Introduction

Assumptions

1. All EMS personnel will function within their scope of practice as defined by the Illinois EMS Act, IDPH Rules and Regulations, Illinois Dept of Financial and Professional Regulation, and practice privileges authorized by the EMS MD of the System in which they are working.
2. These SOPs shall be evidence-based and revised as standards of practice or clinical practice guidelines change. They include recommendations from the National Association of EMS Physicians (NAEMSP) (National Model EMS Clinical Guidelines), Am Heart Association (AHA) (CPR, ACLS/PALS), Am College of Surgeons (ACS) (ATLS & PHTLS), Am College of Emergency Physicians (ACEP) (ITLS), Brain Trauma Foundation, Centers for Disease Control and Prevention (CDC), Dept. of Health & Human Services, EMS for Children (EMSC); the National EMS Education Standards, Scope of Practice Model and National EMS Core Content.
3. *Italicized options* within a protocol may not be used in all Systems. Refer to the System-specific SOP documents. Those marked NR are non-region protocols that may or may not be adopted by each System or substituted with a System-specific document.
4. **Levels of acuity:** Definitions match *Model of Clinical Practice of Emergency Medicine; in the* Ntl. EMS Core Content: Acuity level is essential for identifying care priorities in EMS setting. They are coded to NEMSIS standards and should be documented as such in the PCR/EHR. **CRITICAL** pts are **TIME-SENSITIVE** with black box notations in the SOPs.

   CRITICAL: Symptoms of a life threatening illness or injury with a high probability of mortality if immediate intervention is not begun to prevent further airway, respiratory, hemodynamic and/or neurologic instability.

   EMERGENT: Symptoms of illness or injury may progress in severity or result in complications w/ a high probability for morbidity if treatment is not begun quickly. These may be identified as time-sensitive on a case by case basis.

   LOWER ACUITY: Symptoms of an illness or injury that have a low probability of progression to more serious disease or development of complications.
5. **Stable:** Ability to maintain a steady state of equilibrium with VS that support adequate oxygenation, ventilation, perfusion, & mentation

Guidelines

1. **Abandonment:** EMS personnel shall not knowingly abandon a patient. Abandonment is the unilateral termination of a health professional-patient relationship and/or the unreasonable discontinuation of care by the health care provider when there is still a need for continuing medical attention, contrary to the patient's will, and/or without the patient's knowledge. Abandonment for our purposes includes executing an inappropriate refusal, releasing a patient to a less qualified individual, or discontinuing needed medical monitoring before patient care is assumed by other professionals of equal or greater licensure than the level of care required by the patient.
2. **Bus Accident:** Refer to Region policy.
3. **Consent:** Decisional adults must consent to treatment. Consent must be informed or clearly implied via verbal agreement to the treatment or gestures indicating their desire for treatment. A patient's lack of refusal or physical resistance or withdrawal will be taken as consent.
4. **Consent (Implied):** Patients who are unconscious or otherwise so incapacitated that they cannot comply with the above provisions and do not exhibit the ability to make sound judgments, will be treated under implied consent.

   Patients who are obviously impaired with altered judgment who are unable to understand their decisions, have slurred speech, and/or ataxia; those suffering from mental illness; those who have made **suicidal statements** (to EMS personnel or persons physically present at the scene who will attest to the statements on a petition form) are to be treated under the doctrine of implied consent. They are not allowed to refuse treatment or transport.
5. **Expanded scope**: Expanded scope of practice is System specific as approved by IDPH. See System SOPs and policies.
6. **Minors:** Patients who are minors (<18) should have consent of a parent or guardian obtained prior to treatment unless they qualify as an emancipated minor or qualify for care under implied consent under the Emergency Doctrine. See System-specific policies regarding notification of parent or guardian if they are not immediately available.
7. **Refusals:** Patients who are judged to be legally and mentally decisional have the right to refuse any and all treatment. Patients who are non-decisional may not consent to or refuse treatment. (See System-specific policies)
8. **Treatment of prisoners:** Prisoners should be transported under the custody of a law enforcement officer for a medical screening exam at the officer's request. The officer should accompany the prisoner in the ambulance. Note the officer's name and badge number on the PCR/EHR. EMS personnel are not responsible for the secured custody of prisoners. If a prisoner has been placed in handcuffs, the officer is still responsible for the prisoner. If the officer does not accompany the patient in the ambulance, he or she must follow the ambulance in their vehicle during EMS transport but EMS personnel must be given the handcuff key.
9. **Lights and sirens:** Routine use of lights and sirens is not warranted. Pursuant to Illinois Vehicle Code Section 625 ILCS 5/11-1421, the use of visual and audible warning devices from the scene to the hospital is authorized by the EMS MDs for time sensitive patients and in accordance with System policy, unless contraindicated per individual SOP.
10. **Selection of receiving healthcare facility**: See Initial Medical and Initial Trauma Care and local System policies.

EMS Scopes of Practice
Includes IDPH additional Standards exceeding the National EMS Education Standards and National Scope of Practice Model as adopted by Region IX EMS MDs

See local policies/ procedures for details	EMR	EMT [BLS]	Paramedic/PHRN [ALS]
Monitoring	• Apply an appropriate pulse oximetry (SpO_2) sensor • Blood glucose monitoring	• Capnography monitoring • Interpret SpO_2 findings	• Blood chemistry analysis (point of care testing • ECG rhythm & 12 L interpretation
Airway/ventilatory management Oxygen delivery	• BLS airway access: position, OPA/NPA • Pulse oximetry	• Obstructed airway maneuvers • Oral suctioning • Tracheal-bronchial suctioning of an already intubated pt. • Capnography monitoring • O2: NC, mask, NRM, BVM • BiPAP, CPAP, PEEP • *Alternate extraglottic airways* • Occlusive dressing applied to a penetrating chest wound	• Magill forceps for airway FB removal • Stoma suctioning • Tracheostomy tube replacement through a stoma • *Intubation: Adult & peds (bougie)* • Extraglottic airways (NG in gastric port) • Needle*/surgical* Cricothyrotomy • Use of transport ventilators • Needle pleural decompression
Circulatory/cardiac mgt Vascular access	• Quality CPR • Hemorrhage control: Direct pressure; tourniquet • AED use	• Applications of 3-5 leads for ECG rhythm analysis • 12L ECG acquisition & submission to OLMC • Hemorrhage control: use of hemostatic agents • Spiking IV bag; priming tubing for vascular access	• ECG rhythm & 12L interpretation • Manual defibrillation; synchronized cardioversion • Transcutaneous pacing • Obtaining a blood sample • Vascular access: peripheral veins, IO (adult & peds) • Accessing central venous devices already placed based on OLMC
Psychomotor skills	• Blood glucose monitoring • Use of backboard • Application of C-collar	• Monitoring of OG/NG tube already inserted • Selective spine precautions • Splinting/bandaging • Vaginal delivery • Limb restraints	• Eye irrigation *w/ Morgan lens* • Assess JVD & pulsations • Targeted temperature mgt after ROSC • ALS burn care • Protective equipment removal • Monitoring indwelling urinary catheter already placed
Preparation and administration of drugs by the routes listed for all ages			
Pharmacology Medication administration	• ASA for chest pain PO • Oral glucose/glucose paste • Epinephrine: Assisted administration of pt's autoinjector • Epinephrine autoinjector • Naloxone IN; autoinjector IM	• Albuterol nebulized • Calcium gluconate gel • Diphenhydramine PO/ IM • Ipratropium bromide nebulized • Epinephrine (1mg/1mL) IM from ampule or vial • Glucagon IM or IN • Mark I or DuoDote autoinjector • Naloxone IN & IM • NTG sublingual (assist pt taking their own) • Ondansetron ODT	PO, IN, IM, IVP, IVPB, IO, SL, topical, IR depending on drug • Adenosine; Amiodarone • Atropine sulfate • Benzocaine spray • Benzodiazepines • Cyanide antidotes • Dextrose 10% IVPB • Diphenhydramine • Epinephrine 1mL/10 mL • Etomidate/Ketamine • Fentanyl • *Furosemide* • Lidocaine 2% • Magnesium sulfate • Naloxone; Norepinephrine, NTG • Ondansetron • Sodium bicarbonate • *Steroids* • Tetracaine ophthalmic solution • *Morphine* • Verapamil • Vaccinations in approved program

Practice privileges are cumulative from EMR to Paramedic

General Patient ASSESSMENT/Initial Medical Care (IMC)

Assessments and initial interventions shall be performed on all pts at the point of contact unless it is unsafe, as circumstances allow, and the pt. consents. Monitoring & intervention equipment/devices for EMS personnel to function to their level of licensure, in accordance with the level of service at which the EMS vehicle is operating must be brought to the pt. so complete information is obtained that will allow treatment at the appropriate level of care without delay. **Perform resuscitative interventions during the primary assessment as impairments are found.**

Care should progress from BLS to ALS as required by pt. condition, practitioner scope of practice, level of service, and local policy/procedure.

Secure all EMS equipment and ensure appropriate restraint systems are used by all ambulance occupants during transport.

1. **SCENE SIZE UP: Situational awareness; dynamic risk assessment –Assess/intervene as needed:**
   - Scene safety; control and correct hazards; remove pt/crew from unsafe environment ASAP; if potential crime scene, make efforts to preserve integrity of possible evidence
   - Nature of illness; scan environment for clues; DNR/POLST orders
   - Universal blood/body secretion & sharps precautions; use appropriate personal protective equipment prn
   - Number of patients; triage / request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.
2. **PRIMARY ASSESSMENT:** establish rapport with patient/significant others
   - **General impression:** age, gender, general appearance, position, purposeful movements
   - Determine if immediate life threat exists and resuscitate as found
   - **Level of consciousness** using AVPU or GCS; chief complaint S&S
     If unconscious, apneic or gasping, & pulseless START QUALITY CPR – see appendix
   - **AIRWAY**: snoring, gurgling, stridor, silence; consider possible spine injury
     - Open/maintain using position, suction, and appropriate adjuncts
     - If Obstructed: Go to AIRWAY OBSTRUCTION SOP
     - Loosen tight clothing; vomiting and seizure precautions as indicated
   - **BREATHING/gas exchange/adequacy of ventilations**: Assess/intervene as needed:
     - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
     - Position, adequacy of air movement, symmetry of chest expansion; accessory muscle use; retractions
     - Lung sounds if in ventilatory distress
     - SpO_2 if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O_2 if able.
     - $ETCO_2$ number & waveform if possible ventilatory/perfusion/metabolic compromise

     ***Correct hypoxia/assure adequate ventilations**: Target SpO_2: 94%-98% (92% COPD) unless hyperoxia contraindicated**
     - **O_2 1-6 L/NC**: Adequate rate/depth; minimal distress; SpO_2 92%-94% (88%-91% COPD)
     - **O_2 12-15 L/NRM:** Adequate rate/depth: mod/severe distress; SpO_2 < 92%; (<88% COPD)
     - **O_2 15 L/ BVM:** Apnea and/or shallow/inadequate rate/depth with moderate/severe distress; unstable
       Adults: 1 breath every 6 sec (10 breaths/minute) (Asthma: 6-8 BPM)
     - **CPAP:** Per appropriate SOP

     ***Hyperoxia contraindicated**: Uncomplicated Acute MI; post-cardiac arrest; acute exacerbations COPD; stroke; newborn resuscitation. Give O_2 only if evidence of hypoxia; titrate to dose that relieves hypoxemia without causing hyperoxia: SpO_2 94% (92% COPD)
   - **CIRCULATION / PERFUSION / ECG**:
     - **Pulse**: General rate, quality, & regularity of central vs. peripheral pulses. If none: start quality CPR.
     - **Perfusion**: Mental status (central); skin: color, temperature, moisture; turgor (peripheral)
     - Identify type, volume, & source(s) of external bleeding; **control hemorrhage** (See ITC p. 39)
     - **ECG:** (rhythm/12 L) based on chief complaint or PMH: pain/discomfort nose to navel, SOB/HF, weak/tired/ fatigued, dizziness/syncope, c/o nausea, indigestion, palpitations/dysrhythmia, diaphoresis, etc.
       See notes in ACS SOP re: 12 L ECG.
       ALS patients **do not necessarily** require ongoing ECG monitoring or transmission of a strip to OLMC.
       If ECG is run, attach/append to PCR/EHR left at, faxed to, or downloaded to, the receiving facility.
     - Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP
     - **Vascular access:** Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
       - **0.9% NS** – Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC
       - Do not delay transport of time-sensitive pts to establish elective vascular access on scene

General Patient ASSESSMENT/Initial Medical Care (IMC) cont.

- **CIRCULATION / PERFUSION / ECG** cont.
  - **Indications for IO**: Pts in extremis urgently needing fluids and/or medications (circulatory collapse; difficult, delayed, or impossible venous access; or conditions preventing venous access at other sites).
    If conscious: infuse Lidocaine 2% 1 mg/kg (max 50 mg) IO before NS flush unless contraindicated
  - If peripheral IV unsuccessful / not advised, may use central venous access devices already placed based on OLMC
  - Limit 2 attempts/route unless situation demands or authorized by OLMC to continue
  - Peripheral IV may be attempted enroute; place IO while stationary
  - Document total amount of IV fluid infused; report to receiving facility
- **Disability**: If AMS: assess pupils (size, shape, symmetry, reactivity) Glasgow Coma Score (GCS), glucose level
  Evaluate gross motor and sensory function in all extremities; if acute stroke suspected go to Stroke SOP
- **Expose** as indicated/**E**nvironmental control; Be considerate of pt modesty; keep pt warm unless specified by protocol
- **Identify time-sensitive priority transport pts:** Does not authorize accelerated transport speed; emphasizes rapid pt packaging and limiting on-scene time (barring prolonged access) to a minimum (Goal: 10 min or less).

3. **SECONDARY ASSESSMENT:** History and physical exam – tailor to pt presentation & chief complaint
   - **Vital signs**: BP (MAP if able) – Obtain 1st BP manually; trend pulse pressures; orthostatic changes if indicated; Pulse: rate, quality, rhythmicity Respirations: rate, pattern, depth Temp if indicated
   - **Chief complaint; history of present illness; SAMPLE history**
     - **S&S: OPQRST** (symptom onset, provocation/palliation, quality, region/recurrent/radiation, severity, time); quantify pain using an appropriate pain scale that is consistent with the pt's age, condition, and ability to understand.
     - **Allergies** (meds, environment, foods), **Medications** (prescription/over-the-counter – bring containers to hospital if possible), **PMH** (medic-alert jewelry; advance directives; medical devices/implants); **Last oral intake**/LMP
       Events leading to illness. In pts with **syncope, seizure, AMS, cardiac arrest, or acute stroke**, consider bringing witness to hospital or obtain their **contact/call back phone number** to provide to ED.
   - **Review of systems** based on chief complaint; S&S; practitioner scope of practice, and patient level of acuity
     - **Head**, eyes, ears, nose, throat/neck; jugular venous distention
     - **Chest**: Symmetry, chest wall movement; deformity, retractions; lung/heart sounds
     - **Abdomen**/pelvis/GU/reproductive organs: Inspect contour, symmetry; discoloration; pain; changes in function; auscultate bowel sounds; palpate (light); assess for rebound tenderness if S&S peritonitis
     - **Extremitie**s: Edema, pulses, discoloration; warmth, pain, motor/sensory changes/deficits
     - **Back**/flank: pain, discoloration
     - **Neurologic**: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
     - **Skin**: color (variation), moisture, temp, texture, turgor, lesions/breakdown; hair distribution; nails (clubbing)

4. **Position:** Semi-Fowler's or position of comfort unless contraindicated or otherwise specified
   AMS: Place on side or elevate head of stretcher 10-30°, unless contraindicated, to minimize aspiration

5. **Nausea: ONDANSETRON 4 mg** oral dissolve tablet [BLS] or slow IVP over no less than 30 sec [ALS]
   May repeat once in 10 min to total of 8 mg

6. **Pain:** Pharmacologic and non–pharmacologic (distraction, cold pack) options should reflect a patient–centered approach based on specific needs. Consider pt. status, responder scope of practice, risks/benefits of each strategy. Provide individualized pain mgt regardless of transport interval. If SBP ≥ 90 (MAP ≥ 65): **STANDARD DOSING:**

   FENTANYL: 1 mcg/kg (max single dose 100 mcg) IVP/IN/IM/IO.
   May repeat once in 5 min: 0.5 mcg/kg (max dose 50 mcg). Max total dose per SOP: 150 mcg (1.5 mcg/kg)
   Elderly (≥ 65) / **debilitated**: **0.5 mcg/kg** (**max single dose 50 mcg)** IVP/IN/IM/IO.
   Additional doses require OLMC: 0.5 mcg/kg q. 5 min up to a total of 3 mcg/kg (300 mcg) if indicated & available

7. **Ongoing assessment**: Reassess VS/pt. responses. Every transported pt. should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
   Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings

8. **Patient disposition:** Transport to nearest hospital by travel time unless preexisting transport patterns exist (trauma, STEMI, stroke, OB, peds) or an exemption applies. Stable pts may be transported to an alternate or more distant requested facility per local policy/procedure and/or with prior OLMC authorization.

Note: A patient's condition or behavior may require routinely performed IMC to be waived or deferred. This decision is made jointly by OLMC and EMS. Document situation and patient's condition or behaviors necessitating a change in usual and customary assessment/care.

EMERGENCY DRUG ALTERNATIVES

Purpose: To provide alternative treatment for serious emergencies when the primary medications are unavailable due to drug supply shortages.

PAIN management: Consider patient status, responder scope of practice, risks/benefits of each strategy.

Provide individualized pain management regardless of transport interval**.**

Goal: Pain is relieved and/or tolerable or all pain relieving options have been exhausted, pain medications are contraindicated (SBP < 90 or MAP < 65), or patient refuses the medication.

Assess and document response to interventions/medications including reassessment of VS within 5 min after each intervention.

This protocol excludes pts who are allergic to narcotics and/or who have AMS (GCS < 15 or mentation not appropriate for age).

If SBP ≥ 90 (MAP ≥ 65): **MORPHINE 0.1 mg/kg slow IVP** to max of 10 mg
If pain persists after 10 mg - contact OLMC to increase dose to a max of 20 mg.
If no IV: **MORPHINE 10 mg IM** for musculoskeletal pain/burns

Alternative for pain if no fentanyl:

KETAMINE: See dose charts in appendix Adult p. 102; Peds p. 101

0.5 mg/kg slow **IVP** (over 1 min) or **IN/IM: 1** mg/kg;
May repeat at ½ dose after 10 min.

DIAZEPAM - Alternative to MIDAZOLAM for sedation/seizure management

Adults 2 mg increments to 10 mg slow IVP/IO or 4-20 mg IR if packaged as Diastat (gel formulation for IR route)
Peds 0.3 mg/kg IVP/IO (max 10 mg) or 0.5 mg/kg IR (max 20 mg)

DOPAMINE – **Alternative to norepinephrine** as a vasopressor

Beta (ß) dose: 2-10 mcg/kg/min (start at 5)

Alpha (α) dose: 10 mcg/kg/ min. Titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥ 65) or acceptable peds SBP.

On-line Medical Control (OLMC)/handover REPORTS

- Establish **OLMC** via radio, landline or cellular phone as soon as practical or as indicated per local policy/procedure.
- Reports should be concise, organized, and address information directly related to EMS assessments/care.
- Communicate assessment/treatment completed prior to calling; discuss further assessment/intervention options.
- Do not delay transport while attempting to establish OLMC unless hospital destination is in question.
- Notify OLMC ASAP regarding **critical (time sensitive) patients**
- May call prior to availability of any specific information on VHF/MERCI. Re-contact with updates as able.

GENERAL FORMAT

1. **Identification:** Hospital being contacted; EMS provider agency and unit #
2. Age, gender of patient
3. Level of consciousness and orientation
4. **Chief complaint, nature of call, and prehospital impression** including perceived acuity/severity
   - Chief complaint (OPQRST); life-threats; degree of distress
   - Associated complaints
   - Pertinent negatives/denials
5. **History (SAMPLE)**
   - Signs & Symptoms
   - Allergies
   - Medications (current): compliance; time and amount of last dose if applicable
   - Past medical history (pertinent)
   - Last oral intake, last menstrual period if indicated
   - Events leading up to present illness (HPI)
     Mechanism of injury if appropriate; pertinent scene information; environmental factors, social situation
6. **Assessment findings**
   - Physical examination; include pertinent positive and negative findings
   - Vital signs – trends if multiple changes
     - BP: auscultated then automated; MAP if known
     - Pulse: rate, regularity, quality, equality
     - Respirations: rate, pattern, depth, effort
     - Temperature if relevant
   - Skin: color, temperature, moisture, turgor
   - Pulse oximetry reading on room air and O_2 if indicated
   - Capnography reading and waveform configuration if indicated and available
   - ECG interpretation: Rhythm, 12 L if indicated
   - Blood glucose level; if indicated
   - Glasgow Coma Scale parameters if AMS
7. **Treatments initiated** (or refused by pt) prior to hospital contact and patient response to treatment
8. **Destination facility**; **ETA**, update as necessary.

Call update report directly to receiving facility if different from OLMC if changes occur prior to arrival & if time permits.

An EMS "time-out" to allow for an uninterrupted **handover report** after hospital arrival is useful in ensuring continuity of care especially if a complete written/electronic ePCRs/EHRs are not left/downloaded at the time of pt handoff (ACS, 2014).

ABBREVIATED REPORT

Indications: Multiple patient incidents; BLS transports with normal assessment findings; CRITICAL patients where priorities rest with patient care and # of EMS responders is limited to give a radio report.

Report format:

1. ID information: Hospital contacted, EMS agency, receiving hospital and ETA
2. Identify the nature of the situation and how it meets the criteria for an abbreviated report
3. Patient age, gender, level of consciousness and orientation
4. Chief complaint and brief history of present illness: Initial impression including perceived acuity/severity; apparent life-threats; degree of distress
5. Vital signs and major interventions/resuscitation provided

Withholding or Withdrawing Resuscitative Efforts

1. **Use of this SOP MUST be guided by a physician**. Contact OLMC via UHF radio or cellular phone.
   Note: MERCI radio or private phone may be used in rare circumstances per policy.
2. Provide emotional support to patient and significant others.
3. Patient disposition according to local and county requirements.
4. **Patients may be pronounced dead in the field per individual System policy**.
   Document date and time of pronouncement and the physician's name in the PCR/EHR.
5. Document thoroughly all circumstances surrounding use of this protocol.

