METRO REGIONAL EMS CONSORTIUM

Marion County
Emergency Medical Services

PATIENT TREATMENT PROTOCOLS

2022

Introduction to Protocols

These patient care protocols will go into effect xx for EMRs, EMTs, and Paramedics of Salem Fire Department, Falck Northwest Ambulance, Keizer Fire District, Marion County Fire District #1, Santiam Ambulance, Stayton Fire District, Turner Fire District, Gates Fire District, Lyons Fire District, Mill City Fire District, Aumsville Fire District, Sublimity Fire District, Mt. Angel Fire District, Silverton Fire District, and Idenha Fire District.

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 On-Line Medical Control) 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.

Medical Director Signature and Name

HOSPITALS	ADDRESS	MAIN PHONE	ED PHONE	FAX NUMBER
Salem Hospital	890 Oak St SE Salem OR 97301	503-561-5200		503-814-1055
Santiam Hospital	1401 N 10th St Stayton OR 97383	503-769-2175	503-769-9256	503-769-4023
Legacy Silverton Hospital	342 Fairview St, Silverton, OR 97381	(503) 873-1500		
Good Sam Albany Hospital	1046 6th Ave SW Albany, OR 97321	541-812-4000		
Good Sam Regional Medical Center Corvalllis	3600 NW Samaritan Drive Corvallis, OR 97330	541-768-5111		
Samaritan Lebanon Community Hospital	525 Santiam Hwy SE, Lebanon, OR 97355	541-258-2101		
West Valley Hospital	525 SE Washington Street Dallas OR 97355	503-623-8301		
Providence Newberg Medical Center	1001 Providence Dr. Newberg. OR 97132	503-537-1555	503-537-1785	
Shriners Hospital for Children -Portland	3101 SW Sam Jackson Park Rd Portland OR 97239	503-241-5090		
Legacy Emanuel	2801 N. Gantenbein Ave. Portland OR 97227	503-413-2200	503-413-4121	
Randall Children's Hospital at Legacy Emanuel	2801 N. Gantenbein Ave. Portland OR 97227	503-276-6500		
OHSU ED	3181 SW Sam Jackson Park Rd Portland OR 97239	503-494-4036	503-494-7551	
VA Portland ED	3710 SW US Veterans Hospital Rd, Portland, OR 97239		503-721-7803	
Willamette Valley Medical Center	2700 SE Stratus Ave. McMinnville OR 97128	503-472-6131		
Kaiser Sunnyside	10180 Sunnyside Rd Clackamas OR 97015	503-813-2000	503-571-9516	
Legacy Meridian Park	19300 S.W. 65th Ave. Tualatin Oregon 97062	503-692-1212	503-692-7467	
Portland Adventist Medical Center ED	10300 SE Main St Portland OR 97216	503-251-6168	503-257-2500	
Providence St Vincent ED	9205 SW Barnes Rd. Portland OR 97225	503-216-1234	503-216-2444	
Providence Willamette Falls ED	1500 Division St Oregon City 97045	503-656-1631	503-657-6702	
Mckenzie Willamette Medical Center	1460 G Street Springfield OR 97477	541-726-4400		
Sacred Heart University District	1255 Hilyard Street Eugene OR 97401	541-686-7300		
Saint Charles Bend	1253 NE Neff Rd Bend OR 97701	541-382-4321		

Table of Contents

Table of Contents

Treatment – 10.000 (Continued)

Medications – 20.000

Table of Contents

Medications – 20.000 (Continued)

Table of Contents

Procedures – 30.000

Table of Contents

Scope of Practice

Medical Control for Medications and Procedures

• Scope of Practice (OAR Div 35. 847-035-0030) – 00.010

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. Prepare and administer naloxone via intranasal device or auto-injector for suspected opioid overdose;
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) – 00.010

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 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 nitroglycerine 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 COVID-19 Immunizations:
    1. According to the CDC Advisory Committee on Immunization Practices (ACIP) and/or the Oregon State Public Health Officer's recommended immunization guidelines;
    2. As directed by the agency's supervising physician's standing order;
    3. Under the direction of their supervising physician; and
    4. Prior to vaccine administration, the EMT must be trained by the supervising physician or their designee. The EMT and the EMS agency or employer must maintain records of training.

• Scope of Practice (OAR Div 35. 847-035-0030) – 00.010

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;
        b. Ipratropium bromide;
    6. Vasodilators: nitroglycerine;
    7. Opioid antagonists: naloxone;
    8. Isotonic crystalloid solutions.

• Scope of Practice (OAR Div 35. 847-035-0030) – 00.010

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. 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;
D. 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;
E. Distribute medications at the direction of the Oregon State Public Health Officer as a component of a mass distribution effort;
F. Prepare and administer routine or emergency immunizations and tuberculosis skin testing, as part of an EMS Agency's occupational health program, to the EMT-Intermediate's EMS agency personnel, under the supervising physician's standing order;
G. Insert an orogastric tube;
H. 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;
I. Perform electrocardiographic rhythm interpretation; and
J. Perform cardiac defibrillation with a manual defibrillator.

• Scope of Practice (OAR Div 35. 847-035-0030) – 00.010

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'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
- 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®)
- Hydroxocobalamin (Cyanokit®)
- IV solutions
- Ibuprofen
- Ipratropium Bromide (Atrovent®)
- Ketamine Hydrochloride
- Ketorolac Tromethamine (Toradol®)
- Lidocaine
- Magnesium Sulfate (wide complex irregular tachycardia/torsades and adult asthma)
- Midazolam (Versed®)
- Morphine Sulfate
- Naloxone (Narcan®)
- Nitroglycerin
- Norepinephrine (Levophed®)
- Olanzapine (Zyprexa®)
- Ondansetron (Zofran®)
- Oxygen
- Oxymetazoline Hydrochloride (Afrin®)
- Pralidoxime (Protopam® / 2-PAM®)

Medical Control for Medications & Procedures – 00.040

Drugs – Category A (continued):

- Proparacaine (Alcaine®)
- Rocuronium (Zemuron®)
- Sodium Bicarbonate
- Succinylcholine
- Tranexamic Acid (TXA)
- Vecuronium (Norcuron®)
- Ziprasidone (Geodon®)

Procedures – Category A:

- Combitube
- Chemical patient restraint
- Defibrillation in cardiac arrest
- End-tidal CO_2 monitoring
- Endotracheal intubation
- Endotracheal intubation with paralytics
- 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
- 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
- Positive end-expiratory pressure (PEEP)
- Sports equipment removal
- Suctioning
- Synchronized cardioversion
    - Unstable V-Tachycardia, OR
    - SVT, unstable patient
- Taser barb removal
- Tension pneumothorax decompression
- Tourniquet placement
- Transcutaneous pacing

Medical Control for Medications & Procedures – 00.040

Procedures – Category A (continued):

- Ventilator management
- XSTAT

The following drugs and procedures are considered **CATEGORY B** and require On-line Medical Control 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)
- Magnesium Sulfate (pediatric asthma **OR** seizures in eclampsia/pre-eclampsia)
- Sodium Thiosulfate 25%

Procedures – Category B:

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

Treatment

TREATMENT:

A. Assess scene safety and use appropriate personal protective equipment.
B. Begin initial patient assessment and determine chief complaint.
C. Monitor blood pressure, heart rate, respiratory rate, and SpO_2. Repeat the BP manually if the NIBP seems inaccurate.
D. Secure airway and start oxygen as needed to maintain oxygen saturation of ≥ 94% per Airway Management protocol.
E. Monitor ECG, $EtCO_2$ and obtain CBG readings as appropriate.
F. Establish vascular access (IV or IO) as appropriate for patient's condition.
G. Obtain pain severity scale if applicable.
H. Follow appropriate Treatment protocol if patient's chief complaint or assessment findings change.

KEY CONSIDERATIONS:

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.

TREATMENT:

A. Treat per Universal Patient Care.
B. Place patient in a position of comfort.
C. If systolic blood pressure is < 90 mmHg systolic, follow Shock protocol and initiate rapid transport.
    1. If traumatic injury is suspected, enter patient into Trauma System.
    2. If patient has a suspected abdominal aortic aneurysm, titrate IV to maintain systolic blood pressure of 90 mmHg.
D. Avoid having the patient eat or drink.
E. Treat pain per Pain Management protocol.

PEDIATRIC PATIENTS:

A. Consider non-accidental trauma.
B. Closely monitor vital signs; blood pressure may drop quickly.
C. 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:

A. Abdominal pain may be the first sign of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscous, etc.).
B. Since the bleeding is not apparent, you must think of volume depletion and monitor the patient closely for signs of shock.
C. 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.

KEY CONSIDERATIONS:

Inferior MI, ectopic pregnancy, abdominal aortic aneurysm, recent trauma, perforated viscous, emesis type and amount, last meal, bowel movements, urinary output, ruptured spleen or liver, GI bleed, abnormal vaginal bleeding

TREATMENT:

A. Treat per Universal Patient Care protocol.
B. Treat underlying cause if known.
C. Determine Capillary Blood Glucose level:
    1. If CBG > 400 mg% or if glucometer reads “HIGH”, treat per Diabetic Emergencies protocol.
    2. If CBG < 60 mg%, or < 80 mg% in a known diabetic patient:
        a. If patient can protect their own airway, give oral glucose.
        b. 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
    3. Check CBG after 5 minutes and repeat treatment if blood sugar remains low and patient remains symptomatic.
    4. If no IV can be established, give glucagon 1 mg IM.
    5. Refer to the Diabetic Emergencies protocol in patients who refuse transport.
D. If opiate intoxication suspected:
    1. Administer naloxone 0.5 mg IV. Dose may be repeated every 2 minutes up to 2 mg titrating to respiratory rate. If no improvement and opiate intoxication is still suspected, repeat naloxone 2 mg every 3 - 5 minutes up to a maximum of 8 mg total.
    2. If no IV, give naloxone 2 mg IM/IN every 3 - 5 minutes up to 8 mg.
E. If patient is combative, consider sedation per Patient Restraint Protocol.

NOTES & PRECAUTIONS:

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

KEY CONSIDERATIONS:

Hypoxia, trauma, CNS (stroke, tumor, seizure, infection), cardiac (MI, CHF), infection, thyroid (hyper or hypo), shock (septic, metabolic, traumatic), toxicological (carbon monoxide, cyanide), acidosis/alkalosis, heat stroke or hypothermia, electrolyte abnormality

PEDIATRIC MEDICATIONS:

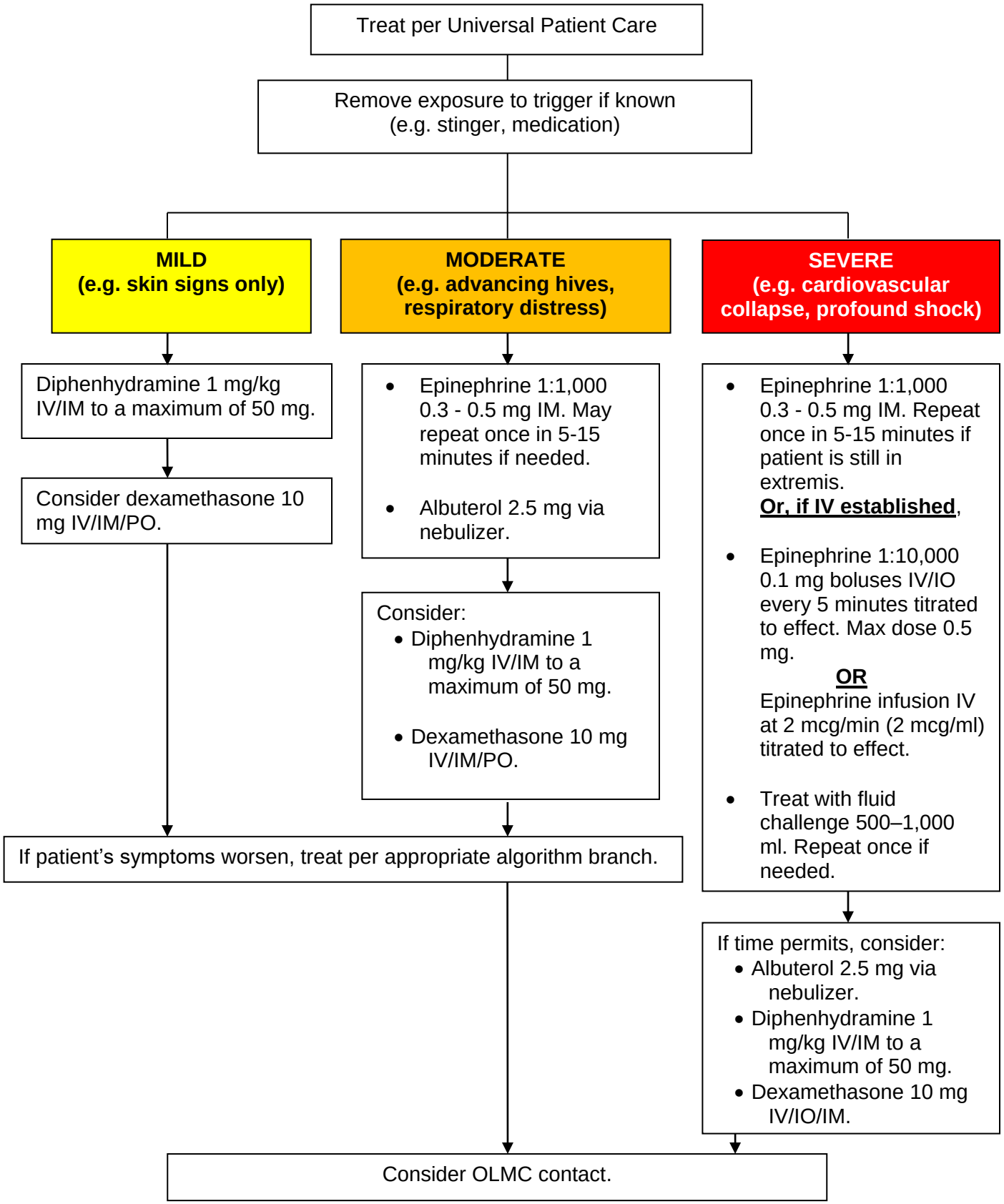
A. Dextrose – For infants < 10 kg (birth to 1 year) with CBG < 40 mg% and children 10 kg – 35 kg with CBG < 60 mg% give:
- Dextrose 10%, 5 ml/kg by infusion not to exceed 250 ml total.
  (Note: for D10% each 10 ml = 1 gram of dextrose)

Or (if diluting D50)
- Dextrose 12.5%, 4 ml/kg by infusion not to exceed 200 ml total.

B. Glucagon: 0.02 mg/kg IM to a maximum of 1 mg.

C. Naloxone: 0.1 mg/kg IV/IM/IN up to 2.0 mg per dose. May repeat q 3-5 minutes up to 2 mg per dose. Max total dose 8 mg. Do not use in neonates.

Anaphylaxis and Allergic Reaction – 10.030



Anaphylaxis and Allergic Reaction – 10.030

PEDIATRICS:

Treat per Universal Patient Care

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

MILD (e.g. skin signs only)

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

Consider dexamethasone 0.6 mg/kg IV/IM/PO to a maximum of 10 mg.

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

- Epinephrine 1:1,000 0.01 mg/kg IM to a max of 0.5 mg. 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 0.6 mg/kg IV/IM/PO to a maximum of 10 mg.

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

- Epinephrine 1:1,000 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 minutes titrated to effect. Max dose 0.5 mg.

OR

Epinephrine infusion IV at 0.01 mcg/kg/min (2 mcg/ml) titrated to effect.

- Treat with fluid challenge 20 ml/kg.

If time permits, consider:

- Albuterol 2.5 mg via nebulizer.
- Diphenhydramine 1 mg/kg IV/IM to a maximum of 50 mg.
- Dexamethasone 0.6 mg/kg IV/IO/IM/PO to a maximum of 10 mg.

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

Consider OLMC Contact.

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.

NOTES & PRECAUTIONS:

A. Preferred location for IM administration is the mid-anterolateral aspect of thigh.
B. Common side effects of epinephrine include anxiety, tremor, palpitations, tachycardia, and headache.
C. If epinephrine is ineffective in treating anaphylaxis in patients with beta-blockade, both glucagon administration (OLMC contact required) 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:

A. Cyanosis or pallor
B. Absent, decreased, or irregular breathing
C. Marked change in muscle tone (hypertonia or hypotonia)
D. Altered level of responsiveness

Patient must appear well and be at baseline health.

TREATMENT:

A. Follow appropriate airway and/or respiratory protocols.
B. 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.
C. Obtain and document description of event including symptoms, inciting event, and any resuscitation attempts before EMS arrival.
D. Obtain vital signs.
E. Place on cardiac monitor and follow dysrhythmia protocol as needed.
F. Assess blood glucose.
G. Transport via ALS to an emergency department even if the infant currently appears in no distress.
H. Contact OLMC if parents or caregivers cannot be convinced to take the ambulance to the ED for evaluation.

NOTES & PRECAUTIONS:

A. 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.
B. Many infants appear normal by the time EMS arrives.
C. Consider non-accidental trauma.
D. Serious underlying causes can include pneumonia, bronchiolitis, seizures, sepsis, intracranial hemorrhage, and meningitis.
E. BRUEs are more frequent in premature infants and infants with other health conditions such as cystic fibrosis, bronchiolitis, and congenital heart disease.

TREATMENT:

A. Treat per Universal Patient Care.
B. If systolic BP < 90 mmHg follow Shock protocol, otherwise follow initial fluid administration rate as below.
C. Remove jewelry and clothing that is smoldering or non-adherent to the patient.
D. Burn Classifications:
    1. Superficial thickness: Epidermis only and looks like a sunburn. The skin is erythematous and mildly painful.
    2. Partial thickness (superficial): Beyond the epidermis to include the superficial dermis. These burns can have blisters.
    3. Partial thickness (deep): Beyond the superficial dermis to include the deep dermis.
    4. Full thickness: Burn involves all layers of the skin and subcutaneous tissue, with involvement of underlying fascia.
F. Determine Total Body Surface Area (TBSA) involved utilizing either the rule of nines or palm method. (**Do not include superficial thickness burns in TBSA**)
G. If the patient has the following, transport to the Burn Center:
    1. Partial thickness burn that is 10% or more of total body surface area.
    2. Full thickness burns.
    3. Burns with inhalation injuries.
    4. Chemical burns.
    5. Electrical burns, including lightning injury.
    6. Burns to face, hands, feet, genitalia, perineum, major joints, or circumferential burns.
    7. Burns in high-risk patients (pediatrics, elderly, significant underlying cardiac or respiratory problems).
    8. Trauma system patients with burns meeting the above criteria.
H. Airway consideration in the burn and inhalation injury patient.
    1. Signs such as singed nasal hairs and facial burns alone are not indications for intubation.
    2. Mild inhalation injuries in patients with normal oxygen saturations and no signs of respiratory distress can be safely observed.
    3. Indications for early intubation:
        a. Signs of respiratory distress, stridor, accessory muscle use
        b. New onset of hoarseness
        c. Blisters or edema of oropharynx
        d. Deep burns to lower face or neck
I. Cool burned areas (no more than 5 minutes) then cover with clean, warm, and dry sheet or blanket. Discontinue cooling if patient begins to shiver. Attempt to leave unbroken blisters intact.
J. Wound care
    1. Transport using clean, dry sheets or blankets
    2. Do not wrap extremities individually
    3. Do not use products such as Silvadene or burn gel
    4. Do not pack burns with wet towels or do saline soaks
K. Treat pain per Pain Management protocol.

L. Fluid Administration (Ringers Lactate if available). These rates are for patients not in shock.
   1. Initial Fluid Rate:
      a. ≤ 5 years old @ 125 ml/hr
      b. 6-13 years of age @ 250 ml/hr
      c. ≥ 14 years old @ 500 ml/hr
   2. Burns greater than 20% TBSA should have 2 large bore IV's.

M. Apply carbon monoxide (e.g. Rad-57) monitor if available.

N. If chemical burn:
   1. Consider Haz-Mat response.
   2. Protect yourself from contamination. (See Decontamination protocol)
   3. Flush contaminated areas with copious amounts of water.
   4. If chemical is dry, carefully brush off prior to flushing.
   5. Do not use a neutralizer.

O. If electrical burn:
   1. Apply sterile dressings to entry and exit wounds. As with other injuries, keep clean, warm, and dry.
   2. Treat any dysrhythmias per appropriate Cardiac Dysrhythmia protocol.
   3. Electrical injuries have a risk for rhabdomyolysis so early fluid infusion is important
   4. Specify arc flash or contact and voltage if known.

P. 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:
   1. Hydroxocobalamin (CYANOKIT®) 5 g IV/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. Do NOT administer Hydroxocobalamin (CYANOKIT®) and Sodium Thiosulfate to the same patient.
   3. Treat other presenting symptoms per appropriate protocol.
   4. Initiate emergent transport to appropriate facility.
   5. Make sure to notify receiving facility if either Hydroxocobalamin or Sodium Thiosulfate are administered due to changes in urine and blood color

PEDIATRIC PATIENTS:

A. Treat pain per Pain Management protocol.

B. Consider possibility of non-accidental cause in children.

C. Hydroxocobalamin dose for pediatric patients is 70 mg/kg IV/IO over 15 minutes. Do not exceed adult dosing. For cardiac arrest, hydroxocobalamin should be administered as a rapid fluid bolus. Contact OLMC for advice regarding second dose.

D. 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.

Burns – 10.040

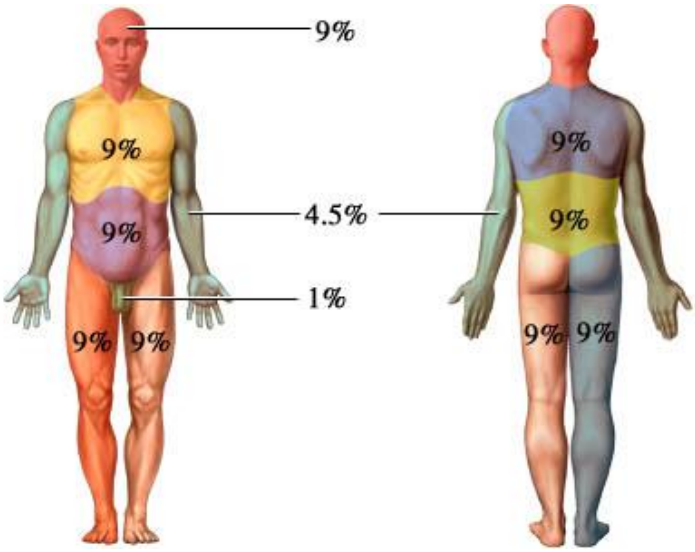
NOTES & PRECAUTIONS:

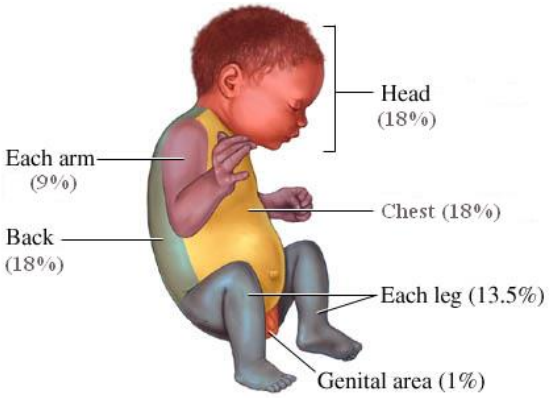
A. Remove rings or other constricting items immediately.
B. Be prepared to use RSI early to control airway if necessary.
C. Maintaining the patient's core body temperature is a priority. EMS transport vehicles should be warmed, and the patient should be covered to prevent hypothermia.
D. For firefighters, consider the potential for other traumatic injury or MI.

KEY CONSIDERATIONS:

Enclosed space, lung sounds, possibility of inhaled toxins, past medical history, CO/Cyanide poisoning, evidence of respiratory burns, extent of burns, explosion or trauma injuries

RULE OF NINES:





PALM METHOD:

The size of the **patient's hand**, including the fingers, represents approximately 1% of his /her total body surface area

Cardiac Arrest (AED/CPR) – 10.050

CPR GUIDELINES			
Component	Adults and Adolescents	Child 1 year to puberty	Infant Under 1 year of age, 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 3-5 seconds (12 to 20 breaths/min) (Approximate)	
Breathing: CPR with advanced airway	One breath every 6 seconds (10 breaths/min) asynchronous with chest compressions. About 1 sec/breath. Visible chest rise. (If using a BVM with ventilation rate timer, follow timing light). Optional method, 30:2 compression-ventilation ratio with advanced airway		
Foreign Body – Conscious pt	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 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. (Approx 2” in child and 1 ½” in infant)	
Compression rate	100 - 120 per minute		
Compression-ventilation ratio w/o advanced airway	30:2 10:1 with continuous compressions	30:2 (single rescuer) 15:2 (two rescuers)	
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 30 DAYS OLD)			
Assisted ventilation 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 be 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.			

Cardiac Arrest Guidelines – 10.050

PURPOSE:
To establish general guidelines for the management of cardiac arrest patients.

INDICATIONS:
Cardiac Arrest

TREATMENT:

A. Cardiac arrest rhythms frequently change. If, or when, there is a change in the rhythm, move to the appropriate algorithm.
B. Use a Pit-Crew Approach to assign responders to designated positions.
C. Initiate and maintain high quality chest compressions with limited interruptions (< 10 seconds).
D. There should be no interruptions to CPR when securing a patient's airway. Once secured, ventilation rate should be 8 – 10 breaths per minute. Consider early use of a supraglottic airway to minimize CPR interruptions or when ALS resources are limited.
E. If a mechanical CPR device is available, avoid extra or prolonged pauses in CPR when applying.
F. Preferred order of vascular access in adults is upper extremity IV (or external jugular vein), upper extremity IO, then lower extremity IO. Preferred access site for pediatric patients is the proximal tibia or the distal femur. Humeral IO is **NOT** recommended for infants and toddlers.
G. Early epinephrine administration is associated with improved patient outcomes.
    1. 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.
    2. For shockable rhythms, administer epinephrine as soon as feasible after second defibrillation attempt has failed.
H. If patient has return of spontaneous circulation, reassess vital signs to ensure stability before packaging for transport. Follow the Cardiac Arrest Post Resuscitation protocol to include targeted temperature management, obtaining a 12-lead ECG, and managing blood pressure.
I. In general, continue resuscitation for a minimum of 30 minutes. Cardiac arrests are best run at location the patient is found until ROSC or until resuscitation attempts cease. Patient movement and transport is associated with low quality compressions unless a mechanical CPR device is available.
J. 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:
    1. Up to 2.5 mg of midazolam IV/IO and 50 mcg of fentanyl IV/IO.
    2. May repeat as needed every 5 – 10 minutes.
K. Refer to the individual algorithms for rhythm specific key considerations.

Cardiac Arrest (Asystole) – 10.050

TREATMENT:

FLOW OF ALGORITHM ASSUMES ASYSTOLE IS CONTINUING

If the heart rhythm changes move to the appropriate algorithm. Interruptions to CPR should be avoided (less than 10 seconds)

Start or continue CPR until monitor and defibrillator pads are attached

↓

Assess heart rhythm
1:10,000 Epinephrine 1 mg IV/IO
Continue CPR for two minutes

↓

If asystole persists, continue two-minute cycles of CPR and rhythm analysis
Continue 1:10,000 Epinephrine 1 mg IV/IO every 3-5 minutes

PEDIATRIC PATIENTS:

A. Follow adult algorithm.
B. Epinephrine 1:10,000 dose - 0.01 mg/kg IV/IO as soon as possible after cardiac arrest is recognized. Repeat every 3-5 minutes.

NOTES & PRECAUTIONS:

A. If unwitnessed arrest and no obvious signs of death, proceed with resuscitation and get further information from family/bystanders.
B. For patients in whom only 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.
C. If cause of arrest is suspected to be hyperkalemia, consider calcium gluconate 3 grams IV/IO.
D. Sodium bicarbonate is not recommended for the routine cardiac arrest sequence but should be used early in cardiac arrest of known cyclic antidepressant overdose or in patients with suspected hyperkalemia. It may also be considered after prolonged arrest. If used:
    a. Administer 1 mEq/kg IV/IO.
    b. May be repeated at 0.5 mEq/kg every 10 minutes.

KEY CONSIDERATIONS:

Consider and treat possible causes:

- Acidosis - Sodium bicarbonate 1 mEq/kg IV/IO.
- Cardiac tamponade – Initiate rapid transport.
- Hyperkalemia – Treat with calcium gluconate 3 grams IV/IO and sodium bicarbonate 1 mEq/kg IV/IO.

- Hypothermia – Treat per Hypothermia protocol.
- Hypovolemia – Treat with up to 2000 ml of a crystalloid solution.
- Hypoxia/Hypoventilation – Oxygenate and provide normal ventilation. Avoid hypo and hyperventilation.
- Pulmonary embolus – Initiate rapid transport.
- Tension pneumothorax – Needle decompression.
- Tri-cyclic antidepressant overdose – Sodium bicarbonate 1 mEq/kg IV/IO.

Cardiac Arrest (PEA) – 10.050

TREATMENT:

FLOW OF ALGORITHM ASSUMES PEA IS CONTINUING

If the heart rhythm changes move to the appropriate algorithm.
Interruptions to CPR should be avoided (less than 10 seconds)

Start or continue CPR until monitor and defibrillator pads are attached

↓

Assess heart rhythm
1:10,000 Epinephrine 1 mg IV/IO
Continue CPR for two minutes

↓

If PEA persists, continue two-minute cycles of CPR and rhythm analysis
Continue 1:10,000 Epinephrine 1 mg IV/IO every 3-5 minutes

↓

Administer up to 2000 ml of a crystalloid solution

PEDIATRIC PATIENTS:

A. Follow adult algorithm.
B. Epinephrine 1:10,000 dose - 0.01 mg/kg IV/IO as soon as possible after cardiac arrest is recognized. Repeat every 3-5 minutes.
C. Administer fluid boluses of 10-20 ml/kg.

NOTES & PRECAUTIONS:

A. SURVIVAL FROM PEA is based on identifying and correcting the responsible factors: consider a broad differential diagnosis, with early and aggressive treatment of possible causes. **(See Key Considerations)**
B. Death in the field may be determined with $EtCO_2$ of 10 or less in patients with PEA after 30 minutes of attempted ACLS resuscitation. For patients with $EtCO_2$ greater than 10, either continue resuscitation or contact OLMC to stop resuscitation.
C. If cause of arrest is suspected to be hyperkalemia, consider calcium gluconate 3 grams IV/IO.
D. Sodium bicarbonate is not recommended for the routine cardiac arrest sequence but should be used early in cardiac arrest of known cyclic antidepressant overdose or in patients with suspected hyperkalemia. It may also be considered after prolonged arrest. If used:
    a. Administer 1 mEq/kg IV/IO.
    b. May be repeated at 0.5 mEq/kg every 10 minutes.

Cardiac Arrest (PEA) – 10.050

KEY CONSIDERATIONS:

Consider and treat possible causes:

- Acidosis - Sodium bicarbonate 1 mEq/kg IV/IO.
- Cardiac tamponade – Initiate rapid transport.
- Hyperkalemia – Treat with calcium gluconate 3 grams IV/IO and sodium bicarbonate 1 mEq/kg IV/IO.
- Hypothermia – Treat per Hypothermia protocol.
- Hypovolemia – Treat with up to 2000 ml of a crystalloid solution.
- Hypoxia/Hypoventilation – Oxygenate and provide normal ventilation. Avoid hypo and hyperventilation.
- Pulmonary embolus – Initiate rapid transport.
- Tension pneumothorax – Needle decompression.
- Tri-cyclic antidepressant overdose – Sodium bicarbonate 1 mEq/kg IV/IO.

Cardiac Arrest (V-Fib / Pulseless VT) – 10.050

TREATMENT:

FLOW OF ALGORITHM ASSUMES VF/VT IS CONTINUING

If the heart rhythm changes move to the appropriate algorithm. Interruptions to CPR should be avoided (less than 10 seconds).

Start or continue CPR until monitor and defibrillator pads are attached

↓

Assess heart rhythm
Defibrillate

↓

Immediately continue CPR for two minutes
Establish IV/IO access

↓

Assess heart rhythm
1:10,000 Epinephrine 1 mg IV/IO
Defibrillate

↓

Immediately continue CPR for two minutes

↓

Assess heart rhythm
Amiodarone 300 mg IV/IO or Lidocaine 1.5 mg/kg IV/IO
Defibrillate

↓

Immediately continue CPR for two minutes

↓

Assess heart rhythm
1:10,000 Epinephrine 1 mg IV/IO
Defibrillate

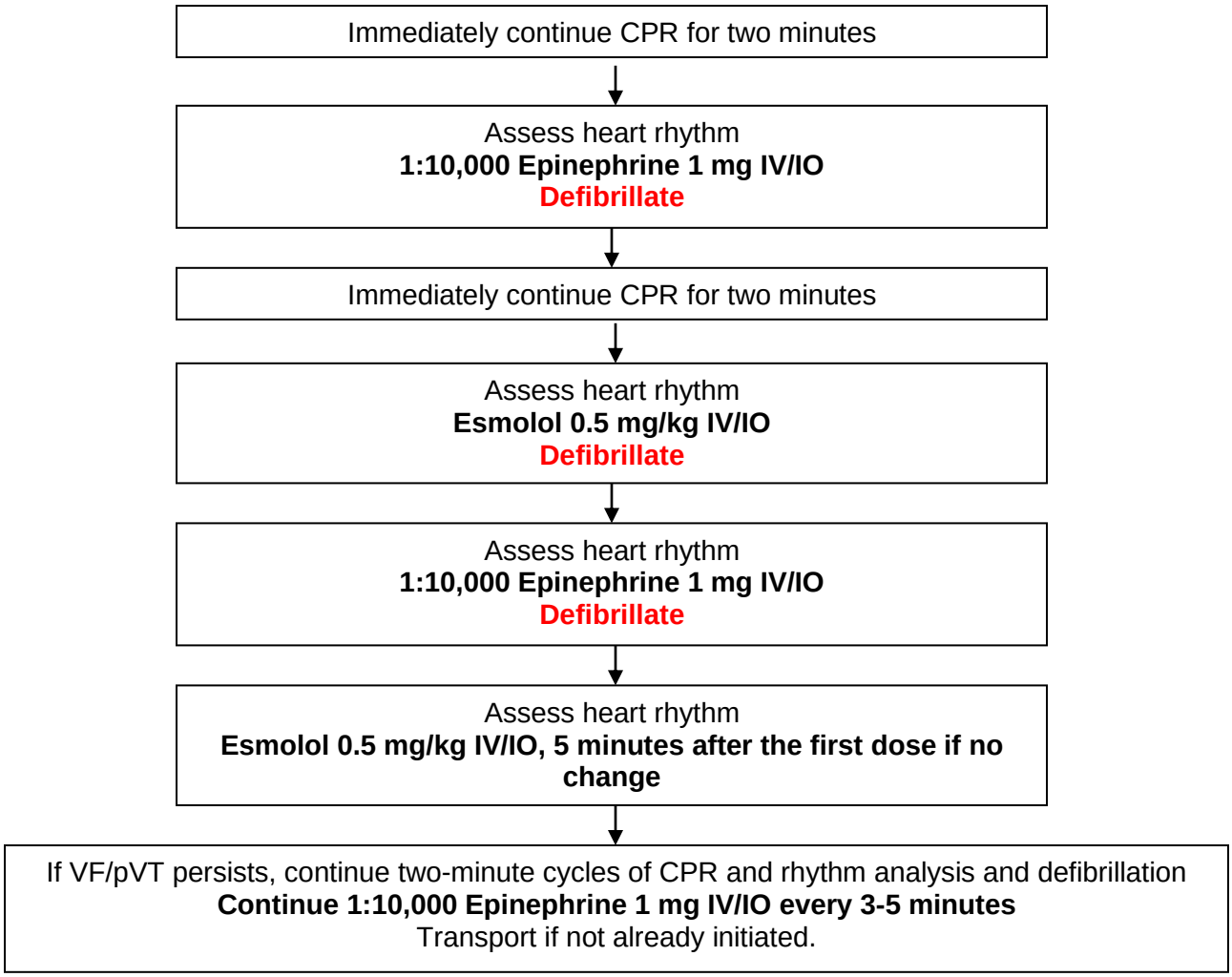
↓

Immediately continue CPR for two minutes

↓

Assess heart rhythm
Amiodarone 150 mg IV/IO (If Amiodarone was first anti-dysrhythmic) or Lidocaine 1.5 mg/kg IV/IO (if Lidocaine was first anti-dysrhythmic)
Defibrillate

Cardiac Arrest (V-Fib / Pulseless VT) – 10.050



PEDIATRIC PATIENTS:

Follow adult algorithm flow. Use the following dosing:

- Defibrillation:
  4j/kg

- Drugs:
  1. Epinephrine – 1:10,000 – 0.01 mg/kg IV/IO
  2. Amiodarone – 5 mg/kg IV/IO. May repeat once with 2.5 mg/kg IV/IO.
  3. Lidocaine – Follow adult dosing.
  4. Sodium bicarbonate - Follow adult dosing. For children less than 10 kg (1 yr.), dilute by one-half with normal saline prior to administration.

- Induced Hypothermia – Patients ≥ 13 years old after successful return of spontaneous circulation. Follow Induced Hypothermia protocol.

Cardiac Arrest (V-Fib / Pulseless VT) – 10.050

NOTES & PRECAUTIONS:

A. If persistent/refractory VF/Pulseless VT, consider early transport, especially if mechanical CPR is available.
B. If patient remains in persistent VF/Pulseless VT (greater than three consecutive shocks) reposition defibrillation pads to either anterior/posterior or anterior/lateral depending on initial placement.
C. If cause of arrest is suspected to be hyperkalemia, consider calcium gluconate 3 grams IV/IO.
D. Sodium bicarbonate is not recommended for the routine cardiac arrest sequence but should be used early in cardiac arrest of known cyclic antidepressant overdose or in patients with suspected hyperkalemia. It may also be considered after prolonged arrest. If used:
    1. Administer 1 mEq/kg IV/IO.
    2. May be repeated at 0.5 mEq/kg every 10 minutes.

