses IV/IO every 5 min titrated to effect. Max dose 0.5 mg. **OR,**
- Infusion IV at 2 mcg/min (2 mcg/ml) titrated to effect. (See drip preparation below)

Symptomatic Bradycardia -
Infusion at 2 mcg/min and increase as needed to a maximum of 10 mcg/min titrating to effect. (See drip preparation below)

Push Dose Epinephrine

INDICATIONS

A. Severe shock (MAP < 50 mmHg or SBP < 60 mmHg) not responsive to fluids.
B. A bridge to drip vasopressors.
C. Short-lived hypotension (e.g., post-intubation or during sedation).

ONSET

- 1 minute

DURATION

- 5 - 10 minutes

MIXING INSTRUCTIONS:

A. 10 ml syringe with 9 ml of normal saline.
B. In this syringe, draw up 1 ml of epinephrine 1:10,000 (amp contains 100 mcg/ml epinephrine).
C. Result is 10 ml of epinephrine with 10 mcg/ml (or 100mcg per syringe).

DOSE:

Adult Dosing: 10 - 20 mcg (1 - 2 ml) IV/IO every 1 - 5 minutes.
Pediatric Dosing: 1 mcg/kg every 1 - 5 minutes up to 10 mcg.

Epinephrine Drip Preparation

Mix 1 mg of 1:1000 epinephrine in 500 ml of NS or LR (2 mcg/ml), deliver by micro-drip or infusion pump.

PEDIATRIC DOSING:

V Fib, Pulseless V-Tach, asystole, PEA -
0.01 mg/kg 1:10,000 IV/IO.

Symptomatic Bradycardia (cardiac) -
0.01 mg/kg 1:10,000 IV/IO. Repeat every 3 - 5 minutes.

Asthma -
0.01mg/kg 1:1000 IM (max dose 0.5 mg). Contact OLMC for additional doses.

Anaphylaxis -

- Epinephrine 1:1000, 0.01 mg/kg IM to a max of 0.5 mg. Repeat once in 5 - 15 minutes if patient is still in extremis. **OR, if IV established**,
- Epinephrine 1:10,000, 0.01 mg/kg (max 0.1 mg) IV/IO boluses every 3 - 5 min titrated to effect. Max dose 0.5 mg. **OR**
- Epinephrine infusion IV at 0.01 mcg/kg/min (2 mcg/ml) titrated to effect.

Respiratory Distress with suspected croup (audible stridor at rest in patients 6 months to 6 years old)-

- **See Racepinephrine dosing box below**

Racepinephrine (Racemic Epinephrine) - Pediatric use only in suspected croup.

PHARMACOLOGY AND ACTIONS:
Racemic epinephrine is a mixture consisting of d-Epinephrine and l-Epinephrine enantiomers. Epinephrine causes smooth muscle relaxation on various tissues, including bronchial smooth muscles. It also results in vasoconstriction of airway soft tissues when nebulized.

CONTRAINDICATIONS:
Life-threatening cardiac arrhythmias (i.e., ventricular tachycardia, unstable SVT)

PRECAUTIONS:
A. Monitor efficacy to nebulization by clinical status, oxygen saturation, respiratory rate, and work of breathing.
B. Monitor response to heart rate and blood pressure.
C. Administer via nebulization ONLY.
D. DO NOT administer IV/ IO/ IM/ IN.

PEDIATRIC DOSE:
Respiratory distress with audible stridor at rest (pts 6 months to 6 years old) - 0.5 ml (11.25 mg) of racepinephrine diluted with 2.5 ml of normal saline via nebulizer. May repeat once in 10 minutes if necessary. Contact OLMC for additional doses.
In the absence of Racepinephrine, you may substitute 5 ml (5 mg) of Epi 1:1000 via nebulizer.

Esmolol (Brevibloc®) – 20.112

OLMC REQUIRED: No

SUPPLIED: 100 mg / 10 ml vial

PHARMACOLOGY AND ACTIONS:
Esmolol is a short-acting intravenous cardio-selective beta-blocking agent. Esmolol can mitigate the depression of the VF threshold produced by high doses of epinephrine used during cardiac arrest due to its ability to dampen the sympathetic tone. Due to its quick onset and offset, it is ideal for these patients, without having the excessive/prolonged effects of the drug during and after resuscitation.

INDICATIONS:
Refractory ventricular fibrillation/pulseless ventricular tachycardia following 2 doses of an anti-dysrhythmic medication.

CONTRAINDICATIONS:
None in the setting of cardiac arrest

PRECAUTIONS:
Ensure the patency of the IV/IO to prevent extravasation.

SIDE EFFECTS AND NOTES:

A. Esmolol is not to be used until both doses of an anti-dysrhythmic medication is administered, whether that is two dose of amiodarone or two doses of lidocaine.
B. Esmolol is not compatible with sodium bicarbonate. Flush IV/IO line before and after when used with bicarbonate.

ADULT DOSING:

Refractory VF/pVT

0.5 mg/kg IV/IO. If refractory VF/pulseless VT persists, repeat with another 0.5 mg/kg bolus in 5 minutes.

PEDIATRIC DOSING:

Not indicated for pediatric patients in refractory VF/pulseless VT.

Esmolol bolus dosing 0.5 mg/kg
Concentration 10 mg/ml

Weight (lbs)	Weight (kg)	Dose (mg)	Volume (ml)*
66	30	15	1.5
77	35	17.5	2.0
88	40	20	2.0
99	45	22.5	2.5
110	50	25.0	2.5
121	55	27.5	3.0
132	60	30	3.0
143	65	32.5	3.5
154	70	35	3.5
165	75	37.5	4.0
176	80	40	4.0
187	85	42.5	4.5
198	90	45	4.5
209	95	47.5	5.0
220	100	50	5.0
231	105	52.5	5.5
242	110	55	5.5
254	115	57.5	6.0
265	120	60	6.0
275	125	62.5	6.5
287	130	65	6.5
298	135	67.5	7.0
309	140	70	7.0
320	145	72.5	7.5
331	150	75	7.5

*Dose volumes have been rounded for ease of administration

Etomidate (Amidate®) – 20.115

OLMC REQUIRED: No

SUPPLIED: 40 mg / 20 ml pre-filled syringe or 2 mg/ml in 40 mg vial

PHARMACOLOGY AND ACTIONS:
Etomidate is a hypnotic drug without any analgesic activity. Intravenous injection of etomidate produces hypnosis characterized by rapid onset of action; usually within one minute. Duration of hypnosis is dose dependent but relatively brief, usually 3 - 5 minutes.

INDICATIONS:
A. As an induction agent for Drug Assisted Airway Management (DAAM).
B. As a sedation agent prior to synchronized cardioversion of unstable tachycardia.

CONTRAINDICATIONS:
Etomidate is contraindicated in patients who have a known hypersensitivity to the drug.

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SIDE EFFECTS AND NOTES:
A. The most frequent adverse reactions are transient injection site pain and transient skeletal muscle movements (myoclonus).
B. Etomidate may also cause nausea and/or vomiting.

ADULT DOSING:

Induction agent for DAAM -
0.3 mg / kg IV/IO slow push.

Synchronized cardioversion for unstable tachycardia -
0.15 mg / kg IV /IO push to a max of 10 mg. Wait 45 - 60 seconds for signs of sedation such as patient becoming verbally unresponsive or no longer following commands.

PEDIATRIC DOSING:

Same as adult

Fentanyl (Sublimaze®) – 20.117

OLMC REQUIRED: No

SUPPLIED: 100 micrograms / 2 ml vial

PHARMACOLOGY AND ACTIONS:
Fentanyl is a potent synthetic opioid analgesic that produces analgesia and sedation. It is about 50 - 100 times more potent than morphine on a weight basis. Onset of action when given is 2 - 3 minutes. Peak effect occurs at 3 - 5 minutes and lasts 15 - 45 minutes.

INDICATIONS:
A. Pain due to musculoskeletal injury or burns.
B. Suspected ischemic chest pain.
C. Post-intubation analgesia.
D. CPR Induced Consciousness.

CONTRAINDICATIONS:
A. Known allergy to fentanyl.
B. Moderate to severe respiratory depression.

PRECAUTIONS:
A. Fentanyl can cause respiratory depression that is reversible with naloxone. Respiratory depression can also be exacerbated by underlying lung disease and the use of other respiratory depressant drugs (e.g., benzodiazepines, alcohol, cyclic antidepressants). Have naloxone and respiratory support available when administering fentanyl.
B. If administered rapidly and in very large doses, fentanyl can cause muscle spasm and chest wall rigidity. The only reliable treatment for this is neuromuscular blockade.
C. The action of fentanyl is prolonged, and its elimination is slower in the elderly. Smaller maintenance doses are advisable.
D. Fentanyl must be used cautiously in patients who have already received morphine for prehospital analgesia.

SIDE EFFECTS AND NOTES:
A. If hypotension develops, it is usually responsive to naloxone administration and Trendelenburg position. If hypotension continues, follow Shock protocol.
B. Check and document vital signs and patient response after each dose.
C. The goal of fentanyl administration is patient comfort, not the total elimination of pain but the reduction in the perception of pain by the patient.

ADULT DOSING:
Pain Management -
IV/IN – 50 - 100 mcg. May repeat 25 - 50 mcg every 10 - 15 minutes as needed to a maximum of 500 mcg. IM – 50 - 100 mcg. May repeat every 10 - 15 minutes as needed to a maximum of 500 mcg. <u>If BP < 100 mmHg and/or patient has minor altered mental status or respiratory depression - first dose fentanyl is 25 mcg, may repeat 25 - 50 mcg every 10 - 15 minutes to a maximum of 500 mcg. Monitor closely.</u>

Post-Intubation analgesia -

After successful airway placement, administer fentanyl 50 - 100 mcg IV/IO if systolic BP ≥ 100 mmHg (MAP is >65 mmHg). Repeat every 10 - 15 minutes as necessary to maintain analgesia.

CPR Induced Consciousness-

50 mcg IV/IO used in conjunction with midazolam or lorazepam. May repeat every 5 - 10 minutes as needed.

PEDIATRIC DOSING:

Pain Management -

1 mcg/kg IV. May repeat with 0.5 - 1 mcg/kg every 10 - 15 minutes as needed to a maximum of 4 mcg/kg. Or, 2 mcg/kg IN repeated with 1 mcg/kg every 10 - 15 minutes as needed to a maximum of 4 mcg/kg. If no IV/IN, may give fentanyl 1 - 2 mcg/kg IM. May repeat every 10 - 15 minutes to a max of 4 mcg/kg. Do not exceed adult dosing. IN is preferred if no IV.

Post-Intubation analgesia -

After successful airway placement, administer fentanyl 1 mcg/kg IV/IO, not to exceed the adult dose, with repeat doses at 0.5 - 1 mcg/kg every 10 - 15 minutes.

Furosemide (Lasix®) – 20.120

OLMC REQUIRED: No

SUPPLIED: 40 mg / 4 ml pre-filled syringe or 40 mg / 4 ml vial

PHARMACOLOGY AND ACTIONS:
Furosemide is a potent diuretic with a rapid onset of action and short duration of effect. It acts primarily by inhibiting sodium reabsorption in the kidney. Increase in potassium excretion occurs along with the sodium excretion. Peak effect is 30 - 60 minutes after IV administration with a duration of about 2 hours. (Duration if taken orally is 6 - 8 hours with peak effect in 1 - 2 hours).

INDICATIONS:
In congestive heart failure to decrease the extracellular volume and reduce pressure on the lungs in cardiac failure.

CONTRAINDICATIONS:
A. Hypovolemia or hypotension.
B. Pregnancy.

PRECAUTIONS:
A. May lead to profound diuresis with resultant shock and electrolyte depletion. Monitor patient closely after administration.
B. Hypovolemia, hypotension, hyponatremia, and hypokalemia are the main toxic effects. Other toxic effects are usually not related to single-dose use.
C. Patients who are on digitalis and are having arrhythmias consistent with digitalis toxicity (atrial tachycardia with conduction block, non-paroxysmal junctional tachycardia, sinus arrest, etc.) may need lower doses of furosemide. Contact OLMC.
D. Because of the potency and need for close monitoring, furosemide should only be given with specific indications.
E. Patients with Sympathetic Crashing Acute Pulmonary Edema (SCAPE) usually present with a sudden onset of extreme respiratory distress, diaphoresis, markedly elevated systolic blood pressure > 160, tachycardia, and decreased oxygen saturation. Most of these patients are euvolemic and respond better to preload/afterload reduction (Nitroglycerin SL every 5 minutes) in conjunction with CPAP/BiPAP. Furosemide is not helpful in SCAPE.

ADULT DOSING:
Respiratory distress from suspected congestive heart failure and evidence of volume overload and systolic BP > 100 mmHg –
A. If patient is <u>not</u> currently taking furosemide, give 20 mg IV.
B. If the patient is taking furosemide, give 40 mg IV.

PEDIATRIC DOSING:
Not indicated for pediatric patients. Contact OLMC

Glucagon – 20.130

OLMC REQUIRED: No

SUPPLIED: 1 mg vial of powder / 1 ml vial of diluent

PHARMACOLOGY AND ACTIONS:
Glucagon is a hormone that causes glucose mobilization in the body. It works opposite to insulin, which causes glucose storage. It is released at times of insult or injury when glucose is needed and mobilizes glucose from body glycogen stores. Return to consciousness should be within 20 minutes of an IM dose if patient is hypoglycemic.

INDICATIONS:
A. Known hypoglycemia (preferably demonstrated by blood glucose determination) when patient is confused or comatose and dextrose is not available or an IV cannot be started.
B. Anaphylaxis in patients with beta-blockade when epinephrine is ineffective.

CONTRAINDICATIONS:
None

PRECAUTIONS:
IV Dextrose is the treatment of choice for hypoglycemia in the patient who cannot tolerate oral glucose. The use of glucagon is restricted to patients who are seizing, comatose, combative, or with collapsed veins and in whom an IV cannot be started.

SIDE EFFECTS AND NOTES:
A. Nausea and vomiting may occur with administration.
B. Persons with no liver glycogen stores (e.g., malnutrition, alcoholism) may not be able to mobilize any glucose in response to glucagon.

ADULT DOSING:
Hypoglycemia -
1 mg IM.
Anaphylaxis (If epinephrine is ineffective in treating anaphylaxis in patients with beta-blockade)-
1 mg IM/IV.

PEDIATRIC DOSING:
Hypoglycemia -
0.02 mg/kg IM to a maximum of 1 mg.

Glucose (Oral) – 20.140

OLMC REQUIRED: No

SUPPLIED: 15 - 24 grams glucose in gel tubes

PHARMACOLOGY AND ACTIONS:
Glucose is the body's basic fuel and it produces most of the body's quick energy. Its use is regulated by insulin that stimulates storage of excess glucose from the bloodstream and glucagon that mobilizes stored glucose into the bloodstream.

INDICATIONS:
Oral glucose is indicated in the conscious patient where a suspicion of hypoglycemia exists, or a blood glucose measurement indicates a low blood glucose level.

CONTRAINDICATIONS:
Do not give to patients who cannot adequately protect their own airway.

PRECAUTIONS:
To give solutions orally, a patient must be continually assessed for the ability to protect his or her own airway.

SIDE EFFECTS AND NOTES:
A. Research suggests that hyperglycemia may complicate, or worsen, a number of medical conditions (e.g., myocardial infarction, stroke). Oral glucose should be given to a conscious patient whenever hypoglycemia is documented by blood glucose meter. If these objective findings are not available, the EMS Clinician should use judgment based on signs and history.
B. Effects will be delayed in the elderly and people with poor circulation.
C. May be more tolerable if administered with liquid between dosages.
D. Patient's condition may require more than one dose of oral glucose.

ADULT DOSING:
Hypoglycemia -
One tube or equivalent. Repeat as needed.

PEDIATRIC DOSING:
Same as adult

Haloperidol (Haldol®) – 20.142

OLMC REQUIRED: No

SUPPLIED: 5 mg / 1 ml vial

PHARMACOLOGY AND ACTIONS:
Haloperidol is an antipsychotic that may be used for pharmacological sedation by producing marked sedation and allaying apprehension. It also provides a state of mental detachment and indifference while maintaining a state of reflex alertness. Haloperidol may potentiate the effects of other CNS depressants. It also causes mild alpha-adrenergic blockade which can lead to peripheral vasodilatation and hypotension, as well as a reduction of the pressor effect of catecholamines. It is also a very effective anti-emetic. The onset of action of a single IV dose is from 5 - 15 minutes following administration, and the peak effect may not be apparent for up to 30 minutes. Duration is generally from 2 - 6 hours.

INDICATIONS:
A. Sedation of combative patients to facilitate restraint.
B. Nausea and vomiting

CONTRAINDICATIONS:
A. Known allergy to haloperidol
B. Known Parkinson's disease or use of dopamine agonists medications like carbidopa-levodopa (Sinemet), Pramipexole (Mirapex), or ropinirole (Requip).

PRECAUTIONS:
A. Hypotension may occur; IV fluids and other measures to manage hypotension should be readily available.
B. Use caution when administering haloperidol to patients who have taken other CNS depressant drugs (e.g., barbiturates, benzodiazepines, alcohol).
C. Haloperidol may induce Torsade de Pointes. Monitor the patient's ECG Q-T interval following use.

SIDE EFFECTS AND NOTES:
A. The most common side effects are hypotension and tachycardia, which usually responds to a fluid bolus.
B. Dysphoric (restlessness) and dystonic reactions have been reported following administration. These symptoms can be treated with the administration of diphenhydramine.
C. Haloperidol should be used with caution in patients with a seizure disorder or condition that causes seizures; other similar neuroleptics are known to lower the seizure threshold.

Haloperidol (Haldol®) – 20.142

ADULT DOSING:

Pharmacological sedation -

5 - 10 mg IV, IO, IM. May repeat to a maximum of 20 mg (**For patients > 65:** 2 mg IV/IO. May repeat after 15 mins. **or** 2.5 mg IM. May repeat after 15 - 20 mins.)

Nausea and vomiting

1.25 mg IV/IM

PEDIATRIC DOSING:

Haloperidol is not recommended for children**.**

Hydromorphone (Dilaudid®) – 20.144

OLMC REQUIRED: No

SUPPLIED: 2 mg / 1 ml vial. Concentration and packaging may vary based on availability.

PHARMACOLOGY AND ACTIONS:
Hydromorphone is an opioid agonist that binds to several opioid receptors. Its analgesic characteristics are through its effect on the mu-opioid receptors. Hydromorphone has been shown to be 5 - 7 times more potent than morphine with a shorter duration of analgesia. Onset of action when given IV is 5 minutes and peak effect occurs at 8 - 20 minutes. Duration is 3 - 4 hours.

INDICATIONS:
A. Pain due to burns or musculoskeletal injury.
B. Suspected ischemic chest pain unresponsive to nitroglycerin.
C. Post-intubation analgesia.

CONTRAINDICATIONS:
A. Known allergy to hydromorphone.
B. Blood pressure less than 100 mmHg systolic for pain management and post-intubation analgesia.
C. Respiratory rate less than 14 breaths per minute or oxygen saturation less than 90%. For pediatric patients, vital signs should be maintained within the normal age-appropriate range.
D. Patients < 12 months.

PRECAUTIONS:
A. Hydromorphone causes respiratory depression that is reversible with naloxone. This respiratory depression is exacerbated by underlying lung disease (COPD, etc.) and other depressant drugs (Valium, alcohol, cyclic anti-depressants). Naloxone and respiratory support must be available when using hydromorphone.
B. If hypotension develops, it is usually responsive to naloxone administration and Trendelenburg position. If hypotension persists, follow Shock protocol.
C. The goal of hydromorphone administration is patient comfort (not the total elimination of pain but reduction in perception of pain by the patient).
D. Use a 1 ml syringe for administration due to small volume.

SIDE EFFECTS AND NOTES:
A. Common side effects include flushing, pruritus, diaphoresis, dry mouth, nausea and vomiting, asthenia, dizziness, headache, and somnolence.
B. Serious adverse effects include hypotension, syncope, coma, increased intracranial pressure, seizures, respiratory depression, and apnea.

ADULT DOSING:
Pain Management -
0.25 - 0.5 mg IV. Repeat every 15 - 20 minutes up to a maximum of 2 mg. If no IV, give 0.5 - 1.0 mg IM. May repeat IM every 15 - 20 minutes to a maximum of 2 mg.

Hydromorphone (Dilaudid®) – 20.144

PEDIATRIC DOSING:

Pain - Musculoskeletal injuries–

For patients ≥ 12 months**:** 0.01 mg/kg IV/IM not to exceed the adult dose. May repeat every 15 - 20 minutes to a maximum of 2 mg.

NOTE: Hydromorphone is not preferred in young infants and toddlers if fentanyl or morphine is available.

Hydroxocobalamin (CYANOKIT®) – 20.145

OLMC REQUIRED: Repeat dose for pediatric patients.

SUPPLIED: 5 grams powder in vial for reconstitution with 200 ml NS. Kit has one vial.

PHARMACOLOGY AND ACTIONS:
Hydroxocobalamin (vitamin B12a) is an effective antidote in the treatment of cyanide poisoning based on its ability to bind cyanide ions. Each hydroxocobalamin molecule can bind one cyanide ion to form cyanocobalamin (vitamin B12), which is then excreted in the urine. Cyanide is an extremely potent toxic poison. In the absence of rapid and adequate treatment, exposure to a high dose of cyanide can result in death within minutes due to inhibition of cytochrome oxidase resulting in arrest of cellular respiration.

INDICATIONS:
Cyanide poisoning or smoke inhalation with suspected cyanide poisoning due to the presence of coma, persistent hypotension, or cardiorespiratory arrest.

CONTRAINDICATIONS:
Do not administer hydroxocobalamin and sodium thiosulfate to the same patient.

PRECAUTIONS:
Hydroxocobalamin has physical (particulate) and chemical incompatibilities with many medications, and it is best to administer other drugs or products (e.g., blood) through a separate intravenous line.

SIDE EFFECTS AND NOTES:

A. The most frequently occurring side effects are chromaturia (red colored urine) and erythema (skin redness) which occur in nearly all patients.
B. Other reported serious side effects include allergic reactions, temporary increases in blood pressure, nausea, headache, and infusion site reactions.
C. Because of its deep red color, hydroxocobalamin has also been found to interfere with certain laboratory tests based on light absorption including co-oximetric measurements or carboxyhemoglobin, methemoglobin, and oxyhemoglobin.

ADULT DOSING:

Cyanide poisoning or smoke inhalation with suspected cyanide poisoning -
5 grams IV or IO over 15 minutes. Repeat once if needed. For cardiac arrest, hydroxocobalamin should be administered as a rapid fluid bolus.

PEDIATRIC DOSING:

Cyanide poisoning or smoke inhalation with suspected cyanide poisoning -
70 mg/kg IV or IO to a max of 5 g over 15 minutes. For cardiac arrest, hydroxocobalamin should be administered as a rapid fluid bolus. Contact OLMC regarding second dose.

Ibuprofen – 20.147

OLMC REQUIRED: No

SUPPLIED: Liquid - 100 mg / 5 mL (Children's); 50 mg / 1.25 mL (Infant's);
200 mg tablets, capsules

PHARMACOLCOGY AND ACTIONS:
Ibuprofen, from isobutyl phenyl propionic acid, is a nonsteroidal anti-inflammatory drug (NSAID) used for relieving pain, lowering fever, and reducing inflammation. Like other NSAIDs, it works by inhibiting the synthesis of prostaglandins, involved in mediating inflammation (swelling), pain, and fever. It achieves this effect on prostaglandin synthesis by inhibiting cyclooxygenase, an enzyme that is present in various tissues of the body.

INDICATIONS:

A. Mild to moderate pain.
B. Fever.

CONTRAINDICATIONS

A. Known hypersensitivity to ibuprofen.
B. Previous asthma, urticarial, or allergic reaction after taking aspirin or other NSAID.
C. Recent heart surgery.
D. Has taken ibuprofen in last 6 hours.
E. Unable to take oral medication.
F. Any signs of dehydration in pediatric patients.
G. Patients less than 6 months old.

PRECAUTIONS:
Ibuprofen may cause a severe allergic reaction, especially in people who are allergic to aspirin. May cause stomach bleeding especially in patients:

- Older than 60 years.
- Who have had stomach ulcers or bleeding problems.
- Take blood thinners.
- Take other medications containing NSAIDs.

ADULT DOSING:

Fever and Pain Management –
200 - 600 mg PO.

PEDIATRIC DOSING:

Fever and Pain Management –
10 mg/kg PO liquid only to maximum of 600 mg (refer to dosing chart below)

Ibuprofen – 20.147

Pediatric dosing using 100 mg/5 mL (Children's liquid)

Weight	Dose	Volume
17 lbs. / 7.5 kg	75 mg	3.75 mL
22 lbs. / 10 kg	100 mg	5 mL
33 lbs. / 15 kg	150 mg	7.5 mL
44 lbs. / 20 kg	200 mg	10 mL
55 lbs. / 25 kg	250 mg	12.5 mL
66 lbs. / 30 kg	300 mg	15 mL
77 lbs. / 35 kg	350 mg	17.5 mL
88 lbs. / 40 kg	400 mg	20 mL

Ipratropium Bromide – 20.150

OLMC REQUIRED: No

SUPPLIED: 0.5 mg / 2.5 ml vial individually or 0.5 mg packaged with 3 mg albuterol (Duo-Neb).

PHARMACOLOGY AND ACTIONS:
Ipratropium is an atropine derivative used for inhalation therapy. For severe asthma, ipratropium taken in addition to a short acting beta agonist (such as albuterol) can provide greater bronchodilation and clinical benefit than the beta agonist alone. It has no anti-inflammatory effects and does not decrease bronchial hyper-responsiveness.

INDICATIONS:
As a supplement to albuterol in patients with asthma and COPD.

CONTRAINDICATIONS:
Do not use in patients with severe glaucoma.

PRECAUTIONS:
Ipratropium in the meter dose inhaler and auto-inhaler formulations should not be administered to individuals allergic to soy lecithin or related food products (e.g., soybeans, peanuts). The nebulized formulation may be administered to these patients.

SIDE EFFECTS AND NOTES:

A. Dry mouth.
B. Pharyngeal irritation.
C. Increased intra-ocular pressure in glaucoma patients.

ADULT DOSING:

Asthma/ COPD -

3.0 ml DuoNeb (3.0 mg albuterol/0.5 mg ipratropium) via nebulizer. Repeat as needed X 2. Do not administer more than three total treatments.

PEDIATRIC DOSING:

Same as adult dosing

Ketamine Hydrochloride - 20.155

OLMC REQUIRED: No

SUPPLIED: 500 mg/10 ml vial.

PHARMACOLOGY AND ACTIONS:
Ketamine is a NDMA receptor antagonist, that is structurally similar to phencyclidine (PCP), that acts as a dissociative anesthetic agent by interrupting the connection between the thalamo-neocortical tracts and the limbic system in the brain, producing anesthesia. In addition, it has analgesic effects and can be used at lower doses for pain control – without causing anesthesia. It also stimulates catecholamine release from the adrenal glands causing an increase in heart rate, blood pressure, and cardiac output. Ketamine is also a bronchodilator and is a useful induction agent when intubating patients with severe bronchospasm.

INDICATIONS:
A. As an induction agent for Drug Assisted Airway Management (DAAM).
B. Post intubation sedation.
C. Pain management.

CONTRAINDICATIONS:
A. Known pregnancy.
B. Non-traumatic chest pain.
C. Patients with a history of schizophrenia or history of psychosis.

SIDE EFFECTS AND NOTES:
A. Increased blood pressure due to catecholamine release.
B. Emergence reaction can occur in 5 - 30% of patients. Duration of action is 10 - 20 minutes IV and continued sedation must be provided before the induction agent wears off.

ADULT DOSING:

Pain management -

A. 12.5 - 25 mg IV/IO **slow push over 5 minutes,** or by IV infusion over 15 minutes**,** or 25 - 50 mg IM. May repeat once after 30 min unless patient develops nystagmus, hallucinations, or dysphoric symptoms. **Ketamine must be diluted prior to IV or IO administration for pain management. Either dilute 12.5 mg in 9.75 ml or 25 mg in 9.5 ml of Normal Saline for slow IVP or dilute 12.5 - 25 mg in 100 ml of Normal Saline and infuse over 15 minutes.***

OR

B. 1mg/kg **VIA BREATH ACTUATED NEBULIZER (BAN)**. Add saline for total volume of 5 ml**.**

Induction agent for DAAM -

1 - 2 mg/kg IV/IO slow push over 1 minute. Dilute Ketamine with normal saline to a minimum of 10 ml total volume for a slower administration.

Post intubation sedation –

Initial dose is 1 mg/kg slow IV/IO push if not used for induction. If used for induction, initial dose is 0.5 mg/kg slow IV/IO push. May repeat 0.5 mg/kg every 15 minutes as necessary to maintain analgesia and sedation. **Ketamine should not be used for sedation following ROSC in cardiac arrest patients.**

***Ketamine should not be mixed with lactated ringers for dilution purposes due to compatibility concerns.**

PEDIATRIC DOSING:

Pain management -

A. For children ≥ 15, dose is 0.3 mg/kg IV slow push over 5 minutes, up to a max of 25 mg. Dose must be diluted in normal saline prior to administration.
OR
B. For children ≥ 7, dose is 1 mg/kg **VIA BREATH ACTUATED NEBULIZER (BAN)**. Add saline for total volume of 5 ml.

Induction agent for DAAM - Same as adult

Nebulized ketamine with a concentration of 500 mg/10 ml

Pt. weight lbs/kg	Dose in mg (1 mg/kg)	mL of ketamine to add to nebulizer	mL of fluid to add to nebulizer	Concentration of ketamine in nebulizer after fluid is added
220 lbs/100 kg	100 mg	2 ml	3 ml	20 mg/ml
209 lbs/95 kg	95 mg	1.9 ml	3.1 ml	19 mg/ml
198 lbs/90 kg	90 mg	1.8 ml	3.2 ml	18 mg/ml
187 lbs/85 kg	85 mg	1.7 ml	3.3 ml	17 mg/ml
176 lbs/80 kg	80 mg	1.6 ml	3.4 ml	16 mg/ml
165 lbs/75 kg	75 mg	1.5 ml	3.5 ml	15 mg/ml
132 lbs/60 kg	60 mg	1.2 ml	3.8 ml	12 mg/ml
110 lbs/50 kg	50 mg	1 ml	4 ml	10 mg/ml
88 lbs/40 kg	40 mg	0.8 ml	4.2 ml	8 mg/ml
77lbs/35 kg	35 mg	0.7 ml	4.3 ml	7 mg/ml
66 lbs/30 kg	30 mg	0.6 ml	4.4 ml	6 mg/ml
55 lbs/25 kg	25 mg	0.5 ml	4.5 ml	5 mg/ml
44 lbs/20 kg	20 mg	0.4 ml	4.6 ml	4 mg/ml

(5 minus volume left in BAN) X Concentration of ketamine in BAN = mg administered to patient.

Example for 80 kg patient (80 mg dose) with 1.5 ml of volume left in BAN: (5 – 1.5 ml) X 16 mg/ml = 56 mg administered. Waste amount in BAN is 24 mg + the 420 mg left in vial for a total waste of 444 mg.

Ketorolac Tromethamine (Toradol®) – 20.157

OLMC REQUIRED: No

SUPPLIED: 30 mg /1 ml vial

PHARMACOLOGY AND ACTIONS:
Ketorolac works by inhibiting cyclooxygenase-1 and 2 enzymes to block the synthesis of prostaglandins and reduces inflammation/pain.

INDICATIONS:
A. Musculoskeletal pain.
B. Flank pain from suspected kidney stone.

CONTRAINDICATIONS:
A. Age < 2 or > 80.
B. Multisystem trauma
C. History of kidney disease or transplant.
D. History of liver disease.
E. Allergies to aspirin or other NSAIDs.
F. Pregnancy, or lactating females.
G. On anticoagulants, such as vitamin K antagonists (e.g., warfarin) or direct acting agents such as rivoraxaban, apixaban, edoxaban, lovenox, and dabigatran.
H. Bleeding or clotting disorder or history of ulcer.
I. Suspected cardiac chest pain.

SIDE EFFECTS AND NOTES:
A. Burning or pain at the injection site
B. Nausea and vomiting
C. Dizziness
D. Headache
E. Itching
F. Flushing

ADULT DOSING (≤ 80 years):
Pain management -
30 mg IM or 15 mg IV. **Single dose only**

PEDIATRIC DOSING (age 2-16 years):
Pain management -
1 mg/kg IM to a max of 30 mg or 0.5 mg/kg IV to a max of 15 mg.

Labetalol – 20.158

OLMC REQUIRED: No

SUPPLIED: 100 mg / 20 ml vial

PHARMACOLOGY AND ACTIONS:

Labetalol combines both selective, competitive alpha1-adrenergic blocking and nonselective, competitive beta-adrenergic blocking activity in a single substance. These actions decrease blood pressure without reflex tachycardia and without a significant reduction in heart rate.

INDICATIONS:

The treatment of uncontrolled, and sustained, hypertension in pregnant and postpartum women.

CONTRAINDICATIONS:

A. Bronchial asthma.
B. Overt cardiac failure.
C. Greater than first degree heart block.
D. Cardiogenic shock.
E. Severe bradycardia.

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SIDE EFFECTS AND NOTES:

A. Cardiovascular: Symptomatic postural hypotension, ventricular dysrhythmia, syncope, bradycardia, and heart block.
B. CNS: Dizziness, tingling of the scalp/skin, numbness, and vertigo.
C. Respiratory: Wheezing and bronchospasm.
D. GI: Nausea and vomiting.

ADULT DOSING:

For sustained elevation in BP > 160 mmHg systolic and/or ≥ 110 mmHg diastolic (either one or both) that persists for at least 15 minutes or more in pregnant or post-partum women.

10 mg slow IV push over 1 - 2 minutes. May be repeated twice (3 doses total) every 15 minutes if BP is not within target range. Depending on effect of preceding dose, double remaining doses (e.g., 1st dose 10 mg, 2nd dose 20 mg, 3rd dose 40 mg. Maximum total dose 70 mg.) Target systolic BP 140 - 150 mmHg and diastolic BP 90 - 100 mmHg. Stop administration if HR < 60 bpm or other adverse effects.

PEDIATRIC DOSING:

Not indicated for pediatric patients

Lidocaine – 20.160

OLMC REQUIRED: See Contraindications.

SUPPLIED: 100 mg / 5 ml of 2% solution in pre-filled syringe

PHARMACOLOGY AND ACTIONS:
Lidocaine depresses the automaticity of Purkinje fibers, raising stimulation threshold in the ventricular muscle fibers which makes the ventricles less likely to fibrillate. It has little antiarrhythmic effect on the atrial muscle in normal doses. The effect of a single bolus on the heart disappears in 10 - 20 minutes due to redistribution in the body. The metabolic half-life of lidocaine is about 2 hours.

INDICATIONS:
A. Recurrent ventricular fibrillation or pulseless ventricular tachycardia.
B. Following successful defibrillation from ventricular fibrillation or pulseless ventricular tachycardia.
C. Pain management following IO placement.

CONTRAINDICATIONS:
Do not use in perfusing pts in the following situations without OLMC approval:
A. Systolic BP is less than 90 mmHg.
B. Heart rate is less than 50 beats per minute.
C. Periods of sinus arrest are present.
D. Second or third-degree heart block are present.

PRECAUTIONS:
A. Lidocaine is not recommended in the treatment of supra-ventricular arrhythmias.
B. If administering maintenance dosing and the patient begins seizing, stop the lidocaine dosing and treat per Seizure protocol.

SIDE EFFECTS AND NOTES:
A. Side effects include drowsiness, dizziness, disorientation, confusion, and seizures.
B. Hypotension.
C. Lidocaine is metabolized in the liver and, therefore, patients with hepatic disease, shock, or congestive heart failure will have decreased metabolism. All doses after the initial dose must be decreased to one-quarter of the initial dose in these patients.
D. Toxicity is more likely in elderly patients.

ADULT DOSING:
V-Fib/Pulseless VT -
Bolus dose - 1.5 mg/kg IV/IO. Repeat to a max of 3 mg/kg if needed.
ROSC (from V-Fib/Pulseless VT arrest) -
- If no antidysrhythmic given prior to ROSC - 1.5 mg/kg bolus repeated with 0.75 mg/kg every 10 minutes to a max total dose of 3 mg/kg.
- If Lidocaine was the last anti-dysrhythmic given - 0.75 mg/kg every 10 minutes. Max total arrest/post-ROSC dose is 3 mg/kg.

Pain management for IO placement -
40 mg IO (**2**cc's of **2**% Lidocaine slowly over **2** minutes).

PEDIATRIC DOSING:
Same as adult for V-Fib/Pulseless VT, and ROSC.
Pain management for IO placement- 0.5 mg/kg IO slowly, not to exceed 40 mg.

Lorazepam – 20.165

OLMC REQUIRED: None

SUPPLIED: 2 mg / 1 ml vial or 4 mg / 1 ml vial

PHARMACOLOGY AND ACTIONS:
Long-acting benzodiazepine with central nervous system depressant, anticonvulsant, muscle relaxant, and anxiolytic effects. It enhances the inhibitory effects of GABA in the brain but has no analgesic properties.

INDICATIONS:
A. Patients actively seizing upon EMS arrival or having repetitive seizures without regaining consciousness.
B. To relieve anxiety and produce amnesia during cardioversion, pacing, or following drug assisted airway management (DAAM).
C. To facilitate restraint in patients whose cause of agitation is likely drug ingestion (especially stimulants), withdrawal, or from a postictal state.
D. CPR Induced Consciousness.
E. To relieve anxiety and agitation in hospice and palliative care patients.

CONTRAINDICATIONS:
A. Prior anaphylactic reaction to lorazepam, any component of the formulation, or other benzodiazepines (cross-sensitivity with other benzodiazepines may exist).
B. Acute narrow-angle glaucoma.
C. Neonates and premature infants.

PRECAUTIONS:
Must be used with caution in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

SIDE EFFECTS AND NOTES:
Like most benzodiazepines, adverse reactions to lorazepam include CNS and respiratory depression, which are dose dependent. More severe effects occur with high doses. Concomitant use of other sedative-hypnotics, opioids, and alcohol can worsen adverse reactions caused by lorazepam.

ADULT DOSING:
Seizures –
2 mg IV/IO or 4 mg IM. Repeat IV/IO dose every 5 minutes until seizure stops to a max of 8 mg. May repeat IM dose once in 10 minutes to a max of 8 mg.
Pharmacological sedation –
2 mg IV/IO or 4 mg IM. May repeat once in 10 minutes. Max total dose of 4 mg IV/IO or 8 mg IM. (***For immediate threat, RASS +3 or + 4, may repeat IV/IO dose once in 5 minutes***).
Sedation after intubation & for induced hypothermia shivering –
1 - 2 mg IV/IO if systolic BP is ≥ 100 mmHg. May repeat every 5 - 10 minutes as needed to a max total dose of 4 mg.
Sedation before cardioversion (with no IV) –
2 mg IM.

Sedation for external pacing
1 - 2 mg IV/IO, may repeat every 5 minutes as needed to a max total dose of 4 mg. If no IV, 2 mg IM, may repeat once in 10 minutes.

CPR Induced consciousness –
1 mg IV/IO. May repeat every 5 - 10 mins. as needed to max total dose of 4 mg.

Anxiety/Agitation for hospice/palliative care patients –
0.5 mg IV/IM for mild to moderate symptoms. 1.0 mg IV/IM for severe symptoms.

PEDIATRIC DOSING:

Seizures –
0.1 mg/kg IV/IO to a max single dose of 2 mg or 0.2 mg/kg IM to a max single dose of 4 mg. Repeat IV/IO dose every 5 minutes until seizure stops to a max total dose of 8 mg. Repeat IM dose every 10 minutes until seizure stops to a max total dose of 8 mg.

Pharmacological Sedation (Age > 12 only) –
0.05 mg/kg IV/IM, max single dose of 2 mg IV and 4 mg IM. May repeat once in 10 mins.