EMS personnel may withhold or cease resuscitative efforts in the following circumstances:

- There is a risk to the health and safety of EMS personnel
- Resources are inadequate to treat all patients (i.e., medium to large scale multiple patient incident)
- Death has been declared by a physician, Medical Examiner or coroner
- A child (< 18 years), where a Court Order is provided to EMS personnel indicating that CPR is not to be commenced
- Patient w/ blunt trauma who is found apneic, pulseless, and asystolic upon arrival of EMS at the scene

For additional examples see below

ADVANCE DIRECTIVES

IDPH POLST form	"**Practitioner O**rders for **L**ife-**S**ustaining **T**reatment"; provides guidance during life-threatening emergencies. Must be followed by all healthcare providers.
Power of Attorney for healthcare (PoA)	Names agent: rarely contains directions for authorized practitioner
Mental Health Treatment Declaration	Directions + Agent (for authorized practitioner)
Living Will	Directions for authorized practitioner (NOT EMS)

1. A valid, completed POLST form or previous DNR order does not expire. A new form voids past ones; follow instructions on most recent form. EMS is not responsible for seeking out other forms - work with form that is presented as truthful.
2. Original form NOT necessary – all copies of a valid form are also valid; form color does not matter
3. **Section A Cardiopulmonary Resuscitation**: (**no pulse and not breathing**)
   - If "Attempt Resuscitation" box is checked, start full resuscitation per SOP. Full treatment (section B) should be selected
   - If "Do not attempt resuscitation/DNR" box is checked:; do not begin CPR
4. **Section B** explains extent/intensity of treatment for persons found with a pulse and/or breathing

   Full Treatment: Primary goal of sustaining life by medically indicated means. In addition to treatment described in selective treatment and comfort-focused treatment, use intubation, mechanical ventilation, and cardioversion as indicated. Transfer to hospital or ICU if indicated.

   Selective treatment: Primary goal of treating medical conditions with selected medical measures. In addition to treatment describe in Comfort-Focused Treatment, use medical treatment, IV fluids and IV medications as medically appropriate, and consistent with pt preference. Do not intubate. May consider less invasive airway support (CPAP/BiPAP). Transfer to hospital if indicated.

   Comfort-Focused Treatment: Primary goal of maximizing comfort. Relieve pain and suffering through the use of medications by EMS-approved routes as needed; use oxygen, suction, manual treatment of airway obstruction. Do not use treatments listed in Full and Selected Treatment unless consistent with comfort goal. Transfer to hospital only if comfort needs cannot be met in current location.

5. **COMPONENTS OF A VALID POLST form/DNR Order:** Region IX recognizes an appropriately executed IDPH POLST form and/or any other written document that has not been revoked; containing at least the following elements:
   - Patient name
   - Resuscitation orders (Section "A")
   - Date

   All other information is *optional*

   - 3 Signatures
     Patient or Legal Representative signature
     Witness signature
     Authorized practitioner name & signature
     (Physician, licensed resident (2nd yr or higher), APN, PA)
6. **If POLST or DNR form is valid**: follow orders on form. If form is missing or inappropriately executed, contact OLMC.
7. A patient, PoA, or Surrogate that consented to the form may revoke it at any time. A PoA or Surrogate should not overturn decisions made, documented, and signed by the patient.
8. If resuscitation begun prior to form presentation, follow form instructions after order validity is confirmed.
9. If orders disputed or questionable contact OLMC and explain situation; follow orders received.

Withholding or Withdrawing of Resuscitative Efforts cont.

Injuries/presentations incompatible with life - *"Triple Zero"*

Pts found not-breathing, pulseless, asystolic and with any of these injuries &/or long term indications of death:

- Decapitation
- Thoracic/abdominal transection
- Massive cranial/cerebral destruction
- Rigor mortis without hypothermia
- Profound dependent lividity
- Decomposition
- Mummification/putrefaction
- Incineration
- Frozen state
- Trauma where CPR is impossible

1. DO NOT start CPR.
2. Contact OLMC; explain the situation; indicate that you have a "triple zero". Follow any orders received.
3. Document time and date death is confirmed and the physician's or coroner's name.
4. Removal of bodies per local policy and procedure.

Power of Attorney for Healthcare (POA)/ Living Wills

If someone represents themselves as having POA to direct medical care for a patient and/or a Living Will is presented; follow these procedures:

1. Contact OLMC; explain the situation and follow any orders received.
2. **Living wills** alone may not be honored by EMS personnel
3. If a **power of attorney** for healthcare document is presented by the agent, confirm that the document is in effect and covers the current situation.
   - If yes, the agent may consent to or refuse general medical treatment for the patient.
   - A POA cannot rescind a DNR order consented to by the patient.
   - A POA may rescind a DNR order for which they or another surrogate provided consent.
   - If there is any doubt, continue treatment, contact OLMC, explain the situation and follow orders received.
4. Bring any documents received to the hospital.

Hospice patients not in cardiac/respiratory arrest

- If pt. is registered in a hospice program and has a POLST form completed, follow pt. wishes as specified in Box B
- Consult with hospice representatives if on scene re: other care options.
- Contact OLMC; communicate patents' status; POLST selection; hospice recommendations; presence of written treatment plans and/or valid DNR orders. Follow OLMC orders. Consider need for CPAP to ease ventilatory distress.
- If hospice enrollment is confirmed but a POLST form is not on scene, contact OLMC. A DNR order should be assumed in these situations; seek an OLMC physician's approval to withhold resuscitation if cardiorespiratory arrest occurs.

Termination of Resuscitation (TOR)

A physician's order is required to stop resuscitation

1. Provide care per SOP based on patient's condition.
2. Contact OLMC physician and explain events. Report any response to EMS treatment.
3. Criteria to consider:
   - Adult is normothermic and experienced an arrest unwitnessed by bystanders or EMS;
   - No bystander CPR was provided;
   - The patient has remained in continuous monitored asystole or cardiac arrest with a non-shockable rhythm with no ROSC after full ALS resuscitation in the field for at least 30 minutes;
   - No AED or defibrillator shocks have been delivered for at least 30 minutes;
   - Capnography (if available) has remained ≤ 10 for 20 minutes
   - There are no reversible causes of cardiac arrest identified.
4. The physician may give the order to discontinue medical treatment if determined to be appropriate.
   Note the time resuscitation was terminated. Follow System policy for patient disposition.

ELDERLY PATIENTS (65 and older)

- Aging reflects natural loss of function and reserve capacity as one gets older.
  Everyone ages differently at different rates – can look older or younger than chronological age - evaluate individually
- **Frail elderly** may have impairments with mobility, nutrition, disability, and/or cognition; evaluate for possible abuse/neglect
- Advanced age alone is NOT predictive of poor outcomes & should NOT be used as sole criterion for denying/limiting care
- Physiologic responses may differ from those in younger pts due to changes assoc. w/ aging + comorbidities
- **Elderly pts can experience significant injury despite a relatively minor mechanism.**
- Advanced age should **lower threshold for field triage directly to a trauma center** if injured (See p. 41)
  If ≥ 65 years, a GCS ≤ 8 is associated with a poor prognosis. Geriatric pt w/ TBI & GCS <15= same mortality as adult w/ GCS <10.
- Post-injury complications negatively impact survival. Implement therapies to prevent/reduce complications.

1. **IMC/ITC special considerations**: Rapid airway control; adequate oxygenation; ventilatory support
   - Use SpO_2 central sensor (if available) if poor peripheral perfusion (cold hands) or tremors
   - **Pulmonary system:** Prone to ventilatory failure (↓ lung compliance, ↓ ability to breathe deeply, ↑ WOB)
   - **Consider need for CPAP,** intubation and/or ventilation w/ BVM if O_2 via NC or NRM is ineffective
   - **Blunt thoracic trauma**: higher risk for rib fx due to bone brittleness. Pain control titrated to ventilations.
   - **If chronic hypercarbic state** (COPD): Manage **ventilatory failure** w/ acute resp. acidosis carefully. Slowly eliminate only extra CO_2 (above chronic norms). **Do not hyperventilate and do not over-correct**. If rapidly ventilated to an $ETCO_2$ of 35-45, pt may suffer lethal dysrhythmias from Ca binding.
2. **Generally hypertensive, thus normal BP may reflect hypotension**. Concern: HR > 90; SBP < 110 in trauma pts.
   Anticipate ACS/silent MIs, side effects of meds; hypovolemia/dehydration; pneumonia; UTI/acute renal failure; stroke, syncope; GI, glucose emerg; sepsis/septic shock. Identify cause/correct hypotension/shock/acidosis. May appear "stable" yet have perfusion deficit due to low cardiac output. Need to ↑ perfusion to brain & coronary arteries if hypotensive: **IV NS up to 1 L: Do not volume overload**. Monitor mental status, SpO_2, $ETCO_2$, glucose, lung sounds, skin, VS (HR, RR, BP (MAP) & pulse pressure, temp); obtain 12-L ECG [if indicated and available].
3. **Changes in mentation** may be due to dementia or delirium, leading to late recognition of hypoxia, hypoglycemia, hypothermia, shock, stroke, or TBI. Assess pt's baseline and time of onset of acute alterations from their normal. Neuro exam can be unreliable for detecting S&S intracranial hemorrhage. KEEP WARM!
4. **PMH; ask about medications/compliance**: Polypharmacy poses special risks; see drugs p. 22.
   - Beta blockers, ACEI, ARBs, Ca blockers, dig may impair ability to compensate for hypoperfusion & hypotension
   - Anticoagulants can increased systemic or intracranial hemorrhage; notify OLMC ASAP
   - Benzodiazepine, alcohol. & opioid prescription abuse common; monitor mental/ventilatory status carefully
5. Accommodate for hearing, visual, cognition, memory, perception, communication, and motor deficits.
6. **Handle gently:** Bone density losses predispose to fx. Do not log roll. Use sheets or scoop stretcher to lift and move to board/stretcher. **Carefully assess and provide selective spine precautions for falls**
   If placed on spine board: Pad well, protect bony prominences. **Inform ED re elderly pt. on board.**
7. **PAIN management**: Reduce doses of **FENTANYL**. May be more susceptible to adverse effects (respiratory depression & CV effects). Pts may also have age-related kidney function impairment resulting in lower clearance rates.
8. **All refusals must have OLMC contact from scene prior to releasing the patient.**

Physiologic changes in the elderly	
Circulatory	↓ total body water; ↓vascular compliance, ↑ resistance, ↑ BP, ↓ circulating volume and blood flow to lower legs. Cardiac output does not elevate to compensate for increased O_2 needs. Oxygenation almost totally dependent on hemoglobin levels. Hypotension carries higher mortality and is a late & unreliable sign of hemorrhage.
Cardiac	↑ afterload leads to ↑ LV wall stress, LV hypertrophy and ↓LV compliance. Cardiac output ↑ from an ↑ in LV end diastolic volume, not from ↑ in contractile force. Meds (digoxin, beta or Ca blockers) may limit compensatory tachycardia and vasoconstriction normally seen in shock. Reduced heart function increases risk of pump failure in response to physiologic stress, shock and trauma.
Pulmonary	Stiffer chest wall: ↓ total lung capacity, ↓ lung elastic recoil. Weaker muscles cause less efficient inhalation. Gas diffusion diminishes d/t loss of alveolar-capillary membrane surface area thus reducing pO_2 but no changes in pCO_2 if healthy. Impaired ventilatory effort related to inadequate pain relief. Decreased gag and cough reflexes. Pneumonia/pulm contusion risk.
Renal	Fewer cortical nephrons, ↓ renal function; impairs metabolism and excretion of meds
Nervous	↓ brain mass; eye disease; ↓ depth perception; ↓ pupillary response; ↓ hearing & sense of smell; ↓ responsiveness to ANS & ß agonists, ↓ pain perception. Prone to subdural hematomas; brain atrophy may delay S&S; high c-spine injury (C-2 fx) most common; Central cord syndrome more frequent d/t hyperextension; nerve damage – peripheral neuropathy.

EXTREMELY OBESE PATIENTS

Definition – Bariatrics is the branch of medicine that deals with the causes, prevention and treatment of obesity. Excess weight becomes a health hazard at 20% or greater increase above desirable weight. This protocol applied to those who have a BMI of > 35. These pts are at higher risk for heart disease, HTN, high cholesterol; diabetes and possibly HF.

1. **IMC/ITC special considerations:**

   Positioning: Consider risk for apnea, airway obstruction, ventilatory distress, and desaturation when flat. Elevate head of stretcher 30°-45°; use padding to achieve sniffing position, or sit patient up as tolerated.

   Intubation considerations: Higher incidence of tube dislodgement; effectively secure airway
   - Attempt intubation X 1: Use bougie if unable to visualize cords
   - If difficult to intubate: Consider nasotracheal approach unless contraindicated
     - Insert alternate airway rather than attempting a difficult intubation
     - Anticipate difficult access for cricothyrotomy

   Breathing: Assessment of lung sounds may be difficult; listen over back first
   - **SpO_2 monitoring**: Can desaturate more quickly and be more difficult to monitor Consider use of earlobe (central) sensor to better detect perfusion; - expect SpO_2 of 88% – 92% on 6 L O_2/NRM
   - O_2 by NRM or **CPAP** (PEEP 5 – 10 cm H_2O); assist w/ BVM (2 person technique) if hypoxia or hypercarbia persists
   - CO_2 retention probable (46-52 mEq/L); monitor capnography if available
   - If ventilated: give V_T 8 – 10 mL/kg – use V_T of ideal body weight
   - **Flail chest:** Difficult to diagnose clinically; palpate chest wall; CPAP trial if no pneumothorax; intubate/ventilate if respiratory failure
   - **Tension pneumothorax**: Needle pleural decompression per system procedure

   Circulation:
   - Fluid loading is poorly tolerated
   - Standard large bore IV approaches may be difficult d/t thickness of sub-q fat and relatively short catheters
   - **IO** alternate site: proximal humerus; 45 mm 15 g needle if available
   - **ECG**: Changes due to obesity: decreased amplitude (leads farther from heart); flattening of T waves in leads II, III, AVF, V5, V6, & T wave flattening or inversion in I and AVL

   Disability:
   - Supine patients will have decreased range of motion
   - Motor strength may be diminished & difficult to assess due to weight of extremities; look for symmetry
   - May have deceptive pain perception

   Exposure:
   - Pannus (abd skin), back, buttocks, and perineum may be difficult to examine; addl. personnel may be needed
   - View as much skin as possible; lift and retract pannus to inspect for wounds, skin ulcers; infections
2. **Secondary assessment**: Use right size BP cuff / consider forearm location; abdominal exam ≤25% accurate; high index of suspicion Ask about recent surgery for weight reduction; type/nature (restrictive, malabsorptive or combination; open or laparoscopic); compliance with follow up instructions. High suspicion for dumping syndrome & hypoglycemia.
3. **Medications:** Consider using weight-adjusted dose to avoid sub-therapeutic levels. Contact OLMC for orders.
4. **Transport considerations**: Stretcher/spine board weight limits. Request a bariatric-equipped vehicle if available.

Anatomic and Physiologic Changes

Pulmonary	**Cardiovascular**
Reduced pulmonary compliance	↑ blood volume, but as a % of body wt, may be as low as 45 mL/kg
↑ Chest wall resistance	↑ stroke volume and stroke work index in proportion to body wt
↑ Airway soft tissue/resistance	↑ cardiac output and metabolic demand
Abnormal diaphragmatic position	↑ LV volume, which can lead to dilation and hypertrophy
↓ Diameter of trachea	Atherosclerosis
↓ Reserve volumes	↓ myocardial compliance up to 35% of normal
↑ O_2 consumption &CO_2 production	HTN augments pathophysiologic cardiac changes
Obesity hypoventilation syndrome	Obesity cardiomyopathy syndrome; HF w/ pronounced hemodynamic changes
GI	**Musculoskeletal**
↑ intraabdominal pressure	Limited mouth opening capacity; short neck with limited mobility
↑ volume of gastric fluid	↓ ROM; osteoarthritis, chronic pain
↑ incidence of GERD and hiatal hernia	

AIRWAY OBSTRUCTION

1. **Begin BLS IMC:**
   - Determine responsiveness and ability to speak or cough
   - If conscious: Allow patient to assume preferred position
   - If unconscious: Position appropriately to open the airway
     - No trauma: Head tilt/chin lift
     - If possible c-spine injury: modified jaw thrust
     - Maintain in-line spine stabilization/immobilization
   - Check for breathing; assess degree of airway impairment
   - Monitor for cardiac dysrhythmias and/or arrest

CONSCIOUS

ABLE TO SPEAK or COUGH:

2. **Complete IMC**:
   Do not interfere with patient's own attempts to clear airway by coughing or sneezing

CANNOT SPEAK or COUGH:

2. 5 abdominal thrusts (Heimlich maneuver) with victim standing or sitting.
   If pregnant > 3 months or morbidly obese: 5 chest thrusts.

   REPEAT IF NO RESPONSE:

3. **If successful**: complete **Initial Medical Care** and transport

4. **If still obstructed:** Continue step #2 while enroute until foreign body expelled or patient becomes unconscious. (See below)

UNCONSCIOUS

Note: Any time efforts to clear the airway are successful complete **Initial Medical Care**

2. If no effective breathing: Attempt to ventilate. If obstructed: reposition head, reattempt to ventilate.

3. If unsuccessful: Begin CPR.
   - Look into mouth when opening the airway to begin CPR.
   - Use finger sweep to remove visible foreign body.

ALS

4. **As soon as equipment is available:**
   Visualize airway w/laryngoscope and attempt to clear using forceps or suction.

5. Intubate; attempt to push the foreign body into right mainstem bronchus, pull ETT back and ventilate left lung.

6. **If still obstructed and unable to intubate or ventilate adequately:**
   - Perform cricothyrotomy (adult: surgical; children 12 or less: needle); O_2 12-15 L/BVM
   - May attempt surgical cricothyrotomy in children 8 - 12 only per OLMC
   - Transport; attempt to ventilate with 15 L O_2/BVM

DRUG-ASSISTED INTUBATION (DAI)

Purpose: Achieve rapid tracheal intubation of patient with intact protective airway reflexes who needs an immediate airway through the use of pharmacological aids and techniques that facilitate intubation.

Consider indications for DAI:

- Actual or potential airway impairment or aspiration risk (trauma, stroke, AMS)
- Actual/ impending ventilatory failure (HF, pulmonary edema, COPD, asthma, anaphylaxis; shallow/labored effort; $SpO_2 \leq 90$; $ETCO_2 \geq 60$)
- Increased WOB (retractions, use of accessory muscles) resulting in severe fatigue
- GCS 8 or less due to an acute condition unlikely to be self-limited
  (Ex. self-limited conditions: seizures, hypoglycemia, postictal state, certain drug overdoses or traumatic brain injuries)
- Inability to ventilate/oxygenate adequately after inserting an OPA/NPA and/or via BVM
- Need for ↑ inspiratory or positive end expiratory pressures to maintain gas exchange
- Need for sedation to control ventilations

Contraindications/restrictions to use of sedatives: Coma with absent airway reflexes or known hypersensitivity/allergy.
Use in pregnancy could be potentially harmful to fetus; consider risk/benefit.