CARDIAC MONITOR JOULE SETTINGS:

Stryker-Physio Control LP15® – 360j all shocks.

Philips Heartstart MRX® – 150j – 200j all shocks **(Follow local agency guidelines)**

Zoll E/X-Series® – 120j, 150j, 200j, and then repeat at 200j as needed.

Cardiac Arrest (Trauma) – 10.050

PURPOSE: Unwitnessed traumatic arrest is almost uniformly fatal while EMS witnessed arrest due to severe hypovolemia, hypoxia, or tension pneumothorax may respond to prehospital resuscitation. The purpose of this protocol is to determine when someone should have an attempt at resuscitation when in traumatic arrest.

DEFINITIONS:

A. Traumatic arrest: Loss of pulses and apnea secondary to trauma, not attributable to medical causes.
B. **HAT** Resuscitation: Treatable causes of witnessed traumatic arrest.
   Hypovolemia:
   - Control external bleeding
   - If blunt trauma, apply pelvic binder/wrap
   - Administer 1000 ml of Normal Saline or Lactated Ringers

   Airway/Oxygenation:
   - Ensure airway patency and effective oxygenation

   Tension Pneumothorax:
   - Perform bilateral needle chest decompression

PROCEDURE:

A. Trauma patients who are pulseless and apneic on EMS arrival are considered dead in the field per the Death and Dying protocol (50.025) unless there are extenuating circumstances (e.g. hypothermia, possible medical cause).
B. For patients found in VF or Pulseless VT on EMS arrival, suspect a medical event and treat per the VF/pulseless VT protocol.
C. For patients who deteriorate to PEA or asystole on scene, begin HAT resuscitation:
   1. If ROSC is obtained, transport.
   2. If ROSC is not achieved, you may declare the patient dead or contact OLMC for guidance.
D. For patients who arrest during transport, initiate HAT resuscitation and:
   1. If within 15 minutes of a trauma center, continue to the trauma center.
   2. 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 AND PRECAUTIONS:

A. 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.
B. 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.
C. 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.
D. Post-ROSC cooling in the traumatic arrest patient should be deferred to the hospital.

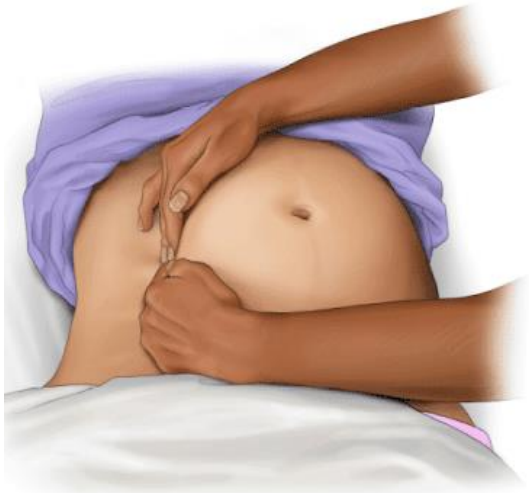
Cardiac Arrest with Pregnancy (> 22 weeks) – 10.050

TREATMENT:

Manage rhythm per appropriate cardiac arrest algorithm (V-Fib/Pulseless VT, PEA, Asystole)

↓

CPR with continuous manual left lateral uterine displacement using the two-handed method shown below (see Note G).



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.

Cardiac Arrest with Pregnancy (> 22 weeks) – 10.050

NOTES & PRECAUTIONS:

A. Consider early transport prior to achieving ROSC, especially if a mechanical CPR device is available.
B. Alert the receiving facility early in order 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.
C. If ROSC has been achieved and maintained prior to, or during transport, bypass to an OB and NICU capable facility.
D. Lidocaine is preferable (Class B in Pregnancy) to amiodarone (Class C in Pregnancy) in the setting of ventricular fibrillation or pulseless ventricular tachycardia.
E. 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.
F. 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.
G. 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.
H. High flow oxygen needs to be maintained in all peri-arrest patients.
I. Consider OG placement when possible.

Cardiac Arrest Post Resuscitation – 10.050

TREATMENT CHECKLIST:

Airway

- ☐ Airway secured with ETT or supraglottic device (If no airway prior to ROSC, follow standard RSI procedures as appropriate)
- ☐ Titrate oxygen to SPO2 ≥ 95%
- ☐ Ventilate patient to EtCO2 of 35-45 mmHg-**Do not hyperventilate**

Vital Signs

- ☐ Place patient on SPO2 monitor
- ☐ Obtain manual blood pressure and MAP
- ☐ Monitor ETCO2 (35-45 mmHg)
- ☐ Obtain 12-lead – If patient meets criteria, call for STEMI Activation

Package Patient for Transport

Ongoing Care

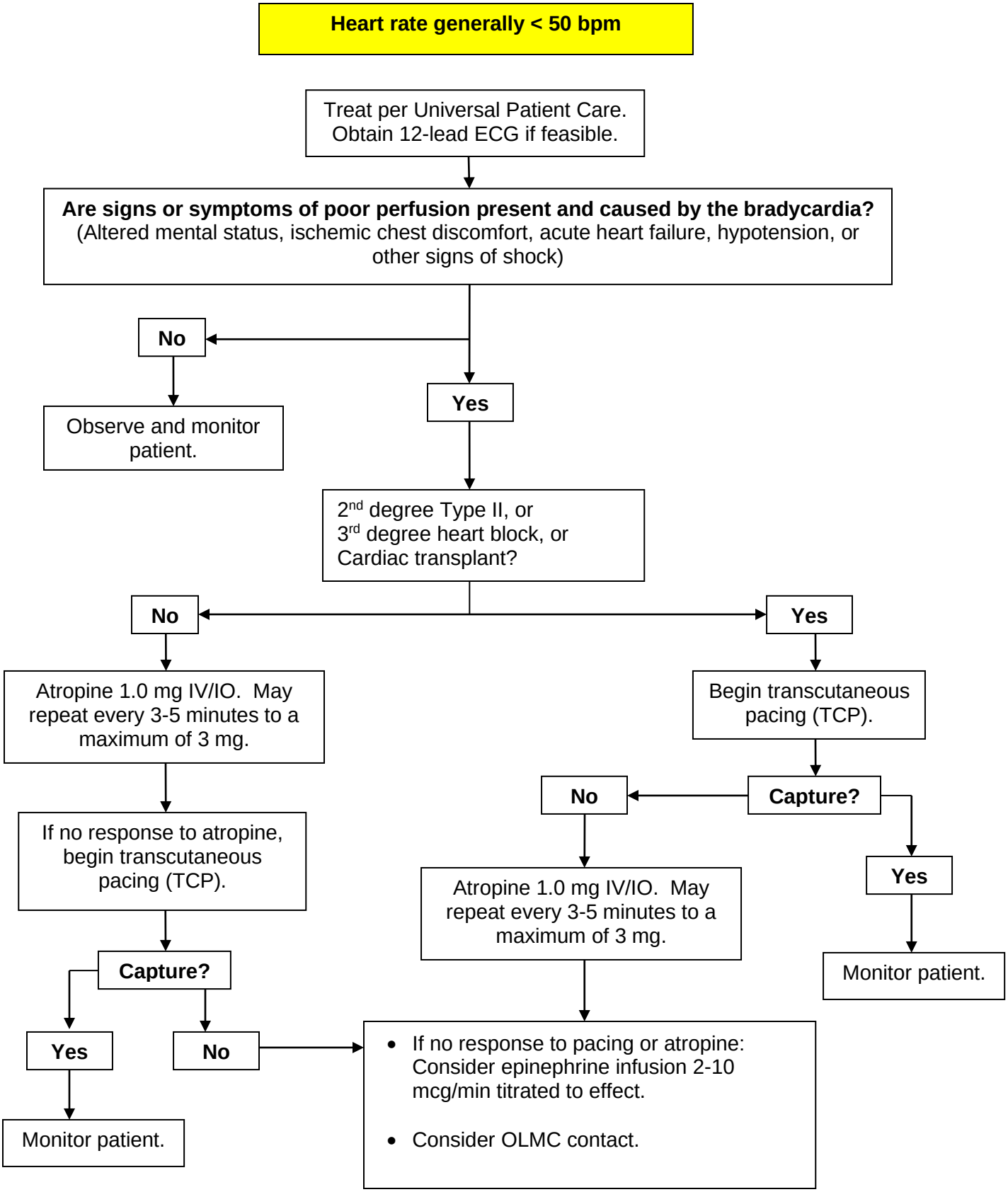
- ☐ If no anti-dysrhythmic given *before* ROSC in v-fib/v-tach arrest, administer Lidocaine 1.5 mg/kg IV/IO
- ☐ If amiodarone last anti-dysrhythmic given, re-dose 30 minutes after ROSC: 150 mg over 10 minutes
- ☐ If lidocaine was last anti-dysrhythmic given re-dose 0.75mg/kg every 10 minutes
- ☐ Maintain SBP > 90mmHg and MAP > 65mmHg
- ☐ Sedation and pain management as needed for the intubated patient
- ☐ Consider Push Dose Epi as a bridge to vasopressors as needed

Cardiac Arrest Post Resuscitation – 10.050

NOTES & PRECAUTIONS:

A. In most cases, a patient who has return of spontaneous circulation should not be packaged for transport right away. This allows for hemodynamic stabilization of the patient. If the patient does arrest again, CPR is more effective at the scene than during transport.
B. For transgen er an non-binary patients, use sex assigne at birth for 12-lea ECG computerize interpretation.
C. 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.
D. The condition of post-resuscitation patients fluctuates rapidly, and they require close monitoring
E. Do not place a c-collar on a patient post resuscitation as a measure to protect an airway; this can cause an increase in intracranial pressure.
F. Do not use amiodarone or lidocaine 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.
    . Periods of sinus arrest are present.
    4. Second or third-degree heart block are present.

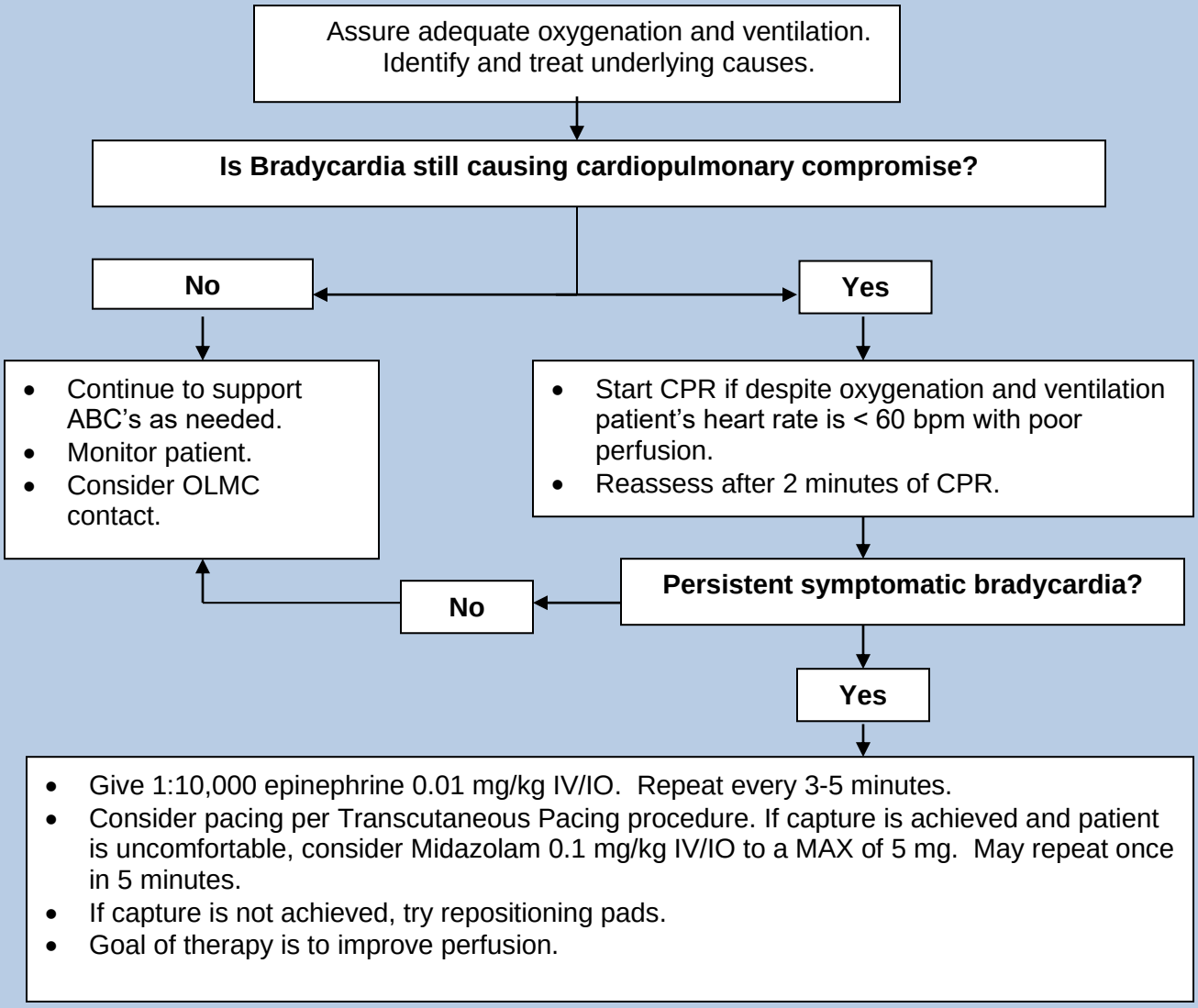
Cardiac Dysrhythmias (Bradycardia) – 10.060



Cardiac Dysrhythmias (Bradycardia) – 10.060

PEDIATRIC PATIENTS:

BRADYCARDIA WITH A PULSE AND POOR PERFUSION



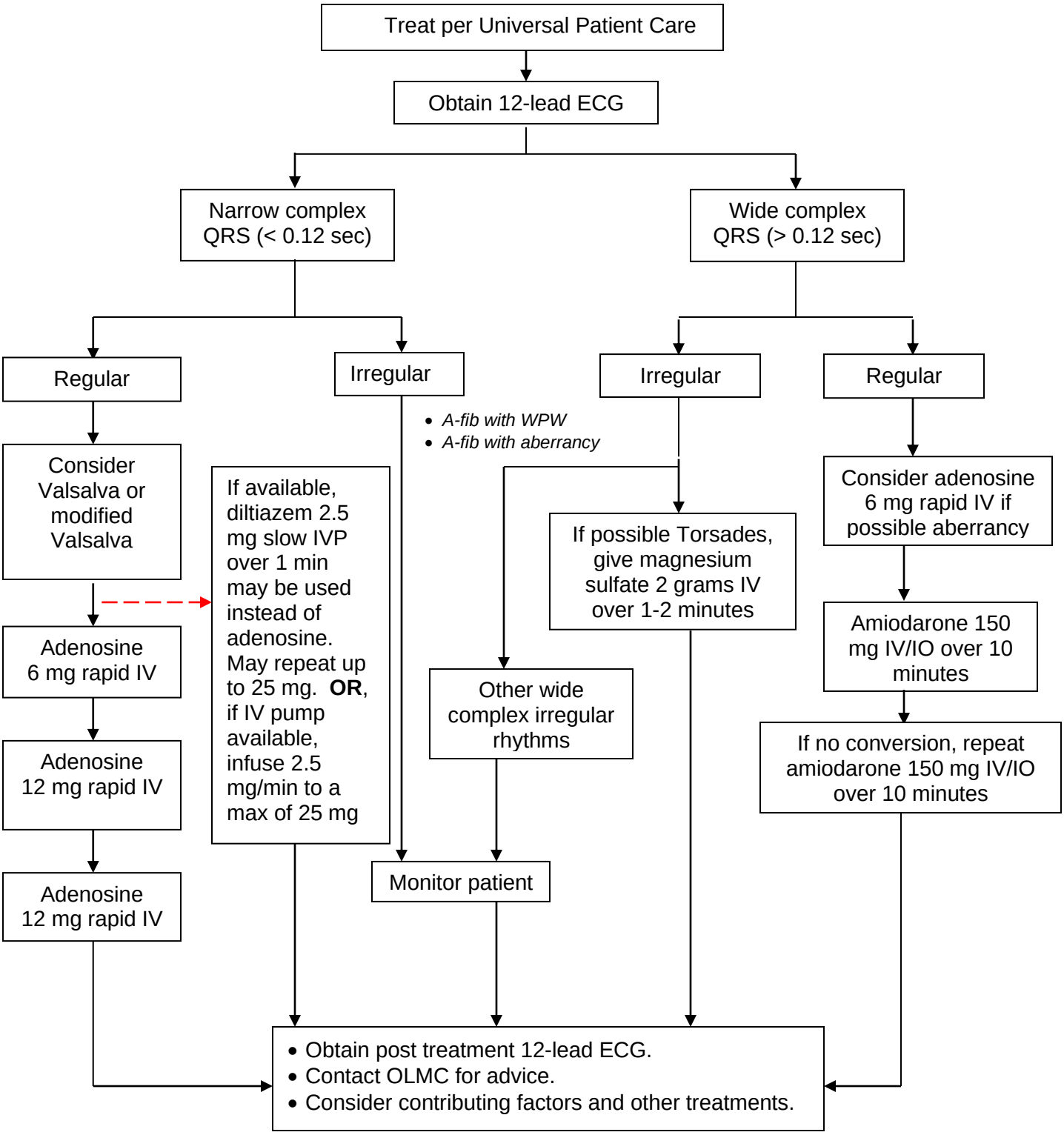
Cardiac Dysrhythmias (Bradycardia) – 10.060

NOTES & PRECAUTIONS:

A. Hypoxia is a common cause of bradycardia.
B. 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.
C. Hyperkalemia may cause bradycardia. If the patient has a wide complex bradycardia with a history of renal failure, muscular dystrophy, paraplegia, crush injury or serious burn > 48 hours prior, consider treatment per Hyperkalemia protocol.
D. Immediate TCP can be considered in unstable patients when vascular access is not available.
E. TCP is at best a temporizing measure and is not useful in asystole.
F. If TCP capture is not achieved, try repositioning pads.
G. If capture is achieved with TCP and patient is experiencing discomfort, administer midazolam 2.5 – 5 mg IV/IO or 5 mg IM/IN. May repeat once. Call OLMC for additional orders.
H. Atropine will likely be ineffective in heart transplant recipients because they lack vagal innervation.
I. 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.

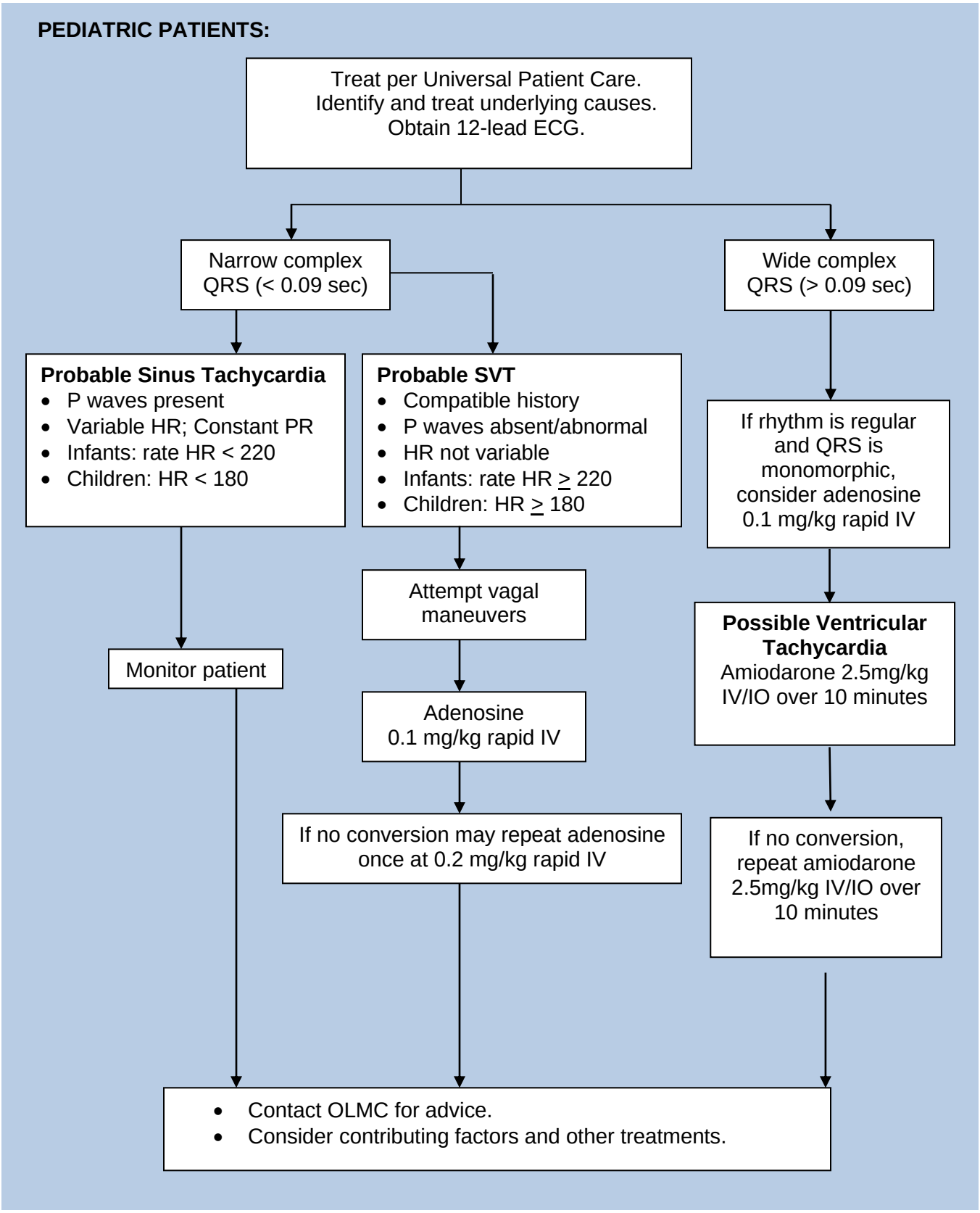
Cardiac Dysrhythmias (Tachycardia Stable) – 10.060

Patient **does not** have signs or symptoms of poor perfusion caused by the dysrhythmia.
(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:

A. In stable wide complex tachycardia, which is monomorphic, consider adenosine if SVT with aberrancy is suspected.
B. 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.
C. Other possible causes of tachycardia include:
    1. Acidosis
    2. Hypovolemia
    3. Hyperthermia/fever
    4. Hypoxia
    5. Hypo/Hyperkalemia
    6. Hypoglycemia
    7. Infection
    8. Pulmonary embolus
    9. Tamponade
    10. Toxic exposure
    11. Tension pneumothorax
D. If pulseless arrest develops, follow appropriate Cardiac Arrest protocol.
E. 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, Aggrenox).
    3. Administration through any central line.
F. Adenosine may initiate atrial fibrillation with rapid ventricular response in patients with Wolff-Parkinson-White syndrome.
G. Adenosine should be used with caution in patients with asthma as it may cause a reactive airway response in some cases.
H. 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.
I. Consider the following Valsalva techniques for pediatric patients:
    1. For infants and toddlers, apply ice or chilled IV fluid to the patient's face.
    2. 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
(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.

Treat per Universal Patient Care

Immediate synchronized cardioversion**
If patient is conscious, consider sedation. Do not delay cardioversion for sedation.

If IV/IO is established - administer etomidate 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.
If no IV/IO – administer midazolam 5 mg IM/IN.

If no change, repeat synchronized cardioversion.

Did the patient convert?

No

Amiodarone 150 mg IV/IO slow push over 3 mins.

Repeat synchronized cardioversion** x 2 if needed

If still no conversion

Initiate rapid transport

Contact OLMC

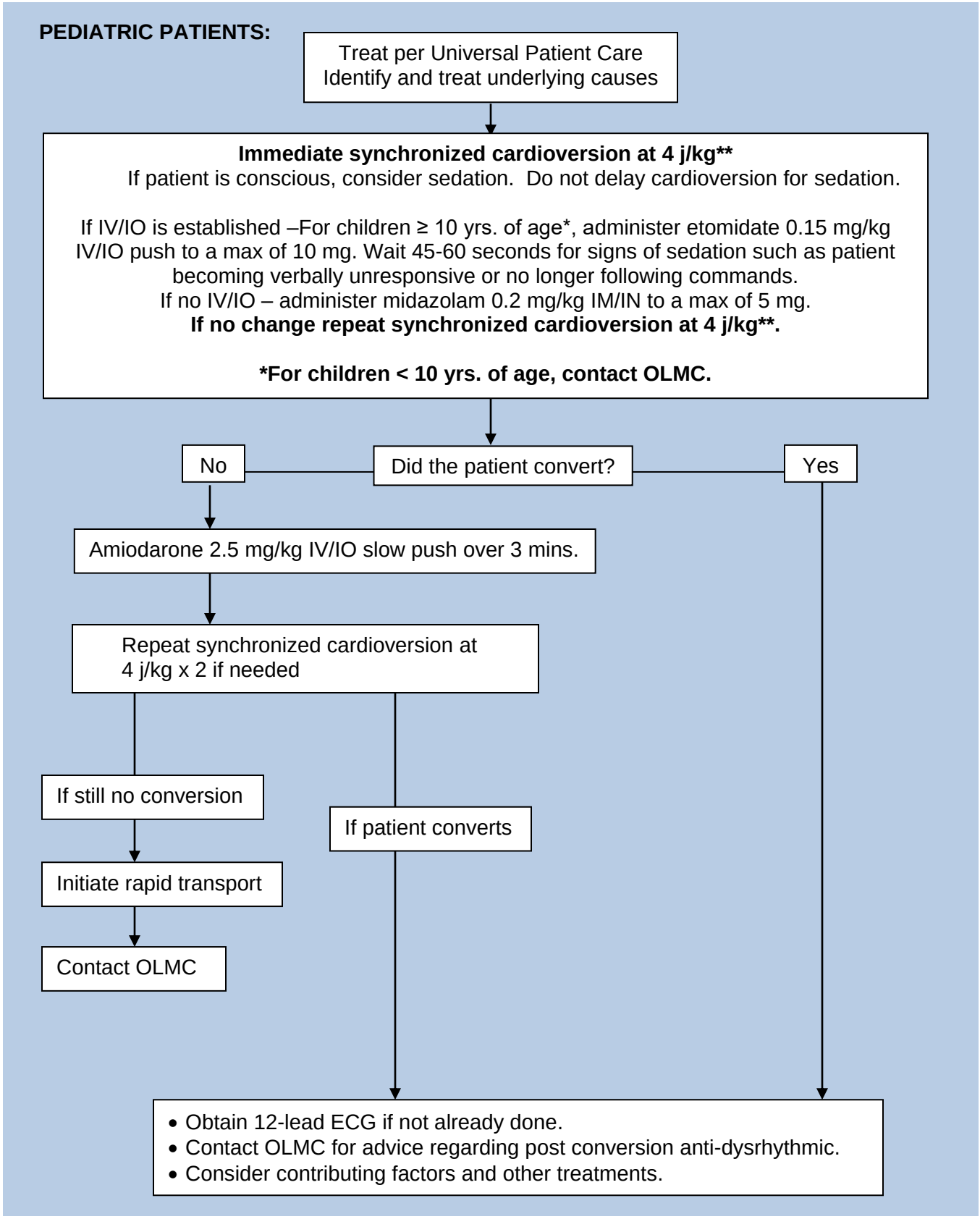
If patient converts

Yes

- Obtain 12-lead ECG if not already done.
- Contact OLMC for advice regarding post conversion anti-dysrhythmic.
- Consider contributing factors and other treatments.

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

Cardiac Dysrhythmias (Tachycardia Unstable) – 10.060



Cardiac Dysrhythmias (Tachycardia Unstable) – 10.060

NOTES & PRECAUTIONS:

A. Possible causes of tachycardia include:
   1. Acidosis
   2. Hypovolemia
   3. Hyperthermia/fever
   4. Hypoxia
   5. Hypo/Hyperkalemia
   6. Hypoglycemia
   7. Infection
   8. Pulmonary embolus
   9. Tamponade
   10. Toxic exposure
   11. Tension pneumothorax

B. If pulseless arrest develops, follow Cardiac Arrest protocol.

C. Defibrillation is recommended for wide complex irregular tachycardia.

D. Etomidate may result in myotonic jerking, apnea and/or pain at the injection site.

.

Heart Monitor Adult Synchronous Cardioversion Settings (Joules)	
Physio LifePak®	360 j
Philips MRX®	150 j – 200 j (follow local agency guidelines)
Zoll E/M Series®	200 j

TREATMENT:

A. Treat per Universal Patient Care.
B. Give high flow oxygen if patient is dyspneic. Titrate oxygen to the lowest level required to achieve a SpO2 between 95 – 99% (must have good waveform and consistent number to ensure accuracy).
C. Obtain a 12-lead ECG if acute ischemic event suspected. This may be done concurrently with other treatment and should not delay treatment. In general, a 12-lead should be obtained within the first 6-8 minutes of patient contact. Repeat every 3-5 minutes if symptoms persist or change. (*NOTE: For transgender and non-binary patients use sex assigned at birth for computerized interpretation.)*
D. Administer aspirin 324 mg orally unless contraindicated.
E. If blood pressure is > 100 mmHg systolic, administer nitroglycerin 0.4 mg sublingual. Repeat every 5 minutes until chest pain is relieved. *Vascular access should be done prior to nitroglycerin administration in patients who have not taken nitroglycerin previously or who have a potential for hemodynamic instability*.
F. For pain unrelieved after three doses of nitroglycerin, consider analgesia per Pain Management protocol. Nitroglycerin may be continued for strong suspicion of acute coronary syndrome.
G. Call for a "**STEMI Activation**" if the patient meets the criteria as defined in Field Identified STEMI.
H. Call for a **"Priority Cardiac Patient"** if the patient meets the criteria as defined in Priority Cardiac Patient.
I. Treat any dysrhythmias per appropriate Cardiac Dysrhythmia protocol.
    - PVC's **in the setting of an acute ischemic event only** (i.e. chest pain, couplets, R on T, runs of VT) may be treated with:
        1. Lidocaine 1.5 mg/kg IV/IO over 1-2 minutes.
        2. If no change, give 1.5 mg/kg IV/IO every 5 min up to 3 mg/kg.
        3. When PVC's are suppressed, give 0.75 mg/kg IV/IO every 10 minutes.
        4. All doses of lidocaine, after the initial bolus, must be reduced to ¼ of the initial bolus in patients with congestive heart failure, shock, hepatic disease, or in patients > 70 years old.
        5. Lidocaine should not be used without OLMC direction if:
            - BP is less than 90 mmHg.
            - Heart rate is less than 50 beats per minute.
            - Periods of sinus arrest.
            - Presence of second or third degree AV block.

PEDIATRIC PATIENTS:

A. Consider pleuritic causes or trauma.
B. Contact OLMC for advice.

NOTES & PRECAUTIONS:

A. DO NOT DELAY ADMINISTRATION OF ASPIRIN TO OBTAIN 12-LEAD ECG.
B. **Do not give nitroglycerin to patients with an inferior myocardial infarction** (ST elevation in II, III and AVF) **as this may result in hypotension due to right ventricle involvement**. The latter is present in 50% of such infarcts.
C. Do not administer nitroglycerin without OLMC if patient has taken Viagra or other similardrugs in the last 24 hours, or Cialis within the last 48 hours.

D. Do not administer aspirin in patients who have an allergy or sensitivity to aspirin, who have a history of an active bleeding disorder, GI bleed or ulcer, or who have a suspected aortic dissection.
E. Be aware of atypical presentations including absence of chest pain in women, diabetic and geriatric patients.

FIELD IDENTIFIED ST-ELEVATION MI (STEMI)

Indication:

A. Patient presentation consistent with acute MI (chest/pain pressure, dyspnea, diaphoresis, nausea/vomiting.)

AND

B. Diagnostic Quality 12-lead ECG with Paramedic interpretation of probable STEMI:
- **≥ 1 mm** ST elevation in any two or more contiguous leads *(except V2, V3)*
- **≥ 2 mm** ST elevation in **V2, V3**
- QRS **≤ 0.12**
- **No** STEMI imitators present
  - Paced rhythm
  - LBBB or RBBB
  - LVH
  - SVT with aberrancy
  - Pericarditis
  - Benign early repolarization
  - Digitalis effects

Action:

A. Rapid transport to destination hospital ED with interventional capability.

B. Early notification of destination hospital and advise the receiving hospital of a "**STEMI Activation**."

C. If available, transmit 12-lead ECG to destination hospital. If transmission is unavailable, describe ECG to receiving hospital or contact OLMC.

Notes & Precautions:

A. T-waves will present as convex (domed or tombstone) in the setting of acute infarct.

B. Computer Interpretation; Paramedics should not diagnose STEMI based solely on 12-lead computer interpretation. While the interpretation can be used to support your diagnosis, the computer is not infallible. The computer will not read all STEMIs as ***MEETS ST ELEVATION MI CRITERIA*** and the computer may read ***MEETS ST ELEVATION MI CRITERIA*** when the ECG is clearly not a STEMI. The computer is less accurate with wide QRS complexes, tachycardic rhythms, anterior MIs and STEMI imposters.

C. STEMIs are often evolving. The STEMI may not appear until the 3rd 12-lead or the STEMI captured on 1st 12-lead may disappear by arrival at the ED. A prehospital 12-lead documenting the transient elevation is critical in these patients.

PRIORITY CARDIAC PATIENT (SALEM HOSPITAL ONLY)

Indication:

A. Salem Hospital may be advised of a "**Priority Cardiac Patient**" for clinically concerning orpotentially unstable patients that are cardiac in nature. This includes:
   - Patients that present with symptoms of ACS without ST elevation (NSTEMI) present
   - Patients that present with symptoms of ACS with poor quality ECG's or have ECGs with potential imitators
   - Patients in extremis of CHF
   - Unstable arrythmia's (tachycardias, bradycardias, ischemic PVC's)

B. STEMI imitators include:
   - Paced rhythm
   - LBBB or RBBB
   - LVH
   - SVT with aberrancy
   - Pericarditis
   - Benign early repolarization
   - Digitalis effects

Action:

C. Rapid transport to destination hospital ED with interventional capability.

D. Early notification of destination hospital and advise the receiving hospital of a "**Priority Cardiac Patient**.**"**

E. If available, transmit 12-lead ECG to destination hospital. If transmission is unavailable, describe ECG to receiving hospital or contact OLMC.

TREATMENT:

A. Treat per Universal Patient Care.
B. Spinal immobilization if indicated and feasible.
C. Consider pain management.
D. Evaluate degree of entrapment and viability of extremities (absent pulse, blanched skin, capillary refill, diminished sensation, extremely cold to the touch).
    1. If one or more extremities are trapped for a prolonged period (> 2-4 hours.), and circulation is compromised or absent consider the placement of tourniquet prior to extrication to reduce reperfusion injuries.
    2. If extrication of a limb will be prolonged and patient's condition is deteriorating, strongly consider calling Trauma Communications to arrange on-scene management.
E. During extrication, administer 1000 - 2000 cc NS or LR via IV bolus, then maintain at 500 cc/hr.
F. 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 with calcium gluconate, high dose albuterol inhalation and sodium bicarbonate.
G. Wound care:
    1. Remove all restrictive dressings (clothing, jewelry, etc.).
    2. Monitor distal pulse, motor, and sensation in involved extremity.
    3. Bandage all open wounds (irrigate if needed).
    4. Stabilize all protruding foreign bodies (impaled objects).
    5. Splint/immobilize injured areas.
    6. For suspected pelvic crushing injuries, follow the Pelvic Wrap procedure if indicated.