Sedation after intubation with or without drug assistance –
0.05 mg/kg IV/IO to a max single dose of 2 mg, may repeat every 5 - 10 minutes as needed up to a max total dose of 4 mg.

Sedation before cardioversion (with no IV) –
0.1 mg/kg IM to a max single dose of 2 mg.

Sedation for pacing –
0.05 mg/kg IV/IO to a max single dose of 2 mg, may repeat every 5 minutes to a max total dose of 4 mg. If no IV, 0.1 mg/kg IM to a max single dose of 2 mg, may repeat once in 10 minutes.

Magnesium Sulfate – 20.170

OLMC REQUIRED:
Seizures in eclampsia/pre-eclampsia. Asthma in pediatric patients.

SUPPLIED: 1 gram (50%) / 2 ml vial or 5 grams (50%) / 10 ml vial

PHARMACOLOGY AND ACTIONS:
Magnesium is a cation that is present in human cells and intercellular fluids. It acts as an antiarrhythmic agent and is useful in the treatment of polymorphic ventricular tachycardia due to an underlying prolonged QTc interval, ventricular fibrillation, and ventricular tachycardia.

INDICATIONS:

A. Polymorphic ventricular tachycardia (stable wide complex, irregular tachycardia associated with an underlying prolonged QTc Torsade de Pointes).
B. Patients with prolonged QTc (> 500 msec) who are at risk for Torsade de Pointes.
C. For the treatment of seizures in women with pre-eclampsia/eclampsia with OLMC approval.
D. In severe asthma as a smooth muscle relaxant and inhibitor of histamine.

CONTRAINDICATIONS:
None in the emergency setting.

PRECAUTIONS:
In the non-arrest patient, magnesium sulfate may cause hypotension, bradycardia, decreased reflexes, and respiratory depression.

ADULT DOSING:

Wide complex, irregular tachycardia -
Dose is 2 grams IV/IO over 1 - 2 minutes.

Prolonged QTc (> 500 msec.) -
Dose is 2 grams IV over 15 - 20 minutes.

Eclampsia/Pre-eclampsia -
Contact OLMC for dosing in this situation. Normal dose is 4 grams IV over 15 - 20 minutes.

Asthma -
Dose is 2 grams IV over 15 - 20 minutes.

PEDIATRIC DOSING:

Asthma -
Contact OLMC for dosing in this situation.

DILUTING FOR IV ADMINISTRATION

A. Dilute each gram of magnesium sulfate in 8 ml of normal saline. (Example: Mix 1 gram in 8 ml of NS; mix 2 grams in 16 ml of NS)
B. For use with IV pump, dilute either 2 grams or 4 grams of magnesium sulfate in 100 ml of normal saline or lactated ringers (in Buretrol or 100 ml bag).

Midazolam (Versed®) – 20.190

OLMC REQUIRED: No

SUPPLIED: 10 mg / 2 ml vial

PHARMACOLOGY AND ACTIONS:
Midazolam is a benzodiazepine with potent sedative, anti-anxiety, and anticonvulsant properties. It also causes significant antegrade amnesia when administered IV.

INDICATIONS:
A. Patient actively seizing upon EMS arrival or having repetitive seizures without regaining consciousness.
B. To relieve anxiety and produce amnesia during cardioversion, pacing, or following Drug Assisted Airway Management (DAAM).
C. To facilitate restraint in patients whose cause of agitation is likely drug ingestion (especially stimulants), withdrawal, or from a postictal state.
D. CPR Induced Consciousness.

CONTRAINDICATIONS:
In seizures, do not give unless patient is actively seizing.

PRECAUTIONS:
Midazolam causes respiratory depression and/or hypotension especially if administered rapidly. Monitor patient closely.

SIDE EFFECTS AND NOTES:
A. Common side effects include drowsiness, hypotension, respiratory depression, and apnea. These are more likely to occur in the very young and the elderly. Rarely, patients may experience paradoxical agitation.
B. Respiratory depression is more likely in patients who have taken other CNS depressant drugs such as opioids alcohol, sedative-hypnotics, or when given rapidly.
C. Midazolam is metabolized in the liver and excreted by the kidney. Doses should be adjusted accordingly in patients with underlying hepatic or renal diseases and low flow states such as congestive heart failure.

ADULT DOSING:
Seizures -
2.5 - 5 mg IV/IO or 10 mg IM/IN. Repeat every 5 minutes until seizure stops.
Pharmacological sedation -
2.5 mg IV/IO or 5 mg IM. May repeat once in 10 minutes.
For immediate threat (RASS +3 or +4): 2.5 - 5 mg IV/IO or 5 - 10 mg IM with repeat doses of 1 - 2 mg IV/IO every 5 minutes as needed.
Induction medication for DAAM (Least desirable option) -
10 mg IV/IO if systolic BP is $\geq$ 100 mmHg.
5 mg IV/IO if systolic BP < 100 mmHg.
Sedation after intubation & for induced hypothermia shivering -
2.5 - 5 mg IV/IO if systolic BP is $\geq$ 100 mmHg. Repeat every 15 minutes as necessary to maintain sedation.
Sedation before cardioversion (with no IV) -
5 mg IM/IN

Sedation for Pacing -
2.5 - 5 mg IV/IO or 5 mg IM/IN, may repeat once. Call OLMC for additional orders.

CPR Induced Consciousness-
Up to 2.5 mg IV/IO used in conjunction with fentanyl. May repeat every 5 - 10 minutes as needed.

PEDIATRIC DOSING:

Seizures -
0 - 11 months (16 - 29", 0 - 8 kg) **or patient is extremely small for age**: Follow pediatric guide and administer midazolam 0.3 mg/kg IM/IN to a max of 10 mg. Repeat every 5 minutes until seizure stops.
12 months - 13 years old (use reported age; if unknown, measure patient and use corresponding length in inches to determine dose):
12 - 16 months (29.5 - 31.5", 9 kg): 0.25 ml (= 1.25 mg) IM/IN
17 months - 5 years (32 - 43", 10 - 19 kg): 0.5 ml (= 2.5 mg) IM/IN
6 - 11 years (43.5 - 56.5", 20 – 37 kg): 1 ml (= 5 mg) IM/IN
12 - 13 years (≥ 57", ≥ 38 kg): 2 ml (= 10 mg) IM/IN
Repeat every 5 minutes until seizure stops.

Pharmacological sedation (Age > 12 only) -
0.1 mg/kg IV/IM, max 10 mg IM and 6 mg IV. May repeat every 10 mins. as needed. (Refer to pediatric pharmacological sedation flow chart in the Agitated Patient Protocol 10.015).

Induction medication for DAAM (Least desirable option) -
0.2 mg/kg IV/IO not to exceed adult dose.

Sedation after intubation with or without paralytics -
0.1 mg/kg IV/IO, max dose 2.5 mg, repeat every 15 minutes as necessary to maintain sedation.

Sedation before cardioversion -
0.2 mg/kg IM/IN to a max of 5 mg

Sedation for pacing -
0.1 mg/kg IV/IO, max dose 5 mg. May repeat once after 5 minutes.
* Call OLMC for additional orders.

Morphine Sulfate – 20.200

OLMC REQUIRED: No

SUPPLIED: Varies

PHARMACOLOGY AND ACTIONS:
Morphine is a narcotic analgesic that induces drowsiness, mental clouding, and mood changes. It also increases venous capacitance, decreases venous blood return (preload), and reduces systemic vascular resistance at the arteriolar level (afterload). This may lead to decreases in myocardial oxygen demand. Onset of action when given IV is 2 - 3 minutes and peak effect occurs at 7 - 10 minutes. Duration is 3 - 5 hours.

INDICATIONS:

A. Suspected ischemic chest pain unresponsive to nitroglycerin.
B. Pain due to burns or musculoskeletal injury.

CONTRAINDICATIONS:

A. Known allergy to morphine or sulfates (Sulfa drugs are not sulfates).
B. Blood pressure less than 100 mmHg systolic.
C. Trauma or pain of the head or abdomen.
D. Respiratory rate less than 14 breaths per minute or oxygen saturation less than 90%. For pediatric patients, vital signs should be maintained within the normal age-appropriate range.

PRECAUTIONS:

A. Morphine causes respiratory depression that is reversible with naloxone. This respiratory depression is exacerbated by underlying lung disease (COPD, etc.) and other depressant drugs (Valium, alcohol, cyclic anti-depressants). Naloxone and respiratory support must be available when using morphine.
B. If hypotension develops, it is usually responsive to naloxone administration and Trendelenburg position. If hypotension persists, follow Shock protocol.

SIDE EFFECTS AND NOTES:

A. The goal of morphine administration is patient comfort (not the total elimination of pain but reduction in perception of pain by the patient).
B. Morphine is a Schedule II controlled substance. Follow your agencies Controlled Substance policy or procedure for control and monitoring of use.

ADULT DOSING:

Pain - Musculoskeletal injuries, burns, chest pain -
2 - 8 mg IV. Repeat every 15 - 20 minutes to max of 20 mg. If no IV give 5 - 10 mg IM. May repeat IM with 5 mg every 15 - 20 minutes to a maximum of 20 mg.

PEDIATRIC DOSING (< 20kg):

Pain - Musculoskeletal injuries, burns, chest pain -
0.1 mg / kg IV/IM. May repeat IM after 15 - 20 minutes. Do not exceed adult dosing.

Naloxone (Narcan®) – 20.210

OLMC REQUIRED: No

SUPPLIED: 2 mg / 2 ml pre-filled syringe

PHARMACOLOGY AND ACTIONS:
Naloxone is an opioid antagonist that competitively binds to opioid receptor sites, but which exhibits almost no pharmacologic activity of its own. Duration of effect is 1 - 4 hours.

INDICATIONS:
A. Reversal of opioid effects, particularly respiratory depression, due to opioid drugs either ingested or injected or administered during treatment. Opioid drugs include fentanyl, morphine, meperidine, hydromorphone, oxycodone, hydrocodone, and codeine.
B. Diagnostically in coma of unknown etiology to rule out or reverse opioid depression.

CONTRAINDICATIONS:
Do not use in neonates.

PRECAUTIONS:
A. In patients physically dependent on opioids, violent withdrawal symptoms may occur. Be prepared to restrain the patient.
B. Some opioid intoxications may require up to 8 mg of naloxone to reverse symptoms (e.g., methadone, carfentanil).

SIDE EFFECTS AND NOTES:
A. The duration of some opioids is longer than naloxone, repeat doses may be necessary. Monitor the patient closely. Patients who have received naloxone must be transported to the hospital because coma may reoccur when naloxone wears off.
B. Side effects are rare. Do not hesitate to use if indicated.
C. If no effect is seen from naloxone administration, consider other causes of coma.

ADULT DOSING:
Reversal of opioid effects, coma of unknown etiology -
0.5 mg IV. Repeat every 2 minutes up to 2 mg titrating to respiratory rate. If no IV, give 2 mg IM/IN. If no response to initial dose and opiate intoxication is still suspected, repeat 2 mg IV/IM/IN every 3 - 5 minutes up to a maximum of 8 mg total.

PEDIATRIC DOSING:
Reversal of opioid effects, coma of unknown etiology -
0.1 mg / kg IV/IM/IN up to 2 mg. May repeat q 3 - 5 minutes up to 2 mg / dose. Max total dose 8 mg. Do not use in neonates.

Nitroglycerin – 20.220

OLMC REQUIRED: See Contraindications (B).

SUPPLIED: 0.4 mg metered dose spray, 0.4 mg tablets, 50 mg/10 ml vial

PHARMACOLOGY AND ACTIONS:
Nitroglycerin is a vasodilator. It is a smooth muscle relaxant that reduces venous tone causing pooling of blood in the peripheral veins, decreasing peripheral resistance, and thereby decreasing cardiac preload. It also causes mild dilation of the coronary arteries.

INDICATIONS:
A. Presumed ischemic chest pain.
B. Decompensated heart failure.
C. SCAPE (Sympathetic Crashing Acute Pulmonary Edema).

CONTRAINDICATIONS:
A. Blood pressure less than 100 mmHg systolic.
B. Patients who have taken Viagra® (sildenafil citrate), Levitra® (vardenafil HCl) or other similar drugs within 24 hours, or who have taken Cilais® (tadalafil) within 48 hours. Contact OLMC for direction.

PRECAUTIONS:
A. Nitroglycerin can cause hypotension in 10% of patients.
B. Nitroglycerin should be used with caution in patients with an inferior myocardial infarction (ST elevation in II, III and AVF) as this can result in hypotension due to an associated right ventricle infarction (RVI).
C. RVI may be present in up to 50% of inferior myocardial infarctions. 12-lead ECG clues to RVI include STE in III > II. RVI can also be confirmed with a right sided 12 lead ECG and STE ≥ 1 mm in V_4R. RVI patients are preload dependent and may benefit from IV fluids.
D. Generalized vasodilatation can cause profound hypotension and reflex tachycardia.
E. IV should be established prior to administration in patients who have not taken nitroglycerin previously, or who have a potential for hemodynamic instability.

SIDE EFFECTS AND NOTES:
A. Common side effects are headache, flushing, and dizziness.
B. Because nitroglycerin causes generalized smooth muscle relaxation, may relieve chest pain caused by esophageal spasm.

ADULT DOSING:
Chest pain-
0.4 mg SL every 5 minutes until pain is relieved as long as systolic BP is greater than 100 mmHg.
Decompensated heart failure –
Nitroglycerin 0.4 mg SL; repeat every 3 - 5 minutes. *(Do not administer nitroglycerin without OLMC approval if patient has taken sildenafil (Viagra®), vardenafil (Levitra®) or other similar drugs in the last 24 hours, or tadalafil (Cialis®) within the last 48 hours).*

SCAPE - Sympathetic Crashing Acute Pulmonary Edema (extreme respiratory distress, systolic BP > 160 mmHg, diaphoresis, tachycardia, decreased oxygen saturation).

- 0.4 mg SL; repeat every 3 - 5 minutes.
- Once CPAP/BiPAP is established; push dose 1 mg IV if respiratory distress persists and systolic BP remains > 160 mmHg. May repeat once in 5 minutes if respiratory distress persists and if SBP > 160 mmHg.

PEDIATRIC DOSING:
Contact OLMC for dosing.

Push dose NTG:

INDICATIONS:
SCAPE (Sympathetic Crashing Acute Pulmonary Edema) evidenced by: Rapid onset, extreme respiratory distress, diaphoresis, markedly elevated systolic blood pressure > 160, tachycardia, and decrease oxygen saturation.

DOSE:
Push dose 1 mg IV. May repeat once in 5 minutes.

MIXING OPTIONS*:

A. To make a 0.5 mg/ml concentration:
1. Expel 1 ml of Normal Saline from a 10 ml flush.
2. Draw up 1 ml of NTG (5 mg/ml concentration).
3. Result is a concentration 0.5 mg/ml in the 10 ml syringe.
4 Administer 2 ml of the 0.5 mg/ml concentration over 5 - 10 seconds.

B. To make a 0.2 mg/ml concentration:
1. Draw up all 10 ml from the vial of NTG (50 mg/10 ml vial).
2. Put medication in 250 ml bag of Normal Saline.
3. Result is a 0.2 mg/ml concentration.
4. Mix for 10 seconds.
5. Draw up 5 ml of this mixture.
6. Administer 5 ml of the 0.2 mg/ml concentration over 5 - 10 seconds.

***Push-dose NTG should not be mixed with lactated ringers for dilution purposes due to compatibility concerns.**

Norepinephrine (Levophed®) – 20.225

OLMC REQUIRED: No

SUPPLIED: 4 mg/4 ml ampules or vials

PHARMACOLOGY AND ACTIONS:
Norepinephrine stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction related increase in systemic blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation.

INDICATIONS:
Obstructive, cardiogenic, and distributive shock unresponsive to fluid administration.

CONTRAINDICATIONS:
Hypovolemic shock.

PRECAUTIONS:

A. Norepinephrine should be given in a large, patent vein (i.e., antecubital or larger). Do not administer through a hand or leg vein, as these are more likely to be affected by vaso-occlusive diseases and more prone to ischemic complications.
B. Extravasation of norepinephrine into tissue may cause necrosis. The IV should be checked for patency prior to administration and monitored continuously.
C. Norepinephrine is a potent vasoconstrictor and may cause hypertension. The rate of flow should be carefully monitored, and blood pressures checked often.
D. Consider hypovolemia and treat this with appropriate fluids before administration of norepinephrine.

SIDE EFFECTS AND NOTES:

A. Symptoms may include headache, palpitations, tachycardia, chest pain, and eventual hypertension.
B. Reflex bradycardia can result from an increase in blood pressure.

ADULT DOSING:

Cardiogenic/Distributive/Obstructive shock -
Begin at 4 mcg/min. If no response, increase every 5 minutes in 4 mcg/min increments to max of 24 mcg/min. Goal is MAP > 65 mmHg (SBP > 90 mmHg).

PEDIATRIC DOSING:
Begin at 0.1 mcg/kg/min. If no response in 5 min, increase to 0.2 mcg/kg/min. If still no response after 5 more minutes may increase to 0.4 mcg/kg/min. Goal is age appropriate systolic blood pressure.

MIXING/ADMINISTRATION:
Add one 4 mg ampule or vial to 500 ml of NS or LR, or two 4 mg ampules or vials to 1000 ml of NS or LR for a concentration of 8 mcg/ml. Administer via infusion pump or 60 gtt/ml infusion set (**Infusion pump preferred).**

For example: Adults (8 mcg/ml concentration)

Mcg/min	4	8	12	16	20	24
Drops/min	30	60	90	120	150	180

Olanzapine (Zyprexa®)– 20.227

OLMC REQUIRED: No

SUPPLIED:
5 mg or 10 mg orally dissolving tablets (ODT)

PHARMACOLOGY AND ACTIONS:

A. Dopamine and serotonin (5-HT) antagonist, along with anticholinergic, antihistaminic, and anti-alpha-adrenergic effects.
B. Has anxiolytic properties.
C. Low incidence of extrapyramidal effects.

INDICATIONS:
To avoid the need for physical restraint in the mildly agitated patient who is willing to take an oral agent. (**RASS +1, see Agitated Patient protocol 10.015).**

CONTRAINDICATIONS
Known hypersensitivity.

PRECAUTIONS AND NOTES:

A. May cause QTc prolongation, but unlikely with a single dose. Obtain ECG before administration if known history or suspicion for prolonged QTc or cardiovascular disease.
B. Use with caution in suspected drug overdose.
C. Administer tablet immediately once it is removed from the blister unit or bottle. Tablets disintegrate in the mouth and can be swallowed subsequently with saliva or liquid.
D. Patients who have received olanzapine (ODT) may be transported directly to Unity Hospital (see Behavioral Health Emergencies protocol 30.025).

ADULT DOSING:
10 mg ODT.

For patients > 65 years old, dose should be reduced to 2.5 - 5 mg ODT.

PEDIATRIC DOSING:
2.5 mg ODT for < 20 kg or
5 mg ODT for ≥ 20 kg

***The 10 mg ODT tablets can be quartered or the 5 mg ODT tablets can be halved to obtain the 2.5 mg dose.**

Ondansetron (Zofran®) – 20.230

OLMC REQUIRED:
Patients < 6 months except for children in spinal motion restriction or children receiving chemotherapy.

SUPPLIED: 4 mg oral tablet; 4 mg / 2 ml vial

PHARMACOLOGY AND ACTIONS:
Ondansetron is a potent, highly selective serotonin (5-HT3) receptor agonist. Its precise mode of action in the control of nausea is not known. Pharmacologic agents and other triggers may cause release of 5-HT3 receptors. Ondansetron blocks the initiation of this reflex. Ondansetron is commonly used in the treatment of nausea in patients who are receiving chemotherapy or as a postoperative nausea treatment. Peak plasma concentrations of the drug occur 10 minutes after IV administration, and 40 minutes after IM injection. Both routes have the same elimination half-life of 4 hours.

INDICATIONS:
Prevention and control of uncomplicated nausea and vomiting.

CONTRAINDICATIONS:
Known hypersensitivity to Zofran or similar medications.

PRECAUTIONS:

A. Hypersensitivity reactions have been reported in patients who have exhibited hypersensitivity to other 5-HT3 medications (Anzemet®, Kytril®).
B. Patients with bowel obstruction should be monitored closely following administration.
C. Ondansetron may precipitate if mixed with alkaline solutions.
D. ECG changes including QTc interval prolongation and Torsade de Pointes have been observed in patients receiving ondansetron. Monitor patient's ECG closely.

SIDE EFFECTS AND NOTES:

A. The most common side effects include headache, dizziness, drowsiness, and shivers.
B. Body aches, agitation, dysuria, hypotension, and rash have also been reported in a very small number of patients.

ADULT DOSING:

Nausea & vomiting -

8 mg oral dissolving tablet or 4 mg IV/IM. Give slowly over two minutes if giving IV. If nausea and/or vomiting are inadequately controlled after 10 minutes, may repeat dose once.

PEDIATRIC DOSING:

Nausea & vomiting (children 6 months - 2 yrs)

2 mg oral dissolving tablet.

Nausea & vomiting (children 2 yrs - 12 yrs)

4 mg oral dissolving tablet **or**
0.1 mg/kg IV/IM. Give slowly over two minutes if giving IV. Do not exceed 4 mg.

Oxygen – 20.240

OLMC REQUIRED: No

SUPPLIED: Various. D cylinder contains 415 liters at 2,000 psi.

PHARMACOLOGY AND ACTIONS:
Oxygen added to the inspired air raises the amount of oxygen in the blood and the amount delivered to the tissues. Breathing in most persons is regulated by small changes in acid/base balance and CO_2 levels and it takes a large drop in oxygen concentration to stimulate respiration.

INDICATIONS:
A. Suspected hypoxemia or respiratory distress from any cause.
B. Acute chest pain in which cardiac ischemia or myocardial infarction is suspected.
C. Shock from any cause.
D. Major trauma.
E. Carbon monoxide poisoning.

CONTRAINDICATIONS: None

PRECAUTIONS:
A. If the patient is not breathing adequately on their own, the treatment of choice is ventilation with oxygen, not just supplemental oxygen.
B. In a small percentage of patients with chronic lung disease, administration of oxygen will decrease respiratory drive. Do not withhold oxygen because of this possibility. Be prepared to assist ventilations if needed.
C. Titrate oxygen to the lowest level required to achieve an $SpO_2 \geq 94\%$.

SIDE EFFECTS AND NOTES:
A. Non-humidified oxygen is drying and irritating to mucous membranes.
B. Restless may be an important sign of hypoxia.
C. Oxygen toxicity is not a risk in acute administration.
D. Nasal cannula prongs work equally well on nose and mouth breathers.

DELIVERY:

Nasal cannula -		
2 - 8 lpm		24 - 40% inspired O_2
Simple face mask -		
6 lpm		50 - 60% inspired O_2
Rebreather mask -		
10 - 12 lpm		90% inspired O_2
Bag valve mask -		
Room air		21% inspired O_2
12 lpm		40% inspired O_2
With reservoir	+	90% inspired O_2

Oxymetazoline Hydrochloride (Afrin®) – 20.245

OLMC REQUIRED: No

SUPPLIED: 0.5 fl oz nasal solution or other various sizes

PHARMACOLOGY AND ACTIONS:
Oxymetazoline hydrochloride is a selective alpha 1 adrenergic receptor agonist and alpha 2 adrenergic receptor partial agonist that causes localized vasoconstriction.

INDICATIONS:
Epistaxis uncontrolled by direct pressure.

CONTRAINDICATIONS:

A. Allergy to oxymetazoline hydrochloride.
B. Monoamine Oxidase Inhibitor (MAOI) use within the past 14 days.
C. Diastolic blood pressure > 110 mmHg.

SIDE EFFECTS AND NOTES:

A. Avoid administration into the eyes, which will dilate pupils.
B. Temporary burning, stinging, dryness in the nose, runny nose, and sneezing may occur.

ADULT DOSING:

Epistaxis -
Instill two sprays to each affected nostril.

PEDIATRIC DOSING:

A. Follow adult dosing.
B. Oxymetazoline hydrochloride should be avoided if child cannot follow instructions to blow their nose or are unable to tolerate the administration of a nasal medication.

Oxytocin (Pitocin®) – 20.246

OLMC REQUIRED: No

SUPPLIED: 10 unit/ml, 1 ml vial

PHARMACOLOGY AND ACTIONS:
Synthetic pituitary hormone which stimulates uterine contractions to assist with control of postpartum bleeding or atony.

INDICATIONS:
Prophylactic use to reduce risk of postpartum hemorrhage after delivery.

CONTRAINDICATIONS:
A. Uterine Rupture
B. Incomplete delivery

PRECAUTIONS:
When administered IV, must be given slowly over 1 minute. Rapid infusion may lead to hypotension and dysrhythmias.

SIDE EFFECTS AND NOTES:
Confusion, seizures, difficulty breathing, fast or irregular heartbeat, headache, hives, pelvic or abdominal pain, skin rash, or itching.

ADULT DOSING:
Postpartum-
10 IU IV/IM if the neonate is a singleton. For multiple births, administer only after last neonate has been delivered.

PEDIATRIC DOSING:
Not indicated for pediatrics. Consider OLMC.

Pralidoxime (2-Pam®) – 20.250

OLMC REQUIRED: For IV use.

SUPPLIED: 600 mg / 2 ml auto-injector, 1 gm powder vial – reconstitute with 20 ml NS

PHARMACOLOGY AND ACTIONS:
The principal action of Pralidoxime is to reactivate cholinesterase which has been inactivated by an organophosphate pesticide or related compound. The drug's most critical effect is in relieving paralysis of respiratory muscles. Atropine is always required concurrently to block the effect of acetylcholine.

INDICATIONS:

A. As an antidote in the treatment of poisoning due to organophosphate pesticides and chemicals.
B. Control of overdose by anticholinesterase drugs (e.g. treatment of myasthenia gravis).

CONTRAINDICATIONS:
None in the emergency setting.

PRECAUTIONS:

A. Rapid IV injection may cause tachycardia, laryngospasm, muscle rigidity, and transient neuromuscular blockade. Administration should be done slowly and preferably by infusion.
B. Pralidoxime is a relatively short acting drug; repeat dosing may be necessary.

SIDE EFFECTS AND NOTES:
Dizziness, blurred vision, diplopia, headache, drowsiness, nausea, tachycardia, and muscle weakness have been reported following administration.

ADULT DOSING:
Refer to Haz-Mat Protocol – Organophosphate Poisoning for dosing.

PEDIATRIC DOSING:
Refer to Haz-Mat Protocol – Organophosphate Poisoning for dosing.

Proparacaine – 20.255

OLMC REQUIRED: No

SUPPLIED: 0.5% solution in 15 ml bottle

PHARMACOLOGY AND ACTIONS:
Proparacaine hydrochloride is a short-acting local anesthetic of the ester type with an onset of action within 30 seconds. Duration is up to 15 minutes.

INDICATIONS:
Superficial foreign bodies or chemical burns to the eye.

CONTRAINDICATIONS:
Known hypersensitivity to any component of the solution.

PRECAUTIONS:
Systemic effects are rare with topical use.

SIDE EFFECTS AND NOTES:
Instillation of Proparacaine in the recommended concentration and dosage produces little or no initial irritation, stinging, or burning. These effects may occur several hours after use.

ADULT DOSING:

Chemical burns or foreign body to outer eye -

Instill one drop in the affected eye. If there is no effect within one minute, three additional drops may be instilled at one-minute intervals. For transports longer than 15 minutes, if eye pain returns, 1 - 4 additional drops may be instilled to continue anesthetic effect.

PEDIATRIC DOSING:
Same as adult

Rocuronium (Zemuron®) – 20.257

OLMC REQUIRED: No

SUPPLIED: 100 mg in 10 mL vial

PHARMACOLOGY AND ACTIONS:
Rocuronium is a non-depolarizing neuromuscular blocking agent causing skeletal muscle relaxation. Rocuronium produces a pure reversible competition between antagonist molecules and acetylcholine (Ach) for occupancy at the Ach binding site. Neuromuscular blockade occurs within 90 seconds for induction dose and 1 to 3 minutes for maintenance dose. Time to recovery is 20 - 30 minutes. Metabolism is 5 - 35% renal and the remainder by the liver.

INDICATIONS:
A. For sustained neuromuscular blockade in the intubated patient.
B. For Drug Assisted Airway Management (DAAM) in the patient when succinylcholine is contraindicated or unavailable.

CONTRAINDICATION:
Maintenance of paralysis in patients in status epilepticus

PRECAUTIONS:
A. Use of pulse oximetry is required.
B. Rocuronium does not substantially affect heart rate or rhythm, systolic or diastolic blood pressure, mean arterial pressure, cardiac output, or systemic vascular resistance.
C. Rocuronium has no effect on consciousness and must be used with a sedative or induction agent.
D. Rocuronium should not be administered simultaneously with furosemide, methylprednisolone, or sodium bicarbonate.

ADULT AND PEDS DOSING:

Maintenance of post-intubation paralysis - 0.5 mg/kg IV/IO.

Induction for DAAM – 1.2 mg/kg IV/IO.

Sodium Bicarbonate – 20.260

OLMC REQUIRED: Pediatric hyperkalemia and crush injury

SUPPLIED: 50 mEq / 50 ml pre-filled syringe

PHARMACOLOGY AND ACTIONS:
Sodium bicarbonate is an alkalotic solution which neutralizes acids found in the blood. Acids are increased in the blood when body tissues become hypoxic due to cardiac or respiratory arrest. Acidosis depresses cardiac contractility and cardiac response to catecholamines and makes the heart more likely to fibrillate and less likely to defibrillate. Current guidelines no longer recommend routine use of sodium bicarbonate, except in cases of arrest secondary to hyperkalemia, cyclic antidepressant overdose, or acidosis.

INDICATIONS:
A. Acidosis associated with PEA and asystole.
B. To control arrhythmias or asystole in cyclic antidepressant overdose or hyperkalemia.
C. Chlorine inhalation injury.

CONTRAINDICATIONS: None

PRECAUTIONS:
A. Addition of too much bicarbonate may result in alkalosis that is difficult to reverse and may cause as many problems in resuscitation as acidosis.
B. May increase cerebral acidosis, especially in diabetic ketoacidosis.
C. Do not mix sodium bicarbonate with calcium preparations. Slowly flush one drug from the catheter before administering the other.

SIDE EFFECTS AND NOTES:
Each amp of sodium bicarbonate contains 50 mEq of sodium. This may increase intravascular volume and hyperosmolarity resulting in cerebral impairment.

ADULT DOSING:
Sodium Channel Blockade overdose (Tricyclic Antidepressants, Diphenhydramine, propranolol, Type 1a or 1c anti-dysrhythmics) -
1 mEq/kg IV or IO.
PEA, asystole -
1 mEq/kg IV or IO. May repeat q 10 minutes at 0.5 mEq/kg.
Hyperkalemia -
50 mEq IV or IO.
Crush injury -
50 mEq IV or IO.
Chlorine Inhalation -
2.5 ml of 8.4% Sodium Bicarbonate via nebulizer

PEDIATRIC DOSING:
A. Use same dosing as for adult with exception of hyperkalemia and crush injury; call OLMC for dosing in that situation.
B. For children less than 10 kg (1 yr.), dilute by one-half with normal saline prior to administration.

Sodium Thiosulfate – 20.265

OLMC REQUIRED: All situations.

SUPPLIED: 12.5 grams / 50 ml vial

PHARMACOLOGY AND ACTIONS:
Sodium thiosulfate is used as an antidote for cyanide poisoning. The primary mechanism of cyanide detoxification involves the conversion of cyanide to the thiocyanate ion, which is relatively non-toxic. This reaction involves the enzyme rhodanese which is found in many body tissues but with the major activity in the liver. The body has the capability to detoxify cyanide, however, the rhodanese enzyme system is slow to respond to large amounts of cyanide. The rhodanese enzyme reaction can be accelerated by supplying an exogenous source of sulfur. This is commonly accomplished by administering sodium thiosulfate.

INDICATIONS:
Cyanide poisoning.

CONTRAINDICATIONS:
Do not administer to a patient who has been given hydroxocobalamin (Cyano-Kit).

PRECAUTIONS:
A. Sodium thiosulfate is essentially non-toxic. However, some animal studies showed that a constant infusion of sodium thiosulfate led to hypovolemia which was considered due to an osmotic effect.
B. It is not known whether sodium thiosulfate can cause fetal harm when administered to a pregnant woman and should only be administered in this setting if clearly needed.

SIDE EFFECTS AND NOTES:
Sodium thiosulfate is administered as a slow push over 10 minutes. Consider using a Buretrol® or similar device.

ADULT DOSING:
Cyanide poisoning -
50 ml slow IV over 10 - 20 minutes.

PEDIATRIC DOSING:
Cyanide poisoning -
1.65 ml/kg slow IV over 10 - 20 minutes.

Succinylcholine – 20.270

OLMC REQUIRED: No

SUPPLIED: 200 mg / 10 ml vial

PHARMACOLOGY AND ACTIONS:
Succinylcholine is a short acting motor nerve depolarizing skeletal muscle relaxant. It competes with acetylcholine to combine with cholinergic receptors in the motor end plate causing depolarization inhibiting neuromuscular transmission. After intravenous injection, paralysis is obtained within 1 - 2 minutes and persists for approximately 4 - 6 minutes. Effects then start to fade and return to normal. It has no effect on consciousness. Muscle relaxation begins in the eyelids and jaw, then progresses to the limbs, abdomen, diaphragm and finally intercostal muscles. Succinylcholine is hydrolyzed by plasma pseudocholinesterase and is excreted by the kidneys.

INDICATIONS:
To achieve temporary paralysis where endotracheal intubation is indicated.

CONTRAINDICATIONS:

A. Hypersensitivity to the drug.
B. Major burns and crush injuries between 48 hours and 6 months old.
C. Stroke or spinal cord injuries with profound residual deficits between 48 hours and 6 months old.
D. Neuromuscular disease (e.g., muscular dystrophy, multiple sclerosis).
E. Suspected hyperkalemia (e.g., end-stage renal disease patients who have missed dialysis).

PRECAUTIONS:

A. Succinylcholine shall not be administered unless personnel trained and authorized in this procedure are present and ready to perform the procedure.
B. Oxygen, ventilation equipment, and resuscitation drugs should be readily available.
C. Succinylcholine produces paralysis but does not alter a person's level of consciousness. Paralysis in the conscious patient is very frightening, therefore, sedation should be provided to the patient during the procedure. Verbal explanations should be provided to the patient during the procedure, even if you do not think they can hear you.

SIDE EFFECTS AND NOTES:
In rare individuals, because of pseudocholinesterase deficiency, paralysis may persist for a prolonged period. Be prepared to continue to assist ventilations as needed.

ADULT DOSING:

Drug Assisted Airway Management (DAAM) -
1.5 mg/kg IV/IO

PEDIATRIC DOSING:

DAAM -
1.5 mg/kg IV/IO for patients $\geq$ 6 years old.
2 mg/kg IV/IO for patients < 6 years old.

Tranexamic Acid (TXA)– 20.277

OLMC REQUIRED: No

SUPPLIED: 1000 mg (1 gram) / 10 ml vial

PHARMACOLOGY AND ACTIONS:
Tranexamic acid (TXA) is a synthetic analog of the amino acid lysine. It reversibly binds to lysine receptor sites on plasminogen to decrease the conversion of plasminogen to plasmin. This antifibrinolytic effect reduces breakdown of fibrin and helps to stabilize clots to reduce bleeding. TXA also has anti-inflammatory properties.

INDICATIONS:

A. Moderate to severe head trauma, either blunt or penetrating, in patients with a GCS ≤ 12 and with a reactive pupil.
B. Hemorrhagic shock from blunt or penetrating trauma with a systolic blood pressure < 70 mmHg.
C. Significant postpartum hemorrhage (> 500 ml).

CONTRAINDICATIONS

A. Patients less than 15 years old (or weight < 50 kg if age unknown).
B. > 2 hours from time of injury for hemorrhagic shock or TBI.
C. GCS of 3 with no reactive pupil.
D. EMS chest compressions (manual or mechanical).
E. Patients with clinical concern for epilepsy/seizures, MI, stroke, PE, DVT, renal failure, or dialysis.
F. Known or suspected pregnancy.
G. Drowning.
H. Hanging.
I. Burns > 20% TBSA.

PRECAUTIONS AND SIDE EFFECTS:

A. Hypotension has been observed with **rapid IV injection**.
B. TXA, by causing clots to get stronger, can make MI, stroke, PE, and DVTs more challenging to manage.
C. TXA is renally cleared, so its use in patients with known renal failure or dialysis should be avoided.
D. Reported side effects have included seizures, nausea, vomiting, and chest pain.

ADULT DOSING (Age ≥ 15):

Head trauma, hemorrhagic shock, or postpartum hemorrhage: 2 g slow IV/IO push.

PEDIATRIC DOSING:

Not indicated in patients < 15 years of age suffering from head trauma, hemorrhagic shock, or postpartum hemorrhage. Consider OLMC.

Vecuronium (Norcuron®) – 20.290

OLMC REQUIRED: No

SUPPLIED: 10 mg vial of powder and 10 ml vial of diluent solution

PHARMACOLOGY AND ACTIONS:
Vecuronium is a non-depolarizing neuromuscular blocking agent causing skeletal muscle relaxation. It reversibly binds the acetylcholine receptor, blocking the action of acetylcholine. Neuromuscular blockade occurs within 2 - 3 minutes. Time to recovery is 30 - 45 minutes. Vecuronium metabolism is 5 - 35% renal with the remainder done in the liver.

INDICATIONS:
A. For sustained neuromuscular blockade in the intubated patient.
B. As the first line agent for Drug Assisted Airway Management (DAAM) in the patient where succinylcholine is contraindicated.

CONTRAINDICATIONS:
Patients in status epilepticus who require intubation.

PRECAUTIONS:
A. Patients with renal or hepatic failure may experience prolonged paralysis.
B. Vecuronium has no effect on consciousness and must be used with a sedative or induction agent.

SIDE EFFECTS AND NOTES:
A. Vecuronium exhibits minimal side effects and does not substantially affect heart rate or rhythm, systolic or diastolic blood pressure, mean arterial pressure, cardiac output, or systemic vascular resistance.
B. Vecuronium can be used to maintain paralysis even if intubation was performed without Succinylcholine.

ADULT DOSING:
0.1 mg/kg IV/IO.

PEDIATRIC DOSING:
Same as adults.

Ziprasidone (Geodon®) – 20.300

OLMC REQUIRED: No

SUPPLIED: 20 mg single dose vial when reconstituted

PHARMACOLOGY AND ACTIONS:

A. Antipsychotic.
B. The mechanism is related to blockade of dopamine and serotonin receptors producing sedation and tranquilization.
C. Onset of action of a single IM dose is from 15 - 30 minutes and duration of action is 2 - 4 hours. The peak effect may not be apparent for up to 2 hours.

INDICATIONS:
Pharmacological sedation in the agitated and combative patient.

CONTRAINDICATIONS:
Known allergy.

PRECAUTIONS:

A. May cause hypotension. Treat shock per protocol when feasible.
B. Use caution when administering ziprasidone to patients who have taken other CNS depressant drugs (e.g., sedative-hypnotics, alcohol, opioids). Consider reduced doses in these cases.
C. May induce Torsade de Pointes. Monitor ECG and Q-T interval following use, if feasible.
D. Extrapyramidal symptoms have been reported. If severe, treat with diphenhydramine 1 mg/kg IV/IM to a max of 50 mg.
E. Use with caution in patients with a seizure disorder or condition that causes seizures.
F. Ziprasidone is for IM dosing only

NOTES & PRECAUTIONS:

A. Somnolence, dizziness, headache, and nausea have been reported following administration.
B. Reconstitution: Add 1.2 ml sterile water for injection and shake vigorously until completely dissolved.
    - 1 ml = 20mg of ziprasidone.

ADULT DOSING:
10 - 20 mg IM. Do not repeat. (For patients > 65, max dose is 10 mg IM.)

PEDIATRIC DOSING (Age > 12 only):
10 mg IM. Do not repeat.