1. **IMC:** SpO_2, evaluate before and after airway intervention; confirm patent IV/IO; ECG monitor
2. **Prepare patient:**
   - **Position** supine in sniffing position (earlobe horizontal w/ xiphoid) if not contraindicated
   - Assess for signs suggesting a difficult intubation
3. **Preoxygenate for 3 minutes**
   - Breathing at RR 8 or greater: O_2 12-15 L/NRM to avoid gastric distention
   - RR < 8 or shallow: O_2 15 L/BVM at 10 BPM (asthma: 6-8)
4. **Prepare equipment**: BSI, suction source (attach rigid tip catheter); drugs & airway equipment (bougie)
5. **Premedicate** while preoxygenating
   - Gag reflex present: **BENZOCAINE** 1-2 second spray, 30 seconds apart X 2 to posterior pharynx
     May need to wait until after etomidate or ketamine given if teeth clenched
   - Pain mgt if needed Fentanyl standard dose per IMC
6. **Sedation**
   - **ETOMIDATE 0.5 mg/kg IVP** up to max dose 40 mg **OR**
   - **KETAMINE** (preferred for asthma) **2 mg/kg** slow **IVP** (over one min) or **4 mg/kg IM**
   - Allow for clinical response before intubating (if possible)
7. **Intubate per procedure**: May maintain O_2 6 L/NC during procedure
   - Apply lip retraction, external laryngeal pressure; in-line stabilization if indicated
   - Monitor VS, level of consciousness, skin color, $ETCO_2$, SpO_2 q. 5 min. during procedure
   - Assist ventilations at 10 BPM if ↓ RR or depth, or ↓ BP & hypoxic
8. **Confirm tube placement**
   - Monitor $ETCO_2$ (quantitative waveform capnography preferred)
   - Ventilate and observe chest rise; auscultate over epigastrium, bilateral midaxillary lines, anterior chest
   - If $ETCO_2$ not detected, confirm position with direct laryngoscopy
9. **If successful**
   - O_2 15 L/BVM at 10 BPM (asthma 6-8)
   - Inflate cuff (avoid overinflation); note diamond number on ETT level with teeth or gums (3 X ID ETT)
   - Secure ETT with commercial device. Reassess $ETCO_2$ & lung sounds. Apply lateral head immobilization.
   - Post-intubation sedation: If SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM 2 mg slow IVP/IN** increments q. 2 min to 20 mg prn
   - Continue to monitor $ETCO_2$ to confirm tracheal placement.
10. **If unsuccessful**: Reoxygenate X 30 sec; repeat steps 7 & 8. Consider need for additional medication.
    If unsuccessful (max 2 attempts) or ETI attempts not advised: insert **alternate airway**; ventilate with O_2 15 BVM
11. **If alt airway unsuccessful/contraindicated and/or unable to adequately ventilate**: Needle or surgical cricothyrotomy

ALLERGIC Reactions / ANAPHYLACTIC Shock

1. **IMC** special considerations:
   - Repeat assessments for patent airway, airway edema; wheezing, respiratory effort & adequacy of perfusion
   - Ask about a history of allergies vs. asthma; determine if EpiPen used
   - Apply venous constricting band proximal to bite or injection site if swelling is ↑ rapidly
   - Attempt to identify and/or remove inciting cause: scrape away stinger
   - Apply ice/cold pack to bite or injection site unless contraindicated
   - Do NOT start IV, give meds, or take BP in same extremity as a bite or injection site

LOWER ACUITY: LOCAL Reaction

No AMS, hives and edema at site of exposure or GI distress after food ingestion; SBP ≥ 90 (MAP ≥ 65)

2. Observe for progression and transport

LOWER ACUITY: Mild SYSTEMIC Reaction — SBP ≥ 90 (MAP≥ 65)

S&S: Peripheral tingling, warmth, fullness in mouth and throat, nasal congestion, periorbital swelling, rash, itching, tearing, and sneezing

2. **DIPHENHYDRAMINE 1 mg/kg** (max 50 mg) **PO** [BLS]

EMERGENT: Moderate SYSTEMIC Reaction — SBP ≥ 90 (MAP≥ 65)

S&S: Above PLUS bronchospasm, dyspnea, wheezing, edema of airways, larynx, or soft tissues; cough, flushing, N&V, warmth, or anxiety

2. **EPINEPHRINE** (1mg/1mL) **0.3 mg** (mL) **IM** (vastus lateralus muscle) [BLS]
   - Caution: P > 100, CVD/HTN; on beta blockers, digoxin, MAO inhibitors; or pregnant
   - May repeat in 5-10 minutes; **DO NOT DELAY TRANSPORT waiting for a response**
3. **DIPHENHYDRAMINE 50 mg IVP**; if no IV give **IM**
4. If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** via HHN/mask. Add O_2 6 L/NC if SpO_2 <94% [BLS]

CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC Shock — SBP <90

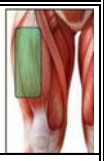
Life-threatening Time sensitive pt

Likely allergy; 2 or more of the following occurring rapidly after exposure:

- **Skin signs**: Itching, flushing, hives, swelling/edema
- **Respiratory compromise**: Severe dyspnea, hypoxia, decreased/absent lung sounds, wheeze, stridor, hoarseness
- **Cardiovascular collapse:** HYPOTENSION; dysrhythmias; syncope, or coma

Others: GI edema (dysphagia, intense abdominal cramping/pain, diarrhea, vomiting)

2. **IMC** special considerations:
   - **EPINEPHRINE** (1mg/1mL) **0.5 mg IM** (vastus lateralus muscle) [BLS] while attempting airway & vascular access
   - If airway/ventilations severely compromised: Rx per DAI SOP
   - **IV NS consecutive 200 mL IVF challenges; Goal:** SBP ≥ 90 (MAP ≥ 65); reassess after every 200 mL



As soon as vascular access is successful:

3. **EPINEPHRINE** (1mg/10mL) **titrate in 0.1 mg IVP/IO doses** q. 1 min **to a total max dose of 2 mg** [IM + IV/IO] if needed
   - Reassess after each 0.1 mg
   - If no IV/IO: May repeat (1 mg/1mL) 0.5 mg IM in 5 min [BLS]
   - Contact OLMC for additional doses

If on beta blockers & not responding to Epi:

GLUCAGON 1 mg IVP/IN/IO/IM [IN / IM BLS]

- **DIPHENHYDRAMINE 50 mg IVP/IO**; if no IV/IO give IM
- If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** /HHN/mask/BVM; May repeat X 1 enroute. [BLS] Contact OLMC for additional doses due to long transport time:

If cardiac arrest occurs – Begin quality CPR; Prolonged CPR indicated while S&S of anaphylaxis resolve

- Start 2nd vascular access line; give IVF as rapidly as possible (up to 8 L) (use pressure infusers if available)
- **EPINEPHRINE** (1mg/10mL) **1 mg IVP/IO q. 2 minutes** (high dose); treat dysrhythmias per appropriate SOP

ASTHMA/COPD
with Respiratory Distress

1. **IMC** special considerations:
   - Assess ventilation/oxygenation, WOB, accessory muscle use, degree of airway obstruction/resistance, speech, cough (productive or non-productive – color), cerebral function, fatigue, hypoxia, CO_2 narcosis, and cardiac status
   - Current meds: time and amount of last dose; duration of this attack
   - **If wheezing without Hx of COPD/Asthma**: consider FB aspiration, pulmonary embolus, vocal cord spasm, HF/ pulmonary edema. See appendix for differential. **If probable cardiac cause** (PMH: CVD): Rx per Cardiac SOPs.
   - Assess for pneumonia, atelectasis, pneumothorax or tension pneumothorax.
     If tension pneumothorax (↓ BP, unilaterally absent lung sounds): Needle pleural decompress affected side.
   - **Airway/Oxygen:** Assess need for DAI if near apnea, coma or depressed mental status, exhaustion, severe hypoxia (SpO_2 < 90); hypercapnia ($ETCO_2$ ≥ 60 mmHg); hemodynamic instability, impending respiratory failure or arrest.

     If chronic hypercarbic state (COPD): Rx ventilatory failure w/ acute resp. acidosis carefully.
     Eliminate only extra CO_2 (above chronic hypercarbic norms) causing acute ventilatory failure.
     Do not hyperventilate and do not over-correct. If intubated and rapidly ventilated to $ETCO_2$ of 35-45, pt may suffer lethal dysrhythmias from Ca binding. Slowly reduce $PaCO_2$.

     If assisted: **ventilate at 6 - 8 BPM** (slower rate, smaller tidal volume -6-8 mL/kg), shorter inspiratory time & longer expiratory time to allow complete exhalation. **Target SpO_2: 92%** (COPD)

     If cardiac arrest: Option: briefly disconnect from BVM and compress chest wall to relieve air-trapping (Class IIa)
   - **Monitor ECG:** Bradycardia signals deterioration

LOWER ACUITY to EMERGENT: Mild to Moderate distress with wheezing and/or cough variant asthma

2. **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** via HHN or mask — BLS
   - Add O_2 6 L/NC if patient is hypoxic (asthma: SpO_2 < 94%; COPD: SpO_2 < 92%) & using a HHN
   - **Begin transport as soon as neb is started**. Do not wait for a response.
   - Continue nebulizer therapy enroute. May repeat X 1.

CRITICAL (Severe distress): Severe SOB, orthopnea, use of accessory muscles, speaks in syllables, tachypnea, lung sounds diminished or absent; exhausted; HR & BP may be dropping

Time sensitive pt

2. IMC special considerations: [BLS] — BLS
   Prepare resuscitation equipment; anticipate rapid patient deterioration. If immediate intubation not needed:
   O_2 /C-PAP 5-10 cm PEEP; use 15 L/NRM or assist w/ BVM if CPAP unavailable or contraindicated
   If SBP falls < 90 (MAP < 65): Titrate PEEP values downward to 5 cm; remove C-PAP if hypotension persists.

History of ASTHMA

3. **EPINEPHRINE** (1mg/1mL) **0.3 mg IM** [BLS]
   Caution: HR > 100, CVD/HTN; on beta blockers, digoxin, or MAO inhibitors; pregnant; or significant side effects to albuterol
   Begin transport as soon as Epi is given
   Do not wait for a response
   May repeat X 1 in 10 min if minimal response
4. **Follow immediately with**
   ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg via HHN, mask or BVM; continue enroute [BLS]
   May repeat X 1 as needed.
5. **If severe distress persists:**
   MAGNESIUM (50%) **2 Gm** in NS to total volume 20 mL (slow IVP) over 5 min (Alt. 2 Gm in 50 mL NS IVPB on mcgtt tubing over 10 min). Max 1 Gm / minute.

History of COPD

3. **ALBUTEROL 2.5 mg &**
   IPRATROPIUM 0.5 mg /HHN/ mask/ BVM — BLS
   Begin transport as soon as neb is started
   Do not wait for a response
   Continue nebulizer therapy enroute
   May repeat X 1 as needed

Pts w/ TRACHEOSTOMY (adult or peds)

with Respiratory Distress

1. **IMC special considerations: Assess the following:**
   - Airway patency & lung sounds; RR; WOB; oxygenation by skin color & temp, SpO_2, $\underline{ETCO_2}$ (if available) ineffective airway clearance as evidenced by crackles and wheezes; need to suction.
   - Tube position.
   - Tracheostomy cuff to ensure that it is deflated unless pt is on a ventilator or if pt has excessive secretions
   - Tracheostomy site
     - Redness, swelling; character & amount of secretions
     - Tracheostomy ties - should be secure but not too tight
     - Subcutaneous emphysema around site
   - Stoma for presence of purulence or bleeding
   - Need of tracheostomy care
   - ECG

2. **If airway patent and respiratory effort/ventilation adequate:**
   - Support ABCs, complete IMC; suction as needed to clear secretions
   - Maintain adequate humidity to prevent thick, viscous secretions (if available)
   - Position head of stretcher up 45 degrees or sitting position as patient tolerates
   - Remove oral secretions if necessary.

3. **Report to OLMC:**
   - Significant respiratory distress
   - S&S of local inflammation/infection (redness, swelling, purulent drainage)
   - Changes in character and amount of secretions
   - Dislodgement of tracheostomy tube
   - Damage to tracheostomy cuff line
   - Subcutaneous emphysema

4. **Respiratory distress:**
   - Have disposable inner cannula available at all times. Suction after removing inner cannula if present
   - Place inner cannula back in tracheostomy to allow attachment of BVM
   - O_2 per tracheostomy collar or blow by & initiate supportive ventilation via BVM prn using 15 L O_2
   - Maintain head position to open airway maximally
   - Have second tracheostomy tube available if possible
   - **Dislodgement of trach tube**: In an emergency, insert the replacement trach tube or insert appropriately sized ETT into stoma per procedure; reassess patency

5. **If continued obstruction and/or ventilation/effort inadequate:**
   - If trach not patent after changing; ventilate mask to mouth
     If no chest rise, ventilate with infant mask to stoma
   - If chest rise inadequate: reposition airway, compress bag further and/or depress pop-off valve
   - Transport ASAP to the nearest hospital
   - Refer to respiratory arrest or cardiac arrest protocols as indicated

Acute CORONARY Syndromes (ACS)

Suspected angina or acute MI with or without pain

All time sensitive pt

Chest discomfort at rest or for a prolonged period (>10 min, unrelieved by NTG), recurrent chest discomfort, or discomfort associated with syncope, acute HF, or shock is a medical emergency.

Anginal equivalents: pain, discomfort or tightness from nose to navel, back or arm; weakness, fatigue, dyspnea, diaphoresis, nausea and vomiting. Atypical pain may be sharp and pleuritic.

Silent MIs without chest pain more common in women, diabetics and the elderly.

Some presenting with non-STEMI chest pain have a low likelihood of ACS (e.g. blunt trauma to the chest or a pt. < 30). Defer giving aspirin and nitrates to these pts unless positive 12L ECG changes; refer to pain mgt. guideline

1. **Begin immediate IMC** BLS
   - Perform brief, targeted history & physical exam; identify STEMI quickly; determine time of symptom onset
   - Assess for rate, rhythm, pump, volume problem; hypoperfusion & cardiorespiratory compromise Rx per appropriate SOP.
   - Decrease O_2 demand - limit activity, do not allow to walk; sit up, loosen tight clothing
   - If dyspnea, hypoxemia, or obvious signs of HF, titrate O_2 to achieve SpO_2 of 94%
2. **ASPIRIN 324 mg** (4 tabs 81 mg) chewed and swallowed while prepping for 12 L ECG
   Give to all w/ suspected ACS regardless of pain unless contraindicated or an adequate dose of immediate-release ASA can be verified as taken. Do not give if chest pain follows acute trauma. If indications unclear, contact OLMC.
3. **12-L ECG**. Perform early (preferably w/ 1st set of VS) and within 5 min of pt contact; ensure correct lead placement & excellent data quality. Capture while stationary; may transmit while moving.
   - **If** 12 L ECG indicates **AMI (STEMI):** Contact OLMC with **STEMI alert** ASAP; place defib pads per policy
     Communicate: ECG findings (transmit tracing if able; if unable to transmit, read interpretation to hospital)
     Pt age, gender, DNR status Time of symptom onset Primary physician/cardiologist if known
     If taking a blood thinner PMH of MI, PCI/stent/CABG, renal failure, or contrast allergy (GWTG)

     Consider second 12L ECG in 10 min if initial tracing shows no acute changes & S&S persist or change
     All ECGs should be made available to treating personnel at receiving hospital, whether brought in or transmitted from the field
   - Observe for clinical deterioration: dysrhythmias, chest pain, SOB, decreased LOC/syncope, shock/hypotension
     Be prepared to provide CPR and defibrillation if needed
   - Transport directly to primary PCI hospital/STEMI-Receiving Center for pts with transport time ≤ 30 min
     Goal: First EMS contact to balloon inflation (initial device used) within 90 min (or current AHA guidelines)

NONE to MILD cardiorespiratory compromise + pain/discomfort present Alert, oriented, well perfused & SBP > 100	**EMERGENT: Moderate cardiorespiratory compromise + pain/discomfort present** Alert, oriented, perfused & SBP 90-100
4. **NITROGLYCERIN** (NTG) **0.4 mg SL** (unless contraindicated – see drug appendix) 5. **Complete IMC: IV NS** TKO	4. **Complete IMC**: **IV NS** 200 mL fluid challenge if lungs clear 5. **NITROGLYCERIN 0.4 mg SL** (unless contraindicated)

6. Pain persists & SBP ≥ 90 (MAP ≥ 65) Repeat **NTG 0.4 mg SL every 3-5 min X 2;** monitor for hypotension
7. Pain persists & SBP ≥ 90 (MAP ≥ 65) **3-5 min. after 3rd NTG: FENTANYL**

CRITICAL (Severe cardiorespiratory compromise): Altered sensorium + S&S hypoperfusion; **SBP < 90 (MAP <65)**

4. If HR **less than 60**: Treat per **Bradycardia SOP** (p. 17)
   If HR **60 or above:** Treat per **Cardiogenic Shock SOP** (p. 22)

If ICD is firing repeatedly & hemodynamically stable: Assess indications/contraindications for sedation & pain mgt.

Sedation If SBP ≥ 90 (MAP≥ 65):

MIDAZOLAM 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) **up to 10 mg IVP/IN** titrated to pt. response.

If IV unable and IN contraindicated: **IM** dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.

All routes: May repeat prn to a total of 20 mg prn if SBP ≥ 90 (MAP≥ 65) unless contraindicated.

If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.

Pain: **FENTANYL standard dose per IMC**

BRADYCARDIA with a PULSE

HR < 60 w/ S&S (dysrhythmia, AMS, chest pain, HF, seizure, syncope, shock, pallor, diaphoresis) and/or evidence of hemodynamic instability
Functional or relative bradycardia (inappropriate or insufficient rate for condition)

1. Assess for rate, rhythm, pump, or volume problem; hypoperfusion and cardiorespiratory compromise
   Goal: Maintain adequate perfusion; treat underlying cause per appropriate SOP:
   Differential: MI, hypoxia, pacemaker failure, hypothermia, sinus brady, athletes, increased ICP, stroke, spinal cord lesion w/ neurogenic shock, sick sinus syndrome, AV blocks, hyperkalemia with wide complex bradycardia; toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin), electrolyte disorder
   If hypotensive & bradycardic: Correct rate problem first unless VT / VF (see those SOPs)
2. **IMC:** Support ABCs; determine need for airway mgt.; O_2 as needed to maintain SpO_2 at 94% [BLS]
   ECG monitoring; obtain, review, and transmit 12L ECG per ACS SOP (don't delay therapy)
   If AMS: Assess blood glucose; treat hypoglycemia per SOP
   IV/IO access, consider IVF challenges if hypotensive and lungs clear [ALS]
3. If possible ACS & alert with gag reflex: Treat per ACS SOP: Ischemia: ASA; pain (if SBP ≥ 90; MAP ≥ 65): fentanyl (NTG contraindicated due to slow HR)

Treat via the least invasive manner possible; escalating care as needed

LOWER ACUITY: None to mild cardiorespiratory/perfusion compromise SBP ≥ 90 (MAP ≥65)

4. Place TCP electrodes in anticipation of clinical deterioration in pts w/ acute ischemia or MI associated w/ severe sinus bradycardia, asymptomatic 2˚ AVB Mobitz type 2, asymptomatic 3˚ AVB; or new onset BBB or bifascicular block with AMI. Do not pace yet.

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

Instability related to slow HR: Acute AMS, SBP < 90 (MAP <65), chest discomfort or pain, SOB, poor peripheral perfusion, weakness, fatigue, light headedness, dizziness and presyncope or syncope, pulmonary congestion, HF or pulmonary edema, escape beats, frequent PVC.

Time sensitive pt

4. **ATROPINE 0.5 mg rapid IVP/IO** q. 3-5 minutes **(max 3 mg)** unless contraindicated
   - **Contraindications**: AVB 2˚ Mobitz type 2 or 3˚ w/ wide QRS; transplanted hearts (lack vagal innervation)
   - Use with caution in suspected ACS or MI

If atropine ineffective or contraindicated

5. **NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB),** adjust upwards in 2 mcg/min (0.5 mL/min) increments (Max 20 mcg/min). Target SBP ≥ 90 (MAP ≥ 65). Retake BP q. 2 min until desired BP reached, then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)

6. **If atropine and/or norepinephrine ineffective or no vascular access**
   Transcutaneous external cardiac PACING (TCP) per procedure manual
   - Select rate of 60 BPM. May adjust rate to 70 BPM based on clinical response.
   - Increase mA until mechanical capture is confirmed by palpable femoral pulse or a maximum of 200 mA
   - Evaluate BP once capture is achieved. If mechanical capture present: continue PACING enroute; do not turn off

   If SBP ≥ 90 (MAP≥ 65) after above intervention: Assess indications/contraindications for sedation and pain mgt:
   Sedation: MIDAZOLAM as below**.** If condition deteriorating and critical, omit sedation.
   Pain: **FENTANYL standard dose per IMC**

7. If on beta blockers & unresponsive to atropine, norepinephrine and pacing:
   GLUCAGON 1 mg IVP/IN/IO/IM.

MIDAZOLAM 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) **up to 10 mg IVP/IN** titrated to pt. response.
If IV unable and IN contraindicated: **IM** dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
All routes: May repeat prn to a total of 20 mg prn if SBP ≥ 90 (MAP≥ 65) unless contraindicated.
If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.

NARROW QRS Complex Tachycardia

w/ pulse & HR > 100

1. **Consider/treat for possible underlying causes**: pain, fever, anemia, anxiety, medications (caffeine, diet pills, thyroid, decongestants), cocaine, amphetamines, history of dysrhythmia, HF; cardiac ischemia, hypoperfusion, cardiorespiratory compromise, and compensation for other pathologies etc.
   - Rate problem: Tachycardia w or w/o coordination between atria & ventricles is reducing CO -use this SOP
   - Pump problem: HR > 100 & LV failure: - see HF/Pulmonary Edema/Cardiogenic Shock
   - Volume/vessel problem: See Hypovolemic, anaphylactic, septic shocks
   - Metabolic problem: See Glucose Emergencies, Drug OD, & Renal emergencies
2. **IMC:** Support ABCs as needed
   - Identify rhythm; obtain, review and transmit 12-lead ECG per ACS SOP if available
   - IV NS TKO in proximal vein (AC/external jugular); assess blood glucose – treat hypoglycemia per SOP
   - If unconscious: defer vascular access until after cardioversion
3. If possible ACS & alert with gag reflex: Treat per ACS SOP: Ischemia: ASA; pain (if SBP ≥ 90; MAP ≥ 65): fentanyl (NTG contraindicated due to fast HR)

Lower Acuity (NO cardiorespiratory or perfusion compromise): Sinus tachycardia

4. Ongoing assessment of cardiorespiratory status; treat underlying cause; transport.

Lower Acuity to EMERGENT: Mild to Moderate cardiorespiratory or perfusion compromise

HR >150; alert, SBP ≥ 90 (MAP ≥ 65) with chest pain or SOB but no evidence of ↓ cardiac output

4. **Vagal** maneuvers unless contraindicated

REGULAR R-R PSVT, reentry SVT (PSVT), AT, JT	**IRREGULAR R-R** (AF; A-flutter; MAT) **OR** PSVT that recurs despite Adenosine
5. **SVT persists:** **ADENOSINE 6 mg rapid IVP** + 20 mL NS flush (Contraindication: asthma) 6. **SVT persists or recurs w/in 1-2 min:** **ADENOSINE 12 mg rapid IVP** + 20 mL NS flush 7. Rhythm persists: Go to irregular R-R	**Note:** HR of 120-150 in AF may require drug therapy. Contact OLMC for orders. Do not give to WPW. **VERAPAMIL 5 mg SLOW** IVP over 2 min (over 3 min in older patients). May repeat 5 mg in 15 min.