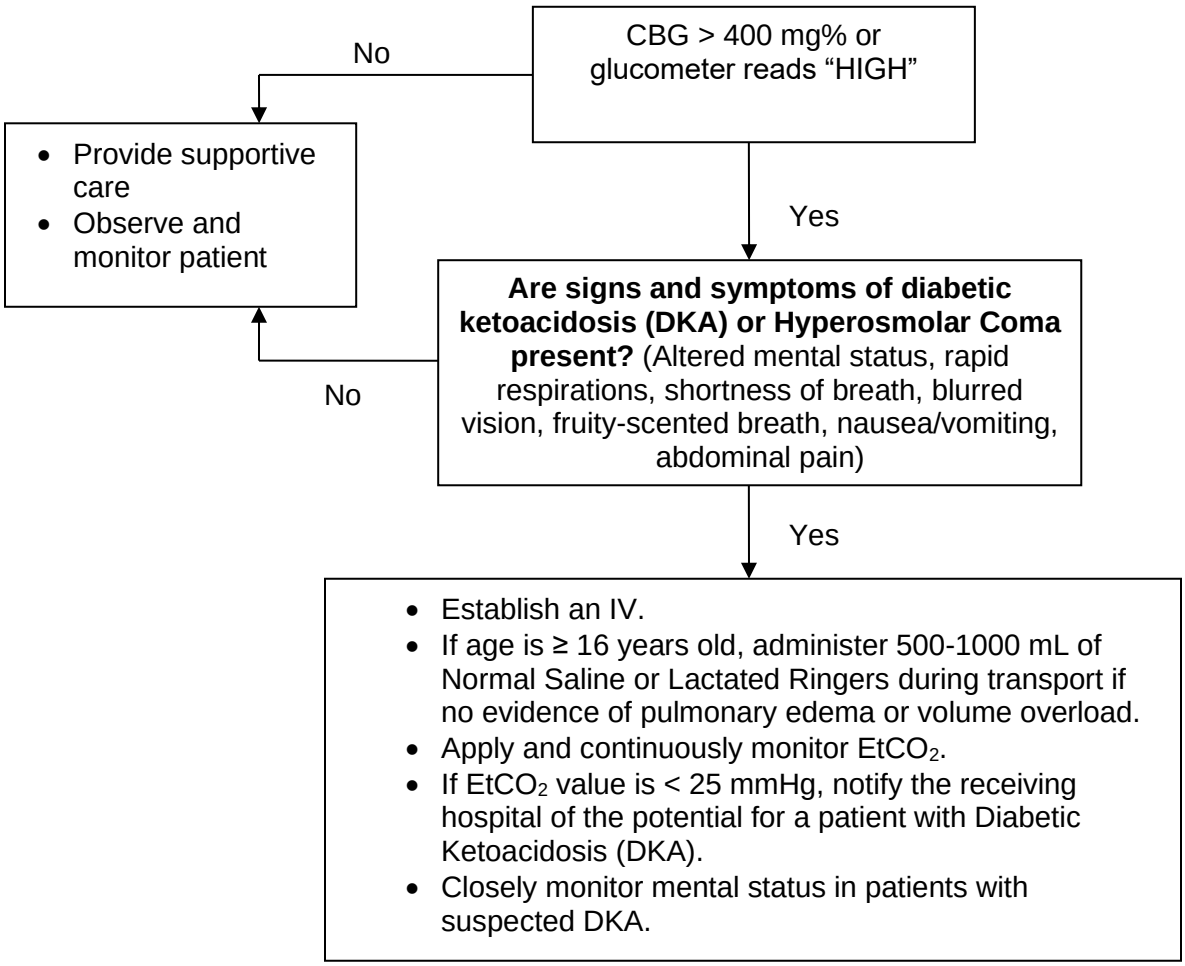
NOTES & PRECAUTIONS:

A. Crush injury may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse, and shallow respirations.
B. Plan extrication activities to allow for periodic patient assessment. Plan for occasional extrication equipment "shut down" to assess vital signs.
C. Carefully track vital signs, IV fluids, cardiac rhythm, and medications during extrication.
D. Protect patient from environment (rain, snow, direct sun, etc.). If applicable, begin warming methods to prevent hypothermia (warm blankets, heated air with blower, warm IV fluids).
E. Carefully assess collateral injuries that may have occurred during event.
F. 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.
G. Do not allow any personnel into extrication area (inner circle) without proper protective equipment and thorough briefing to include evacuation signal.
H. Notify the receiving Trauma Center through Trauma Communications early in the extrication process to receive additional advice.

Hyperglycemia

TREATMENT:

A. Treat per Universal Patient Care.
B. Determine capillary blood glucose level.



PEDIATRIC PATIENTS:

A. Follow adult algorithm.
B. 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.

Hypoglycemia

TREATMENT:

A. Treat per Universal Patient Care.
B. Determine Capillary Blood Glucose level:
    a. If CBG < 60 mg%, or < 80 mg% in a known diabetic patient:
        i. If patient can protect their own airway, give oral glucose.
        ii. 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
    b. Check CBG after 5 minutes and repeat treatment if blood sugar remains low and patient remains symptomatic.
    c. If no IV can be established, give glucagon 1 mg IM.

PEDIATRIC PATIENTS:

Hypoglycemia

A. Dextrose – 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)

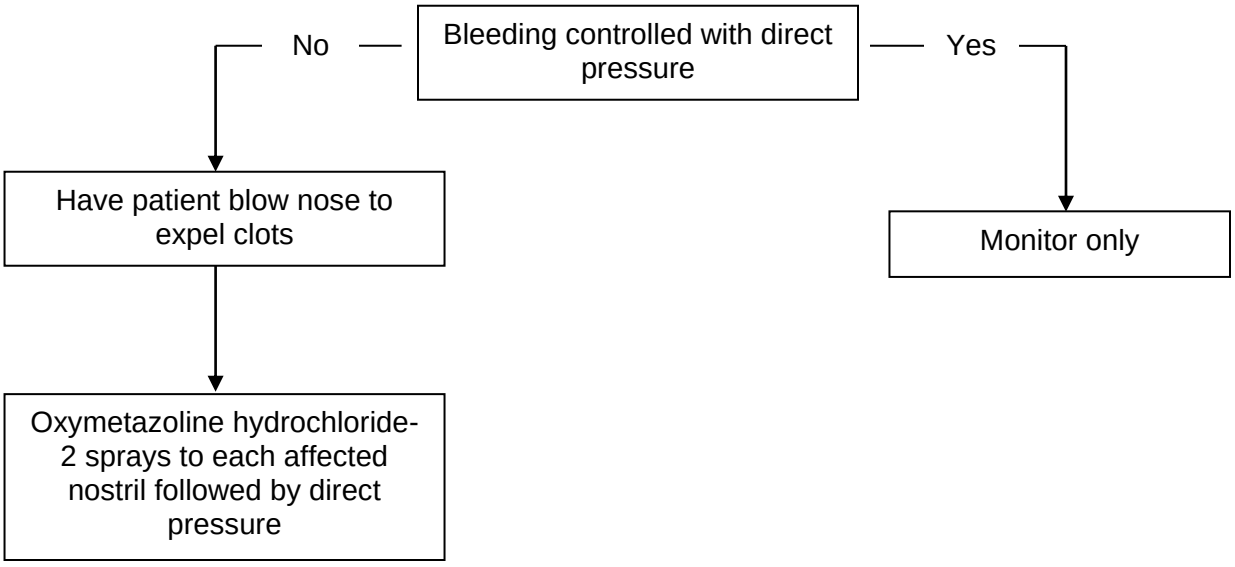
    Or (if diluting D50)
    - Dextrose 12.5%, 4 ml/kg by infusion not to exceed 200 ml total.
B. Glucagon:
    - 0.02 mg/kg IM to a maximum of 1 mg.

NOTES & PRECAUTIONS:

A. Hypoglycemic patients who receive glucose/dextrose/glucagon often refuse transport. This may be reasonable if all the following are present:
    a. The patient's mental status has returned to normal.
    b. There is a clear precipitating cause (e.g. took insulin but forgot to eat).
    c. The patient is able to eat a meal.
    d. The patient's recent blood sugar control has been otherwise stable.
    e. The patient's blood glucose level is >80mg%.
    f. A reliable adult will be with the patient.
B. Patients with recent evidence of poor glucose control and those who use oral hypoglycemic medications, in particular 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.
C. Symptoms of hypoglycemia can include the following: Sweating, shakiness, nervousness, hunger, tiredness, dizziness, difficulty thinking, blurred vision, tingling sensation, or heart pounding.

TREATMENT:

A. Treat per Universal Patient Care.
B. Place patient in position of comfort and have them tilt their head forward.
C. Compress the nose with direct pressure or approved nose clip device.
D. If systolic blood pressure is < 90 mmHg (MAP < 65 mmHg), follow Shock protocol.



PEDIATRIC PATIENTS:

A. Follow adult algorithm.
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.

NOTES & PRECAUTIONS:

A. It may be difficult to quantify blood loss in epistaxis.
B. Bleeding may be also occurring posteriorly. Evaluate for posterior blood loss by examining the back of the throat.
C. 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.
D. 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.
E. For patients on home oxygen via nasal cannula, place the cannula in the patient's mouth while the nares are compressed for active bleeding.

KEY CONSIDERATIONS:

Age, medications (HTN, anticoagulants, aspirin, clopidogrel, NSAID), previous episodes of epistaxis, trauma, duration of bleeding, quantity of bleeding

TREATMENT:

A. Treat per Universal Patient Care.
B. Unless contraindicated, patients should be transported in a seated position of at least 30 degrees in order to decrease intraocular pressure.
C. Treat specific injuries as follows:
    1. Chemical Burns
        a. Administer proparacaine.
        b. Irrigate from the center of the eye towards the eyelid with lactated ringers (preferred), isotonic saline, or tap water for at least 30 minutes.
        c. Do not attempt to neutralize acids or bases.

    2. Direct Trauma to Eye (Suspected Rupture/Penetration of Globe)
        a. Protect the affected eye and its contents with a hard shield or similar device and cover the other eye.
        b. Follow Pain Management protocol as indicated and consider ondansetron per Nausea and Vomiting protocol.

    3. Foreign body on outer eye
        a. Do not wipe eye.
        b. Administer proparacaine.
        c. 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 to continue anesthetic effect.

NOTES & PRECAUTIONS:

A. Document new onset of blurring, double vision, perceived flashes of light, or other visual changes.
B. Contact lenses should be removed, if possible.

Fever Management – 10.077

TREATMENT:

A. Document temperature before administration of antipyretics and provide written documentation of temperature to receiving facility.
B. Remove heavy blankets or bundling but avoid shivering.
C. For temperature >102°F (38.9°C) consider, if available:
    1. Acetaminophen 15mg/kg PO to maximum of 1000 mg.
       OR
    2. Ibuprofen 10mg/kg PO to a maximum of 600 mg.

PEDIATRIC MEDICAITONS:

Medication dosing is the same as adult. **Do not give ibuprofen to children less than 6 months old or with signs of dehydration.**

NOTES AND PRECAUTIONS:

A. 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.
B. Do not give acetaminophen if known liver disease, alcohol abuse, acute intoxication or has taken acetaminophen in last 4 hours.
C. Do not give ibuprofen in infants under 6 months, or in known renal disease, dehydration, ulcer, GI bleeding, gastric reflux disease (heartburn), pregnancy or has taken within the last 6 hours.
D. Antipyretics are not indicated for environmental hyperthermia.

Hyperkalemia – 10.078

TREATMENT:

A. Treat per Universal Patient Care.
B. If hyperkalemia is suspected based on history and physical findings:
    1. Administer 10% calcium gluconate 1-3 gram IV/IO slowly over 5 – 10 minutes in a proximal port.
    2. If no change in rhythm following calcium administration and transport time is prolonged, consider alternate therapy:
        a. High dose albuterol (10 mg by nebulizer).
        b. With approval of OLMC-Sodium bicarbonate 50 mEq IV or IO.

NOTES & PRECAUTIONS:

A. Treatment is going to be based on patient history. Renal failure may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse, and shallow respirations. Other patients who are predisposed to hyperkalemia are those who have muscular dystrophy, paraplegia/quadriplegia, crush injury, or patients who have sustained serious burns > 48 hours. A 12-lead ECG may be helpful.
B. ECG changes that may be present with hyperkalemia include:
    1. Peaked T waves.
    2. Lowered P wave amplitude or no P waves.
    3. Prolonged P-R interval (> 0.20 seconds).
    4. Second degree AV blocks.
    5. Widened QRS complex.
C. DO NOT mix sodium bicarbonate solutions with calcium preparations. Slowly flush remaining calcium gluconate from the catheter prior to administering sodium bicarbonate.

KEY CONSIDERATIONS:

Previous medical history, medications and allergies, trauma

PEDIATRIC PATIENTS:

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

Hyperthermia – 10.080

TREATMENT:

A. Treat per Universal Patient Care.
B. Remove clothing and begin cooling measures that maximize evaporation (spray bottle with tepid water, cool wipes, and fans).
C. If blood pressure is less than 90 mmHg systolic, treat per Shock Protocol.

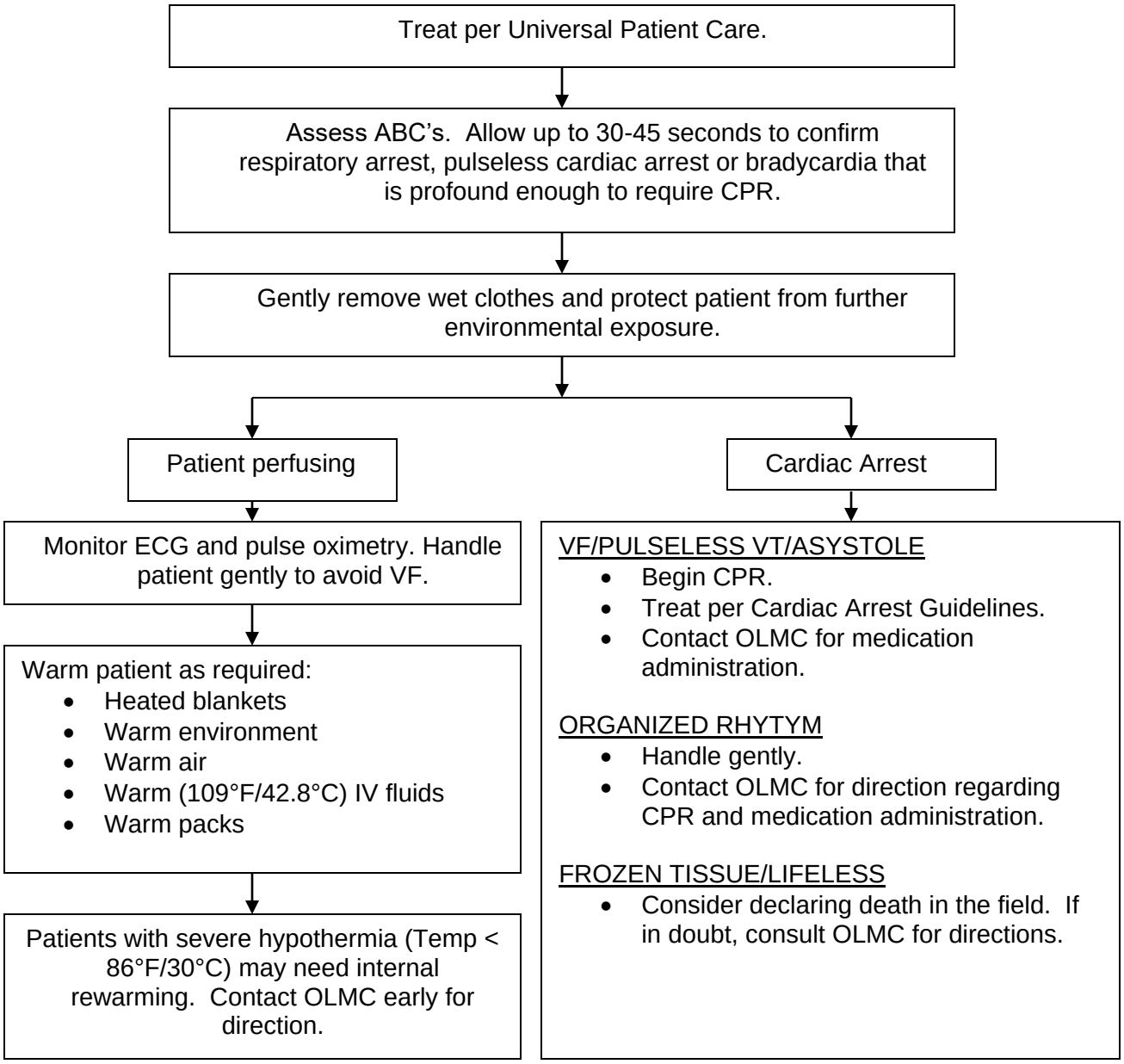
NOTES & PRECAUTIONS:

A. Heat stroke is a medical emergency. Differentiate from heat cramps or heat exhaustion. Be aware that heat exhaustion can progress to heat stroke.
B. Wet sheets over a patient without good airflow will increase temperature and should be avoided.
C. Do not let cooling measures in the field delay transport.
D. Suspect hyperthermia in patients with altered mental status or seizures on a hot, humid day.
E. Consider sepsis and/or contagious disease. Examine patient for rashes or blotches on the skin or nuchal rigidity.

KEY CONSIDERATIONS:

History of onset, sweating, patient's temperature, recent infection/illness, medical history, medications and allergies

Hypothermia – 10.090



NOTES & PRECAUTIONS:

A. At-risks groups for hypothermia include trauma victims, alcohol and drug abuse patients, homeless persons, elderly, low-income families, infants and small children, and entrapped patients.
B. Hypothermia may be preceded by other disorders (alcohol, trauma, OD) look for and treat any underlying conditions while treating the hypothermia.
C. The hypothermic heart may be unresponsive to cardiovascular drugs, pacer stimulation or defibrillation.

KEY CONSIDERATIONS:

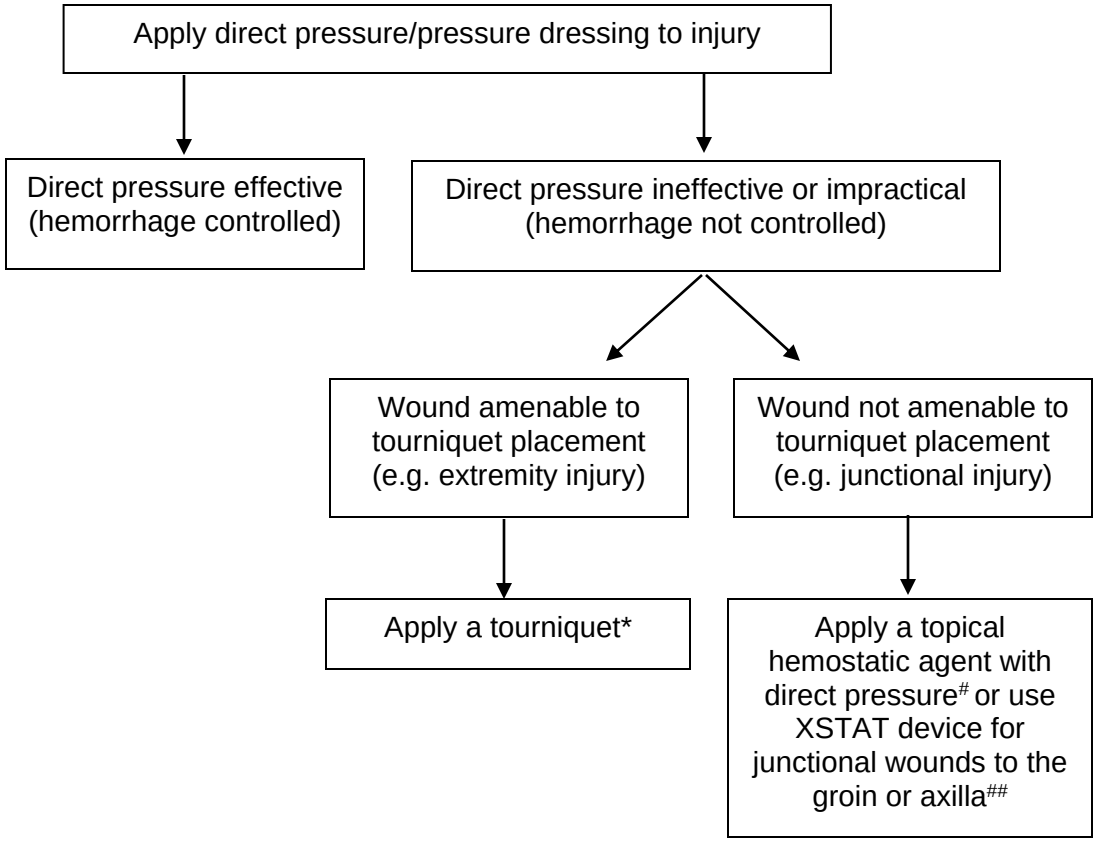
Submersion, cool rainy weather, wind chill, prolonged exposure

Musculoskeletal Trauma – Extremity / Hemorrhage – 10.100

TREATMENT:

A. Treat per Universal Patient Care.

B. External bleeding - Control with direct pressure, elevation, hemostatic dressings, and/or tourniquet per flowchart:



C. Fracture, Sprain or Dislocation:
   1. Check for pulses, sensation, and movement distal to the injury site before and after immobilization.
   2. 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.
   3. If fracture/dislocation is open, place a moist sterile dressing over wound and cover with a dry dressing.
   4. Elevate and/or place cold packs over fracture site if time/injuries allow.
   5. Apply traction splint to femur shaft fractures.
   6. For pelvic fractures, utilize pelvic sling and secure patient to a backboard to minimize movement and blood loss.

D. Amputation:
   1. Cover stump or partial amputation with moist sterile dressing.
   2. Splint partial amputations in anatomical position to avoid torsion and angulation.

3. Wrap amputated part in a sterile dressing, and place in a plastic bag to keep dry. Place bag in ice water if available.
4. If transport time is prolonged (extended extrication, etc.) consider sending the amputated part ahead to be prepared for reimplantation.

E. Treat pain per Pain Management protocol.

PEDIATRIC PATIENTS:

A. Treat pain per Pain Management protocol.
B. Consider non-accidental trauma as a cause of injury.

KEY CONSIDERATIONS:

Mechanism of injury, previous medical history, medications and allergies, time of injury, quality of distal pulses, capillary refill

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.

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. Only utilize topical hemostatic agents that have been determined to be effective and safe in a standardized laboratory model.

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.

TREATMENT:

A. Treat per Universal Patient Care.
B. Provide initial cervical spine immobilization using manual in-line stabilization.
C. Apply cervical collar, log roll and immobilize on a long spine board or flat on stretcher if the patient has a mechanism with the potential for causing spinal injury and meets ANY of the following:
    1. Neck or spine pain/tenderness on palpation.
    2. Altered mental status or history of LOC.
    3. Drug or alcohol intoxication.
    4. Distracting injury (e.g., fracture, dislocation, any injury requiring pain medication), communication barrier, or emotional distress.
    5. New neurological deficit (numbness, tingling, weakness, or paralysis).
D. Complete physical and serial neurological exams after immobilization.
E. Treat per Pain Management protocol.
F. Regularly assess the patient's respiratory status during transport. Loosen straps as needed to avoid respiratory compromise.

PEDIATRIC PATIENTS:

If using an adult backboard:

A. Children may require extra padding under the upper torso to maintain neutral cervical alignment.
B. Consider using a short-spine device (OSS, KED) to immobilize the patient prior to placing on the backboard.

NOTES & PRECAUTIONS

A. Decreasing the use of backboards does not imply eliminating the use of spinal immobilization.
B. Have a very low threshold for placing patients over 65 years of age in spinal precautions, even with a minor mechanism of injury.
C. If any immobilization 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.
D. For isolated penetrating head, neck, or torso trauma, immobilization of the cervical spine is unnecessary unless there is a neurologic deficit, or an adequate physical examination cannot be performed (e.g. a patient with altered mental status or a patient with distracting injury).
E. For patients who are awake, alert and do not have neurological deficits, spinal precautions can be maintained by application of a rigid cervical collar and securing the patient firmly to a **flat** EMS stretcher.
F. Patients in the third trimester of pregnancy should have the right side of the backboard elevated six inches.
G. Pad backboards for all inter-facility transports. If feasible, especially in prolonged scene transports, pad backboards.
H. If sports injury, immobilize patient per Sports Equipment Removal protocol.

KEY CONSIDERATIONS:

Mechanism of injury, neurological deficits, PMS before/after immobilization

TREATMENT:

A. Treat per Universal Patient Care.
B. If shock syndrome is present, follow Shock protocol.
C. Consider IV fluids in patients exhibiting signs of dehydration.
D. 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.
E. Give 8 mg ondansetron orally dissolving tablets (Zofran® ODT) or 4 mg ondansetron slow IV push over 2 minutes, or 4mg IM.
F. If nausea and/or vomiting are inadequately controlled after 10 minutes, consider:
    1. Repeating ondansetron **or**
    2. Administer haloperidol 1.25 mg IV/IM or droperidol 0.625 mg IV.
G. If patient continues to vomit, administer fluid challenge and consider other causes.

PEDIATRIC PATIENTS:

A. Ondansetron use in patients under 6 months of age requires OLMC consultation except for children in spinal immobilization or children receiving chemotherapy.
B. 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.

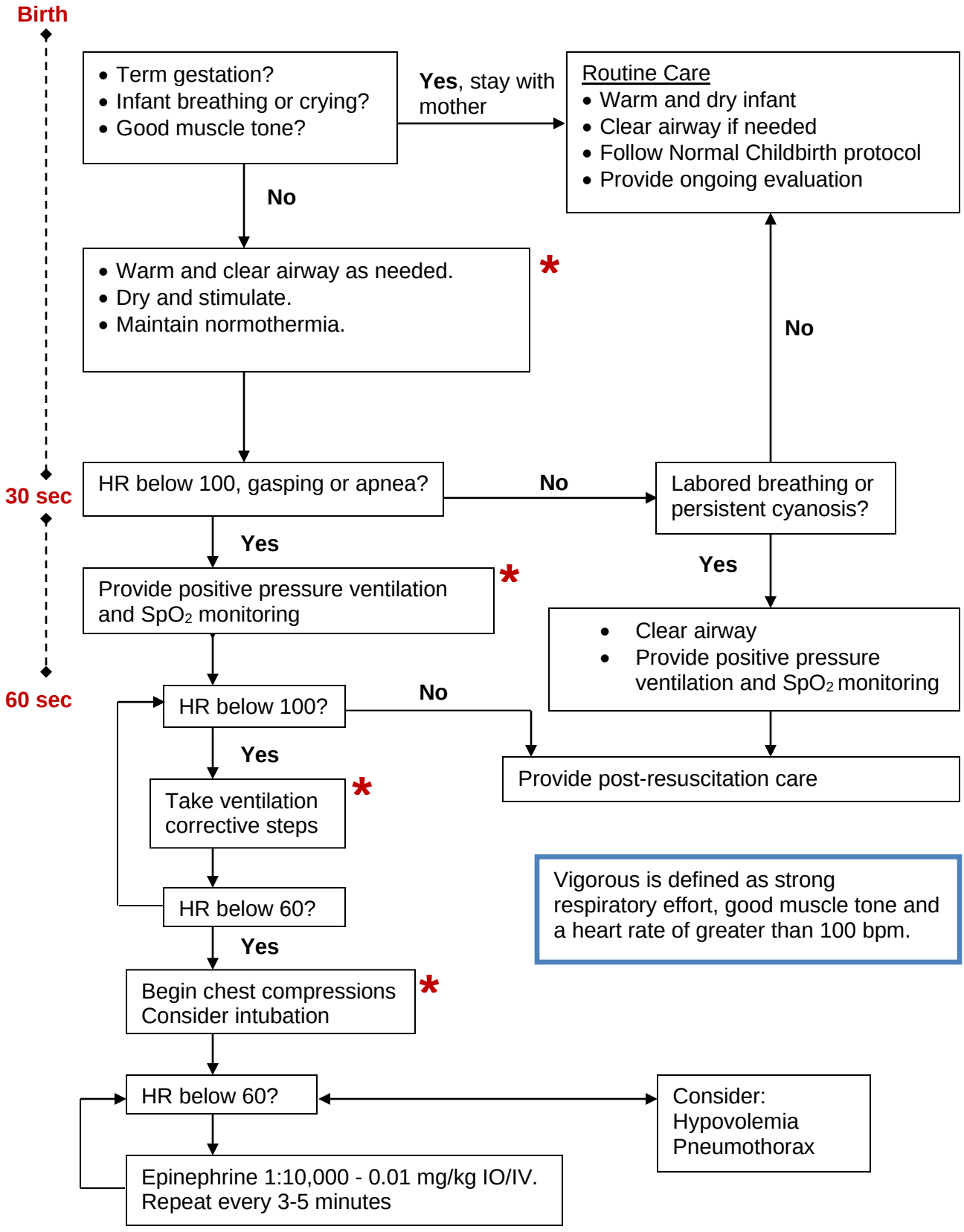
NOTES & PRECAUTIONS:

A. 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.)
B. Do not administer alkaline medications or preparations in the same IV as ondansetron as it may cause precipitation.

KEY CONSIDERATIONS:

Vomiting blood or bile, complaint of nausea, medications and allergies, pregnancy, abdominal pain or trauma, diarrhea, head trauma, orthostatic vital signs

Neonatal Resuscitation – 10.120



* **Critical points at which endotracheal intubation should be considered.**

POST RESUCITATION CARE:

A. Continue to provide assisted ventilations as needed.
B. Closely monitor respiratory effort, heart rate, blood glucose, and pulse oximetry.
C. **Keep newborn normothermic.** Hypothermia significantly increases risk of morbidity.
D. 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:

A. 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.
B. 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.
C. An electronic cardiac monitor is the preferred method for assessing heart rate.
D. The ratio of compressions to ventilations should be 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.

TREATMENT:

A. General
   1. Treat per Universal Patient Care.
   2. Start O_2 in all abnormal deliveries.
   3. If multiple, or abnormal birth, consider second transport unit.
   4. 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.
   5. Vital signs may not be a reliable indicator of shock or respiratory distress in the pregnant patient.

B. Pre-eclampsia and Eclampsia
   1. Pre-eclampsia is defined as the presence of new-onset hypertension and proteinuria or other end-organ damage occurring after 20 weeks gestation and it can present up to 12 weeks post-partum.
   2. Symptoms may include headache, visual disturbances, chest discomfort, shortness of breath, confusion, and abdominal pain.
   3. Notify receiving hospital of at-risk patients with sustained elevation in BP ≥ 140 mmHg systolic and/or ≥ 100 mm Hg diastolic that is present for at least 15 minutes or more.
   4. 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.

C. Normal Childbirth
   1. Use sterile or clean technique.
   2. Guide/control but do not retard or hurry delivery.
   3. Check for cord around neck and gently remove if found.
   4. After delivery, assess infant per Neonatal Resuscitation protocol. If no resuscitation is needed (term infant, breathing or crying, good muscle tone), proceed as below.
   5. 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.
   6. Briefly dry infant and place on mother's chest, in skin-to-skin contact. Cover both with a clean, dry blanket.
   7. 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).
   8. At 30 to 60 seconds after delivery, clamp and cut the umbilical cord about 6 inches from infant. If resuscitation is needed, cord may be clamped and cut as soon as necessary.
   9. Do not delay transport to deliver the placenta. After the placenta has delivered, gently externally massage uterus to encourage contractions and prevent bleeding.
   10. If mother has significant postpartum hemorrhage (> 500 ml), continue uterine massage, treat for shock, and update receiving facility.
   11. Unless infant needs treatment, keep on mother's chest for transport.
   12. Monitor vital signs of mother and infant during transport.

D. Abnormal Childbirth
   1. General
      a. Transport to nearest appropriate hospital.

b. Give receiving hospital earliest possible notification.
c. Contact OLMC for advice.
d. Transport in position as described in General treatment above.

2. Breech Presentation (buttocks first)
   a. 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.
   b. If the head does not deliver within three minutes, suffocation can occur.
      1. Place a gloved hand into the vagina, with your palm toward the baby's face.
      2. 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.
      3. Assess for the presence of pulse in umbilical cord, if presenting.

E. Prolapsed Cord
   1. With a gloved hand, gently attempt to push the baby back up the vagina several inches.
   2. Do not attempt to push the cord back.
   3. Assess for the presence of pulse in umbilical cord.

F. Limb Presentation
   1. The presentation of an arm or leg through the vagina is an indication for immediate transport to the hospital.
   2. Assess for presence of pulse in umbilical cord, if presenting.

G. Abruptio Placentae – Occurs in the third trimester of pregnancy when the placenta prematurely separates from the uterine wall leading to intrauterine bleeding.
   1. The patient experiences lower abdominal pain and the uterus becomes rigid.
   2. Shock may develop without significant vaginal bleeding.

H. 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.

KEY CONSIDERATIONS:
Due date/prenatal care, last menstrual period, previous childbirth history, single or multiple birth, fetal heart tones, ruptured membranes, vaginal bleeding, contractions, cramping, edema or hypertension, abdominal pain, seizures

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

TREATMENT:

A. Treat per Universal Patient Care.
B. Determine location of pain and severity using numeric scale (1-10) or faces scale.
C. Consider and treat underlying causes of pain.
D. Use non-pharmacological pain management (i.e., position of comfort, hot/cold pack, elevation, splinting, padding, wound care, therapeutic calming and communication).
E. For oral medication consider:
    1. Acetaminophen 15 mg/kg to a maximum of 1000 mg, **or**
    2. Ibuprofen 10 mg/kg to a maximum of 600 mg
F. For parenteral medications consider:
    1. Ketorolac: 30 mg IM or 15 mg IV. **Do not repeat**. Use only in patients 2-64 years of age, and for musculoskeletal pain or flank pain with suspected kidney stone.
    2. Opioids
        a. Fentanyl:
        50–100 mcg IV/IN. May repeat with 25–50 mcg every 5 minutes as needed to a maximum of 500 mcg. If IV/IN not available, give 50-100 mcg IM. May repeat IM every 15 minutes as needed to a maximum 500 mcg. **If BP is less than 100 mmHg and/or patient has minor altered mental status or respiratory depression**, the first dose fentanyl by any route is 25 mcg, may repeat 25-50 mcq every 5 minutes to a maximum of 500 mcg. Monitor patient closely.
        OR
        b. Morphine:
        2-8 mg IV every 5 minutes to a maximum of 20 mg. If IV not available give morphine 5-10 mg IM. May repeat IM with 5 mg every 15 minutes to a maximum of 20 mg. **Do not administer morphine if systolic BP is less than 100 mmHg.**
    3. Ketamine
        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 other psychiatric symptoms.
        b. **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.**
        (Example for IV push: Expel 0.5 ml from a saline flush prior to drawing up 0.5 ml of ketamine.)

G. Monitor SpO_2 and $EtCO_2$.
H. Document vital signs, response to treatment and pain scale rating prior to and after each administration of pain medication.
I. Opioids and ketamine can be used in the same patient to obtain pain relief if necessary.

PEDIATRIC PATIENTS:

A. 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.
B. Fentanyl dose (not to exceed adult dose)
   - 1 mcg/kg IV. May repeat with 0.5 -1 mcg/kg every 5 minutes as needed to a maximum of 4 mcg/kg IV
   - 2 mcg/kg IN. May repeat with 1 mcg/kg every 5 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 15 minutes to a max of 4 mcg/kg IM.
   - IN is preferred if no IV.
C. Morphine dose is 0.1 mg/kg IV or IM. (IM may repeat after 15 minutes). Do not exceed adult dosing.
D. Ketamine is not approved for use in pain control in pediatric patients < 15 years of age. 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.
E. If no contraindication to oral medication, consider acetaminophen 15 mg/kg PO to a maximum of 1000 mg or ibuprofen 10 mg/kg PO to a maximum of 600 mg, if available.
F. 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 & PRECAUTIONS:

A. Acetaminophen potentiates the analgesic effect of opioids and they can be given together if the patient can take PO.
B. 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 along with opioids for pain management.
C. Do not give oral medication to patients with abdominal pain, open or obviously angulated fractures.
D. Ketorolac should not be used in patients less than 2 or over 64.
E. Do not administer ketamine to patients who are pregnant, have eye pain, or have non-traumatic chest pain.
F. Ketamine should not be given to patients with schizophrenia or history of psychosis due to the potential for exacerbating the mental health condition.

USE PROPER PRECAUTIONS. DECONTAMINATE PT PRIOR TO TREAMENT/TRANSPORT

TREATMENT:

A. Treat per Universal Patient Care.
B. If systolic BP < 90 mmHg follow Shock Protocol. Goal is to maintain a mean arterial pressure (MAP) ≥ 65 mmHg.
C. If unknown poison or overdose and the patient has a decreased level of consciousness, treat per Altered Mental Status protocol.
D. Manage airway per the Airway Management protocol.
E. Contact OLMC and/or Oregon Poison Center (1-800-222-1222) for advice.
F. Treat specific **symptomatic** poisoning/overdose patients as outlined below:

- **Aspirin or acetaminophen:**
  1. If it is less than two hours since ingestion, administer 1 g/kg of activated charcoal PO/NG to a max of 50 g.
  2. If ingestion involves more than just aspirin and/or acetaminophen contact OLMC for use of activated charcoal.
  3. Avoid intubating aspirin overdoses unless absolutely necessary. If intubation becomes necessary, the ventilation goal should be 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:**
  1. Place all suspected CO poisoning patients on CPAP with high flow O_2.
  2. Recommend NRB with nasal cannula if contraindications to or if patient does not tolerate CPAP.
  3. Measure CO level with SpCO monitor when possible.
  4. All symptomatic patients (e.g. headache, dizziness, nausea) or patients with an SpCO monitor reading ≥ 15 should be transported.
  5. Transport to the nearest facility, or designated hyperbaric chamber if available, for patients with severe symptoms (e.g. cardiac ischemia, coma, syncope, seizures, loss of consciousness) for stabilization.
  6. Treat symptoms per appropriate protocol (e.g. 12-lead ECG for suspected cardiac ischemia.)
  7. If cyanide poisoning is also suspected, consider obtaining SpCO, if possible, before administration of CYANOKIT® since the latter will interfere with the carboxyhemoglobin monitor.

- **Chlorine inhalation:**
  Treat symptomatic patients with:
  1. Albuterol- 2.5 mg nebulized.
  2. Dexamethasone- 10 mg IV/IO/IM/PO.
  3. 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 fluid bolus.

- **Hydrofluoric Acid:**
  Dermal: Calcium gluconate 3 g mixed with 5 oz water soluble lubricant and applied to burn.

- **Sodium Channel Blockade (e.g. Tricyclic Antidepressants, Diphenhydramine, Type 1a or 1c anti-arrhythmics):**
  1. If patient exhibits arrhythmias or a widening QRS complex, administer sodium bicarbonate 1 mEq/kg IV/IO.
  2. Treat hypotension per Shock protocol.

- **Organophosphates:**
  1. Prepare to handle copious secretions.
  2. 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.
  3. 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.
  4. Treat seizures per seizure protocol.
  5. See Haz-Mat Protocol for more specifics of treatment.

G. Contact OLMC for advice on activated charcoal for other ingested poisons.

PEDIATRIC PATIENTS:

A. Consider possibility of neglect or abuse.
B. For organophosphate poisoning, atropine dose is 0.05 mg/kg IV/IO. Contact OLMC for frequency of dosing.
C. Activated charcoal dose is 1 g/kg, max of 50 g.
D. For children < 1-year, dilute sodium bicarbonate by one-half with normal saline prior to administration.
E. 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 fluid bolus. Contact OLMC for advice regarding second dose.