Procedures

AICD Deactivation – 30.020

DEFINITION:
An AICD is an implanted defibrillator device that consists of a lead system that senses cardiac activity, logic circuitry to analyze sensed signals, a power supply for device function and generating high voltage, and a capacitor that stores and delivers shocks. This device activates when brady and/or tachyarrhythmias are detected within programmed parameters.

INDICATIONS:
Consider application of a magnet to deactivate an implanted cardioverter defibrillator that is firing inappropriately. **Call OLMC prior to application**. Inhibition of AICD devices should be considered when continuous ECG monitoring verifies malfunction and ACLS is readily available.

PROCEDURE:
A. Contact OLMC.
B. Monitor ECG and verify sinus rhythm AND inappropriate defibrillator discharge.
C. Locate the position of the AICD device.
D. Place doughnut magnet directly over the device.
E. After proper positioning and AICD deactivation, tape magnet securely in place and transport.

NOTES & PRECAUTIONS:
A. It is very important to make the correct diagnosis before utilizing this protocol. Be sure that the ECG is showing a normal sinus rhythm without ectopy AND indications of recurrent AICD discharges.
B. Some AICD devices will emit varying beeping or continuous tones when magnets are applied, other will not. Disregard these tones.
C. If the magnet placement is successful in overriding the pulse generation of the AICD, **DO NOT REMOVE THE MAGNET**. Some units will return to normal operation after removal from the magnetic field.
D. Magnets should be stored so as not to come into contact with magnetic sensitive materials (e.g., monitor screens, tapes, credit cards, magnetic door entry cards, and other electronic equipment).
E. A small percentage of AICDs are impervious to magnetic fields (AICD recipients who normally work around magnetic fields have these special units). These will not be deactivated with the doughnut magnet. In such cases, advise OLMC and transport.
F. Consider use of the AICD magnet in deactivating cardiac pacemaker malfunctions. Application of a magnet to a pacemaker changes the pacing to asynchronous mode but will not turn off the pacemaker. Call OLMC prior to application.
G. Identification information of the AICD type, date implanted, and location of implantation should accompany the patient to the hospital. This information is typically found on a wallet card that the patient has.

Behavioral Health Emergencies (Transports to Unity Center) – 30.025

Purpose:
To establish criteria for EMS assessment, triage, and treatment of patients with potential behavioral/mental health emergencies who may be transported directly to the Unity Center for Behavioral Health (UCBH).

Definition:
Behavioral health encompasses behavioral factors in chronic illness care, care of physical symptoms associated with stress rather than diseases, and health behaviors, as well as mental health and substance use conditions and diagnoses.

Inclusion Criteria:

A. Voluntary patient or patient on police or mental health director hold.
B. 9-1-1 call or police request.
C. Age between 18 - 70 years.
D. Mental health complaint (e.g., depression, psychosis, suicidal or homicidal ideation), substance use or behavioral disorder with no acute medical or traumatic condition requiring treatment.
E. Alert and oriented to person, place, and time.
F. No evidence of trauma other than minor abrasions.
G. Able to perform activities of daily living independently (e.g., ambulate, bathe, toileting, eat, and drink).
H. If CBG is obtained, between 60 and 300 mg/dl.

Vital Signs:

A. HR 60 - 130 bpm
B. O_2 sat > 90%
C. Systolic BP 90 - 200mmHg
D. Diastolic BP < 110 mmHg
E. Temperature between 96.0° F (35.6° C) and 100.4° F (38° C), if taken

Exclusion Criteria:

A. Possible drug overdose or acute intoxication impairing ability to ambulate or perform activities of daily living.
B. Acute medical or traumatic condition including altered level of consciousness, chest or abdominal pain, significant bleeding, respiratory distress, or other acute illness or injury.
C. Patients with abnormal vital signs or physical findings.
D. Patients who require pharmacological sedation (olanzapine ODT or IM haloperidol or droperidol alone **IS NOT** an exclusion).
E. Signs/symptoms of acute drug/alcohol withdrawal (e.g., tachycardia, hypertension, tremors, visual hallucinations).
F. Patients with central or peripheral IV lines.
G. Patients requiring gastric or nasogastric tube feedings.
H. Patients requiring dialysis.
I. Pregnancy greater than 20 weeks.
J. Patients requiring CPAP or BiPAP for treatment of acute respiratory failure.
K. Patients that require continuous supplemental oxygen; tracheostomies, or that require any type of services administered by RT such as nebulization.
L. Patient weight > 500 lbs.

Behavioral Health Emergencies (Transports to Unity Center) – 30.025

Procedure:

A. Assess and assure scene safety.
B. If police or Crisis Intervention Team (CIT) is on scene, EMS assessment and intervention should not be delayed, however, police or the CIT may need to diffuse the situation in order to allow for EMS to safely assess the patient. EMS crews should get an initial report from the officer before approaching the patient. If EMS is first on scene, give an initial report to officer.
C. Approach the patient in a calm, slow, reassuring, and honest manner. Multiple people attempting to intervene may increase the patient's confusion and agitation.
D. Consider offering olanzapine ODT 10 mg for agitation.
E. Protect the patient, bystanders, and rescuers from injury. Consider restraint and follow Agitated Patient protocol, if indicated.
F. Obtain history, physical, and mental status examination.
G. Assess and treat any medical conditions per EMS protocol and then determine if patient is eligible for transport to UCBH.
H. All patients will be assessed and evaluated by EMS regardless of transport status.

Specific Precautions:

A. Red Flags that this might **not** be a psychiatric condition:
    1. Waxing and waning level of consciousness.
    2. Abnormal vital signs.
    3. Dilated or pinpoint pupils.
    4. First psychotic episode over the age of 30.
    5. Acute onset over hours/days (consider substance use).
B. Psychiatric signs/symptoms:
    1. Mood disorder: Depression, mania, suicide ideation, anxiety.
    2. Thought disorder: Hallucinations, pressured speech, racing thoughts, grandiose or paranoid ideation, delusions.
C. Medical illnesses including hypoglycemia, hypoxia, stroke, head injury, or CNS infection may mimic psychiatric illness. Do not assume the patient's condition is purely psychiatric.

Breath Actuated Nebulizer (AEROECLIPSE® II BAN®) – 30.030

DEFINITION:
The AEROECLIPSE® II BAN® Nebulizer only creates aerosol when the patient breathes in. This means medication is not wasted between breaths This puts the patient in control of their aerosol treatment and creates a safer environment. Other nebulizers continuously produce aerosol whether you are inhaling, exhaling or resting. This means the medication may be lost into the room instead of delivered to the lungs. In some cases, this can be hazardous to the health of others who may be nearby during the treatments.

INDICATIONS:
Nebulized ketamine administration for pain management. **The BAN® must be used when nebulizing ketamine to avoid the risk of secondary exposure to aerosol medications.**

CONTRAINDICATIONS:
Only to be used by patients ≥ 7 years of age.

PROCEDURE:

A. Unscrew and remove the top of the nebulizer.
B. Carefully place the prescribed medication into the nebulizer cup and replace the nebulizer top.
C. Make sure that the quarter turn valve on top of the nebulizer is pointed towards the dotted arrow which indicates that it is in breath actuated mode. (see picture below).
D. Connect the nebulizer to an oxygen source.
E. Have the patient place the mouthpiece into their mouth and instruct them to breathe slowly and deeply and to exhale normally through the device as desired.
F. The green button on the top of the BAN® will go down when the patient breathes in and will go up when the patient breathes out.
G. Follow your agency's controlled medication disposal process for any remaining medication left in the BAN®.

Continuous Positive Airway Pressure – 30.032

DEFINITION:
Continuous Positive Airway Pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, and to decrease the work of breathing, the sense of dyspnea, and the need for endotracheal intubation in patients who suffer from shortness of breath secondary to CHF/Pulmonary edema, COPD, or asthma. In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

INDICATIONS:
Medical patients complaining of moderate to severe respiratory distress meeting **ALL** the following criteria:

A. Is awake, oriented, and has the ability to maintain an open airway.
B. Has signs and symptoms consistent with either CHF/pulmonary edema, COPD, or asthma.
C. Has a systolic blood pressure above 90 mmHg.
D. Is over 12 years old and is able to fit the CPAP mask.

CONTRAINDICATIONS:

A. Respiratory arrest.
B. Non-cooperative patient.
C. Suspected pneumothorax.
D. Hemodynamically unstable.
E. Inability to maintain mask seal.
F. Active vomiting.

PROCEDURE:

A. EXPLAIN and COACH THE PATIENT ON THE PROCEDURE.
B. Ensure adequate oxygen supply to ventilation device.
C. Place the patient on continuous pulse oximetry and end-tidal CO_2.
D. Turn on device. Set device to minimum flow (2 - 5 cmH_2O).
E. Place the CPAP over the patient's mouth and nose (consider having the patient hold the mask against their face initially to reduce anxiety).
F. Secure the mask with the provided straps.
G. Check for air leaks.
H. Monitor and document the patient's respiratory response to the treatment.
I. Continue to coach patient to keep mask in place and readjust as needed to a maximum of 10 cmH_2O.
J. IF RESPIRATORY STATUS DETERIORATES, REMOVE THE DEVICE AND CONSIDER BAG VALVE MASK VENTILATION AND/OR ENDOTRACHEAL INTUBATION.

REMOVAL PROCEDURE:
CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask or experiences continued or worsening respiratory failure.

Continuous Positive Airway Pressure – 30.032

SPECIAL NOTES:

A. If unable to maintain oxygen saturation > 90%, administer positive airway pressure via BVM and PEEP valve.
B. Contact the receiving hospital as soon as possible that a patient with CPAP is enroute to their hospital so they can be prepared for the patient.
C. Reassessment of the patient's status is critical, and documentation should be performed every 5 - 10 minutes until patient is stable.
D. CPAP mask may be removed temporarily to administer nitroglycerin.
E. Suctioning of secretions may be required on some patients.
F. Watch for gastric distention and/or nausea.
G. The CPAP monometers should be used to determine and adjust CPAP pressures as this will vary depending on the device used and whether nebulization is occurring simultaneously.
H. Monitor mean arterial blood pressure closely in all patients with CPAP.

Double Sequential External Defibrillation – 30.034

PURPOSE:
To define the procedure for performing Double Sequential External Defibrillation (DSED) for refractory ventricular fibrillation.

INDICATIONS (Must meet all indications):

A. ≥ 18 years of age.
B. Persistent Ventricular Fibrillation/Pulseless Ventricular Tachycardia after 3 defibrillation attempts.

PROCEDURE:

A. Prepare the sites for placement of external defibrillation pads by drying the sites and minimizing interference of hair or other obstacles to good pad adhesion.
B. Apply one set of external defibrillation pads in anterior-posterior location. Apply the other set of external defibrillation pads in the anterior-lateral location. **Pads must be placed anterior-lateral and anterior-posterior while assuring they do not contact.** If using LUCAS, ensure that the defibrillation pads and wires are not underneath the suction cup.

1. Anterior-Posterior (A-P) Placement (Figure 1):
    a. Place the ♥ or ✚ therapy electrode over the left precordium. The upper edge of the electrode should be just below the nipple line. Avoid placement over the nipple or the bony prominence of the sternum, if possible.
    b. Place the other pad on the posterior side of the patient below the scapula. Do not place the pad over the bony prominences of the spine or scapula.
2. Anterior-Lateral (A-L) Placement (Figure 2):
    a. Place the ♥ or ✚ therapy electrode lateral to the patient's left nipple between the mid and posterior axillary line.
    b. Place the other therapy electrode on the patient's upper right torso, lateral to the sternum and below the clavicle.

Fig. 1

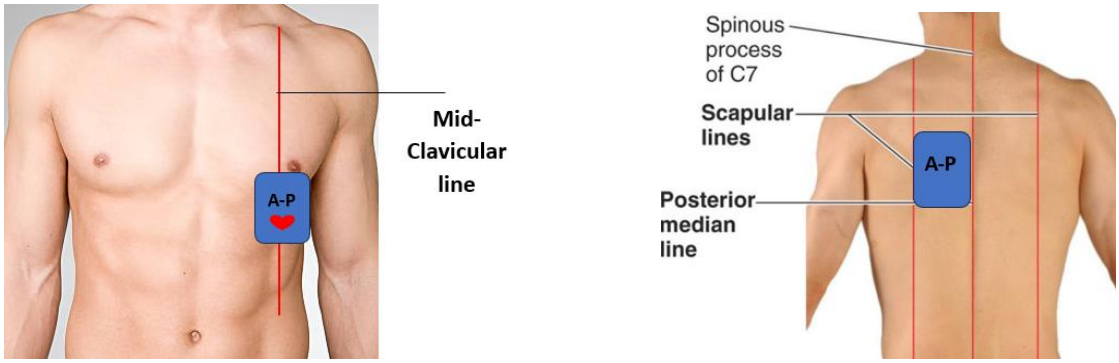
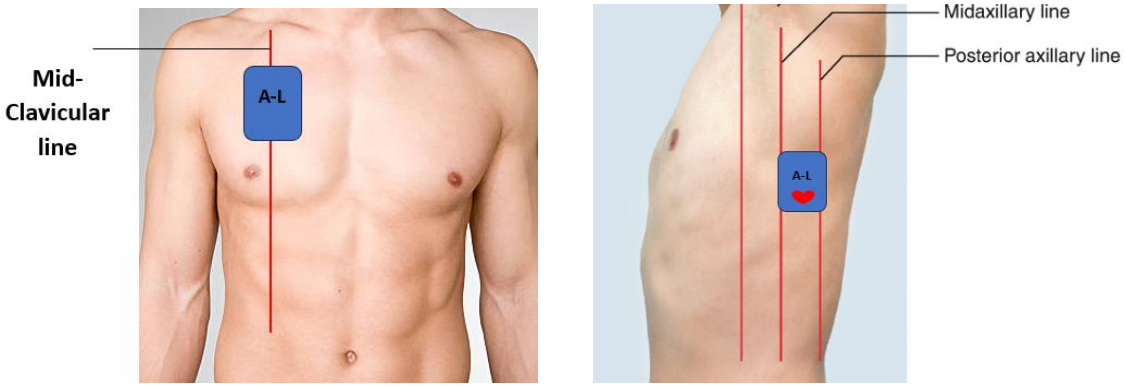


Fig. 2



C. Positon both defibrillators so they are accessible to a single operator.
D. Select the maximum energy for both defibrillators (e.g., Stryker-Physio Control LP15- 360J or Zoll 200J). When documenting DSED, the combined energy will be 720J if using 2 LP15's, 400 if using 2 Zoll's, or 560 if using 1 of each.
E. Charge both devices 15 seconds in advance of the anticipated break in CPR. Assure chest compressions continue while the devices are charging.
F. At the prescribed time in the CPR cycle, discontinue compressions and analyze the rhythm.
G. If a shock is indicated, assure all providers are clear from the patient and have a <u>single provider</u> deliver DSED by depressing the A-L defibrillator first then the A-P defibrillator as quickly as possible.
H. Immediately resume chest compressions.
I. Repeat the DSED steps for each subsequent shock until change in rhythm or ROSC.
J. Ideally, DSED should be performed after the intial dose of an antidysrhythmic (amiodarone or lidocaine) has been administered. In cases of delayed vascular access, DSED should still be performed after the 3rd unsuccessful defibrillation.
K. Following use of DSED, it is recommended that a test load shock be performed on both defibrillators that were used.

Emergency Cricothyrotomy – 30.035

INDICATIONS:
This technique is to be used only when other attempts to establish an airway have been unsuccessful (i.e., you are unable to oxygenate or ventilate using BVM) and respiratory failure exists. Such conditions are most likely to be found with foreign-body obstruction, facial and laryngeal trauma, inhalation, thermal, or caustic injury to the upper airway, angioedema, upper airway bleeding, epiglottitis, and severe croup.

PROCEDURE:
Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck. Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage. This is the position of the cricothyroid membrane.

Surgical Cricothyrotomy (Patients > 40 kg)

A. Cleanse the site with antiseptic.
B. Using your non-dominant hand (thumb and middle finger), stabilize the trachea. Your index finger is used to maintain location of the cricothyroid membrane throughout the procedure.
C. Locate the cricothyroid membrane.
D. Make a vertical incision through the skin. **NOTE**: There may be significant bleeding; consider use of combat gauze to control bleeding.
E. Make a horizontal incision through the cricothyroid membrane large enough to pass the tube.
F. Follow insertion instructions for commercial device being used or follow agency specific guidelines including use of gum elastic bougie.
G. Secure device.
H. Attach end-tidal CO_2 adapter and BVM.
I. Consider sedation if necessary.

Needle Cricothyrotomy – (pediatric patients 12 years and younger).

A. Assemble equipment: 14g or 16g angiocath, 3 cc syringe, 3.0 ETT adapter, oxygen, BVM.
B. Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck unless C-Spine injury is suspected.
C. Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage. This is the position of the cricothyroid membrane.
D. Prepare the area with antiseptic solution.
E. Stabilize the airway between thumb and forefingers.
F. Insert the needle with catheter into the cricothyroid membrane at a 30-degree angle caudally (toward the patient's feet).
G. When the needle is through the membrane. Stop and aspirate for air to ensure tracheal entry.
H. Advance the catheter over the needle and then remove the needle.
I. Attach the 3.0 ETT adapter to the hub of the catheter and begin ventilations with the BVM.
J. Secure the cannula with tape after confirming correct placement by auscultation for breath sounds (5-point check). Observe for kinking of cannula.
K. Consider sedation if necessary.

Emergency Cricothyrotomy – 30.035

NOTES & PRECAUTIONS:

A. Hazards in performing this procedure are primarily those of damage to nearby structures; major vessels to either side of the midline, to the vocal cords if the puncture is made too high, or a through and through injury of the trachea if the puncture is made too deeply. The latter is more commonly seen in infants and children whose tracheas may be deceptively narrow.
B. Palpation of the cricothyroid membrane is very difficult in the infant and young child. The key to success is immobilization of the trachea throughout the procedure.
C. Needle cricothyrotomy is only a temporizing measure providing oxygenation not adequate ventilation.

Endotracheal Intubation – 30.040

INDICATIONS:

A. Airway obstruction
B. Need for airway protection
C. Respiratory failure

PROCEDURE:

Cardiac Arrest Patients:

A. Patients in cardiac arrest can typically be intubated without the use of an induction agent and paralytics. Pre-oxygenation and apneic oxygenation are not indicated.
B. Assemble and check all equipment:
    1. Cardiac monitor
    2. Suction
    3. $EtCO_2$
    4. Pulse Oximeter
    5. O_2 tank w/regulator
    6. Mask and BVM
    7. Intubation equipment (VL, DL)
    8. Backup devices ready: Bougie, supraglottic airway, surgical airway (cric kit)
C. Intubate in a controlled, but timely manner. (Consider use of a supraglottic airway to minimize CPR interruptions or when ALS resources are limited.)
D. Use of the bougie is encouraged for endotracheal intubation to facilitate first pass success.
E. Verify placement of ET tube using waveform capnography and a careful five-point check. Monitor waveform capnography continuously.
F. Secure the tube utilizing ETT securing device. Record ET Tube depth at the teeth or gum line. Depth in adults is height based. Reasonable targets are 21 cm for women, and 23 cm for men at the teeth.
G. Avoid interruptions to CPR when securing a patient's airway. Once secured, deliver 1 breath every 6 secs. (10 breaths/min) asynchronous with compressions. About 1 second per breath, with visible chest rise. Optional method: 30:2 compression/ventilation ratio with advanced airway until ROSC. Post-ROSC, deliver 1 breath every 6 seconds.
H. Ventilate and monitor patient's vital signs including SpO_2.
I. If signs of "CPR Induced Consciousness" are present, administer up to 2.5 mg of midazolam IV/IO **or** 1 mg lorazepam IV/IO **and** 50 mcg of fentanyl. May repeat as needed every 5 - 10 minutes. Maximum total dose of lorazepam is 4 mg.
J. Consider orogastric tube placement.

Drug Assisted Airway Management (DAAM) in Perfusing Patients:

A. DAAM is the technique of using medications to overcome the body's protective airway reflexes to facilitate airway insertion using sedatives and paralytics.
B. Two DAAM techniques are Rapid Sequence intubation (RSI) and Delayed Sequence Intubation (DSI).
C. RSI and DSI choice should be based on paramedic discretion and/or medical director preference.
D. If the patient is agitated and difficult to preoxygenate, consider DSI with ketamine to optimize oxygenation and facilitate resuscitation.

Endotracheal Intubation – 30.040

E. Assemble and check equipment: Two O_2 tanks with regulators, nasal cannula, BVM with mask, $EtCO_2$, intubation equipment, suction, back up devices (bougie, SGA, cric kit).
F. Attach pulse oximeter, cardiac monitor, BP cuff, and waveform capnography.
G. Establish 2 IVs or IOs, if not already done.
H. Verbalize missed airway plan to the entire team and verify/mark surgical airway landmarks.
I. Physiologically optimize patient prior to intubation with a MAP > 65 mmHg (systolic BP > 100 mmHg). **Preoxygenation and denitrogenation are essential steps in every DAAM.**
J. Treat hypotension with fluids and Push Dose epinephrine 10 -20 mcg every 1- 5 minutes, with a goal MAP > 65 mmHg (SBP ≥ 100 mmHg).
K. **Place nasal cannula and administer oxygen at 15 lpm. Continue apneic oxygenation during the procedure.**

Delayed Sequence Intubation procedure

1. Administer Induction Agent:
Ketamine 1 - 2 mg/kg IV/IO slow push over 60 seconds for sedation and analgesia prior to paralysis

2. Positioning:
Ensure patient is positioned ear to sternal notch with head of bed/backboard elevated ≥ 15°. Maintain apneic O_2 via NC at 15 lpm throughout

3. Preoxygenation and Denitrogenation:
- If patient is **breathing adequately**, Hold BVM (**NO VENTILATIONS)** using 25 lpm of oxygen and NPA/OPA with two-handed mask seal **and PEEP @ 10.** Increase PEEP if unable to achieve SpO_2 ≥ 94%
- If patient is **breathing inadequately**, **VENTILATE** with BVM using 25 lpm of oxygen and OPA/NPA with two-handed mask seal **and PEEP @ 10.** Increase PEEP if unable to achieve SpO_2 ≥ 94%
- Upon reaching SpO_2 ≥ 94%, **begin 3-minute countdown** to allow for complete denitrogenation. **See letter K below**

4. Paralysis
Administer one of the following paralytics:
- Succinylcholine
- ≥ 6 years or > 20 kg - 1.5 mg/kg IV/IO
- < 6 years or < 20 kg - 2 mg/kg IV/IO **OR**
- Rocuronium 1.2 mg/kg IV/IO **OR**
- Vecuronium 0.1 mg/kg IV/IO

Rapid Sequence Intubation procedure

1. Positioning:
Ensure patient is positioned ear to sternal notch with head of bed/backboard elevated ≥ 15°. Maintain apneic O_2 via NC at 15 lpm throughout

2. Preoxygenation and Denitrogenation:
- If **breathing adequately**, administer oxygen via NRB at 25 lpm
- If **breathing inadequately**, use a BVM at 25 lpm with OPA/NPA. Perform two-person BVM ventilations with two-handed thumbs-down seal on mask
- Ensure the patient has a $SpO_2 \geq 94\%$ for at least 3 minutes before medication administration.
- If unable to achieve a $SpO_2 \geq 94\%$, consider DSI

3. Administer Induction Agent:
- Etomidate 0.3 mg/kg IV/O **OR**
- Ketamine 1 - 2 mg/kg IV/IO slow push over 60 seconds **OR**
- Midazolam 0.2 mg/kg IV/IO (least desirable option)
  -If systolic BP ≥ 100 mmHg- max dose 10 mg
  -If systolic BP < 100 mmHg- max dose 5 mg

4. Paralysis
Immediately following induction agent, administer one of the following paralytics:
- Succinylcholine
- ≥ 6 years or > 20 kg - 1.5 mg/kg IV/IO
- < 6 years or under 20 kg - 2 mg/kg IV/IO **OR**
- Rocuronium 1.2 mg/kg IV/IO **OR**
- Vecuronium 0.1 mg/kg IV/IO

L. If unable to achieve SpO_2 ≥ 94%, consider failed airway plan, including use of a supraglottic airway.

M. Perform intubation approximately 60 seconds after succinylcholine or rocuronium, and 2 - 3 minutes after vecuronium.

N. Use of the bougie is encouraged to facilitate first pass success.

O. If SpO_2 drops to < 94% during intubation attempt, ventilate with BVM using 100% oxygen before next attempt.

P. If intubation unsuccessful, consider use of BVM and/or backup supraglottic airway device.

Q. If unable to ventilate with BVM or backup airway, proceed to surgical airway (cricothyrotomy).

R. If bradycardia occurs, first ensure adequate oxygenation and ventilation, and if persistent, administer atropine 0.5 mg IV/IO (Pediatric patients: 0.02 mg/kg IV/IO. Minimum dose 0.1 mg. Do not exceed adult dose.)

S. Verify placement of ET tube using waveform $EtCO_2$ and a careful five-point check.

T. Continue cardiac, waveform $EtCO_2$, and pulse oximetry monitoring at all times.

U. Following intubation, titrate PEEP down to lowest setting to maintain SpO_2 ≥ 94%.

V. Insert an oral airway or compatible bite-block device if needed.

W. Secure the endotracheal tube and record the depth at the teeth/gums.

X. Recheck and document ET tube placement after every patient movement or change in vital signs. For sudden hypoxia, consider DOPE:
   1. **D**islodgement
   2. **O**bstruction
   3. **P**neumothorax
   4. **E**quipment issue

Y. After successful airway placement, administer fentanyl **PLUS** midazolam/lorazepam, **OR** ketamine for analgesia and sedation:
   1. Fentanyl and midazolam/lorazepam:
      a. Fentanyl 50 - 100 mcg IV/IO if SBP ≥ 100 mmHg (MAP > 65 mmHg), repeat every 15 minutes as necessary to maintain analgesia. (Pediatric dosing, 1 mcg/kg, not to exceed the adult dose with repeat doses at 0.5-1 mcg/kg)
      b. Midazolam 2.5 - 5 mg IV/IO if SBP ≥ 100 mmHg (MAP > 65 mmHg). Repeat every 15 minutes as necessary to maintain sedation. (Pediatric dose of midazolam is 0.1 mg/kg IV/IO up to 2.5 mg), **OR**
      c. Lorazepam 1 - 2 mg IV/IO if SBP ≥ 100 mmHg (MAP > 65 mmHg). May repeat every 5 - 10 minutes as needed to a max total dose of 4 mg. (Pediatric dose of lorazepam is 0.05 mg/kg IV/IO up to max single dose of 2 mg. May repeat every 5 - 10 minutes as needed up to a max total dose of 4 mg).

      Analgesia should be addressed first. Opioids are preferred first line agents before benzodiazepines. Ensure hemodynamic stability before giving a second agent to facilitate analgesia and sedation.
   2. Ketamine: Initial dose is 1 mg/kg slow IV/IO push if not used for induction. If used for induction, initial dose is 0.5 mg/kg slow IV/IO push. May repeat 0.5 mg/kg every 15 minutes as necessary to maintain analgesia and sedation. **Ketamine should not be used for sedation following ROSC in cardiac arrest patients.**

Z. Consider ketamine for ongoing sedation in airway management if:
   1. Non-depolarizing neuromuscular blockade (e.g. vecuronium, rocuronium) is used at any point as a paralytic agent, or
   2. Ketamine is used for DAAM.

AA. If additional paralysis is needed, administer vecuronium 0.1 mg/kg **or** rocuronium 0.5 mg/kg IV/IO.

AB. Consider orogastric tube placement.

NOTES & PRECAUTIONS:

A. If unable to establish and/or maintain an adequate airway, transport patient, including trauma patients, to the nearest hospital to obtain definitive airway control.

B. An attempt is defined as the insertion of the laryngoscope blade or rescue airway past the teeth. In most situations, intubation attempts should be limited to 2 per paramedic (with a maximum of 4 attempts prior to/during transport).

C. DO NOT rely solely on monitoring equipment. Auscultate for lung sounds and/or re-visualize with laryngoscope (VL or DL) if there is any doubt about tube placement.

D. Continuously monitor the patient's overall condition including vital signs, SpO_2, $EtCO_2$, cardiac rhythm, perfusion, and ease of ventilation post-intubation.

E. Succinylcholine, rocuronium and vecuronium do not affect the level of consciousness and should be used with etomidate/ketamine/midazolam.

F. Succinylcholine is contraindicated in the following:
   1. Known hypersensitivity.
   2. Major burns and crush injuries between 48 hours and 6 months old.
   3. Stroke or spinal cord injuries with profound residual deficits between 48 hours and 6 months old.
   4. Neuromuscular disease (e.g., muscular dystrophy).
   5. Suspected hyperkalemia (ESRD patients on dialysis).

G. Avoid vecuronium and rocuronium in patients suspected of having underlying status epilepticus (seizures).

H. In DSI, start with 1 mg/kg of ketamine for induction. If disassociation is not achieved, administer a second 1 mg/kg dose of ketamine.

I. Rapid administration of ketamine can lead to apnea. Ketamine should be administered slowly over 60 seconds. Dilute ketamine with normal saline to a minimum of 10 ml total volume for a slower administration.

J. Ketamine can cause laryngospasm and may cause an emergence reaction with vivid dreams.

K. Preoxygenation and denitrogenation can be challenging in some instances (e.g., ARDS, pneumonia). Consider a BVM with a PEEP valve or non-invasive positive pressure ventilation (e.g., CPAP/BiPAP).

L. Patients dependent on sympathetic tone may develop profound hypotension post intubation. This should be treated with fluids and/or push dose pressors per the shock protocol. It is always best to have push dose epinephrine available.

DOCUMENTATION:

Visualization of the cords (if applicable), size and depth of tube at the teeth/gums, number of attempts, 5-point check and equal chest expansion, $EtCO_2$ waveform device used/reading, SpO_2, any other devices/ techniques used, and reconfirmation of placement after each patient movement.

End-Tidal CO_2 Monitoring – 30.070

PURPOSE:
To define the various uses of end-tidal CO_2 ($EtCO_2$) and capnography monitoring.

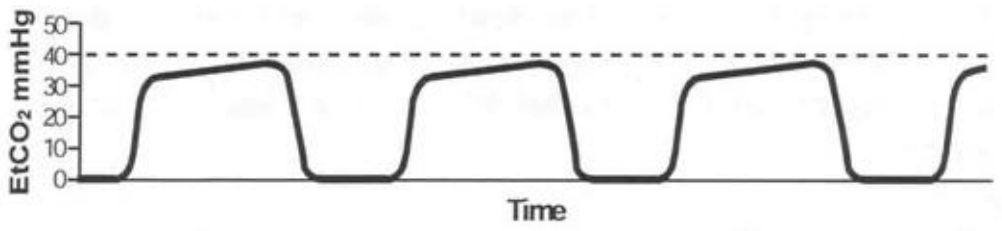
BACKGROUND:

A. Capnography (an $EtCO_2$ value with a waveform) allows for the assessment of ventilation and/or perfusion.
   1. $EtCO_2$ is primarily an indicator of ventilation in patients with normal perfusion (e.g., normal blood pressure).
   2. $EtCO_2$ is primarily an indicator of perfusion in patients with low blood flow (e.g., shock, cardiac arrest).

B. Consider use of capnography in suspected critical patients and when required by protocol.

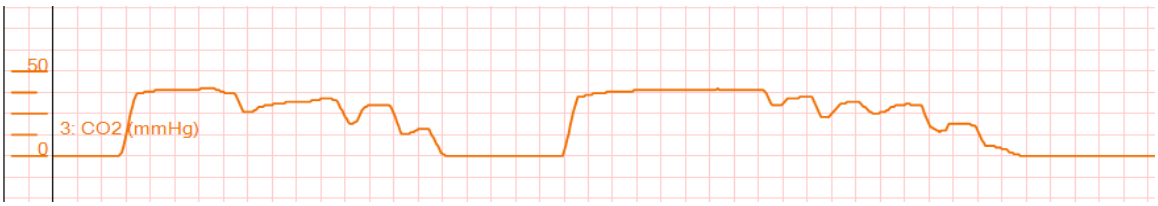
PROCEDURE:

A. Airway Management
   1. Airway Confirmation
      a. Manage airway according to ***Airway Management*** protocol.
      b. Apply waveform capnography device.
      c. Ensure appropriate normal capnographic waveform to confirm airway patency (see figure below).

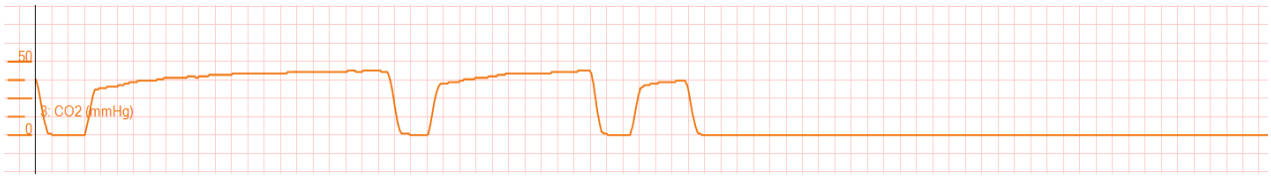


      d. Failure to obtain an $EtCO_2$ numerical reading and/or waveform requires the following immediate action:
         i. Re-visualization of the ETT using direct/video laryngoscopy.
         ii. If proper location of the ETT or i-gel is not confirmed, immediate removal of the airway and use of an alternative airway.

   2. Continued Airway Assessment
      a. A sudden drop in $EtCO_2$ output and an obvious change in the waveform (see figure below) is indicative of advanced airway displacement (most likely into the hypopharynx) or a cuff leak (e.g., under inflated balloon, balloon rupture, or poorly sized ETT or i-gel®). Re-assess airway placement immediately and take corrective action.



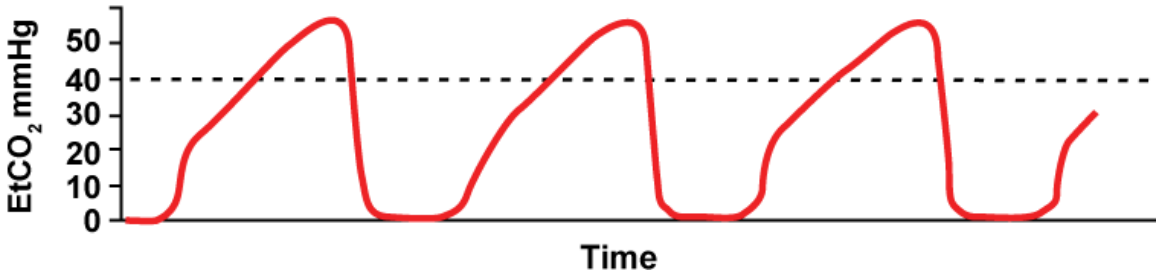
b. A sudden and sustained drop in $EtCO_2$ output (see figure below) may indicate a blocked airway (e.g., kinked tube, mucus plug).



c. Document pulse oximetry and $EtCO_2$ readings in your prehospital care report at regular intervals, especially following movement of the patient or change in vital signs.

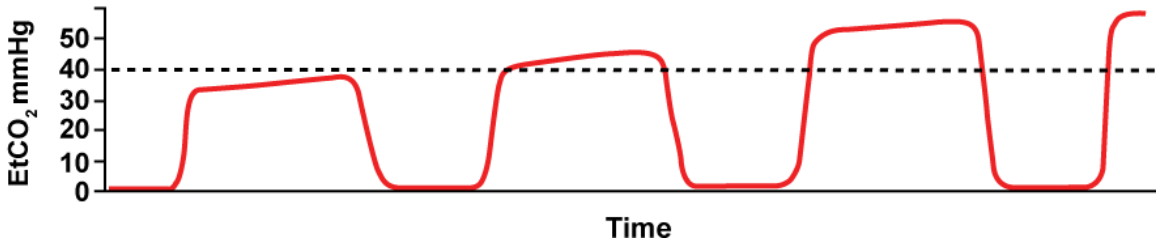
B. Cardiac Arrest
1. Manage according to ***Cardiac Arrest*** protocols.
2. Apply waveform capnography device as soon as feasible.
3. The trend of $EtCO_2$ values is the most important to guide a resuscitation.
   a. Values that decline over time may indicate poor CPR quality (e.g., need for a new compressor, LUCAS device has shifted).
4. Do NOT ventilate to EtCO2 values during cardiac arrest, as hyperventilation or hypoventilation are harmful to the patient. During cardiac arrest, the $EtCO_2$ values are indicative of pulmonary blood flow (i.e., chest compression quality).
5. A sudden and sustained rise in $EtCO_2$ values may indicate ROSC.
6. A gradual decline in $EtCO_2$ values may be the first sign of recurrent arrest in a patient who has achieved ROSC.
7. Do NOT rely solely on an $EtCO_2$ value when determining termination decisions.

C. Respiratory Distress/Respiratory Failure
1. A “shark fin” waveform can be seen in Asthma and COPD (see figure below).



2. Consider use of capnography when initiating CPAP/BiPAP as it can assist with diagnosis (e.g., evaluating for “shark fin” waveform), assess response to treatment, and can evaluate for patient decompensation.

3. Use of waveform capnography is required in patients who are experiencing respiratory depression or have received sedating medications (e.g., opiates, benzodiazepines, antipsychotics, etc.) to help detect hypoventilation (i.e. rise in $EtCO_2$ with progressively rising waveform). (See figure below).



D. Acidosis
   1. Sepsis: In patients with concern for infection and ≥ 2 of the following: Respiratory rate > 20, heart rate > 90 BPM and fever (i.e., SIRS criteria), an $EtCO_2 \leq 25$ mmHg is suggestive of hypoperfusion and increased mortality. Treat per ***Sepsis Protocol.***
   2. DKA: In patients with elevated blood sugar, $EtCO_2 < 25$ may indicate DKA. Treat per ***Diabetic Emergencies-Hyperglycemia*** protocol

E. Hypoperfusion (low blood flow)
   1. A low $EtCO_2$ can help determine cases of hypoperfusion (low blood flow) given the lack of blood flow to the lungs.
   2. In trauma patients, $EtCO_2 < 25$ mmHg may indicate presence of shock and is associated with the need for blood transfusion and increased mortality.

F. Traumatic Brain Injury
   1. Maintain $EtCO_2$ output between 35 - 40 mmHg. The following approximates the degree of ventilation:
      > 40 = Hypoventilation
      35 - 40 = Normal ventilation
      30 - 35 = Hyperventilation
      < 30 = Aggressive hyperventilation
   2. Patients with signs of increased intracranial pressure (unilateral dilated pupil, posturing, focal neurologic findings) maintain $EtCO_2$ between 30 - 35.

G. Transcutaneous Pacing
   1. A sudden and sustained rise in $EtCO_2$ indicates increased pulmonary blood flow and may confirm mechanical capture.

NOTES AND PRECAUTIONS:

A. Remember: Pulse oximetry does not equate to ventilation. You can have a poorly ventilated patient displaying an oxygen saturation of 100%. Excessively high $PaCO_2$ levels can be detrimental to your patient's outcome.

B. A sudden drop in $EtCO_2$ output from normal (35 - 40 mmHg) to 15 - 20 mmHg and an obvious change in the waveform is indicative of tube displacement, most likely into the hypopharynx. Re-assess tube placement immediately and take corrective action.
C. Do not rely on pulse oximetry or $EtCO_2$ monitoring solely to determine the efficacy of intubation.
D. Waveform capnography is required for all intubated patients throughout transport.
E. Failure to obtain an $EtCO_2$ numerical reading or waveform requires the following immediate action:
    1. Immediate removal of the endotracheal tube and placement of a rescue airway or BVM ventilation.
    OR
    2. Re-visualization of the ETT using direct laryngoscopy.

i-gel® Supraglottic Airway Device – 30.072

DEFINITION:
The i-gel® is a disposable supraglottic airway created as an alternative to endotracheal intubation or mask ventilation. The i-gel® is designed for positive pressure ventilation as well as for spontaneously breathing patients.