CRITICAL: Severe cardiorespiratory/perfusion compromise (unstable)

Time sensitive pt

HR > 150, AMS, SBP < 90 (MAP < 65), SOB, ongoing chest pain, shock, pulmonary edema, HF or ACS
Immediate cardioversion is seldom needed for HR <150 unless pt has significant heart disease or other conditions

4. IMC special considerations in conscious patient:
   - Lungs clear + SBP < 90 (MAP < 65): Consider IV NS fluid challenges in 200 mL increments
   - May give a brief trial of meds (as above) while prepping to synchronize cardiovert if IV placed and time allows
   - **Sedation**: If responsive & SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM 5 mg IVP/**IN.
     May repeat X 1 up to **10 mg** if needed **and** SBP ≥ 90 (MAP≥ 65). If condition deteriorating, omit sedation.
5. **Synchronized cardioversion** at 50*-100-200-300-360 J (check monitor for specific setting recommendations)
   - If not possible to synchronize and condition critical, go immediately to unsynchronized shocks
   - Support ABCs; ongoing assessment of cardiorespiratory status enroute

Notes:
- If unresponsive to Adenosine/Verapamil and questionable QRS width (> 0.10 sec): Refer to VT SOP
- DC cardioversion is ineffective in junctional and ectopic atrial tachycardias
- *PSVT & A-flutter often responds to lower energy levels, start with 50 J

WIDE COMPLEX TACHYCARDIA with a PULSE

(QRS 0.12 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

1. Assess for hypoperfusion, cardiorespiratory compromise, acidosis
2. **IMC:** Support ABCs as needed
   Obtain, review and transmit 12-lead ECG per ACS SOP if available; **determine rhythm & stability ASAP**
   If unconscious: defer vascular access until after cardioversion
3. If possible ACS & alert with gag reflex: **ASPIRIN** per ACS SOP

Low Acuity to EMERGENT: None to moderate cardiorespiratory/perfusion compromise

Alert, HR > 150, SBP > 90 (MAP> 65), no evidence of tissue hypoperfusion or shock

Time sensitive pt

Regular Monomorphic VT; polymorphic VT w/ normal QT interval; WPW; Irregular wide complex tachycardia; AF w/ aberrancy; AF w/ WPW (short PR, delta wave)	**Polymorphic VT w/ prolonged QT** (Torsades de points)**:**
4. **AMIODARONE 150 mg** in 7 mL NS **slow IVP** over 10 min (Alt. 150mg in 100 mL NS IVPB over 10 min) Complete dose even if rhythm converts. **OLMC**: **ADENOSINE** 6 mg rapid IVP Contraindication: polymorphic rhythm	4. **MAGNESIUM** (50%) **2 Gm** in NS to total volume 20 mL (slow IVP) over 5 min (Alt. 2 Gm in 50 mL NS IVPB on mcgtt tubing over 10 min). Max 1 Gm / minute.
5. **Chest pain**: NTG per ACS SOP if HR drops to 100 or less. If pain persists: **Fentanyl standard dose**	

CRITICAL: Severe cardiorespiratory/perfusion compromise (unstable)

Instability must be related to **HR > 150**: Altered sensorium, SBP < 90 (MAP <65), shock, pulmonary edema, HF, or ACS. Immediate cardioversion seldom needed for HR < 150.

Time sensitive pt

4. **Sedation**: If responsive & SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM 5 mg IVP/**IN.
   May repeat X 1 up to **10 mg** if needed **and** SBP ≥ 90 (MAP≥ 65). If condition deteriorating, omit sedation.
5. **All but torsades** (see above): **Synchronized CARDIOVERSION** starting at **70**-**100-J** (manufacturer-specific)
   Torsades de pointes: DEFIBRILLATE at device & AED specific J see below
   If not possible to synchronize and clinical condition critical, go immediately to unsynchronized defibrillation
   - Assess ECG and pulse after each shock delivery
   - Treat post-cardioversion dysrhythmias per appropriate SOP

VT persists

6. **AMIODARONE 150mg** in 7 mL NS **slow IVP/IO** (Alt. 150mg in 100 mL IVPB over 10 min)
   Do not give amiodarone to patients with Torsades, AV blocks, IVR or ventricular escape beats
7. **Synchronized cardioversion at device specific J** after ½ of the Amiodarone dose (75 mg)
   Complete the medication dose even if pt. converts after cardioversion, provided SBP ≥ 90 (MAP≥ 65)

Notes: *See table of maximum QT intervals based on gender and heart rate in drug appendix p. 103

Defibrillator energy recommendations for VT			
Manufacturer	Waveform	Adult Synch J	Adult Defib J
LifePak 12 & 15	NA	100-150-200-300-360	200-300-360
MRL		100-150-200-300-360	200-300-360
Philips SMART™	BTE	100-150-200	150
Welch-Allyn	BTE	100-150-200-300-360	200-300-360
Zoll all series	RB	70 or 75-120-150-200	120-150-200
BTE = Biphasic Truncated Exponential, RB = Rectilinear Biphasic			

VENTRICULAR FIBRILLATION (VF)

& PULSELESS VENTRICULAR TACHYCARDIA (PVT)

- Use "Pit crew" or "Team" approach to cardiac arrest management per local policy/procedure.
- Do not move while CPR is in progress unless in a dangerous environment/adverse climate or pt. is in need of intervention not immediately available (trauma). CPR is better and has fewer interruptions when resuscitation is conducted where the pt. is found. Continue resuscitation for at least 30 minutes (non-trauma) before moving.

Begin **BLS IMC** – All care is organized around 2 minute cycles of CPR in C-A-B priority unless arrest is caused by hypoxic event – **multiple steps may be done simultaneously** if personnel resources allow

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction prn; **simultaneously** Assess pulse: If not definitively felt in <10 sec - **Begin quality CPR with compressions** (See p. 89)
- **Apply defib pads** with chest compressions in progress **as soon as monitor** [ALS]/**AED** [BLS] **is available**
  Disconnect Lifevest batteries; remove vest if present; DO NOT disconnect VAD batteries – See p. 23
  Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
  - **Shockable?** Resume compressions while charging monitor; charge to device specific joules see below
  - Pause compressions (< 5 sec) just long enough to deliver shock (after a compression -not a ventilation)
  - Resume chest compressions immediately for 2 min
  - NO rhythm/pulse check until after 2 min of CPR unless pt wakes or begins to move extremities (see below)
- **Airway/ventilations**:
  Witnessed arrest; shockable rhythm: Delayed PPV; 3 cycles (200) compressions before ventilating; O_2/NRM
  Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O_2 when available
  Attach impedance threshold device (RQP/ITD) to mask/advanced airway and capnography sensor to bag

Do the following simultaneously in separate time cycles.

After each 2 min cycle of CPR
(use real-time CPR feedback device if available):

Check rhythm & $ETCO_2$ – as above

Shockable? Resume compressions and deliver shocks as above

Not shockable? Asystole/PEA: resume compressions

Organized rhythm? ✓palpable pulse → ROSC

Switch compressors during rhythm ✓

NO rhythm/pulse check until after 2 min of CPR unless pt. wakes or move extremities

Repeat pattern as long as CPR continues - PLUS

If persistent/refractory VF: change pad location to A-P
If 2 monitors available: consider dual sequential defibrillation at device-specific joule settings

ALS interventions with no interruption to CPR

- Establish vascular access (IV/IO): NS TKO
- When IV/IO available, give meds during CPR:
  EPINEPHRINE (1mg/10mL) **1 mg IV/IO**
  Repeat every 3-5 min as long as CPR continues.
- **AMIODARONE 300 mg IVP/IO**
  After 5 min: **AMIODARONE 150 mg IVP/IO**
- Advanced airway if needed: 10 BPM (NO hyperventilation)
  After advanced airway: no compression pause for breaths

As time allows**: ✓Hs & Ts** (treat appropriately)

If possible opioid OD: **NALOXONE** 1 mg; repeat q. 30 sec up to 4 mg.

SODIUM BICARBONATE 1 mEq/kg IVP/IO: Only if arrest is caused by a bicarb-responsive acidosis (DKA/tricyclic antidepressant or ASA OD, cocaine or diphenhydramine) or known hyperkalemia.

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO_2, $ETCO_2$ q. 5 min.

- Support ABCs; **remove impedance threshold device;** assist ventilations / start 2nd IV if needed
  Do not hyperventilate even if ↑ $ETCO_2$; **titrate O_2 to SpO_2 94%** (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- **BP support is high priority**: If SBP < 90 (MAP < 65): IV WO while prepping
  NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB), adjust upwards in 2 mcg/min (0.5 mL/min) increments prn (Max 20 mcg/min). Retake BP q. 2 min until desired BP reached, then every 5 min.
  Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)
  Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA; Goal: MAP 90-100
- 12 L ECG ASAP after ROSC (call alert if STEMI); assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:

- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

If **ICD** is delivering shocks, wait 30-60 sec. for cycle to complete. Place pads at least 1" from implanted device.

Hs & Ts: Refer to specific SOPs: Acidosis (shock, renal failure); hypothermia; hypoglycemia; hypovolemia; Toxins (drugs); tamponade, tension pneumothorax; thrombosis

Defibrillator energy recommendations

Manufacturer	Waveform	Adult Defib J
LifePak 12 & 15	NA	200-300-360
MRL		200-300-360
Philips SMART™	BTE	150
Welch-Allyn	BTE	200-300-360
Zoll all series	RB	120-150-200

ASYSTOLE; PEA

- Use "Pit crew" or "Team" approach to cardiac arrest management per local policy/procedure.
- Do not move while CPR is in progress unless in a dangerous environment/adverse climate or pt. is in need of intervention not immediately available (trauma). CPR is better and has fewer interruptions when resuscitation is conducted where the pt. is found. Continue resuscitation for at least 30 minutes (non-trauma) before moving or seeking order to cease resuscitation.

Search for and treat possible contributing factors (Hs & Ts):

- Hypoxia (ventilate/O_2)
- Hypothermia (core rewarm)
- Toxins (**opiate? Naloxone**; TCA? $NaHCO_3$)
- Hypovolemia (IVF boluses)
- Hypo/**hyper**kalemia ($NaHCO_3$)
- Tamponade, cardiac (IVF)
- Thrombosis (coronary/pulmonary)
- H ion (acidosis; $NaHCO_3$)
- Hypoglycemia (✓glucose)
- Tension pneumothorax (✓ lung snds; pleural decompression)

Begin **BLS IMC** – All care is organized around 2 minute cycles of CPR in C-A-B priority unless arrest is caused by hypoxic event – **multiple steps may be done simultaneously** if personnel resources allow

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction prn; **simultaneously** Assess pulse: If not definitively felt in <10 sec - **Begin quality CPR with compressions** (See appendix p. 89)
- **Apply defib pads** with chest compressions in progress **as soon as monitor** [ALS]/ **AED** [BLS] **is available**
  Disconnect Lifevest batteries; remove vest if present; DO NOT disconnect VAD batteries – See p. 23
  Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
  Not Shockable? Resume compressions; no rhythm/pulse check until after 2 min of CPR unless pt. wakes or begins to move extremities (see below)
- **Airway/ventilations**:
  Witnessed arrest; shockable rhythm: Delayed PPV; do 3 cycles (200) compressions before ventilating; O_2/NRM
  Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O_2 when available
  Attach impedance threshold device (RQP/ITD) to mask/advanced airway and capnography to bag

Do the following simultaneously in separate time cycles.

After each 2 min cycle of CPR
(use real-time CPR feedback device if available):

Check rhythm every 2 minutes

Asystole/PEA persists/no shock advised: cont. CPR
Organized rhythm? ✓ pulse
If pulse present → ROSC

Switch compressors during rhythm ✓

NO rhythm or pulse check until after 2 min of CPR unless pt wakes or move extremities

Repeat pattern as long as CPR continues

ALS interventions with no interruption to CPR

- Establish vascular access (IV/IO): NS TKO
- When IV/IO available, give meds during CPR:
  EPINEPHRINE (1mg/10mL) **1 mg IV/IO**
  Repeat every 3-5 min as long as CPR continues.
- Advanced airway if needed: 10 BPM (NO hyperventilation)
  After advanced airway: no compression pause for breaths

As time allows**: ✓Hs & Ts** (see above; treat appropriately)

If possible opioid OD: **NALOXONE** 1 mg; repeat q. 30 sec up to 4 mg.

SODIUM BICARBONATE 1 mEq/kg IVP/IO: Give only if arrest is caused by a bicarbonate-responsive acidosis (DKA/tricyclic antidepressant or ASA OD, cocaine or diphenhydramine) or known hyperkalemia.

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO_2, $ETCO_2$ q. 5 min.

- Support ABCs; **remove impedance threshold device;** assist ventilations / start 2nd IV if needed
  Do not hyperventilate even if ↑ $ETCO_2$; **titrate O_2 to SpO_2 94%** (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- **BP support is high priority**: If SBP < 90 (MAP < 65): IV WO while prepping
  NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB), adjust upwards in 2 mcg/min (0.5 mL/min) increments prn (Max 20 mcg/min). Retake BP q. 2 min until desired BP reached, then every 5 min.
  Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)
  Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA; Goal: MAP 90-100
- 12 L ECG ASAP after ROSC (call alert if STEMI); assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:

- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.

Avoid hyperthermia & hyperglycemia

TERMINATION OF RESUSCITATION – See p. 8. If normothermic pt. remains in persistent monitored asystole or no shock advised rhythm for 30 minutes or longer despite steps above, and if capnography remains ≤ 10 for 20 min & no reversible causes of arrest are identified, seek OLMC physician's approval to terminate resuscitation.

HEART FAILURE / PULMONARY EDEMA

- Assess for hypoperfusion and cardiorespiratory compromise. **12 L ECG obtained and transmitted**
- Differentiate HF from COPD/asthma by PMH, meds, S & S, and capnography if available (See p. 106).
- **Consider cause**: rate, rhythm, volume, or pump problem; treat per appropriate SOP based on etiology.
- Auscultate lung sounds all lobes, front & back; report timing/location of wheezes/crackles

Low Acuity to EMERGENT: Mild to Moderate cardiorespiratory/perfusion compromise

Alert, normotensive or hypertensive **(SBP ≥ 90 and DBP ≥ 60) (MAP ≥ 65)**

BLS

1. **IMC** special considerations:
   - Position patient sitting upright at 90˚ (if tolerated); dangle legs over sides of stretcher
   - **C-PAP:** 5-10 cm PEEP; If SBP falls < 90 (MAP < 65): Titrate PEEP down to 5 cm; remove if hypotension persists
   - If respiratory distress and CPAP contraindicated, not tolerated, or unavailable: Assess need for advanced airway (DAI) [ALS]; O_2 15 L/NRM
2. **ASPIRIN 324 mg** (4 tabs 81 mg) PO per ACS SOP unless contraindicated

ALS

3. **NITROGLYCERIN 0.4 mg SL** If SBP remains ≥ 90 (MAP ≥ 65): Repeat **NTG 0.4 mg** every 3-5 min – no dose limit
   NTG may be given if HR > 100 in pulmonary edema
4. Severe anxiety and SBP ≥ 90 (MAP ≥ 65): **MIDAZOLAM** standard dosing per ACS SOP

CARDIOGENIC SHOCK (CRITICAL): Pump failure due to AMI, dysrhythmia; HF; obstructive shock (tension pneumothorax, cardiac tamponade, pulmonary embolus); or drugs with **SBP < 90; MAP < 65; & S&S hypoperfusion**

Time sensitive pt

1. **IMC** special considerations:
   - Assess need for advanced airway to ↓ work of breathing, protect airway, or ventilate patient
   - Assess for hypovolemia/dehydration
2. If hypovolemic and/or dehydrated - **lungs clear** and **ventilations unlabored:**
   NS IVF in 200 mL increments up to 1 L; attempt to achieve SBP ≥ 90 (MAP≥ 65). Frequently reassess lung sounds.
3. **NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB),** adjust upwards in 2 mcg/min (0.5 mL/min) increments prn (Max 20 mcg/min). Target SBP ≥ 90 (MAP ≥ 65). Retake BP q. 2 min until desired BP reached, then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)
4. If possible ACS: (alert with gag reflex): **ASPIRIN 324 mg** (4 tabs 81 mg) PO per ACS SOP [BLS]

Sampling of drugs prescribed for patients with CV disease/Heart Failure
ACE Inhibitors (ACEI): Benza***pril*** (Lotensin), captopril (Capoten), enalapril (Vasotec), fosinopril, monopril, lisinopril (Prinivil/Zestril), moesipril (Univasc), perindopril (Aceon), quinapril, accupril, Ramipril (Altace), trandolapril (Mavik)
Angiotensin Receptor Blockers (ARB): cande***sartan*** (Atacand), eprosartan (Teveten), irbesartan (Avapro), losartan (Cozaar), olmesartan (Benicar), telmisartan (Micardis), valsartan (Diovan)
Anticoagulants: apixaban (Eliquis), aspirin, argatroban, bivalirudin (Angiomax), clopidogrel (Plavix), dabigatran (Pradaxa), endoxaban (Savaysa), eptifibatide (Integrilin), lepirudin (Refludan), presugrel (Effient), rivaroxaban (Xarelto), ticagrelor (Brilinta), ticlodipine (Ticlid), warfarin (Coumadin, Jantoven); Sub-q route: dalteparin (Fragmin), enoxaparin (Lovenox), fondaparinux (Arixtra), tinzaparin (Innohep); Heparin (IV & sub-q)
Beta Blockers: acebuto***lol*** (Sectral), atenolol (Tenormin), betaxolol (Betopic,Kerlone), bisoprolol (Zebeta), carvedilol (Coreg), esmolol (Brevibloc), labetalol (Normodyne, Trandate), levobunolol (Betagan), metoprolol (Lopressor/Toprol), nadolol (Corgard), pembutolol, pindolol (Visken), propranolol (Inderal), timolol (Blocadren, Timoptic), sotalol (Betapace)
Calcium channel blockers: amlodipine (Norvasc), felodipine, diltiazem (Cardizem), nicardipene (Cardene), nifedipine (Procardia, Adalat), verapamil (Calan, Isoptin)
Diuretics: amilor***ide*** (Midamor), bumetanide (Bumex), chlorothiazide (Diuril), Diazide, furosemide (Lasix), hydrochlorothiazide (Hydrodiuril), indapamide (Lozol), metolazone (Zaroxolyn), Polythiazide, spironolactone (Aldactone), torsemide, triamterene (Dyrenium)
Digoxin (Lanoxin)
Vasodilators: hydralazine (Apresoline), isosorbide (Isordil), minoxidil (Loniten), nesiride (Natrecor), Nitrates/NTG

Left Ventricular Assist Device (LVAD) Patients

LV assist device (LVAD): Battery operated, mechanical pump surgically implanted next to native heart. A tube pulls blood from LV into pump that bypasses aortic valve to send blood directly into aorta. Purpose: help a weakened ventricle.

1. **CALL LVAD Coordinator listed on patient information sheet for instructions**

   EMS personnel are authorized to follow directions of the LVAD Coordinator
2. **Patient may or may not have a peripheral pulse or normal BP at any time;** SpO_2 registers if perfusion is present
3. **Evaluate perfusion based on mental status, skin signs**
4. **CHEST COMPRESSIONS ARE ALLOWED if patient is unconscious and non-breathing.**
   Follow all other BLS and ALS protocols.
5. Patient may be defibrillated, as necessary for V-fib with loss of consciousness, without disconnecting the pump.
6. Do not defibrillate over the pump; defibrillate at nipple line or above. Anterior-posterior pad placement preferred.
7. ECG waveforms may have a lot of artifact due to the device.
8. Patients will often have pacemakers and/or Internal Cardioverter Devices (ICDs).
9. Waveforms may be flat; without amplitude in spite of accurate readings – i.e. pulse ox.
10. Patient should have a binder with record of daily VAD parameters.
11. Patients will be on anticoagulation medications
12. NO MRIs - CT Scans are ok; avoid water submersion; avoid contact with strong magnets or magnetic fields
13. **Never** remove both sources of power (batteries) at the same time!

Acute ABDOMINAL/FLANK PAIN

1. **IMC** special considerations:
   - Inspect, auscultate, palpate abdomen in all quadrants
   - Compare pulses in upper vs. lower extremities
   - Note and record nature & amount of vomiting/diarrhea, jaundice; vomiting precautions
   - Adjust IV rate to maintain hemodynamic stability
   - Document OPQRST of the pain; menstrual history in females of childbearing age; last BM; orthostatic VS; travel history
   - Pain mgt.: **FENTANYL**

LOWER ACUITY: NONE to MILD cardiorespiratory compromise

Alert, SBP ≥ 90 (MAP ≥ 65), no evidence of tissue hypoperfusion or shock

2. Transport in position of comfort

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

Altered sensorium, signs of hypoperfusion.

Time sensitive pt

2. **IMC** special considerations:
   Consider need for NS IVF challenges if pt. severely dehydrated/hypovolemic: (Ex: appendicitis, cholecystitis, pancreatitis, hepatitis, cirrhosis, upper/lower GI bleed, bowel obstruction, sepsis)
3. If suspected **abdominal aortic aneurysm** (AAA): Do not give IV fluid challenges unless SBP < 80

DIALYSIS / Chronic Renal Failure Emergencies

Vascular access in dialysis patients is often through an AV fistula or graft (a surgical connection of an artery and vein). This access is the patient's lifeline, take meticulous care to protect it.

1. **IMC** special considerations:
   - BPs, venipunctures, and IVs should **NOT** be performed on an extremity with a shunt
   - If patient unresponsive: Vascular access by IO
   - When emergencies occur during dialysis, the staff may leave access needles in place, clamping the tubing. If this is the only site, request their assistance to connect IV tubing.
2. Treat per appropriate SOP and with special considerations listed below

HYPOTENSIVE (CRITICAL): SBP < 90 (MAP < 65); & S&S hypoperfusion

Occurs during dialysis due to rapid removal and acute reduction in fluid volume. Other causes: hemorrhage, cardiogenic shock, sepsis, electrolyte disorders, anaphylaxis, pericardial tamponade, or pulmonary embolism.

Time sensitive pt

2. Supine position with legs elevated unless contraindicated
3. If lungs clear: treat per Hypovolemic Shock SOP: **IV/IO NS fluid boluses in 200 mL increments** up to 1 L
4. If unresponsive to IVF or pulmonary edema is present: Rx per HF/Pulmonary edema/Cardiogenic Shock SOP

Suspected significant HYPERKALEMIA with cardiotoxicity or cardiac arrest (CRITICAL)

Wide QRS w/ tall, peaked T wave, flattened or absent P waves, prolonged PRI, sine-wave pattern, IVR, asystolic cardiac arrest; high index of suspicion if patient is on lisinopril (retains K)

2. Treat dysrhythmias per appropriate SOP with the following addition(s):
   - **SODIUM BICARBONATE 50 mEq** slow **IVP** over 5 min followed by 20 mL NS IV flush
   - **No IV: In-line ALBUTEROL 5 mg continuous neb up 20 mg** (throughout transport) [BLS]
   - OLMC may order use of both
3. Do NOT give magnesium sulfate to these patients.