NOTES & PRECAUTIONS:

A. SpCO levels may be elevated in smokers. Levels can range from 3-20% depending on the number of packs smoked.
B. Pulse oximeter may provide a false reading in patients with elevated SpCO levels.
C. If the patient exhibits extrapyramidal symptoms/dystonias with a history of phenothiazine use, consider diphenhydramine.
D. For large organophosphate poisonings, refer to Haz-Mat protocol.
E. Do not neutralize acids or alkalis.
F. Strongly consider Haz-Mat Team activation when appropriate.

KEY CONSIDERATIONS:

Route of poisoning, amount of ingestion, antidote given, suicidal intent, multiple patients, psychiatric history

CO Clinical Presentation Transport Matrix				
Carbon Monoxide	Yes	Yes	Yes	Yes
Burns	No	Yes	No	Yes
Trauma	No	No	Yes	Yes
Destination	Hyperbaric Center	Burn Center	Trauma Center	Trauma Center

Carbon Monoxide = ≥ 15, Burns = Burn Center Criteria, Trauma = Trauma Center Criteria

TOXIDROME TABLE

Toxidrome	Examples	Clinical Features	Antidotes
Sympathomimetic	Cocaine Methamphetamine	Agitation Diaphoresis Hypertension Hyperthermia Dilated pupils Tachycardia	Midazolam (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) (Hazmat, OLMC)
Sedative-Hypnotic	Barbiturates Benzodiazepines GHB	Depressed mental status Hypotension Hypothermia	Supportive treatment
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)	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	**Nicotinic	***Central
Diarrhea, Urination, Miosis, Bradycardia, Bronchospasm, Bronchorrhea, Emesis, Lacrimation, Salivation, Sweating	Mydriasis, Tachycardia, Weakness, Hypertension, Hyperglycemia, Fasciculations	Confusion, Convulsions, Coma

TREATMENT:

A. Treat per Universal Patient Care.
B. Follow appropriate Airway Management or Cardiac Dysrhythmia protocol if indicated.
C. Treat patient's clinical impression as follows:

- **Upper Airway**
  1. Croup & Epiglottitis – Transport in position of comfort, monitor airway.
  2. Anaphylaxis – Treat per Anaphylaxis and Allergic Reaction protocol.
  3. Foreign Body – Begin obstructed airway procedures. Remove object using direct laryngoscopy if complete obstruction exists.
  4. Complete Obstruction – If you cannot effectively ventilate/oxygenate the patient and the patient is deteriorating, consider cricothyrotomy.

- **Decompensated Heart Failure**
  1. Sit patient upright.
  2. If BP < 100 mmHg systolic, treat for possible cardiogenic shock per Shock protocol.
  3. If BP > 100 mmHg systolic:
     a. Nitroglycerine 0.4 mg SL; repeat every 3-5 minutes. *(Do not administer nitroglycerine 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).*
     b. Consider albuterol 2.5 mg by nebulizer. May repeat as needed.
     c. If the patient remains in respiratory distress, consider CPAP if available.
     d. Furosemide (If systolic BP > 100 and fluid overload state with JVD, edema (peripheral, sacral, abdominal), recent weight gain):
        1. If patient is not currently taking furosemide, give 20 mg IV.
        2. If the patient is taking furosemide, give 40 mg IV.

- **"SCAPE" - Sympathetic crashing acute pulmonary edema** (Presentation consistent with rapid onset, extreme respiratory distress, diaphoresis markedly elevated systolic blood pressure > 160, tachycardia, decreased oxygen saturation)
  1. Nitroglycerine 0.4 mg SL; repeat every 3-5 minutes. (*Do not administer nitroglycerine 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).*
  2. 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 if available. (**CPAP can be started prior to SL NTG being given. Once CPAP is started, do not break the seal of the CPAP mask. If CPAP is in place prior to SL nitroglycerine, you can proceed to push dose nitroglycerine directly.)**
  3. If available-push dose nitroglycerine 1 mg IV, if respiratory distress persists and SBP remains > 160 mmHg systolic. May repeat once in 5 minutes.

- **COPD**
  1. DuoNeb (albuterol 3 mg / ipratropium 0.5 mg) by nebulizer. Repeat DuoNeb as needed X 2. Do not administer more than three total treatments.
  2. If additional bronchodilator needed after DuoNeb, repeat albuterol only 2.5 mg by nebulizer as needed.
  3. If patient has moderate to severe respiratory distress based on Severity Assessment Guide, give dexamethasone 10mg IV/IO or IM. May also be given orally.
  4. Consider CPAP if available.

- **Asthma**
  1. DuoNeb (albuterol 3 mg / ipratropium 0.5 mg) by nebulizer. Repeat DuoNeb as needed X 2. Do not administer more than three total treatments.
  2. If additional bronchodilator needed after DuoNeb, repeat albuterol only 2.5 mg by nebulizer as needed.
  3. If patient has moderate to severe asthma based on Asthma Severity Assessment Guide, give dexamethasone 10mg IV/IO/IM/PO.
  4. 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.
  5. If transport time is long and asthma is severe, consider magnesium sulfate 2 grams over 15-20 minutes.
  6. Consider CPAP if non-responsive to interventions or impending respiratory failure.

PEDIATRIC PATIENTS:

A. Upper Airway

1. 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 mins. if necessary. Contact OLMC for additional dosing.
2. Treat anaphylaxis and foreign body obstruction per adult guidelines.
3. The usual cause of respiratory arrest in children with croup, epiglottitis or laryngeal edema is exhaustion, not complete obstruction.
   a. If suspected croup, administer dexamethasone 0.6 mg/kg IV/IO/IM/PO up to 10 mg.
   b. If the child deteriorates, ventilate with a BVM.
   c. If you cannot effectively ventilate with BVM perform intubation.
4. If complete obstruction is present and you cannot effectively BVM ventilate the patient and the patient is deteriorating, consider needle cricothyrotomy.

B. Asthma

1. Give DuoNeb and albuterol per adult guidelines.
2. If patient is deteriorating give 1:1000 epinephrine 0.01 mg/kg IM (max dose 0.5 mg). Contact OLMC for additional doses.
3. If patient has moderate to severe asthma based on Severity Assessment Guide and is not improving with treatment, consider dexamethasone 0.6 mg/kg IV/IO/IM/PO up to 10 mg.
4. If transport time is long and asthma is severe, contact OLMC for consideration of magnesium sulfate.

C. Acute Bronchiolitis (< 2 years old)

Mild-moderate respiratory distress (see Infant Respiratory Distress table below)

1. Give oxygen via blow-by, nasal cannula or mask to keep SpO_2 > 92%. Monitor $EtCO_2$ if available.
2. If nasal secretions and/or congestion use nasal suction with adapter if available, if secretions are thick may use normal saline to loosen.
3. If wheezing, give albuterol 2.5 mg via nebulizer. If improvement may use every 10 minutes. Discontinue if pts heart rate is > 200.
4. If patient worsens and is still wheezing, give epinephrine 5 mL of 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 mins. if necessary. Discontinue if patient's heart rate is > 200.
5. If unable to keep SpO_2 > 92% with oxygen or patient has continued significant work of breathing despite treatment:
   a. 30-90 days old - titrate high flow nasal cannula (pediatric) oxygen ($HFNCO_2$) starting at 2 LPM up to 4 LPM.
   b. Greater than 90 days old - titrate high flow nasal cannula oxygen up to 6 LPM.

Severe respiratory distress (see Infant Respiratory Distress table below)

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

NOTES & PRECAUTIONS:

A. Aggressive airway management, including early intubation, is appropriate for the patient who does not respond to treatment or is rapidly deteriorating.

B. The best indicator for the cause of respiratory distress is past history. If a person has had COPD or CHF in the past, it is likely the person has the same condition again.
C. 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.
D. COPD and asthma patients receiving CPAP need to be monitored closely due to the higher risk of pneumothorax.

KEY CONSIDERATIONS:
Speed of onset, recent illness/infection, fever, chills or productive cough, medications and allergies, distended neck veins, peripheral edema, lung sounds, medical history (including asthma, CHF, COPD, pneumonia)

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
ETCO2	20 - 30	30 - 40	>50

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

TREATMENT:

A. Treat per Universal Patient Care.
B. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness):
    1. Administer midazolam 2.5 - 5 mg IV/IO. Repeat every 5 minutes until seizure stops.
    2. If no IV/IO access, administer midazolam 10 mg IM/IN. Repeat every 5 minutes until seizure stops.
    3. Monitor patient's respiratory status closely after midazolam administration.
C. Check blood glucose and treat per Altered Mental Status protocol.
D. Place patient on left side for transport.
E. If the seizure activity does not stop after two doses of midazolam, transport to the closest hospital.
F. 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. If patient is not transported have the patient (or guardian) sign a Patient Information Form and document the patient's mental status.
G. All first-time seizure patients require medical evaluation and should be transported. Contact OLMC if patient refuses.

PEDIATRIC PATIENTS:

A. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness):
    1. Administer midazolam 0.3 mg/kg IM/IN to a max of 10 mg. Repeat every 5 minutes until seizure stops.
    2. If an IV/IO is available, may administer midazolam 0.1 mg/kg IV/IO to a max of 5 mg. Repeat every 5 minutes until seizure stops.
    3. Monitor patient's respiratory status closely after midazolam administration.
B. Febrile seizures are generally found between the ages of 1- 6 and are usually short in duration.
C. If seizure does not stop after two doses of midazolam, transport to the closet hospital. Transport to a non-pediatric hospital may be necessary to get alternative antiepileptics.
D. If, on arrival, the patient is not actively seizing (post-ictal) an IV is not required.
E. All hypoglycemic or first time pediatric seizure patients should be transported.

NOTES & PRECAUTIONS:

A. 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.
B. The longer status seizure lasts, the more difficult it is to control. Seizures that aren't responsive to midazolam may require alternative antiepileptic agents in a timely manner.
C. New onset of seizures in a pregnant patient, especially in the third trimester, may indicate toxemia of pregnancy. Contact OLMC for consideration of magnesium sulfate. Normal dose is 4 grams IV over 15-20 minutes.

TREATMENT:

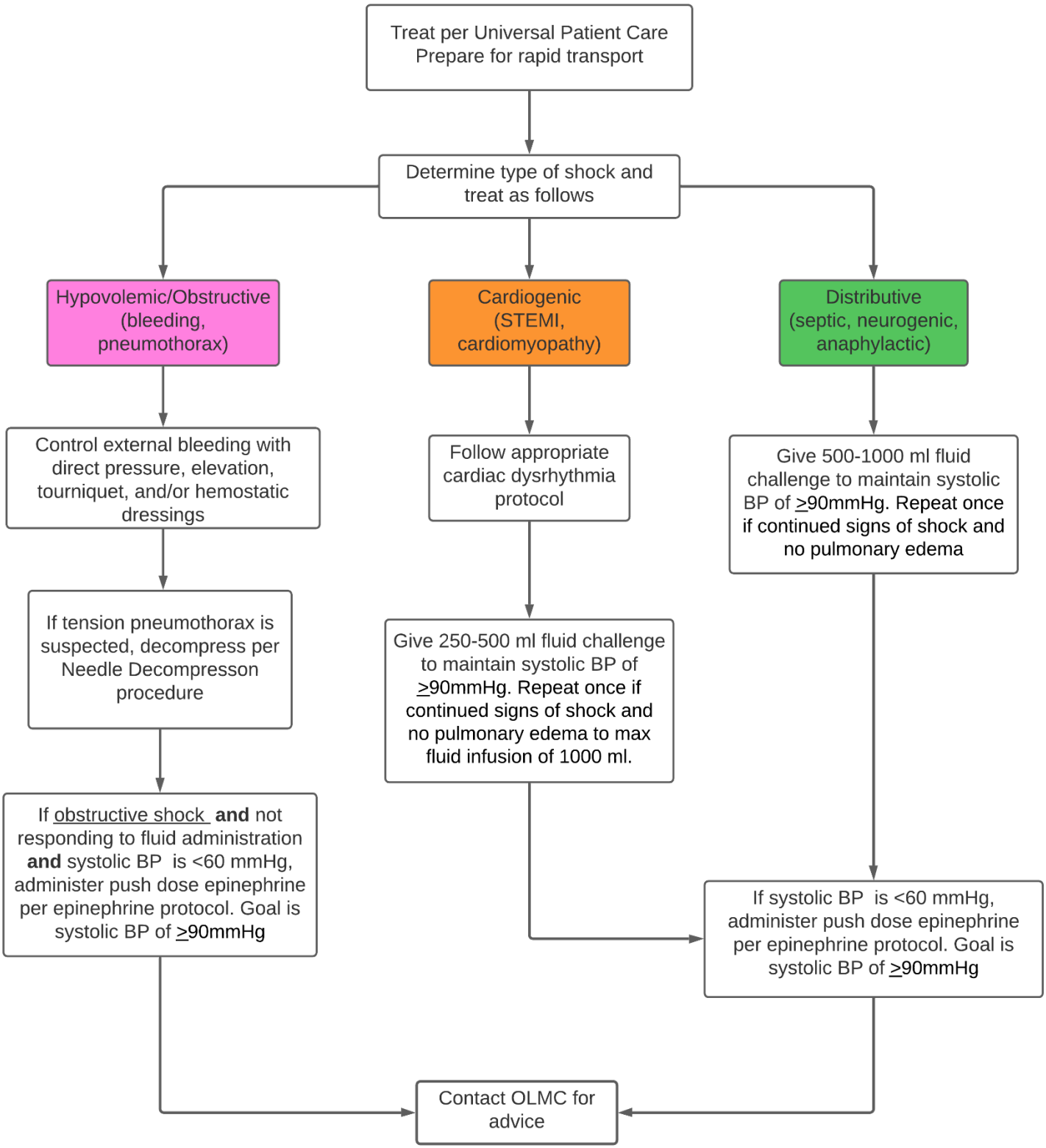
A. Treat per Universal Patient Care.
B. Maintain $SpO_2 \geq 94\%$.
C. If suspected infection and two or more of the following qSOFA criteria are met:
   - Systolic Blood Pressure < 100 mmHg
   - Respiratory rate > 22 breaths/min (and/or $EtCO_2$ < 25 mmHg)
   - Altered mental status (GCS < 15)

   1. Notify the receiving hospital with a "Sepsis Alert" and begin fluid resuscitation at 30 ml/kg.
   2. If available, check point of care lactate and notify receiving hospital if > 4 mMol.
   3. If systolic BP < 90 mmHg, start IV and treat per shock protocol. Target mean arterial pressure (MAP) ≥ 65 mmHg.

NOTES & PRECAUTIONS:

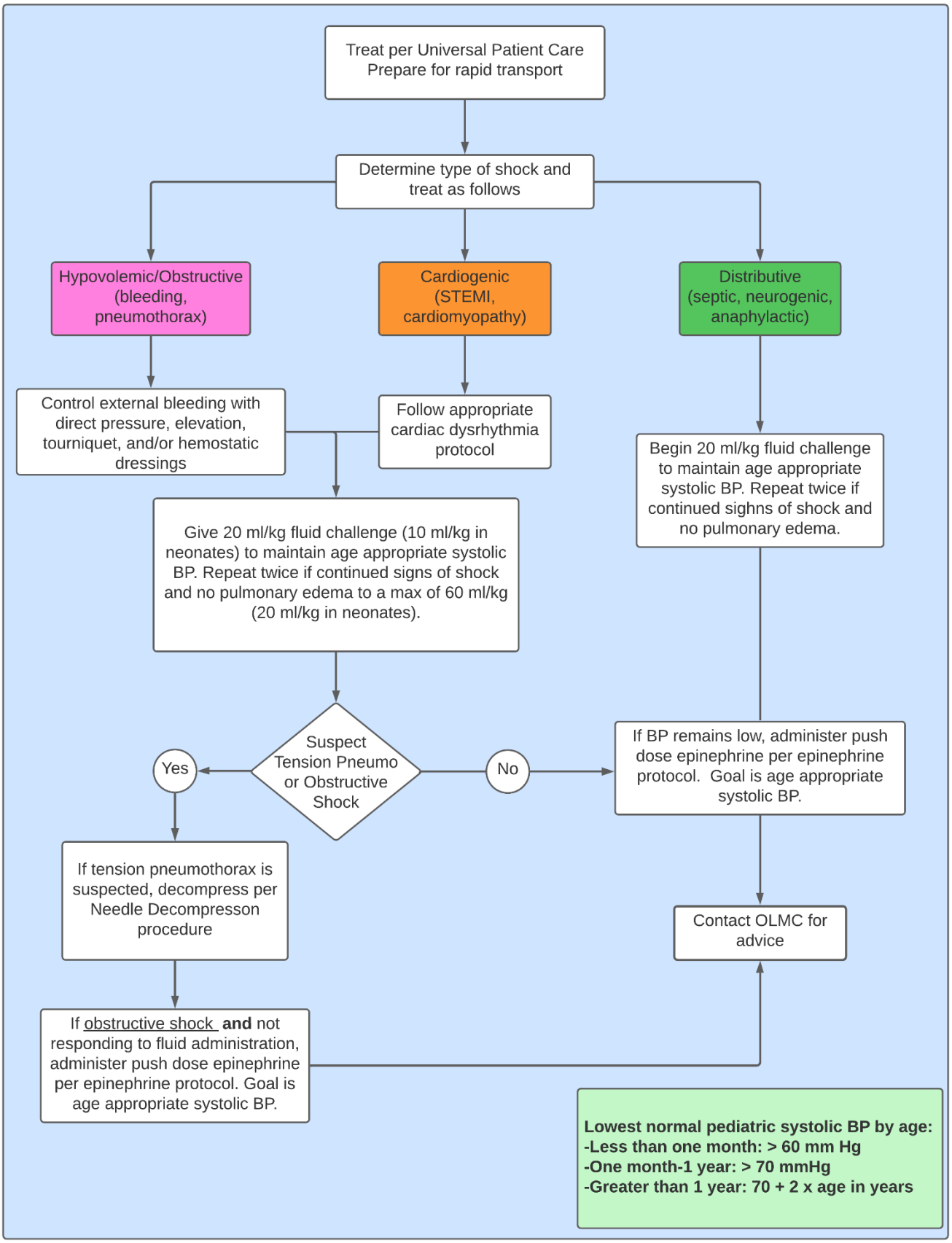
A. Sepsis is a rapidly progressing, life threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and death.
B. The purpose of a "Sepsis Alert" is to provide pre-arrival emergency department notification to facilitate rapid assessment and treatment of a suspected severe sepsis patient.
C. qSOFA – Quick Sepsis-related Organ Failure Assessment.

Shock – 10.180


Treat per Universal Patient Care
Prepare for rapid transport
Determine type of shock and treat as follows
Hypovolemic/Obstructive (bleeding, pneumothorax)
Cardiogenic (STEMI, cardiomyopathy)
Distributive (septic, neurogenic, anaphylactic)
Control external bleeding with direct pressure, elevation, tourniquet, and/or hemostatic dressings
Follow appropriate cardiac dysrhythmia protocol
Give 500-1000 ml fluid challenge to maintain systolic BP of ≥90mmHg. Repeat once if continued signs of shock and no pulmonary edema
If tension pneumothorax is suspected, decompress per Needle Decompresson procedure
Give 250-500 ml fluid challenge to maintain systolic BP of ≥90mmHg. Repeat once if continued signs of shock and no pulmonary edema to max fluid infusion of 1000 ml.
If obstructive shock and not responding to fluid administration and systolic BP is <60 mmHg, administer push dose epinephrine per epinephrine protocol. Goal is systolic BP of ≥90mmHg
If systolic BP is <60 mmHg, administer push dose epinephrine per epinephrine protocol. Goal is systolic BP of ≥90mmHg
Contact OLMC for advice

Shock – 10.180

PEDIATRIC PATIENTS:



NOTES & PRECAUTIONS:

A. Closely monitor patient's respiratory status and vital signs. Avoid fluid overload.
B. Mean Arterial Pressure targets:
    1. Uncontrolled traumatic hemorrhagic shock without TBI or suspected AAA, target MAP is 55-65 mmHg (SBP 70-90).
    2. Uncontrolled traumatic hemorrhagic shock with TBI or shock from all other causes, target MAP is ≥ 65 mmHg (SBP ≥ 100).
C. 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.
D. If an improvised tourniquet is present before medical provider arrival, place a commercial tourniquet per protocol and remove the improvised tourniquet if operationally feasible.

KEY CONSIDERATIONS:
Mechanism of injury, medications, recent illness, medical history

EMS - Field Activated Stroke Alert Algorithm

Patient with Complaint of Stroke-Like Symptoms

Identify Time Symptoms Started or Last Seen Normal Time (If patient woke up or was found with symptoms must identify when the last time patient was seen normal)

Determine how long it has been since onset or last seen normal time (Time Now – Onset/Last Normal Time)

- Onset/Last Normal ≤ 24 hours
- Onset/Last Normal ≥ 24 hours → NO Stroke Alert Activation

BE FAST STROKE SCREEN Balance - Eyes - Face - Arm - Speech - Time		Normal	Abnormal	
B Balance	**Finger to nose or observe patient's gait** Normal: Not dizzy, steady gait Abnormal: lack of balance, inability to walk, abnormal gait, ataxia (stumbling, falling, as if drunk)	Normal	Balance	Gait/Ataxia
E Eyes	**Visual Acuity (Count fingers in all 4 quadrants, one eye at a time), visual field assessment (patient look forward, wiggle fingers in all visual fields)** Normal: Vision normal for patient, with or without correction Abnormal: Sudden double or blurred vision, blindness, visual field cut	Normal	Left	Right
F Face	**Have patient smile/show teeth** Normal: Both sides of face move equally Abnormal: One side of face weak/unequal/movement absent	Normal	Left	Right
A Arm	**Arm: Extend arms, close eyes, palms down** Normal: Both arms move equally or not at all Abnormal: One arm drifts compared to the other	Normal	Left	Right
S Speech	**Ask patient to repeat, "You can't teach an old dog new tricks"** Normal: Patient uses correct words with no slurring Abnormal: Patient has difficulty finding words, may speak in long meaningless sentences and/or cannot understand/follow simple verbal commands	Normal	Abnormal	
T Time	**Time: Onset/Last Seen Normal**	**Time**		
	New onset of neurologic deficits within the last 4.5 hours?	Yes		No
	New onset of neurologic deficits within the last 24 hours?	Yes		No

- All Findings Normal → NO Stroke Alert Activation
- Onset/Last Normal ≤ 4.5 hours → ACTIVATE STROKE ALERT
- Onset/Last Normal ≥ 4.5 hours but ≤ 24 hours → Proceed to CSTAT

CINCINNATI STROKE TRIAGE ASSESSMENT TOOL - C-STAT

This tool is a large vessel occlusion (LVO) assessment tool.

	Points	Definition
GAZE		Unable to look in certain direction with both eyes.
Absent (Normal)	0	
Present (Abnormal)	2	
ARM WEAKNESS		Cannot hold up arm(s) for 10 seconds.
Absent (Normal)	0	
Present (Abnormal)	1	
LEVEL OF CONCSIOUSNESS		Incorrectly answers at least one of two LOC questions **AND** does not follow at least one of two commands.
Absent (Normal)	0	**LOC Questions** - What month is it? How old are you?
Present (Abnormal)	1	**LOC Commands** - Open your eyes. Make a fist.

C-STAT positive is defined as a score of ≥ 2

- CSTAT Score ≤ 1 → NO Stroke Alert Activation
- CSTAT Score ≥ 2 → ACTIVATE STROKE ALERT

PRE-HOSPITAL TREATMENT:

A. Treat per Universal Patient Care (No oxygen if SpO2 ≥ 94% with good waveform).
B. Apply cardiac monitor as soon as possible and continuously assess rhythm.
C. Place I8g IV or larger, in the AC when possible.
D. Check CGG. If CBG is low, treat per Altered Mental Status guidelines.
E. Complete **BE FAST Stroke Screen.**
F. If **BE FAST** is positive, obtain Last Known Normal Time.
G. If Last Known Normal Time is ≥ 4.5 hours but ≤ 24 hours, perform **Cincinnati – Stroke Triage Assessment Tool (C-STAT)**
   1. If C-STAT is ≥ 2, activate at Stroke Alert
   2. When contacting receiving hospital notify them that patient is either C-STAT positive or negative.
H. Transport patient with head elevated at least 30 degrees.
I. Document serial neurologic examinations.

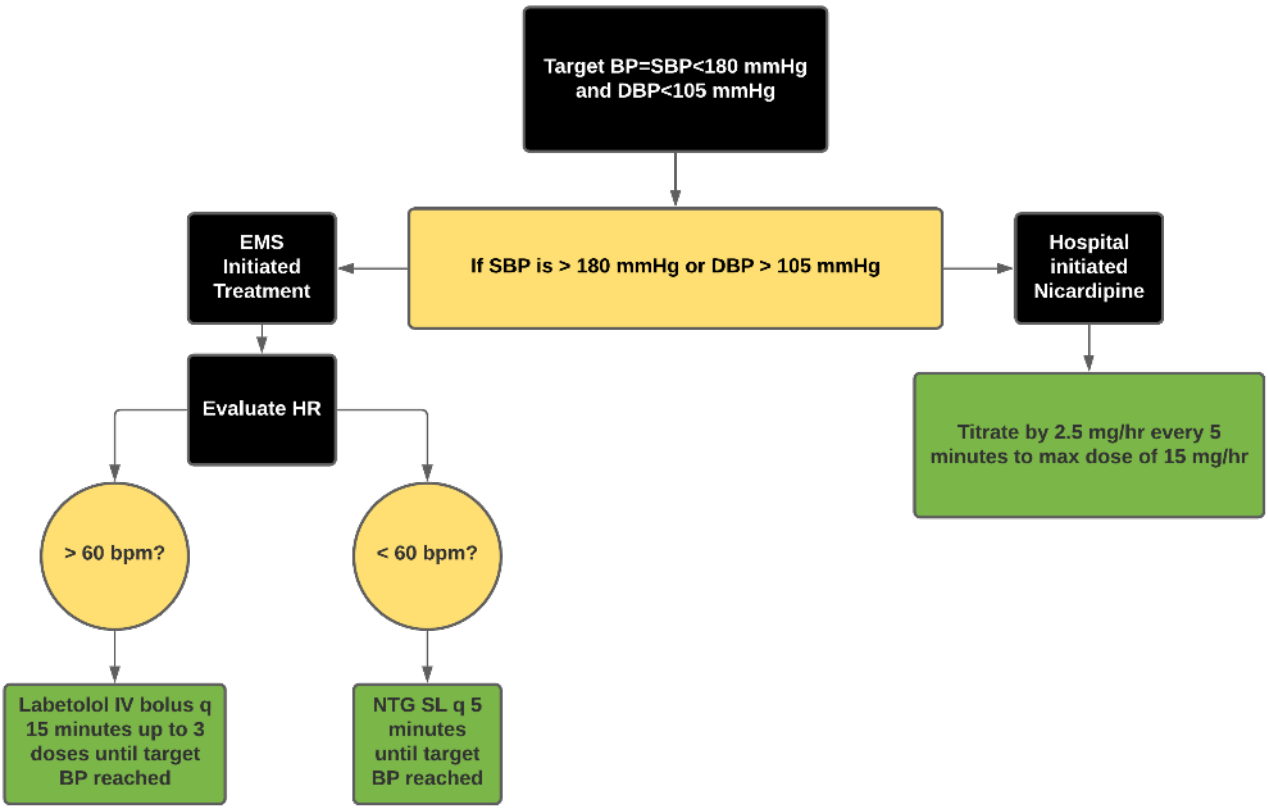
INTERFACILITY TREATMENT BETWEEN SALEM HOSPITAL AND ACCEPTING COMPREHENSIVE STROKE CENTER:

Assessment:

- Continuous cardiac and SpO2 monitoring.
- Vital signs every 5 minutes.
- Evaluate and document GCS, original deficits, facial droop, movement of each extremity, lateral gaze, speech, pupil size and reaction.
- Constant surveillance for adverse effects of tPA:
  - Angioedema:
    - Allergic reactions (e.g. angioedema, anaphylaxis) to tPA have been reported, especially in people taking ACE inhibitors.
    - Edema to the tongue, lips, mouth, oropharynx and/or difficulty breathing.
  - Signs of intracranial hemorrhage:
    - Spike in blood pressure, widening pulse pressure, change in heart rate ≥ 20% of initial heart rate.
    - Vomiting with neurological changes.
    - New severe headache.
    - Decreased LOC.
    - Sudden worsening of neurological exam.
  - Signs of severe and uncontrolled hemorrhage:
    - Sudden, increased heart rate and decrease in SBP of 20% or more from initial BP.
    - Sudden abdominal or flank pain.

Treatment:

- Position patient on gurney with head of bed less than 30 degrees as tolerated.
- Maintain SpO2 > 94%
- Monitor tPA infusion site. No other medications can be administered through the tPA IV.
- Maintain tPA infusion initiated by hospital:
  - Alteplase infusion 0.81 mg/kg to max of 81 mg over 60 minutes (requires IV pump)
  - Monitor volume remaining in tPA infusion. When bag is empty, but fluid remains in in IV tubing, stop infusion. Remove tPA bag and spike bag of NS using same IV tubing. Continue 50 ml of NS at same rate as initial tPA infusion. After 50 ml infusion is complete, discontinue the IV infusion.
- Blood Pressure Control:



- Nicardipine IV (hospital initiated):
  - IV pump required.
  - Titrate 2.5 mg/hr q. 5 minutes to max dose of 15 mg/hr to maintain SBP 140-180 mmHg.
  - If SBP drops more than 20% or < 120 mmHg, turn off Nicardipine. Do not titrate in this situation. Lay head of bed flat as tolerated.
- Labetalol (EMS initiated):
  - Used if heart rate is > 60 bpm.
  - Administer 10 mg IV.
  - May be repeated twice q. 15 minutes if BP not in target range.
  - Double remaining doses following initial dose i.e. 1st dose 10 mg, 2nd dose 20 mg, 3rd dose 40 mg.
  - If heart rate decreases to < 60 bpm or adverse effects noted, stop administration.
  - Max dose is 70 mg.
  - Do not administer through tPA site/IV.
- Nitroglycerin (EMS initiated):
  - Used if heart rate < 60 bpm.
  - Administer 1 tablet SL.
  - May be repeated q. 5 minutes until target BP reached.

Documentation:

- Vital signs.
- GCS q. 15 minutes

- Any neuro assessment associated with positive or negative change.
- Alteplase (tPA)
    - Infusion rate and end time.
    - 50 ml NS flush start/end time and infusion rate.
- BP Medications
    - Nicardipine-rate and titration with BP before and 15 minutes after.
    - Labetalol bolus-dose, time, BP before and 15 minutes after.
    - Nitroglycerin-dose, time, BP before and 5 minutes after

Submerged Patient – 10.200

TREATMENT:

A. Treat per Universal Patient Care.
B. If there is any doubt as to mechanism of injury or any possibility of cervical injury, immobilize patient and consider Trauma System entry.
C. If indicated, treat per Hypothermia protocol.
D. If patient is in cardiac arrest, 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:
   1. Children < 6 years of age and water temperature at recovery depth of < 40° F.
   2. Patients who may have been trapped in an underwater air pocket.
   3. Water temperature at recovery depth is < 40 degrees F and information suggests that patient may have been swimming on the surface for at least 15 minutes prior to becoming submerged.
   4. Paramedic discretion (contact OLMC).

NOTES & PRECAUTIONS:

A. If patient is still in the water, rescue should be performed by properly trained and equipped personnel only.
B. Be prepared to manage vomiting.
C. Even if patient initially appears fine, delayed pulmonary edema is likely to occur.

KEY CONSIDERATIONS:

Medical history, length of submersion, water temperature at recovery depth, medications and allergies, events prior to submersion

TREATMENT:

A. Treat per Universal Patient Care.
B. Patient evaluation should include best GCS to help categorize injury severity.
    1. Mild injury GCS of 13-15
    2. Moderate GCS 9-12
    3. Severe GCS ≤ 8
C. Avoid hypoxia at all times. Place a non-rebreather facemask on **ALL** patients with potential TBI.
D. Prevent hypotension (Goal SBP ≥ 100 or MAP ≥ 65).
    1. Initiate a bolus of normal saline or lactated ringers.
    2. Continue fluid boluses to maintain the systolic blood pressure ≥ 100 mmHg (MAP ≥ 65).
E. 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).
F. 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.
G. If the patient has an airway placed (oral or advanced), carefully manage ventilations in order to minimize hyperventilation.
    1. Monitor $EtCO_2$ with goal of $EtCO_2$ of 40 mmHg.
    2. If available, use a pressure-controlled bag (PCB) and ventilation rate timer (VRT).
    3. If a transport ventilator is available, begin with the following settings:
        a. Tidal volume of 7ml/kg,
        b. Rate of 10 BPM. Adjust rate to keep $EtCO_2$ within target range
H. If there are signs of herniation, then <u>MILD</u> hyperventilation to an $EtCO_2$ of 35 mmHg may be performed. Signs of herniation include:
    1. Blown pupil
    2. Posturing
I. For moderate to severe blunt or penetrating head trauma: **<u>If available</u>**, administer 2 grams Tranexamic Acid (TXA) slow IV/IO push over 10 minutes (Optional method: Mix 2 grams in 100 ml of NS and infuse over 10 minutes via drip or pump), if **<u>both</u>** the following indications are met:
    1. Age ≥ 15 (or ≥ 50 kg if age unknown)
    2. 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
    - Any chest compressions (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
    - Other procoagulant drugs (e.g. KCENTRA) already administered
J. Consider and treat reversible causes of altered mental status including hypoxia, hypoglycemia, and overdose.

PEDIATRIC PATIENTS:

A. Manage hypoxia. Place a non-rebreather facemask in **ALL** patients with potential TBI.
B. Manage blood pressure. Avoid hypotension.

    1. Initiate a 20 ml/kg bolus of normal saline or lactated ringers.
    2. Continue fluid boluses to maintain SBP goals:
        a. Infants/children age <10: 70 mmHg + (age X 2).
        b. Children age ≥ 10: 100 mmHg (same as adults).

C. If patient 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).
D. 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.
K. If an airway is placed (oral or advanced), then carefully manage ventilations in order to minimize hyperventilation.
    1. Monitor $EtCO_2$ on all patients with goal of $EtCO_2$ of 40 mmHg.
    2. If available, use a pressure-controlled bag (PCB) and ventilation rate timer (VRT).
    3. If a transport ventilator is available, set a tidal volume of 7 ml/kg. Adjust rate to keep $EtCO_2$ within target range.
    4. Pediatric ventilatory rates:
        a. Infants: (age 0-24 months): 25 breaths per minute (bpm);
        b. Children: (age 2-14): 20 bpm;
        c. > 15 years: 10 bpm (same as adults).
E. If there are signs of herniation, then MILD hyperventilation to an $EtCO_2$ of 35 mmHg may be performed. Signs of herniation include:
    1. Blown pupil
    2. Posturing

NOTES & PRECAUTIONS:

A. The main goal is to avoid the three H's that increase mortality:
    1. Avoid **h**ypoxia
    2. Avoid **h**yperventilation
    3. Avoid **h**ypotension
B. A single episode of hypoxia is independently associated with DOUBLING of the mortality rate.
C. Hyperventilation is independently associated with a mortality rate that is between TWO and SIX times higher.
D. Inadvertent hyperventilation happens reliably if not meticulously prevented by proper external means.
E. 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:
Acetaminophen liquid 160 mg/5 mL
Acetaminophen 325 mg and 500 mg tablets, capsules, gel, suppositories

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 & PEDIATRIC DOSING:
Acetaminophen 15 mg/kg PO to 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
45 lbs/20 kg	320 mg	10 mL
66 lbs/30 kg	480 mg	15 mL
88 lbs/40 kg	640 mg	20 mL
110 lbs/50 kg	800 mg	25 mL
130 lbs/60 kg	960 mg	30 mL

Activated Charcoal – 20.010

OLMC REQUIRED:

A. Aspirin and acetaminophen with time of ingestion > two 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 has the ability to slow conduction through the AV node. Since most cases of PSVT involve AV nodal re-entry, adenosine is capable of interrupting 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 less than ten seconds.

INDICATIONS:
To convert PSVT to a normal sinus rhythm, including PSVT that is associated with accessory bypass tracts (e.g. Wolff-Parkinson-White Syndrome).

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.

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 PVC's 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.

Alteplase (tPA) – 20.035

OLMC REQUIRED: For interfacility transports only.

SUPPLIED: IV infusion of __ mg/__ ml of NS.

PHARMACOLOGY AND ACTIONS:
Thrombolytic drugs dissolve blood clots by activating plasminogen, which forms a cleaved product called plasmin. Plasmin is a proteolytic enzyme that is capable of breaking cross-links between fibrin molecules, which provide the structural integrity of blood clots. Because of these actions, thrombolytic drugs are also called "plasminogen activators" and "fibrinolytic drugs."

INDICATIONS:
Interfacility transport only of patient diagnosed with non-hemorrhagic CVA to comprehensive stroke center.

CONTRAINDICATIONS:

A. Hypersensitivity
B. Recent surgery (within 10 days)
C. GI/GU bleeding
D. Uncontrolled hypertension (systolic BP > 180 or diastolic BP > 110)
E. Active internal bleeding
F. History of CVA (within 2 months)
G. Recent brain, or spinal surgery (within 2 months)
H. Recent trauma

PRECAUTIONS AND NOTES:
A. Monitor all puncture sites (e.g., catheters, incisions, etc.) during therapy.
B. Avoid new puncture sites or injections.
C. Allergic reactions and anaphylaxis can occur when administering this medication.