INDICATIONS:
The i-gel® supraglottic airway device can be used as an alternative to endotracheal intubation in those patients who need a secure airway.

CONTRAINDICATIONS:
A. Trismus (clenched jaw), limited mouth opening.
B. Suspected upper airway obstructions secondary to laryngeal edema, smoke inhalation, foreign body, tumor, mass, or abscess.

SIZES:

i-gel Size		Patient Size	Patient Weight (kgs)	Patient Weight (lbs)
	1	Neonate	2.5	4-11
	1.5	Infant	5-12	11-26
	2	Small pediatric	10-25	22-55
	2.5	Large pediatric	25-35	55-77
	3	Small adult	30-60	66-132
	4	Medium adult	50-90	110-198
	5	Large adult	90+	198+

Size should be determined on lean body mass

PROCEDURE:
A. Identify correct size i-gel®.
B. Lubricate i-gel® prior to insertion with water soluble gel and only to the back side of the device.
C. If equipped, ensure that the supplemental oxygen port is capped.
D. Position the patient. The patient should always be in the "sniffing position" prior to insertion unless head/neck movements are considered inadvisable or are contraindicated.
E. If needed, use tongue depressor or curved laryngoscope blade to facilitate passage of i-gel® through the oropharynx.
F. Grasp the lubricated i-gel® firmly along the integral bite block.
G. Position the device so that i-gel® cuff outlet is facing towards the chin of the patient.
H. Introduce the leading soft tip into the mouth of the patient in a direction toward the hard palate. The leading edge of the i-gel's® tip must follow the curvature of the patient's hard palate upon insertion. Glide the device downward and backward along the hard palate with a continuous but **gentle** push until a definitive resistance is felt.
I. Determine appropriate depth of insertion. When placed correctly, the tip of the i-gel® will be within the upper esophageal opening and the cuff will be against the laryngeal framework. The incisors will be resting on the integral bite block. There is a horizontal black line on sizes 3, 4, and 5 indicating optimal position. (Fig. 1)

Fig. 1

J. Secure i-gel® to maxilla with approved holder, strap, or tape.
K. If gastric distention is present or fluid is present in the gastric channel of i-gel®, an appropriately sized lubricated orogastric tube (Fig. 2) may be passed down the gastric channel.
L. Attach capnography per protocol.

Fig. 2

i-gel Size		Maximum Size of Orogastric Tube (French Gauge) or French Suction Catheter
	1	N/A
	1.5	10
	2	12
	2.5	12
	3	12
	4	12
	5	12/14

NOTES & PRECAUTIONS:

A. Do not use excessive force to insert the device or orogastric tube.
B. Sometimes a feel of “give-way” is felt before the end point resistance is met. This is due to the passage of the i-gel® bowl through the faucial pillars (pharyngo-epiglottic folds).
C. Once resistance is met and the teeth are located on the integral bite block, do not repeatedly push the i-gel® down or apply excessive force during insertion.
D. Do not allow peak airway pressure of ventilation to exceed 40 cm H_2O (Zoll Series 731 EMV+ or equivalent).
E. Patients with any condition which may increase the risk of a full stomach (e.g. hiatal hernia, sepsis, morbid obesity, pregnancy, or a history of upper gastrointestinal surgery), may increase the risk of aspiration.

Induced Hypothermia – 30.076

PURPOSE:
To define the procedures for inducing hypothermia following post-resuscitation from sudden cardiac arrest; with the aim to reduce the patient's body temperature to 33°- 36° C (91.4°- 96.8° F).

INDICATIONS (Must meet all indications):
A. Patients with return of spontaneous circulation (ROSC).
B. Unconscious and without purposeful response to pain or verbal stimuli.
C. Systolic BP ≥ 100 mmHg (may use pressors to maintain pressure).

CONTRAINDICATIONS:
A. Age < 13 years old.
B. Traumatic cardiac arrest or suspected significant hemorrhage.
C. Hypothermia already present.
D. Pulmonary edema.
E. Known pregnancy.
F. Refractory or recurrent VF/VT, 2nd or 3rd degree heart blocks.

COOLING METHODS:
A. Exposure combined with ice packs, and/or
B. Chilled fluid (NS or LR); stored at a temperature of approximately 4° C (39° F).

PROCEDURE:
A. Remove patient's clothing (undergarments may remain in place).
B. Obtain 12-lead ECG if feasible. If STEMI is identified, follow STEMI protocol.
C. Cooling can be initiated with ice packs applied to the groin and axilla (wet towels may be used along with ice packs). Alternatively, consider infusion of up to 1 liter of chilled fluid.
D. Do not administer medications at the same time through the same IV line as the chilled fluid. If patient begins to shiver, move, or have an increased level of consciousness, administer midazolam 2.5 - 5 mg IV/IO if systolic BP is ≥ 100 mmHg, repeating every 15 minutes as necessary to maintain sedation, **OR** administer lorazepam 1 - 2 mg IV/IO if systolic BP is ≥ 100 mmHg, repeating as necessary every 5 - 10 minutes as needed to a max total dose of 4 mg.

Intraosseous Access & Infusion - 30.080

DEFINITION:
Intraosseous cannulation is an alternative technique for establishing vascular access in critical adult and pediatric patients when peripheral IV access is difficult or time sensitive.

INDICATIONS:

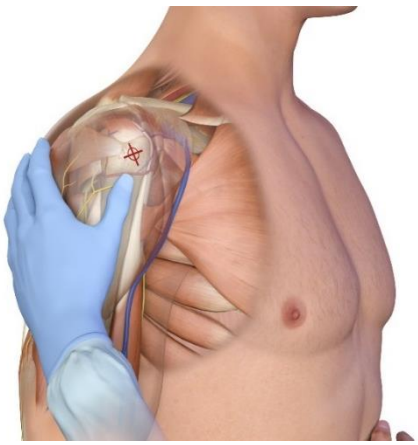
A. Intraosseous infusion is indicated in emergency situations when lifesaving fluids or drugs should be administered and IV cannulation is difficult, impossible, or too time-consuming to perform.
B. If a peripheral IV cannot be established after two attempts or within 60 - 90 seconds of elapsed time *and* in:
C. Adult and pediatric patients, within the proper weight range, who present with one or more of the following clinical conditions:
    1. Cardiac arrest.
    2. Hemodynamic instability (BP < 90 mmHg and clinical signs of shock).
    3. Imminent respiratory failure.
    4. Status epilepticus with prolonged seizure activity greater than 10 minutes, and refractory to IM anticonvulsants.
    5. Toxic conditions requiring immediate vascular access for antidote.
D. Intraosseous placement may be considered prior to peripheral IV attempts in cases of cardiopulmonary or traumatic arrest, in which it may be obvious that attempts at placing an IV would likely be unsuccessful and/or too time consuming, resulting in a delay of life-saving fluids or drugs.

EZ-IO® PROCEDURE:

A. Determine patient's weight.
B. Assemble all necessary equipment:
    1. The 25 mm (Blue) EZ-IO® needle can be utilized for patients who weigh ≥ 3 kg.
    2. The 45 mm (Yellow) EZ-IO® needle can be used for adult insertions (larger individuals weighing > 40 kg) where the 25 mm (Blue) needle is not adequate. The 45 mm needle should be used for all humeral IOs.
    3. EZ-Stabilizer® should be used to secure the needle.
C. Site selection:
    1. Proximal humerus is preferred in adult patients to achieve the following:
        a. Increased flow rates
        b. Decreased pain
        c. Closer access to central circulation (heart) during cardiac arrest and for resuscitation
    2. Proximal Tibia
    3. Distal Tibia
D. Site landmarks:
    1. Proximal humerus (contraindicated in children)
        a. Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body). Alternatively, the arm can remain adducted to the body with the arm rotated medially, thumb pointing down.

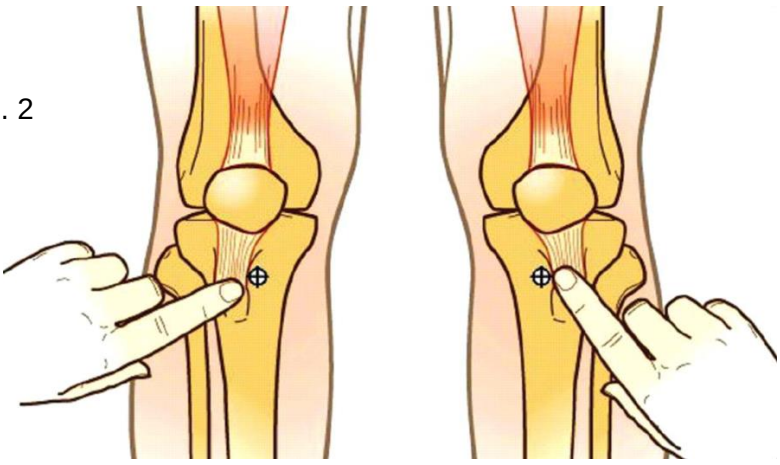
b. Insertion site is located directly on the most prominent aspect of the greater tubercle. Place palm on the anterolateral aspect of the arm and push deeply. The target will feel like a ball rolling under your palm; this is the greater tubercle. (Fig. 1)

Fig. 1



2. Proximal tibia
    a. Palpate the landmarks at the proximal tibia (patella and tibial tuberosity).
    b. Insertion site should be approximately one finger width (2 cm) medial to the tibial tuberosity, along the flat aspect of the tibia. Alternatively, landmarks are 3 cm below the patella and 2 cm medial when you can't palpate the tibial tuberosity. (Fig. 2)

Fig. 2



3. Distal tibia
   -Two finger widths proximal to the medial malleolus along the midline of the tibia. (Fig. 3)

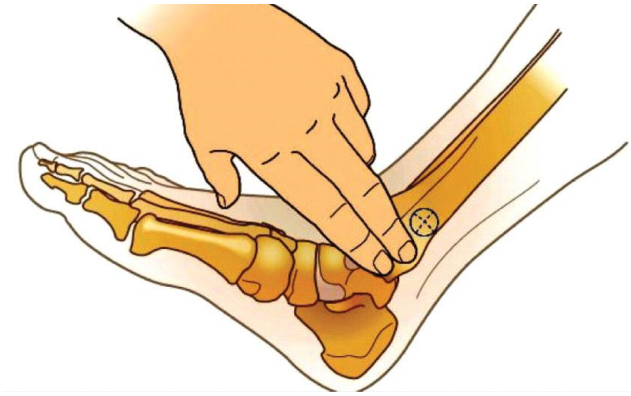


Fig. 3

E. Needle insertion
   1. Prep the surface with povidone-iodine or chlorohexidine and wipe dry with a sterile gauze pad.
   2. Stabilize patient's extremity and begin insertion from a 90-degree angle to the insertion site for both proximal and distal tibia. Insertion should be at a 45-degree angle for the proximal humerus. Push the needle set through the skin until the tip touches the bone.
   3. With the needle tip against the bone, assure adequate needle length by ensuring at least one black line (5 mm) is visible outside the skin.
   4. Gently advance the needle set into position–**do not force**. Stop when you feel the "pop" or "give" on smaller patients.
   5. When needle is in proper position, remove stylet, place the EZ-Stabilizer® on the hub, but do not secure EZ-Stabilizer® yet.
   6. Connect EZ-Connect tubing, primed with saline, to IO hub.
   7. Rapid bolus or "power" flush with approximately 10 ml normal saline **(administer lidocaine to the awake patient prior to flushing).**
   8. Confirm the catheter position:
      a. Catheter is stable at a 90-degree angle to the bone, able to aspirate blood (not always able to aspirate even with the line in the proper position), and fluids flow without evidence of extravasation.
      b. If insertion fails, leave the needle in place and clamp the EZ-Connect; do not attempt second insertion on same extremity.
   9. Secure the EZ-Stabilizer® when patency is confirmed.
   10. Consider additional bolus of saline if flow rates slower than expected.
   11. Utilize a blood pressure cuff or pressure bag around the IV bag to help infuse fluids.
   12. Monitor for patency frequently.

F. Pain Management
   1. If the procedure is performed on a conscious patient, immediately following placement of the IO needle **and before saline flush**, administer 2 ml (40 mg) of 2% lidocaine slowly over 2 minutes (rule is 2 ml of 2% over 2 min). Wait approximately 60 seconds before flushing with normal saline.
   2. In the event a patient regains consciousness and complains of severe pain secondary to the IO insertion, temporarily stop infusing the fluids, and administer lidocaine as in Fig.1 above. Wait approximately 60 seconds before continuing fluid administration.
   3. If fluids do not flow freely, flush IO site with an additional 10 ml normal saline.

PEDIATRIC EZ-IO® PROCEDURE (patients weighing 3 - 39 kg)

A. Assemble all equipment
   1. The 15 mm (Pink) EZ-IO® needle or 25 mm (Blue) EZ-IO needle should be used for patients who weigh less than 3 kg (approximately 6 lb.). The 15 mm needle, if carried, is used primarily on neonates.
   2. The 25 mm (Blue) EZ-IO® needle should be utilized for pediatric patients who weigh $\geq$ 3 kg or when the 15 mm (Pink) is deemed inadequate or not carried.
   3. EZ-Stabilizer should be used to secure the needle.

B. Site selection (Patients weighing 3 - 39 kg)
   1. Proximal Tibia
      a. Palpate the landmarks at the proximal tibia (patella and tibial tuberosity).
      b. Insertion site should be one finger width below the patella and one finger width medial to the tibial tuberosity. If the tibial tuberosity cannot be identified on the child, then the insertion site may be 1 cm below the patella and 1 cm medial.
   2. Distal femur
      a. Secure the leg outstretched to ensure the knee does not bend.
      b. Locate upper edge of the patella. Insertion site is one finger width above and then one finger width medial (towards the inner leg, “BIG TOE IO”) from the upper patella edge. This location will avoid the growth plate of the distal femur. (Fig. 4)

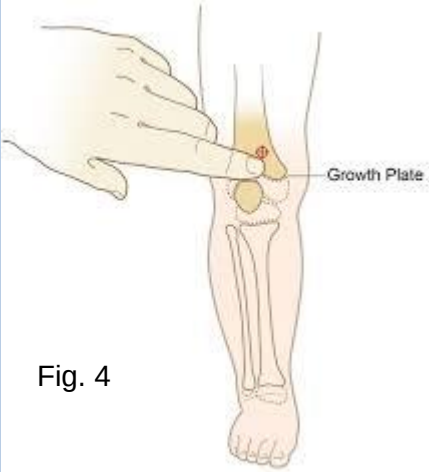


Fig. 4

C. Needle insertion
1. Prep the surface with povidone-iodine or chlorohexidine and wipe dry with a sterile gauze pad.
2. Stabilize patient's leg and begin insertion from a 90-degree angle to the insertion site. Push the needle set through the skin until the tip touches the bone.
3. With the needle tip against the bone, assure adequate needle length by ensuring at least one black line (5 mm) is visible outside the skin.
4. Gently advance the needle set into position–do not force. Stop when you feel the "pop" or "give".
5. When needle is in proper position, remove stylet, place the EZ-Stabilizer® on the hub, but do not secure EZ-Stabilizer® yet.
6. Connect EZ-Connect tubing, primed with saline, to IO hub.
7. Rapid bolus or "power" flush with approximately 5 ml normal saline.
8. Confirm the catheter position:
    a. Catheter is stable at a 90-degree angle to the bone, able to aspirate blood, and fluids flow without evidence of extravasation.
    b. If insertion fails, leave the needle in place and clamp the EZ-Connect; do not attempt second insertion on same extremity.
9. Secure the EZ-Stabilizer® when patency is confirmed.
10. Consider additional bolus of saline if flow rates slower than expected, no more than 2 - 3 ml normal saline
11. Consider a blood pressure cuff or pressure bag to help infuse fluids.
12. Monitor for patency frequently.

D. Pain Management
1. If the procedure is performed on a conscious patient, immediately following placement of the IO needle, administer 0.5 mg/kg of 2% lidocaine slowly over 2 minutes, not to exceed adult dose of 40 mg. Wait approximately 60 seconds before flushing with normal saline.
2. If fluids do not flow freely, flush IO site with an additional 2-3 ml normal saline.

Intraosseous Access & Infusion - 30.080

PEDIATRIC PROCEDURE WITH MANUAL IO DEVICE:

A. Assemble equipment
   1. Approved bone marrow needles, 15- or 18-gauge size (Jamshidi)
   2. Povidone-iodine or chlorohexidine preps
   3. Two small syringes (3 - 5 ml)
   4. One large Luer-lock® syringe (35 - 50 ml)
   5. Flush solution
   6. Sterile gauze pads and tape

B. Site Selection – Proximal tibia. Palpate the landmarks and note the entry point that is the anteromedial flat surface 1 - 3 cm below the tibial tuberosity.

C. Prep the surface with povidone-iodine or chlorhexidine prep and wipe dry with a sterile gauze pad.

D. Needle Insertion
   1. Insert the needle at the proximal tibial site, directing the needle caudally. The needle should penetrate the skin and subcutaneous tissue and be pushed through the cortex of the bone using rotation (avoid rocking the needle) until a “pop” or “give” is felt.
   2. Confirm placement of the needle by:
      a. Firm fixation of the needle and free aspiration of marrow/blood.
      b. Infusion of 2 - 3 ml of NS, palpating for extravasation or noting significant resistance. If extravasation occurs, further attempts at the site should be avoided.
      c. It is not always possible to aspirate blood/marrow, but the line may be patent.

E. Tape and secure IO needle firmly in place.

F. Start Infusion
   1. Although gravity drainage may suffice, pressurized infusions may be needed during resuscitation.
   2. When infusing medications via an IO route, pressure must be applied to the fluid bag to maintain flow rates. The provider must continually monitor the rate of infusion.

CONTRAINDICATIONS:

A. Suspected fracture of the bone selected for IO insertion.
B. Prior prosthetic joint replacement involving bone selected for IO insertion.
C. Previous significant orthopedic procedures (IO within 48 hours, surgery, etc.).
D. Infection at the site of insertion.
E. Excessive tissue at insertion site with the absence of landmarks.

NOTES & PRECAUTIONS:

A. Osteomyelitis, growth plate injury (in pediatric patients), and extravasation of fluid with compression of popliteal vessels or the tibial nerve may occur.
B. Airway and breathing should be established first in accordance with other protocols.
C. Do not perform more than one attempt in each extremity.
D. Any ALS medication may be administered IO.
E. Do not give hypertonic saline through an IO line.
F. In the event of driver failure, EZ-IO® needle may be inserted manually.
G. All EZ-IO® needles are 15 gauge regardless of length.

King Airway® Placement – 30.105

DEFINITION:
The KING LT-D® is a disposable supraglottic airway created as an alternative to tracheal intubation or mask ventilation. The KING LT-D® is designed for positive pressure ventilation as well as for spontaneously breathing patients.

INDICATIONS:
Use of the King LT-D® airway is indicated if endotracheal intubation cannot be performed and the patient needs a secure airway.

CONTRAINDICATIONS:
A. Intact gag reflex.
B. Airway obstruction.
C. Patients under 3 feet in height.
D. Known or suspected caustic ingestion.
E. Known esophageal disease.

PROCEDURE:
A. Attach pulse oximeter and monitor oxygen saturation.
B. If vomitus, blood or other foreign material is present in the hypopharynx, rapid and aggressive suctioning and/or manual removal must be done prior to placement of the King Airway®.
C. Ventilate with BVM to optimize oxygen saturation prior to King LT-D® intubation especially if several endotracheal intubations were attempted.
D. Estimate patient's height (for sizing of King LT-D® airway) and select proper tube size.

Type	LTD	LTD	LTS-D	LTS-D	LTS-D
Size	2	2.5	3	4	5
Tube Color	Green	Orange	Yellow	Red	Purple
Patient Height	3-3.5 feet	3.5 feet	4-5 feet	5-6 feet	Greater than 6 feet
Inflation Volume	25-35 mL	30-40 mL	40-55 mL	50-70 mL	60-80 mL
Age	4-8 years	5-10 years	Adult →		

E. Lubricate the posterior distal end of the King Airway® with a water-soluble gel.
F. Place patients head into a "sniffing" position. If suspected or potential cervical spine injury keep patients head in neutral position during insertion.
G. Using a midline approach, introduce tip into mouth and advance behind base of tongue. The blue orientation line on the tube should face the chin of the patient.
H. Without using excessive force, advance tube until the base of the connector is aligned with the teeth and/or gums. Never force the tube into position.
I. Inflate the cuff using the appropriate volume of air (see table above).

J. Attach bag valve device to the tube with supplemental oxygen. While gently bagging the patient to assess ventilation, simultaneously withdraw the King Airway® until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).
K. Listen for lung sounds in both lung fields and over epigastrium.
L. As soon as feasible, secure the King Airway® with an endotracheal tube holder.
M. Monitor oxygen saturation, chest rise, and attach continuous $EtCO_2$ monitor.
N. After successful placement, continue to monitor for adequate ventilations and possible displacement or cuff failure.

SUCTIONING THROUGH THE KING LTS-D:

A. Use of the gastric access lumen for suctioning and removal of stomach contents will be at the discretion of the user.
B. Attach a maximum size 18 Fr suction catheter to a portable suction unit.
C. If necessary, lubricate the catheter with a water-soluble gel.
D. Insert the suction catheter into the opening of the gastric access lumen and advance to the maximum depth.
E. Turn on suction unit and maintain continuous suction until there is no further return of stomach contents.
F. After detaching suction unit, the catheter may be left in place to prevent any additional stomach contents from being expelled from the gastric access lumen.
G. If active suctioning is not performed, a suction catheter may be placed in the gastric access lumen to act as a passive vent, and to prevent stomach contents from being expelled from the lumen.

NOTES & PRECAUTIONS:

A. It is important that the tip of the device be maintained in the patient's midline. Keeping the tip at midline assures that the distal tip is properly placed in the hypopharynx and upper esophagus.
B. Depth of insertion is key to providing a patent airway. A shallow initial insertion will require deflation of the cuffs to advance the tube deeper.
C. It is extremely important to open the airway and ensure that the tip of the King Airway® advances past the base of the tongue.
D. Unlike the Combitube®, the King LT-D® device is not designed to ventilate the patient if placed in the trachea. If unable to ventilate the patient after placement deflate balloons and adjust depth of tube to optimize ventilation.

Left Ventricular Assist Devices LVAD – 30.107

BACKGROUND:

Left ventricular assist devices (LVADs) are designed to assist the pumping function of the patient's left ventricle. The HeartWare HVAD®,HeartMate II®, and HeartMate III® devices attach to the apex of the left ventricle (pump inflow) and propel blood to the ascending aorta (pump outflow). These devices utilize an external wearable system that includes a small controller connected to the internal pump by an external driveline and is powered by two batteries. They may also be "plugged in" to 110 or 12 V power, depending on the device. When managing an LVAD patient, follow these general assessment guidelines.

ASSESSING PATIENT WITH LVAD:

A. Establish airway and provide supplemental oxygen if any respiratory signs or symptoms are present.
B. **If a patient with an LVAD is having a medical emergency, it does not necessarily mean that it is a device issue. Consider the whole clinical picture and perform a thorough patient assessment, including device function. Infection, volume depletion, stroke, bleeding, and dysrhythmias may be the cause of patient's symptoms. Most LVAD patients are anticoagulated and are at risk for bleeding complications.**
C. Auscultate heart sounds to determine if the device is functioning. Both the HeartWare HVAD® and HeartMate II®, are continuous flow devices and you should hear a "whirring" sound". Because these devices diminish pulsatile flow in the circulation, peripheral pulses may not be palpable. The HeartMate III®, although continuous flow, may provide artificial pulsatility (as well as a pulsatile hum) due to the addition of intermittent speed reduction which was designed into the device. Since this artificial pulse is not synchronized with the patient's heart rate, it may augment or diminish the native pulse. If a pulse is palpable, a BP can be attempted. Assess other signs of circulation—capillary refill, absence or presence of dizziness, temperature/ moisture of skin, end-tidal CO_2, and mental status to determine perfusion status.
D. Standard blood pressure devices may not work. If unable to obtain a blood pressure consider using the following, if available, to estimate perfusion pressure:
    1. End-Tidal CO_2 - Expected values should be between 35 – 45 mmHg.
    2. Doppler cuff pressure - Estimates the mean arterial pressure. The goal range for Doppler MAP is > 60 and less than 90.
    3. Other clinical signs – Capillary refill, mental status.
E. Locate the device to identify which type is in place and follow the device specific troubleshooting guidelines. Intervene appropriately based on the type of alarm and device.
F. Start Large Bore IV and treat with fluids as needed.
G. Pulse oximetry may not be accurate due to the continuous flow nature of the device. You may not get an accurate reading in the field.
H. Your cardiac monitor **will** work, and a reliable ECG may be obtained. Because the LVAD creates continuous flow independent of left heart function, not all arrhythmias will be symptomatic, including ventricular arrhythmias. If a patient requires defibrillation, leave the pump running and all components in place. The LVAD does not interfere with electrical conduction. In general, LVAD patients also have an AICD/Pacemaker. Do not place defibrillation pads directly over the pump or AICD/Pacemaker (consider anterior/posterior placement).
I. All ACLS medications may be administered if necessary.
J. **If suspected cardiac arrest, proceed to following flow chart:**

Call Patient's VAD Center
- St. Vincent's: 971-678-4042
- Kaiser: 503-449-4672
- OHSU: 503-494-9000 (ask for on-call LVAD coordinator to be paged)

Unresponsive LVAD patient

Is the patient breathing **AND** can you hear a VAD hum?

NO

Initiate CPR and follow ACLS protocols

YES

Doppler MAP > 50mmHg OR $ETCO_2$ > 20mmHg?

NO

YES

2nd Responder available and/or trained family member assess LVAD function:
- Look/Listen for alarms
- Check driveline connection to LVAD controller
- Check power connection to LVAD controller

If any of the following true?
- Absent VAD hum
- "Pump Off" displayed
- Flow < 1 L/min
- Pulsatility < 1

Perform controller exchange

LVAD restarted AND
- Doppler MAP > 50mmHg

OR
- $ETCO_2$ > 20mmHg

YES

Follow standard protocols except **NO CHEST COMPRESSIONS** because the VAD is likely providing adequate forward flow

NO

Continue CPR and follow ACLS protocols

- Refer to the LVAD Protocol for detail instructions on the battery and controller.
- DO NOT USE MECHANICAL CPR.
- The 2 most common causes of pump failure are disconnection of the power and failure of the controller.
- Transport LVAD patient in circulatory arrest to the nearest VAD hospital; otherwise transport the patient to their designated VAD center.
- Patients on LVAD support frequently do not have a palpable pulse or recognizable BP yet have adequate perfusion.
- In the non-invasive assessment of the BP, use a manual BP cuff with Doppler when available, with ETCO2 as the second option.
- Assess and treat non-LVAD pathology:
  - 5 H's: Hypovolemia, hypoxia, hydrogen ion (acidosis), hypo/hyperkalemia, hypothermia
  - 5 T's: Toxins, tamponade, tension pneumothorax, thrombosis-heart, thrombosis-lung
- **Keep all back-up equipment with the patient during transport!**

Left Ventricular Assist Devices LVAD – 30.107

TRANSPORTING AN LVAD PATIENT:

A. Consider transporting the LVAD patient in circulatory arrest to the nearest VAD hospital; otherwise transport the patient to their designated VAD center. **Call the number on the device and follow advice of the LVAD Coordinator on call for troubleshooting the device.**
B. For all other concerns contact OLMC.
C. The patient must be supported by battery power. **Remember to also transport the backup controller and the spare batteries.**
D. The controller should be kept close to the patient, and care taken to not kink the leads.
E. If removing or cutting patients clothing, use caution as not to sever the driveline.
F. Do not put external pressure on any area of the LVAD system.
G. Place gurney straps underneath the leads, and keep the batteries easily accessible.
H. Allow the trained caregiver to ride in the transport vehicle if possible to act as an expert on the device in the absence of consciousness in the patient.
I. Bring all of the patient's equipment.

NOTES AND PRECAUTIONS:

A. LVAD patients who are anticoagulated have a higher risk of bleeding and hemorrhage.
B. There are no valves on an LVAD, so there is the risk of retrograde flow and stagnation of blood if the device stops, or flow is impeded.
C. These patients are pre-load and afterload dependent, so hypovolemia can have a profound effect.
D. If a patient is **hypertensive**, flow through the device may be reduced.

Orogastric Tube Insertion and Maintenance – 30.115

OVERVIEW:

While a patient is being ventilated with a BVM, trapped air can gather in the stomach increasing the risk of vomiting and aspiration. In addition, an enlarged stomach pushes against the diaphragm to increase intrathoracic pressure, decrease venous return, and interferes with lung ventilation.

INDICATIONS:

To alleviate gastric distention, reduce aspiration, and facilitate ventilation in intubated patients.

CONTRAINDICATIONS:

A. Known alkali or acid ingestion.
B. Known esophageal varices.
C. Esophageal obstruction.
D. Suspected epiglottitis or croup.

PROCEDURE:

A. Assemble equipment:
    1. Proper size orogastric tube
    2. Lubricant
    3. 30 or 60 cc syringes
    4. Suction unit

Gastric Tube Size Guide	
Age	**Size**
Less than 1 year	Refer to Pediatric Guide
1 yr. to 16 yrs.	10 - 14 French
Older than 16 yrs.	Up to 18 French

B. With patient's head in a neutral position measure tube length from xiphoid process to angle of jaw to corner of the mouth. Place a mark on the tube to indicate how far to advance the tube.
C. Lubricate end of tube; about 3 - 4 inches.
D. Gently insert tube and advance toward posterior oropharynx.
E. For non-traumatic patients, repositioning the head into a slightly flexed forward position may facilitate OG tube passage past the hypopharynx and into stomach.
F. Continue to insert tube to the measured mark. Secure tube with tape.
G. Attach syringe to the distal end of the OG tube.
H. Confirm tube placement by placing stethoscope over epigastrium and auscultate while inserting 30 - 60 ml of air in tube. You should hear gastric gurgling.
I. Secure tube in place with tape.
J. Place the tube to low continuous suction as needed, gastric contents should be visible in tubing.
K. Document tube size and depth, color, consistency, and amount of gastric contents.

Orogastric Tube Insertion and Maintenance – 30.115

NOTES AND PRECAUTIONS:

A. OG tube placement can cause bradycardia.
B. Do not delay transport for this procedure.
C. Monitor SpO_2 and $EtCO_2$ continuously.

Patellar Dislocation Reduction – 30.118

INDICATIONS:

Isolated non-traumatic lateral patellar dislocation.

CONTRAINDICATIONS:

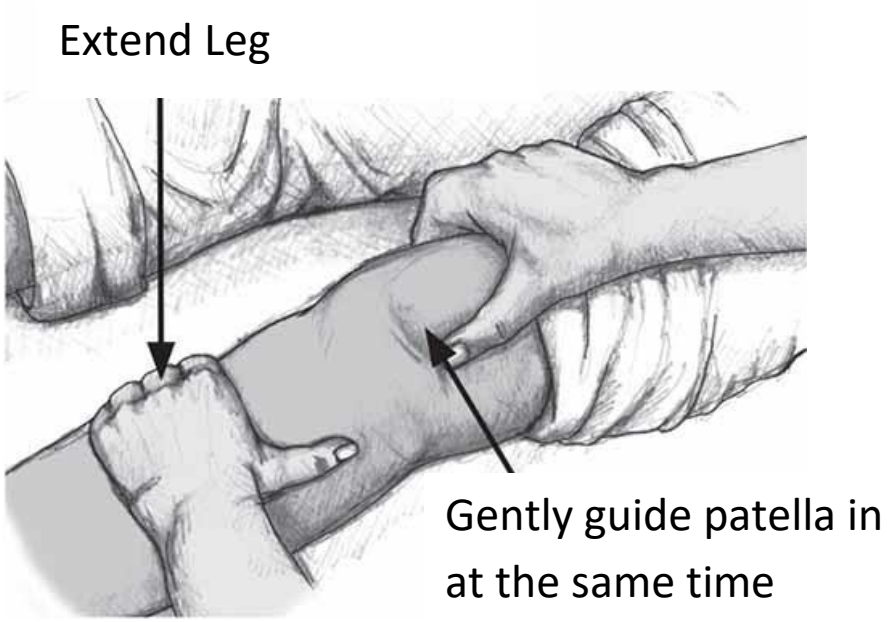
A. Direct traumatic mechanism of injury (impact directly to the knee).
B. Any sign of associated patella fracture (crepitus).
C. Any associated injury to same extremity (femur fracture, tibia/fibula fracture, pelvic fracture).

PROCEDURE:

A. Follow Pain Management protocol.
B. Patient will usually present with the knee flexed and an obviously laterally displaced patella.
C. Gently apply pressure to the lateral aspect of the patella (directing it medially) while extending the leg.

NOTES & PRECAUTIONS:

A. Reductions should not be attempted for medial dislocations, as these commonly have associated fractures.
B. Patients should be splinted and transported regardless of success of reduction attempt. If a patient does not want transport after successful reduction, OLMC contact is mandatory as part of the refusal process.



PICC Line Access – 30.140

BACKGROUND:
A Peripherally Inserted Central Line (PICC) is a common method of maintaining long-term venous access in select patients. PICC lines are typically inserted into the antecubital fossa, and then threaded into central circulation. PICC lines are flushed with heparin to maintain patency and therefore it is imperative to aspirate 5 ml of blood from the line prior to use.

INDICATIONS:

A. PICC lines may be accessed when there is a need for drug or fluid administration and traditional means of venous access are unsuccessful.
B. Patient or patient's caregiver requests use of PICC line.

CONTRAINDICATIONS:

A. Inability to aspirate or infuse through the catheter.
B. Catheter located in any place other than the patient's upper arm.
C. Need for rapid fluid resuscitation.

PROCEDURE:

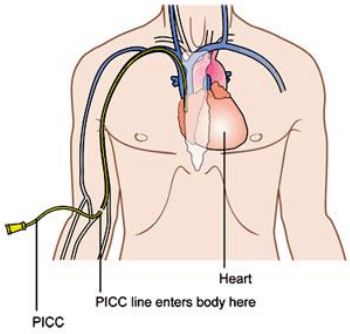
A. Use clean gloves and maintain sterility as much as possible.
B. If there is a needleless type port on the distal end of the catheter, perform the following: *(figure 1)*
    1. Scrub the port with an alcohol pad for at least 15 seconds and allow to dry for at least 5 seconds.
    2. Attach a 10 ml syringe (without saline) to the port.
    3. Unclamp if necessary (needleless port may not have a clamp).
    4. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, remove the syringe and DO NOT use the catheter for access.
    5. If blood aspirates freely, remove the 10 ml syringe with blood and discard.
    6. Attach a 10 ml syringe with NS and gently flush the line. Never use a smaller syringe. If line does not flush, remove the syringe and DO NOT use the catheter for access.
    7. If line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of NS or LR. Adjust the rate to the needs of the patient within the limits of the catheter.
    8. Administer medications though IV tubing port if indicated.

C. If there is a capped needle-type port on the distal end of the catheter, perform the following: *(figure 2)*
    1. Scrub the cap with an alcohol pad for at least 15 seconds and allow to dry for at least 5 seconds.
    2. Clamp the catheter tubing using ONLY the existing clamp on the catheter and then remove the cap. **Never allow a central line to be open to air.**
    3. Attach a 10 ml syringe on the catheter end.
    4. Unclamp the catheter.
    5. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
    6. If blood aspirates freely, clamp the catheter again.
    7. Remove the 10 ml syringe with blood and discard.

8. Attach a 10 ml syringe with NS.
9. Unclamp and gently flush the line. Never use a smaller syringe. If line does not flush, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
10. If line flushes, re-clamp and remove the syringe.
11. Attach the catheter to the end of the IV tubing.
12. Unclamp the catheter and begin infusion of NS or LR. Adjust the rate according to the needs of the patient within the limits of the catheter.
13. Administer medications though IV tubing port if indicated.

NOTES & PRECAUTIONS:

A. **Do not administer medications, flush, or aspirate with less than a 10-cc syringe. Smaller size syringes generate too much pressure and can damage the catheter.**
B. **Do not attempt to reinject aspirated blood as it may contain clots.**
C. The maximum flow rates for a PICC line is 125 ml/hr for less than size 2.0 French, and 250 ml/hr for catheters over 2.0 size French.
D. Keep patient's arm straight to avoid kinking the PICC line and obstructing flow.
E. Ensure all line connections are secure.
F. PICC lines access the patient's central circulation and the risk of infection is high. Avoid contamination to ports and connections while accessing.
G. **Do not administer the following medications through a PICC line:**
    1. **Adenosine** - The line may rupture during rapid infusion due to over pressurization.
    2. **Dextrose 50%** – The catheter can be damaged due to the viscosity of the fluid.



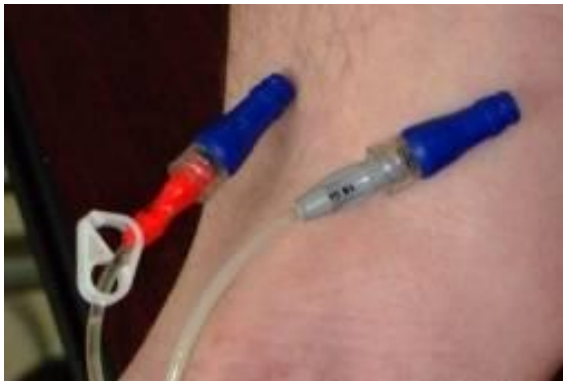


Figure 1- Needleless port

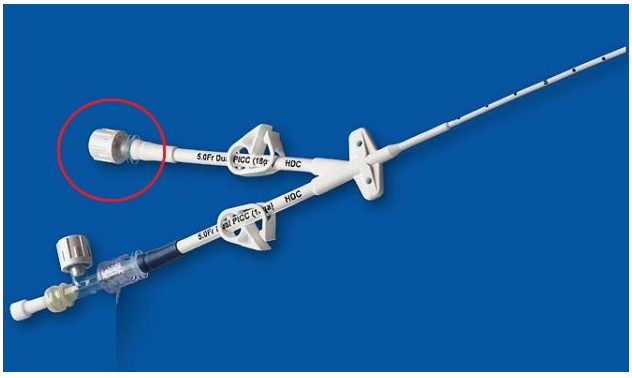


Figure 2 – Non-needleless type port with cap

Positive End-Expiratory Pressure (PEEP)– 30.145

DEFINITION:
Positive end-expiratory pressure (PEEP) is a method of ventilation in which airway pressure is maintained above atmospheric pressure at the end of exhalation by means of a mechanical impedance (PEEP valve). PEEP has some similarity to CPAP/BiPAP although it is delivered through bag instead of a facemask. It can be delivered via bag-valve-mask or bagging into an endotracheal tube. At the end of exhalation PEEP prevents alveolar collapse (i.e., the alveoli stay open) and improves oxygen exchange across the alveolar membrane. Additionally, PEEP may recruit more alveoli that have collapsed, which may further improve oxygenation. **ADDING PEEP IS DONE TO IMPROVE OXYGENATION.** The disadvantage to PEEP is that it may increase intrathoracic pressure, which may reduce blood flow in cardiac arrest or a shock state.

INDICATIONS:
Hypoxia, either prior to or post intubation despite appropriate bag ventilation with 100% oxygen.

CONTRAINDICATIONS:
A. Cardiac arrest (absolute).
B. Hypotension or shock state (relative). May still choose to apply PEEP when preparing to RSI a hypoxic/hypotensive patient.

PROCEDURE:
A. If not already applied, apply PEEP valve to bag device.
B. Dial PEEP valve to 5 cm H_2O and bag per usual.
C. Increase PEEP by 5 cm H_2O every 3 - 5 minutes until hypoxia resolves (oxygen saturation > 95%).
D. Maximum PEEP is 15 cm H_2O.

NOTES AND PRECAUTIONS:
A. Increasing bagging rate will not necessarily improve oxygenation but can cause hyperventilation, which can be detrimental to patients.
B. PEEP valve may come out of the package set to five or zero. Be aware of valve settings.
C. **Maximum PEEP in pediatrics is 5 cm H_2O.**

Sports Equipment Removal – 30.160

DEFINITION:
To provide direction on the safe removal of protective sports equipment that includes helmet and shoulder pads. This procedure page uses football gear as an example, but these guidelines can be used with other sports equipment as well.