ALCOHOL INTOXICATION / WITHDRAWAL

1. **IMC** special considerations:
   - Do not assume that the smell of alcohol automatically means intoxication; consider alternative causes of impaired behavior/motor incoordination
   - Assess **mental status** and cognitive functioning per AMS SOP
     If GCS 8 or less: Assess need for DAI or alternate advanced airway
   - Assess **hydration status**: If dehydrated: sequential IV NS 200 mL fluid challenges
   - Assess for hallucinations, delusions, tremors
   - Ask patient about time and amount of last alcohol ingestion
2. If combative or uncooperative, attempt verbal means to calm patient; seek law enforcement assistance and/or use restraints per System policy
3. Evaluate for evidence of **motor impairment** and deficits in coordination (ataxia); nystagmus
4. **If generalized tonic/clonic seizure activity**:

   MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN*)* **up to 10 mg IVP/IO/IN** titrated to stop seizure.
   If IV/IO unable/IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP $\geq$ 90 (MAP $\geq$ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: $\downarrow$ total dose to 0.1 mg/kg.
5. **If altered mental status**, **seizure activity, or focal neurologic deficit:**

   Obtain blood glucose level (per local policy/procedure) [BLS]
   - **If < 60 or low**: **DEXTROSE per Glucose emergencies SOP**
     If unable to start IV: **GLUCAGON 1 mg IM/IN** [BLS]
     If borderline (60-70): **DEXTROSE per Glucose emergencies SOP**

     Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   - **If 70 or greater**: Observe and continue to assess patient
6. **Alcohol withdrawal symptoms -** S&S may appear within 8 hrs of last drink, peak 1-2 days; last for 5 days: Nausea/vomiting; tachycardia, tremors (arms extended, fingers spread apart), sweating, anxiety, agitation/irritability, tactile disturbances (itching pins and needles, burning, numbness, bugs crawling on or under skin), auditory or visual disturbances (hallucinations); disorientation & clouding of sensorium; headache/fullness in head.

   Tremors or **Delirium tremens** (mental confusion, constant tremors, fever, dehydration, P > 100, hallucinations).
   If SBP ≥ 90 (MAP≥ 65):

   MIDAZOLAM 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) **up to 10 mg IVP/IN** titrated to pt. response.
   If IV unable and IN contraindicated: **IM** dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: May repeat prn to a total of 20 mg prn if SBP ≥ 90 (MAP≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: $\downarrow$ total dose to 0.1 mg/kg.
7. Transport. Ongoing assessment enroute.

Note: A patient who is chemically impaired, evidenced by AMS, altered cognition, hallucinations, delusions, and/or ataxia is considered non-decisional and may not refuse transport to a hospital or other healthcare facility.

ALTERED MENTAL STATUS (AMS)/SYNCOPE

AMS: Consider possible etiologies; use appropriate SOPs

- **A**: Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation
- **E**: Endocrine/exocrine, particularly thyroid/liver; electrolyte/fluid imbalances; ECG abnormalities: prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation
- **I**: Insulin disorders: hypoglycemia; DKA/HHNS
- **O**: O_2 deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)
- **U**: Uremia; other renal causes including hypertensive problems
- **T**: (recent) Trauma, temperature changes
- **I**: Infections, both neurologic and systemic; infarction
- **P**: Psychological; massive pulmonary embolism
- **S**: Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures

Syncope differential

- **H** Head injury
- **E** Epilepsy
- **A** Aneurysm
- **D** Drugs/psychiatric causes
- **H** Hypoxia or heart disease
- **E** Embolism
- **A** Arrhythmia
- **R** Respiratory (hyperventilation or breath-holding)
- **T** Thoracic outlet syndrome
- **V** Vasovagal
- **E** Ectopic (pregnancy-related hypotension)
- **S** Situational, sepsis
- **S** Sinus sensitivity
- **E** Electrolytes
- **L** Lung (pulmonary embolism)
- **S** Subclavian steal syndrome

Scene size up:

- Inspect environment for bottles, meds/drugs, letters/notes, sources of toxins suggesting cause
- Ask bystanders/patient about symptoms immediately prior to change in mentation; S&S during event; duration of event, resolution of event (spontaneous, after interventions)

Secondary assessment: Special considerations

- **A**ffect; **B**ehavior: consolable or non-consolable agitation
- **C**ognitive function (ability to answer simple questions); hallucinations/delusions
- Memory deficits; speech patterns
- Inspect for Medic alert jewelry, tags, body art
- General appearance; odors on breath; evidence of alcohol/drug abuse; trauma
- VS: observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- Skin: Lesions that may be diagnostic of the etiology
- Neuro exam: Pupils/EOMs; visual deficits; motor/sensory exam; ✓ for nuchal rigidity; EMS stroke screen

1. **IMC** special considerations:
   - Suction prn; seizure/vomiting/aspiration precautions
   - If GCS 8 or less: Assess need for intubation (DAI) or alternate advanced airway per local policy/procedure
   - If SBP < 90 (MAP < 65) & lungs clear: **NS IVF challenges** in consecutive 200 mL increments; monitor lung sounds
   - Position patient on side unless contraindicated
   - If supine: maintain head and neck in neutral alignment; do not flex the neck
   - **Consider need for 12 L ECG** if Hx of presyncope or syncope; monitor ECG rhythm; Rx dysrhythmias per SOP
   - Monitor for S&S of ↑ ICP: reduce environmental stimuli
   - Document changes in GCS & VS
2. Obtain and record blood **glucose** level (capillary and/or venous sample)
   - **If < 60 or low**: **DEXTROSE per Glucose emergencies SOP**
     If unable to start IV: **GLUCAGON 1 mg IM/IN** [BLS]
     If borderline (60-70): **DEXTROSE per Glucose emergencies SOP**
     Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   - **If 70 or greater**: Observe and continue to assess patient
3. **If possible opiate toxicity** w/ AMS & respiratory depression/arrest: **NALOXONE** IVP/IO [ALS] IN/IM [EMR/BLS]
   If spontaneously breathing: 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg
   If apneic: 1 mg. May repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC.

Presyncope: Prodromal symptoms of syncope; lasts for seconds to minutes; "nearly blacking out" or "nearly fainting".

Syncope: Loss of consciousness and loss of postural tone. Abrupt in onset and resolves quickly. Older age, structural heart disease, or history of CAD are risk factors for adverse outcomes. (Ann Emerg Med, 2007; 49; 431-444).

Syncope vs. seizure: Assess for PMH of seizure disorder. Look for incontinence with seizures; rare with syncope.

DRUG OVERDOSE / POISONING

Case by case determination if time sensitive

GENERAL APPROACH

1. **History**: Determine method of injury: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.
2. **IMC** special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; do not get distracted from assessment of underlying pathology
   - Anticipate hypoxia, respiratory arrest, seizure activity, dysrhythmias, and/or vomiting
   - Assess need for advanced airway if GCS ≤ 8**,** aspiration risk, or airway compromised unless otherwise specified
   - Support ventilations w/ 15L O_2/BVM if respiratory depression, hypercarbic ventilatory failure
   - Large bore IV/IO NS titrated to adequate perfusion (SBP ≥90; MAP ≥ 65); monitor ECG
   - Impaired patients may not refuse treatment/transport
3. If AMS, seizure activity, or focal neurologic deficit: Assess **blood glucose**; If < 70: treat per Hypoglycemia SOP
4. **If possible opiate toxicity** w/ AMS & respiratory depression/arrest: **NALOXONE** IVP/IO [ALS] IN/IM (EMR/BLS)
   If spontaneously breathing: 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg
   If apneic: 1 mg. May repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC.
5. **Anxiety/serotonin syndrome: MIDAZOLAM** 2 mg increments **slow IVP q. 2 min** (0.2 mg/kg IN) up to 10 mg titrated to response
   Tonic clonic seizures: **MIDAZOLAM** 2 mg increments IVP/IO **q. 30-60 sec** (0.2 mg/kg IN) up to 10 mg IVP/IN/IO prn
   If IV/IO unable/IN contraindicated - **IM**: 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose
   All routes: May repeat to total of 20 mg prn if SBP≥ 90(MAP≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to **0.1 mg/kg** for anxiety.
6. **If excited delirium, violent, severe agitation: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM
   May repeat at ½ dose after 10 min up to max of 4 mg/kg (500 mg). Do not give to pts with schizophrenia, psychosis, or bipolar mania.

BETA BLOCKER "LOLs" - See list on Pulmonary Edema/Cardiogenic shock SOP.

6. If HR < 60 & SBP < 90 (MAP < 65): & unresponsive to atropine, norepinephrine, & pacing per Bradycardia w/ Pulse SOP: **GLUCAGON** 1 mg IVP/IN/IO/IM.

CYCLIC ANTIDEPRESSANTS (Block Na channels and alpha receptors): Adapin, Amitriptyline, Amoxapine, Anafranil, Ascendin, Desipramine, Desyrel, Doxepin, Elavil, Endep, Imipramine, Limbitrol, Ludiomil, Norpramine, Pamelor, Sinequan, Triavil, Tofranil, Vivactil. These DO **NOT** include serotonin reuptate inhibitors (SSRIs) like Paxil, Prozac, Luvox, Zoloft

6. If hypotensive**: IV/IO NS wide open up to 1 L**
7. **If wide QRS: SODIUM BICARB 1 mEq/kg IVP**. Repeat dose if ↓ BP, deterioration of mental status, wide QRS, or dysrhythmias.

DEPRESSANTS: ***Barbiturates*****:** Phenobarbital, Seconal (secobarbital)l ***Benzodiazepines*****:** diazepam (Valium), midazolam (Versed), lorazapem (Ativan), Librium, flunitrazepam (Rohypnol) - Relatively non-toxic except when combined with other CNS depressants (ETOH). ***GHB****:* Cherry meth, Easy lay, G-riffic, Grievous body harm, liquid ecstasy, liquid X, liquid E, organic quaalude, salty water, scoop, soap, and somatomax; SSRIs

6. Observe for CNS depression, respiratory depression, apnea, nystagmus, ↓ P, ↓ BP, seizures. Supportive care.

Dextromethorphan (DXM): Active ingredient in over-the-counter cough-suppressants. Liquid & capsule/tablet forms. Abuse referred to as "Robotripping" referring to Robitussin®, and using "Skittles" or "Triple C's" due to red pill forms in Coricidin Cough & Cold® products. Acts as a dissociative anesthetic with increasing effects depending on amount consumed. Clinical effects may **mimic ketamine** (including nystagmus).

6. Supportive care: Check for salicylate or *acetaminophen intoxication*, as preparations are often coformulated. If coformulated with *diphenhydramine*, look for S&S of tricyclic antidepressant-like sodium channel blockade (wide QRS and/or abnormal R wave in aVR).
7. Treat Na channel blockade with **SODIUM BICARBONATE** (See cyclic antidepressants)

HALLUCINOGENS: Lysergic acid diethylamide (LSD), phencyclidine (PCP, Angel dust, TIC); cannabis, ketamine, methoxetamine (MXE) - analog of ketamine, (structural similarity to PCP). Synthetic cannabinoids come as white/off-white powders or may be combined with plant products and sold as *Spice, K2, Chill Zone, Sensation, Chaos, Aztec Thunder, Red Merkury,* and *Zen*. May be ingested or insufflated (if powdered chemicals) or smoked when mixed with other plant products. Liquid forms increasingly popular for use in electronic cigarette devices. Belong to varied classes of designer drugs and do not resemble THC in chemical structure.

S&S: Variable (mild to significant paranoia and agitation resulting in self-harm); nystagmus, AMS (out-of-body experiences), significant analgesia

6. Supportive care, quiet environment devoid of stimulation (lights, noise and touch)

INHALANTS: Caustic gasses, vapors, fumes or aerosols. Ex: Gases - CO, NH_4 (ammonia), chlorine, freon, carbon tetrachloride, methyl chloride, tear gas, mustard gas, nitrous oxide; spray paint (particularly metallics); household chemicals like cooking spray, furniture polish, correction fluid, propane, mineral spirits, nail polish remover, aerosol propellants, glue, oven cleaners, lighter fluid, gasoline and solvents.

Mechanisms of abuse: Sniffing, huffing, bagging**. S&S**: alcohol-like effects - slurred speech, ataxic movements, euphoria, dizziness and hallucinations; may also include bad HA, N/V, syncope, mood changes, short-term memory loss, diminished hearing, muscle spasms, brain damage, non-cardiogenic pulmonary edema, and dysrhythmias. Sniffing volatile solvents can affect the nervous system, liver, kidneys, blood, bone marrow and severely damage brain. Can suffer from "sudden sniffing death" from a single inhalant use.

6. Look for discoloration, spots or sores around the mouth, nausea, anorexia, chemical breath odor and drunken appearance. Supportive care.

OPIATES: *Codeine, fentanyl* (Duragesic, Sublimaze, Actiq), *heroin*, *hydrocodone* (Vicodin, Norco, Lortab, Lorcet), *hydromorphone* (Dilaudid, Exalgo, Opana ER), *meperidine* (Demerol), *methadone* (Dolophine, Methadose, Diskets), *morphine* (MS Contin, Kadian, Roxanol, Morphine Sulfate ER), *oxycodone* (Oxycontin, Percodan, Percocet), *propoxyphene* (Darvon, Darvocet), *diphenoxylate/atropine* (Lomotil), Roxanol, Talwin, *tramadol* (Ultram), Tylox, Wygesic

6. If AMS and RR < 12 (pupils may be small): **NALOXONE standard dose** (see general approach)
7. Assess need for restraints; monitor for HTN after opiate is reversed if speedballs are used

ORGANOPHOSPHATES (cholinergic poisoning): Insecticides, bug bombs, flea collars, fly paper, fertilizers containing Lorsban, Cygon, Delnav, malathion, Supracide parathion, carbopenthion. Cause a "SLUDGE" reaction (salivation, lacrimation, urination, defecation, GI distress, emesis). May also exhibit ↑ bronchial secretions, ↓ P, pinpoint pupils

6. Remove from contaminated area; decontaminate as much as possible before moving to ambulance.
7. **ATROPINE 1 mg rapid IVP/IO.** Repeat q. 3 minutes until reduction in secretions. May need large doses – usual dose limit does not apply. Cholinergic poisonings cause an accumulation of acetylcholine. Atropine blocks acetylcholine receptors, thus inhibiting parasympathetic stimulation. Also see Chemical Agents SOP.

STIMULANTS: Amphetamines: Benzedrine, Dexedrine, Ritalin, Methamphetamine (crystal, ice); **ECSTASY:** "Molly" -MDMA (methylene-dioxy-methamphetamine), designer drug used at "rave" parties with stimulant and hallucinogenic properties. Produces feelings of increased energy and euphoria and distorts users' sense and perception of time. May have S&S of serotonin syndrome (hyperthermia, HTN, tachycardia, AMS, ophthalmic clonus, hyper-reflexia, clonus, muscle rigidity, and bruxism (teeth grinding-users known to use pacifiers). Suspect if pt is holding a Vicks vapor rub inhaler; anticipate seizures). **COCAINE** ("Coke", "Crack", "Blow", "Rock"), **ephedrine, PCP; BATH SALTS** produce clinical effects like amphetamines or other stimulants. Sympathomimetic effects (↑ HR, BP & Temp; diaphoresis; agitation; hallucinations and psychotic S&S

6. Supportive care; prepare to secure pt safety with restraint if necessary
   Treat tachycardia, dysrhythmias, cardiac ischemia, and hyperthermia per appropriate SOP.
7. **If generalized tonic clonic seizure activity, anxiety, severe HTN: MIDAZOLAM** (see general approach)
8. **If excited delirium, violent, severe agitation: KETAMINE** (see general approach)
9. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)

CARBON MONOXIDE POISONING

1. **IMC** special considerations:
   - Use appropriate Haz-mat precautions & PPE; remove patient from CO environment as soon as possible
   - O_2 12-15 L/NRM or BVM; ensure tight seal of mask to face; SpO_2 **UNRELIABLE** to indicate degree of hypoxemia
   - Vomiting precautions; ready suction; monitor ECG
   - Keep patient as quiet as possible to minimize tissue oxygen demands
   - CO screening per System policy if available. If using CO-oximeter >12% abnormal, (<3% CO normal, smokers may have as high as 10%); use manufacturer standard levels if given; carefully assess for clinical correlation due to questionable device sensitivity.
2. Transport lower acuity/stable patients to nearest hospital
   Severely confused/hemodynamically stable: Consider transporting directly to a facility w/ a hyperbaric chamber (OLMC order).
   CRITICAL: If in respiratory/cardiac arrest or airway unsecured, transport to nearest hospital.

Hyperbaric oxygen chambers

Advocate Lutheran General Hospital	847/ 723-5155	24/7
St. Luke's Medical Center (Milwaukee)	414/ 649-6577	24/7

CYANIDE EXPOSURE (CRITICAL)

Time sensitive patient

Toxic twins: Consider cyanide poisoning in presence of smoke/fire if patient has soot in nose/mouth/oropharynx plus confusion//disorientation, AMS, coma, respiratory or cardiac arrest. **Also consider in the presence of** silver recovery, electroplating solutions, metal cleaning, jewelry cleaners, and a metabolic product of the drug amygdalin (laetrile). http://emergency.cdc.gov/agent/cyanide/erc74-90-8pr.asp
Assess for hypotension, CNS depression, metabolic acidosis, soot in nares or respiratory secretions, rapid CV collapse, central apnea, and seizures.

1. PPE including SCBA; evacuate danger area
2. **IMC** per Drug OD/Poisoning SOP; decontaminate as necessary. Do NOT direct water jet on liquid.
   Absorb liquid in sand or inert absorbent and remove to a safe place. Remove vapor cloud w/ fine water spray.
   Remove contaminated clothing and wash skin with soap and water for 2-3 min.
3. Establish OLMC ASAP so receiving hospital is prepared for your arrival
4. If hypotensive or pulseless: **IV/IO NS wide open**. CPR as indicated.
5. Per OLMC: Antidotes if available: **AMYL NITRITE** inhalants 1 per min X 12 min *OR* **HYDROXOCOBALAMIN** 5 gm IV (one vial) given IVPB over 15 minutes. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g.

Environmental: COLD Emergencies

FROSTBITE

1. **ITC:** Move to a warm environment as soon as possible. Remove wet/constrictive clothing/jewelry.
2. Rapidly rewarm frozen areas. Do **NOT** thaw if chance of refreezing.
   - Immerse in warm water (90°-105° F) if available
   - May use hands/hot packs wrapped in a towel. Use warming mattress if available.
   - HANDLE SKIN GENTLY like a burn. Do **NOT** rub. Do not break blisters.
   - Protect with light, dry, sterile dressings; cover with warm blankets and prevent re-exposure
3. Anticipate severe pain when rewarming: **FENTANYL:** Standard dosing per IMC.

HYPOTHERMIA: Risk factors: Exposure, extremes of age, cold IVF, burns, head/SCI injuries, shock, co-morbidities, drugs & alcohol use, impaired thermoregulation, stroke, malnutrition, endocrine failure, vascular compromise

1. **ITC** special considerations:
   - Prevent further heat loss & begin rewarming immediately: place in warm environment, remove wet clothing; dry patient; insulate from further environmental exposures
   - Position supine; handle gently when checking responsiveness, breathing and pulse
   - Assess breathing and pulse for 30-45 sec. Pulse & RR may be slow and difficult to detect
   - IV NS. Warm IVF up to 43˚ C (109˚ F); coil tubing if possible; do not infuse cold fluids
   - Monitor ECG & GCS continuously; may observe **Osborn or J wave** in leads II and V6
   - Obtain core temperature if possible; assess for local thermal injury (frostnip, frostbite)
   - Minimize movement to ↓ myocardial demand; prevent translocation of cold blood from periphery to the core and ↓ severe muscle cramping

MILD/MODERATE Hypothermia (Lower acuity to EMERGENT)

Mild: Core temp 90.6-95° F (32-35° C)**:** Confusion, tachycardia, shivering

Moderate: Core temp 82.4-90.6° F (28-32° C): lethargy, bradycardia, arrhythmias, shivering ceases <31°C (87.8°F); heat production falls, slowed speech/ataxia (mimics stroke) replaced by muscle rigidity, slowed reflexes, slow RR, CO_2 retention, pupils dilated & minimally responsive

2. **Passive rewarming** generally adequate for pts w/ T > 93.2° F: Cover with blankets; protect head from heat loss.
   Active external rewarming (T 82°- 93.2° F): Continue passive + apply surface warming devices (wrapped hot packs to axillae, groin, neck, & thorax; warming mattress if available). Passive rewarming alone inadequate for these pts.
3. Warm NS IVF challenges in 200 mL increments to maintain hemodynamic stability

SEVERE Hypothermia (CRITICAL): Core temp <28°C (82.4° F), coma, muscle rigidity, cardiac dysrhythmias: bradycardia, VF (cardiac arrest/absent pulse); hypotension, slowed RR to apnea, pupils fixed & dilated, no shivering

Time sensitive pt

2. **ITC** special considerations:
   - Core rewarming (not generally available in field). Rewarm trunk only with hot packs; avoid rewarming extremities.
   - **Consider need for intubation:** If indicated; use gentle technique to prevent vagal stimulus and VF
   - O_2 12-15 L/NRM or BVM (warm to 42˚ C / 107.6° F if possible); do **NOT** hyperventilate - chest will be stiff
   - **Vascular access:** Warm **NS** 200 mL IVP/IO fluid challenges up to 1 L
     Will require large volume replacement due to leaky capillaries, fluid shift, and vasodilation as rewarming occurs
3. If unresponsive with no breathing or no normal breathing (only gasping) check for a pulse.
   - Pulse is not definitely felt in 30 seconds: Start CPR - **TRIPLE ZERO CANNOT BE CONFIRMED on these patients**
   - Rhythm shockable: **Defibrillate** per VF SOP
   - Treat patient per VF or Asystole/PEA SOP concurrent with rewarming
4. **ROSC**: Support CV status per VF / Asystole SOPs; look for & treat causes of severe hypothermia
   - If induced hypothermia indicated: Continue to warm to goal temp of 34° C / 93.2° F
   - If hypothermia contraindicated (trauma patient); continue rewarming to normal temp
5. Transport very gently to avoid precipitating VF

Environmental: SUBMERSION INCIDENT

Notes:

- All victims of submersion who require any form of resuscitation (including rescue breathing alone) should be transported to the hospital for evaluation and monitoring, even if they appear to be alert and demonstrate effective cardiorespiratory function at the scene (Class I, LOE C).
- All persons submerged ≤ 1 hour should be resuscitated unless there are signs of obvious death.