ADULT DOSING:
Hospital Initiated Infusion for Interfacility Transport to Comprehensive Stroke Center:
- Alteplase requires an IV pump
- 81 mg/kg to a max of 81 mg infused over 60 minutes.
- Monitor volume remaining in tPA infusion. When bag is empty, but fluid remains in in IV tubing, stop infusion. Remove tPA bag and spike bag of NS using same IV tubing. Bolus 50 ml of NS than reduce to TKO rate.

Amiodarone (Cordarone®) – 20.040

OLMC REQUIRED: See contraindications.

SUPPLIED: 150 mg / 3 ml pre-filled syringe or 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 QT 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

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 QT 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 - 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).

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.

Stable V Tach with a pulse - 2.5 mg/kg IV/IO. Mix with 2 ml/kg of NS in Buretrol (or in 100 ml bag if using an IV pump) and infuse over 10 minutes. May repeat once if no conversion.

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 (i.e. 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 (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 with unconsciousness (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.

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 -
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 EMT 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)

Diphenhydramine (Benadryl ®) – 20.090

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 drugs (e.g. Haldol®, Thorazine®, Compazine®, Inapsine®). 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 drugs.

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 rarely necessary in the field. It is not the first-line drug for allergic reactions but may be useful for long 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.

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

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 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 systolic BP is at least 90 mmHg and signs of shock have been alleviated.

PEDIATRIC DOSING:
Same as adult.

Droperidol (Inapsine®) – 20.102

OLMC REQUIRED: Patients < 14 years old

SUPPLIED: 5 mg / 2 ml vial and ampule

PHARMACOLOGY AND ACTIONS:
Droperidol is an antipsychotic that may be used as a chemical restraint by producing marked sedation and allaying apprehension. 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. Sedation of combative patients to facilitate restraint.
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. Patients < 14 years old

PRECAUTIONS:
A. Use caution when administering droperidol to patients who have taken other CNS depressant drugs (barbiturates, benzodiazepines, alcohol)
B. Droperidol may induce Torsades 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 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)
Patient restraint -
2.5 mg IV/IO or 5 mg IM. May repeat once in 10 minutes.
For immediate threat (RASS +3 or +4, see patient restraint protocol 30.120):
2.5 – 5 mg IV/IO or 5 – 10 mg IM in addition to midazolam.

PEDIATRIC DOSING: Contact OLMC for patients < 14 years old.

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 mcg (1 ml) IV/IO every 1-5 minutes.
Pediatric Dosing: 1 mcg/kg every 2 - 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 and 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 is able to 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 (kg)	Dose (mg)	Volume (ml)*
30	15	1.5
35	17.5	2.0
40	20	2.0
45	22.5	2.5
50	25.0	2.5
55	27.5	3.0
60	30	3.0
65	32.5	3.5
70	35	3.5
75	37.5	4.0
80	40	4.0
85	42.5	4.5
90	45	4.5
95	47.5	5.0
100	50	5.0
105	52.5	5.5
110	55	5.5
115	57.5	6.0
120	60	6.0
125	62.5	6.5
130	65	6.5
135	67.5	7.0
140	70	7.0
145	72.5	7.5
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 use in rapid sequence intubation.
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.

.

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 rapid sequence intubation -
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 (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 5 minutes as needed to a maximum of 500 mcg. IM – 50-100 mcg. May repeat every 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 5 minutes to a maximum of 500 mcg. Monitor closely.</u>

Post-Intubation analgesia -

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

CPR Induced Consciousness-

50 mcg IV/IO used in conjunction with midazolam. 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 5 minutes as needed to a maximum of 4 mcg/kg. Or, 2 mcg/kg IN repeated with 1 mcg/kg every 5 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 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 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. 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:
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.

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 (malnutrition, alcoholism) may not be able to mobilize any glucose in response to glucagon.

ADULT DOSING:
Hypoglycemia -
1 mg IM.

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 (i.e. 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 EMT 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 as a chemical restraint 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:
Known allergy to haloperidol

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 (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.

ADULT DOSING:
Patient restraint -
5-10 mg IV, IO, IM. May repeat to a maximum of 20 mg.
Nausea and vomiting
1.25 mg IV/IM

PEDIATRIC DOSING:
Contact OLMC for dosing.

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 isobutylphenyl 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 & PEDIATRIC DOSING:
10 mg/kg PO to maximum of 600 mg.

Pediatric dosing using 100 mg/5 mL liquid

Weight	Dose	Volume
18 lbs / 7.5 kg	75 mg	3.75 mL
24 lbs / 10 kg	100 mg	5 mL
36 lbs / 15 kg	150 mg	7.5 mL
48 lbs / 20 kg	200 mg	10 mL
60 lbs / 25 kg	250 mg	12.5 mL
72 lbs / 30 kg	300 mg	15 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 use in rapid or delayed sequence intubation (RSI or DSI).
B. Pain management.

CONTRAINDICATIONS:
A. Eye pain or trauma.
B. Known pregnancy.
C. Non-traumatic chest pain.
D. 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.
B. **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.**

Induction agent for RSI or DSI -
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.**

PEDIATRIC DOSING:
Pain management -
Ketamine is not approved for use in pain control in pediatric patients < 15 years of age. 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.
Induction agent for rapid or delayed sequence intubation - Same as adult

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 and pain.

INDICATIONS:

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

CONTRAINDICATIONS:

A. Age < 2 or > 64.
B. Multisystem trauma
C. History of renal disease or kidney transplant.
D. History of liver disease.
E. Allergies to aspirin or other NSAIDs.
F. Pregnancy, or lactating females.
G. On anticoagulant, such as vitamin K antagonists (e.g. warfarin) or directing 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:

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 – 20.159

OLMC REQUIRED: For interfacility transports only.

SUPPLIED:
- 20 ml multidose vial of 5 mg/ml
- 40 ml multidose vial of 5 mg/ml
- 4 ml prefilled syringe of 5 mg/ml

PHARMACOLOGY AND ACTIONS:
Sympathetic blocker, Alpha-adrenergic blocker, Beta-adrenergic blocker. 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:
Interfacility Transport Only: blood pressure control for CVA patients with systolic BP > 180 mmHg or diastolic BP > 105 mmHg and HR greater than 60 bpm (see protocol 10.190 for Stroke/CVA).

CONTRAINDICATIONS:
A. Uncompensated congestive heart failure
B. Pulmonary edema
C. Cardiogenic shock
D. Bradycardia or heart block

PRECAUTIONS:

A. Use caution with patients that have a medical history of liver problems, heart problems (e.g., mild/moderate congestive heart failure), lung disease (chronic bronchitis, emphysema), pheochromocytoma, diabetes, any allergies to beta blockers.

B. Blood pressure, pulse, and EKG must be constantly monitored. Atropine and transcutaneous pacing should be available.

C. Do not administer through same site as tPA infusion.

SIDE EFFECTS AND NOTES:
A. Cardiovascular: symptomatic postural hypotension, ventricular dysrhythmia, and rarely syncope, bradycardia, and heart block.
B. CNS: dizziness, tingling of the scalp/skin, numbness, vertigo.
C. Respiratory: wheezing, bronchospasm
D. GI: nausea, vomiting.

ADULT DOSING:
Hospital Initiated Infusion for Interfacility Transport to Comprehensive Stroke Center:
- IV Bolus q. 15 minutes to reach target of systolic blood pressure < 180 mmHg and diastolic blood pressure < 105 mmHg.
- First dose: 10 mg
- Second dose: 20 mg
- Third dose: 40 mg
- If heart rate decreases to < 60 bpm or adverse effects are noted, stop administration.
- Max dose is 70 mg.

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. PVC's in a suspected ischemic event.
D. 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.
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 repeated with 0.75 mg/kg every 10 minutes.
If Lidocaine was the last anti-dysrhythmic given - 0.75 mg/kg every 10 minutes.
PVCs (In the setting of an acute ischemic event only) -
Bolus 1.5 mg/kg IV/IO over 1 – 2 minutes. If no change, give 0.75 mg/kg IV/IO every 5 minutes, up to 3 mg/kg. When PVCs are suppressed, give 0.75 mg/kg every 10 minutes.
Pain management for IO placement -
40 mg (**2**cc's of **2**% Lidocaine slowly over **2** minutes).

Lidocaine – 20.160

PEDIATRIC DOSING:

Same as adult for V-Fib/Pulseless VT, ROSC, and PVC's.

Pain management for IO placement- 0.5 mg/kg slowly, not to exceed 40 mg.

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 QT interval, ventricular fibrillation and ventricular tachycardia

INDICATIONS:

A. Polymorphic Ventricular Tachycardia (stable wide complex, irregular tachycardia associated with an underlying prolonged QT [Torsade de Pointes]).
B. For the treatment of seizures in women with pre-eclampsia/eclampsia with OLMC approval.
C. 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 -
2 grams IV/IO over 1-2 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. Status seizure (any seizure that has lasted longer than 2 minutes or two consecutive seizures without regaining consciousness)
B. To relieve anxiety and produce amnesia during cardioversion, pacing, or paralytic intubation.
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 and barbiturates, 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.

Chemical restraint -
Refer to Patient Restraint protocol (30.120) for dosing.

Pre-medication for RSI (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 -
0.1 mg/kg IV/IO to a max of 5 mg, or
0.3 mg/kg IM/IN to a max of 10 mg
* Repeat every 5 minutes until seizure stops.

Chemical restraint -
0.1 mg/kg IV/IO to a max of 5 mg, or
0.2 mg/kg IM/IN to a max of 10 mg
* Call OLMC for additional orders.

Pre-medication for RSI -
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 5 to max of 20 mg. If no IV give 5-10 mg IM. May repeat IM with 5 mg every 15 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 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.

Nicardipine – 20.218

OLMC REQUIRED: Initiated by sending hospital for interfacility transports.

SUPPLIED:

- Infusion solution 20 mg/200 ml
- Infusion solution 40 mg/200 ml

PHARMACOLOGY AND ACTIONS:
Calcium-channel blocker (dihydropyridine); inhibits transmembrane influx of extracellular calcium ions across membranes of myocardial cells and vascular smooth muscle cells without changing serum calcium concentrations. This inhibits cardiac and vascular smooth muscle contraction dilating main coronary and systemic arteries and decreasing peripheral resistance.

INDICATIONS:
Interfacility Transport Only: blood pressure control for CVA patients systolic blood pressure > 180 mmHg or diastolic blood pressure > 105 mmHg.

CONTRAINDICATIONS:

A. Hypersensitivity to nicardipine or other calcium-channel blockers
B. Advanced aortic stenosis

PRECAUTIONS:

A. May cause symptomatic hypotension or tachycardia.
B. Titrate slowly to avoid symptomatic hypotension and possible negative inotropic effects with CHF, angina, or left ventricular disfunction.
C. To reduce possibility of venous thrombosis, phlebitis, and vascular impairment, do not use small veins such as those on the dorsum of hand or wrist.

SIDE EFFECTS AND NOTES:
Common side effects are headache, flushing, dizziness, peripheral edema, polyuria.

ADULT DOSING:
Hospital Initiated Infusion for Interfacility Transport to Comprehensive Stroke Center:

- 2.5 mg/hour titrated q. 5 minutes to reach target of systolic blood pressure < 180 mmHg and diastolic blood pressure < 105 mmHg.
- Max dose is 15 mg/hour.

Nitroglycerin – 20.220

OLMC REQUIRED: See Contraindications (C).

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. Acute inferior myocardial infarction (ST elevation in II, III and AVF).
C. 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. Generalized vasodilatation can cause profound hypotension and reflex tachycardia.
B. 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, or 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 –
Nitroglycerine 0.4 mg SL; repeat every 3-5 minutes. *(Do not administer nitroglycerine 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 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/ml vial)
2. Put medication in 250 ml bag
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

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 12 mcg/min. Goal is a systolic blood pressure of $\geq$ 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).**

Adults (8 mcg/ml concentration)

Mcg/min	4	8	12
Drops/min	30	60	90

Olanzapine (Zyprexa®)– 20.227

OLMC REQUIRED: No

SUPPLIED:
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 between the ages of 18 – 65 who is willing to take an oral agent. (**RASS +1, see patient restraint protocol 30.120).**

CONTRAINDICATIONS

A. Patients less than 18 or greater than 65 years of age.

PRECAUTIONS:

A. May cause QT prolongation, but unlikely in single dose. Obtain ECG before administration if known history or suspicion for prolonged QT or cardiovascular disease.
B. Known hypersensitivity.
C. Use with caution in suspected drug overdose.

ADULT DOSING (Age 18 – 65):

10mg PO - 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.

Patients who have received olanzapine (ODT) may be transported directly to Unity Hospital (see Behavioral Health Emergencies protocol 30.025).

Ondansetron (Zofran®) – 20.230

OLMC REQUIRED:
Patients < 6 months except for children in spinal immobilization 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 QT 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.

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 to 30 minutes. Metabolism is 5 to 35% renal and the remainder by the liver.

INDICATIONS:
A. For sustained neuromuscular blockade in the intubated patient.
B. For induction intubation (RSI/DSI) in the patient when succinylcholine is contraindicated or unavailable.

CONTRAINDICATION:
Maintainance 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 intubation – 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. In the non-perfusing patient sodium bicarbonate has been shown to increase the intracellular acidosis and worsen acid/base balance, thus it is not recommended in the routine cardiac arrest sequence.

INDICATIONS:
A. To control arrhythmias or asystole in cyclic antidepressant overdose or hyperkalemia.
B. Acidosis caused by prolonged cardiac arrest.
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 diabetics who are ketotic.
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, Type 1a or 1c anti-dysrhythmics) -
1 mEq/kg IV or IO.

V-Fib, pulseless V-Tach, 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

Sodium Bicarbonate – 20.260

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 hydoxocobalimin (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 defecits 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:

Rapid or delayed sequence intubation -
1.5 mg/kg IV/IO

PEDIATRIC DOSING:

Rapid or delayed sequence intubation -
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.

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. Any 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
J. Other procoagulant (e.g. KCENTRA) drug already administered

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):
2 grams slow IV/IO push over 10 minutes (Optional method: Mix 2 grams in 100 ml of NS and infuse over 10 minutes via drip or pump)

PEDIATRIC DOSING:
Not indicated in patients < 15 years of age.

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 rapid sequence intubation (RSI) or delayed sequence intubation (DSI) 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 of action of ziprasidone is unknown. However, it is thought to be through blocking of dopamine and serotonin receptors producing sedation and tranquilization.
C. Onset of action of a single IM dose is from 15 to 30 minutes and duration of action is 2-4 hours. The peak effect may not be apparent for up to 2 hours.

INDICATIONS:

Chemical restraint in combative patients.

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). Consider reduced doses in these cases.
C. May induce Torsades 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.

NOTES & PRECAUTIONS:

A. Somnolence, dizziness, headache, and nausea have occurred following administration. These are not life threatening and generally do not require treatment.
B. Reconstitution: Add 1.2 ml sterile water for injection and shake vigorously until completely dissolved.
    - 1 ml = 20mg of ziprasidone.

ADULT DOSING:

Patient Restraint -

10 - 20 mg IM. (**IM ONLY)** Do not repeat.

PEDIATRIC DOSING:
Contact OLMC.

Procedures

Airway Management / General - 30.010

PURPOSE:
Proper airway management is the first priority of the EMS Provider/Paramedic.

INDICATIONS:
A. Airway control and protection.
B. Inadequate ventilation and/or oxygenation.

Oxygenation, Maintenance of Airway and Ventilation:

A. Supplemental oxygen:
    1. A Nasal cannula is useful for small amounts of supplemental oxygen.
    2. Partial Rebreather masks (PRB) are recommended when higher flow and concentrations of oxygen need to be delivered.
    3. “Blow-by” oxygen should be used for infants and toddlers.

B. Nasopharyngeal Airways (NPA) or Oropharyngeal Airways (OPA) should be used for patients who are unable to maintain their own airway.

C. A Bag-Valve-Mask (BVM) should be used when inadequate ventilation is present.

D. CPAP should be considered for MEDICAL patients complaining of moderate to severe respiratory distress meeting ALL the criteria described in the Continuous Positive Airway Pressure (CPAP) procedure.

E. Continuous End-tidal CO_2 shall be utilized on all intubated patients.

F. PEEP valve should be considered when ventilating a patient with COPD or emphysema to maintain alveolar inflation during exhalation.

NOTES & PRECAUTIONS:
In trauma patients, airway maintenance with cervical spine control is the primary concern. If unable to establish or maintain an airway, transport the patient to the closest hospital. This includes patients entered into the Trauma System.

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, i.e., 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.

Combitube® Placement – 30.030

DEFINITION:
The Combitube® is a two-tube system similar to the PTL, EOA or EGTA airways. However, the Combitube® has combined the lumens of an endotracheal and esophageal tubes. The device is inserted blindly, entering the esophagus (approx. 90% of the time) or the trachea (approx. 10% of the time). Depending on which structure it enters it will function as an esophageal or endotracheal ventilation device. The Combitube® may be used by Paramedics and EMT-Intermediates who have received the appropriate training.

INDICATIONS:
A. Immediate intubation is not available or cannot be performed.
B. Access to the patient's head is inhibited due to entrapment.
C. Direct visualization of the larynx is inhibited.

CONTRAINDICATIONS:
A. Patient less than 16 years of age.
B. Patient under five (5) feet tall.
C. Patient who has an intact gag reflex.
D. Patient with known esophageal disease (i.e. varices, cancer).
E. Patient who has ingested a caustic substance.

PROCEDURE:
A. Pre-oxygenate.
B. Place head in neutral position.
C. Insert device using a jaw-lift maneuver to the depth indicated by the marking on the tube. The black rings on the tube should be positioned between the patient's teeth (or gums if patient has no teeth).
D. Inflate the pharyngeal (large) cuff with 100cc of air.
E. Inflate the distal (small) cuff with 15cc of air.
F. Ventilate through longer blue connector (number 1) tube.
G. Listen for sounds in both lungs and stomach.
    a. If you hear breath sounds instead of gastric sounds, continue ventilation through tube number 1.
    b. If you hear gastric sounds and no lung sounds, begin ventilation through shorter (number 2) clear tube.
H. Confirm lung sounds with 5-point auscultation.
I. Ventilate with 100% oxygen.
J. Secure using ETT securing device.
K. Apply $EtCO_2$ detection device.

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 oximetery 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.

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 intubate or ventilate using BVM) and respiratory obstruction 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, angioneurotic edema, 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 available 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. Insert the tracheal hook or dilator through the cricoid membrane. If using the hook secure the superior edge of the cricothyroid cartilage and apply caudal displacement.
G. Insert a 6.5 or smaller tube (rotate at 90° if necessary).
H. Remove tracheal hook.
I. Inflate the cuff.
J. Secure device.
K. Attach end-tidal CO_2 adapter and BVM.
L. Consider sedation if necessary.

PerTrach

A. Locate the cricothyroid membrane.
B. Palpate the cricothyroid membrane with gloved hand.
C. Pinch the skin, and make a 1-2 cm vertical incision, cutting away from the patient.
D. Firmly grasp the trachea and insert the needle.
E. Aspirate for air with a syringe.
F. Remove syringe, and thread dilator through needle.
G. Squeeze wings of needle and open out to split needle. Carefully remove needle.
H. Insert dilator into airway, place tube in functional position, (faceplate against skin.)
I. Remove dilator.
J. Inflate cuff with 1-8 ccs of air.
K. Secure the device to the neck and ventilate.
L. Consider sedation with midazolam as with RSI if not already given.

Emergency Cricothyrotomy – 30.035

QuickTrach

A. Place the patient in a supine position. Assure stable positioning of the neck region and hyperextend the neck.
B. Locate the cricothyroid membrane (in the midline between the thyroid cartilage and the cricoid cartilage).
C. Pinch the skin and make a vertical incision in a downward motion with a scalpel over the cricothyroid membrane large enough to introduce the device.
D. Secure the larynx laterally between the thumb and middle finger and reconfirm the location of the cricoid membrane.
E. Firmly hold the device and puncture the cricothyroid membrane at a 90-degree angle.
F. After puncturing the cricothyroid membrane, check entry of the needle into the trachea by aspirating air through the syringe. If air is aspirated the needle is in the trachea.
G. Change the angle of the needle to 60 degrees and advance the device forward into the trachea to the level of the stopper.
H. Remove the stopper being careful not to advance the device further into the trachea with the needle still attached.
I. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
J. Secure the device to the neck.
K. Apply the connecting tube to the device and ventilate.
L. Consider sedation with midazolam as with RSI if not already given.

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 with midazolam as with RSI if not already given.

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/regulators
    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. Verify placement of ET tube using $EtCO_2$ and a careful five-point check. **Keep patient on continual $EtCO_2$ monitoring and pulse oximetry.**
E. Secure the tube utilizing ETT securing device. Record ET Tube depth at the teeth.
F. Do not interrupt CPR when securing a patient's airway. Once secured, ventilate to EtCO2 of 35-45 mmHg.
G. Ventilate and monitor patient's vital signs including SpO_2.
H. If signs of "CPR Induced Consciousness" are present, administer up to 2.5 mg of midazolam IV/IO **and** 50 mcg of fentanyl. May repeat as needed every 5 – 10 minutes.
I. Consider orogastric tube placement.

Perfusing Patients:

A. Follow the Intubation Checklist. *Use is mandatory.*
B. If the patient is **less than 12 years old**, only consider intubation if they have thermal burns present or the patient is in anaphylactic shock and the airway is compromised. All other pediatric cases should be managed by BVM or supraglottic airway.
C. Physiologically optimize patient prior to intubation with a MAP > 65 mmHg (systolic BP > 100 mmHg), $SpO_2 \geq 94\%$ for at least 3 minutes, and aggressive treatment of underlying conditions
D. Treat hypotension with fluids as well as Push Dose epinephrine 10 mcg every 1- 5 minutes, with goal for a MAP > 65 mmHg (SBP 100 mmHg).
E. Place nasal cannula (not ETCO2 cannula) and administer oxygen at 15 lpm. Continue apneic oxygenation during procedure
F. **If unable to achieve $SpO_2 \geq 94\%$, consider a supraglottic airway.**
G. Assemble and check equipment:
    1. Two O_2 tanks w/regulators
    2. Nasal cannula (not ETCO2 NC)
    3. Mask and BVM
    4. PEEP Valve (if appropriate)
    5. Inline $EtCO_2$

6. Intubation equipment (VL, DL)
7. Suction
8. Backup devices ready (bougie, supraglottic airway, cric kit)

H. Attach pulse oximeter, cardiac monitor, BP cuff, and wave form $EtCO_2$ monitor.
I. Establish 2 IVs or IOs, if not already done.
J. Verbalize missed airway plan to the entire team and verify/mark surgical airway landmarks
K. The **preferred** medication to sedate patients during resuscitation/pre-intubation is Ketamine 200 mg IV/IO slow push over 60 seconds.
L. The **preferred** paralytic agent pre-intubation is Rocuronium 100 mg IV/IO.
M. Perform intubation approximately 60 seconds after Rocuronium or Succinylcholine, and 2-3 minutes after Vecuronium.
N. **If SpO2 drops to < 94% during intubation attempt, STOP and ventilate with BVM using 100% oxygen before next attempt.**
O. If intubation unsuccessful, consider use of BVM and/or backup supraglottic airway device.
P. If unable to ventilate with BVM or backup airway, proceed to cricothyrotomy.
Q. Verify placement of ET tube using wave form $EtCO_2$, five-point check and video laryngoscopy if available. **If ETCO2 with waveform cannot be obtained, the airway device must be removed immediately.**
R. Insert an oral airway or compatible bite-block device if needed.
S. Secure the endotracheal tube and record the depth at the teeth.
T. Continue cardiac, waveform $EtCO_2$, and pulse oximetry monitoring.
U. 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

V. After successful airway placement, administer:
1. **Preferred**-Ketamine 200 mg IV/IO slow push over 60 seconds **OR**
2. 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) **AND**
3. 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).

W. Consider orogastric tube placement.

.

INTUBATION CHECKLIST

Items are to be read aloud and confirmed by crew members.

ASSESS

Can this patient be intubated on the gurney in the present location?

- ☐ **YES – Move Patient to gurney**
- ☐ **NO – Move Patient to appropriate location to facilitate intubation on gurney**

PATIENT PREPARATION

****NOTE**** if patient is experiencing hypoxic agitation and does not tolerate treatment, administer **Ketamine – 200 mg** slow IV push over 60 seconds.

- ☐ **Patient on gurney in Ear-to-Sternal Notch position**
- ☐ **SPO_2 attached** with good waveform
- ☐ **Vitals Signs -** HR, SPO2, BP, RR
- ☐ **4-lead ECG Attached**
- ☐ **NC placed @ 15 lpm** (not $ETCO_2$ cannula)
- ☐ **IV/IO Placed**

EQUIPMENT PREPARATION

- ☐ **BVM, OPA/NPA**
- ☐ **PEEP Valve** attached set to 10 cm H_2O
- ☐ **ETCO2** attached to BVM (Inline)
- ☐ **Intubation equipment and back-up devices prepared** (GlideScope, rigid stylet, i-gel)
- ☐ **Suction**
- ☐ **Medications prepared:**
  - **Ketamine – 200mg** *(prepare 2 syringes)*
  - **Rocuronium – 100mg**
  - **Push-Dose Epi – 1:100,000**
- ☐ **Verbalize failed airway plan**

TIME OUT

MAP ≥ 65 AND SPO2 ≥ 94%?

- ☐ **NO – Continue to Resuscitation**
- ☐ **YES – Continue to Intubation**

RESUSCITATION

HYPOXIA

- ☐ **Ketamine – 200 mg** slow push over 60 seconds *If not given previously*

Assess Breathing

- ☐ **Adequate?** HOLD BVM with NPA/OPA and two-handed mask seal
- ☐ **Inadequate?** VENTILATE with BVM/OPA or NPA/two-handed mask seal

↑ PEEP by 5 cm H_2O at a time, max 20cm H_2O, as needed

HYPOTENSION

- ☐ **Fluid Bolus –** can give concurrently with Push-Dose Epi
- ☐ **Push Dose Epi – 1 mL every 1-5 min** as indicated

TIME OUT

MAP ≥ 65 AND SPO_2 ≥ 94%?

- ☐ **NO – Go back to Resuscitation**
- ☐ **YES – Continue to Intubation**

Reassess - does this patient still need to be intubated?

Consider **i-gel** w/o paralytics if unable to resuscitate

INTUBATION

- ☐ **Ketamine – 200 mg** slow push over 60 seconds *If not given previously*
- ☐ Begin 3-min countdown to allow for complete de-nitrogenation using two-handed mask seal

DO NOT administer Rocuronium until 3-min countdown is complete

- ☐ **Rocuronium - 100 mg,** *wait 60 sec before intubating*
- ☐ **Suction** before or during blade insertion
- ☐ **Intubate -** Max 2 Attempts. If unsuccessful, go to failed airway plan

If SpO2 falls below 94% during the intubation attempt, STOP and reoxygenate

- ☐ **Confirm** placement EtCO2 **with** wave form, vocal cords visualized, lung sounds

If unable to obtain $ETCO_2$ with waveform, the airway device must be removed immediately

- ☐ **Secure ET tube and record depth**

POST INTUBATION

- ☐ **Ketamine – 200 mg** slow push over 60 seconds
- ☐ **Titrate PEEP to lowest setting for SaO2 ≥ 94%** *(PEEP >15 cmH2O can cause hypotension; monitor BP closely.)*
- ☐ **Vitals Signs -** HR, SPO2, BP, RR
- ☐ **Push-Dose Epi & fluids as indicated**
- ☐ Consider OG insertion

E. With high quality CPR and 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 to include moaning.
F. Succinylcholine, rocuronium and vecuronium do not affect the level of consciousness and should be used with etomidate/ketamine/midazolam.
G. 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 (patients who have missed dialysis).
H. Avoid vecuronium and rocuronium in patients suspected of having underlying status epilepticus (seizures).
I. Start with 1 mg/kg of ketamine for induction. If disassociation is not achieved, administer a second 1 mg/kg dose of ketamine.
J. 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.
K. Ketamine can cause laryngospasm and may cause an emergence reaction with vivid dreams.
L. Pre-oxygenation 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).
M. 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, $EtCO_2$ device used/reading, any other devices/ techniques used, reconfirmation of placement after each patient movement.

End-Tidal CO_2 Monitoring – 30.070

INDICATIONS:
For use to measure effectiveness of ventilation by measuring the amount of carbon dioxide in exhaled air.

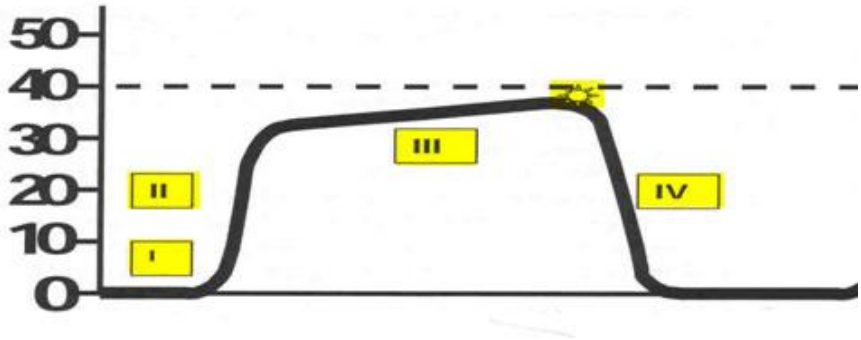
PROCEDURE:
A. Manage airway according to appropriate Airway Management Procedure.
B. Apply $EtCO_2$ monitor, if available. Maintain $EtCO_2$ output between 35-40 mmHg.

The following approximates the degree of ventilation:

> 40 mmHg	***=***	***Hypoventilation***
35 – 40 mmHg	***=***	***Normal ventilation***
30 – 35 mmHg	***=***	***Hyperventilation***
< 30 mmHg	***=***	***Aggressive hyperventilation. This should be avoided in all patients!***

C. If there are signs of traumatic brain injury (TBI) and herniation, then MILD hyperventilation to an $EtCO_2$ of 35 mmHg may be performed.

NOTES & PRECAUTIONS:
A. **Remember, pulse oximetry does not equate 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 CO_2 output from normal (35-40 mmHg) to 15-20 mmHg and an obvious change in 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.



- **PHASE I:** Respiratory baseline, CO_2 free dead space air, normally 0.
- **PHASE II:** Expiratory upstroke, rapid rise due to mixing of dead space air and alveolar air, should be steep.
- **PHASE III:** Expiratory plateau, exhalation of mostly alveolar air
- ☼**:** Peak $EtCO_2$ Level, end of exhaled air, peak end tidal CO_2 level, normally 35-45mmHg.
- **PHASE IV:** Inspiratory downstroke, inhalation of CO_2 free gas, quickly returns to the baseline.

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.

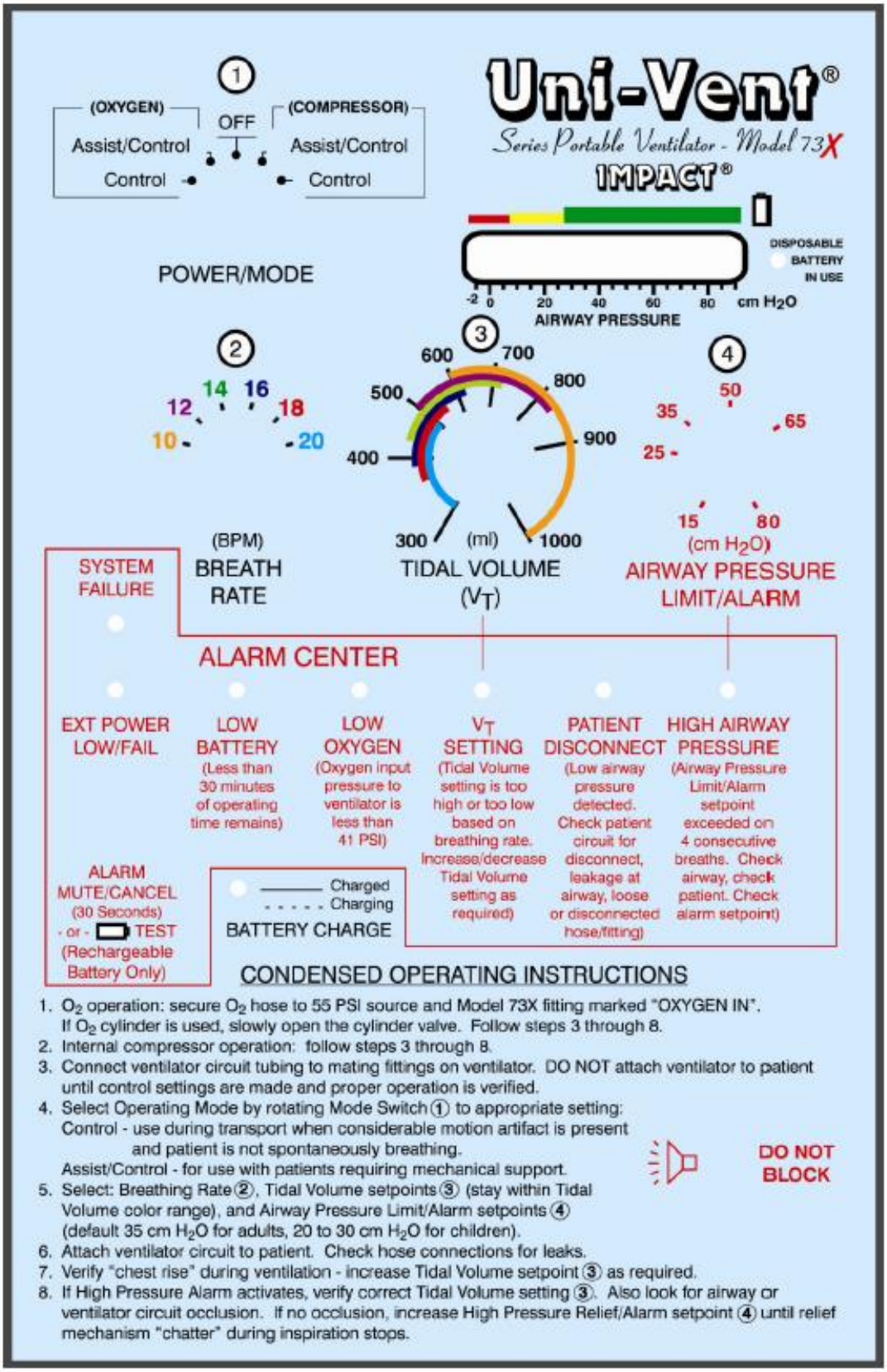
Impact Uni-vent® 73x Ventilator – 30.075

INDICATION:
Need for prolonged ventilation.

PROCEDURE:
A. O_2 operation:
    1. Secure O_2 hose to 55 PSI source and model 73x fitting marked "Oxygen In".
    2. If O_2 cylinder is used, slowly open the cylinder valve. Follow steps 3-8.
B. Internal compressor operation: follow steps 3-8.
C. Connect the 3 ventilator circuit tubing (Gas Output, Transducer, and Exhalation Valve) to mating fittings on ventilator. Do not attach ventilator to patient until control settings are made and proper operation is verified.
D. Select Operating Mode by rotating Power/Mode Switch (1) to appropriate setting:
    1. Control - used during transport when considerable motion artifact is present and patient is not spontaneously breathing.
    2. Assist/Control - for use with patients requiring mechanical support.
E. Select :
    1. Breath Rate (2) between 8-12 breaths per minute.
    2. Tidal Volume (VT) set points (3) between 6-10 ml/kg ideal body weight , (stay within the Tidal Volume color range), and
    3. Airway Pressure Limit / Alarm (4) set points (Default 35 cm H20 for adults, 20-30 cm H2O for children).
F. Attach ventilator circuit to patient.
G. Check hose connection for leaks.
H. Verify chest rise during ventilation. Increase Tidal Volume (VT) set point as required.
I. If High Pressure Alarm activates, verify correct Tidal Volume setting (3). Also look for airway or ventilator circuit occlusion. If no occlusion, increase High Pressure Relief Alarm (4) Set point until relief mechanism "chatter during inspiration stops.
J. Adjust settings to maintain PaO_2 > 90%, $ETCO_2$ between 35-40 mm Hg.

NOTES & PRECAUTIONS:
A. Contraindications include Active CPR, suspected pneumothorax, inability to maintain adequate oxygenation (PaO_2 > 90%), pediatric patient under 30 kg (66 lbs).
B. Initial settings should be 100% oxygen, ventilatory rate between 8-12 breaths per minute, and tidal volume 6-10 mL/kg ideal body weight. Attempt to decrease tidal volume to 6 mL/kg to minimize barotrauma.
C. If patient becomes unstable or saturations < 80% disconnect from ventilator and bag patient with 100% FiO_2.

Impact Uni-vent® 73x Ventilator – 30.075



Intranasal Medication Administration – 30.078

DEFINITION:
In the absence of an established IV, intranasal is a rapid route offering high level of bioavailability of the medication being administered. The intranasal route can reduce the risk of needle sticks while delivering effective medication levels. The rich vasculature of the nasal cavity provides a direct route into the bloodstream for medications that easily cross the mucous membranes.

INDICATIONS:

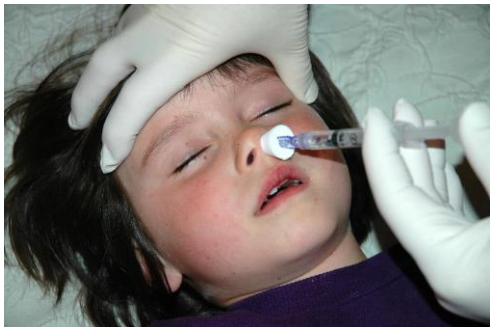
A. Patient without IV access requiring urgent medication administration (e.g., active seizure, respiratory arrest secondary to opiate overdose).
B. Alternate administration route for fentanyl administration for pain management.