PROCEDURE:

A. **Initial Evaluation**
   1. The initial evaluation should begin by assessing level of consciousness, breathing, and circulation. If the athlete is breathing and stable, but a neck injury is suspected, a quick sensory and motor nerve exam should be initiated.
   2. After the quick neurological exam on a stable athlete, the facemask should always be removed.

B. **Face Mask Removal**
   1. Stabilize the head.
   2. Release side attachments first by quick release or screwdriver. Second unscrew top loops to remove facemask. Cutting should be the last resort if quick release or screwdriver does not work.
   3. Quick release face masks are also in use and found on newer helmets. One popular device looks like a “rivet” instead of a screw (pictured below). The release mechanism can be activated by pressing it down with a pen or tip of a screwdriver.
   4. Athletic trainers and coaching staff are familiar with this and can provide assistance.

C. **General equipment removal guidelines:**
   1. Equipment should be removed on the field if an athletic trainer and/or 3+ individuals trained in technique are present. If no athletic trainer is present, and individuals are not comfortable with removal, leave gear intact, but attempt to remove facemask should be performed for airway access.
   2. Equipment removal should be performed by at least three trained and experienced rescuers.
   3. **If removing equipment, always remove the helmet and the shoulder pads, never just one or the other.** Leaving the helmet on or just the shoulder pads on by itself creates head, neck, or spinal cord flexion.

D. **Removal of helmet and shoulder pads as a unit:**
   1. Gear removal starts from the head and proceeds down the body.
   2. Remove the helmet first and then remove the shoulder pads, and leg gear. **Do not start with the shoulder pads.**
   3. Cut chin straps.
   4. Remove ear pad or deflate pad bladder.
   5. Use a **two-person technique** to remove the helmet.
      a. Person at the top firmly holds manual c-spine at the top using two hands to stabilize the patient's helmet.
      b. The other responder, starting at the chin, slides his or her hands inside the patient's helmet "firmly" gripping the head and sliding their hands inside the helmet.
      c. Responders transition manual c-spine responsibility from the person at the top of the head/ helmet to the person supporting the patients head from underneath.
      d. Firm control of the head and neck is the goal. The person at the top proceeds to remove the helmet off the patient's head in a coordinated and smooth manner. **DO NOT SPREAD APART SIDES OF HELMET.**
      e. Once helmet is removed, the person at the top of the head resumes manual c-spine until full c-spine precautions are in place.
   6. Cut shoulder pad straps.
   7. Cut both the jersey and shirt up sleeves towards midline of body.
   8. Person at head stabilizes maxilla and occiput and gives commands.
   9. Position three people on each side, with one stabilizing the head. Another person removes the equipment as a unit.

<u>While backboard and straps are being prepared</u>:

E. **Chest access:**
   1. Cut jersey and front laces of shoulder pads.
   2. Flip out shoulder pads. Some newer systems allow the shoulder pads to come apart prior to removal. Athletic trainers and coaching staff are familiar with these systems and can provide assistance.
   3. Place hands on shoulders with thumbs grasping the clavicle and fingers surrounding the upper trapezius muscles.
   4. Secure the athlete's head between the responder's forearms.

F. **Backboard utilization:**

1. If an athletic trainer is present an 8-person lift and slide technique is preferred as it causes the least amount of cervical movement. If no athletic trainer is present and the athlete is too big for lift and slide, a log roll technique will be performed.
2. The person at head initiates commands and oversees proper placement and techniques.
3. Position three responders on each side of body; one at shoulders, one at hips, and one at legs.
4. One other person is in charge of the backboard and slides it into place.
5. If the helmet is not resting on board, padding can be added to fill space.
6. Fasten straps and tape helmet to board.
7. Chinstrap remains in place unless it interferes with airway.
8. Recheck sensory and motor nerve vitals for changes and document.
9. If C-Spine injury is suspected with neurological deficits, spine board should be utilized in route to the hospital.
10. If athlete is sitting or standing, a c-collar can be utilized, and athlete can be carefully placed on the gurney.

NOTES & PRECAUTIONS:

Athletic Trainers and coaching staff are subject matter experts when it comes to the gear regardless of the sport. Collaborate with them early and often.

Suctioning – 30.161

INDICATIONS:
When patient is exhibiting respiratory difficulty secondary to secretions in airway or the potential for aspiration exists.

PROCEDURE:

A. Oral Suctioning

1. Pre-oxygenate patient with 100% oxygen.
2. Assemble equipment: Suction unit with tonsil tip or dental tip, personal protective equipment (gloves, goggles, gown).
3. Attach required monitoring equipment.
4. Turn suction unit on and confirm mechanical suction is present.
5. Insert tip without suction.
6. Cover thumbhole to begin suction if using a tip other than dental tip.
7. Apply suction for < 15 seconds.
8. Monitor patient's oxygen saturation.
9. Re-oxygenate patient for at least 2 - 3 minutes between suctioning attempts.

B. Tracheal Suctioning

1. Pre-oxygenate patient with 100% oxygen.
2. Assemble equipment: Suction unit, correct size suction catheter, sterile rinse, personal protective equipment (gloves, goggles, gown).
3. Attach required monitoring equipment.
4. If patient is being ventilated with BVM through an endotracheal tube prior to suctioning, have someone else remove the bag from end of ET tube prior to suction attempt.
5. Insert catheter into the ET tube without applying suction.
6. Advance catheter as far as possible.
7. Withdraw slowly using **intermittent** suctioning while rotating catheter.
8. Do not suction more than 15 seconds.
9. Monitor patient's oxygen saturation.
10. Rinse catheter in sterile saline.
11. Re-oxygenate patient for at least 2 - 3 minutes between suction attempts.

C. Suctioning with Meconium Aspirator

Tracheal suctioning is generally not indicated in the vigorous infant born with meconium-stained fluid, whatever the consistency. You can use a bulb syringe or large bore catheter to clear secretions from the mouth and nose as needed. If the newborn is having respiratory distress, then meconium aspiration should be performed as follows.

1. Assemble equipment: Suction unit, appropriate size ET tube, personal protective equipment (gloves, goggles, gown).
2. Attach required monitoring equipment.
3. Turn suction unit on and confirm mechanical suction is present.
4. After infant has been intubated, attach meconium aspirator to end of ET tube.
5. Cover thumbhole to begin suctioning while slowly withdrawing the ET tube. Do not suction for more than 15 seconds.

6. Monitor patient's oxygen saturation and heart rate and stop if patient becomes bradycardic.
7. Re-oxygenate patient for at least 2 - 3 minutes between suctioning attempts.
8. If patient has not been intubated and meconium is thick, at the least, aggressive oropharyngeal suctioning should be carried out with the largest diameter suction device available.

D. Suctioning with Nasal Aspirator Device

1. Assemble equipment: Bulb syringe, suction unit with nasal aspirator, personal protective equipment.
2. If nasal secretions are thick consider instilling 1 - 4 drops of NS into nares to loosen prior to suctioning.
3. If using electric suction be sure vacuum is set less than 100 mmHg.
4. Gently place device tip into nostril. Avoid placing against inside walls of nostril.
5. Apply suction (< 15 seconds if using electric suction).
6. Repeat as needed.

NOTES & PRECAUTIONS:

A. Oral and tracheal suctioning can cause trauma to the oropharynx and airway, bradycardia, or hypoxia. It should not delay other resuscitation.

B. Suction pressure should be set as low as possible and yet effectively clear secretions. Negative pressure of less than 80 - 100 mmHg in neonates and less than 150 mmHg in adults are recommended.

C. When suctioning the intubated patient, the diameter of the suction catheter should not exceed one half of the internal diameter of the endotracheal tube.

TASER® Barb Removal – 30.162

INDICATIONS:

TASER® barbs should be removed at the request of law enforcement if:

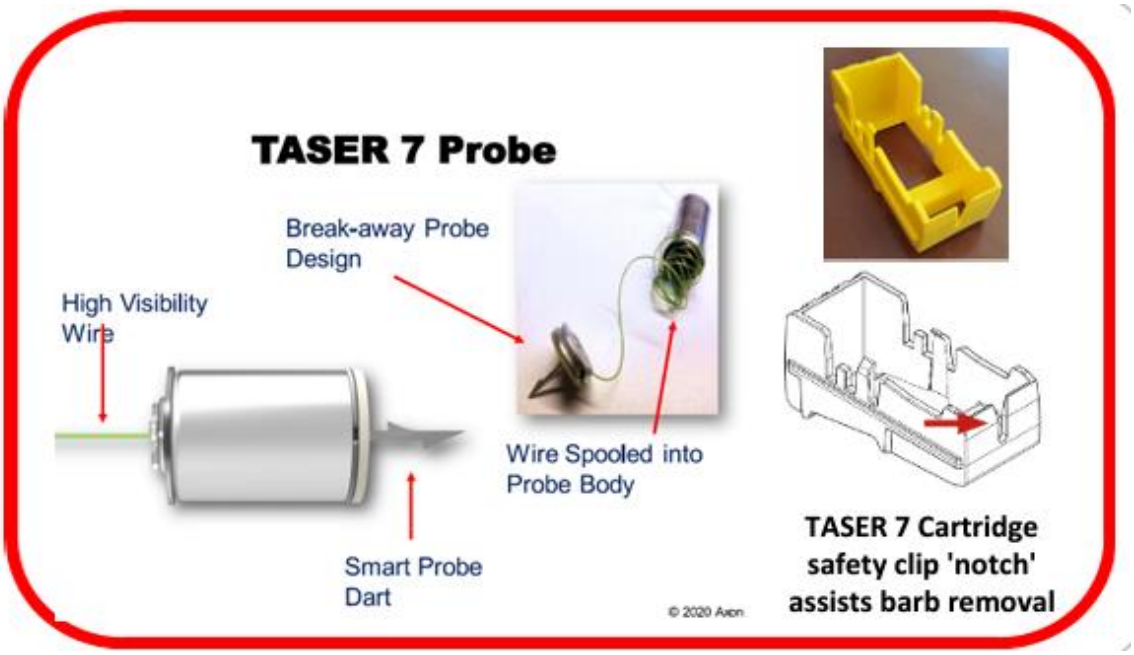
A. The patient has been adequately subdued so as not to pose a danger to Fire/EMS personnel. AND,
B. The barbs are not embedded in the face, neck, or groin areas.

PROCEDURE:

A. Perform patient assessment.
B. Monitor vital signs and LOC. Ensure that vital signs are in the normal limits for the situation.
C. Expose the area where TASER® barb has implanted under the skin.
D. Cut wires from the barb if still attached.
E. Place thumb and forefinger above and below the barb parallel to the portion of the shaft implanted in the patient's skin.
F. Spread your thumb and forefinger apart to stretch the skin tightly over the barb.
G. Holding tension, use needle-nose pliers (or similar tool) with gripping strength and grasp the end of the barb protruding out of the skin near the wire lead and firmly pull out the barb with one quick jerking motion.
H. If probe removal tool is available (see TASER® 7 picture below)
    1. Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site.
    2. Slide the safety clip notch between the probe and the subject, catching the probe between the dart body and the dart point.
    3. In one uninterrupted motion, pull the safety clip, and probe with it, straight out of the puncture site maintaining a 90-degree angle to the skin (avoid twisting or bending the probe).
I. Assess the skin where the barb was removed. The skin should be cauterized from the electrical current. Dress the wound to prevent infection.
J. Contact OLMC if unsure whether to transport.

NOTES & PRECAUTIONS:

A. Patients should be in police custody and monitored by police for the safety of medical personnel.
B. Do not remove TASER® Barbs from the face, neck, or groin area. Stabilize the barbs and transport to the Emergency Department.
C. TASERS® emit two barbs. Make sure both are removed. Treat all barbs as a biohazard and dispose as you would any other sharps. Some law enforcement agencies may direct you to place the probe back into the cartridge as evidence.
D. Potential trauma may have occurred before (during a struggle) or after the patient was hit by the TASER® (e.g., patient falls and hits head).
E. Consider whether the patient meets criteria for Altered Mental Status or Poisonings and Overdoses protocols.
F. CAUTION: Where barbs have wires still connected to the TASER® Gun, shock can still be delivered.


TASER 7 Probe
Break-away Probe Design
High Visibility Wire
Wire Spooled into Probe Body
Smart Probe Dart
© 2020 Axon
TASER 7 Cartridge safety clip 'notch' assists barb removal

Tension Pneumothorax Decompression – 30.170

DEFINITION:
The emergency decompression of a tension pneumothorax using an over-the-needle catheter.

INDICATIONS:
To warrant chest decompression in the field, the patient must be <u>significantly symptomatic or in extremis (at risk of death)</u> with:

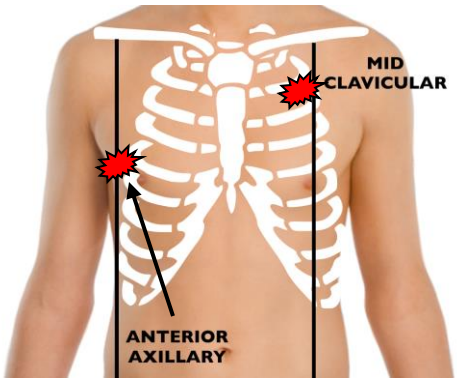
A. High clinical suspicion **and**,
B. Progressive respiratory distress **and**,
C. Shock symptoms with low or rapidly decreasing blood pressure.

<u>and</u> at least one of the following:

A. Decreased or absent breath sounds.
B. Consistent history (e.g., chest trauma, COPD, asthma).
C. Distended neck veins.
D. Tracheal shift away from affected side (late sign).
E. Asymmetrical movement on inspiration.
F. Hyper-expanded chest on affected side.
G. Drum-like percussion on affected side.
H. Increased resistance to positive pressure ventilation, especially if intubated.

EMS witnessed traumatic arrest patients with abdominal or chest trauma for whom resuscitation is indicated should have bilateral chest decompression performed even in the absence of the above signs.

PROCEDURE:
A. Expose the entire chest.
B. Establish landmarks:
    1. Anterior – 2nd intercostal mid clavicular **<u>or if unavailable.</u>**
    2. Lateral – 4th intercostal space <u>anterior</u> axillary (<u>above nipple</u>).
C. Clean chest vigorously with appropriate antiseptic.
D. On affected side, locate the landmark and insert a large gauge over-the-needle catheter with syringe attached along **<u>the superior margin</u>** of the rib below (e.g., top of third rib to enter second intercostal space).
E. If the air is under tension, the barrel will pull easily and "pop" out of the syringe.
F. Remove syringe, advance catheter, and remove needle.
G. Secure from movement.



Tension Pneumothorax Decompression – 30.170

NOTES & PRECAUTIONS:

A. Patient's chest should be auscultated often for return of tension or other respiratory complications.
B. Tension pneumothorax is a rare condition, but can occur with trauma, spontaneously, or as a complication of intubation. Tension takes time to develop, but forceful positive ventilation may increase the rate of development.
C. Simple or non-tension pneumothorax is not life threatening and should not be decompressed in the field.
D. The ideal decompression catheter length is three inches.
E. Possible complications:
    1. Creation of pneumothorax if none existed previously.
    2. Laceration of lung or pericardium. Stop needle advancement once it has popped through the pleura and advance the catheter only.
    3. Laceration of blood vessels. (Always slide the needle above the rib).
    4. Infection. Clean rapidly but vigorously; use sterile gloves if possible.
F. Tension pneumothorax can be precipitated by the occlusion of an open chest wound. If the patient deteriorates after dressing an open chest wound, remove the dressing.

Tourniquet Placement – 30.175

DEFINITION:
Placement of a circumferential band around a limb to occlude arterial blood flow distal to the band.

INDICATIONS:
Extremity hemorrhage that is uncontrollable by less aggressive means (direct pressure, bandaging, or pressure dressing) OR a wound that could cause life threatening extremity hemorrhage during an ongoing tactical problem (e.g., potential building collapse, mass casualty event, amputation).

PROCEDURE:

A. Fully expose and evaluate the wound.
B. Apply tourniquet directly to the skin, 2 - 3 inches proximal to the most proximal limb wound, not over a joint.
C. Tighten until all bleeding stops and no distal pulse is palpable.
D. Secure the windlass per manufacturer instructions.
E. If one properly placed tourniquet does not control bleeding, a second should be placed proximal to the first and tightened appropriately.
F. Endeavor to keep all tourniquets exposed.
G. Mark with time of application and communicate this to receiving providers.
H. Re-evaluate tourniquets frequently to ensure they have not loosened.

NOTES & PRECAUTIONS:

A. If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove the improvised tourniquet if operationally feasible**.**
B. Properly applied tourniquets will rarely damage tissue if removed within two hours.
C. If unable to fully expose a limb and identify all wounds on that limb place the tourniquet as high on the limb as possible. Once all wounds on that limb can be identified, every effort should be made to move the tourniquet to 2 - 3 inches proximal to the most proximal wounds, and not on a joint.
D. Intermittently loosening and tightening a tourniquet to “reperfuse” a limb is of no benefit and dangerous as it encourages additional bleeding.
E. A single commercially available tourniquet completely occludes femoral artery blood flow about 70% of the time. Two tourniquets placed side by side completely occlude about 80% of the time.
F. The ability of the tourniquet to completely occlude arterial flow is dependent on limb circumference. Larger limbs are more difficult to occlude.
G. A persistent pulse, continued venous congestion / distention, re-bleeding after initial hemorrhage control, and expanding hematoma are all indications of an ineffective tourniquet.
H. Clothing, padding under the tourniquet, and limb movement all cause tourniquets to loosen over time and should be avoided.
I. Tourniquets can cause significant pain and may require narcotics for pain control.
J. Proper placement of a CAT® tourniquet on a lower extremity requires threading the circumferential band through both slits of the buckle.
K. Proper placement of the SOFTT tourniquet requires tightening the knurled screw on the buckle before tightening the windlass.

Transcutaneous Pacing – 30.180

DEFINITION:
Transcutaneous pacing is the technique of electronic cardiac pacing accomplished by using skin electrodes to pass repetitive electrical impulses through the thorax.

INDICATIONS:
Transcutaneous pacing should be considered in bradycardia with evidence of inadequate perfusion, (e.g. altered mental status, chest pain, hypotension, other signs of shock).

PROCEDURE:
A. Ensure ECG pads are attached, and monitor displays a rhythm.
B. Attach pacing electrodes to anterior and posterior chest just to the left of the sternum and spinal column, respectively. Alternatively, pads may be placed in the standard anterior and lateral position as with defibrillation. If there is difficulty in obtaining capture, try alternative position.
C. Begin pacing at a heart rate of 80 beats per minute and 30 mA current output.
D. Increase current by increments of 10mAs while observing monitor for evidence of electrical capture. Confirm mechanical capture by checking pulses and BP.
E. If patient is comfortable at this point, continue pacing. If patient is experiencing discomfort, consider analgesia per pain management protocol and/or sedation with a benzodiazepine per appropriate medication protocol if blood pressure allows.
F. If the patient remains unconscious during pacing, assess capture by observing the monitor and evaluating pulse and blood pressure changes. In the event of electrical capture and no pulses, follow PEA protocol.
G. If there is no response to pacing and drugs, consult with OLMC. If a change in pacing rate is desired, contact OLMC.

PEDIATRIC PATIENTS:
Use above guidelines except:
A. Use anterior/posterior pad placement first for patients less than 1 year.
B. Begin pacing at smallest mA output.
C. Increase current in increments of 10 mA while observing monitor for evidence of electrical capture.
D. Confirm mechanical capture by checking pulses and BP.
E. Contact OLMC for adjustments to rate based on age and response to pacing.

NOTES & PRECAUTIONS:
Transcutaneous pacing should not be used in the following settings:
A. Asystole.
B. Patients meeting Death In The Field criteria.
C. Patients in traumatic cardiac arrest.

Operations

Ambulance Diversion Guidelines – 50.015

DIVERSION SYSTEM OVERVIEW

The Greater Portland Metropolitan Area (Multnomah, Clackamas, Columbia, and Washington Counties, and in coordination with Clark County, Washington) is a large geographic area with a growing population. There is a complex network of medical providers, and hospital systems servicing the area. The Portland Metro Five County Emergency Medical System (EMS) values transporting patients to the hospital of their choice, and also getting patients to the right hospital for specialty services. These systems require coordination between patient transport and patient destination, ensuring continued use and availability of emergency medical resources to the community. The patient diversion guidelines exist to provide guidance for emergency departments and ambulance providers during high-capacity times. The guidelines are a collaborative effort between many stakeholders that include hospitals, ambulance providers, county oversight agencies, and the Oregon Association of Hospitals and Health Systems (OAHHS).

This policy does not pertain to prescheduled, non-emergency, or inter-facility transports.

A. PURPOSE

Ambulance diversion is a hospital short-term management tool used as a last resort when the patient load overwhelms ED resources after internal diversion avoidance procedures have been implemented. Ambulance diversion is not to take the place of effective patient volume management processes. This protocol defines how the Portland Metro Quad-County EMS system will effectively manage situations where the diversion of an ambulance may be necessary and when such diversions may have an adverse effect on individual patient care or the EMS system.

B. PHILOSOPHY

The Greater Portland Metropolitan Area hospitals will make every effort to avoid the diversion of ambulances which may result in:

1. Transporting patients away from their hospital or physician of choice.
2. Prolonged prehospital care for unstable or critically ill patients.
3. Prolonged transport times.
4. Attempts by field personnel to predict the specific diagnostic and therapeutic resources needed by individual patients.
5. Reduced ED availability to the community.
6. Reduced ambulance availability to the community.

This protocol sets the standard that diversion should be the exception rather than the rule.

C. OBJECTIVES

1. To promote efficient and effective provision of EMS services in accordance with county ambulance service plans, codes, as well as state and federal regulations.
2. To assure hospitals develop and adhere to diversion avoidance strategies.
3. To assure hospitals limit diversion to ED patient safety reasons and remove diversion status immediately after the patient safety issue has been resolved.
4. To provide consistent definitions and agreed upon procedures to guide each hospital.
5. To assure system accountability and quality improvement to facilitate the goal of limiting diversion.
6. To report and collect meaningful data, which more accurately defines prehospital and hospital EMS demand, service consumption, and resource availability.

7. To identify a system of accountability and quality improvement by providing diversion data to all participants monthly.

D. DEFINITIONS

1. All Divert No Divert – When all hospitals in a zone go on diversion simultaneously (all close), the HOSCAP/OCS system or zone manager will immediately open all hospitals within the zone. No zone or all hospitals within a zone will be allowed to close for zone management unless authorized by the EMS medical director/zone manager for emergent reasons.
2. Disaster Management – Epidemic, pandemic, inclement weather, man-made or natural disaster, zone management, mass casualty incident, or other circumstances that challenge emergency services abilities to continue meeting patient care demand.
3. Diversion – The redirection of an ambulance from an intended receiving facility to an alternate receiving facility due to a sudden, unanticipated, temporary inability to receive any additional 9-1-1 patients; or safely care for additional **critical/unstable** patients in the ED.
4. Inter-Facility Transfers – Hospital destination is pre-determined by physician-to-physician communication as a formal transfer.
5. OCS (Oregon Capacity System) – State owned and managed, data system for distribution of hospital status information and incident management.
6. Regional Hospital – A medical facility designated to coordinate Mass Casualty Incident (MCI) or disaster situations co-located with Trauma Center Communications (TCC) and Medical Resource Hospital (MRH) which provides online medical control for Multnomah, Clackamas, Washington and Clark Counties, currently located within Oregon Health Science University (OHSU).
7. Zone Manager – An agency or facility authorized to provide coordination to pre-hospital care providers and hospitals during times of zone wide diversion.
8. ED Diversion Status Categories:
    a. OPEN (GREEN) – The ED can accept patient(s) transported from an ambulance.
    b. CLOSED (RED) – The ED is unable to accept patient(s) transported from an ambulance; except:
        i. Uncontrolled airway
        ii. Non-trauma patient too unstable to transport to another facility.
        iii. Patient refuses alternate facility.
        iv. Prearranged inter-facility transfer.
        v. Pregnant patients > 20 weeks gestation or illness or injury which could have a potential life-threatening effect on the mother and/or the fetus.
9. Trauma Diversion Status Categories:
    a. TRAUMA YELLOW – A designated trauma hospital has declared that trauma restrictions exist, and some trauma related services may be limited.
    b. TRAUMA RED – A designated trauma hospital will divert to another trauma hospital when it has exceeded its capacity of personnel, equipment, or facilities to assess and care for trauma patients.
10. Life Flight Network Status:
    a. GREEN – Available
    b. YELLOW– On stand-by for another patient
    c. RED – Unavailable

Destination Hospital/Services Abbreviation and EMS Abbreviations:

1	DC	Doernbecher Children's Hospital (located within OHSU ED)	Portland
2	EM	Legacy Emanuel Medical Center	Portland
3	EC	Legacy Randall Children's Hospital (located in Emanuel's ED)	Portland
4	GS	Legacy Good Samaritan Medical Center	Portland
5	MH	Legacy Mt. Hood Medical Center	Gresham
6	MP	Legacy Meridian Park Medical Center	Tualatin
7	SC	Legacy Salmon Creek Medical Center	Vancouver
8	PA	Adventist Medical Center	Portland
9	PM	Providence Milwaukie Hospital	Milwaukie
10	PR	Providence Portland Medical Center	Portland
11	SK	Kaiser Sunnyside Medical Center	Clackamas
12	SV	Providence St. Vincent Medical Center	Portland
13	SW	PeaceHealth Southwest Medical Center	Vancouver
14	TH	Hillsboro Medical Center	Hillsboro
15	UH	Oregon Health Sciences University Hospital	Portland
16	UC	Unity Center for Behavioral Health	Portland
17	VA	Veterans Administration Hospital	Portland
18	WF	Providence Willamette Falls Hospital	Oregon City
19	WK	Kaiser Westside Medical Center	Hillsboro
20	LF	Life Flight Network	Hillsboro
21	MW	Metro West Ambulance	Hillsboro
22	WCEO	EMS Washington County EMS Office	Hillsboro
23	AMR	American Medical Response	Portland

E. ED AMBULANCE DIVERSION CRITERIA

It is the expectation that all hospitals receiving 9-1-1 patients make every effort to be continuously open and available.

1. Diversion is not to be initiated for:
    a. Lack of in-patient staffing or inpatient/ICU beds.
    b. Key resources being reserved for anticipated elective patient care (i.e., elective surgical cases or radiological studies).
    c. Routine ED overcrowding:
        i. Full waiting room
        ii. Long waiting room time
        iii. Extended LOS of ESI 3, 4, 5s
        iv. ED boarders
2. ED diversion may be initiated under the following conditions:

    By the hospital:
    a. ED charge nurse and ED physician leader determine that the ED is reaching capacity with critical/unstable patients occupying all ED care spaces.
    b. ED charge nurse and ED physician leader have attempted to accommodate increased demand by following their internal ED surge plan yet determine that ambulance diversion is necessary to safely care for patients in the ED because:

i. There are not enough resources to safely care for additional **critical/unstable** patients in the ED.
ii. There is a loss of CT scanner capability.
iii. There is an in-house disaster which compromises patient care/safety (i.e., fire, flooding, or electrical power outage).

By the EMS system:

a. For nonstandard or extended off-load times of 35 min or greater – collaboration will occur with the EMS supervisor and affected ED(s) leadership to develop a patient placement plan.
b. Under the discretion of the EMS medical director.

3. Hospitals request diversion via OCS. Hospital initiated diversion events will last no longer than two hours before OCS automatically opens the hospital to ambulance traffic again and the hospital will not be allowed to request diversion for two hours.
4. In the event a hospital is unable to change their status in OCS, (i.e., connection problems), the hospital may contact the zone manager to authorize the zone manager to change the hospital status in OCS.
5. A hospital's diversion status at the time ambulance transport begins with a loaded patient will determine the ability of the hospital to accept patients. To ensure the up-to-the-minute ability of a hospital to accept a patient, a transporting unit will contact dispatch requesting the status of the preferred destination hospital when the patient has been loaded and as they are preparing to depart the scene. Diversion of a patient shall not occur after the transport has begun.

F. TRAUMA AMBULANCE DIVERSION CRITERIA

1. The intent of the Trauma System is that only one of the designated Level 1 Trauma Centers may divert at a time: OHSU/Doernbecher's Children or Legacy Emanuel/Randall's Children.
   a. When one of the Level 1 (adult or pediatric) trauma centers goes on diversion status, notification of diversion status to the other designated trauma center must occur. Trauma patients will then be diverted to the other trauma center.
   b. When both Level 1 trauma centers are at capacity, the Trauma Center Communications Center will be notified to begin rotating trauma patients between the two trauma hospitals until the situation has stabilized or either hospital is able to return to standard operations. The Regional Hospital may also need to do an "All Call" to other community hospitals activating the MCI or disaster system to coordinate distribution of trauma patients.

G. MULTNOMAH COUNTY PEDIATRIC HOSPITAL ED'S

1. When one of the dedicated Multnomah County pediatric EDs (Doernbecher's Children and Randall's Children) goes on diversion status, notification of diversion status to the other designated pediatric ED must occur. Pediatric patients will then be diverted to the other pediatric ED.
2. When both Multnomah County pediatric EDs are on diversion, the OHSU zone manager will rotate destination between the two Multnomah County pediatric ED's until the situation has stabilized or one of the pediatric EDs returns to green status.

H. ZONE MANAGEMENT

Hospitals are grouped into the following geographical zones:

West Zone	Central Zone	South Zone	North Zone	East Zone
Providence St. Vincent Medical Center	Legacy Emanuel Medical Center/Randall Childrens Hospital	Kaiser Sunnyside Medical Center	PeaceHealth SW Medical Center	Portland Adventist
Legacy Meridian Park Medical Center	Legacy Good Samaritan Medical Center	Providence Milwaukie	Legacy Salmon Creek Medical Center	Providence Portland Medical Center
Hillsboro Medical Center	Oregon Health Science University/Doernbecher Childrens	Providence Willamette Falls		Legacy Mount Hood
Kaiser Westside Medical Center	Portland VA Medical Center			
	Unity Center for Behavioral Health			
Zone Manager Metro West	**Zone Manager** Regional Hospital	**Zone Manager** Regional Hospital	**Zone Manager** Regional Hospital	**Zone Manager** Regional Hospital

1. When multiple hospitals go on diversion at the same time it poses a challenge to other hospitals trying to stay open. In the event all hospitals in a zone go on diversion simultaneously, an All DIVERT NO DIVERT process will be initiated and the OCS system or zone manager will immediately open all hospitals within the zone.
2. Occasionally, for emergent reasons, i.e., MCI, the zone manager may need to initiate zone management. In the event this is required to enhance the EMS system or provide for public safety the zone manager will initiate diversion by:
    a. Initiating “Active Zone Management” for the zone(s) affected and will facilitate an “all call” via the 800 MHz radio to hospitals informing them of the “Active Zone Management” status.
    b. Local ambulance providers/dispatch centers will notify their respective ambulances that zone management is in effect for the defined zone(s) and that their units are to contact the zone manager to obtain hospital destination(s).
    c. Under zone management, the zone manager will determine the destination of all ambulances within the affected zone(s).
    d. Ambulances may go outside their zone during zone management if their destination hospital is GREEN, this may be done based on patient and EMS provider agreement and following patient treatment and transport guidelines on the final destination. This includes honoring previously agreed upon destinations.
    e. Rotation will continue with one patient per hospital as determined by the zone manager. Note: the rotation will not apply to the trauma hospitals for trauma entry patients. Trauma hospitals participating in zone management will

adhere to the trauma diversion portion of the ambulance diversion policy located above.

f. Trauma, STEMI, stroke, pediatric, and behavioral patient care protocols will continue.

g. Prior to discontinuing zone management, the zone manager will monitor key area hospitals and ambulance providers. When system resources are above the activation threshold the zone manager may discontinue zone management.

h. When appropriate, the county EMS Medical Director will participate in this discussion for the zones within their jurisdictional boundaries.

I. DISASTER MANAGEMENT

1. Hospital destinations will be coordinated by Regional Hospital through OCS and according to regionally and locally adopted EMS protocols.
2. During times of disaster management, situational status updates should be initiated and continued in four-hour operational intervals to provide updates to stakeholders.
    a. Disaster management as reported by community emergency responders.
    b. Any one facility activating their internal emergency management protocol.
    c. Actual or forecasted inclement weather.
    d. Any zone requiring persistent zone management.
    e. Circumstances as deemed appropriate by emergency operations officials or county EMS Medical Director(s).
3. Stakeholders involved in proactive (thresholds) communications may include:
    a. Medical directors/ED physicians.
    b. Managers or their designee, assistant nurse managers, charge nurses, house supervisors, AOC/AOD, executive leadership, hospital HICS members.
    c. Fire and EMS officials.
    d. Public health officials.
    e. Others, as appropriate.

J. SIGNIFICANT EVENTS PROCESS FOR DIVERSION DEVIATION:

1. Inclement weather, hazardous road conditions, heavy snow, ice storms, or other unusual conditions may prevent ambulance crews from transporting patients to their hospital of choice. County EMS authorities shall have a process in response to these unusual circumstance and significant events. The significant event process has been developed to modify operations to better manage and coordinate EMS resources during large scale incidents or inclement weather events in the Greater Portland Metropolitan Area.
2. During the significant event process:
    a. The impacted area's zone manager will be responsible for communicating the modification of EMS transport destinations to affected hospitals.
    b. Activation of the significant event process or modified EMS operations is under the authority of county EMS administration and medical direction. This is generally done in consultation with emergency ambulance providers and hospitals as well as fire first response and emergency dispatch supervisors.
    c. Dependent on the nature of the event, Regional Hospital may establish hospital destinations.

   d. Consideration will be given to patients requiring specialized care such as trauma, STEMI, stroke, behavioral, burn, hyperbaric, pediatric and obstetrical patients.
   e. Every effort will be made to accommodate the patient's wishes for destination, however during a significant event; determination of the most appropriate facility may consider patient and crew safety.
   f. Final determination of patient destination must rest with the treating paramedic actually caring for the patient. This paramedic, in consultation with EMS operational supervisors and zone managers, as well as acting in accordance with county laws, and medical protocols, and with the ability to seek medical consultation, has the most direct knowledge of the patient's condition and conditions affecting transport.
3. The patient requires transport emergently to the closest hospital when in the judgement of the treating paramedic the patient is unstable and patient transport guidelines recommend transport to the closest hospital regardless of diversion status.
4. Anytime a patient is transported to a hospital other than the one requested the reason for the change and the destination hospital shall be documented on the Prehospital Care Report.

K. <u>ACCOUNTABILITY AND QUALITY IMPROVEMENT:</u>

1. The hospitals will:
   a. Develop an internal policy and systems to avoid diversion.
   b. Submit updated ED surge plan annually to the ED/EMS Leadership Collaborative.
   c. Ensure a hospital ED leader attends the monthly ED/EMS Leadership Collaborative meeting to review any diversion events the from the prior month and share what action planning is occurring to reduce diversion utilization.
2. County EMS will report number of hours and category of diversion to all zones based on information in OCS.
3. The ED/EMS Leadership Collaborative is responsible for the monitoring of region-1 diversion hours and events, provide recommendations for quality improvement, and is responsible for the annual evaluation and revision to the Multnomah Operations Policy 50.030 Diversion System and the Quad-County consortium Ambulance Diversion Guidelines 50.015. The ED/EMS Leadership Collaborative is a cooperative effort between involved EMS agencies, hospitals, their ED managers, and ambulance providers.
4. Problems related to the implementation of these guidelines should be forwarded to the chair of the ED/EMS Leadership Collaborative.

Organizations in Support of These Guidelines

<u>HOSPITALS</u>
Adventist Medical Center
Doernbecher Children's Hospital
Hillsboro Medical Center
Kaiser Sunnyside Medical Center
Kaiser Westside Medical Center
Legacy Emanuel Medical Center
Legacy Good Samaritan Medical Center

Legacy Meridian Park Medical Center
Legacy Mt. Hood Medical Center
Legacy Salmon Creek Medical Center
Oregon Health Sciences University
Providence Milwaukie Hospital
Providence Portland Medical Center
Providence St. Vincent Medical Center
Randall Children's Hospital
PeaceHealth SW
Unity Behavioral Health
Veterans Administration Hospital
Willamette Falls Hospital
Oregon Association of Hospitals and Health Systems

COUNTY EMS REGULATORY AGENCIES FOR THE FOLLOWING COUNTIES
Washington County
Clackamas County
Clark County
Multnomah County

AMBULANCE PROVIDERS
American Medical Response
Banks Fire District
Canby Fire Department
Camas Fire Department
Clackamas County Fire District 1
Cornelius Fire Department
Forest Grove Fire & Rescue
Gaston Rural Fire District
Hillsboro Fire & Rescue
Metro West Ambulance
Molalla Fire Department
North Country Ambulance
Life Flight Network
Tualatin Valley Fire & Rescue

TABLE: HOSPITAL SERVICES

HOSPITAL	BURN UNIT	CARDIAC SURGERY	DECON	HELI PAD	HYPER BARIC	OB	NICU	PEDS INPATIENT	PICU	TRAUMA CENTER	CATH LAB	LVAD	STROKE INTERVENTIONAL	DIALYSIS
Adventist		X	X	X		X					X			X
Doernbecher Children's		X	X	X			X	X	X	X				X
Hillsboro Medical Center			X	X		X	X	X			X (Not 24/7)			X
Kaiser Sunnyside		X	X			X	X				X	X	X	X
Kaiser Westside			X			X								X
Randall Children's Hospital Legacy Emanuel	X	X	X	X (2)		X	X	X	X	X				X
Legacy Emanuel	X	X	X	X (2)	X	X	X	X	X	X	X		X	X
Legacy Good Samaritan			X			X					X			X
Legacy Meridian Park			X	X		X					X			
Legacy Mount Hood			X	X		X								
Legacy Salmon Creek			X	X		X	X				X			X
OHSU		X	X	X (3)		X	X	X	X	X	X	X	X	X
Peace Health SW Washington		X	X	X		X	X	X		X	X		X	X
Providence Milwaukie			X											
Providence Newberg			X	X		X								X
Providence Portland				X		X	X				X		X	X
Providence St. Vincent		X	X	X		X	X	X	X		X	X	X	X
Providence Willamette Falls				X		X								
Veteran's Administration		X									X			X

Crime Scene Response – 50.020

PURPOSE:
Law enforcement agencies stress that their priority on any crime scene is the preservation of life with reconstruction of the crime scene second. EMS personnel can be of assistance by adhering to the following guidelines regarding crime scene response.

PROCEDURE:

A. Response and Arrival
   1. Be conscious of physical and weather conditions around the site. Tire tracks of suspect vehicles are often located in or adjacent to a driveway.
   2. Limit the number of personnel allowed onto the scene. Consult with police on the scene to direct placement of vehicles and route of personnel onto the scene.

B. Access and Treatment
   1. Select a single route to the victim. Maintaining a single route decreases the chance of altering or destroying evidence or tracking blood over a suspect's footprints.
   2. Note the location of furniture, weapons, and other articles, and avoid disturbing them. If they need to be moved, someone should note the location the article was moved from, by whom it was moved, and where it was placed.
   3. Remove from the scene all EMS generated debris that is contaminated with blood or body fluid and dispose of through established channels.
   4. Be conscious of any statements made by the victim or other persons at the crime scene. Write down what these statements were and report to the investigating officers.
   5. Note the specific garments worn by the patient at the time of treatment. It is also important not to tear the clothing off or cut through any holes, whether made by a knife, bullet, or other object.
   6. The victim should be placed on a clean sheet when ready for transport. At the hospital, please try to obtain the sheet once the victim is moved off it. Fold it carefully in on itself and give it to the investigating officers. This is especially important in close contact crimes such as rape, serious assault, and death cases.