1. **ITC** special considerations:

BLS

   - **Rescue and removal**: Ensure EMS safety during the rescue process; only rescuers with appropriate training and equipment should enter moving or deep water to attempt rescue
     - Rescue personnel should wear protective garments if water temp is < 70˚
     - A safety line should be attached to the rescue swimmer
     - Patient should be kept in a horizontal position if at all possible. Cold-induced hypovolemia, cold myocardium, and impaired reflexes may result in significant hypotension. If hypothermic, appropriate rewarming should be done concurrent with resuscitation.
   - **Selective spine precautions** only if circumstances suggest a spine injury
   - **EMERGENT**: If awake with good respiratory effort, yet congested and increased work of breathing:
     O_2 /**C-PAP** mask to deliver 5-10 cm PEEP; use 15 L/NRM if CPAP unavailable or contraindicated
     If SBP falls < 90 (MAP < 65): Titrate PEEP down to 5 cm; remove C-PAP if hypotension persists
   - **CRITICAL: If unresponsive and ineffective ventilations with a pulse**: Ventilate using BLS airways and BVM. No need to clear airway of aspirated water by any means other than suction. Abdominal thrusts contraindicated. Pts usually respond after a few ventilations. Consider need for advanced airway if patient does not respond to initial bag and mask ventilations.
   - **CRITICAL: If unresponsive, apneic and pulseless**: CPR using traditional A-B-C approach due to hypoxic nature of arrest. Rx per appropriate SOP.
   - Vomiting is common in those who require compressions & ventilations; prepare suction
   - Remove wet clothing; dry patient as possible – especially the chest before applying pads and defibrillating pt
   - If pt is cold: refer to HYPOTHERMIA SOP p. 29
2. Evaluate for ↑ICP: (↑ SBP, widened PP; ↓ pulse, abnormal respiratory pattern, gaze palsies, HA, vomiting)
   If present; treat per **Head Trauma SOP** p. 47
3. **Enroute**: Complete ITC: IV NS TKO [ALS]

Diving-related emergencies

Note: Consider decompression illness even if an apparently safe dive according to the tables or computer

ITC special considerations:

- Position supine or in recovery position
- Consider transport to Hyperbaric chamber: See Carbon Monoxide Poisoning SOP for chamber locations.
- If assistance is needed: **Divers Alert Network (DAN) (919) 684-8111**

Environmental: HEAT EMERGENCIES

HEAT CRAMPS OR TETANY (Lower acuity)

1. **IMC**: IV may not be necessary; if cramps severe/vomiting and/or oral electrolyte replacement unavailable; IV NS
2. Move patient to a cool environment, remove excess clothing, and transport
   Do **NOT** massage cramped muscles

HEAT EXHAUSTION (EMERGENT to CRITICAL): Heavy sweating; weakness; cool, pale, moist skin; fast, weak pulse; N / V, syncope (If AMS, see Heat Stroke below)

Time sensitive pt

1. **IMC** special considerations:
   - **NS IVF challenge** in consecutive 200 mL increments to maintain SBP ≥ 90 (MAP≥ 65)
   - Vomiting precautions; ready suction; consider need for ondansetron (standard dosing per IMC SOP)
   - Monitor ECG
   - Monitor and record mental status; seizure precautions
2. Move patient to a cool environment. Remove as much clothing as possible.

HEAT STROKE (CRITICAL): High body temperature (above 103°F); hot, red, dry or moist skin; rapid pulse; AMS, possible unconsciousness

Time sensitive pt

1. **IMC** special considerations:
   - Anticipate ↑ ICP; check for hypoglycemia
   - **If SBP 110 or above:** IV NS TKO (may use cold NS); elevate head of stretcher 10˚-15˚
   - **If signs of hypoperfusion:**
     - Place supine with feet elevated (do NOT place in Trendelenburg position)
     - NS IVF challenge in consecutive 200 mL increments to maintain SBP ≥ 90 (MAP≥ 65)
       Caution: Patient at risk for pulmonary and cerebral edema
   - Monitor ECG
2. Move to a cool environment. **Initiate rapid cooling:**
   - Remove as much clothing as possible
   - Chemical cold packs (CCP) to cheeks, palms, soles of feet
     If additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees
   - Sponge or mist with cool water and fan
3. **If generalized tonic/clonic seizure activity:**
   MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN*)* **up to 10 mg IVP/IO/IN** titrated to stop seizure.
   If IV/IO unable and IN contraindicated: **IM** dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.

Medications/substances that predispose to heat emergencies:

- Anticholinergics (atropine), antihistamines (diphenhydramine)
- Beta blockers, anti-hypertensives, cardiovascular drugs
- Tranquilizers, antidepressants, antipsychotics, phenothiazines (Thorazine), MAO inhibitors
- ETOH, LSD, PCP, amphetamines, cocaine
- Diuretics

GLUCOSE / DIABETIC Emergencies

1. **IMC** special considerations:
   - Obtain PMH; type of diabetes (1, 2, gestational, other specific types); assess for presence of insulin pump
   - Determine time and amount of last dose of diabetic medication/insulin and last oral intake
   - Vomiting and seizure precautions: prepare suction
   - Obtain/record **blood glucose** (bG) level (capillary and/or venous sample) on all pts with AMS or neuro deficits
   - Elderly patients who are hypoglycemic may present with S&S of a stroke

Blood glucose 70 or less or S & S of hypoglycemia

Hypoglycemic patients are not considered decisional. When hypoglycemia is corrected and confirmed by a repeat bG reading, they can be re-assessed for ability to refuse care.

2. **GCS 14 or 15 and able to swallow:** Oral glucose in the form of paste, gel, or sugar-containing liquid if available
3. **If bG is borderline 60-70:**

   DEXTROSE 10% (25 g/250 mL) IVPB rapidly (wide open) - infuse **12.5 grams** (**125 mL** or ½ IV bag)
   Observe for improvement while infusion is being given.
   If S&S of hypoglycemia fully reverse and pt becomes decisional after partial dose, reassess bG
   If >70; clamp off D10% and open 0.9 NS TKO

3. **If bG < 60** (no S&S pulmonary edema – if lungs congested see cautions):

   DEXTROSE 10% (25 g/250mL) IVPB rapidly (wide open) - infuse **25 grams (entire 250 mL)**
   Observe for improvement while infusion is being given.
   If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG.
   If >70; clamp off D10% and open 0.9 NS TKO

4. **Assess patient response 5 minutes after dextrose administration**: Mental status (GCS) and bG level
   If bG 70 or greater: Ongoing assessment
   If bG less than 70: Repeat D10% in 5 gram (50 mL) increments at 5 -10 min intervals.
   Reassess bG and mental status every 5 min after each increment.
5. If no IV/IO: **GLUCAGON 1 mg IM/IN –** [BLS]
6. If a decisional patient refuses transportation after bG has normalized, they must be advised to eat & call their PCP for follow-up before EMS leaves the scene.

DIABETIC KETOACIDOSIS (DKA) or HHNS (CRITICAL)

Time sensitive pt

Pts may be hyperglycemic and NOT be in DKA or HHNS.
They must present with at least S&S of **dehydration and hyperglycemia**.

- **Dehydration**: tachycardia, hypotension, ↓ skin turgor, warm, dry, flushed skin, N/V, abdominal pain
- **Acidosis**: AMS, Kussmaul ventilations, seizures, peaked T waves, and ketosis (fruity odor to breath)
- **Hyperglycemia:** Elevated blood sugar; most commonly 240 or above

Notes:

- **DKA** presents with **all 3** S&S above.
- Consider presence of hyperosmolar hyperglycemic nonketotic syndrome (**HHNS**) in elderly pts w/ T2DM, or those without history of DM who present with very high glucose levels and dehydration, but no acidosis or ketosis
- EMS personnel shall not assist any patient in administering insulin

2. **IMC** special considerations:
   - Monitor ECG for dysrhythmias and changes to T waves
   - **Vascular access: NS wide open** up to 1 L unless contraindicated (HF, bilateral crackles)
   - Assess lung sounds & respiratory effort after each 200 mL in elderly or those w/ Hx CVD
   - Attempt to maintain SBP ≥ 90 (MAP≥ 65); Monitor for development of cerebral and pulmonary edema

HYPERTENSION
Stable / Acute Crisis

1. **IMC** special considerations:
   - Maintain head and neck in neutral alignment; do not flex neck or knees
   - Assess and record GCS and neuro signs as a baseline
   - Assess for history of HTN, CVD, ACS, renal disease, diabetes, pregnancy, or adrenal tumor

NONE to MILD Cardiorespiratory compromise
BP > 140/90

No focal neurologic deficits

2. Assess for chest pain and/or pulmonary edema. If present: treat per appropriate SOP.
3. If patient is hypertensive but **without** CV or neurologic compromise: Transport without drug therapy to reduce BP
4. If severe headache:

   Adult: FENTANYL1 mcg/kg (max single dose 100 mcg) IVP/IN/IM/IO.
   May repeat once in 5 min: 0.5 mcg/kg (max dose 50 mcg). Max dose per SOP: 150 mcg (1.5 mcg/kg)
   Elderly (≥ 65) or **debilitated**: **0.5 mcg/kg** (max single dose **50 mcg)** IVP/IN/IM/IO.
   Additional doses require OLMC: 0.5 mcg/kg q. 5 min up to a total of 300 mcg if indicated & available.

HYPERTENSIVE CRISIS (CRITICAL):
SBP > 220 and DBP > 130

Non-traumatic origin

Time sensitive pt

Assess for S&S of end organ dysfunction: Neurovascular S&S (headache, visual disturbances, seizures, AMS, paralysis); chest pain and/or pulmonary edema

Assess EMS stroke screen

DO NOT use drug therapy solely to rapidly lower BP in chronically hypertensive patients
Needs IV BP control at hospital – not in field

2. **IMC** special considerations:
   - Keep patient as quiet as possible; reduce environmental stimuli
   - If GCS ≤ 8: Assess need for DAI
   - Elevate head of stretcher 10˚-15˚ with head/neck in neutral alignment
   - Seizure/vomiting precautions; suction only as needed
   - Repeat VS before and after each intervention
3. If chest pain or pulmonary edema: **NITROGLYCERIN 0.4 mg.** Contact OLMC for repeat dose.
4. **If generalized tonic/clonic seizure activity:**

   MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN*)* **up to 10 mg IVP/IO/IN** titrated to stop seizure.
   If IV/IO unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
5. Treat per appropriate Cardiac SOP.

PSYCH / BEHAVIORAL /Agitated/Violent

May be critical

1. Assess **SCENE AND PERSONAL SAFETY**. Call law enforcement personnel to scene, if needed.
   DO NOT JEOPARDIZE YOUR OWN SAFETY; always position self for a safe exit.
   - Inspect environment for bottles, drugs, letters, notes, or toxins.
   - Ask bystanders about recent behavioral changes.
2. **Assess patient's decisional capacity**
   - **C**onsciousness/arousal using GCS (see ITC for chart), attention span
   - **A**ctivity: restlessness, agitation (consolable or non-consolable), compulsions
   - **S**peech: rate, volume, articulation, content
   - **T**hinking/thought processes: delusions, flight of ideas, obsessions, phobias; thoughts of suicide/harm to others
   - **A**ffect and mood: appropriate or inappropriate
   - **M**emory: immediate, recent, remote
   - **O**rientation X 4, understands and complies with instructions
   - **P**erception: delusions, hallucinations (auditory, visual, tactile)
   - General appearance; odors on breath
   - Inspect for **Medic alert jewelry**; evidence of alcohol/drug abuse; trauma
   - Is patient a **threat to self or others, or unable to care/provide for self?**
   - Explore **suicidal thoughts/intentions** with patient directly. Bring any suicidal notes to hospital.
3. **IMC** special considerations:
   - Limit stimuli and the personnel treating the patient as much as possible.
   - Do not touch patient without telling them your intent in advance.
   - Provide emotional reassurance. Verbally attempt to calm and reorient the patient as able. Do not reinforce a patient's delusions or hallucinations.
   - Avoid threatening or advanced interventions unless necessary for patient safety.
   - Protect patient from harm to self or others. Do not leave the patient alone.
4. **If combative and/or uncooperative** (See possible medication Rx below):
   - Attempt verbal reassurance to calm pt. If unsuccessful: Provide chemical and/or physical **restraint** per procedure.
   - Use only to protect the patient and/or EMS personnel. They should not be unnecessarily harsh or punitive. Document reasons for use.
   - In an emergency, apply restraints; then confirm necessity with OLMC.
   - Ensure an adequate airway, ventilations, and peripheral perfusion distal to restraint after application. Monitor patient's respiratory and circulatory status.
5. **Consider medical etiologies** of behavioral disorder and treat according to appropriate SOP:
   - Hypoxia; substance abuse/overdose; alcohol intoxication
   - Neurologic disease: stroke, seizure, intracerebral bleed, Alzheimer's, etc.
   - Metabolic disorders: hypoglycemia (✓ glucose), acidosis, electrolyte imbalance, thyroid/liver/renal disease etc.
   - Evidence of traumatic injuries
6. **If patient is non-decisional and/or a threat to self or others and/or is unable to care for themselves**
   - Complete **Petition Form** for all adults who meet above criteria: Persons who witnessed statements or behaviors should sign the form.
   - Make every effort to gain the patient's consent for transport.
   - **Refusing transport: Call OLMC from the scene.** Pt must be transported against their will if necessary. Ask police for assistance with transport if needed.
6. **Severe anxiety** and SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg titrated to response. If IV unable/IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
8. **If excited delirium, violent, severe agitation: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM
   May repeat at ½ dose after 10 minutes up to Max dose of 4 mg/kg (500 mg).
   Do not give to patients with schizophrenia, psychosis, or bipolar mania.

STROKE

Time sensitive pt

Patient history	S&S: (Prehospital Stroke Screen) Acute onset…	**Differential:** Consider alternative causes of S&S
○ Age ○ Onset: Abrupt or gradual ○ **Time last known well** (seen normal for them) ○ Duration of acute S&S ○ **Medications (blood thinners)** ○ Heart/vascular disease ○ Intracranial or intraspinal surgery, serious head trauma or previous stroke/TIA ○ AV malformation, tumor or aneurysm ○ Active bleeding or acute trauma ○ A-fib/flutter, HTN; diabetes, smoking ○ High cholesterol, obesity ○ C/O new onset severe headache; stiff neck; seizure ○ Bleeding disorder: Sickle cell disease, hemophilia	**Mental status** ○ Level of consciousness; GCS ○ **Speech:** "You can't teach an old dog new tricks." Slurred? Uses wrong words? Mute? ○ Questions: Age, month (orientation) ○ Commands: Open/close eyes **Cranial nerves** ○ **Facial asymmetry/droop:** smile, show teeth ○ **Vision deficits:** loss of visual fields; diplopia ○ **Horizontal gaze abnormalities:** dysconjugate gaze, forced or crossed gaze ○ Other deficits: pupil changes; light sensitivity, deviated uvula; hoarse voice; vertigo/dizziness, sound sensitivity **Limbs** ○ **Unilateral weakness or paralysis (arm drift)** – Close eyes, hold both arms out for 10 sec. Assess if arm drifts down compared to other side or is flaccid. ○ **Leg drift:** Open eyes; lift each leg separately ○ **Sensory:** Arm/leg (close eyes; touch/pinch): note paresthesias, numbness ○ **Coordination –** arm/leg (finger-nose; heel-shin) Note loss of balance, coordination(ataxia), gait disturbance	See Altered Mental Status SOP ○ Hypoglycemia (esp. elderly) ○ Brain tumor ○ Cardiac disease; dysrhythmia ○ Drug OD ○ Encephalitis ○ ↓ Na ○ Infection/sepsis ○ Seizures, syncope ○ Trauma ○ Isolated nerve dysfunction (radial nerve palsy or Bell's palsy)

1. **IMC** special considerations:
   - Support ABCs as needed; O_2 if SpO_2 < 94% or O_2 sat unknown; avoid hypoxia and hyperoxia
   - Seizure/vomiting precautions; suction only as needed
   - Maintain head/neck in neutral alignment; do not use pillows. If SBP > 100: Elevate head of bed 10° - 15°
   - Monitor ECG; acquire 12L if possible
   - **IV not necessary at scene** unless hypoglycemia or need for DAI. Avoid multiple IV attempts/excess fluid loading.
   - If IV started, insert 18 g antecubital line to facilitate time to CT at hospital.
   - Repeat VS frequently & after each intervention. Anticipate hypertension & bradycardia due to ↑ ICP.
   - Do NOT Rx hypertension or give atropine for bradycardia if SBP > 90 (MAP > 65)
   - Provide comfort and reassurance; establish means of communicating with aphasic patients
   - Limit activity; do not allow pt to walk; protect limbs from injury
2. **If generalized tonic/clonic seizure activity**: Observe and record seizure activity per SOP p. 37
   MIDAZOLAM 2 mg increments **IVP/IO** q. 30-60 sec (0.2 mg/kg **IN**) **up to 10 mg** prn titrated to stop seizure.
   If IV unable and IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: May repeat prn to a total of 20 mg if SBP ≥ 90 (MAP≥ 65) unless contraindicated
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
3. **If AMS, seizure activity, or neurologic deficit**: Assess **blood glucose**
   - Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   - If < 70 or low reading: **DEXTROSE 10% / Glucagon** per Hypoglycemia SOP
4. Determine time **last known well** (last seen normal for patient) (not when pt. was discovered w/ S&S present)
5. Obtain and document history; stroke screen; and other physical exam findings as above
6. *Use thrombolytic checklist (short) per local policy/procedures*
7. Minimize scene time delays (< 10 minutes) - transport to the nearest PSC/CSC per decision tree next page
8. **Contact OLMC ASAP with Stroke Alert**:: Age; S&S: c/o sudden, severe HA; PMH (Meds – anticoagulants within past 48 hrs), PMH previous TIA/stroke, intracranial hemorrhage/aneurysm; time last known well (seen normal for them), stroke screen findings, blood glucose ; VS; Rx given.
9. ☎ **Obtain call back number** from reliable historian; provide to receiving staff if not accompanying pt. to hospital

NWC EMSS STROKE TRANSPORT ALGORITHM

EMS Stroke Screen: new onset
- Facial asymmetry/Droop
- Arm drift/Unilateral motor deficit
- Speech abnormal

Additional
- Ataxia (acute)
- Vision loss (acute)
- New onset gaze abnormality

→ **NO acute S&S stroke**
Treat per appropriate SOP

Is patient UNSTABLE?
After EMS intervention:
- Airway/Breathing/Gas exchange: persistent impairment
- Circulation: SBP <90 (MAP <65)

→ **YES**
Transport to **CLOSEST** hospital

Patient Stable: Last Known Well (normal for pt) Time

3.5 - 6 hours

YES – Stroke Center Destination
If ≤30 min scene to CSC → Comprehensive
If >30 min scene to CSC → Closest PSC

Less than 3.5 hours
or
Greater than 6 hours

- GCS 8 or less?
- Sudden, severe headache?
- Anticoagulant* use within 48 hrs?
- PMH Intracranial hemorrhage/ aneurysm?

NO
Closest STROKE center
(Primary **or** Comprehensive)

Consider alternate transport means (flight) per system policy.

* "Anticoagulants"	NOT considered an "anticoagulant" for this SOP
warfarin / Coumadin	Aspirin
apixaban / Eliquis	clopidogrel / Plavix
dabigatran / Pradaxa	dipyridamole / Aggrenox
edoxaban / Savaysa	prasugel / Effient
enoxaparin / Lovenox	ticagrelor / Brilinta
rivaroxaban / Xarelto	

List is not all inclusive, new drugs may be added.

CSC: Comprehensive stroke center
PSC: Primary stroke center
See p. 110 for designations

SEIZURES

History:

- History/frequency/type of seizures
- Prescribed meds and patient compliance; amount and time of last dose
- Recent or past head trauma; fall, predisposing illness/disease; recent fever, headache, or stiff neck
- History of ingestion/drug or alcohol abuse; time last used

Consider possible etiologies:

- Anoxia/hypoxia
- Cerebral palsy or other disabilities
- Eclampsia
- Stroke/cerebral hemorrhage
- Trauma/child abuse
- Anticonvulsant withdrawal/noncompliance
- Infection (fever, meningitis)
- Metabolic (glucose, electrolytes, acidosis)
- Toxins/intoxication; OD; DTs
- Tumor

Secondary assessment Observe and record the following

- Presence of an aura
- Focus of origin: one limb or whole body
- Simple or complex (conscious or loss of consciousness)
- Partial/generalized
- Progression and duration of seizure activity
- Eye deviation prior to or during seizure
- Abnormal behaviors (lip smacking)
- Incontinence or oral trauma
- Duration and degree of postictal coma, confusion

1. **IMC** special considerations:
   - No bite block. Vomiting/aspiration precautions; suction prn
   - Protect patient from injury; do not restrain during tonic/clonic movements
   - Position on side during postictal phase unless contraindicated
2. **If generalized tonic/clonic seizure activity**:

   MIDAZOLAM 2 mg increments **IVP/IO** q. 30-60 sec (0.2 mg/kg IN*)* **up to 10 mg IVP/IO/IN** titrated to stop seizure.
   If IV/IO unable/IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
3. **Identify and attempt to correct reversible precipitating causes** (see above)
   - Benzodiazepine administration takes precedence over bG determination in pts who are actively seizing
   - Obtain and record **blood glucose** level per System procedure (capillary and/or venous sample)
   - If < 70: **DEXTROSE** or **GLUCAGON** per Hypoglycemia SOP

SHOCK Differential / Hypovolemic - Septic

Time sensitive pt

Shock: Cellular hypoxia due to a sustained perfusion deficit leading to anaerobic metabolism; metabolic acidosis; and organ failure.