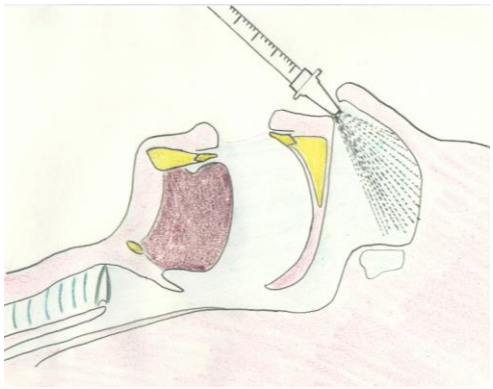
CONTRAINDICATIONS:

A. Epistaxis
B. Nasal Trauma
C. Nasal septal abnormalities
D. Nasal congestion or discharge

PROCEDURE:

A. Patient should be in a supine or recumbent position. If the patient is sitting, then compress the nares after administration.
B. Draw up medication into a syringe using appropriate transfer device.
C. Remove air from syringe.
D. Remove transfer device and place atomizer onto syringe and confirm it is secure.
E. Administer medication by briskly compressing the plunger to expel and atomize the medication administering a maximum of 1cc of solution per nare.
F. Evaluate medication effectiveness and continue with treatment protocol.





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.

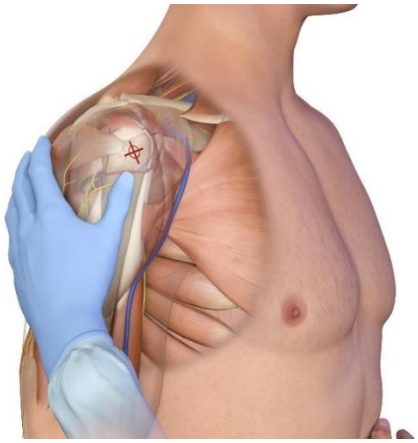
INDICATIONS:

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.

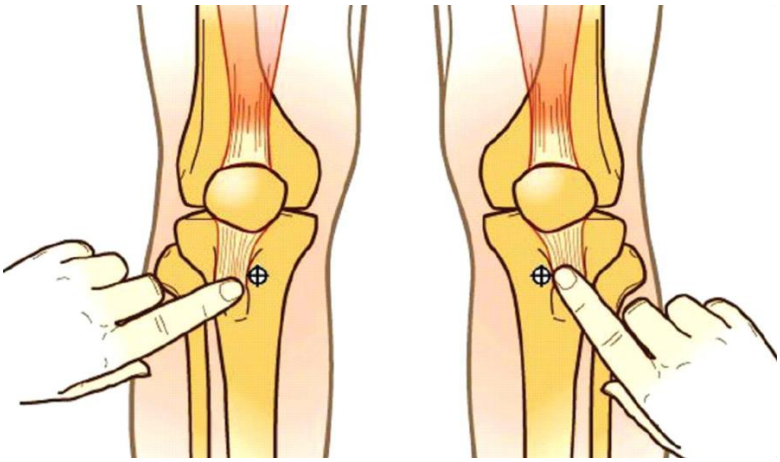
EZ-IO® PROCEDURE:

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 $\geq$ 3 kg.
    2. The 45 mm (Yellow) EZ-IO® needle can be used for adult insertions (larger individuals) 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).

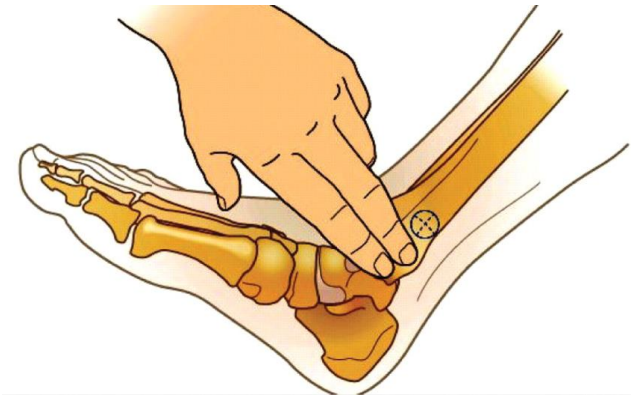
b. Insertion site is located directly on the most prominent aspect of the greater tubercle. Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site.



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.



3. Distal tibia
   -Two finger widths proximal to the medial malleolus along the midline of the tibia.



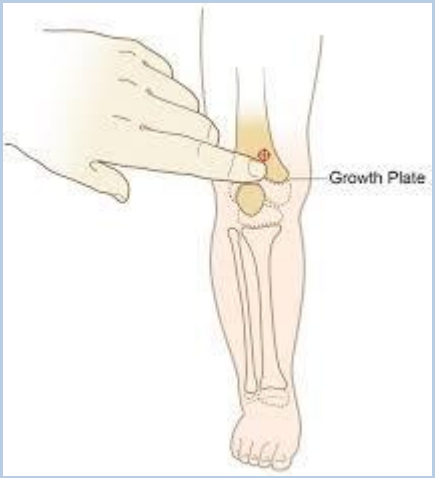
E. Needle insertion
   1. Prep the surface with povidone-iodine or chlorohexidine and wipe dry with a sterile gauze pad.
   2. Stabilize patient's extremity and begin insertion from a 90-degree angle to the insertion site. Push the needle set through the skin until the tip touches the bone.
   3. With 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 of 2 ml of 2% over 2 min). Wait approximately 30–60 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 F.1 above. Wait approximately 30–60 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 3kg (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 ≥ 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 and one finger width medial of the tibial tuberosity.
      c. If the tibial tuberosity cannot be identified on the child, then the insertion site may be two finger widths below the patella, then medial along the flat aspect of the tibia.
   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) from the upper patella edge. This location will avoid the growth plate of the distal femur.



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 30–60 seconds before flushing with normal saline.
2. If fluids do not flow freely, flush IO site with an additional 2-3 ml normal saline.

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 in order to maintain flow rates. The EMT 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 tibia.
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.

Intravenous Access & Infusion – 30.090

INDICATIONS:

A. Normal Saline or Lactated Ringers is indicated for replacement of fluid volume losses such as in trauma, burns, dehydration, or shock.
B. A saline lock may be substituted for an IV line in all situations, except where IV fluid is the therapy of choice for volume replacement. If an IV line is started, it should be a regular macro drip unless otherwise indicated.

PROCEDURE FOR IV ACCESS:

A. IV access:
   1. Select vein and appropriate gauge catheter for the vein according to the patient's condition.
   2. Prep the skin with an antiseptic solution. If using 2% chlorhexidine allow to dry before covering with dressing.
   3. Insert the needle with the bevel up.
   4. Advance the catheter into the vein. Never reinsert the needle through the catheter.
   5. Remove tourniquet.
   6. Connect IV line or saline lock. For trauma system and burn patients, connect extension set between the IV hub and the solution bag and tubing.
   7. Assure free flow of the fluid.
   8. Cover the site with a sterile dressing.
   9. Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.

B. IV access with a saline lock:
   1. Establish IV access as above.
   2. Connect pre-flushed extension set to IV hub.
   3. Flush with normal saline checking for extravasation.
   4. If the IV lock system is used for the administration of medication, the line must be flushed after each administration.

PROCEDURE FOR IV MEDICATION INFUSION:

A. Using a Buretrol®, Volutrol®, or Soluset® volume control type device:
   1. Establish IV access and prepare solution.
   2. Connect the volume control device between the IV bag and the IV catheter.
   3. Place one hour's solution into the chamber and close the connection between the volume control device and the IV bag.
   4. Begin infusing solution at the appropriate rate.
   5. If necessary, additional solution may be placed in the volume control device chamber.
   6. Do not place more than one hour’s worth of solution in the chamber.

B. Using an infusion pump:
   1. Establish IV access and prepare solution.
   2. Connect compatible IV tubing to infusion pump according to manufacturer's directions.
   3. Begin infusing solution at the appropriate rate.

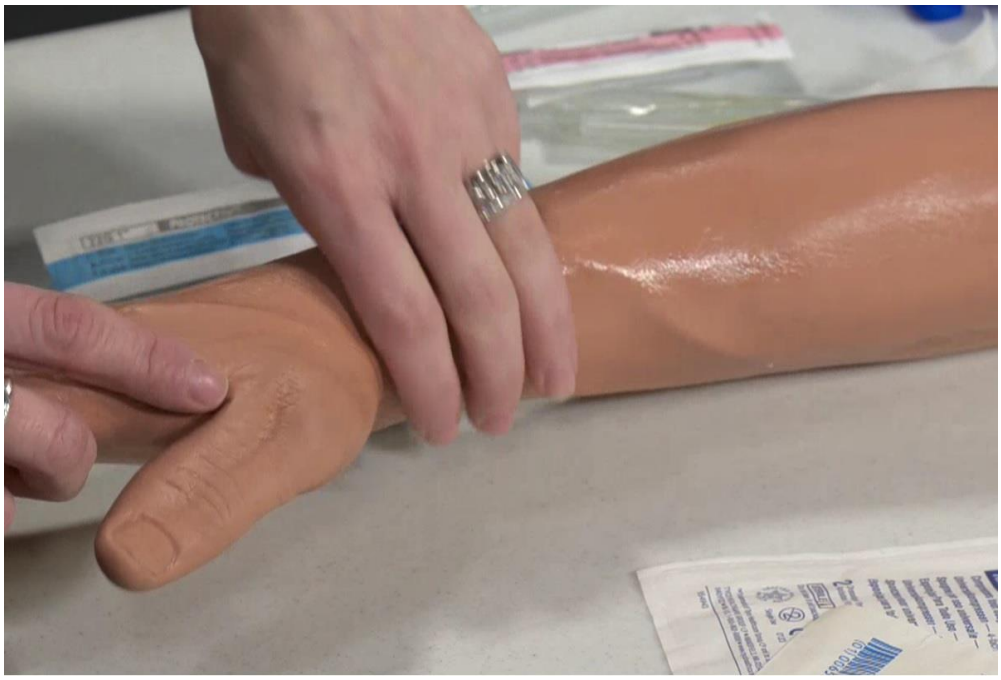
NOTES & PRECAUTIONS:

A. Normal Saline and Lactated Ringers should be used with caution in patients with renal impairment (hyperkalemia), cardiac and respiratory disorders (fluid overload), or extremes of age.
B. Avoid having the tourniquet on longer than two minutes as this can result in hemolysis and vasospasm in the extremity.
C. If possible, avoid wrist area as shown below secondary to possible radial nerve damage.
D. If patient has had a mastectomy or lymphectomy, avoid starting IV on that side as there is an increased risk of complications to the patient.

IV CATHETER FLOW RATES:

SIZE	ML/Min
18G x 1 1/4"	110
20G x 1"	65
20G x 1 1/4"	63
22G x 1"	38
24G x 5/8"	24

AVOID IV START IN THIS AREA:



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.

Medication and Procedure Cross Check – 30.108

PURPOSE:

Closed-loop communication and two provider cross checks are well established techniques for improving safety in multiple settings. The intent of this protocol is to provide a structured interaction that improves patient safety and reduces the risk of medication and procedure errors.

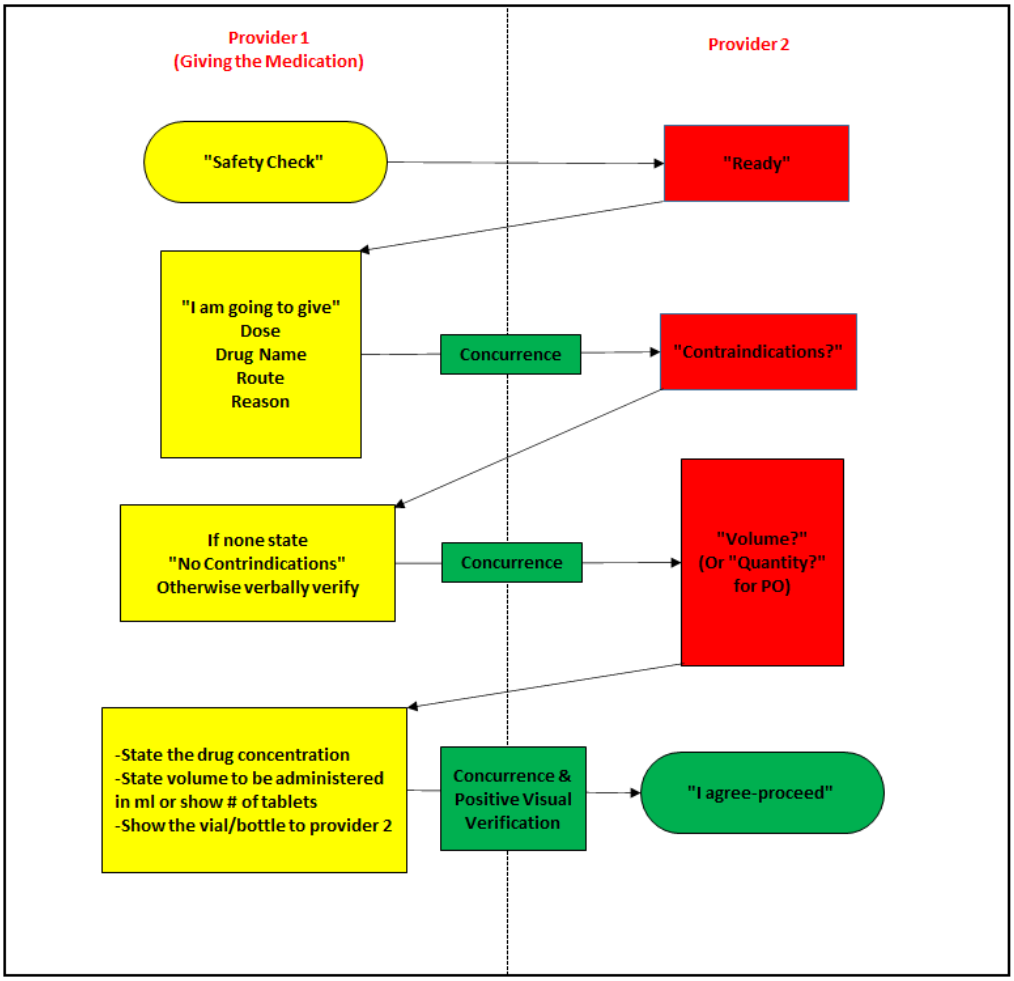
INDICATION:

The following cross check should be used under the following circumstances:

- Medication administration
- High-risk invasive procedures such as intubation, needle thoracostomy, and/or cricothyrotomy.

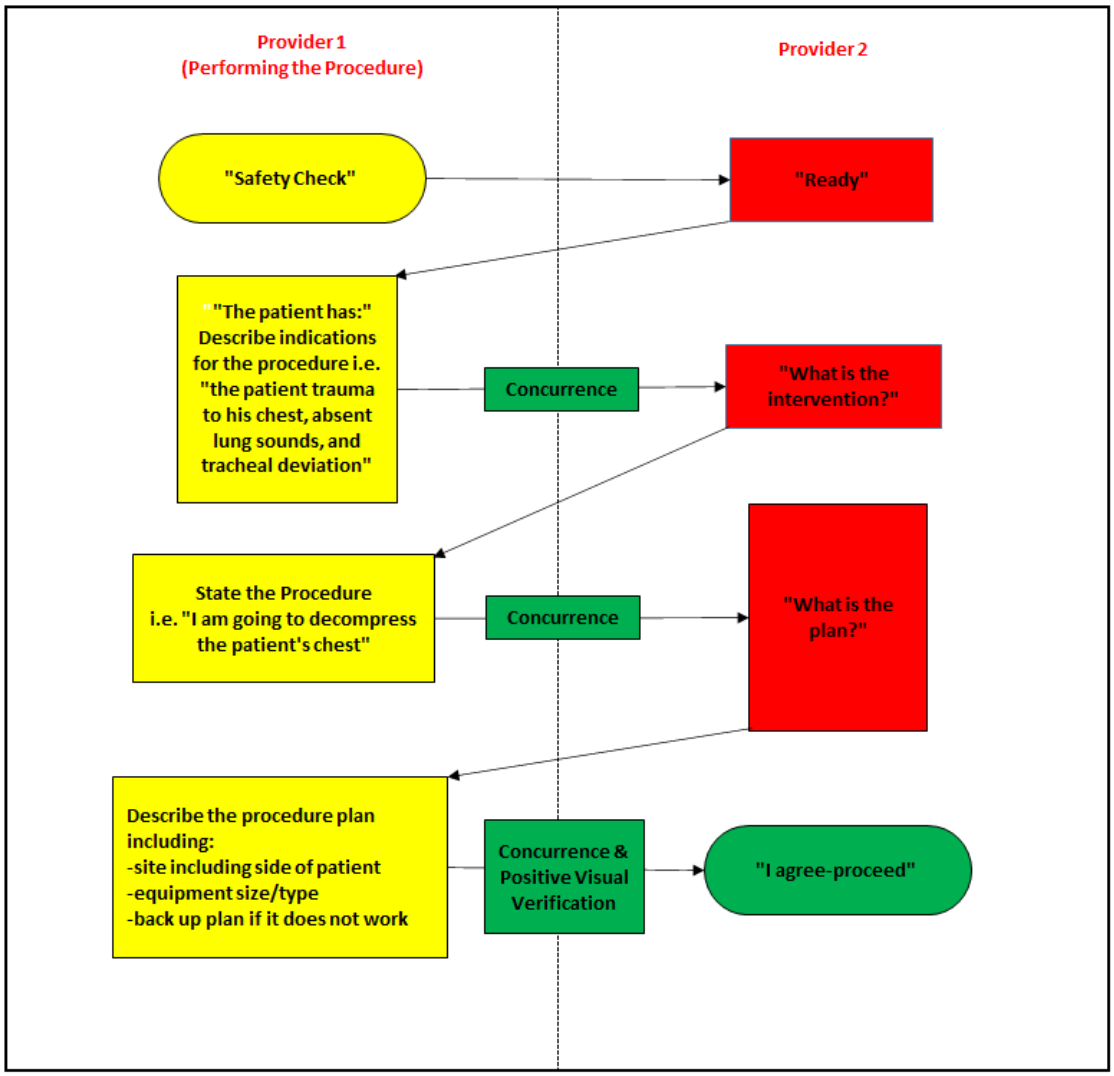
PROCEDURE:

Medication Cross Check:



Medication and Procedure Cross Check – 30.108

Procedure Cross Check:



NOTES:

A. If there is an interruption or change in patient condition, the process must be re-initiated by Provider 1.

B. Avoid ambiguous statements or confirmations like “ok.”

C. Medication contraindications include:

   1. Verification of appropriate vital signs
   2. Known patient allergies
   3. Expiration dates

D. The provider drawing up the medications will be the provider giving the medication.

E. EMT’s can verify Paramedic medications for dose/volume but cannot administer Paramedic scope medications.

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.

Trouble Shooting HeartMate II® with Pocket Controllers

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see changing batteries section on next page)*
- If pump does not restart, change controllers. *(see changing controllers section on next page)*

Alarms: Emergency Procedures

Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

Changing Batteries

WARNING: At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 1 and 2)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 3)
- Controller will start beeping, flash yellow signals and will read **power disconnect** on the front screen.
- Replace with new battery by lining up **RED** arrows on battery and clip. (Figure 4)
- Slide a new, fully-charged battery (Figure 2) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and yellow flashing will stop.
- Repeat previous steps with the second battery and battery clip.


Figure 1
Not Charged


Figure 2
Fully Charged


Figure 3


Figure 4

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the **RED** arrows.

- On the back of the replacement controller, rotate down the perc lock so the red tab is fully visible. Repeat this step on the original controller until the red tab is fully visible.
- Disconnect the drive line from the original controller by pressing down on the red tab and gently pulling on the metal end. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is put to sleep. You can silence the alarm by holding down the silence button. **Getting the replacement controller connected and pump restarted is the first priority.**
- Connect the replacement Controller by aligning the BLACK ARROWS on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

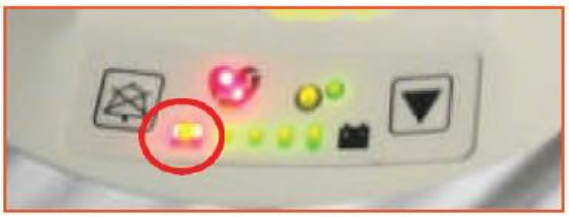
- After the pump restarts, rotate up the perc lock on the new controller so the red tab is fully covered. If unable to engage perc lock to a fully locked position, gently push the driveline into the controller to assure proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.
- Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

Trouble Shooting HeartMate II®

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see changing batteries section on next page)*
- If pump does not restart, change controllers. *(see changing controllers section on next page)*

Alarms: Emergency Procedures



Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

Changing Batteries

WARNING: **At least one power lead must be connected to a power source AT ALL TIMES**. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 3 and 4)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 1)
- Controller will start beeping and flashing green signals.
- Replace with new battery by lining up RED arrows on battery and clip. (Figure 2)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the RED arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.

- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the RED arrows. **ALARMS WILL SOUND-THIS IS OK.**
- Depress the silence alarm button (upside-down bell with circle) until the alarm is silenced on the new, replacement Controller.
- Rotate the perc lock on the replacement controller in the direction of the "unlocked" icon until the perc lock clicks into the fully- unlocked position. Repeat this same step for the original Controller until the perc lock clicks into the unlocked position.

- Disconnect the perc lead/driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound.

Note: The alarm will continue until power is removed from the original Controller. ***Getting the replacement Controller connected and the pump restarted is the first priority.***

- Connect the replacement Controller by aligning the BLACK LINES on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

- After the pump restarts, rotate the perc lock on the new controller in the direction of the "locked" icon until the perc lock clicks into the fully-locked position. If unable to engage perc lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

HeartWare® Ventricular Assist System Emergency Operation

CONTROLLER

BATTERY

ALARM ADAPTER

- **Used to silence the internal NO POWER ALARM.**
- **Should only be used on a controller that is NOT connected to a patient's pump.**
- **Must be inserted into the blue connector of the original controller after a controller exchange BUT before the power sources are disconnected or the NO Power alarm will sound for up to two hours.**

DRIVELINE CONNECTION

To Connect to Controller:

- Align the two red marks and push together. An audible click will be heard confirming proper connection. (Figure A)
- The Driveline Cover must completely cover the Controller's silver driveline connector to protect against static discharge. (Figure B)
- NOTE: an audible click should be heard when connecting the Driveline or Driveline extension to the controller. Failure to use the Driveline Cover may cause an Electrical Fault Alarm.

Figure A

Figure B

TO DISCONNECT A DEPLETED BATTERY

- Make sure there is a fully charged battery available to replace the depleted one.
- Disconnect the depleted battery by turning the connector sleeve counterclockwise until it stops.
- Pull the connector straight out from the controller.

CONNECTING POWER TO CONTROLLER

To Connect a Charged Battery:

- Grasp the cable of the charged battery at the back end of the connector (leaving front end of connector free to rotate)
- Line up the solid white arrow on the connector with the white dot on the Controller.
- Gently push (but DO NOT twist) the battery cable into the Controller until it naturally locks into place; you should hear an audible click.
- Confirm that the battery cable is properly locked on the controller by gently pulling the cable near the controller power connector.
- DO NOT force the battery cable into the controller connector without correct alignment as it may result in damaged connectors .

HeartWare® Ventricular Assist System Emergency Operation

STEPS TO EXCHANGE THE CONTROLLER

Step 1: Have the patient sit or lie down.

Step 2: Place the new controller within easy reach.

Step 3: Connect back-up power sources (batteries or AC Power) to the new controller.

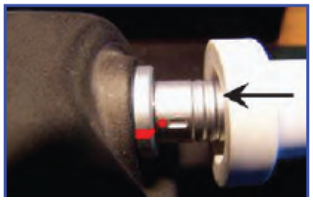
- Confirm that the power cables are properly locked on the controller by gently pulling on the cable near the connector.
- A "Power Disconnect" alarm will activate if a second power source is not connected to the new controller within 20 seconds of controller power up
- A "VAD Stopped" alarm will activate if the pump driveline is not connected to the new controller within 10 seconds - this alarm will resolve once the pump driveline is connected

Step 3

Step 4: Pull back the white driveline cover from the original controller's silver connector.

Step 4

Step 5: Disconnect the driveline from the original controller by pulling the silver connector away from the controller. Do not disconnect by pulling on the driveline cable. A "VAD Stopped" alarm may activate. Don't panic. You can silence the alarm after restarting the pump, which is the priority.



Step 6

Step 6: Connect the driveline to the new controller (align the two red marks and push together). If the "VAD Stopped" alarm was active on the new controller, it will now resolve.

Step 7: The pump should restart. Verify the pump is working (RPM, L/min, Watts).

Step 8: **IF THE PUMP DOES NOT RESTART, CALL FOR MEDICAL ASSISTANCE IMMEDIATELY.**

Step 9: Insert the Alarm Adapter into the blue connector on the original controller.

- Disconnect both power sources from the original controller.
- The controller will be turned off and all alarms silenced.

Step 9

Step 10: Slide the white driveline cover up to cover new controller's silver connector.

Step 11: Contact the VAD Center or Implanting hospital for a new backup controller.

Step 10

Trouble Shooting HeartMate III® with Pocket Controllers

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see Changing Batteries section on next page)*
- If pump does not restart, change controllers. *(see Changing Controllers section on next page)*

Alarms: Emergency Procedures

Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

Trouble Shooting HeartMate III®

Changing Batteries

WARNING: At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 1 and 2)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 3)
- Controller will start beeping and flashing yellow signals and will read **POWER DISCONNECT** on the front screen. (Figure 4)
- Replace with new battery by lining up **RED** arrows on battery and clip. Gently tug on battery to ensure connection. If battery is properly secured, the beeping and yellow flashing will stop. (Figure 5)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.

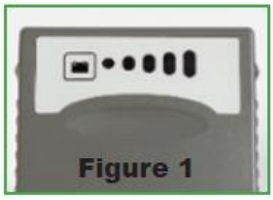


Figure 1


Figure 2


Figure 3

Figure 4


Figure 5

Trouble Shooting HeartMate III® with Pocket Controllers

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the RED arrows.

- On the back of the replacement controller, rotate down the perc lock so the red tab is fully visible. Repeat this step on the original controller until the red tab is fully visible.

- Disconnect the drive-line from the original controller by pressing down on the red tab and gently pulling on the metal end. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is put to sleep. You can silence the alarm by pressing the silence button. **Getting the replacement controller connected and pump restarted is the first priority.**

- Connect the replacement Controller by aligning the **BLACK ARROWS** on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the power source to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. DO **NOT** pull the lead.

- After the pump restarts, rotate up the perc lock on the new controller so the red tab is fully covered. If unable to engage perc lock to a fully locked position, gently push the driveline into the controller to assure proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.
- Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

Trouble Shooting HeartMate III® with Pocket Controllers

Modular Cable

The HeartMate 3 has a modular cable connection near the exit site of the driveline (Figure 1). This allows a damaged driveline to be quickly replaced (if damage is external).

- When disconnecting a driveline, **NEVER** use the modular cable connection.
- If this section of the driveline requires replacement, this must be performed at and by the implanting center. Patients are not given a back-up modular cable.
- If the connection is loose, there will be a yellow/green line at the connection showing (Figure 2). If the line is visible, it can be retightened by turning with the arrow in the locked direction. It will ratchet and stop turning once tight.

Figure 1

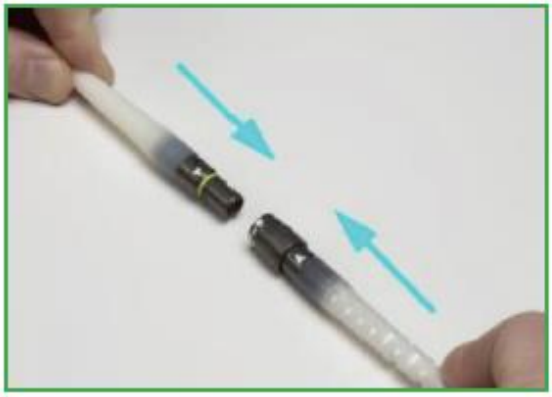


Figure 2

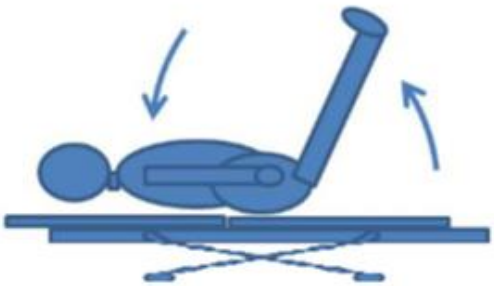
Modified Valsalva Maneuver – 30.110

DEFINITION:
Traditional vagal maneuvers have a low frequency of successfully converting Supraventricular Tachycardia (SVT) to sinus rhythm. However, Modified Valsalva Maneuvers have been repeatedly shown to have a high rate of rapid success in terminating SVT, thereby decreasing the need for administration of medications, IV access, and reducing patient discomfort.

INDICATIONS:
SVT (Regular narrow complex tachycardia- QRS < 0.12 secs)

CONTRAINDICATIONS:
A. Atrial fibrillation or atrial flutter
B. Hemodynamic instability or SBP <90
C. Known aortic stenosis
D. Inability to physically perform procedure due to anatomy

PROCEDURE:
A. Perform 12-lead EKG prior to performing modified-Valsalva maneuver.
B. Record rhythm strip during procedure.
C. Have the patient sit in an upright position.
D. 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.
E. Lay the patient supine and elevate their legs 45° - 90° for 15 seconds.
F. Lay the patient's legs flat for 60 seconds.
G. If the rhythm has changed or there is a significant change in heart rate after maneuver, perform repeat 12-lead EKG.
H. May repeat x 1 if patient has not converted to sinus rhythm.



PEDIATRIC VAGAL MANUVERS:
A. Infants and toddlers: Place ice packs on the face.
B. Pre-school and older: Have child blow on a syringe.

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:

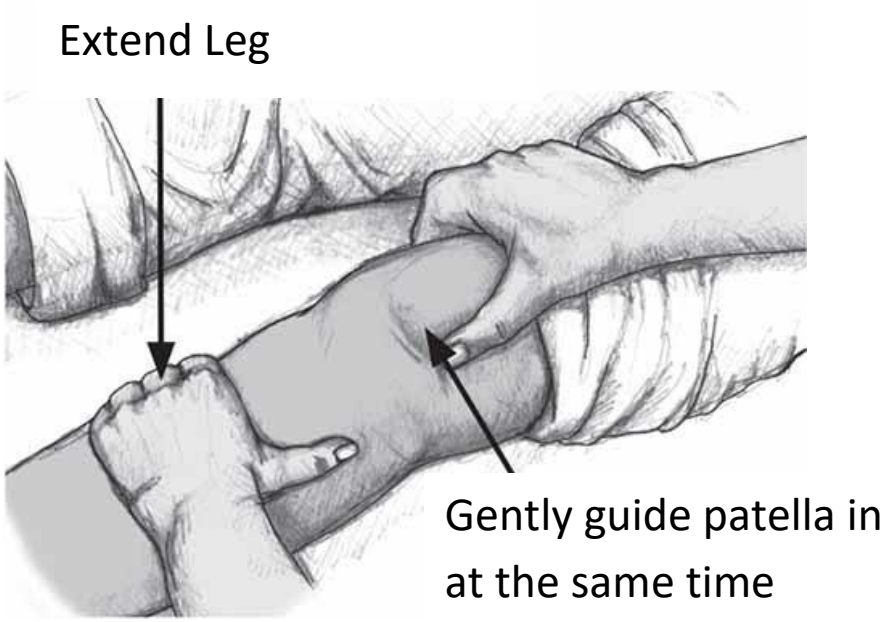
A. Direct traumatic mechanism of injury (impact directly to the knee).
B. Any sign of associated patella fracture (crepitus).
C. Any associated injury to same extremity (femur fracture, tibia/fibula fracture, pelvic fracture).

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.



Patient Restraint – 30.120

PURPOSE:
Escalation control of agitation or aggressive behavior should be attempted prior to physical or chemical restraint. However, if escalation control is not feasible, physical, and chemical restraint should be used to protect the safety of patients and responders. Patient restraints should be utilized only when necessary and because the patient is exhibiting behavior that presents a danger to themselves and/or others based on an assessment using the Broset Violence Assessment.

PROCEDURE:

Escalation Control Guideline:

Respect Personal Space: allowing extra physical space between you and the patient helps the patient not feel crowded or threatened and allows for provider safety. Always try to position near an exit. Do not rush in. Assess the patient's body language, listen to their tone of voice, and make a plan.

Do not go in alone: but limit the number of responders in the room or area with the patient so as not to overwhelm them. All communication with the patient should channel through one person.

Appear Calm: use a low, monotonous voice when speaking to the patient. Use good body language: avoid crossed legs/hands, hands in pockets, etc. Try to be at the patient's eye level.

Listen Without Judgement: acknowledge what the patient is saying. Confirm the legitimacy of their perceived problem, not their behavior.

Use Reflective Statements/Responses: for example, if the patient says, "I can't believe no one in my family has called me or visited" a reflective response would be, "sounds like you are frustrated and feeling unsupported by your family."

Tolerate Silences

Set Limits: it is ok to set parameters around the patient's behavior so that everyone is safe.

Give the Patient Appropriate Choices: this can help the patient regain a sense of control. For example, "Would you like to sit up on the gurney or lay down?"

Offer Optimism However Do Not Make Promises That Cannot Be Kept

Do Not Argue with the Patient: stick to the goal of escalation control. Remember they do not know you so do not take insults personally.

Physical Restraint Guidelines:

A. Perform the Broset Violence Assessment checklist.

Broset Violence Assessment checklist

Confusion	0 point 1 point
Irritability	0 point 1 point
Boisterousness	0 point 1 point
Verbal Threats	0 point 1 point
Physical Threats	0 point 1 point
Attacks on objects	0 point 1 point

Score 0 = Low risk of violence
Score 1-2 = Moderate risk of violence (preventative measures should be taken)
Score ≥ 3 = High risk of violence (preventative measures are required)

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

C. Do not place restraints in such a way as to preclude evaluation of the patient's medical status or interfere with management of the airway.

Physical Restraint Procedure:

A. Place patients face up on long backboard or gurney, NOT PRONE. Closely monitorthe patient's respiratory status.
B. Secure ALL extremities to backboard or gurney. Try to restrain lower extremities first using restraints around both ankles. Next, restrain the patient's arms at his/her sides.
C. If necessary, utilize cervical spine precautions (tape, foam bags, etc.) to control violent head or body movements.

D. If patient is on backboard, secure the backboard onto gurney for transport using additional straps if necessary. Remember to secure additional straps to the upper part of the gurney to avoid restricting the wheel carriage.
E. Evaluate the patient's respiratory and cardiac status continually. Monitor SpO_2 if possible.
F. DO NOT tighten chest straps to the point that they restrict breathing.

Pharmacological Sedation Guidelines:

Sedative agents may be needed to restrain the violently combative patient. These patients may include alcohol and/or substance abuse patients, intoxicated patients, and restless and combative head-injury patients.

Pharmacological Sedation Procedure:

A. Obtain initial Richmond Agitation Sedation Score (RASS).

Richmond Agitation Sedation Scale (RASS)

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

B. Evaluate the personnel needed to safely restrain the patient.
C. If patient is cooperative, consider offering olanzapine ODT 10 mg oral dissolving tablet.
D. If immediate threat (RASS +3 or +4):
    1. Administer midazolam (2.5 - 5 mg IV, IO, or 5-10 mg IM) **PLUS** haloperidol (5-10 mg IV/IM)
    2. Titrate midazolam 1-2 mg IV, IO as needed every 5 minutes to control agitation.