C. Documentation
   1. A detailed report is important in case you are later called to testify in court. An incident report should be completed and should cover your observations, conversations with family or witnesses, location of response vehicles and equipment, furniture, weapons, clothing that has been moved, items that were handled, and your route to the victim.
   2. An Unusual/Supplemental Event Report may be helpful for you to complete. This is a protected document and if you are called to court may be used by you to refresh your memory of aspects of the call that are not included in the Patient Care Report.
   3. Do not offer your opinions or evaluations about the crime scene.

REMINDER:
Any location can be, or become, a crime scene. When responding, and upon arrival, if something does not appear to be right, notify police. If you suspect a crime scene, and police are not present, secure area and document what you see.

Death and Dying – 50.025

PURPOSE:
To define under what conditions treatment can be withheld or stopped.

PROCEDURE:

A. DEATH IN THE FIELD

Resuscitation efforts may be withheld if:

1. The patient has a Do Not Attempt Resuscitation (DNAR)/Do Not Resuscitate (DNR) order.
2. The patient is pulseless and apneic in a mass casualty incident or multiple patient scene where the resources of the system are required for the stabilization of living patients.
3. The patient is decapitated.
4. The patient has rigor mortis in a warm environment.
5. The patient is in the stages of decomposition.
6. The patient has skin discoloration in dependent body parts (dependent lividity).

Medical Cardiac Arrest:

1. If the initial ECG shows asystole or agonal rhythm confirmed in 3 leads, and the patient, in the responder's best judgment would not benefit from resuscitation:
   a. The PIC may determine death in the field, ***OR***
   b. Begin BLS procedures, and contact OLMC with available patient history, current condition, and with a request for advice regarding discontinuing resuscitation.
2. If after the airway is established and the asystole protocol has been exhausted the patient persists in asystole (confirmed in 3 leads) the PIC may determine the patient to be dead in the field.
3. Death in the field may be determined with $EtCO_2$ of 10 or less in patients with PEA after 30 minutes of ACLS resuscitation. For patients with $EtCO_2$ greater than 10 either continue resuscitation or contact OLMC to stop resuscitation.
4. Patients in VF should be treated and transported.

Traumatic Cardiac Arrest:

1. Traumatic arrest carries high rates of mortality, but improved outcomes have been seen in EMS witnessed arrest. Causes of arrest that may be amenable to prehospital resuscitation include severe hypovolemia, hypoxia, and tension pneumothorax.
2. A cardiac monitor may be beneficial in determining death in the field.
3. Trauma patients who have arrested prior to EMS arrival can by declared dead in the field.
4. Witnessed traumatic arrest patients and patients who deteriorate to PEA or asystole may benefit from "HAT" resuscitation. Follow the Traumatic Cardiac Arrest Protocol (10.050).

Pediatric Non-Traumatic Cardiac Arrest:

1. Death in the field may be determined **if all** the following conditions are met:
   a. Patient remained in asystole for duration of resuscitation. If at any time there was PEA or a shockable rhythm, they should be transported.
   b. Resuscitation has been ongoing for at least 30 minutes.
   c. At least 3 doses of epinephrine have been administered.
   d. There is adequate safety/support on scene.
2. In unclear circumstances, call OLMC or initiate transport.

Notes & Precautions**:**

1. ORS allows a layperson, EMT or paramedic to determine "Death in the Field".
2. Consult OLMC with any doubt about the resuscitation potential of the patient.
3. A person who was pulseless or apneic and has received CPR and has been resuscitated is not precluded from later being a candidate for solid organ donation.

B. POLST ORDERS AND DECISION MAKING

1. In the pulseless and apneic patient who does not meet DEATH IN THE FIELD criteria but is suspected to be a candidate for withholding resuscitation, begin CPR and contact OLMC.
2. A patient with decision-making capacity or the legally authorized representative has the right to direct his or her own medical care and can change or rescind previous directives.
3. EMS providers may honor a DNAR/DNR order signed by a physician, nurse practitioner or physician assistant. DNAR/DNR orders apply only to the patient in cardiopulmonary arrest and do not indicate the types of treatment that a person not in arrest should receive. POLST was developed to convey orders in other circumstances.
4. Portable Orders for Life-Sustaining Treatment (POLST):
   The POLST was developed to document and communicate patient treatment preferences across treatment settings. While these forms are most often used to limit care, they may also indicate that the patient wants everything medically appropriate done. **Read the form carefully!** When signed by an allopathic physician (MD or DO), naturopathic physician, nurse practitioner, or physician assistant, POLST is a medical order and EMS providers are directed to honor it in their Scope of Practice unless they have reason to doubt the validity of the orders or the patient with decision-making capacity requests change. If there are questions regarding the validity or enforceability of the health care instruction, begin BLS treatment and contact OLMC [OAR 847-035-030 (7)] If the POLST is not immediately available, a POLST form as documented in the Electronic POLST registry hosted at MRH (503-494-7333) may also be honored.
   - Section A: Applies only when patient is in cardiopulmonary arrest.
   - Section B**:** Applies in all other circumstances.
   - For a POLST form to be valid it must include:
     i. Patient's name
     ii. Date signed (forms do not expire)
     iii. Health care professional's signature (patient signature is optional)

- Consider providing pain/symptom management and not transporting patient if they are Comfort Measures Only, the symptoms can be managed, and the patient and caregivers on scene do not want transport to the hospital. Consider OLMC contact for advice.

5. The legally authorized representative may make decisions for the patient who is unable to make medical decisions. However, when in doubt or for unresolved conflict on the scene contact OLMC. The order is:
    a. A legal guardian
    b. A power of attorney for health care as designated by the patient on the Oregon Advance Directive
    c. Spouse or legal domestic partner
    d. Adult children
    e. Parent
6. Death with Dignity:
   If a person who is terminally ill and appears to have ingested medication under the provisions of the Oregon Death with Dignity Act, the EMS provider should:
    a. Provide comfort care as indicated.
    b. Determine who called 9-1-1 and why (i.e., to control symptoms or because the person no longer wishes to end their life with medications).
    c. Establish the presence of DNAR/DNR orders and/or documentation that this was an action under the provisions of the Death with Dignity Act.
    d. Contact OLMC.
    e. Withhold resuscitation if DNAR/DNR orders are present, and there is evidence that this is within the provisions of the Death with Dignity Act and OLMC agrees.

C. PATIENTS ENROLLED IN HOSPICE AND DYING PATIENTS

1. Look for POLST forms (contact Registry if needed) and attempt to honor patient preferences. Always provide comfort measures.
2. If the patient is enrolled in hospice or receiving palliative care, refer to Hospice and Palliative Care protocol 50.062.

D. CARE OF GRIEVING PERSONS

Resuscitation phase:

1. As time allows, give accurate and truthful updates about the patient's prognosis. If available, assign one person to interact with and support family members.
2. Consider gently removing children from the resuscitation area.
3. Depending upon the emotional state of family members, consider allowing them to watch and/or participate in a limited and appropriate way.
4. If family or friends were doing CPR prior to your arrival, commend their efforts.

5. If family or friends are disruptive consider removing them or try assigning simple tasks, such as helping bring in the stretcher, holding doors open, telling other family about the event, and calling the doctor or clergy member.
6. Be respectful. Make requests. Don't give orders.

Once death is determined:

1. Treat the recently dead with respect.
2. Tell family and friends of the death honestly. Use the words “death” or “dead”. Avoid using euphemisms such as “passed away” or “gone”.
3. Avoid using past tense terms when speaking to survivors of the recently dead.
4. Allow family and friends to express their emotions. Listen to them if they want to talk but don’t push them.
5. Give factual information.
6. Genuine warmth and compassion will be more helpful than almost anything else for survivors. Don't feel it necessary to say the "right" things. Listening often provides grieving people with the most comfort.

Focusing on survivors:

1. See to it that survivors have a support system present before you leave. Consider calling TIP through EMS Dispatch, if available in your jurisdiction. Call friends, family, clergy, or neighbors to be with them. Respect the survivor's wishes to be alone.
2. Explain the next steps to them after you have pronounced death. This will include the police coming to make reports, possibly the medical examiner, and the possible need for an autopsy.
3. Contact the Medical Examiner's office as soon as possible before moving or altering the body.
4. Allow family and friends to say their good-byes if possible.
5. A chaplain may be helpful in assisting with survivors. It is advisable to call early, as the chaplains do not have code-3 capabilities.
6. Help survivors make decisions such as which people should be called. If they ask you to make calls, try to comply, mention the need to find a funeral home, if one has not already been chosen. Clergy may also be helpful with this decision.

E. DEATH OF A CHILD:

1. Do not accuse the parents of abuse or neglect but take careful note of the patient’s surroundings and the general physical condition of the child.
2. Do not be overly silent, which may imply guilt to the parents.
3. Ask the parents only necessary questions and do not judge or evaluate them. Do not tell them what they “should have” been doing before your arrival.
4. Remind parents to arrange for childcare of other children.
5. Listen carefully to their statements and answer only with accurate information.
6. If there is a police investigation, tell the parents that this is routine.
7. Successful management of child deaths requires supportive, compassionate, and tactful measures.

Death Notifications – 50.030

PURPOSE:

To establish guidelines for the handling of the body and required notification following a declaration of death as outlined in ORS Chapter 146. The goal of an investigation by the medical examiner's office is to determine the cause and manner of death.

PROCEDURE:

A. If the patient appears to meet obvious death in the field criteria, have only one person enter the scene to verify death; limit access if possible. Don't move the decedent unless necessary. Document anything that was altered by your examination (e.g., unbuttoned/removed clothing, movement of the decedent, etc.).
B. Contact police for all deaths in the field except for hospice and skilled nursing facilities.
C. Upon declaration of death, the medical examiner (ME) must be contacted. Until contact is made with the ME:
    1. Do not move the body.
    2. Do not cover the body unless necessary (e.g., outside, public place). If covering the body is necessary, use a new/clean non-cloth disposable sheet or blanket such as an emergency blanket.
    3. Do not remove clothing or cleanse the body or otherwise alter the appearance of the state of the body.
    4. Do not remove any of the effects of the deceased or instruments or weapons related to the death.
    5. Do not let anyone in the area where the deceased is located.
    6. If resuscitation was attempted, do not remove IV's, advanced airways, or defib/ECG pads. Circle all IV attempts or any trauma or marks that you caused to the body with an ink pen if possible.
D. Depending on the circumstances, the ME will either respond to the scene for a full investigation or release the body to a funeral home with a limited investigation. Generally, it is best to turn the scene over to law enforcement once you have given a report.
E. You should not leave the scene without passing the scene off to law enforcement or until the ME has released you over the phone or the ME arrives at the scene and has released you.
F. The following documentation is required for declaration of death calls:
    1. Location and position the body was found.
    2. Location of evidence if moved for safety concerns (gun, knife, bat, etc.).
    3. Anything suspicious (e.g. bruises on the body, deformed arm, black eye, comments made by bystanders/relatives/friends, etc.).
    4. Name and title of individual the scene is turned over to (law enforcement, ME, another crew) and the disposition of the body.
    5. The name of the ME if the body is released with a limited investigation.
    6. Follow your individual agency's medical records policy for listing witnesses or possible witnesses with contact information.

Death Notifications – 50.030

NOTES:

A. Once the person is declared dead, your jurisdiction ends. Even law enforcement is not allowed to touch or move the body. Only the ME, Deputy ME (also referred to as a Medicolegal Death Investigator), or District Attorney, has lawful authority over the body. Any of these individuals can grant access or removal of the body.
B. Not all deaths are under the jurisdiction of the ME (e.g. patient on hospice care longer than 24 hours, patient who dies in a skilled nursing facility). However, EMS calls should be considered an ME case and reported to the ME. It is best to let the ME decide if this is their case or not.
C. Your chart may be read by the ME's office and if read, will become part of the report for cause and manner of death.
D. In smaller counties and jurisdictions, law enforcement officers may be appointed as Deputy ME's or medicolegal Death Investigators, who under the direction of the ME's office, can investigate deaths and authorize the removal of a body of a deceased person from the apparent place of death.
E. The following information should be available, if possible, prior to contacting the ME. The ME may not ask for all this information but be ready with this information.

• Your name	• Any evidence of drug use
• Unit number	• Name of deceased
• What you were dispatched on	• Address of deceased
• How you found the patient	• Age of deceased
• Brief description of your actions	• Gender of deceased
• Whether you suspect foul play	• Medical history
• Whether death occurred at work	• Medications
• Whether death occurred while in custody	• Primary caregiver and phone number
• Whether death was the result of a crime	• Family contact
• Whether death was unattended	• Funeral home
• Whether cause of death might be from a contagious disease	

Documentation – 50.040

PROCEDURE:

A. A patient care report shall be generated for each identified patient and shall be completed on an approved State EMS patient care form.
B. Documentation shall include, at least:
    1. The patient's presenting problem.
    2. Vital signs with times.
    3. History and physical findings as directed by individual protocols.
    4. Treatment(s) provided, and time(s).
    5. If monitored, ECG and 12-lead ECG interpretation.
    6. Any change in the condition of the patient.
    7. OLMC contact:
        a. Include physician name
        b. Time of contact
        c. Orders received from physician
C. An electronic Prehospital Care Report must be submitted to a hospital or facility receiving the patient with 24 hours of the patient being transported per ORS 333-250-0310.
D. If a patient refuses treatment and/or transport, refer to Refusal and Informed Consent protocol.

Hand-Off Reports – 50.050

PURPOSE:
The transfer of care is an activity that has the potential for medical error. Patient hand-off reports between either EMS personnel on scene or between EMS personnel and hospital staff during transfer of care, needs to be delivered in a consistent and clear format to ensure accuracy and completeness of information. As many agencies are transitioning to paperless in-field reporting, the passage of detailed information from one agency to another or to the hospital becomes critically important.

PROCEDURE:
The following "DMIST" format is a guideline for both oral and/or written communications when passing information from one agency to the next as well as for reports to receiving facilities. It is understood that not all information may be available at the time of the handoff.

DEMOGRAPHICS:
- Name
- Legal name (If Different)
- Code status/POLST
- Age, DOB, phone number
- Weight in Lbs./Kg

MEDICAL COMPLAINT/MECHANISM OF INJURY:
- Chief complaint/OPQRST
- Background/time of Injury

ILLNESS/INJURY:
- ECG
- Stroke assessment (BEFAST, C-STAT), Last Known Well
- PMHX
- Medications
- Allergies

SIGNS:
- GCS/LOC
- Lowest and last blood pressure
- SpO_2
- CBG
- $EtCO_2$
- Temperature

TREATMENT:
- IV site and size
- Medications and response to treatments

Hazardous Materials Response – 50.060

PURPOSE:
Non-hazardous materials trained EMS personnel may be first on the scene of a hazardous materials situation because of shorter response times or no knowledge of dispatch that hazardous materials are involved. This protocol is intended to guide personnel who do not normally function in hazardous materials scenes. If the scene you are responding to is a known or suspected (based on information from dispatch) hazardous materials situation, stage and wait for the hazardous materials personnel. When you have arrived at the scene and find out during scene assessment that hazardous materials are involved, stage and wait for the hazardous materials personnel. All scenes (MVA, Industrial, etc.) should be considered as being a potential hazardous materials situation. The following approach procedure should be used:

PROCEDURE:

A. Approach
   1. All scenes:
      a. Be cautious all times.
      b. The reported location may be inaccurate, response into a contaminated area might occur.
      c. Approach upwind and upgrade if possible.
      d. Position vehicle well away from the incident.
      e. Communicate your actions to the 9-1-1 Center.
      f. Remember: Contaminated and/or exposed response personnel may add to the overall problem and reduce their effectiveness to help.

   2. If at any time you suspect a hazardous materials situation:
      a. Confirm that fire and police have been notified. The agency responsible for hazardous materials response may respond with different levels of personnel and equipment based upon the information received. Do not always expect a hazardous materials team to respond.
      b. If you are a first-in responder, the first priority is scene isolation.
      c. If you believe that you or your vehicle is contaminated, stage in an isolated area. KEEP OTHERS AWAY! KEEP UNNECESSARY EQUIPMENT FROM BECOMING CONTAMINATED.

B. Person in Charge
   1. If a “non-hazardous materials trained” paramedic is the first medical person on the scene, he/she should assume the role of PIC (medically) until a "hazardous materials trained paramedic" (HMP) arrives. If possible, the Incident Command Structure should be implemented.
   2. The HMP will direct all care.
   3. The HMP will determine the method of transport of the exposed patient (air vs. ground).
   4. The HMP will determine who will provide care during transport (HMP may remain in that position during transport).

C. Patient Care for the Contaminated Patient
   1. Types of incidents which may require decontamination of the patient:
      a. Radiation
      b. Biological hazards
      c. Chemical
      d. Toxic substances
   2. Contamination can occur though:
      a. Smoke
      b. Vapor
      c. Direct contact
      d. Run-off
   3. Determine the hazardous substance involved and provide treatment as directed by HMP. In the absence of an HMP, consult Poison Control through OLMC.
   4. The hazardous materials team must be contacted about removal of contaminated clothing and packaging of the patient with regard to your protection and the patient's.

D. Ambulance Preparation
   1. The HMP shall determine the process needed for ambulance preparation.
   2. Remove any supplies and equipment that will be needed for patient care.
   3. Seal cabinets and drape interior, including floor and squad bench, with plastic (available from hazardous materials team).

E. Transport and Arrival at the Hospital (if requested by HMP)
   1. If an ambulance has transported a patient from an incident that is subsequently determined to involve hazardous materials exposure, scene personnel must immediately relay all relevant information to the transporting unit(s) and/or receiving facility(s) involved (via EMS dispatch or OLMC).
   2. OLMC and the receiving hospital should be contacted as soon as possible. The EMS providers should communicate the material involved, degree of exposure, decontamination procedures used, and patient condition.
   3. The ambulance should park in an area away from the emergency room or go directly to a decontamination center or area.
   4. Patient(s) should not be brought into the emergency department before the EMS providers receive permission from the hospital staff.
   5. Once the patient(s) has been released to the hospital, follow the HMP's direction and if necessary double bag the plastic sheeting used to cover the gurney and the floor. Double bag any equipment, which is believed to have become contaminated.
   6. After unloading the patient from the ambulance, check with the HMP to see where the ambulance can be safely decontaminated and whether there is equipment available for this purpose. Do not begin decontamination without direction from the HMP. After consultation with the Hazardous Materials Team leader, the HMP may recommend that the ambulance be decontaminated.
   7. Following decontamination recommendations from the HMP, decontaminate the ambulance and personnel before returning to the incident scene. When returning to the incident scene, bring bags containing contaminated materials, equipment, clothing, etc., and turn them over to the HMP.

F. EMS Personnel Exposure

1. If an EMS provider is exposed or is concerned with the possibility of exposure, medical help should be sought immediately.
2. Report all exposures to the HMP, Poison Center, supervisor, and the on-call OHDP nurse.
3. Follow your agencies guidelines for Communicable Disease: Bloodborne/Airborne Pathogens), including appropriate Personnel Exposure Report.
4. Do not return to service until cleared to do so by the HMP or Poison Center.

FOR ADDITIONAL INFORMATION SEE THE HAZMAT PROTOCOL

Hospice and Palliative Care – 50.062

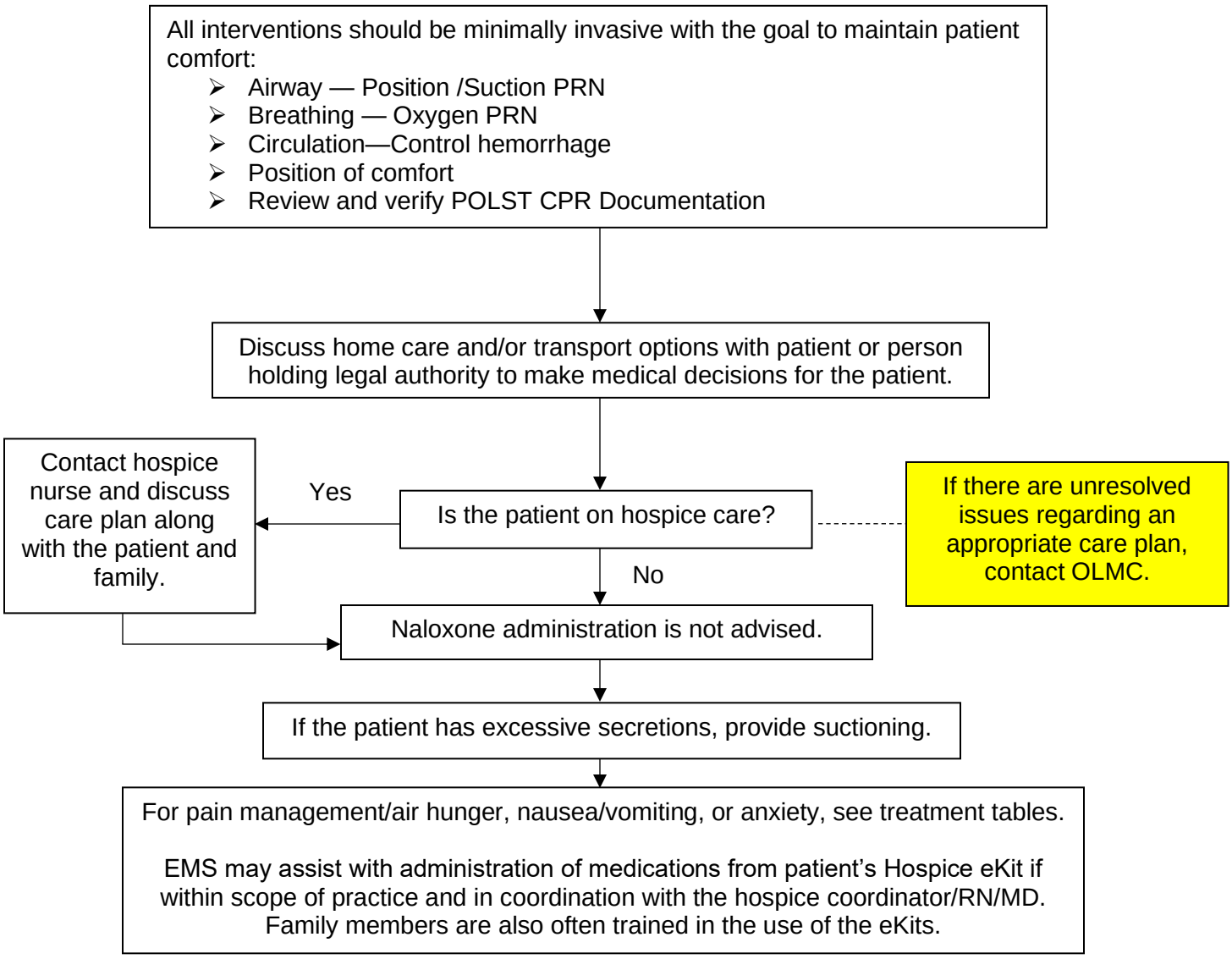
PURPOSE:
To provide guidance to the EMS provider in the care of a patient who has a life-limiting or terminal illness and prefers comfort-focused treatment.

INDICATIONS:
Patient has a life limiting or terminal illness, prefers comfort-focused treatment, and has one of the following:

A. POLST form specifying DNAR/DNR and comfort focused treatment and/or
B. Patient is enrolled in hospice care.

GOALS:

A. Reduce patient symptom distress.
B. Maintain patient dignity by aligning care with stated end-of-life preferences.
C. Affirm dying as a normal process.



Patients with decision making capacity: If the patient can communicate and has the capacity to make decisions regarding treatment and transport, consult directly with the patient before treatment or transport.

Patients without decision making capacity:
If the patient lacks the capacity to make decisions regarding treatment or transport, identify any advanced care planning in place for information relating to advanced care planning and consent for treatment, including:

- Advanced care directives
- POLST
- Guardian, healthcare power of attorney, or other accepted healthcare proxy

NOTES AND PRECAUTIONS:

A. Palliative care is specialized care for patients with a chronic and/or terminal illness which focuses on managing symptoms exacerbation and the stress of illness.
B. Hospice care is specialized care, like palliative care, for patients within the last 6 months of life.
C. Patients may not have a DNAR/DNR or POLST form completed and still be enrolled in hospice care.
D. Careful and thorough assessments should be performed to identify complaints not related to the illness for which the patient is receiving hospice or palliative care.
E. Treat dying persons with warmth and understanding. Do not avoid them. Allow them to discuss their situation, but do not push them to talk. Ask the person how you might help.
F. Many dying people are not upset by discussions of death as long as you do not take away all of their hope. Touching a dying person is important. Use words like “death”. Do not use meaningless synonyms. Give factual information.
G. Be aware of your own fears regarding death and admit when a dying person reminds you of a loved one. If a situation is too disturbing, have your partner or other members of the responding team take over.
H. Social interactions with the family may affect end-of-life care, including psychological and spiritual aspects of patient care.
I. Offer support system to help the family cope during the patient’s illness and in their own bereavement.
J. Care should be delivered with the utmost patience, kindness, and compassion.
K. PICC lines may be accessed for use by EMS with sterile techniques.
L. Emergency Kits (eKit) may be given to patients by hospice to use at home for acute symptom exacerbation. These eKits are individualized and will be different for each patient, but typically contain medications that can address pain, nausea/vomiting, anxiety, and/or secretions. Not every hospice service utilizes an eKit. Family members are frequently trained in the use of the eKit.
M. In collaboration with hospice or palliative care provider, coordinate with guardian, power of attorney, or other accepted healthcare proxy if non-transport is considered.
N. EMS providers cannot take medical orders from a hospice nurse, but their advice is often invaluable and may be followed with direction from OLMC. Providers can take orders from a hospice physician however, and this can include in the form of a written prescription which may be present in a patient’s eKit.

O. Consider OLMC if hospice or palliative care provider is not available or for on scene conflict.
P. After medication administration, if no transport occurs, care may be transferred to the hospice nurse or palliative care provider.

TREATMENT TABLES

Acute Pain/Air Hunger (uncomfortable feeling of breathing difficulty)

Severity*	Medications		
	Fentanyl (IV/IN)	Hydromorphone (IV/IM)	Morphine (IV/IM)
Mild	25 mcg	0.5 mg	2 mg
Moderate	50 mcg	1 mg	4 mg
Severe	100 mcg	2 mg	8 mg

*Consider using moderate/severe dose in opiate tolerant patients. Opiate tolerant patients have a typical daily dose of narcotic that is equivalent to ≥ 60 mg of oral morphine per day.

Anxiety/Agitation

Severity	Medications				
	Midazolam (IV/IM)	Lorazepam (IV/IM)	Droperidol (IV/IM)	Haloperidol (IV/IM)	Ziprasidone (IM)
Mild/Moderate	1 mg	0.5 mg	2.5 mg	2 mg	10 mg
Severe	2 mg	1.0 mg	5 mg	4 mg	20 mg

May repeat dose in 15 minutes for IV administration, or 30 minutes for IM injections.

Nausea/Vomiting:

Medications		
Ondansetron (PO)	Droperidol (IV/IM)	Haloperidol (IV/IM)
8 mg	0.625 mg	1.25 mg

Lift Assist – 50.065

PURPOSE:
Fire and EMS resources are frequently dispatched to provide lifting assistance. This assistance can vary but often involves an individual who has fallen or slipped and is now unable to get up or return to bed without assistance. In all calls from an individual or responsible party requesting lifting assistance, a medical evaluation must be completed looking for any injury, underlying medical process that contributed to this event, or for a deterioration in functional ability.

PROCEDURE:

A. Initial evaluation should begin by assessing for any suspected medical cause or inability to mobilize (e.g. dizziness, lightheadedness, syncope, new weakness or balance problem, dehydration/poor oral intake, visual disturbance, recent illness or infection, etc.).
B. Assess vital signs to include HR, RR, BP, SpO_2. In some instances, based on patient's past medical history or provider discretion, a temperature, $EtCO_2$, and blood glucose should also be checked.
C. Determine if any acute injury or medical condition exists.
D. Ascertain the duration of down time if found on the ground/floor. Consider hypothermia, compartment syndrome, or rhabdomyolysis.
E. Determine if patient is on any oral anticoagulants which may increase risk level for unrecognized bleeding and may prompt the provider to recommend transport.

NOTES:

A. Lift assist calls can be a sentinel event for someone that is developing a medical emergency or who has crossed the threshold from being able to live independently to someone who needs a little more help (assisted living, etc.).
B. Anyone with impaired mobility that requires assistance to mobilize necessitates an assessment of their health status before deciding that the patient does not require further medical assessment.
C. A PCR will be completed on all patient contacts in which a patient receives any assessment, assistance (i.e. lift assist), advice, or treatment by EMS. The PCR may be brief, but must include vital signs, any assessment/exam provided, and documentation of the lack of a medical complaint.
D. Those who decline transport should be evaluated for medical decision-making capacity and the informed refusal process should be followed. Advise patient that they may call 911 if they develop any symptoms.
E. If vitals are unable to be obtained, this must be documented on the PCR along with a reason.
F. EMS/Fire agencies may (and are encouraged to) develop their own, more expansive and detailed documentation policies specific to their own operations.

Multiple Toxic Exposure – 50.070

PURPOSE:

To provide guidelines for emergency response personnel on scenes that involve multiple victims who have been exposed to a hazardous material or hazardous environment. This procedure would be used when MSDS and DOT information indicate that victims **may** suffer untoward effects from their exposure and need **short-term, continuing medical assessment**. It would also apply when victims are symptomatic and have been exposed to a hazardous environment that poses little risk of long-term effects, such as discharge of tear gas. *This protocol is NOT intended for use when there are symptomatic patients and the substance they were exposed to is unknown or when there is a potential for serious or long-term medical consequences.*

PROCEDURE:

A. Triage determines that there are multiple victims who have been exposed to a hazardous material or environment, and that these victims are presently asymptomatic or have been exposed to an agent that has transient effects (e.g., tear gas).

B. Triage will assist the Hazardous Materials (trained) Paramedic/EMT (HMP) in coordinating removal of the victims from the potentially hazardous environment, then isolate the victims as best as possible in a safe, well lit, and climate-controlled environment (consider using a bus or a room in a nearby building). If clothing is contaminated, removal of contaminants and proper procedures will be employed prior to isolating victims.

C. Access to and egress from the Triage and Treatment Area must be strictly controlled at all times. It is necessary to keep track of patients who are under the care of EMS providers, especially when the patient is a minor and his/her parent(s) are present. Patients should not be allowed to leave the treatment or triage area without Triage or Treatment's knowledge. It is recommended that a guard be posted at the entrance and exit to control patient movement.

D. The HMP will attempt to determine the type and level of exposure. The HMP will then contact MRH with information on the type of chemical and level of exposure. MRH will consult with Poison Control to determine any symptoms that are to be expected, the approximate timeline for onset of symptoms, and recommended treatment modalities. When possible, a three-way phone link among the scene, MRH, and Poison Center should be arranged. The HMP will report this information to Triage and to Medical.

E. All potential patients entering the area will be triage tagged and baseline vitals will be obtained and recorded. It is recommended that Triage consult with Medical and assign one EMS provider for every 8 to 10 patients. If any exposure victim starts exhibiting symptoms, they will be immediately removed to the designated Treatment Area.

F. In consultation with MRH, Triage and HMP will make a determination regarding how long the victims will be observed and the frequency of evaluating and taking vital signs of each patient. A log will be maintained of all patients treated and released. This log will include the patient's name, DOB, the date, symptoms (if any), and disposition.
   1. If the patients are asymptomatic after the designated observation time, they may be released. The HMP or Triage will individually brief the patients regarding the symptoms they should watch for and should recommend further medical evaluation by their own physician. Minor patients should only be released to their parent or guardian.
   2. Triage or the HMP will inform Medical of the number of patients being released.

G. It is recommended that Medical proceed with initiating procedures normally undertaken during an MCI. Regional shall be notified that the all-call is precautionary.

Medical Control of Scene – 50.110

PURPOSE:
The purpose of this protocol is to describe who is in charge of patient care on the scene of medical emergencies and how to resolve disputes with other medical professionals in attendance. **This protocol does not apply to MCI/MPS events where ICS is established.**

PROCEDURE:
A. EMS Providers On-Scene: The first arriving, highest certified EMS provider will be the Person-In-Charge (PIC) and will assume responsibility for directing overall patient care. The team approach to patient care assessment and treatment should be utilized by the PIC.
B. When a higher-level EMS provider arrives, in an EMS role, that individual shall assume the role of PIC, after receiving verbal report from the initial PIC.
C. The responsibilities of the PIC directing overall patient care include:
    1. Assuring that treatment, operations, and communications follow protocols.
    2. Coordinating patient care activities. This PIC must watch over the entire patient care scene activities and be sure that the patient care activities are being accomplished in a rapid, efficient, and appropriate manner.
    3. Directing other EMS providers to establish airway management, start IVs, etc.
    4. Establishing the appropriate time to be spent at the scene for doing patient care.
    5. Determining when transportation of the patient is to occur.
    6. Performing medical coordination with all agencies and personnel.
D. The PIC directing overall patient care will be held responsible and accountable for patient care activities performed at the scene and be identified on all patient care reports.
E. If a patient requires transport and the first arriving PIC is from a non-transporting agency, provision of patient care will be turned over to the transporting Paramedic or flight personnel when:
    1. The patient is placed on the transport unit's gurney, **OR**
    2. At a time agreed upon by both EMS providers, continued patient care will then become the responsibility of the transporting unit. There will be a verbal agreement any time transfer of care from one EMS provider to another takes place.

Paramedic Direction On Scene:
EMS providers take medical direction from:
- Physician Supervisors.
- Regional Protocols.
- On-Line Medical Consult (OLMC) as directed in protocols.

Physician On Scene Policy, (within office):
A. When EMS is called to a physician's office, the EMS providers should receive information from the physician and attempt to provide the service requested by the physician.
B. While in the physician's office, the physician shall remain in charge of the patient. The EMS providers may follow the direction of the physician if it is within the Scope of Practice and protocols of the PIC. Anytime there is a conflict between a physician's orders and the protocols, OLMC shall be contacted.

C. Once the patient is in the ambulance, unless the physician accompanies the patient, paramedics shall follow the protocols.

Physician On-Scene Policy, (outside office):

A. Any physician (MD or DO) at the scene of an emergency may be qualified to provide assistance to EMS providers and shall be treated with professional courtesy.
B. A licensed physician requesting control of patient care at the scene shall be:
    1. Thanked for the offer by the PIC.
    2. Advised that the EMS providers work under regional protocols and On-Line Medical Consult.
    3. Advised that we are not permitted to relinquish medical control to a physician on the scene without agreement from On-Line Medical Consult.
C. If the physician requesting control is not the patient's "physician of record", EMS providers shall be authorized to proceed under the direction of the physician ONLY IF ALL THREE OF THE FOLLOWING PROVISIONS ARE MET:
    1. OLMC is contacted and authorizes transfer of patient care.
    2. The physician agrees to accompany the patient to the hospital in the ambulance.
    3. The physician agrees to complete and sign the appropriate patient care report.
D. If communication with OLMC cannot be established, care may be provided only according to approved ALS protocols. No direction from an on-scene physician may be accepted.

Disputes On-Scene Between EMS providers or Other Medical Professionals:

A. Disagreements about care should be handled in a professional manner and shall not detract from patient care.
B. To the extent possible, the ALS and BLS protocols shall be followed and provide the basis for resolving disputes.
C. If an unresolved dispute continues between EMS providers or other medical professionals concerning the care of a patient, **OLMC shall be contacted**.
D. If a dispute arises which results in transfer of patient care from one PIC to another, the approximate time of the transfer shall be included on the patient care report.
E. DISPUTES SHALL NOT APPEAR ON PATIENT CARE REPORTS. Written "Unusual Event Forms", or similar form should be completed pursuant to any dispute arising at the scene.

On-Line Medical Consult – 50.115

PURPOSE:

This protocol describes the steps an EMS provider should follow in contacting Medical Resource Hospital (MRH) and/or a receiving hospital for On-Line Medical Consult (OLMC) and describes the contents of the various reports.

PROCEDURE:

A. Calls to MRH or the Receiving Hospital: EMS Providers shall contact MRH or the Receiving Hospital by radio or telephone in the following situations:

1. As required by the protocols.
2. As required in approved studies.
3. As required for trauma services.
4. When On-Line Medical Consult (OLMC) is needed.

B. All scenes involving OLMC contact:

1. One person at the scene must be designated as the contact person in charge of communications. The EMS provider designated as "in charge" of communications shall contact MRH or the Receiving Hospital by the time transport has begun, including all air ambulance transports.
2. For OLMC, MRH shall be contacted if a patient's destination is in Multnomah, Clackamas or Washington County. If an MRH physician cannot be contacted, contact the Receiving Hospital.
3. The receiving hospital should be contacted to provide patient status updates during transport for all patients except Trauma System entries.
4. If BLS responders have initiated OLMC communications, ALS responders shall continue to use that medical direction source.

C. When requesting OLMC, the following information must be relayed:

1. Unit number, identity and certification level of person making contact
2. Location of the call, street address if appropriate
3. Purpose of call (Identify the protocol being followed)
4. Age and sex of patient
5. Patient's chief complaint
6. Brief history, prior medical history, medications, and allergies
7. Vital signs
8. Pertinent physical findings
9. Treatment at scene
10. Destination hospital and ETA, including loading time

D. When contacting the TCC for trauma system patients, the following information must be relayed:

1. Unit number, identity, and certification level of person making contact
2. Location of the incident, street address if appropriate
3. Number of patients. Follow ***Multi- Casualty Incident*** protocol, if applicable
4. Age and sex of the patients
5. Trauma System entry criteria (<u>be as specific as possible</u>)
6. Trauma Band number(s)
7. Patient's vital signs. Specify if not taken or not present

8. Approximate ETA of patient(s) to Trauma Center; include loading time if appropriate
9. Unit number and mode of transport
10. Patient destination based on incident location or request

Refusal and Informed Consent – 50.117

PURPOSE:

- To establish the process of obtaining informed consent.
- To define which persons may be left at the scene because they are not considered in need of EMS.
- To describe the process of obtaining and documenting patient refusal.

PROCEDURE: (Refer to Refusal Flow sheet)

A. **Identified Patient:** Determine if there is an "Identified Patient":

Any individual meeting the following criteria is considered a patient:

- Has a complaint suggestive of potential illness or injury.
- Person is evaluated for potential illness or injury.
- Has obvious evidence of illness or injury.
- Has experienced an acute event that could reasonably lead to illness or injury.
- Is in a circumstance or situation that could reasonably lead to illness or injury (including behavior problems).
- Person is less than 18 years of age.

B. **Decision Making Capacity:** Consider conditions that may be complicating the patient's ability to make **an informed** decision:

- Orientation to person, place, time, or event that differs from baseline.
- Head injury.
- Drug or alcohol intoxication.
- Mental health issues.
- Language barriers (consider translator or ATT language line through dispatch).
- High risk medical conditions.

C. Identified Patient **WITH** decision making capacity who refuses **needed** treatment and/or transport:

1. Explain the risks and possible consequences of refusing care and/or transport.
2. If a high-risk medical condition exists, consider contacting OLMC for physician assistance.
3. Enlist family, friends, or law enforcement to help convince patient.
4. If patient continues to refuse, complete the Patient Refusal Information Form and have them sign it. Give the top copy to the patient with self-care instructions.

D. Identified Patient **WITH IMPAIRED** decision-making capacity:

1. Treat and transport any person who is incapacitated and has a medical need.
2. Patients with impaired decision-making capacity should **NOT** sign a release form.
3. With any medical need, make all reasonable efforts to assure that the patient receives medical care. Attempt to contact family, friends, or law enforcement to help.
4. If deemed necessary, consult with OLMC and consider pharmacological sedation or physical restraint per Agitated Patient protocol.

E. Consent and refusal guidelines for **minors** (reflecting Oregon Revised Statutes):
   1. A child under the age of 10 cannot be left alone even if he or she is not a patient. If no responsible adult is present and the child is not a patient, contact law enforcement.
   2. Minors who are ages 15 or older and less than 18 years can consent to treatment.
   3. If a minor age 15 or older and less than 18 years is refusing treatment/transport contact OLMC.
   4. If a minor age 15 or older and less than 18 years is not transported, attempt to contact parents to inform them of the EMS call.