HYPOVOLEMIC SHOCK: Associated with internal or external bleeding/volume loss (ATLS)				
S&S progressive	**Compensated**		**Uncompensated (Progressive)**	
	I	**II**	**III**	**IV**
Blood loss	Up to 15% (750 mL)	15-30% (750-1500 mL)	30-40% (1500-2000 mL)	40-50% (>2000 mL)
Mental status	WNL-mild anxiety	Anxious, restless	Restless, confused, agitated	Confused, lethargic, comatose
Skin	Pale	Pale, diaphoretic	Pale, diaphoretic, cool	Pale, diaphoretic, cold
HR	WNL, slight increase	100-120	>120	(>140) Variable
		(unless elderly, paced rhythm, or on Ca/beta blockers/digitalis)		
RR	WNL	20-30	30-40	> 35
Pulse pressure	WNL	Narrowed	Narrowed	Narrowed (10 mmHg)
SBP	WNL	≥100	<100	< 70

1. **ITC special considerations:**
   - Use central sensor for SpO_2 (if available) if pt. has poor peripheral perfusion (cold hands)
   - **Trend serial $ETCO_2$** readings (if available); low levels (<31) suggest hyperventilation + poor perfusion to lungs and metabolic acidosis. Good correlation between $ETCO_2$ and venous lactate levels. See appendix
   - **Trend pulse pressures** (normal 30-50) and **mean arterial pressure** (MAP = DBP + 1/3 PP) (normal 70-110) Pt who are older, hypertensive, or with head injury cannot tolerate hypotension for even a short time.
   - **Vascular access & IVF** per ITC SOP or below with suspected sepsis or septic shock.
2. Assess and treat specific condition/injuries per appropriate SOP.

Etiology	Origin	BP	HR	Skin	Lungs	ETCO2	EMS Treatment
Cardiogenic	Pump failure	↓	↓ or ↑	Pale, cool, moist	Crackles or wheezes	↓ (hyperventilation, metabolic acidosis	Norepinephrine
Hypovolemic/ hemorrhagic	Volume loss	↓	↑	Pale, cool, moist	Clear	↓ (hyperventilation, metabolic acidosis	Hemostasis, IVF
Neurogenic	**Distributive:** Vessels dilate creating low peripheral resistance & maldistribution of blood	↓	↓	Flushed, warm, dry below injury	Clear	↑ w hypoventilation	IVF, atropine, norepinephrine
Septic			↑	Hot, dry, flushed/ pale, cold mottling	Crackles if pulmonary origin	↓ (hyperventilation, metabolic acidosis	IVF, norepinephrine
Anaphylactic			↑	Flushed/moist, hives, rash	May have wheezes, ↓, or no sounds	↑ w hypoventilation & ventilatory failure	IVF, epinephrine, diphenhydramine, albuterol, ipratropium

SEPSIS & SEPTIC shock: Life-threatening dysfunction due to suspected infection: lung, urinary tract, gut & skin (adults). Most frequent in those ≥65 or < 1 yr, or w/ weakened immune systems or chronic medical conditions (cancer, diabetes, kidney disease or catheter use)

Septic shock: Suspect if $ETCO_2$ < 25 (correlates to lactate reading ≥4 mM/L (↑ mortality) and **≥ 2 qSOFA** (Quick Sequential [Sepsis-related] Organ Failure Assessment) criteria: **AMS** (GCS <15); **RR ≥ 22**; **SBP ≤100**

3. Call OLMC with a **Sepsis alert**
4. **NS 200 mL IV boluses** in rapid succession (max 30 mL/kg) to SBP ≥90 (MAP ≥65; reassess after each bolus.
5. **If hypotension persists after 500 mL IVF**: (2^{nd} IV line while IVF continues in 1^{st})
   Adult: NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB), adjust upwards in 2 mcg/min (0.5 mL/min) increments prn (Max 20 mcg/min). Target SBP ≥ 90 (MAP ≥ 65). Retake BP q. 2 min until desired BP reached, then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)
   Peds: NOREPINEPHRINE 1 mcg/kg/min IVPB; increase in increments of 0.5 mcg/kg/min to a max dose of 2 mcg/kg/min titrated to SBP > 70 + (2X Age). Retake BP q. 2 min until desired BP reached, then every 5 min.
   Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA.

See also: Anaphylactic shock (p. 13) Cardiogenic shock (p. 22) Neurogenic shock (p. 50)
Obstructive shock: Cardiac tamponade & Tension pneumothorax (p. 45); massive Pulmonary Embolism: IMC

INITIAL TRAUMA CARE (ITC)

Management of significant trauma requires understanding of kinematics, an accurate assessment of the event, patient's complaints, interpretation of physical findings, & rate of change. Transport to appropriate definitive care.

SCENE SIZE UP: Situational awareness; dynamic risk assessment – Assess/intervene as needed:

- **Scene safety**: control and correct hazards/threats: (gas, powerlines, animals, people); form plan of approach; remove pt./responders from unsafe environment ASAP; attempt to preserve integrity of possible crime scene evidence
- Mechanism of injury **(MOI):** anticipate type/severity of injury
- **Universal blood/body secretion** & sharps precautions; use appropriate personal protective equipment prn
- Number of pts; triage/request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.
- Take essential supplies/equipment to pt.: hemorrhage control; airway & O_2 equipment; spine splinting devices; vascular access/IVF; pain mgt.

PRIMARY ASSESSMENT

1. **General impression:** ~Age, gender; wt.; general appearance, position / surroundings; obvious injuries/bleeding, purposeful movements
2. **Determine if immediate life threat exists** and resuscitate as found
3. **Level of consciousness:** AVPU or GCS; chief complaint S&S
4. Re-sequencing priorities if exsanguinating external hemorrhage: C-A-B-C-D-E: Hemorrhage control first.

   AIRWAY/SPINE: snoring, gurgling, stridor, silence. Consider possible spine injury
   - **Open/maintain** using position, suction, appropriate adjuncts, & manual spine precautions prn
   - Once airway controlled: Apply appropriate size c-collar + selective spine precautions if indicated
   - Vomiting/seizure precautions as indicated
5. **BREATHING/gas exchange/adequacy of ventilations: Assess/intervene as needed**
   - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
   - Air movement, symmetry of chest expansion; accessory muscle use; retractions; lung sounds if vent. distress
   - SpO_2 if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O_2 if able.
   - $ETCO_2$ number & waveform if possible ventilatory/perfusion/metabolic compromise

   Correct hypoxia/assure adequate ventilations: Target SpO_2: 94%-98% (92% COPD) unless hyperoxia contraindicated
   - **O_2 1-6 L/NC**: Adequate rate/depth; minimal distress; SpO_2 92%-94% (88%-91% COPD)
   - **O_2 12-15 L/NRM:** Adequate rate/depth: mod/severe distress; SpO_2 < 92%; (<88% COPD)
   - **O_2 15 L/ BVM:** Apnea and/or shallow/inadequate rate/depth with mod/severe distress; unstable
     Adults: 1 breath every 6 sec (10 breaths/minute) (Asthma: 6-8 BPM)
   - **CPAP:** Per appropriate SOP
   - If tension or open pneumothorax or flail chest → **Chest Trauma SOP**
7. **CIRCULATION/perfusion**:

   Compare radial/carotid pulses for presence, general rate, quality, regularity, & equality; assess skin color, temp, moisture
   - No carotid pulse : Determine if CPR indicated →**Traumatic Arrest SOP**; if yes, quality CPR (see p. 89)
   - Assess bleeding type, amount, source(s) and rate; **hemorrhage control**:
     - **Direct pressure**; pressure dressings to injury. If direct pressure ineffective or impractical:
     - Pack wound w/ topical **hemostatic gauze**/ apply direct pressure. Freq. ✓ for bleeding.
     - **Uncontrolled bleeding limb**: **Tourniquet** 2-3 cm proximal to wound; not over joint; tighten until bleeding stops/distal pulse occluded. If bleeding continues, place 2nd proximal to 1st. Should be visible/well marked (time applied), do not remove. Anticipate pain.
     - **Pelvic fx**: Wrap w/ sheet, pelvic binder, or secure pelvis in upside down KED
   - If suspected cardiac tamponade, blunt aortic or cardiac injury → **Chest Trauma SOP**
   - **Vascular access:** Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
     - **IV 0.9% NS** (warm if possible): Catheter size & infusion rate per pt. size, hemodynamic status; SOP or OLMC
       If in shock: 14-16 g. WO up to 1 L based on SBP (MAP); +/- radial pulse & coherent mental status.
       Do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome.
     - **Penetrating trauma** to torso: Target SBP 80 (MAP 50-60) (permissive hypotension)
     - **Blunt trauma**: Target SBP 90 (MAP 60-65); Trauma w/ **head inj.**: target SBP 110 (MAP>65) or higher
     - Do not delay transport in time-sensitive pts to establish elective vascular access on scene: Limit 2 attempts/route unless situation demands/OLMC order; may place peripheral line when moving; IO while stationary
     - **IO indications**: Critical pts needing urgent IVF/meds: burns, circulatory collapse; difficult/delayed/impossible venous access
     - May use **central venous access devices** already placed based on OLMC
   - Monitor **ECG** if actual or potential cardiorespiratory compromise
7. **Disability**: Rapid neuro exam: GCS; pupils; ability to move all four extremities (S&S ↑ICP or herniation)
   If AMS: ✓blood glucose. If < 70: Treat per Hypoglycemia SOP.
8. **Pain mgt** if SBP ≥ 90 (MAP≥ 65): **FENTANYL** standard dose per IMC
   Nausea: **ONDANSETRON** standard dose per IMC
9. **E**xpose/**e**nvironment: Undress to assess as appropriate. Keep patient warm. **CONTINUED**

TRANSPORT DECISION

- Consider need for trauma surgeon scene response per Region IX policy & local procedure; start early notifications
- **Transport to nearest appropriate hospital per Region triage criteria** (p. 41) or OLMC orders
- Scene use of helicopter or alternate transport means based on local System Policy/Procedure

ITC: Secondary Assessment: Cont. spine precautions if indicated; may complete enroute if pt. critical

1. Obtain full set of VS: BP (MAP if able) – 1st BP manually; subsequent automated OK; trend pulse pressures; Pulse: rate, quality, rhythmicity Respirations: rate, pattern, depth Temp if indicated
   SAMPLE history: OPQRST chief complaint / pain use approp pain scale consistent with pt's age, condition, and ability to understand
   Allergies (meds, environment, foods), **Medications** (prescription/over-the-counter – bring containers to hospital if possible
   PMH (medic-alert jewelry; medical devices/implants); **Last oral intake**/LMP; **Events** leading to injury
2. **Review of Systems:** **D**eformities, **c**ontusions, **a**brasions, **p**unctures/penetrations, **b**urns, **l**acerations, **s**welling, **t**enderness**, i**nstability, **c**repitus, and distal **p**ulses, **m**otor/**s**ensory deficits **+ the following** based on chief complaint; S&S; scope of practice, and pt. level of acuity
   - **HEAD, FACE, EYES, EARS, NOSE, MOUTH:** Drainage; pupils: size, shape, equality, and reactivity; conjugate eye movements; gaze palsies; visual acuity; eye level (symmetry), open & close jaw; malocclusion.
   - **NECK:** Carotid pulses, jugular veins, sub-q emphysema, c- spines; may temporarily remove anterior c-collar to assess neck
   - **CHEST:** Auscultate lung/heart sounds
   - **ABDOMEN**: S&S of injury/peritonitis by quadrant: contour, visible pulsations, pain referral sites, localized tenderness, guarding, rigidity; evidence of rebound tenderness
   - **PELVIS/GU:** Inspect perineum for blood at urinary meatus/rectum
   - **EXTREMITIES:** Inspect for position, false motion, skin color, and signs of injury
   - **BACK/flank:** Note any muscle spasms
   - **Neuro:** Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
   - **SKIN/SOFT TISSUE:** Color (variation), moisture; temp, lesions/wounds; sub-q emphysema
3. **Ongoing assessment**: Reassess VS and pt. responses to interventions. Every transported pt. should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
   Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings
4. **Report** pertinent positive/negative signs as able; any major changes from primary assessment
5. **Document** Revised Trauma Score parameters on ePCR/EHR
6. EMS "time-out" to allow for an uninterrupted **handover report** after hospital arrival to ensure continuity of care especially if complete written/electronic ePCRs/EHRs are not left/downloaded at time of pt handoff (ACS, 2014).

ADULT GLASGOW COMA SCORE (3-15)	**EYE OPENING**	Spontaneous	4		**Total GCS**
		To voice	3		
		To pain	2		
		None	1		
	VERBAL RESPONSE	Oriented & converses	5		***GCS Conversion pts for RTS**
		Confused speech	4		GCS 13-15 4
		Inappropriate words	3		GCS 9-12 3
		Incomprehensible sounds	2		GCS 6-8 2
		None	1		GCS 4-5 1
	MOTOR RESPONSE	Obeys commands	6		GCS 3 0
		Localizes pain	5		
		Withdraws to pain	4		
		Abnormal flexion	3		
		Abnormal extension	2		
		None	1		
ADULT REVISED TRAUMA SCORE (0-12)	***Glasgow Coma Score Conversion Points**				
	Respiratory Rate	10-29	4		
		30 or above	3		
		6-9	2		
		1-5	1		
		0	0		
	Systolic BP	90 or above	4		**Total RTS**
		76-89	3		
		50-75	2		
		1-49	1		
		0	0		

Trauma Triage / Transport Criteria (adult & peds)

Trauma pts should be taken directly to the TC most appropriately equipped and staffed to handle their injuries, as defined by the Region's trauma system (below). EMS should bypass facilities not designated as appropriate destinations, even if those facilities are closest to the incident (ACS-COT, 2014). See appendix for listing of all TCs in Regions 8, 9, & 10.

If local agency concerns oppose using these triage & transport criteria, EMS personnel should contact OLMC for orders.

Meets Level I criteria & is >30 min from a Level I: may go to closest Level II for stabilization
Meets Level I or II criteria & is >30 min from a TC: may go to closest non-TC for stabilization or assess need for helicopter.

***Hemodynamic instability:** Sustained hypotension [SBP < 90 (adults) / <70 (peds)] on 2 consecutive measurements, 5 min apart. Attempt to keep scene time ≤10 minutes for time-sensitive patients; document reasons for delay

Step 1 **Physiologic criteria**	**Time sensitive pt**	**Level I** **Trauma Center**	**Nearest Trauma Center** **Level I or II**	**Nearest hospital** Trauma or non-trauma center
				Traumatic arrest
Glasgow Coma Score	13 or less (assoc. w/ head trauma)		14 - 15	14 - 15
***Systolic BP**	*< 90 (adults) / <70 (peds)		≥90 (adults) / ≥70 (peds)	
Respiratory rate	< 10 or > 29 (<20 infant) or need for ventilatory support		10 – 29 (≥ 20 infant)	
Step 2: Anatomic Criteria				
Head/neck trauma	**All penetrating skull/eyes/neck** Open or depressed skull fx			
	Blunt: GCS 13 or less		Blunt: GCS 14-15	Blunt: GCS 14-15
Spinal cord injury	Paralysis All penetrating SCI		Suspected isolated SCI; hemodynamically stable	
Chest/back	**All penetrating** (superficial or deep) Tension pneumothorax Chest wall instability or deformity (flail chest)		Blunt & hemodynamically stable	
Abdomen/Groin/Pelvis	**All penetrating** (superficial or deep) Blunt w/ *hemodynamic instability		Blunt & hemodynamically stable	
Extremities/Vascular	2 or more proximal long bone Fx; unstable Penetrating proximal to elbow or knee Crushed, degloved, mangled, pulseless limb Amputation proximal to wrist or ankle:		2 or more proximal long bone Fx - stable Amputation distal to wrist or ankle Penetrating injury distal to elbow/knee	Single long bone injury and hemodynamically stable

Step 3: NO physiologic or anatomic criteria above**,** but **MOI** below **,** transport to **closest trauma center** Level I or II

Falls: Adult ≥ 20 ft (one story = 10 ft) Children <15 years: >10 ft or 2-3 times their height

High risk auto crash
- Intrusion (including roof) > 12 inches at occupant site or > 18" any site
- Ejected (partial or complete) from automobile
- Death in same passenger compartment
- Vehicle telemetry data consistent with high risk of injury

Auto v. pedestrian/bicyclist thrown, run over, or with significant (> 20 mph) impact
Elderly pedestrians struck by MV have more than double mortality rate (16.6% v. 7.4%)

Motorcycle crash > 20 mph

Step 4: Special pt. populations: NO physiologic/anatomic criteria above; consider transport to closest trauma or specialty center

Age: Caveats in elderly: Risk of injury & death increases > age 55
- SBP <110 might represent shock after age 65
- Low-impact MOI (ground-level falls) might result in severe injury

Children age < 15 yrs who meet criteria of steps 1 through 3 above should be triaged preferentially to pediatric-capable trauma centers if one is available.

Anticoagulation and bleeding disorders: Pts with head injury are at high risk for rapid deterioration

Burns: (Severe) Without trauma MOI: consider transport directly to burn center (OLMC); all mod-severe w/ trauma MOI go to nearest TC

Pregnancy: Fetal gestational age **≥ 20 weeks** (fundus level with navel or above) even if they lack criteria of Steps 1 thru 3 above.

EMS provider judgment (injury from large animal)

DHHS & CDC. (2012). Guidelines for field triage of injured patients, recommendations of the National Expert Panel on Field Triage, MMWR 61(RR-1), 1-20 Available at: www.facs.org/quality-programs/trauma/vrc/resources .

CARDIAC ARREST due to TRAUMA

Penetrating: Time sensitive pt

Definition: Trauma patient found unresponsive, apneic or gasping and pulseless who does not meet criteria for Triple Zero or non-initiation of CPR policies

1. **ITC** special considerations:
   - Scene size up; ensure EMS and patient safety; CPR and cardiac arrest management per appropriate SOP.
   - Primary assessment to find possible reversible cause(s) of arrest, e.g., hypoxia, hypovolemia, decreased cardiac output secondary to tension pneumothorax, pericardial tamponade, or hypothermia.
   - If multi-system trauma or trauma to head and neck: Selective spine motion restriction; BLS airway maneuvers
   - Stop visible hemorrhage with direct pressure and appropriate dressings
   - ALS: If advanced airway is impossible and ventilation inadequate – consider cricothyrotomy per local policy/procedures
   - Unilateral decrease in lung sounds during PPV: suspect pneumothorax, hemothorax, or ruptured diaphragm
     - Unilateral absence of lung sounds – **pleural decompression** affected side
     - Bilateral absence of lung sounds – pleural decompression both sides
   - **Vascular access:** 14/16 gauge IV or IO. **Do not delay transport attempting to start IV on scene.**
     If volume losses appear to be significant: Consecutive 200 mL fluid challenges up to 1 L NS
     Cardiac arrest survival is unlikely if uncorrected severe hypovolemia exists.
   - Penetrating trauma is time sensitive and should be transported to nearest hospital ASAP with CPR in progress.
   - Patients with blunt trauma found in cardiac arrest with a transport time to an ED of >30 minutes after the arrest is identified may be considered nonsalvageable, and termination of resuscitation should be considered.
2. **Complete ITC ENROUTE** as time and number of EMS personnel permits:
3. Victims of submersion, lightning strike and hypothermia deserve special consideration as they may have an altered prognosis. See appropriate SOP.

Conducted electrical weapon: Post-TASER Care

1. Scene size up: confer with police; determine pt's condition before, during & after taser discharge
2. **ITC** special considerations
   - 12 L ECG If pt has S&S that could be cardiac in nature, is elderly, or has hx of CVD or drug use
   - VS; Assess for hyperthermia; volume depletion; tachycardia (hypersympathetic state); metabolic acidosis
   - IV NS to correct volume depletion if present
   - SAMPLE Hx: Date of last tetanus prophylaxis; cardiac hx; ingestion of mind altering stimulants (PCP, cocaine)
   - Rapid secondary assessment: Tased individuals can have injury or illness that occurs before taser event and/or injury when they are tased and fall
   - Assess for excited delirium: agitation, excitability, paranoia, aggression; great strength; numbness to pain; violent behavior. Apply/maintain restraints if needed
3. **Severe anxiety** and SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** 2 mg increments slow IVP q. 2 min (0.2 mg/kg IN) up to 10 mg titrated to response. If IV unable/IN contraindicated: **IM** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If hypovolemic, elderly, debilitated, chronic dx (HF/COPD); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.
4. **If excited delirium, violent, severe agitation: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM
   May repeat at ½ dose after 10 minutes up to Max dose of 4 mg/kg (500 mg).
   Use w/ caution in patients with schizophrenia, psychosis, or bipolar mania
5. Identify location of and **care for PROBES per local procedure**
   - If probe becomes disengaged: Handle as a sharp; check with local law enforcement to see if they require that probes be kept as evidence; if no place directly in a designated sharps container
   - Cleanse puncture sites and bandage as appropriate
6. Transport for further evaluation

If pt. is decisional and refuses treatment and/or transport, advise to seek medical attention immediately if they experience any abnormal S or S.
If patient has not had tetanus immunization in the last 10 yrs, advise to acquire it
Provide disclosure of risk and obtain signature on refusal form. Contact OLMC from point of patient contact.