E. If RASS is +2, attempt to determine if the patient's agitation is related to substance abuse, alcohol withdrawal, or medical or psychiatric problem.
F. If agitation is likely due to a psychiatric disorder or unknown, administer medications in following sequence:

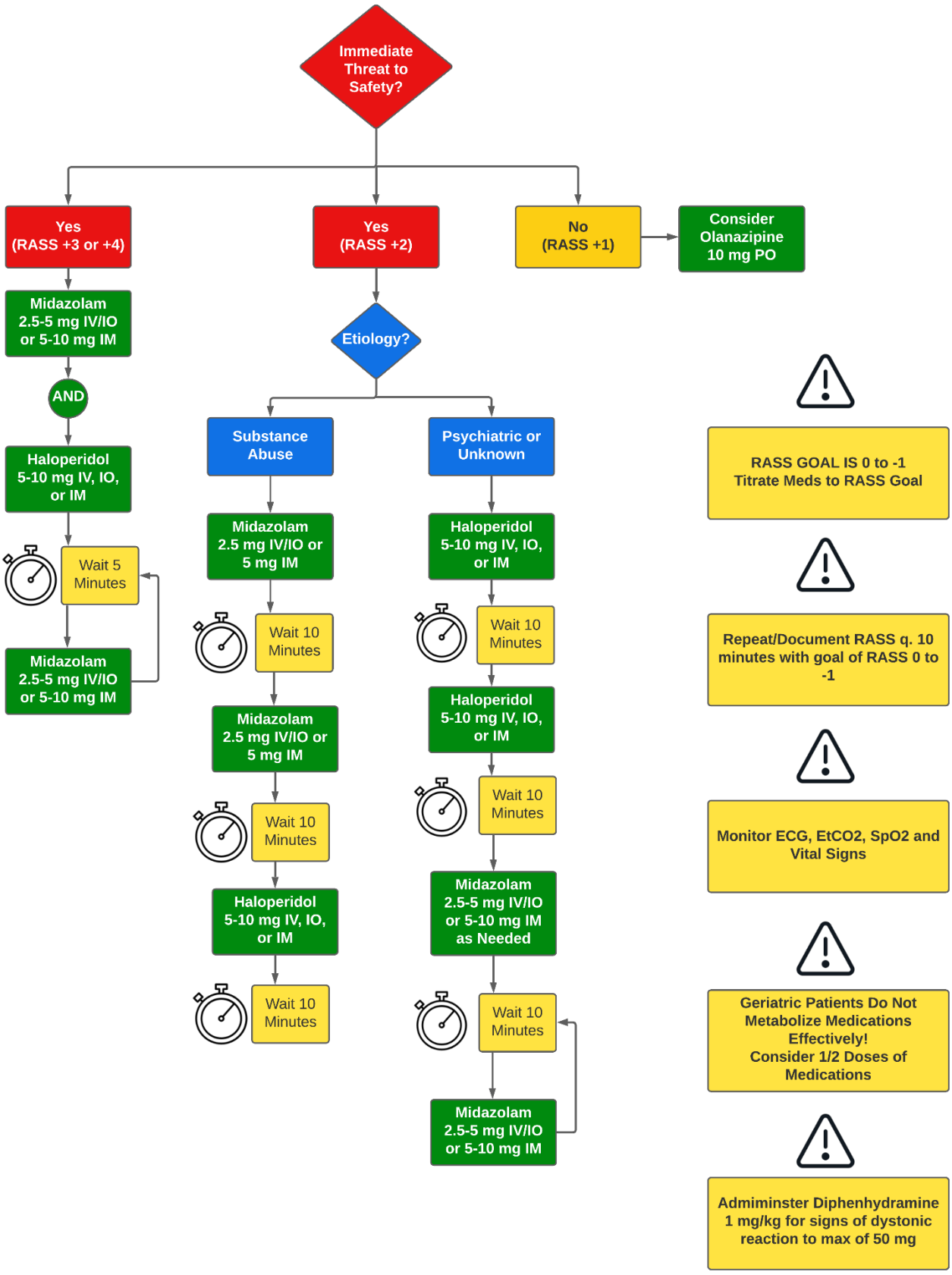
Drug	*Initial Dose*	*Repeat Dose in 10 min*	*Maximum Dose*
Antipsychotic			
Haloperidol	5 – 10 mg IV, IO, or IM	5 – 10 mg IV, IO, or IM	20 mg IV or IM
Benzodiazepine*	***(See I below)***		
Midazolam	2.5 mg IV or 5 mg IM	2.5 mg IV or 5 mg IM	5 mg IV or 10 mg IM

G. If agitation is likely substance abuse (especially stimulants), withdrawal, or postictal state, administer medications in following sequence:

Drug	*Initial Dose*	*Repeat Dose in 10 min*	*Maximum Dose*
Benzodiazepine			
Midazolam	2.5 mg IV or 5 mg IM	2.5 mg IV or 5 mg IM	5 mg IV or 10 mg IM
Antipsychotic*	***(See I below)***		
Haloperidol	5 – 10 mg IV, IO, or IM	5 – 10 mg IV or IM	20 mg IV, IO, or IM

H. Consider and treat medical causes of combativeness (hypoxia, head injury, hypoglycemia).
I. If 10 minutes after administration of the second dose (total of 20 minutes) the patient remains combative, move to next drug class as outlined above (e.g., antipsychotic to benzodiazepine or benzodiazepine to antipsychotic).
J. Asses vital signs in first 5 minutes and at least every 10 minutes and before each additional medication, if possible.
K. If patient shows signs of acute dystonic reaction after receiving haloperidol, give diphenhydramine 1 mg/kg IV or IM to a maximum of 50 mg.
L. Monitor patient's ECG and obtain 12-lead if possible.
M. If RASS is +1, consider olanzapine 10 mg PO.
N. Repeat RASS score every 10 minutes and at patient hand-off to hospital. **Goal is RASS score of 0 to -1**.
O. **Once RASS is at goal of 0 to -1, stop giving medications**. Some patients may not require the full regimen of medications to reach the goal of sedation.
P. **For patients > 65**, consider giving ½ the dose of Midazolam and/or Haloperidol.

Patient Restraint – 30.120



NOTES & PRECAUTIONS:

A. All patients who receive IV, IO, or IM pharmacological sedation must be fully monitored, if possible, with cardiac monitor, SpO_2 and $EtCO_2$.
B. Side effects of haloperidol may include hypotension, tachycardia,and acute dystonic reactions.
C. Haloperidol may induce Torsades de Pointes in patients with history of prolonged QT or patients taking QT-prolonging drugs.Monitor patient's ECG, if possible. If prolonged QT is present (> 500 msec.),contact OLMC.
D. Haloperidol is preferred for patients with known psychiatric disorders. Midazolam is preferred for patients who are known or suspected to be under the influence of stimulants or other intoxicants, who arein withdrawal, or who are postictal.

PEDIATRIC DOSING:

Midazolam:

0.1 mg/kg IV/IO to a max single dose 5 mg or
0.2 mg/kg IM/IN to a max single dose of 10 mg*

*Call OLMC for additional midazolam or other medications

Pelvic Immobilization – 30.132

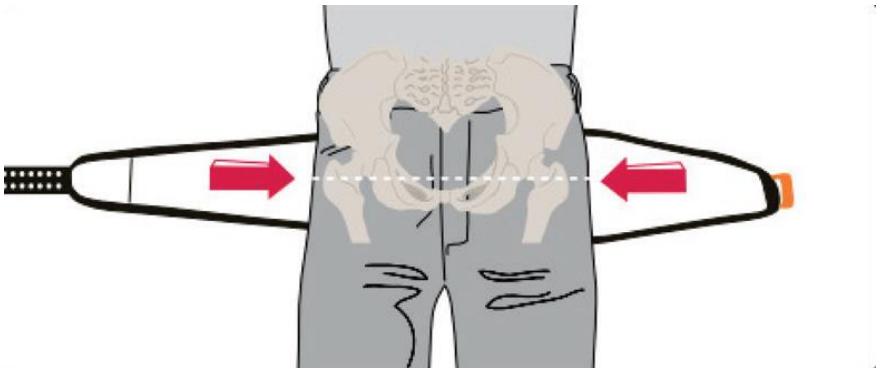
PURPOSE:
The initial reduction of an unstable pelvic fracture (to lessen ongoing internal bleeding and to ease the pain by splinting the fracture) using either a specifically applied sheet or another approved device.

INDICATIONS:

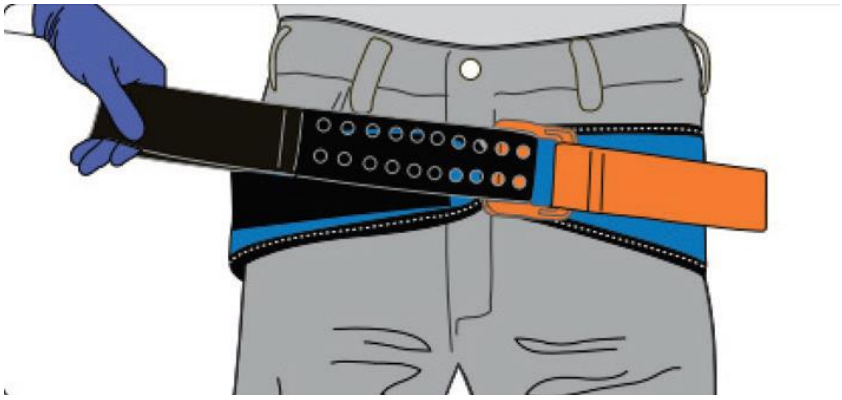
A. To be applied in all trauma patients who have appropriate mechanism(s) of injury and who present with pelvic instability.
B. Consider pelvic wrap in trauma patients who have appropriate mechanism(s) of injury and who are in shock.

PELVIC SLING PROCEDURE:

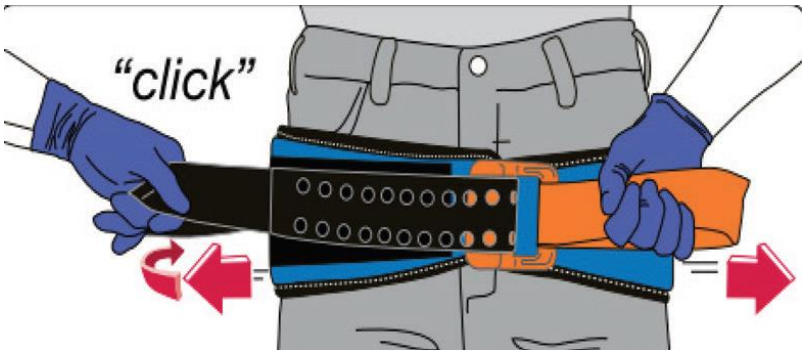
A. Remove objects from patient's pocket or pelvic area. Place SAM® Pelvic Sling gray side up beneath patient at level of trochanters (hips).



B. Place BLACK STRAP through buckle and pull completely through.

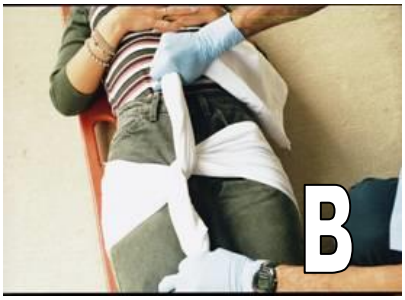


C. Hold ORANGE STRAP and pull BLACK STRAP in opposite direction until you hear and feel the buckle click. Maintain tension and immediately press BLACK STRAP onto surface of SAM® Pelvic Sling to secure.



PELVIC WRAP PROCEDURE:

A. Fold the sheet smoothly lengthwise to about 9 inches wide (do not roll) and apply underneath the pelvis, centered on the greater trochanters. Assure the patient's pockets are empty (if applicable) to avoid placing pressure on the objects into the patient.
B. Tighten the sheet around the pelvis and adjust the tension to try to return the pelvis to normal anatomical position.
C. Secure using a knot or clamps if available.



NOTES & PRECAUTIONS:

A. Always re-check the position of the sheet (in terms of up and down). You should still be able to feel the anterior superior iliac spines after placement. If not, the sheet may be too high on the pelvis and must be repositioned.
B. If the pelvis is unstable on initial exam, do not repeat the exam.
C. Blood loss in a pelvic fracture can be significant. Monitor closely and treat per Shock Protocol.
D. Consider placing prior to extrication from a vehicle if feasible.
E. The pelvic sling/wrap is contraindicated for suspected isolated hip fractures (i.e. ground level falls).

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:

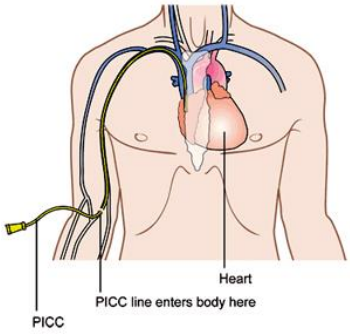
A. Use clean gloves and maintain sterility as much as possible.
B. If there is a needleless type port on the distal end of the catheter, perform the following: *(figure 1)*
    1. Scrub the port with an alcohol pad for at least 15 seconds and allow to dry for at least 5 seconds.
    2. Attach a 10 ml 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.



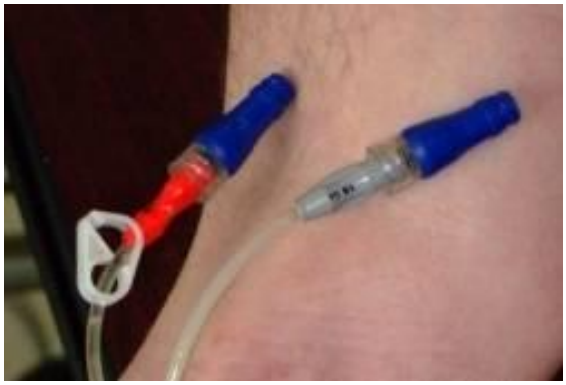


Figure 1- Needleless port

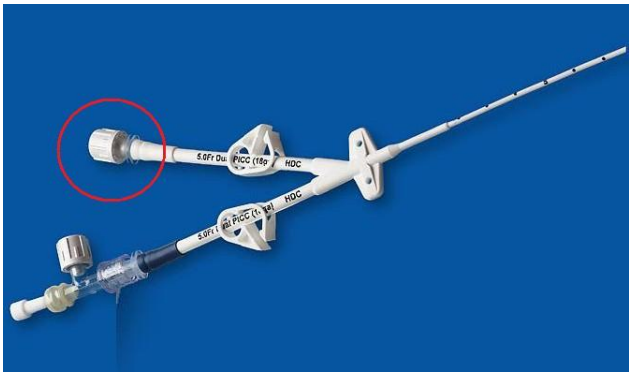


Figure 2 – Non-needleless type port with cap

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 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 5cm H_2O and bag per usual.
C. Increase PEEP by 5cm 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 5cm 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. Cut side and top attachments at loop to remove face mask. Some helmets will need a cutting tool to “release” the top of the facemask from the helmet.
   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. The release mechanism can be activated by pressing it down with a pen or tip of a screwdriver. Athletic trainers and coaching staff are familiar with this and can provide assistance.

C. **General equipment removal guidelines:**
   1. If the athlete has neck pain, numbness or tingling, extremity weakness, or is unconscious, the helmet and shoulder pads should not be removed on the field of play.
   2. If access to the airway is compromised, removal of the helmet and shoulder pads may be initiated.
   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. Release cheek pad snaps.
   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. Log rolling is the preferred method for movement as crews are most familiar with this technique and understand the importance of moving the patient as a unit and maintaining inline alignment of the head, neck, and spine.
2. The lift technique is an alternative method that could be used for smaller patients, but it is manpower intensive. If lifting, remember to lift as a unit. Slide backboard into place from feet.
3. The person at head initiates commands and oversees proper placement and techniques.
4. Position three responders on each side of body; one at shoulders, one at hips, and one at legs.
5. One other person is in charge of the backboard and slides it into place.
6. If the helmet is not resting on board, padding can be added to fill space.
7. Fasten straps and tape helmet to board.
8. Chinstrap remains in place unless it interferes with airway.
9. Recheck sensory and motor nerve vitals for changes and document.

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 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.

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. Assess the skin where the barb was removed. The skin should be cauterized from the electrical current. Dress the wound to prevent infection.
I. 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.
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.

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:

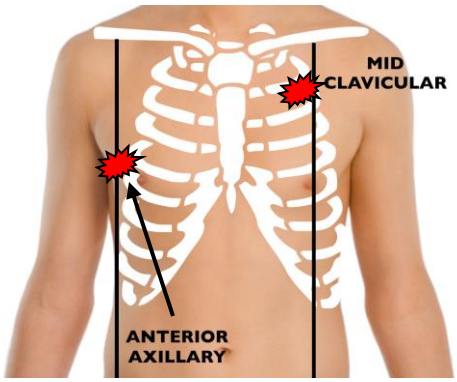
A. High clinical suspicion and;
B. Progressive respiratory distress and;
C. Shock symptoms with low or rapidly decreasing blood pressure.

<u>and</u> at least one of the following:

A. Decreased or absent breath sounds.
B. Consistent history (i.e., 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 30mA 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 *un*comfortable, administer midazolam 2.5 - 5 mg slow IV/IO push or if no IV, 5 mg IM/IN.
F. If patient still complains of pain, repeat dose of midazolam once and contact OLMC.
G. 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.
H. 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. Give midazolam 0.1 mg/kg IV/IO to a max of 5 mg. (May repeat once after 5 minutes.) If more needed, call OLMC.
B. Use anterior/posterior pad placement first for patients less than 1 year.
C. Begin pacing at smallest mA output.
D. Increase current in increments of 10 mA while observing monitor for evidence of electrical capture.
E. Confirm mechanical capture by checking pulses and BP.
F. 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.

XSTAT– 30.200

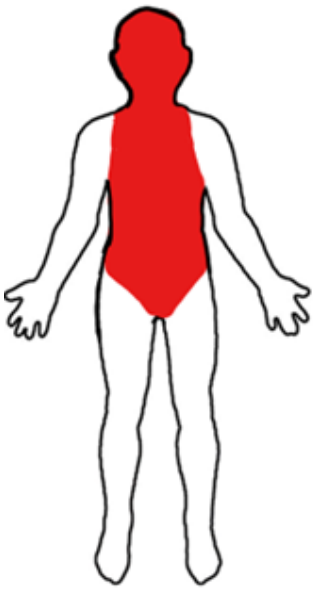
DEFINITION:
The XSTAT is a first-in-kind expanding dressing approved for internal use. A syringe-like applicator applies compressed mini-sponges deep into a wound. Upon contact with blood, the sponges expand to 10-12 times their compressed volume within approximately 20 seconds compressing the wound to stop bleeding.

INDICATIONS:
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.

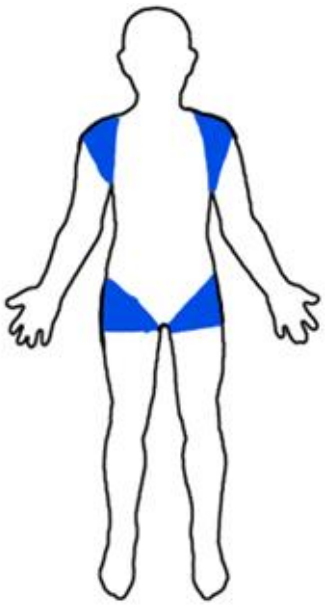
CONTRAINDICATIONS:
XSTAT is not indicated for use in the:

A. Thorax
B. Pleural cavity
C. Mediastinum
D. Abdomen
E. Retroperitoneal space
F. Sacral space above the inguinal ligament
G. Tissue above the clavicle

Contraindicated areas:



Approved areas:



SIZES:

XSTAT comes in two sizes:

PROCEDURE:

A. Open the package and remove the applicator.
B. Insert applicator into wound track as close to bleeding source as possible.
C. Insert plunger into applicator, push plunger firmly to deploy sponges.
D. If resistance met, pull back slightly on applicator to create additional packing space then continue to depress.
E. Use additional applicators as needed to completely pack wound.
F. Cover wound with a proper dressing.
G. If bleeding persists, apply manual direct pressure until bleeding is stopped.

NOTES & PRECAUTIONS:

A. Tourniquets are still the first line treatment for extremity wounds distal to a junction.
B. A radiopaque marker is embedded into each of the mini-sponges to make them detectable by X-Ray.
C. Never attempt to remove the mini-sponges from the wound. They must be removed by a surgeon after achieving proximal and distal vascular control.
D. The manufacturer includes a Casualty Card inside the XSTAT package.
    1. Instructions to the surgeon for removing the sponges from the wound are included on the back of the card.
    2. Record the use of XSTAT on the card and forward these instructions to the medical treatment facility.
E. Segments of the applicator tip may break away during application and be left in the wound.
    1. After injecting the mini-sponges, check the applicator tip for missing segments
    2. Do not attempt to retrieve missing segments from the wound
    3. Record the number of lost segments on the Casualty Card.

Operations

Ambulance Diversion Guidelines – 50.015

DIVERSION SYSTEM OVERVIEW

The Greater Portland Metropolitan Area (Multnomah, Clackamas, 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 Quad-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

To effectively manage situations in the Greater Portland Metropolitan Area where the diversion of an ambulance may be necessary due to temporary shortages of hospital Emergency Department (ED) resources and when such diversions may have an adverse effect on individual patient care or the EMS system as a whole.

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. Unacceptably 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.

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 provide definitions and agreed upon procedures if diversion of patients is determined to be necessary.
3. To identify hospitals utilizing these guidelines and their respective geographical zones in the Greater Portland Metropolitan Area that may be impacted by diversion.
4. To identify a zone management system when multiple hospitals attempt diversion simultaneously.
5. To report and collect meaningful data, which more accurately defines prehospital and hospital emergency medical services demand, service consumption, and resource availability.
6. To identify a system of accountability and quality improvement by providing diversion data to all participants on a monthly basis.

D. DEFINITIONS

1. Diversion – The redirection of an ambulance from an intended receiving facility to an alternate receiving facility due to a temporary lack of emergency resources such as staffing or bed space.
2. Inter-Facility Transfers – Hospital destination is pre-determined by physician-to-physician communication as a formal transfer.
3. 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).
4. Zone Manager – An agency or facility authorized to provide coordination to pre-hospital care providers and hospitals during times of zone wide diversion.
5. HOSCAP (www.oregonhospitals.org) – State owned and managed, data system for distribution of hospital status information and incident management.
6. Diversion Status Categories
   a. GREEN - The ED is able to accept patients transported from ambulance transports; except patients they do not normally treat.
   b. YELLOW - The ED is unable to accept patients transported from ambulance transports which require the following resources:
      i. CT SCAN – The ED is unable to take patients who may need a CT scan, examples include, but are not limited to:
         - Any brain CT (i.e. stroke, acute neurological deficit)
         - Suspected aortic aneurysm (including abdominal and/or thoracic)
         - Isolated abdominal injury which would not otherwise meet criteria for trauma system entry.
      ii. ED CRITICAL CARE – The ED is unable to take unstable patient(s). Examples of chief complaints include, but are not limited to:
         - Acute abdomen, non-traumatic
         - Chest pain
         - Coma/Sustained altered mental status
         - Respiratory distress
         - Shock
         - Status seizures
         - Acute neurologic deficit
         - A patient with a 12-Lead ECG that indicates a STEMI (contact hospital to determine ability to accept patient)
   c. RED – The ED is unable to accept patient(s) transported from an ambulance, except:
      - Uncontrolled airway
      - Non-trauma patient too unstable to transport to another facility
      - Patient refuses alternate facility
      - Prearranged inter-facility transfer
      - Pregnant patients > 20 weeks gestation or illness or injury which could have a potential life-threatening effect on the mother and/or the fetus.

d. 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.

7. Life Flight Network Status 1. GREEN – Available 2. YELLOW– On stand-by for another patient 3. RED – Unavailable
8. Destination Hospital/Services and EMS Abbreviations:

1	DC	Doernbecher's Children's Hospital (located within OHSU ED)	Portland
2	EM	Legacy Emanuel Hospital	Portland
3	EC	Legacy Randall Children's Hospital	Portland
4	GS	Legacy Good Samaritan Hospital	Portland
5	MH	Legacy Mt. Hood Medical Center	Gresham
6	MP	Legacy Meridian Park Hospital	Tuality
7	SC	Legacy Salmon Creek Hospital	Vancouver
8	PA	Adventist Medical Center	Portland
9	PM	Providence Milwaukie Hospital	Milwaukie
10	PR	Providence Portland Medical Center	Portland
11	PN	Providence Newberg	Newberg
12	SK	Kaiser Sunnyside Medical Center	Clackamas
13	SV	Providence St. Vincent Medical Center	Portland
14	SW	PeaceHealth Southwest	Vancouver
15	TH	Tuality Hospital	Hillsboro
16	UH	Oregon Health Sciences University Hospital	Portland
17	UC	Unity Center for Behavioral Health	Portland
18	VA	Portland VA Medical Center	Portland
19	WF	Willamette Falls Hospital	Oregon City
20	WK	Kaiser Westside Medical Center	Hillsboro
21	LF	Life Flight Network	Hillsboro & Aurora
22	MW	Metro West Ambulance	Hillsboro
23	WCEO	Washington County EMS Office	Hillsboro
24	AMR	American Medical Response	Portland

E. AMBULANCE DIVERSION POLICY

1. Diversion is not initiated because of:
   a. Lack of inpatient staffing or beds.
   b. Key resources being reserved for anticipated elective patient care, (i.e. elective surgical cases or radiological studies).
2. ED staff and ED physicians determine that the ED is reaching capacity and attempt to accommodate increased demand by following their internal plans.
3. The ED staff, ED physicians, and ED leadership determine that ambulance diversion is necessary in order to safely care for patients in the ED because:
   a. Critical/unstable patients occupy all suitable ED beds.
   b. There is not enough staff to safely care for additional unstable patients in the ED.
   c. There is a loss of CT scanner capability.
   d. There is an in-house disaster which compromises patient care/safety (i.e. fire, flooding, or electrical power outage).
   e. Trauma resources are unavailable (for designated trauma centers).

f. A critical resource (i.e. CATH team) is unavailable for select emergent presentations (i.e. STEMIs or acute strokes).

4. Hospitals request diversion via HOSCAP. Hospital initiated diversion events will last no longer than two hours before HOSCAP automatically opens the hospital to ambulance traffic again. It is recommended that hospitals should remain open for 30 minutes before activating diversion again.
    a. Tier 1 diversion—1 to 2 diversion activations per day: ED charge nurses, ED physicians, and ED leadership agree that diversion is necessary. Affected ED manager or designee collects thresholds data, enters into HOSCAP.
    b. Tier 2 diversion—3 to 4 diversion activations per day: ED charge nurses, ED physicians, and ED leadership agree that AD is necessary. Consider contacting hospital Administrator on Call/on Duty (AOC/AOD). Affected ED manager or designee collects thresholds data, enters into HOSCAP and considers contacting the affected 9-1-1 ambulance provider(s) with a situation report in situation, background, assessment, and recommendation (SBAR) format.
    c. Tier 3 diversion—5 or more diversion activations per day: ED charge nurses, ED physicians, and ED leadership agree that diversion is necessary. Affected ED manager or designee collects thresholds data, inputs it into HOSCAP, and considers contacting hospital AOC/AOD, executive leadership, the affected 9-1-1 ambulance provider(s), and health department(s)' EMS programs with a situation report in SBAR format.
5. Situation reports in SBAR format will provide consistent, meaningful, relevant data during extremes of ED resource demand. Situation reporting will include HOSCAP threshold data and are agreeable indicators of ED resource demand and strain.

    The HOSCAP threshold data questions are:
    01. ED wait room longest time. Of all the patients in the ED waiting room, what is the longest wait time in minutes?
    02. ED boarding – ICU. Number of ICU patients boarding in the ED.
    03. ED boarding – Inpatient. Number of inpatients boarding in the ED.
    04. ED boarding – Behavioral health. Number of behavioral health patients boarding in the ED.
    05. Are ICU resources at capacity? Is there an ICU staffing need or are all ICU beds full?
    06. Are Inpatient resources at capacity? Is there an inpatient staffing need or are all inpatient beds full?
    07. Are ED resources at capacity? Is there an ED staffing need or are all ED beds full?
    08. Are Inpatient discharge delays impacting the ability for admission? Yes/No
    09. Are scheduled surgeries expected to require more than the number of available beds? Yes/No

6. 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 in order to coordinate distribution of trauma patients.

c. Designated ED staff change their status on the HOSCAP system.
d. In the event a hospital is unable to change their status on the HOSCAP system, (i.e. connection problems), the hospital may contact the zone manager to authorize the zone manager to change the hospital status in HOSCAP.
e. 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. Every effort will be made to reopen to GREEN status as soon as possible.

7. Multnomah County Pediatric Hospital EDs.
   a. 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.
   b. 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.

F. ZONE MANAGEMENT

1. Occasionally, multiple hospitals will go on diversion at the same time. This poses a challenge to other hospitals trying to stay open to serve their community.
2. Hospitals are grouped into the following geographical zones:

West Zone	Central Zone	South Zone	North Zone	East Zone
Providence St. Vincent's	Legacy Emanuel/Randall Children's	Kaiser Sunnyside	PeaceHealth Southwest	Portland Adventist
Legacy Meridian Park	Legacy Good Samaritan	Providence Milwaukie	Legacy Salmon Creek	Providence Portland
Kaiser West Side	Oregon Health Sciences University/Doernbecher Children's	Providence Willamette Falls		Legacy Mount Hood
Tuality Community	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

3. Zone management will begin in the West, South, North or East Zones when all hospitals within it are RED. In the central zone, zone management will begin when Legacy EM, Legacy GS, and OHSU are RED. When operationally feasible, patients from the central zone who are eligible for Veteran's Assistance (VA) benefits will be transported to the Portland VA Medical Center. If a patient meets the triage requirements for Unity Center for Behavioral Health and is capable, patients can be transported to Unity Center for Behavioral Health when all hospitals are RED in any zone.
4. Steps for Activating Zone Management:
    a. If hospital resources meet the criteria for zone management, as specified in item C above, the zone manager will initiate "Active Zone Management" for the zone(s) affected. The zone manager will initiate an "all call" via the 800 MHz radio to hospitals informing them of the "Active Zone Management" status.
    b. After two hours of zone management, affected hospital managers' or designee collects data and enters into HOSCAP.
    c. 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).
    d. Under zone management, the zone manager will determine the destination of all ambulances within the affected zone(s). EMS may transport to any hospital outside of the affected zone if it is GREEN status.
    e. Ambulances may go outside their zone during zone management as long as 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.
    f. 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 sections (D), (E), and (F) of the ambulance diversion policy located above.*
    g. Trauma, STEMI, stroke, pediatric, and behavioral patient care protocols will continue.
    h. ED department zone threshold communication call should be initiated:
        i. After four hours of zone management, the first available ED manager or designee should consider initiating a threshold call with other EDs in the affected zone to discuss thresholds data and prepare consistent SBAR updates for ED leadership and ED physicians.
        ii. After four hours of zone management, the ED manager or designee should submit SBAR information obtained from thresholds communications to their hospitals' AOC/AOD and executive leadership. The first available manager or designee should consider contacting the appropriate 9-1-1 ambulance provider for the county in which the incident is located and health department(s) EMS program with an SBAR update.
    i. 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. When appropriate, the county EMS Medical Director will participate in this discussion for the zones within their jurisdictional boundaries.

        Central and East: Multnomah County

South: Clackamas County
West: Washington County
North: Clark County

G. <u>DISASTER MANAGEMENT</u> (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).

1. Hospital destinations will be coordinated by Regional Hospital through HOSCAP and according to regionally and locally adopted emergency medical services protocols.
2. During times of disaster management, thresholds data collection will be recorded in HOSCAP.
3. During times of disaster management, thresholds communications should be initiated and continued in four hour operational intervals to provide situation report 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).
    f. Stakeholders involved in proactive (thresholds) communications may include:
        i. Medical directors/ED physicians
        ii. Managers or their designee, assistant nurse managers, charge nurses, house supervisors, AOC/AOD, executive leadership, hospital HICS members.
        iii. Fire and EMS officials.
        iv. Public health officials.
        v. Others, as appropriate

H. <u>SIGNIFICANT EVENTS PROCESS FOR DIVERSION DEVIATION:</u>

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.

I. Accountability and Quality Improvement

1. The hospitals shall develop:
   a. An internal system and resources to avoid diversion.
   b. An internal policy related to diversion.
   c. Internal mechanisms to monitor diversion including number of hours and reasons why.
2. Hospitals are encouraged to track their own diversion hours via a report from the HOSCAP system.
3. County EMS will report number of hours and category of diversion to all zones based on information in HOSCAP.
4. The Greater Portland Metropolitan Area Diversion and Zone Management Subcommittee is a component of the ED/EMS Leadership Collaborative, which is established to monitor diversion hours, review diversion events, provide recommendations for quality improvement, and is responsible for the annual evaluation and revision to the Multnomah Operations Policy 50.030 Diversion System. The ED/EMS Leadership Collaborative is a cooperative effort between involved EMS agencies, hospitals, their ED managers, and ambulance providers.
5. Problems related to the implementation of these guidelines should be forwarded to the Diversion and Zone Management Subcommittee.

Organizations in Support of These Guidelines

HOSPITALS

Adventist Medical Center
Doernbecher's Children's Hospital
Kaiser Sunnyside Medical Center
Kaiser Westside Medical Center
Legacy Emanuel Children's Hospital
Legacy Emanuel Hospital
Legacy Good Samaritan Hospital
Legacy Meridian Park Hospital
Legacy Mt. Hood Medical Center
Legacy Salmon Creek Hospital
Oregon Health Sciences University
Portland VA Medical Center
Providence Milwaukie Hospital
Providence Portland Medical Center
Providence St. Vincent Medical Center

Randall's Children's Hospital
Peace Health Southwest
Tuality Hospital
Unity Center for Behavioral Health
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
Canby Fire Department
Camas Fire Department
Clackamas County Fire District 1
Molalla Fire Department
Metro West Ambulance
North Country Ambulance
Life Flight Network
Tualatin Valley Fire & Rescue

Ambulance Diversion Guidelines – 50.015

TABLE: HOSPITAL SERVICES

HOSPITAL	BURN UNIT	CARDIAC SURGERY	DECON	HELI PAD	HYPER BARIC	OB	NICU	PEDS INPT	PICU	PSYCH IN-PATIENT	TRAUMA CENTER	CATH LAB	INR	LVAD	STROKE INTERVENTIONAL
Adventist		X	X	X		X				X		X			
Doernbecher Children's		X	X	X			X	X	X	X	X				
Kaiser Sunnyside		X	X			X				X		X		X	X
Kaiser Westside						X									
Randall Children's Hospital Legacy Emanuel	X	X	X	X (2)		X	X	X	X	X	X				
Legacy Emanuel	X	X	X	X	X	X				X	X	X	X		X
Legacy Good Samaritan		X	X			X				X		X			
Legacy Meridian Park			X	X		X						X			X
Legacy Mount Hood			X	X		X						Dx only			
Legacy Salmon Creek			X	X		X	X	X		X		Dx only			
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	Designated area		X									
Providence Newberg			X	X		X									
Providence Portland		X	X	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		X									
Tuality Community		X	X	X		X						X			
Unity Center for Behavioral Health										X					
Veteran's Administration			X							X					

COVID-19 Response – 50.017

PURPOSE:
This advisory is an overlay to existing patient care protocols and applies to the management of patients diagnosed with or suspected of having COVID-19 or an influenza like illness (ILI) based on dispatch information, patient location/context (care facility, etc.), ongoing outbreak epidemiology, and provider obtained history, judgment and other information.

PROCEDURE:

High Risk Patients, Procedure Questions and Situational Awareness

1. Does the patient have a fever, cough, or respiratory distress?
2. Is the patient or facility suspected to have COVID-19?
3. Has the patient had prior contact with a known COVID-19 patient?
4. Is the patient from a high-risk facility (Assisted Care, AFH, Nursing home, clinic, jail)?
5. Could the patient require aerosol-generating procedures?

If the answer is “yes” to any of the above questions, the patient is a high-risk patient and could be considered a potential COVID-19 patient and considerations for PPE, treatment and procedure modifications should be made as indicated below and as directed by the agency medical director.

SYMPTOMS	SIGNS
1. Fever (observed or reported)**	1. Tachypnea (RR > 24/min)
2. Shortness of breath**	2. Tachycardia (HR > 100/min)
3. Cough**	3. Hypoxia (SpO_2 < 94%)
4. URI symptoms with sore throat, rhinorrhea	4. Hypotension (MAP < 65mmHg or SPB < 90 mmHg)
5. Chest pain	
6. Confusion	
7. Headache	
8. Fatigue/Myalgia (muscle aches)	
9. Anorexia	
10. Nausea, vomiting, diarrhea	
11. Acute loss of smell/taste	
**primary symptoms	

A. Universal Patient Care

HIGH-RISK AEROSOLIZING PROCEDURES	HIGH-RISK PPE REQUIREMENTS (required for all those within 6 feet of the patient)
Bag-Valve-Mask Ventilation	**Gloves**
Endotracheal Intubation	**Eye Protection**
Supraglottic Airway Placement	**Highest Available Respiratory Protection**
Nasal and Oral Airway Placement	**Gown**
Non-Invasive Positive Pressure Ventilation	
Nebulized Treatments	
Suctioning	
Chest Compressions	

1. Wear appropriate PPE for the appropriate patient and situation.
2. Review information provided by dispatch and request additional information from dispatch as needed.
3. Although no longer strictly relevant, the patient should be questioned about a history of recent travel or contact with a known COVID-19 patient.
4. If possible, consider using reporting party (RP) phone number to communicate and obtain more information before entering a scene.
5. If possible, establish communication with the patient, family member(s) or caretaker(s), while maintaining at least 6 feet of distance.
6. If possible, have the patient move to an open area.
7. Equipment and bags (including drug boxes) should be kept >6 feet (or as far away from) the patient as possible.
8. Ensure proper provider donning/doffing for high-risk encounters/procedures. Ideally doffing should be done with a buddy to watch and ensure no personal contamination.
9. PIC should ensure or designate the role to an on-scene provider, that personnel are maintaining proper PPE and distancing themselves as much as possible from patient. If possible, personnel should stay out of the same room as the patient, if not actively providing hands-on care.
10. If possible, at a minimum, for patients with cough, shortness of breath, or fever, a simple surgical/medical mask should be given to the patient to wear over their mouth and nose.

11. If agencies have the capability to utilize remote technology (video - either onsite or remote context e.g. FaceTime, Skype, etc.) to initially screen and assess a patient, this can be considered.
12. When possible and safe, limit the number of personnel exposed to any known or potentially COVID-19 infected person. If safe for patient care, one provider should initially assess a patient.
13. When entering a care facility, including adult foster care homes, with known COVID-19 patients, consider the facility to be a high-risk area for both providers and patients and personnel exposure should be limited as feasible. Appropriate PPE should be worn inside the facility. EMS personnel are encouraged to ask facility staff to bring patients (wearing a simple mask) to a central area near the facility entrance for initial EMS evaluation.

B. PPE
1. For patient encounters with known or suspected COVID-19 infection, minimum PPE will include gloves, eye protection, and mask (N95 or greater if available). Consider gown or coveralls if in physical contact with patient.
2. If high-risk aerosolizing procedures are being performed, airborne-precautions and PPE must be used. This means, the above PPE with the addition of gowns and N95 or higher respiratory protection.

C. Patient Transport Instructions
1. Contact the receiving facility as soon as possible and advise them that you have a patient needing isolation, if available. Do not enter the ED or other patient care area until directed by the ED staff. This may include alternate locations within the facility such as temporary shelters and treatment areas.
2. Family members and contacts of patients with possible COVID-19 shall not ride in the transport vehicle except for pediatric patients or other vulnerable or special needs patients.
3. Isolate the driver from the patient compartment if possible; if unable, the driver should wear appropriate mask and eye protection.
4. During transport, vehicle ventilation settings in both compartments should be on non-recirculated mode. Open the outside air vents in the driver area and turn on the ventilation fans to the highest setting.
5. If possible, place patient in yellow emergency blanket to minimize contamination of the ambulance.