F. **High risk medical conditions where OLMC contact should be considered**:
EMS providers are encouraged to contact OLMC for the following refusal situations:
- Suspected impaired decision-making capacity.
- Suspected high risk medical condition such as:
  - Age younger than 3 months.
  - Minor (age 17 or younger) without a patient or guardian who is refusing care.
  - Serious chief complaint (including but not limited to, chest pain/dysrhythmia, shortness of breath, BRUE, stroke-like symptoms, syncope, first time seizures, poison/overdose, suspected sepsis, or suspected cervical spine injury).
  - Significant MOI or suspicion of injury.
  - You believe a patient requires evaluation.
  - Conflict on scene regarding refusal of care.
  - Suspected abuse situation involving a minor, elderly, or a person with a disability.
  - Any unconscious or altered mental status (individual or parent/guardian for a minor).
  - Sustained abnormal vital signs:
    - Systolic BP less than 90
    - Respirations greater than 29 or less than 10
    - $SpO_2 \leq 90\%$
    - $EtCO_2$ less than 25 mmHg or greater than 60 mmHg

DOCUMENTATION:

All instances of an identified patient, with or without impaired decision-making capacity, must be fully documented on a Patient Care Form. A signed refusal form must be obtained on all patients with decision making capacity who are refusing care and/or transport against medical advice. The following is considered minimum documentation criteria:

- General appearance and level of consciousness (mental status).
- History, vital signs, and physical exam.
- Presence of any intoxicants.
- Assessment of the person's decision-making capacity.

- Risks explained to patient.
- Communication with family, friends, police, and/or OLMC.

GUIDELINES & DEFINITIONS:

A. Decision Making Capacity: The ability to make an informed decision about the need for medical care based on:
   - Accurate information given the patient regarding potential risks associated with refusing treatment and/or transport.
   - The persons perceived ability to understand and verbalize these risks.
   - The person's ability to make a decision that is consistent with his/her beliefs and life goals.

B. Impaired Decision-Making Capacity: The inability to understand the nature of the illness or injuries, or the risks and consequences of refusing care.

C. Emergency Rule: EMS providers may treat and/or transport under the doctrine of implied consent a person who requires immediate care to save a life or prevent further injury. Minors may be treated and transported without parental consent if a good faith effort has been made to contact the parents or guardians regarding care and transport to a hospital, and the patient, in the opinion of EMS provider, needs transport to a hospital. When in doubt, contact OLMC.

Refusal and Informed Consent – 50.117

ASSESS PATIENT'S MEDICAL NEED

IS THIS AN IDENTIFIED PATIENT? **(Any individual meeting the following criteria is considered a patient)**

- Has a complaint suggestive of potential illness or injury
- Person is evaluated for potential illness or injury
- Has obvious evidence of illness or injury
- Has experienced an acute event that could reasonably lead to illness or injury
- Is in a circumstance or situation that could reasonably lead to illness or injury
- Person is less than 18 years of age

NO IDENTIFIED PATIENT

ACTION

- No Information Form required

IDENTIFIED PATIENT

ASSESS ABILITY TO MAKE DECISIONS

Consider:

- Orientation to person, place, time, or event that differs from baseline
- Head injury
- Drug or alcohol intoxication
- Mental health issues
- Language barriers
- High risk medical conditions

ABLE TO MAKE DECISIONS

Ambulance transport advised but patient refuses.

-ACTION-

- **Explain risks of refusal.**
- If serious medical need exists, contact OLMC.
- Enlist family, friends, police, etc. to help convince patient.
- Complete Information Form, obtain patient signature, & give them the top copy.
- Follow *Documentation* protocol.

ABLE TO MAKE DECISIONS

With no apparent need for ambulance transport.

-ACTION-

- **PIC must agree with patient's course of action.**
- Fully document physical findings.
- Fully document advice given to patient.
- Follow *Documentation* protocol.

UNABLE TO MAKE DECISIONS

(Impaired Capacity)

-ACTION-

- Treat & transport if medical emergency exists. Use *Agitated Patient* protocol if needed.
- Make all reasonable efforts to assure patient gets medical care.
- **Consult OLMC.**
- **DO NOT have patient sign an Information Form.**

MINIMUM DOCUMENTATION

For <u>ALL</u> Identified Patients

- General appearance & level of consciousness.
- History, vital signs, & physical exam.
- Presence of any intoxicants.
- Assessment of patient's decision-making capacity.
- Any risks that were explained to the patient.
- Communications with family, police, and/or OLMC.

OLMC CONTACT ENCOURAGED

- Impaired decision-making capacity, AMS, or unconscious.
- Age < 3 months or Minor without guardian refusing care.
- Serious chief complaint (e.g. chest pain, SOB, first time seizures, suspected sepsis, BRUE, stroke like symptoms, syncope, poisoning/overdose, suspected cervical spine injury).
- Suspected abuse – child, elderly or disabled person.
- Scene conflict regarding medical care.
- Sustained abnormal vital signs/significant MOI/suspicion of injury

Rehabilitation – 50.119

PURPOSE:
To establish guidelines for the evaluation and treatment of personnel in the Rehabilitation Group (Rehab).

PROCEDURE:

A. Personnel in Rehab will undergo an initial medical evaluation that will consist of a physical assessment including mental status and vital signs (blood pressure, pulse and temperature, pulse ox and CO monitoring [if available]). All medical evaluations will be recorded on the Medical Evaluation Form.

B. Medical treatment or a resting period will be determined according to the following triage criteria based on entry findings:

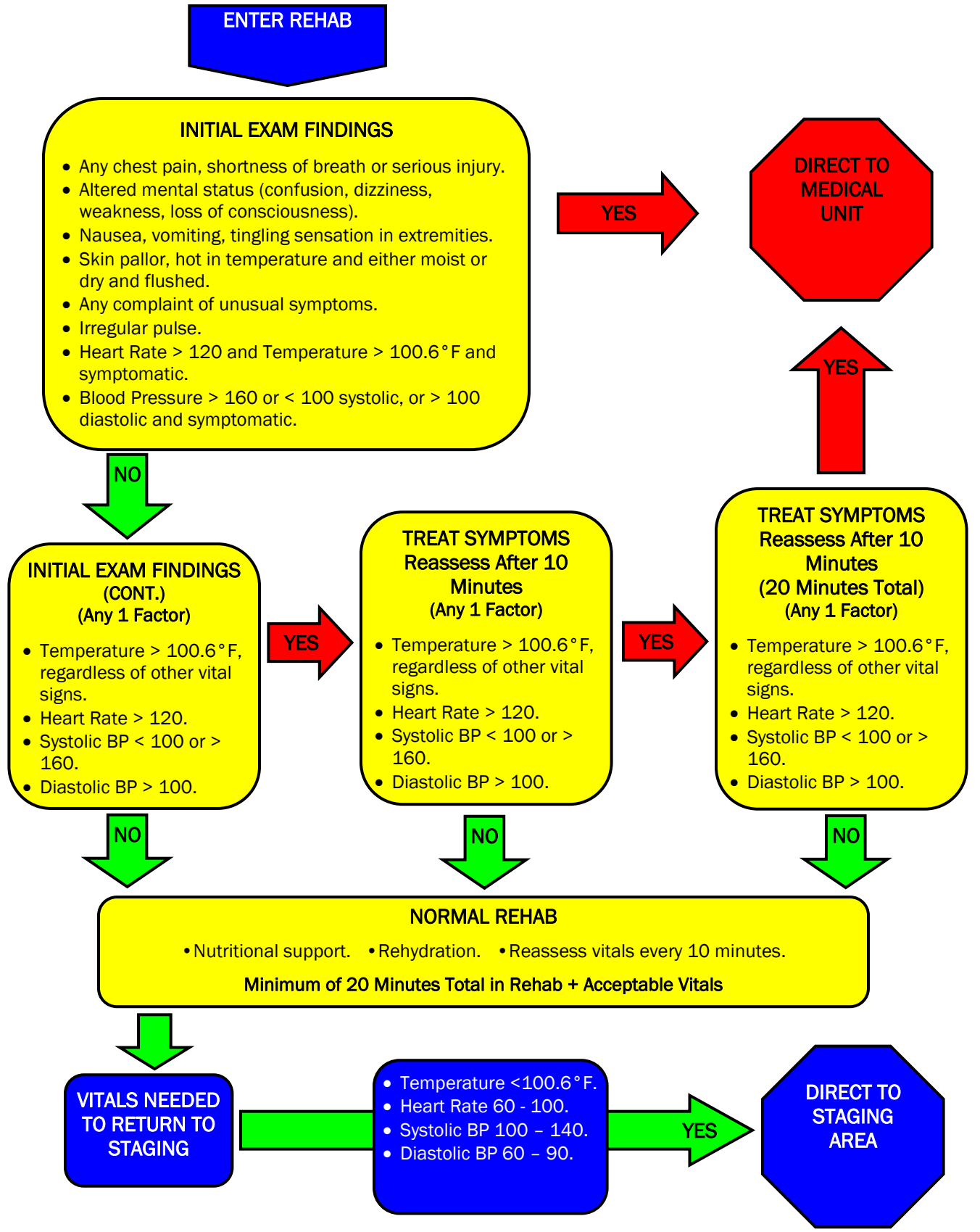
1. Findings mandating that the individual be transferred to the Medical Unit:
    a. Any chest pain, shortness of breath, or serious injury.
    b. Altered mental status (confusion, dizziness, weakness, loss of consciousness).
    c. Nausea, vomiting, or tingling sensation in extremities.
    d. Skin pallor, hot in temperature and either moist or dry and flushed.
    e. Any complaint of unusual symptoms.
    f. Irregular pulse.
    g. Heart Rate > 120 and Temperature > 100.6°F and symptomatic.
    h. Blood Pressure > 160 or < 100 systolic, or > 100 diastolic and symptomatic.

2. If initial exam findings include any of the following, the individual will require reassessment within 10 minutes:
    a. Temperature > 100.6°F, regardless of other vital signs.
    b. Heart Rate > 120.
    c. Systolic BP < 100 or > 160.
    d. Diastolic BP > 100.

3. If reassessment exam findings include any of the following, the individual will require an additional reassessment in 10 minutes:
    a. Temperature > 100.6°F, regardless of other vitals.
    b. Heart Rate > 120.
    c. Systolic BP < 100 or > 160.
    d. Diastolic BP > 100.

4. If, after an additional 10 minutes (20 minutes total in Rehab), reassessment exam findings include any of the following, the individual will be sent to the Medical Unit for further evaluation and/or treatment:
    a. Temperature > 100.6°F, regardless of other vitals.
    b. Heart Rate > 120.
    c. Systolic BP < 100 or > 160.
    d. Diastolic BP > 100.

5. Exam findings allowing an individual to enter Staging for reassignment include:
    a. Temperature < 100.6°F.
    b. Heart Rate 60 - 100.
    c. Systolic BP 100 - 140.
    d. Diastolic BP 60 - 90.


ENTER REHAB
INITIAL EXAM FINDINGS
• Any chest pain, shortness of breath or serious injury.
• Altered mental status (confusion, dizziness, weakness, loss of consciousness).
• Nausea, vomiting, tingling sensation in extremities.
• Skin pallor, hot in temperature and either moist or dry and flushed.
• Any complaint of unusual symptoms.
• Irregular pulse.
• Heart Rate > 120 and Temperature > 100.6°F and symptomatic.
• Blood Pressure > 160 or < 100 systolic, or > 100 diastolic and symptomatic.
YES
DIRECT TO MEDICAL UNIT
NO
INITIAL EXAM FINDINGS (CONT.)
(Any 1 Factor)
• Temperature > 100.6°F, regardless of other vital signs.
• Heart Rate > 120.
• Systolic BP < 100 or > 160.
• Diastolic BP > 100.
YES
TREAT SYMPTOMS
Reassess After 10 Minutes
(Any 1 Factor)
• Temperature > 100.6°F, regardless of other vital signs.
• Heart Rate > 120.
• Systolic BP < 100 or > 160.
• Diastolic BP > 100.
YES
YES
TREAT SYMPTOMS
Reassess After 10 Minutes
(20 Minutes Total)
(Any 1 Factor)
• Temperature > 100.6°F, regardless of other vital signs.
• Heart Rate > 120.
• Systolic BP < 100 or > 160.
• Diastolic BP > 100.
NO
NO
NO
NORMAL REHAB
• Nutritional support. • Rehydration. • Reassess vitals every 10 minutes.
Minimum of 20 Minutes Total in Rehab + Acceptable Vitals
VITALS NEEDED TO RETURN TO STAGING
• Temperature <100.6°F.
• Heart Rate 60 - 100.
• Systolic BP 100 – 140.
• Diastolic BP 60 – 90.
YES
DIRECT TO STAGING AREA

Emergency Incident Medical Evaluation Form (CONFIDENTIAL) Forward to:

Incident #: ____________ Location: ____________ Date: ____________

Name	Unit	Time In/Out	# SCBA Cylinders	Exam Period	BP Sys	BP Dia	Pulse	Temp	Pulse Ox	Co	Notes
					If sys>160 or < 100	or Dia>100 (1)	if >120 (2)	if >100.6 (2)	<95 (3)	>0 (3)	
				INITIAL							
				10 Min							
				20 Min							
				INITIAL							
				10 Min							
				20 Min							
				INITIAL							
				10 Min							
				20 Min							
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				20 Min							
				INITIAL							
				10 Min							
				20 Min							
				INITIAL							
				10 Min							
				20 Min							

Individuals with any of the following symptoms should have aggressive treatment and may be sent to the Medical Unit:
Chest pain, weakness, dizziness, altered mental status, disorientation, headache, nausea, vomiting, muscle cramps, exhaustion, fainting, moist, pale or cool skin, abdominal cramps.

(1) Reassess in 10 minutes
(2) Hold 20 minutes; if unresolved after 20 min, send to Medical Unit
(3) Refer to Carbon Monoxide Exposure Protocol

Trauma System

GUIDELINES FOR FIELD TRIAGE OF INJURED PATIENTS:

RED CRITERIA
High Risk for Serious Injury

Injury Patterns

- 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 (humerus or femur)
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist or ankle
- Active bleeding requiring a tourniquet or wound packing with continuous pressure

Mental Status & Vital Signs

All Patients

- 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%

Age 0 - 9 years

- SBP < 70 mmHg + (2 x age in years)

Age 10 - 64 years

- SBP < 90 mmHg **OR**
- HR > SBP

Age ≥ 65 years

- SBP < 110 mmHg **OR**
- HR > SBP

Patients meeting any of the above RED criteria should be transported to the highest-level trauma center available.

YELLOW CRITERIA
Moderate Risk for Serious Injury

Mechanism of Injury

- High-Risk Auto Crash
  - Partial or complete ejection
  - Significant intrusion (including roof)
    - > 12 inches occupant site **OR**
    - > 18 inches any site **OR**
    - Need for extrication for entrapped patient
  - Death in passenger compartment
  - Child (age 0 - 9 years) unrestrained or in unsecured child safety seat
  - Vehicle telemetry data consistent with severe injury
- Rider separated from transport vehicle with significant impact (e.g., motorcycle, ATV, horse, etc.)
- Pedestrian/bicycle rider thrown, run over, or with significant impact
- Fall from height > 10 feet (all ages)

EMS Judgement

Consider risk factors, including:

- 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

If concerned, take to a trauma center

Patients meeting any of the above YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be transported to a trauma center (depending on Emergency Medical Services Advisory Board (EMSAB) plan, need not be the highest-level trauma center). Consider burn and pediatric capabilities as appropriate.

A. MEDICAL DIRECTION:

1. Off-line medical direction for trauma patients is controlled by the Treatment Protocols.
2. On-Line Medical Consult (OLMC) is controlled by the TCC and its protocols.
3. OLMC does override off-line medical direction. Any instances where this occurs will be reported to the EMS Office.

B. COMMUNICATIONS:

1. Communications from the EMS Clinician at the scene to the TCC:

   a. It is essential that early communications be established with the TCC concerning trauma patient(s).
   b. After assessing a trauma situation and making the determination that the patient should enter the Trauma System, the EMS Clinician who is designated will contact the TCC by 800 MHz (on the TRAUMA talkgroup); the HEAR System; or cellular phone at the earliest practical time.
   c. The EMS Clinician shall provide the TCC with the following information:
      - ✓ Unit number, identity, and certification level of person making contact.
      - ✓ Location of the incident, street address if appropriate.
      - ✓ Number of patients. Follow Multiple Casualty Incident protocol, if applicable.
      - ✓ Age and sex of the patient(s).
      - ✓ Trauma System entry criteria (be as specific as possible).
      - ✓ Trauma Band number(s).
      - ✓ Patient(s) vital signs, specify if not taken or not present.
      - ✓ Approximate ETA of patient(s) to Trauma Center; include loading time if appropriate.
      - ✓ Patient destination based on incident location or request.

2. Communications from the TCC or from OLMC to EMS Clinicians in the field:

   a. The TCC will inform the EMS clinician if more information is needed by the receiving trauma center.
   b. The TCC will inform the EMS Clinician if the destination trauma center is unable to receive the patient and will assist in designating an alternate destination.
   c. In the event that there are multiple Trauma System entries, TCC will assist the EMS clinician at the scene in determining the destinations of all patients.
   d. If the EMS Clinician contacting the TCC needs OLMC regarding care of the trauma patient, a physician at the TCC will offer direction using the EMSAB approved Trauma protocol as a guide.

3. Level-I trauma centers will be notified immediately by the TCC when a trauma patient has been identified and is bound for their facility.

   a. Level-I trauma centers are encouraged to monitor the (Portland) 800 MHz Trauma talkgroup to ensure early notification when ambulances have short transport times.

b. At No Time will the Level-I facility transmit on the Trauma talkgroup.
c. If more information is needed, communications shall be directed through the TCC.

4. Level-I trauma centers are responsible for notifying the TCC if they are unable to accept a trauma patient directed to their facility because of unexpected or expected patient arrivals or multiple patient scenes. Level-I trauma centers should be prepared to make this notification immediately in order to facilitate the re-direct of ground or air ambulances.

5. Communications from the TCC, or from OLMC to the receiving trauma center:
   - ✓ Estimated time of arrival at the trauma center
   - ✓ Location of the incident.
   - ✓ Number of patients in route to the trauma center
   - ✓ Age and sex.
   - ✓ Trauma System entry criteria (also a brief description of each patient(s) condition).
   - ✓ Trauma Band number(s).
   - ✓ Patient vital signs, specify if not taken or not present.
   - ✓ Any other pertinent information received from the scene.

C. TRAUMA CENTER DESTINATION:

1. All Trauma System entry patients should be transported to a Level-I trauma center unless advised by OLMC or under the following circumstances:

   a. If unable to establish and maintain an airway, the nearest hospital is appropriate to obtain definitive airway control.
      i. In this event, the TCC shall be contacted by the EMS Clinicians.
      ii. The TCC will contact the receiving facility with patient information and ETA.
   b. A Level-III hospital is appropriate if the expected scene and transport time to a Level-I facility is greater than 30 minutes and the Level-III hospital is closer.
   c. A Level-IV hospital is appropriate for immediate evaluation and stabilization if the expected scene and transport time to a Level-I, -II, -III is greater than 30 minutes and the Level-IV hospital is closer.

2. The designated trauma center destination from the scene, if by ground ambulance, is to be determined based on the following criteria.

Legacy Emanuel Hospital Service Area: Patient origin on or north of: Tualatin Valley Highway beginning at the West city limits of Hillsboro, to Canyon Road, Canyon Road to Highway 26, to I-405, I-405 to NW Lovejoy, NW Lovejoy across the Broadway Bridge to the East bank of the Willamette, and South on the riverbank to Burnside. From this point, all patients North of, but not on the following line are to be transported to Emanuel: East on Burnside to NE Sandy Blvd, Sandy to NE Glisan at its intersection with 21st, and then East on Glisan St. to 242nd Ave in Gresham.

Oregon Health & Science University Hospital Service Area: Patient origin on or South of Glisan St. beginning at 242nd Street in Gresham, West on Glisan St. to Sandy Blvd at its intersection with 21st, Sandy Blvd. to E. Burnside, then West on Burnside to the East Bank of the Willamette, and North along the riverbank to the Broadway Bridge. From this point, all patients South of but not on the following line will be transported to University: West on the Broadway Bridge to Lovejoy, to I-405, to Highway 26 and then South of but not including Highway 26, to Canyon Road, to Tualatin Valley Highway to the west city limits of Hillsboro.

3. Patient or Guardian request: If the alert, unimpaired patient, or his/her unimpaired guardian, demands transport to a specific hospital, the EMS Clinician must honor that request and notify the TCC immediately. Any deviation from this transport protocol must be fully documented.

4. Outside of Catchment Area: If the Trauma System patient is being transported from a scene outside of the service areas described above, the patient destination is to be the Level-I trauma center in whose service area the main thoroughfare used by the ambulance to enter Portland is located.

5. Multiple Patients: In the event that multiple patients are to be transported from the same scene, all patient destinations are to be assigned to the above service areas, with the following exceptions:

    a. The designated trauma center advised the TCC that the facility cannot accept and care for additional patients. The TCC will assist the EMS Clinicians in determining patient destinations.
    b. If there are more than two unstable trauma patients ready to be transported from the same scene, the first two will go to the Level-I facility designated by the above service area, and TCC will direct the next patients to the other Level-I hospital.

6. If the patient is transported from the scene by helicopter ambulance, the destination will be determined by the flight crew using the following criteria:

    a. Regardless of patient origin, the patient destination is, generally, to be alternated between the designated Level-I trauma centers.
    b. If two patients are transported in the same flight, they will both be brought to the same Level-I trauma center (based on rotation).
    c. In the event that the designated Level-I trauma center, which is to be the patient destination, is unable to accept the patient(s), the TCC will assist the flight crew in determining patient destination.

D. **MODE OF TRANSPORT:**

1. Helicopter ambulance services should be used if it has the potential to save 10 minutes in the patient's prehospital time. This is usually achieved whenever the ground transport time will exceed 25 minutes (scene is > 15 miles from Portland, or other circumstances exist). This information is not intended to define an area in which a helicopter may not be used since there are exceptions based on major arterial routes, time of day, weather, and other factors especially close to the lines. Judgement should be used, based on specific scene circumstances.

    a. Inner "Limited Use" Zone: [up to 15 nautical miles].
    Possible exceptions which might warrant use of the helicopter:
        i. Multiple patient incident.
        ii. Extended extrication, resulting in extended scene times.
        iii. Traffic impediments, such as snowy or icy roads, commuter traffic congestion, and obstructed scene.
        iv. High system demands.
        v. Difficulty for ground ambulance access to the scene.
    b. Outer Zone: [over 15 nautical miles].
    Special considerations:
        i. Inclement weather that may prevent flight, (snow, ice, fog, etc.).
        ii. Helicopter may be unavailable.
        iii. Consider Landing Zone proximity to the scene and consideration of an intermediate rendezvous point between the scene and hospital.
        iv. On main arterial roads, consider possibility that the helicopter may not be able to save time.
        v. It may be appropriate to activate the helicopter and to cancel if the patient is packaged, the ambulance is ready to transport, and the helicopter is not on scene.
        vi. The helicopter may have multiple, simultaneous calls for service and may need to triage use.

2. Dispatch Procedures:

    a. Standby or activation of helicopter ambulance services will be requested through "Dispatch."
    b. Any person who has had first aid or medical training may put helicopter ambulance services on standby.
    c. Only emergency responders may activate helicopter ambulance services, requesting the helicopter through EMS Dispatch.
    d. Units may cancel helicopter ambulance services if it is determined that they are not needed on scene.

E. **PATIENT EVALUATION PROTOCOL:**

Treatment priority should be approached in this order:

1. Control of hemorrhage
2. Airway (with control of the cervical spine). If unable to establish and maintain an adequate airway, the patient should be transported to the nearest acute care facility to obtain definitive airway control.
3. Breathing
4. Circulation
5. Disability assessment (GCS, pupil size and reactivity, motor function)
6. Exposure and temperature control
7. Detailed head to toe exam
8. Splinting of suspected fractures

F. **SCENE TIME:**

1. After gaining access to the patient, scene time should not exceed ten (10) minutes for any patient who is entered into the Trauma System.
2. Establish vascular access and initiate other care once in route to the trauma center.

Multi-Casualty Incidents

MCI General Guidelines – 65.100

The National Incident Management System (NIMS) will be used to manage all incidents.

1. Incident Command (IC) is the responsibility of the agency having jurisdiction (AHJ).
2. Each assisting agency shall retain full authority to operate within the scope of its agency operational and administrative protocols and procedures.
3. Agencies that are assisting in the support of a single jurisdiction will function under the direction of that jurisdiction's designated Unified Incident Command.
4. Incident Command of a multi-discipline event should be predicated on the "Primary Hazard" of the event.
5. In a Unified Command, the "Lead Agency" may change as priorities change.

The **Mass Casualty Incident Protocol** is a tool that may be used in part or whole as determined by the on-scene Incident Commander in situations where the number of patients exceeds the resources of the on-scene responders. There is no set number of patients that will automatically initiate this protocol. If the Incident commander determines that additional resources or incident structure is needed to better manage due to the complexity of the incident, he/she shall announce to dispatch that an MCI is being declared. This may be done upon arrival or at any time during the incident.

- If the incident involves multiple asymptomatic patients (HazMat exposure) set up secure evaluation area. See ***Multiple Toxic Exposure*** protocol.
- During a declared MCI, the Trauma System is not in effect.
- "Licensed ambulances" are not needed for transport.
- If transport resources are limited, more than one critical patient may be placed in an ambulance.

MCI Task Card - Medical

Reports to Incident Commander (or Operations in larger incidents)

OBJECTIVES:

1. **Coordinate all On-Scene EMS activity.**
2. **Coordinate Medical activities with Incident Commander (IC), and other ICS branches as needed.**
3. **Provide accountability for supervised personnel.**

ACTIONS:

☐ Establish Medical with Command.

☐ Obtain a separate working radio channel for use by Medical.

☐ Establish the following roles/functions and hand out vest, triage tags and task cards.

- ☐ **Triage**
- ☐ **Treatment**
- ☐ **Transportation**
- ☐ **Destination** (reports to Transportation)
- ☐ **Staging Area** (confirm area, and proper talk group)
- ☐ **An assistant to help you with radio and face-to-face communications.**
- ☐ **Landing Zone (LZ)**

☐ Order additional resources and ambulances through Incident Command.

☐ Establish accountability system for personnel working within Medical.

☐ Refer to Medical checklists (over).

☐ Monitor performance of subordinates. Provide support and changes as needed.

MCI Task Card - Medical

SCENE CHECKLIST

	Functional Assignments:	Ops:		Order Resources:	Ops:		HazMat:
	Triage			Ambulances (specify #)			Mass Decon
	Treatment			Police (Secure Area)			Safety
	Transportation			Buses			Rescue
	Destination			Vans			
	Staging Area			Medical Examiner			
	Landing Zone			Red Cross			
				Specialty Teams			

OTHER ASSIGNMENTS

Incident Commander	Triage	Treatment	Transportation	Destination
				Staging Area

MCI Task Card – Treatment

Reports to Medical (Use assigned radio channel) Coordinates with Triage and Transportation

OBJECTIVES:

1. **To rapidly treat and transport all patients.**
2. **Identify and establish large treatment area(s) to stabilize and care for patients until transported.**
3. **Coordinate all activities within the treatment area.**
4. **Coordinate movement of patients from treatment area(s) with Transportation.**
5. **Provide accountability for personnel working in Treatment.**

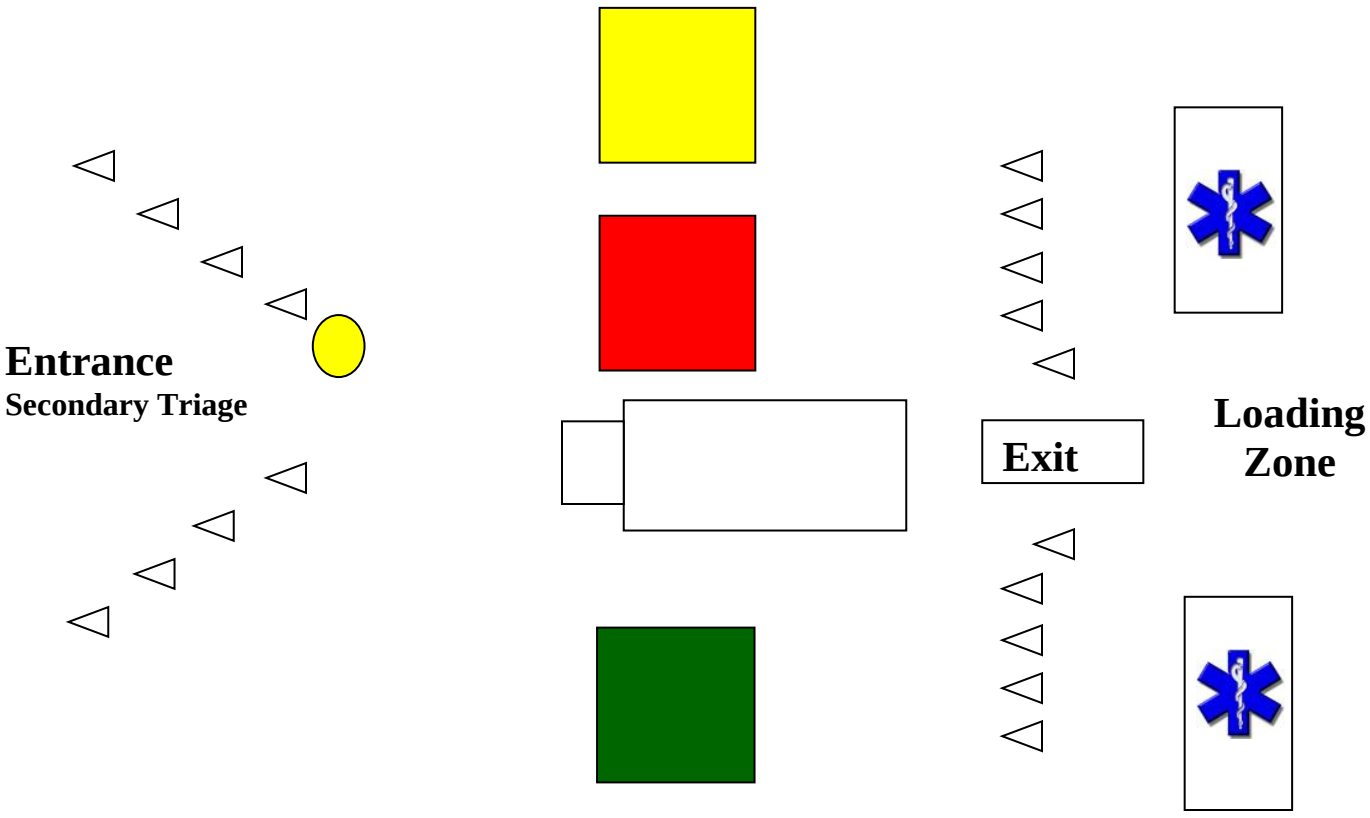
ACTIONS:

- ☐ Establish treatment area(s) large enough to receive estimated number of patients. Set up area with room to expand if necessary. Provide for environmental protection of victims and allow easy ambulance access and egress. If multiple treatment areas are needed, identify each geographically. (e.g. - North/South, street name, division name, etc.). See Diagram.
- ☐ Order additional resources through Medical.
- ☐ Clearly identify treatment area entry point. Assign a person at the entrance to conduct primary or secondary triage, attach triage tags and direct patients to correct treatment area.
- ☐ Consider appointing “Red,” “Yellow,” and “Green” Treatment Team Leaders and assign support personnel.
- ☐ Establish a medical supply drop area for incoming ambulances and fire units.
- ☐ Provide BLS care in the treatment area until resources allow a higher level.
- ☐ Ensure all patients in treatment area have been tagged with a triage tag.
- ☐ Identify the order in which patients are to be transported. Coordinate patient movement to the loading zone with Transportation.
- ☐ Provide accountability for personnel working within treatment area.

MCI Task Card – Treatment

Treatment Area Guidelines

- ☐ Set up treatment area WELL AWAY from Hazardous. Consider ambulance access/egress, wind direction and slope.
- ☐ Make it BIG. Set up in an area that will allow you to expand.
- ☐ Clearly identify entry point and exit point for patient transportation.
- ☐ Utilize colored tarps and flags to identify each treatment area.
- ☐ Separate the green area from yellow/red area. Consider separating with CBRNE unit or other natural barrier.
- ☐ Assign treatment team leaders to each area and identify them with the appropriate colored vests.



MCI Task Card – Treatment

SCENE CHECKLIST

OPS Channels	Medical:	Treatment:	Transport:

Assign Treatment Team Leaders		Current Patients in Treatment Area	
RED Team Leader:		Red	
YELLOW Team Leader:		Yellow	
GREEN Team Leader:		Green	
Supply:		Black	

Additional Company Assignments

Company	Assignment

Notes:

Other Assignments:

Command	Operations	Triage	Staging	Destination
OPS:_____ ___	OPS:_____	OPS:_____	OPS:_____	OPS:_____

MCI Task Card - Triage

- ☐ Manage the triage function at the incident (should not perform task level triage)
- ☐ Coordinate personnel/crews performing primary and secondary triage
- ☐ Maintain accountability of all triage personnel/crews
- ☐ Ensure rapid primary triage is performed – no more than 30 seconds per patient
- ☐ Ensure secondary triage point is established when necessary or that secondary triage is accomplished in place
- ☐ Coordinates movement of triaged patients to treatment/collection/transport area. (order personnel and equipment as appropriate to accomplish this)
- ☐ Ensures appropriate patient triage log is initiated and maintained. (multiple logs may need to be managed and information integrated depending on the scope of the incident)
- ☐ Relay triage information up the chain-of-command and updates status as needed
- ☐ After triage is completed, assists treatment and transport supervisors/teams to locate their patients.

- *In a hazardous incident, patients may not be able to be triaged until they are removed from the hazard zone.*
- *Consider having crews utilize triage tags during secondary triage so that primary triage may be performed at appropriate speed.*

Triage & identify patients by category utilizing "ABC" method:

Red* Immediate life threat. (Must have rapid transport to survive.)
Yellow* Delayed (Injuries can wait 1 - 3 hours before transport.)
Green* Ambulatory (Injuries can wait 3+ hours before transport)
Black* Dead (No transport) Move only if needed to reach other live patients.

MCI Task Card - Transportation

Reports to Medical (Use assigned radio channel)

OBJECTIVES:

1. **Coordinate movement of patients from treatment area with Treatment.**
2. **Coordinate all activities within the loading zone.**
3. **Coordinate flow of transport vehicles with staging.**
4. **Provide accountability for personnel working in Transportation.**

ACTIONS:

- ☐ Establish patient loading zone.
- ☐ Establish one-way vehicle access/egress with Staging.
- ☐ Request additional resources as needed from Medical.
- ☐ Assign Medical Communications.
- ☐ Supervise patient movement to loading zone with Treatment.
- ☐ Monitor medical radio channel to estimate number of incoming patients.

MCI Task Card - Transportation

Loading Zone Location:

_____

_____

Access/Egress Location:

_____

_____

Resources Requested:

Time	Resource	Unit/Agency

Medical Communications:

Name: _____

Unit/Agency: _____

MCI Task Card –Destination

Reports to Transportation

OBJECTIVES:

1. **Coordinate hospital destination for patients leaving the loading zone.**
2. **Maintain the patient transport log using web based or protocol approved alternative.**

ACTIONS:

☐ Establish communications with "Regional Hospital." (Via MCI channel, phone number or approved alternative. (800 radio MCI channel or phone (503) 494-7333.)

☐ Confirm MCI has been declared with Regional Hospital and Dispatch.

☐ Provide total number of estimated patients.

☐ Establish communication with loading zone to receive information on patients ready for transport (e.g., face-to-face, runner, radio etc.).

☐ When a unit is ready to transport, contact Regional Hospital. Provide & record the following information.

1. Triage Tag #'s/ UPI if available
2. Triage color/category
3. Age/gender
4. Unit number of transporting vehicle

☐ Confirm hospital destination with Regional and record.

☐ Inform the transporting unit of its destination.

MCI Task Card –Destination

Triage Tag # (last 4 digits)	Triage Level *R/Y/G*	Age	*Sex*	Injury Type/Location	*Destination*	Unit #	Transport *Time*
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				
	R Y G		M F				

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
1		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
2		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
3		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
4		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
5		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
6		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
7		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
8		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
9		
TRIAGE		
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

Hazardous Materials

DECONTAMINATION ZONE

Note: All victims suspected of ingestion or significant exposure to **hydrogen cyanide** solution **require decontamination**. Others may be transferred immediately to the Support Zone.

A. Decontamination

1. Victims who are able and cooperative may assist with their own decontamination.
    a. **Rapidly remove contaminated clothing** while flushing exposed skin and hair with plain water for 2 - 3 minutes.
    b. Then wash twice with mild soap.
    c. Rinse thoroughly with water.
    d. Double bag contaminated clothing and personal belongings.

2. Irrigate exposed or irritated eyes with plain water or saline for 5 minutes.
    a. Continue eye irrigation during other basic care or transport.
    b. Remove contact lenses if present and easily removable without additional trauma to the eye.

B. Transfer to Support Zone as soon as decontamination is complete.

Hydrogen Cyanide – 70.020

IDENTIFICATION

CAS 74-90-8
UN 1051

Synonyms include formic anammonide and formonitrile. Aqueous solutions are referred to as hydrocyanic acid and prussic acid.

Hydrogen cyanide is very volatile, producing potentially lethal concentrations at room temperature. At temperature below 78°F, hydrogen cyanide is colorless or pale blue liquid (hydrocyanic acid); at higher temperatures, it is a colorless gas. It has a faint bitter almond odor and a bitter burning taste. It is soluble in water. **Hydrogen cyanide is lighter than air.**

PRECAUTIONS

A. Persons whose clothing or skin is contaminated with cyanide containing solutions can secondarily contaminate personnel by direct contact or through off-gassing vapor.
    1. Avoid dermal contact with cyanide-contaminated victims and their bodily fluids.
    2. **Take special care with victims who may have ingested cyanide, as cyanide salts dissolve in the stomach and react with hydrochloric acid to produce hydrogen cyanide gas. Transport patients in vehicles with windows opened and/or good ventilation. These patients who meet *Death in the Field* criteria should be considered a Hot Zone.**
    3. Victims exposed only to hydrogen cyanide gas do not pose contamination risks to rescuers.

B. Hydrogen cyanide is a volatile flammable liquid at room temperature; as a gas, it is flammable and potentially explosive.

C. Hydrogen cyanide is absorbed well by inhalation and can produce death within minutes.
    1. Substantial absorption can occur through intact skin if vapor concentration is high.
    2. Exposure by any route may cause systemic effects.

HEALTH EFFECTS

HCN is classified a systemic (chemical) asphyxiant. Cyanides interfere with the intracellular utilization of oxygen resulting in cellular dysfunction and cell death. Effects are most profound and first evidenced in the CNS and cardiovascular system. Initial symptoms may include CNS excitation and cardiovascular compensation followed by depression/collapse of both systems.

ROUTES OF EXPOSURE

A. Inhalation
    1. Hydrogen cyanide is readily absorbed from the lungs; symptoms of poisoning begin within seconds to minutes.

2. *The odor of cyanide does not provide adequate warning of hazardous concentrations.* ***Perception of the odor is a genetic trait (20% to 40% of the general population cannot detect hydrogen cyanide); also, rapid olfactory fatigue can occur.***

B. Skin/Eye Contact: Exposure to hydrogen cyanide can cause skin and eye irritation and can contribute to systemic poisoning with delayed symptoms.
C. Ingestion of hydrogen cyanide solutions or cyanide salts can be rapidly fatal

SIGNS AND SYMPTOMS

A. Signs and symptoms usually develop rapidly. Initial symptoms are nonspecific and include excitement, dizziness, n/v, HA and weakness.
B. Progressive signs and symptoms may include: Drowsiness, tetanic spasm, convulsions, hallucinations and loss of consciousness.
C. Cardiovascular – Can cause various life-threatening dysrhythmias.
D. Respiratory
    1. Victims may complain of shortness of breath and chest tightness.
    2. Pulmonary findings may include rapid breathing and increased depth of respiration.
    3. As poisoning progresses, respirations become slow and gasping; cyanosis may be present, and pulmonary edema may develop.