TREATMENT:

A. Cardiac Arrest
1. All cardiac arrest patients are high-risk and high-risk PPE should be worn.
2. See airway management instructions and ETI guidance.

B. Respiratory Distress

1. Airborne precautions (high-risk PPE) are needed for any aerosol generating procedures as defined previously.
2. If using a nasal cannula or NRB, a simple mask should be applied over for this equipment on a patient's face if possible.
3. All personnel in the room with a patient receiving any high-risk procedures should use appropriate high-level PPE before treatment is initiated.
4. Nebulized meds should be used as a last resort - consider other appropriate treatments first. A patient with severe respiratory distress and wheezing can still receive nebulized treatments. Perform treatments on scene and outside if possible. Nebulizer treatments should not be performed during transport.
5. Instead of nebulized treatments for asthma, consider epinephrine (0.3mg - 0.5 mg Epi 1:1000 IM every 5 minutes, repeated once). Consider using lower doses (0.1 - 0.3 mg IM) for patients > 40 years old or with known coronary artery disease.
6. If available, use an albuterol Metered Dose Inhaler (MDI) in lieu of nebulizer treatments. If patient has their own MDI, consider bringing it with you for use in route. 4 puffs of an albuterol MDI is equivalent to 1 nebulized treatment; if available, use a spacer.
7. When treating for suspected SCAPE, IV NTG bolus may be preferred over CPAP/BiPaP to decrease exposure risk to providers from COVID-19 possible patients.
8. BVMs should be equipped with Viral/HEPA filters, as available.
9. Maximize area ventilation during these procedures as able: open doors, use exhaust fans, etc.
10. In patients failing to adequately respond to supplemental oxygen (e.g. NC, NRB), consider repositioning patient to improve oxygen saturation.

C. General Airway Management

1. The most experienced provider should assume control of airway management in known or suspected COVID-19 patients.
2. The use of SGAs is considered a continuously aerosolizing procedure.
3. When using a BVM, a viral/HEPA filter must be placed between the mask and the bag, if available.

D. Non-Invasive Positive Pressure Ventilation (CPAP/BiPaP)

1. This is an aerosolizing procedure and should be considered when performing advanced airway management and donning appropriate PPE. Attempt to minimize the performance of this procedure to only when necessary for respiratory distress.
2. **DO NOT** discontinue CPAP/BiPaP upon entering the ED.

E. Advanced Airway Management

1. If advanced airway management is needed in a possible COVID-19 patient, the most experienced provider on-scene is encouraged to be the person in charge of the airway.
2. Preferred pre-oxygenation method, for perfusing patients, is with a BVM with proper facemask-seal with viral/HEPA filter. Consider DSI as the preferred method of intubation if unable to achieve proper preoxygenation levels. If no issue with preoxygenation, RSI can be used.
3. In perfusing patients, do not squeeze BVM bag before intubation attempt but hold facemask with good two-handed technique with PEEP set at 5-10 cmH_2O until initiating advanced airway attempt to maximize recruitment of alveoli.
4. In perfusing patients with no, or inadequate respiratory effort, bag patient at a standard rate.
5. For patients in cardiac arrest, bag patient per standard cardiac arrest protocol.
6. Ensure viral/HEPA filter is attached to BVM before intubation attempt, if available.
7. Intubation with video laryngoscopy (VL) and bougie is strongly preferred over direct laryngoscopy (DL). This is to maximize the distance from patient and limit exposure.
8. Endotracheal intubation is preferred over SGA.
9. If a patient responds to supplemental oxygen with SpO_2 levels above 90% (and can maintain adequate airway) defer advanced airway management and notify the hospital of a potential need for airway management upon arrival.
10. After intubation, make sure that you have the viral/HEPA filter in place on the BVM, as able, to attach to the tube. Inflate the cuff before bagging the patient.
11. Confirm tube placement using standard verification methods, including $EtCO_2$ waveform capnography.

F. Suctioning

Suctioning is a high-risk aerosolizing procedure.

Crime Scene Response – 50.020

PURPOSE:
Law enforcement agencies stress that their first 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.

A. DEATH IN THE FIELD

Purpose: To define under what conditions treatment can be withheld or stopped.

Resuscitation efforts may be withheld if:

1. The patient has a "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).

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 Do Not Resuscitate (DNR) order signed by a physician, nurse practitioner or physician assistant. 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)
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 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 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 patient is enrolled in hospice and the patient has not already done so, contact hospice if possible.
3. EMS providers cannot take medical orders from a hospice nurse, but their advice is often invaluable and may be followed with direction from OLMC.
4. Treat dying persons with warmth and understanding. Do not avoid them. Allow them to discuss their situation, but do not push them to talk.
5. Many dying people are not upset by discussions of death as long as you do not take away all of their hope.
6. Touching a dying person is important. Use words like “death”. Do not use meaningless synonyms.
7. Ask the person how you might help.
8. Give factual information.
9. Be aware of your own fears regarding death and admit when a dying person reminds you of a loved one. If a particular person is too disturbing, have your partner or other members of the responding team take over.
10. 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.

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 (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. If you suspect a COVID-19 death, document the names and contact information of everyone who had contact with the person that is on scene.

F. 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 strip, 12-lead ECG, and 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.

Immunization and Infectious Disease Testing-50.045

PURPOSE:
To allow paramedics to provide immunizations and infectious disease testing for both seasonal outbreaks and during public health emergencies.

Community immunization and other public health applications are important duties that paramedics and EMTs may perform as determined necessary in cooperation with the Oregon Health Authority (OHA) and the local public health department. Training will be approved by the EMS Medical Director and OHA and may be accomplished under the direction of the OHA and/or local public health department.

PROCEDURE:

1. Indications for immunization and/or infectious disease testing:
    a. The public or EMS agency personnel may be immunized or tested under guidelines developed by OHA or the local public health department.

    b. Age groups for immunization will be determined by the OHA or public health department as appropriate for the immunization clinic setting or infectious disease testing requirements as determined necessary by the local public health department or agency infection control guidance.

    c. Timing of immunizations or infectious disease testing will be determined by OHA, EMS agency and public health department to comply with public health needs or agency immunization requirements as determined by agency infection control guidance.

    d. Immunizations or testing may be performed in clinic, mass immunization or agency setting as approved by OHA and/or local public health department.

2. Immunization or infectious disease testing:
    a. Immunizations or testing may be administered via IM, SQ or intranasal route in dosing determined by guidance provided by the MCA or local public health department as required for the agent administered.

    b. Other testing methods/procedures will follow guidance and training provided by OHA or the local health department.

    c. Screening will be performed as determined appropriate for the agent administered by OHA or local health department.

3. Training: Training for immunization or infectious disease testing will be provided by local public health department personnel or under an approved OHA program.

4. Personnel requirements: Immunizations or infectious disease testing may only be performed by paramedics or EMTs trained by local public health department personnel or under approved OHA training programs.

5. Record keeping: A record of public or agency personnel receiving immunizations or infectious disease testing will be maintained by the agency performing the immunizations or testing as determined by the local public health department or OHA.

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 (PPSS, 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 or not 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, and 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

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 time line 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 the Triage consult with the 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 anytime 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 Control (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 Control.
    3. Advised that we are not permitted to relinquish medical control to a physician on the scene without agreement from On-Line Medical Control.

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 Control – 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 Control (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 Control (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 (be as specific as possible)
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, contact 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 chemical or physical restraint per Patient Restraint 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 requiring OLMC Contact**: EMS providers are required 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:
    - Pulse greater than 120 or less than 60
    - Systolic BP greater than 180 or less than 90
    - Respirations greater than 29 or less than 10
    - $SpO_2 \leq 90\%$

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.

Refusal and Informed Consent – 50.117

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 *Patient Restraint* 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 REQUIRED

- 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:

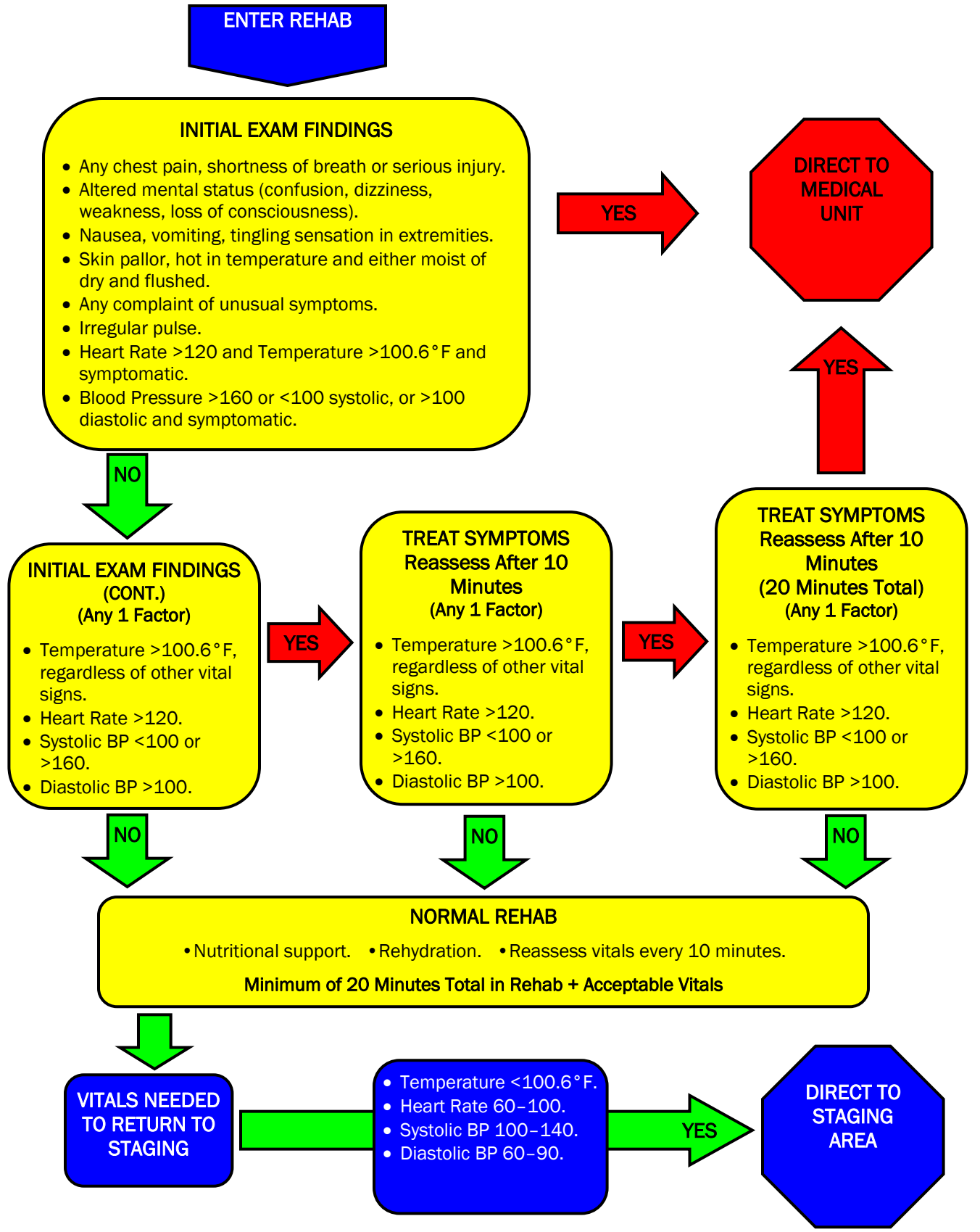
1. Findings mandating that the individual be transferred to the Medical Unit:
   a. Any chest pain, shortness of breath or serious injury.
   b. Altered mental status (confusion, dizziness, weakness, loss of consciousness).
   c. Nausea, vomiting, or tingling sensation in extremities.
   d. Skin pallor, hot in temperature and either moist of 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 of 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
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.
YES
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							
				INITIAL							
				10 Min							
				20 Min							
				INITIAL							
				10 Min							
				20 Min							
				INITIAL							
				10 Min							
				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

Reporting of Suspected Child Abuse – 50.120

PURPOSE: To establish guidelines for the reporting of suspected child abuse.

DEFINITIONS:

A. Abuse: The non-accidental assault or physical injury to a child. This may include mental abuse, sexual abuse, neglect, etc.
B. Child: An unmarried person under the age of 18.
C. Public or Private Officials: physicians, including residents and interns, firefighter or EMT among others.

PROCEDURE:

It is the policy of the State of Oregon to require mandatory reporting of suspected child abuse.

A. DUTY TO REPORT CHILD ABUSE (ORS 419B.010)
All EMS PERSONNEL ARE REQUIRED to report child abuse REGARDLESS OF ON DUTY STATUS. ANY EMT WHO has reasonable cause to believe that a child has either been abused, or witnessed abuse of another child or adult, or who comes into contact with someone who has abused a child, **shall report** the contact to a law enforcement agency, i.e., any city or municipal police department, any county sheriff's office, or the Oregon State Police AS SOON AS POSSIBLE.
Passing the report only to a Nurse or Physician does not meet the requirement of the Statute or the Protocol.

B. CONTENT OF REPORT (ORS 419B.015)
Paramedic must file an Unusual Event Report with the EMS Office within 12 hours as outlined in the Documentation Protocol. If there is imminent danger to health or life, notify police, the Chief Officer and use your agency notification procedure. The report must contain, if known, the following information:
- The names and addresses of the child and parents/person responsible for the child's care.
- The child's age.
- The nature and extent of abuse (including any evidence of previous abuse).
- The explanation given for the abuse.
- Any information the official believes may be helpful in establishing the cause of abuse or the perpetrator's identity.

IMMUNITY OF PERSONS MAKING REPORTS (ORS 419.025**):**

Persons who acting in good faith and upon reasonable grounds, report child abuse are immune from civil and criminal liability.

Reporting of Suspected Elder Abuse – 50.121

PURPOSE:
To establish guidelines for the reporting of suspected elder abuse or abuse of a resident in a long term care facility.

PROCEDURE:
There are two separate elder abuse reporting requirements; a general reporting requirement which applies to patients outside long-term care facilities and a special reporting requirement, which applies to patients of long-term care facilities.

DEFINITIONS:

A. Abuse: The non-accidental physical injury to an elderly person or patient of a long term cares facility. Abuse also includes:
   1. Outside long-term care facilities:
      a. **Neglect** means the withholding of services necessary to maintain health and well being. Treatment solely by spiritual means is not neglect; however, the person must be voluntarily under the care of an accredited practitioner or in accordance with the practices of a recognized church or religion.
      b. **Abandonment**, including desertion or willful forsaking of an elderly person or withdrawal or neglect of duties and obligations owed an elderly person by a caregiver.
      c. **Willful infliction of physical pain or injury.**
   2. Inside long-term care facilities:
      a. Illegal or improper use of the patient's financial resources for personal profit or gain.
      b. Sexual contacts by force, threat, duress or coercion by an employee, agent or other resident.
      c. Use of derogatory names, phrases, harassment, intimidation, punishment or involuntary seclusion.

B. Elderly person - Any person 65 years of age or over.

C. Long-term care facility - Any licensed skilled nursing facility or intermediate care facility.

PROCEDURE:

A. DUTY TO REPORT ELDER ABUSE AND PATIENT ABUSE IN A LONG TERM CARE FACILITY
   An EMT who has reasonable cause to believe that an elderly person has been abused, or who comes into contact with someone who has abused an elderly person, shall file an Unusual Event Report with the EMS Office within 12 hours as outlined in the Documentation Protocol. If there is imminent danger to health or life, notify police, or DHS . DHS: 503-304-3400 or 1-800-232-3020. **Passing the report only to a Nurse or Physician does not meet the requirement of the Statute or the Protocol.**

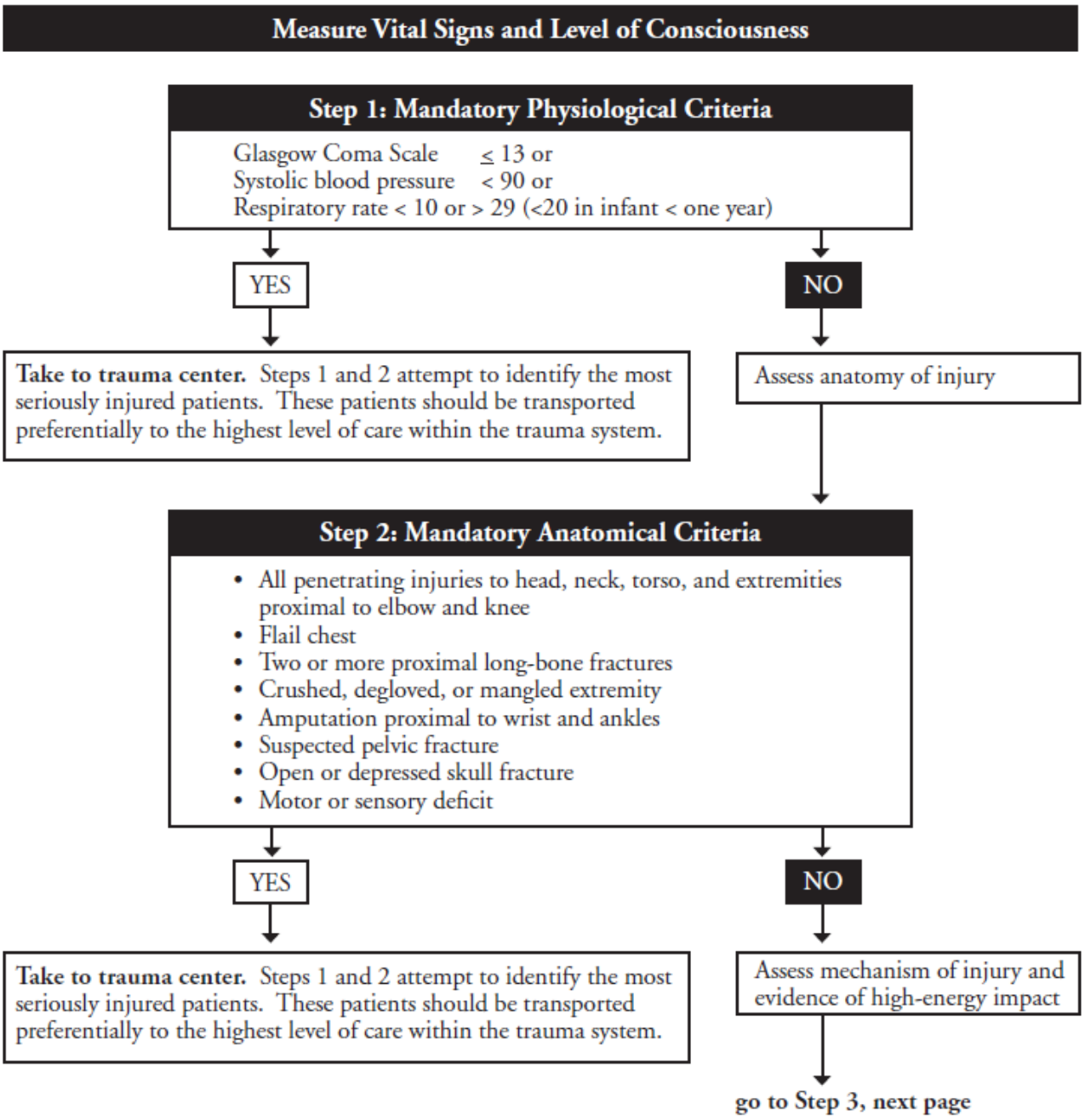
B. CONTENT OF REPORT
   The elder abuse report must contain, if known, the following information:
   - The names and addresses of both the elderly person and anyone responsible for his/her care.
   - The nature and extent of abuse including any evidence of previous abuse.
   - The explanation given for the abuse.
   - Any information the official believes may be helpful in establishing the cause of abuse.

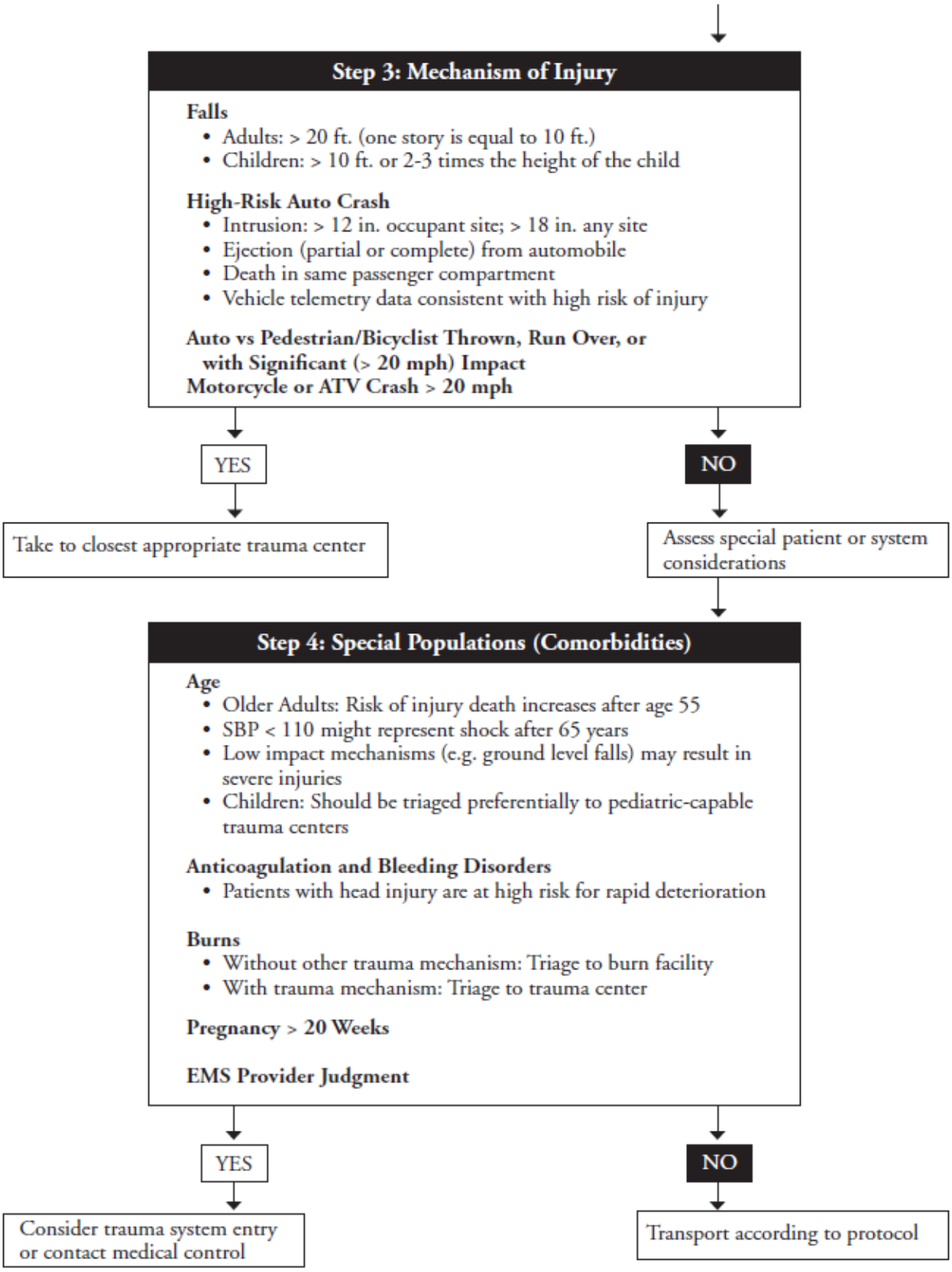
C. IMMUNITY OF PERSONS MAKING REPORTS

Persons participating in good faith in making a report of elder abuse and who have reasonable grounds for making it are immune from civil and criminal liability including participation in any judicial proceeding resulting from their report. Persons making such a report of abuse of a patient in a long term care facility in addition have immunity from any criminal liability that might otherwise be incurred or imposed with respect to making such a report.

Trauma System

I. PATIENT ENTRY:




Step 3: Mechanism of Injury
Falls
• Adults: > 20 ft. (one story is equal to 10 ft.)
• Children: > 10 ft. or 2-3 times the height of the child
High-Risk Auto Crash
• Intrusion: > 12 in. occupant site; > 18 in. any site
• Ejection (partial or complete) from automobile
• Death in same passenger compartment
• Vehicle telemetry data consistent with high risk of injury
Auto vs Pedestrian/Bicyclist Thrown, Run Over, or with Significant (> 20 mph) Impact
Motorcycle or ATV Crash > 20 mph
YES
NO
Take to closest appropriate trauma center
Assess special patient or system considerations
Step 4: Special Populations (Comorbidities)
Age
• Older Adults: Risk of injury death increases after age 55
• SBP < 110 might represent shock after 65 years
• Low impact mechanisms (e.g. ground level falls) may result in severe injuries
• Children: Should be triaged preferentially to pediatric-capable trauma centers
Anticoagulation and Bleeding Disorders
• Patients with head injury are at high risk for rapid deterioration
Burns
• Without other trauma mechanism: Triage to burn facility
• With trauma mechanism: Triage to trauma center
Pregnancy > 20 Weeks
EMS Provider Judgment
YES
NO
Consider trauma system entry or contact medical control
Transport according to protocol

II. MEDICAL DIRECTION:

A. Off-line medical direction for trauma patients is controlled by the Treatment Protocols.

B. OLMC is provided by Medical Resource Hospital (MRH). OLMC may override off-line medical direction. Any instances where this occurs will be reported to the EMS Office.

III. COMMUNICATIONS:

A. Communications with TCC:
The following information will be provided:
1. Unit number and the location of the incident.
2. Number of patients.
3. Age and sex of the patients.
4. Trauma system entry criteria and vital signs.
5. Glasgow Coma Scale.
6. Trauma tag number.
7. ETA to Trauma Center.
8. Patient destination based on incident location or request.

B. Communications from TCC or OLMC to the paramedics in the field will be as follows:
1. TCC will inform the paramedic if more information is needed by the trauma center.
2. TCC will inform the paramedic if the chosen trauma center is unable to receive the patient and will assist in designating an alternate destination.
3. In the event that there are multiple Trauma System entries, TCC will assist the paramedic at the scene in determining the destinations of all patients.

IV. TRAUMA CENTER DESTINATION:

A. **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.

B. **Oregon Health Sciences 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.

C. **Patients or Guardians Request:** If the alert, competent patient or his/her competent guardian demands transport to a specific hospital, the EMT must honor that request and notify the TCC immediately.

D. **Multiple Patients:** From the same scene, all patient destinations are to be that assigned by the above service areas unless the designated Trauma Center advises the TCC that the facility cannot accept additional patients. In this instance, the Trauma Communications Center (TCC) will assist the paramedic in determining patient destinations. If there are more than two critical trauma patients (e.g., intubated, significant trauma) ready to be transported from the same scene, only the first two will be sent to the Level 1 facility designated by catchment area. Subsequent patients shall be directed to the next Level 1 center.

E. **Diversion to Local Hospital:** If the paramedic is unable to establish an airway, the patient should be transported to the nearest acute care facility. In the event this occurs, TCC should be notified of the diversion.

V. MODE OF TRANSPORT:

An air ambulance should be used when it would reduce total pre-hospital time by 10 minutes or greater. This is usually achieved whenever the ground transport time will exceed 25 minutes (Scene is > 15 miles from Portland, or other circumstances exist).

VI. PATIENT EVALUATION PROTOCOL:

A. Treatment priority should be approached in this order:
   1. Airway Maintenance (Including control of the cervical spine).
   2. Breathing.
   3. Control of circulation and hemorrhage.
   4. Treatment of shock.
   5. Neurological examinations.
   6. Complete secondary survey.
   7. Splinting of fractures.

VII. SCENE TIME:

After gaining access to the patient, scene time should not exceed ten minutes for any patient who is entering the Trauma System. Plan to start IV/IOs and initiate other care once en-route to the hospital if necessary.

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.**

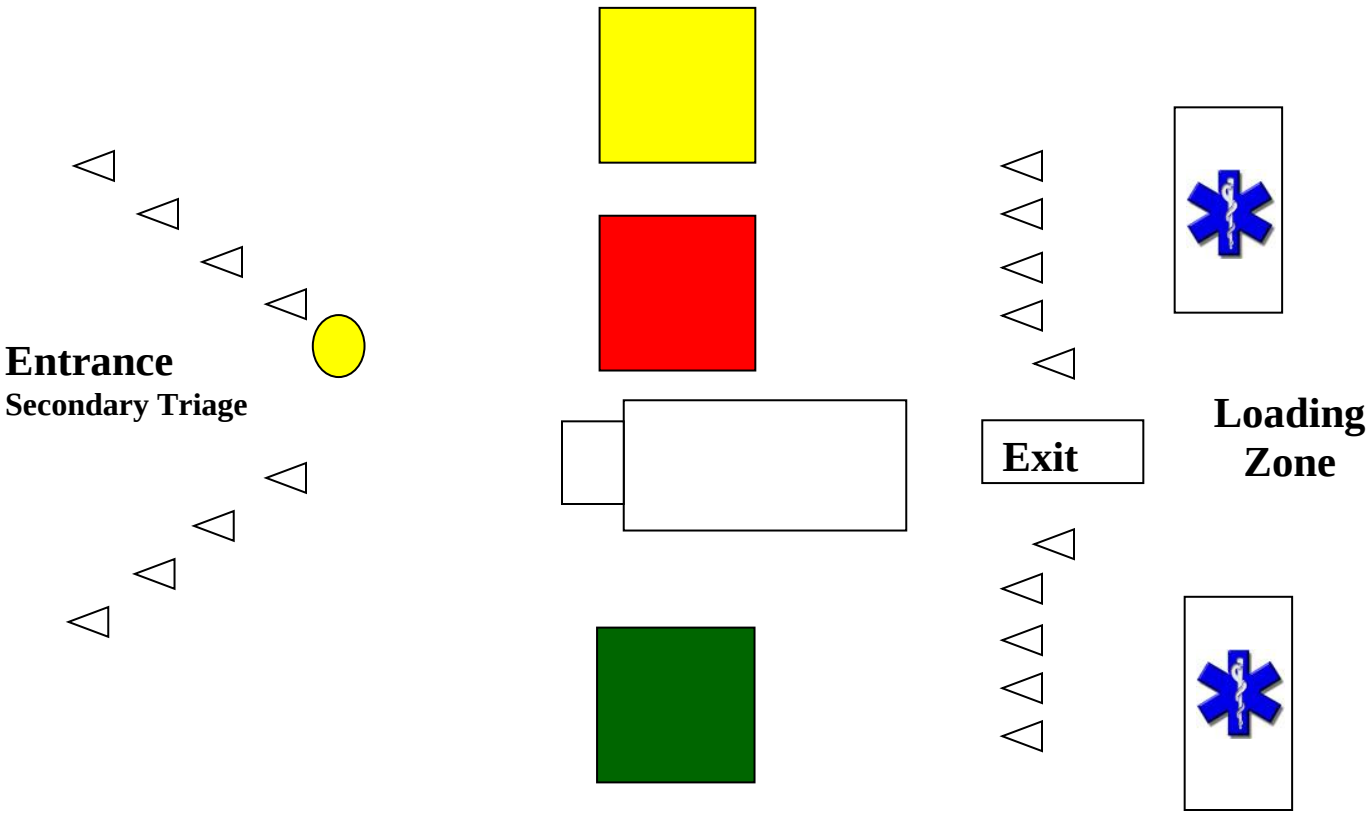
ACTIONS:

- ☐ 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 to 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 to 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 a backboard 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.
         - 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 to 8 ounces of water or milk.
   b. If available, also give 2 to 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, C-spine (prn), Pulse Oximetry, and ECG to obtain baseline QT 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 3ccs 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 to 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.
A. 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 contra-indication 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.
    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.
    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 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

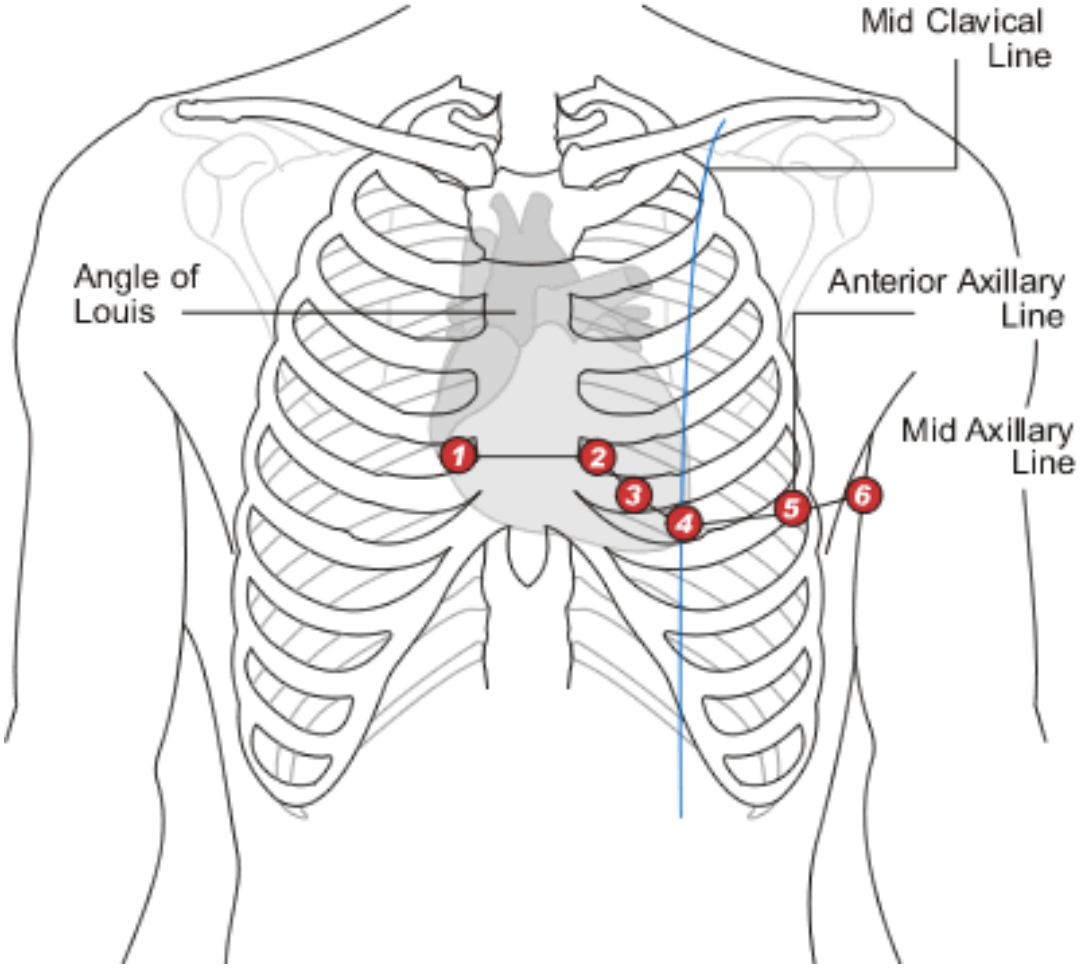
Patients who have histories or evidence suggesting substantial exposure and all persons who have ingested organophosphate should be transported to a medical facility for evaluation.

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.
Pralidoxime: Pediatric dose: 25 to 50 mg/kg and must be given slowly via IV (4 mg/min.)

2022 Patient Treatment Protocol Aids

12 Lead ECG Quick Reference



V1: Fourth intercostal space to the right of the sternum.
V2: Fourth intercostal space to the Left of the sternum.
V3: Directly between leads V2 and V4.
V4: Fifth intercostal space at midclavicular line.
V5: Level with V4 at left anterior axillary line.
V6: Level with V5 at left midaxillary line.

AMI Recognition – Lead Groupings

Limb Leads		Chest Leads	
I Lateral	**aVR**	**V1** Septal	**V4** Anterior
II Inferior	**aVL** Lateral	**V2** Septal	**V5** Lateral
III Inferior	**aVF** Inferior	**V3** Anterior	**V6** Lateral

12-Lead ECG Quick Reference

1 PORTLAND PREHOSPITAL STROKE SCREEN			
1. Age over 45 years	Yes	No	Unknown
2. No prior history of seizure disorder	Yes	No	Unknown
3. New onset of neurologic symptoms in last 24 hours	Yes	No	Unknown
4. Patient was ambulatory at baseline (prior to event)	Yes	No	Unknown
5. CBG between 60 & 400	Yes	No	
Neurological examination	**Normal**	**Abnormal**	
Facial smile/grimace (ask patient to smile/show teeth) Normal: Both sides of face move equally well Abnormal: One side of face does not move as well as the other	Yes	Right	Left
Arm drift (patient closes eyes and hold both arms out palms up) Normal: Both arms move the same or do not move at all Abnormal: One arm does not move or drifts down compared to other	Yes	Right	Left
Hand grip (have patient squeeze both hands simultaneously) Normal: Equal grip strength Abnormal: Unequal grip strength	Yes	Right	Left
Speech (have patient repeat a simple phrase such as "You can't teach an old dog new tricks") Normal: No difficulty repeating Abnormal: Patient has difficulty finding words, may speak in long meaningless sentences and/or cannot understand or follow simple verbal instructions	Normal/Abnormal		
If questions 1 – 5 are all answered "Yes" or "Unknown" and at least 1 of the 4 neurological examination findings are abnormal, the patient is considered to have a POSITIVE screen. Continue to C-STAT evaluation.			

Stroke Assessment Tools

C-STAT – CINCINNATI STROKE TRIAGE ASSESSMENT TOOL		
	Points	
Gaze Preference – Deviation of eyes **away** from side of weakness, toward side of stroke.		
Absent	0	
Present	2	
Arm Weakness - Cannot hold up arm(s) for 10 seconds		
Absent	0	
Present	1	
Level of Consciousness - Incorrectly answers at least one of two LOC questions **AND** does not follow at least one of two commands.		
Absent	0	
Present	1	
******* POSITIVE C-STAT SCORE IS ≥ 2 *******