RESCUER PROTECTION

A. Respiratory protection: Pressure demand self-contained breathing apparatus (SCBA) is recommended in response situations that involve exposure to potentially unsafe levels of hydrogen cyanide.
B. Skin protection: Chemical protective clothing is recommended because both hydrogen cyanide vapor and liquid can be absorbed through the skin to produce systemic toxicity.

DECONTAMINATION ZONE

A. Refer to Decontamination page.
B. Transfer to Support Zone as soon as decontamination is complete.

SUPPORT ZONE

A. Be certain that victims have been decontaminated properly. Additional decontamination may be required for exposed skin and eyes.
B. Decontaminated victims or those exposed only to vapor, pose no serious risks of secondary contamination to rescuers. In these cases, Support Zone personnel require no specialized protective gear.

TREATMENT

Patients who rapidly regain consciousness and who have no other signs or symptoms may not require antidote treatment. Patients who remain comatose or develop shock should be treated promptly with the antidotes per OLMC direction. In cases of ingestion—**emesis and activated charcoal are *contraindicated***.

A. High flow oxygen, establish IV access, apply cardiac monitor and secure protected airway following Airway Management protocol.

B. If Cyanide Toxicity is suspected based on findings (soot in mouth, nose or oropharynx, know exposure) and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:
   1. Administer Hydroxocobalamin (CYANOKIT®) 5 g IV or IO over 15 minutes. Repeat once if needed. For cardiac arrest, hydroxocobalamin should be administered as a rapid fluid bolus.
   2. If Hydroxocobalamin (CYANOKIT®) is not available, then administer Sodium Thiosulfate 50 ml of 25% solution over 10 - 20 minutes. Pediatric dose is 1.65 ml/kg.
   3. Do NOT administer Hydroxocobalamin (CYANOKIT®) and Sodium Thiosulfate to the same patient.
   4. Treat other presenting symptoms per appropriate protocol.
   5. Initiate emergent transport to appropriate facility.
   6. Patients in shock or having seizures should be treated according to existing protocols. These patients may be seriously acidotic; consider giving sodium bicarbonate 50 mEq, with OLMC direction.

C. **MULTI-CASUALTY TRIAGE -** Patients who have only brief inhalation exposure and mild or transient symptoms may be discharged.

Hydrogen Fluoride – 70.030

IDENTIFICATION
CAS 7664-39-3
UN 1052 (Anhydrous)
UN 1790 (Solution)

Synonyms include fluoric acid, hydro fluoride, hydrofluoric acid, and fluorine monohydride.

Hydrogen fluoride is a colorless, corrosive fuming liquid or gas (boiling temperature 67˚F) with a strong irritating odor. It is usually shipped in cylinders as a compressed gas. Hydrogen fluoride readily dissolves in water to form colorless hydrofluoric acid solutions. Dilute solutions are indistinguishable from water. It is present in a variety of over-the-counter products at concentrations of 6% to 12%.

PRECAUTIONS

A. Victims whose clothing or skin is contaminated with HF liquid, solution or condensed vapor, can secondarily contaminate response personnel by direct contact or through off-gassing vapor.
B. Inhalation hazards result not only from HF gas but also from fumes arising from concentrated hydrogen fluoride liquid **or from the patient's bodily fluids.**
C. Rapid flushing of exposed areas with water is critical. HF is water-soluble.

HEALTH EFFECTS

The toxic effects of hydrogen fluoride are due primarily to the fluoride ion. The fluoride ion combines with endogenous calcium and magnesium to form insoluble calcium fluoride and magnesium fluoride.

A. This results in cell destruction and local bone demineralization.
B. Life threatening hypocalcemia, hypomagnesemia, and hyperkalemia can occur.
C. The adverse action of the fluoride ion may progress for several days.

ACUTE EXPOSURE

A. **Respiratory**—Due to HF's water solubility, effects of exposure generally occur in the upper airway including the glottis. However, people incapacitated in large clouds of HF can have severe deep lung injury.
    1. **Mild effects**— mucous membrane irritation, cough, and narrowing of the bronchi.
    2. **Severe effects**:
        a. Almost immediate narrowing and swelling of the throat, causing upper airway obstruction.
        b. Lung injury may evolve rapidly or may be delayed in onset for 12 - 36 hours.
        c. Pulmonary edema and constriction of the bronchi. Partial or complete lung collapse can occur.
        d. Pulmonary effects can result even from splashes on the skin.
B. **Dermal**—Depending on the concentration and duration of exposure, skin contact may produce pain, redness of the skin, and deep, slow healing burns with symptoms delayed up to 24 hours. HF can penetrate tissues deeply, causing both local cellular destruction and systemic toxicity.

C. **Ocular**
   1. **Mild effects**— Rapid onset of eye irritation.
   2. **More severe effects**— May result from even minor hydrofluoric acid splash include, sloughing of the surface of the eye, swelling of the structures of the eye, and cell death due to lack of blood supply. Potentially permanent clouding of the eye surface may develop immediately or after several days.

D. **Gastrointestinal**
   1. A small amount of ingested HF is likely to produce systemic effects including acid-base imbalance and may be fatal.
   2. Ingestion of hydrofluoric acid may cause corrosive injury to the mouth, throat and esophagus as well as inflammation and bleeding of the stomach.
   3. Nausea, vomiting, diarrhea, and abdominal pain may occur.

E. **Electrolyte disturbances**—Exposure by any route may result in systemic effects: Hypocalcemia and/or hypomagnesemia and/or hyperkalemia.

PREHOSPITAL MANAGEMENT

HOT ZONE

Rescuer Protection

A. SCBA is recommended in response situations that involve exposure to potentially unsafe levels of hydrogen fluoride.
B. Skin protection: Chemical protective clothing, (i.e., level A or level B), is recommended because skin exposure to either vapor or liquid may cause severe consequences.

DECONTAMINATION ZONE

A. Victims exposed only to hydrogen fluoride gas or vapor who have no skin or eye irritation do not need decontamination, they may be transferred immediately to the Treatment Area.
B. Rescuer Protection: If exposure levels are determined to be safe, personnel wearing a lower level of protection than that worn in the Hot Zone may conduct decontamination.
C. ABC Reminders:
   1. Quickly ensure a patent airway— anticipate airway edema.
   2. Stabilize the cervical spine with a c-collar and spinal motion restriction if trauma is suspected.
   3. Administer supplemental O_2.
   4. Assist ventilation with a bag-valve-mask device if necessary.
D. Basic decontamination:
   1. Victims who are able and cooperative may assist with their own decontamination
      a. **RAPIDLY REMOVE CONTAMINATED CLOTHING** while flushing exposed skin and hair with plain water for 15 minutes.
      b. If treatment recommended below is available, water flushing may be reduced to 5 minutes and the treatment should be started immediately.
         i. Calcium gluconate 3 g mixed with 5 oz water soluble lubricant and applied to burn.
      c. Double bag contaminated clothing and personal belongings.

2. Irrigate exposed or irritated eyes with plain water or saline or 5 minutes.
   a. Continue eye irrigation during other basic care or transport.
   b. Remove contact lenses if present and easily removable without additional trauma to the eye.
3. In case of ingestion, **do not induce emesis or administer activated charcoal.**
   a. Victims who are conscious and able to swallow should be given 4 - 8 ounces of water or milk.
   b. If available, also give 2 - 4 ounces of an antacid containing magnesium (e.g., Maalox, Milk of Magnesia) or calcium (e.g., TUMS).
4. As soon as basic decontamination is complete, move the victim to the Treatment Area.

TREATMENT

Be certain that victims have been decontaminated properly. Treatment Area personnel require no specialized protective gear if victims have undergone decontamination.

A. ABCs, Spinal Motion Restriction (prn), Pulse Oximetry, and ECG to obtain baseline QTc interval (may be of benefit for this).
B. Treat patients who are symptomatic per existing protocols.
C. Observe for signs of hypocalcemia and contact OLMC regarding treatment with Calcium Gluconate.
   1. ECG—prolonged Q-T interval or QRS or ventricular dysrhythmias.
   2. Other—Muscular tetany. This is probable after ingestion of even small amounts of HF.
D. **For inhalation victims**.
   1. Administer 2.5% calcium gluconate by nebulizer. Mix 1cc of 10% Calcium Gluconate with 3 ccs of Normal Saline into the nebulizer.
   2. If wheezes are present, consider use of Albuterol per Respiratory Distress protocol.
E. **Minor Burns**.
   1. Initially, the health care provider should wear rubber or latex gloves to prevent secondary contamination.
   2. Calcium gluconate 3 g mixed with 5 oz water soluble lubricant and applied to burn.
   3. Continue this procedure until pain is relieved or more definitive care is rendered.
F. **Hand Exposure**
   1. Subungual (under the nail) burns often do not respond to immersion treatment. The treatment for hand burns requires expert assistance; consult with OLMC.
   2. Treatment of hand exposures can be accomplished by placing calcium gluconate gel into an exam glove and placing the glove on the affected hand.
G. **Optical Exposure**—Irrigate exposed eyes with a 1% aqueous solution of calcium gluconate (10 ml of 10% solution in 90 ml of sterile saline in Buretrol) using a nasal cannula.
   1. Up to 500 ml over 1 - 2 hours may be used.
   2. If calcium gluconate is not available, use normal saline for irrigation.

MULTI-CASUALTY TRIAGE

Consult with the OLMC for advice regarding triage of multiple victims. Persons who have had only minor or brief exposure to hydrogen fluoride gas or vapor and are initially asymptomatic are not likely to develop complications. See Multiple Toxic Exposure Protocol.

Organophosphates – 70.040

IDENTIFICATION

CAS 56-38-2
UN 2783

Synonyms include Alkron, Alleron, Danthion, DNTP, DPP, Ethyl Parathion, Etilon, E-605, Stathion, Sulphos, and Thiophos.

The term organophosphate (OP) is generally understood to mean an organic derivative of phosphoric or similar acids. There are many different OPs, and they differ to some extent in their properties. Many OPs inhibit an enzyme known as acetylcholinesterase. This is a class effect of OPs, but not all OPs (e.g., glyphosate) demonstrate this effect. Inhibitors of acetylcholinesterase affect certain nerve junctions in animals, as well as parasympathetic effector sites (the heart, lungs, stomach, intestines, urinary bladder, prostate, eyes and salivary glands). By inhibiting the enzyme acetylcholinesterase, OPs prevent the nerve junction from functioning properly.

PRECAUTIONS

A. Organophosphates are highly contaminating.
B. Victims whose skin or clothing is contaminated with liquid or powdered organophosphate can secondarily contaminate response personnel by direct contact or off gassing of solvent vapor.
C. Clothing and leather goods (e.g., belts or shoes) cannot be reliably decontaminated; they should be incinerated.
D. Special care should be taken to avoid contact with the vomitus of a patient who has ingested organophosphate.

PHYSICAL PROPERTIES

A. At room temperature, organophosphate are powders or combustible liquids.
B. Organophosphates are almost insoluble in water, slightly soluble in petroleum oils, and miscible with many organic solvents. Accordingly, most commercial products contain hydrocarbon solvents.
C. Organophosphates have low vapor pressures; thus, significant inhalation is unlikely at normal temperatures (Exception: Dichlorvos (a.k.a. DDVP and Vapona) when in a poorly ventilated confined space). However, the hydrocarbon solvents remain volatile and flammable, as well as possessing toxic properties.

ROUTES OF EXPOSURE

A. Inhalation:
    1. Toxic inhalation of organophosphate vapor is unlikely at ordinary temperatures because of its low volatility, but toxic effects can occur after inhalation of organophosphate sprays or dusts.
    2. The hydrocarbon solvents (most commonly toluene and xylene) used to dissolve organophosphate are more volatile than organophosphate itself, and toxicity can result from inhalation of solvent vapor as well.
B. Skin/Eye Contact—Organophosphates are rapidly absorbed through intact skin or eyes, contributing to systemic toxicity.
C. Ingestion—Acute toxic effects. May be rapidly fatal.

Organophosphates – 70.040

HEALTH EFFECTS

A. Introduction:
   1. Organophosphates are known as cholinesterase inhibitors. Normally, the neurotransmitter acetylcholine (ACh) is broken down by acetylcholinesterase (AChE). Organophosphates inhibit the activity of AChE and thus ACh is not broken down. The resulting accumulation of ACh overstimulates ACh receptors (aka cholinergic receptors) within the central and peripheral nervous systems. The toxic effects of organophosphates result from this overstimulation of ACh receptors. There are two types of ACh receptors, muscarinic and nicotinic.
   2. Signs and symptoms of poisoning vary according to age, dose, and concentration:
      a. **CNS effects**—Irritability, nervousness, giddiness, fatigue, lethargy, impairment of memory, confusion, slurred speech, visual disturbance, depression, impaired gait, convulsions, loss of consciousness, coma, and respiratory depression. CNS effects can be some of the earliest symptoms.
      b. **PNS Effects**—Nicotinic and muscarinic stimulation can provide opposing effects. In general, nicotinic signs and symptoms predominate early in organophosphate poisoning, while muscarinic signs and symptoms predominate later.
         i. **Muscarinic effects**— **SLUDGE** (Salivation, Lacrimation, Urination, Defecation, Gastroenteritis, Emesis), or **DUMBELS** (Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Bronchospasm, Emesis, Lacrimation, Salivation, Secretion, Sweating).
         ii. **Nicotinic effects**— **MTWHF** (Mydriasis, Tachycardia, Weakness, Hypertension, Hyperglycemia, Fasciculations, Flaccidity).

PREHOSPITAL MANAGEMENT

- **HOT ZONE**

A. Respiratory Protection: SCBA is recommended in response situations that involve exposure to potentially unsafe levels of organophosphates.
B. Skin Protection: Chemical-protective clothing is recommended because organophosphates are rapidly absorbed through the skin and may cause systemic poisoning.

- **DECONTAMINATION ZONE**

  All victims suspected of organophosphate ingestion, or substantial exposure to aerosolized organophosphates, or who have skin or eye exposure to liquid or powdered organophosphates require thorough decontamination.

BASIC DECONTAMINATION

Follow Decontamination General Guidelines. Then, move the victim to the Treatment Area upon completion.

SIGNS AND SYMPTOMS

A. Mild poisoning HA, n/v, abdominal cramps, and diarrhea.

B. Moderate poisoning: Generalized muscle weakness and twitching, slurred speech, pinpoint pupils, excessive secretions, and shortness of breath.
C. Severe poisoning: Seizures, skeletal-muscle paralysis, respiratory failure, and coma.

TREATMENT

A. Secure protected airway in cases of respiratory compromise per Airway Management protocol.
B. There is no contraindication to the use of paralytic agents is in this setting, however both ***succinylcholine and vecuronium will have a significantly sustained duration of paralysis in the presence of organophosphates***.
C. The initial intravenous dose of atropine in adults should be determined by the severity of symptoms. In seriously poisoned patients, very large doses may be required. Alterations of pulse rate and pupillary size are unreliable indicators of treatment adequacy. **Atropine works *only* to correct muscarinic effects.**
    1. In mild to moderate poisonings (e.g. headache, mild bronchorrhea, nausea, vomiting, diarrhea, but normal mentation), administer atropine 1 - 2 mg IV/IO/IM every 3 - 5 minutes until symptoms improve (e.g., decreased secretions).
    2. For severe poisoning (e.g. altered mental status, unconsciousness, seizures), administer atropine 3 - 5 mg IV/IO/IM every 3 - 5 minutes until symptoms begin to improve (e.g., decreased sections, ease of ventilation).
    3. Treat seizures per seizure protocol.
D. Administer pralidoxime (2-PAM), if profound weakness or paralysis present.
    1. Moderate symptoms—1,200 mg (two Mark 1 injectors or one Duodote).
    2. Severe symptoms—1,800 mg (three Mark 1 injectors or three Duodote injectors).

CAUTION: When administering 2-PAM intravenously, administer at rate of less than 200 mg/minute (4 mg/minute for children).

Note: The* Mark 1 auto-Injector *atropine is 2 mg. The 2-Pam auto-injector is 600 mg pralidoxime. The Duodote Auto-Injector is atropine 2.1 mg/0.7 mL and pralidoxime chloride 600 mg/2 mL.

E. Patients who are comatose, hypotensive, have seizures, or have cardiac dysrhythmias should be treated according to ALS protocols.

TRANSPORT TO MEDICAL FACILITY

A. Report to OLMC, and the receiving medical facility, the condition *of* the patient, treatment given, and estimated time of arrival at the medical facility.
B. If organophosphate has been ingested:
    1. Prepare the ambulance in case the victim vomits toxic material.
    2. Prepare several towels (or other absorbent material) and open plastic bags to quickly clean up and isolate vomitus.

MULTI-CASUALTY TRIAGE

Patients who have histories or evidence suggesting substantial exposure and all persons who have ingested organophosphate should be transported to a medical facility for evaluation.

A. Others may be discharged from the scene after their names, addresses, and telephone numbers are recorded.
B. They should be advised to seek medical care promptly if symptoms develop or recur.

PEDIATRIC PATIENTS:

Atropine: In children, dose is 0.05 mg/kg IV/IO/IM.
Pralidoxime: Pediatric dose: 25 - 50 mg/kg and must be given slowly via IV (4 mg/min.)

Washington County EMS Operations

Ambulance Cancellation/Slow Down of EMS Responders – 80.100

In general, no responding unit, including a transport ambulance should be cancelled until:

- It is determined that there is no patient, **or**
- A patient is found and after a full assessment, that person is refusing further treatment and/or transport.
    - A patient refusal should be documented

A. **EXCEPTIONS:**

1. EMERGENCY MEDICAL RESPONDER (EMR) CERTIFIED:
   On scenes where a patient is refusing and only a certified EMR is present the EMR may only slow an ambulance to code 1. The ambulance will continue Code 1 and assess the patient.
2. EMT, AEMT, EMT-INTERMEDIATE, PARAMEDIC:

   An EMT, AEMT, EMT-Intermediate, or EMT-Paramedic may slow or cancel other responders once the patient has been evaluated and a determination is made that no other units are required.
3. POLICE/SHERIFF:
   In the past police agencies have requested a slow-down or cancellation of EMS. If dispatch information/patient information warrants it, EMS responders may use discretion in honoring the request. However, if one unit determines they should continue their response then all units should continue response at same response code.

B. **UPGRADES**:
Any responding agency personnel may request an upgrade in response. All units should respond with the same response code.

Ambulance Coordination - Major Emergencies/Modified EMS Ops – 80.200

THE WASHINGTON COUNTY EMERGENCY MEDICAL SERVICE PROGRAM (WCEMS) IS RESPONSIBLE FOR DECLARING MAJOR EMERGENCIES / MODIFIED EMS OPERATIONS (MEO).

Activation of Modified EMS Operations is under the authority of WCEMS and is generally done in consultation with operational leadership as well as EMS system stakeholders. In a catastrophic event, MEO implementation may be concurrent with making outreach to WCEMS for formal authorization. Any member of the EMS community (first responders, WCCCA, emergency management, or law enforcement) may request implementation of MEO. Requests are to be made to WCEMS via the WCEMS Program Supervisor or their designee.

A major emergency is defined as an extended event that causes a region-wide or countywide disruption of emergency medical or hospital services (e.g., snow, ice, flooding, earthquake, two or more hospitals sustain damage and are not capable of accepting patients). Periods of high ambulance demand not related to one of these types of events would not be considered a major emergency. When a major emergency is declared in Washington County, these guidelines will help guide the dispatch and coordination of emergency ambulances. The EMS response to request for medical assistance coordination will occur between the franchised emergency ambulance provider and Washington County Consolidated Communications Agency (WCCCA). The franchised emergency ambulance provider shall be responsible for the coordination of ambulance resources, including ambulance response into and out of the county as well as requests originating from within the county.

Coordination of system resources will be in line with WCCCA SOG 29. During Emergency operations, WCCCA will continue to triage incoming calls and may defer to the police / fire liaison for changes in dispatching guidelines based on available resources**.**

Modified EMS Operations allows for the selective and scalable application as required by the event or incident.

A. COORDINATION OF AMBULANCE RESOURCES

The franchisee's operations leadership (e.g., manager, supervisor) will actively manage ambulance resources within Washington County with the goal of maintaining and maximizing the availability of ambulances during an MEO event. The following known resources and actions are available to these ends; they are presented in an escalating order/level but need not be used in order and may be selectively combined as deemed necessary to manage the event/incident.

1. Ambulances may respond to, but not be committed to "stand-by" unless there is a known patient with known priority symptoms or the highest possibility that injuries may occur.
2. Activation and utilization of surge resources.
3. Ambulance Response Prioritization occurs when volume surge exceeds the immediate availability of resources, and all resources have been called upon. Calls with no specific illness/complaint and unknown injury calls may be triaged

to a first responder (fire or police) only response, with an ambulance response upon assessment and request by first responders.

4. Mutual aid plans.

B. AMBULANCE DESTINATION

Dependent on the nature of the large-scale major event or incident, WCEMS may establish hospital destination parameters to manage ambulance resources up to, and including, restricting destinations to the nearest hospital. Consideration will be given to patients requiring specialized care such as burn, hyperbaric, and obstetrical patients.

Patients shall be transported utilizing one of the following parameters:

1. Hospital of choice (normal operating procedures).
2. Restricted to Washington County EMS hospitals, as well as Legacy Meridian Park Medical Center in Clackamas County and Providence Newberg Medical Center in Yamhill County.
3. Restricted to closest Washington County EMS hospital, as well as Meridian Park Medical Center in Clackamas County and Providence Newberg Medical Center in Yamhill County.

C. TRAUMA SYSTEM ENTRIES

1. Patients meeting trauma system entry criteria shall be transported using the following parameters:
   a. Directly to OHSU or Emanuel Hospital as transportation routes allow.
   b. Impassible or compromised highways and secondary routes, transport to Providence St. Vincent Hospital Medical Center for treatment, and/or stabilization, and transfer as appropriate.
   c. Under extreme conditions, trauma patients in extremis may be transported to the closest appropriate hospital.

2. The following are required if a patient, who meets trauma system entry criteria, is diverted to a Washington County hospital:
   a. Transporting Ambulance: The patient should be banded and assigned a trauma system entry number. Contact the Trauma Communications Center (TCC) as usual and advise them of the diversion, the destination hospital, along with the normal trauma system entry information including the trauma band number.
   b. Transporting Agency: Within 24 hours, contact the Oregon Health Authority EMS and Trauma Systems Program to notify them of the diversion and provide them with the required information.

D. MANAGING, PLANNING, AND REPORTING OUT BY OPERATIONAL PERIODS

At the beginning of each operational period, the franchisee will provide WCEMS a situation and status (Sit/Stat) report. Both the operations and dispatch supervisors will participate in the Sit/Stat report call.

The Sit/Stat report should include, but not be limited to:

1. Briefing on the last operational period
2. Current situation and status
3. Specific actions to be/being taken relevant to Sit/Stat
4. General plans and expectations for the new/current operational period
5. Status and depth of ambulance and personnel resources

E. RESPONSE INTERVAL REQUIREMENTS

Dependent on the nature of the event or incident requiring the use of MEO, WCEMS may modify or lift response interval requirements.

F. MAJOR EMERGENCY / MODIFIED EMS OPERATIONS CHECKLIST

Activation of Modified EMS Operations is generally a collaborative decision between WCEMS and EMS stakeholders. As activation is being considered or has occurred, the following actions should be taken:

1. Pre-activation planning (when feasible); to include EMS System partners and stakeholders (i.e., County, Franchisee, Fire).
2. Determine operational periods and schedule sit/stat conference calls.
3. Primary notifications:
   a. WCCCA
   b. Fire departments/districts
   c. Washington County Hospitals as well as Meridian Park Medical Center and Providence Newberg Medical Center
   d. MRH
   e. Washington County EMS staff and Public Heath (PH) admin
4. Secondary notifications:
   a. Washington County Emergency Management
   b. Health Preparedness Organization (HPO) as necessary
   c. Washington County Fire Defense Board (WCFDB) (if not already completed)
   d. Clackamas County EMS
   e. Multnomah County EMS
   f. Yamhill County EMS
5. Major Emergency Guideline activation shall be broadcast on the fire dispatch channel.
6. Notify field units that they are now operating under Major Emergency Guidelines. If roadways into and out of Portland are impassible, trauma entry patients shall be transported to St. Vincent Hospital. If transport to St. Vincent Hospital is not possible, patients shall be transported to the nearest hospital.
7. Notify Washington County hospitals, as well as Meridian Park Medical Center and Providence Newberg Medical Center, patients may be transported to the nearest hospital.
8. Contact St. Vincent Hospital Emergency Department Physician and request they be prepared to accept patients that meet trauma system entry criteria. If a patient meets trauma system entry criteria and must be transported to a Washington

County Hospital, the patient must be entered into the trauma system through the Trauma Communications Center (TCC) as usual. TCC must be notified that the patient is being transported to a non-trauma designated hospital based on circumstance.

9. Notify the State EMS Office's Trauma Division that a major emergency has been declared and patients normally entered into the trauma system may be transported to St. Vincent Hospital or other non-trauma designated hospital.
10. When operations under these guidelines are terminated, notify:
    a. Field units that they can return to normal activities.
    b. Washington County hospitals, as well as Meridian Park Medical Center and Providence Newberg Medical Center.
    c. Notify St. Vincent Hospital they will no longer be receiving trauma system patients.
    d. All other EMS stakeholders.

Guidelines for BLS Transport – 80.300

ALS INCLUSION CRITERIA

- ☐ **Pediatric patients (age < 15yrs)**
- ☐ **Following complaints/conditions**
  - ☐ Chest pain
  - ☐ Shortness of breath / increased work of breathing at any time / concern for airway compromise
  - ☐ Altered LOC (or not at baseline)
  - ☐ Syncope / near syncope
  - ☐ Stroke / TIA
  - ☐ Pregnancy > 20 weeks
  - ☐ Overdose / suicide attempt
  - ☐ Behavioral disturbance that may need medication (*see notes)
  - ☐ Suspected chemical or toxic exposure
  - ☐ Seizures
  - ☐ Severe bleeding, amputation, or extremity injury with neuro deficit or without pulse
  - ☐ Isolated abdominal pain in patients > 50 years old
  - ☐ Any specialty activation (sepsis/STEMI/stroke/trauma/burns)
- ☐ **Patient receives any ALS treatment**

  *Exceptions:

*ondansetron	*NSAIDs (e.g., ketorolac, ibuprofen)
*acetaminophen	*fluid bolus outside of observed hypotension

- ☐ **Patient requires cardiac monitoring**
- ☐ **High risk patients (e.g., transplant, Cancer receiving chemotherapy, LVAD, ESRD, ESLD)**
- ☐ **Special circumstances: Strangulation, submersion injury, heat or cold exposure**
- ☐ **Patient assessed by ALS clinician on scene who determines that ALS treatment is needed or anticipated to be needed**
- ☐ **Receiving BLS clinician on scene requests paramedic support**

*****All clinicians (ALS and BLS) must agree that this is a BLS appropriate patient. If there is disagreement, then the patient is to be transported by ALS*****

Guidelines for BLS Transport – 80.300

BLS INCLUSION CRITERIA

- ☐ **Absence of complaints/conditions noted above (ALS inclusion criteria)**
- ☐ **ALS clinician on scene approve BLS transport**
- ☐ **BLS clinician accepts transfer of patient care**
- ☐ **ALL vital signs must be within the following ranges:**
  - ☐ HR between 50 and 130
  - ☐ RR between 8 and 24
  - ☐ Sat > 90% on RA or previous prescribed home O_2
  - ☐ SBP > 90 (MAP > 65) without symptoms of hypotension (e.g., lightheaded, dizzy, diaphoresis)
  - ☐ SBP < 180 (MAP <130) without symptoms of hypertensive urgency (e.g., headache, vomiting, chest pain, altered mental status)
  - ☐ $EtCO_2$ > 25 mmHg & < 60 mmHg
- ☐ **Patients with saline lock may be transported BLS**
- ☐ **Patients already on home oxygen by mask or cannula may be transported BLS**
- ☐ **Patients with an isolated traumatic extremity injury with splinting as only intervention may be transported BLS**
- ☐ **Use of intoxicants with clearly assessed/documented decision-making capacity**

NOTES

When transferring patient care

- ☐ **Receiving and transferring clinicians should:**
  - ☐ Ensure all patient information is transferred to the receiving clinician (e.g., chief complaint, PMHx, current history, VS, care given prior to transfer of care)
  - ☐ Assist the receiving clinician until they are ready to assume patient care
  - ☐ Be willing to accompany the receiving clinician to the hospital if the patient's condition warrants or the receiving clinician requests it
- ☐ ***Patients with suicidal ideation AND no attempt may be appropriate for BLS transport**

Documentation

- ☐ **Both clinicians will complete a Patient Care Report (PCR), detailing the care given to the patient while in their care**
- ☐ **The receiving clinician must briefly document patient care given prior to receiving the patient**

Monitoring of Medications and Procedures – 80.400

The Oregon Medical Board sets the Scope of Practice for EMS Clinicians on a statewide basis. An EMS Clinician's Medical Director authorizes practice at the local level based upon protocols, within the bounds established by the state Scope of Practice. No Medical Director or other physician may direct EMS Clinicians to exceed the Scope of Practice established by the Oregon Medical Board. An EMS Clinician may not monitor and/or administer medications or procedures outside of local protocols except as detailed below.

A. **AN EMS CLINICIAN MAY EXCEED THE BOUNDS OF LOCAL PROTOCOLS UNDER THE FOLLOWING CONDITIONS:**

1. Under direct supervision of a physician for a patient not transported.
2. Under the direct supervision of a physician who accompanies the patient during transport.
3. During an inter-facility hospital transfer subject to the conditions listed below.

B. If a physician requests that an EMS Clinician exceed the bounds of local protocols during an inter-facility hospital transfer, the following information must be collected prior to the start of the transport.

C. **INFUSION OR ADMINISTRATION OF A MEDICATION**

1. Written orders detailing ordering physician name, indication, dosage(s), and considerations for administration/monitoring (preferred) **OR** documentation of verbal orders with the same details.
2. Will patient safety be compromised if the infusion/administration is held for transport?
3. Any additional physician instructions related to patient monitoring due to the procedure.

D. **MONITORING OF A PROCEDURE**

1. Written orders detailing ordering physician name, indication, and considerations for monitoring (preferred) **OR** documentation of verbal orders with the same details.
2. Will patient safety be compromised if the procedure is held for transport?
3. Any additional physician instructions related to patient monitoring due to the procedure.

EMS Clinicians will document this information in the patient care report including the attachment of any written orders.

The EMS Clinician has the right to refuse the inter-facility transport of a patient receiving a medication or procedure that they reasonably believe falls outside of their training and/or clinical abilities.

Clackamas County EMS Operations

Universal Precautions:

- Use personal protective equipment. Gloves for all patient contact. Protective barriers to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply.
- Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices. Do not recap used needles. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant containers for disposal.
- Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood, body fluids containing visible blood, or other body fluids to which universal precautions apply.

Respiratory Precautions:

For any patient with fever and respiratory symptoms or other symptoms suggesting potentially contagious respiratory disease:

- Use personal protective equipment including gown, gloves, and N95 or better mask. Use eye protection if any chance of splash.
- Consider limiting exposure by decreasing the number of people who enter the area until a mask is on the patient. Until a mask is on the patient, personnel should attempt to maintain a distance of 3 - 6 feet from the patient.
- Place a surgical mask on the patient.
- When transporting patient, provide receiving hospital early warning that you are transporting a patient with a potentially contagious respiratory illness.
- Remove gloves and clean hands between patients after removing personal protective equipment.
- Clean and disinfect equipment including personal equipment such as stethoscopes between patients.

Opioid Withdrawal: Adult Medical Treatment Guideline– 90.200

Purpose: Can be utilized for patients experiencing opioid withdrawal symptoms and for patients recently administered naloxone, to treat withdrawal with **Buprenorphine** (Bup).

Assess opioid withdrawal signs/symptoms (should have multiple)

Objective Signs
- Tachycardia
- Diaphoresis
- Vomiting/Diarrhea
- Dilated Pupils
- Restlessness/Agitation
- Runny nose/Tearing
- Yawning
- Gooseflesh

Subjective Symptoms
- Nausea
- Stomach cramps
- Body aches
- Achy bones/joints
- Restlessness
- Nasal congestion
- Hot and Cold

↓

Assess for exclusion criteria
- **No opioid withdrawal signs/symptoms**
- Severe medical illness (sepsis, respiratory distress, etc.)
- Altered mental status and unable to consent or comprehend risks/benefits
- Under 18 years of age
- Any methadone within last 7 days

Exclusion criteria present?

No ↓

Check for COWS Score ≥ 8

No → Not eligible for EMS Bup

Yes ↓

1. Offer **Project Hope** Referral
2. Provide naloxone (if available)
3. Offer transport

Yes ↓

Offer Bup to treat withdrawal symptoms
(May contact Oregon Poison Center Bup physician for clinical support, if needed)

Declines →

Project Hope
Referral

Patient Agrees ↓

1. Give water to moisten mucous membranes
2. Administer 16mg Buprenorphine SL
3. Give 4-8mg ondansetron IV/PO PRN
4. Reassess COWS after 15 minutes

Symptoms improve →

1. Complete **Project Hope** Referral
2. Verify contact information for follow-up, two phone numbers are best
3. Repeat and document 2nd COWS score.
4. Recommend transport to ED for additional care and bridge prescription of buprenorphine
5. Inform the patient that a navigator will initiate contact within 72 hours.

If mod/severe symptoms persist/worsen ↓

Redose with 8 mg of Buprenorphine SL

Total maximum dose 24mg SL during encounter →

Clinical Opioid Withdrawal Scale (COWS)

Patient name: _____ **Opioid(s) last used:** _____ **Date & time opioid(s) last used:** _____	Date: Time:	Date: Time:	Date: Time:	Date: Time:
Resting Pulse Rate (bpm): *Measured after patient is sitting or lying for one minute* 0 pulse rate 80 or below 1 pulse rate 81-100 2 pulse rate 101-120 4 pulse rate greater than 120				
Sweating: *Over past ½ hour not accounted for by room temperature or patient activity.* 0 no report of chills or flushing 1 subjective report of chills or flushing 2 flushed or observable moistness on face 3 beads of sweat on brow or face 4 sweat streaming off face				
Restlessness: *Observation during assessmen*t 0 able to sit still 1 reports difficulty sitting still, but is able to do so 3 frequent shifting or extraneous movements of legs/arm 5 Unable to sit still for more than a few seconds				
Pupil size: 0 pupils pinned or normal size for room light 1 pupils possibly larger than normal for room light 2 pupils moderately dilated 5 pupils dilated, only the rim of iris visible				
Bone or Joint aches: *If patient was having pain previously, only the additional component is scored* 0 not present 1 mild diffuse discomfort 2 patient reports severe diffuse aching of joints/ muscles 4 patient is rubbing joints or muscles and is unable to sit still because of discomfort				
Runny nose or tearing: *Not accounted for by cold symptoms or allergies* 0 not present 1 nasal stuffiness or unusually moist eyes 2 nose running or tearing 4 nose constantly running or tears streaming down cheeks				
GI Upset: *Over last ½ hour* 0 no GI symptoms 1 stomach cramps 2 nausea or loose stool 3 vomiting or diarrhea 5 Multiple episodes of diarrhea or vomiting				
Tremor: *Observation of outstretched hands* 0 No tremor 1 tremor can be felt, but not observed 2 slight tremor observable 4 gross tremor or muscle twitching				
Yawning: *Observation during assessment* 0 no yawning 1 yawning once or twice during assessment 2 yawning $\geq$ 3 times during assessment 4 yawning several times/minute				
Anxiety or irritability: 0 none 1 patient reports increasing irritability or anxiousness 2 patient obviously irritable anxious 4 patient so irritable or anxious that participation in the assessment is difficult				
Gooseflesh skin: 0 skin is smooth 3 piloerection of skin can be felt, arm hairs standing up 5 prominent piloerection				
Total score (Please chart in nursing notes): Score: 5-12 = mild; 13-24 = moderate; 25-36 = moderately severe; greater than 36 = severe				
Initials:				

Transport by Fire Medic Unit – 90.300

PURPOSE:
Fire Medic Units licensed as ambulances by the state may transport patients in Clackamas County when:

- Providing service within their assigned ambulance service area
- Providing mutual aid
- Directed to transport during mass casualty incidents by incident command
- Requested by the County in the event of a sudden or anticipated loss of ambulance service caused by natural or man-made disaster or a work stoppage
- Requested by a transporting agency during inclement weather
- Criteria for the Fire Medic Unit Emergency Transport protocol are met

FIRE MEDIC UNIT EMERGENCY TRANSPORT PROTOCOL

After assessment, Fire Medic Units licensed as ambulances by the state may transport patients if **all** the following conditions are met:

1. The patient is ready to be transported, and
2. A Fire Medic Unit is on scene or can arrive more quickly than the responding ambulance as determined by the PSAP, and
3. In the best judgment of the paramedic, the patient needs **immediate** transport because of life threatening illness or injury requiring a critical hospital intervention. These include:
    - Inability to secure an adequate airway
    - Shock
    - Abnormal childbirth
    - Trauma system entry
    - Cardiac or respiratory arrest
    - Seizures unresponsive to treatment
    - Severe respiratory distress unresponsive to treatment

DOCUMENTATION AND COMMUNICATION

1. The PSAP will be notified of the transport.
2. A hard copy of the Patient Care Report will be left at the hospital.
3. The County EMS medical director and administrator will be notified of transports resulting from following the Emergency Transport protocol the next business day.

Special Studies

Prehospital Airway Control Trial (PACT) – 110.100

PURPOSE:
A stepped wedge, randomized, multi-center trial of prehospital trauma airway management comparing 24-hour survival following standard airway management compared to using a supraglottic airway on the first airway attempt.

INCLUSION CRITERIA:

Subjects must meet **ALL** the following:

- Transporting or intended transport to an enrolling LITES center (OHSU)
- Trauma requiring emergent airway (GCS < 8, SpO_2 < 90 despite supplemental oxygen, $EtCO_2$ > 60, or provider impression that the patient is unable to protect their airway)

EXCLUSION CRITERIA:

Subjects meeting **ANY** of the following:

- Known pregnancy
- Patients < 15 years of age
- Prisoners
- Initial advanced airway attempted by a non-PACT provider
- Caustic substance ingestion or airway burn
- Cardiac arrest without ROSC at the time of intervention

PROCEDURE:

A. Only patients entered into the trauma system with an intended destination of OHSU are eligible.
B. The first advanced airway attempt for patient's meeting the inclusion criteria will be whichever airway device the agency is currently randomized to.
C. If the first attempt is unsuccessful, all subsequent attempts can be any other airway device at the discretion of the paramedic.
D. Crews will follow all applicable protocols regarding induction and paralytic medications as well as for post intubation sedation and analgesia.
E. Consider placement of an appropriately sized orogastric tube to prevent gastric distention.
F. Key documentation points:
    1. All airway attempts and equipment used
    2. Use of oxygen, suctioning, adjuncts
    3. All medications
    4. Any complications/adverse events
    5. The Lot Number of the airway device (each agency will determine their own method for documenting the Lot Number)
    6. Notification of enrollment (each agency will determine their own process for this notification)

Prehospital Airway Control Trial (PACT) – 110.100

NOTES & PRECAUTIONS:

A. There is no limit to the number of ET, i-gel®, or King Airway® attempts. After one failed study arm airway attempt, paramedics are permitted to use any rescue airway technique available to them on scene. Each airway attempt must be documented in the prehospital care report.
B. An attempt is defined as:
    1. ET – blade is inserted into the mouth past teeth
    2. I-gel® or King Airway® passes the teeth
C. Once an agency is randomized to the supraglottic arm of the trial, they will stay on that arm for the remainder of the study.