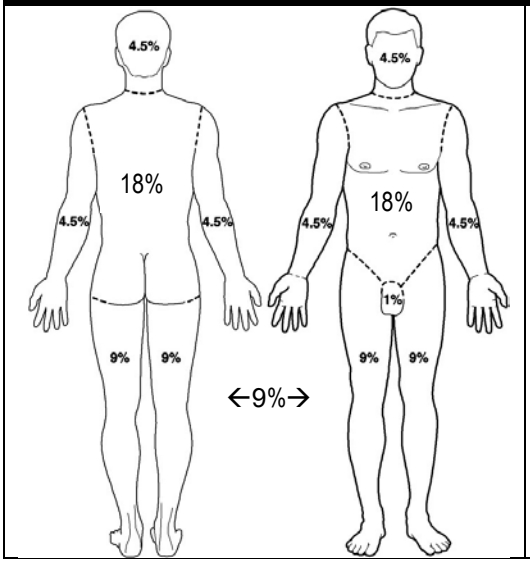
BURNS (Adult & Peds)

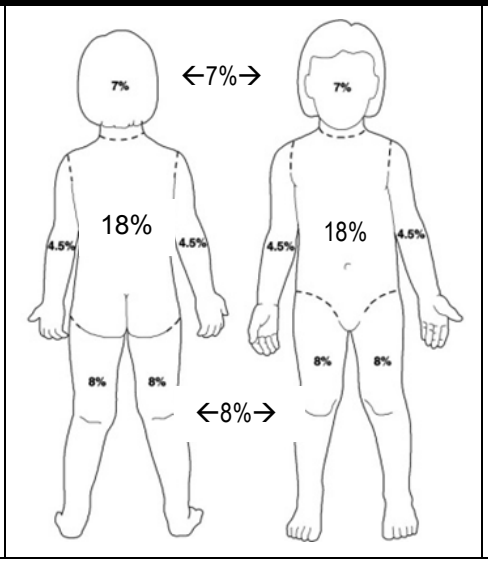
Emergent to Critical: time sensitive

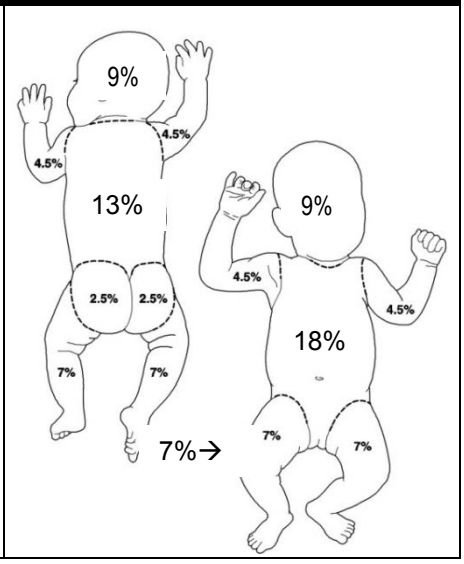
1. **ITC** special considerations: (Scene/responder safety top priority)
   - Stop burning process/further injury: Remove pt. from source. Cool per thermal wound care next page.
   - Remove clothing, constricting jewelry; belts, suspenders, steel toed shoes (retain heat)
     Do not pull away clothing stuck to skin (cut around).
   - Keep burn as clean as possible; wear gloves/mask until burns covered
   - Quantify oxygenation (SpO_2), ventilation, perfusion, shock ($ETCO_2$ if available)
   - **Airway: compromise, hoarseness, wheezing?** Access may be difficult w/ burns of face or anterior neck.
     HOB elevated to decrease airway edema. Assess need for DAI**:** Early intubation (largest ETT possible) may be indicated for pts with severe airway impairment/respiratory distress; secure w/ ties around head; don't apply tape to facial burns.
     If circumferential torso burn, monitor chest expansion closely.
   - **Indications for IV/IO** - % TBSA**:** Adults > 20%; Children >15%; shock; need for IV meds
     - May start through burned skin if needed; infuse warm fluid.
     - If not in shock: Initial NS IVF: ≤5 yrs: 125 mL/hr 6-13 yrs: 250 mL/hr ≥14 yrs: 500 mL/hr
       If in shock IVF per ITC. Hospital will continue IVF based on burn formula. 2-4 mL X kg XTBSA; ½ in first 8 hrs
       Document total amount of IV fluid infused by EMS; report to receiving facility
   - **Mental status**: If AMS consider hypoxia, shock, head trauma, toxic inhalation, alcohol/drug impairment, hypoglycemia. Obtain/document glucose level – treat hypoglycemia per SOP.
   - **Pain:** Document severity**; FENTANYL; Nausea**: **ONDANSETRON prn**
   - **Assess depth**: Pain, swelling, skin color, capillary refill, moisture, blisters, hair loss, appearance of wound edges, foreign bodies, debris, contaminants, bleeding/soft tissue trauma. Note as superficial, partial, or *full thickness
   - **Calculate % TBSA** using Rule of 9s or Rule of Palms (palm + fingers; use for irregularly shaped burns up to 10%). Accurate % may be difficult to determine; include only partial & full thickness in calculation for IVF as superficial burns do not contribute to fluid shifts & do not require IVF resuscitation.

     Obese pts: Trunk may be up to 50% of TBSA, each leg up to 20%. Head & arms smaller % than by Rule 9s.
   - **History**: Allergies: Sulfa?; Meds: those w/ implications for wound healing: steroids
     PMH co-morbid factors (preexisting illness, meds, Hx of drug/alcohol use)
     Events: type of exposure; burning agent; time of exposure; duration of contact; temp of exposure; any LOC?; history of enclosed space fire; consider possible abuse
   - **VS**: Assess on unburned skin if possible; edema may obscure pulse; use alternate sites; ID how quickly condition is changing
   - **Assess for multi-system trauma**; treat associated injuries. Circumferential burns to torso/limbs dangerous due to potential vascular and ventilatory compromise; careful ongoing assessments of distal perfusion.
     Transport per Trauma Triage Guidelines

Rule of Nines







***Full thickness S&S:** White, pale, brown, waxy, leathery, or charred; dry (sweat glands destroyed); no capillary refill; NO pain in area of FT damage (sensory nerves destroyed) hair sloughs (hair follicle destroyed); thrombosed vessels may be seen through the translucent skin surface; coagulated dead skin forms a tough, leathery eschar.

THERMAL

2. **WOUND CARE per System protocol**
   - **COOL** PT burns <10% or FT burns < 2% with water or NS for 10 min; do not apply ice
   - **Minimize contamination:** Cover burns with plastic wrap to ↓ air movement over burn; ↓pain; reduce fluid loss; & prevent hypothermia and prevent contamination; apply dry sterile dressings or other agents per System policy. Smaller burns < 5% or eyelids may have moist dressings.
   - Do not break blisters, debride skin, or apply topical ointments, creams, or anti-microbials in the field
   - Wrap digits individually or place gauze between burned skin areas
3. Prone to hypothermia: Keep warm - Anticipate shivering and temp loss in burns > 20% TBSA.
   Open burn sheet on stretcher before placing pt. Cover pt. with clean dry sheet and blanket; place in warm environment ASAP

INHALATION

2. Assess for stridor, wheezing, carbonaceous (black) sputum, cough, hoarseness, singed nasal or facial hair, dyspnea, burns, edema or inflammatory changes in oral pharynx/upper airway
3. Assess need for DAI; O_2 15 L/NRM or BVM; monitor ECG
4. Consider presence of CO and/or cyanide poisoning and treat per appropriate SOP (SpO_2 unreliable)

ELECTRICAL / LIGHTNING: Deep tissue damage may be more extensive than surface burns

2. Ensure scene safety: do not contact pt until certain electrical source has been disabled/disconnected
3. Assess cardiorespiratory status. If unresponsive, apneic and pulseless: Begin CPR and resuscitation per SOP
   Monitor ECG (12 L if available); treat dysrhythmias and/or tonic clonic seizures per appropriate SOP
   Anticipate respiratory arrest/paralysis of respiratory muscles if pulse is present; assist ventilations prn
   IVF: 2-4 mL X kg X %TBSA burned = ½ in 1st 8 hrs
4. Attempt to locate contact points (entry and exit wounds). Describe appearance of wounds (often full thickness); No cooling needed unless an associated thermal burn; Apply dry, sterile dressings.
5. Assess for potential associated trauma from being thrown from contact point; note neurovascular function all limbs. Assess for potential compartment syndrome; selective spine motion restriction per SCI SOP
6. **Event hx**: Identify nature of the electrical source (AC vs DC), voltage, amperage and duration of exposure if known; position of pt. in relation to electrical source; downtime in cardiac arrest

CHEMICAL: PMH: Type of chemical, concentration; time, duration of exposure; how exposure occurred; body parts exposed/affected; first aid measures instituted.

2. Avoid self-injury; haz-mat precautions; decon per procedure; remove contaminated clothing.
3. Flush/irrigate burn/eyes as soon as possible with the cleanest, readily available water or NS unless contraindicated, i.e., sulfuric acid, sodium metals, dry chemicals (especially alkalines) using copious amounts of fluid.
   If powdered/dry agent, brush away excess before irrigating.
4. **Hydrofluoric acid** skin burn: Apply **CALCIUM GLUCONATE** 2.5% gel to the burn site (if available). Monitor ECG.
5. Bring in SDS (Safety data sheets) if possible; early notice to receiving hospital if decontamination is needed

BURN CENTER REFERRAL CRITERIA (Adult & Peds)

- Partial-thickness burns >10% TBSA
- Full thickness burns in any age group
- Burns involving face, hands, feet, genitalia, perineum, or major joints
- Electrical burns (lightning injury); Chemical burns; Inhalation injury
- Burn injury in pts with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality
- Burns and concomitant trauma (fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases. If the trauma poses the greater immediate risk, the pt's condition may be stabilized initially in a trauma center before transfer to a burn center. Physician judgment will be necessary in such situations and should be in concert with the regional OLMC plan and triage protocols.
- Burned children in hospitals w/o qualified personnel or equipment to care for them.
- Burn injury in pts who will require special social, emotional, or rehabilitative intervention.

ACS Comm on Trauma (2014). Resources for Optimal Care of the Injured Patient (Ch. 14, p. 101).

Burn Centers: Loyola University Medical Center (Maywood), State Burn Coordinating center; Stroger/Cook County Hospital (Chicago); U of Chicago Hospital (Chicago); OSF St. Anthony Med Center (Rockford); Memorial Medical Center (Springfield) See IDPH Burn Surge Annex.

CHEST TRAUMA

Time sensitive pt

1. **ITC: high index of suspicion for "deadly dozen":** airway obstruction, tension pneumothorax, open pneumothorax, flail chest, pulmonary contusion, massive hemothorax, cardiac tamponade, blunt cardiac injury, thoracic aortic injury, tracheal or bronchial tree injury, diaphragmatic tears, blast injuries
   Level I trauma center if transport time 30 minutes or less:
   - All penetrating chest trauma or blunt trauma with hemodynamic instability
   - Tension pneumothorax; chest wall instability or deformity (flail chest)

   Nearest Level I or II trauma center: Blunt chest trauma & hemodynamically stable

TENSION PNEUMOTHORAX

Extreme dyspnea, unilateral absence of lung sounds, SBP < 90 (MAP < 65); JVD, resistance to BVM ventilations, ↑ airway resistance, subcutaneous emphysema

2. **Needle pleural decompression** on affected side while on scene (takes priority over airway).
   Frequently reassess catheter patency. May need to repeat procedure with additional needle.
3. Continue ITC enroute; implement other protocols as required.
4. Monitor for PEA: Treat per SOP.

OPEN PNEUMOTHORAX (Sucking chest wound)

2. Convert open pneumothorax to closed by applying an occlusive (vented) dressing
   - Ask cooperative patient to maximally exhale or cough
     Wound covering options: gloved hand, followed by vented commercial device (preferred); Vaseline gauze, defib pad
     If Vaseline gauze used, may tape on 3 sides to vent
   - Monitor VS, ventilatory/circulatory status, jugular veins after application of occlusive dressing
     If S&S tension pneumothorax after closing wound: Temporarily lift side of dressing to allow air release; recover wound; assess need for needle pleural decompression if no improvement following removal of dressing
3. If impaled object: Do not remove; continue ITC enroute; implement other protocols as required

FLAIL CHEST (+/- paradoxical chest movement; anticipate pulmonary contusion – SpO_2 < 90%)

2. If ventilatory distress; adequate ventilatory effort; no S&S pneumothorax: consider early trial of C-PAP
   PEEP 5-10 cm to achieve SpO_2 of at least 94%
   If SBP falls < 90: titrate PEEP downward to 5 cm; D/C CPAP if hypotension persists
3. If ventilatory failure or persistent hypoxia despite above: intubate (DAI) & ventilate w/ 15L O_2/BVM at 10 BPM
4. Monitor for tension pneumothorax; prepare to perform needle pleural decompression
5. Assess need for pain management per ITC; titrate carefully to preserve ventilations/BP

Note: If patient suffers a cardiac arrest: an impedance threshold device (ResQPod) is contraindicated.

PERICARDIAL TAMPONADE

SBP < 90 (narrowed pulse pressure) (MAP < 65); JVD; muffled heart tones. Lung sounds are usually present bilaterally.

2. Permissive hypotension **NS IV WO** while enroute **just to achieve SBP 80** (MAP 50-60). Additional IVF per OLMC.
3. Monitor for PEA: Treat per Traumatic Arrest SOP

BLUNT Aortic and CARDIOVASCULAR INJURY

Pathology ranges from clinically silent, transient dysrhythmias to deadly injuries including but not limited to, cardiac wall rupture, cardiac contusion, septal and valvular injury, injury to thoracic aorta, myocardial infarction/dysfunction; & lethal dysrhythmias.

Aorta: May have no external S&S of chest trauma. Suspect with rapid deceleration; assess for chest pain, intrascapular pain, difficulty breathing or swallowing; upper extremity HTN, bilateral femoral pulse deficit

Blunt cardiac injury: Chest wall bruising, sternal, clavicular or rib fx; S&S cardiogenic shock; ECG/12 L abnormal if unexplained ST, ventricular **arrhythmia**, atrial arrhythmia (multi-formed PACs or new AF/flutter; right BBB, new onset Q waves/St-T wave abnormality)

2. NS titrated just to achieve SBP 90 (MAP 65)
3. Monitor for pericardial tamponade

EYE Emergencies

General approach:

1. **ITC** special considerations:
   - Quickly obtain gross visual acuity in each eye: light perception/motion/read name badge
   - Assess pain on scale of 0-10
   - Assess cornea, conjunctiva, sclera for injury, tearing, foreign body, spasm of lids
   - Discourage patient from sneezing, coughing, straining, or bending at waist; vomiting precautions (ondansetron)
   - Remove and secure contact lenses for transport with patient
2. Severe pain unrelieved by Tetracaine or Tetracaine contraindicated. **FENTANYL**

CHEMICAL SPLASH / BURN: TRUE EMERGENCY

Time sensitive pt

Chemicals may be acid, alkali, irritant, detergent, or radioactive in nature and may be in the form of vapor, dust, particles or liquid. Irritants and detergents may not produce burns, but can damage eyes by inflammation or drawing water into the tissues.

3. **TETRACAINE 0.5% 1 gtt. each affected eye**. Repeat prn.
4. Irrigate affected eye(s) using copious amounts (min. 500 mL) of NS or any other non-toxic liquid immediately available. Do not contaminate the uninjured eye during irrigation. Continue irrigation while enroute to the hospital.

CORNEAL ABRASIONS: Observe for profuse tearing, severe pain, redness, spasm of eye lid

3. No signs of penetrating injury: **TETRACAINE 0.5% 1 gtt. each affected eye**. Repeat prn.
4. Elevate head of stretcher 45˚.

PENETRATING INJURY/RUPTURED GLOBE

S&S: Peaked pupil, excessive edema of conjunctiva (chemosis), subconjunctival hemorrhage, blood in anterior chamber (hyphema), defect on sclera or cornea (vitreous humor or black defect), foreign body/impaled object

3. **DO NOT** remove impaled objects, irrigate eye, instill tetracaine, or apply any pressure to eye.
4. Cover with **protective shield or paper cup;** do not patch eye directly or pad under metal shield.
5. Elevate head of stretcher 45˚.

FACIAL Trauma (nose, ears, midface, mandible, dentition)

1. **ITC** special considerations:
   - Assess need for selective spine precautions; PMH for **blood thinners;** control exterior bleeding.
   - Clear oral cavity of F/B and gross debris. Allow pt. to assume position that allows for patent airway (sitting or side lying so blood/secretions drain from nose & mouth); avoid aspiration/swallowing blood; suction prn; no nasal airways; O_2 to $SpO_2 \geq 94\%$ unless contraindicated
   - Control epistaxis (squeeze nostrils 10-15 min); do not pack nose if rhinorrhea. Collect blood on rolled 4X4 under nose. Do not let patient blow their nose.
   - Assess for stable midface, mandible, dentition; tissue/dental avulsions: collect/preserve tissue per Musculoskeletal SOP (if possible)
   - Vomiting/aspiration precautions: **ONDANSETRON**
   - IV access for IVF, pain meds, or ondansetron (more likely)
   - Apply cold packs over injury site; severe pain: **FENTANYL**
2. **Avulsed tooth**: Avoid touching root, pick up by crown; do not wipe off, if dirty rinse under cold water for 10 sec. Place in milk, saline or commercial tooth preservative solution. Unrecovered teeth may be aspirated. If GCS 15, may hold tooth in mouth for transport.
3. **Mandible fx**: Cannot open/close jaw, spit/swallow effectively; malocclusion/sublingual hematoma: no chin lift; aspiration risk
4. **Maxillary fx** (LeFort fx): Anticipate nasal bone/anterior basilar skull fx;

HEAD TRAUMA / Traumatic Brain Injury

GCS 13 or less time sensitive

Level I TC: GCS: 13 or less associated w/ head trauma; penetrating head or neck trauma; open or depressed skull fx
Nearest TC: GCS 14-15; blunt head injury; hemodynamically stable

1. **ITC** special considerations:
   - Selective spine precautions if indicated
   - Mod to severe injury: Continuous SpO_2 monitoring; prevent/correct hypoxia ASAP; ensure adequate ventilations
     DO NOT OVERVENTILATE: Assist/ventilate at 10 BPM prn; maintain $ETCO_2$ at 35-40 (if available)
     Do not intubate unless unable to ventilate and oxygenate using position, BLS or alternate advanced airways
   - Vomiting precautions. **ONDANSETRON** prn; limit suction to 10 sec; oxygenate before & after procedure
   - **Scalp wounds**: No unstable fracture: direct pressure, dressings; Unstable fx: hemostatic dressings, avoid direct pressure
   - **12-lead ECG** if dysrhythmia present: PACs, SB, SVT, PVCs, VT, Torsades, & VF.
     SAH. Pathological Q waves, ST elevation or depression; prolonged QTc, wide, large & deeply inverted (neurogenic or cerebral) T waves; prominent U waves > 1 mm amplitude common causing incorrect suspicion of myocardial ischemia.
   - Attempt to maintain cerebral perfusion pressure (CPP): **Avoid/correct all hypotension ASAP**
     If GCS ≤8: Keep head of bed flat; no permissive hypotension in multi-system trauma w/ TBI
     NS IVF boluses (200 mL increments up to 1 L); target **SBP 110-120** (MAP 85-90) or higher
   - If **generalized tonic clonic seizure activity** present**: MIDAZOLAM** standard dose for seizures
   - **AMS**: ✓ **blood glucose level;** If < 70: treat per Hypoglycemia SOP
2. **Neuro exam - Establish patient reliability**
   - Patient must appear calm, cooperative, alert, and perform cognitive functions appropriately with NO AMS, acute stress reaction, brain injury, chemical impairment causing altered decisional capacity, distracting painful injuries, and language or communication barriers.
   - Rapid neuro exam for evidence suggesting traumatic brain injury
   - Reassess at least q. 15 minutes; more frequently as able:
     - Mental status [arousal, orientation, memory (amnesia), affect, behavior, cognition]; GCS
       Early S&S deterioration: confusion, agitation, drowsiness, vomiting, severe headache
     - Pupil size, shape, equality, reactivity; gaze palsy; visual changes/disturbances; light sensitivity, hearing deficits
     - BP (MAP); pulse pressure; HR; respiratory rate/pattern/depth; SpO_2, $ETCO_2$ if available
     - Pain (headache), dizziness, motor/sensory integrity/deficits; coordination & balance
3. If nonresponsive to verbal efforts to calm them or uncooperative in remaining still:
   - Restrain as necessary per system policy. Document reasons for use.
   - **Sedation**: If SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** standard dose for anxiety.

↑ **INTRACRANIAL PRESSURE** (CRITICAL): AMS/GCS drops by 2 or more points < 8; ↑ SBP (widened pulse pressure); bradycardia; resp varies (often decreased/abn pattern); worsening HA, vomiting, and/or abnormal motor/sensory exams; gaze palsies, oval pupil w/ hippus (pupils jiggle when light reflex checked); dilated, nonreactive pupils (unilaterally or bilaterally)

ITC special considerations:

- Maintain supine position with head in axial alignment
- Assess SpO_2; O_2 12-15 L/NRM or BVM at 10 BPM. Monitor capnography (if available).
- Assess for signs of **brain shift**: Coma; dilated, nonreactive pupil(s); motor deficit; GCS drops by 2 or more points (<8)
  If present: Seek OLMC order for **limited hyperventilation: Adult: 17-20 BPM** (must be guided by $ETCO_2$ 30-35)
- NO atropine if bradycardic and SBP ≥ 90 (MAP≥ 65)

BASILAR SKULL FRACTURE (CRITICAL)

Anterior fossa: Telecanthus (wide eyes), periorbital bruising (later), CSF rhinorrhea; loss of sense of smell
Middle fossa: hearing deficit, facial droop, CSF otorrhea, or "Battle sign" (later)

- Do **NOT** place anything into the nose if possible anterior fracture; do not let patient blow their nose
- CSF rhinorrhea or otorrhea: Apply 4X4 to collect drainage; do not attempt to stop drainage

MUSCULO-SKELETAL Trauma

1. **ITC** special considerations:
   - Assess pain, paralysis/paresis, paresthesias, pulses, pressure & pallor before & after splinting. Evaluate for obvious deformity, shortening, rotation, or instability.
   - **Analgesia before moving/splinting:** Hemodynamically stable, isolated MS trauma, no contraindications (drug allergy, AMS):
     - **Pain: FENTANYL** standard dose
     - Severe **muscle spasm**: Analgesia as above plus **MIDAZOLAM** (standard dose for anxiety)
   - **Patients meeting TC I or II criteria: On scene care** restricted to hemorrhage control, airway access, selective spine precautions if needed, & O_2 delivery. Attempt all other interventions enroute.
2. Gently attempt to align long-bone fx unless open; resistance to movement; extreme pain, or involves a joint
3. **Immobilize/splint** per procedure; If pulses lost after applying a traction splint: Do not release traction. Notify OLMC.
4. Acute injury: Apply **cold pack** over injury site and **elevate** extremity after splinting unless contraindicated.

AMPUTATION / DEGLOVING INJURIES:

Life-saving procedures always take priority over management of severed part. If infield amputation needed call OLMC. Transport amputations above the wrist or ankle to a replantation center if ground transport times are 30 minutes or less.

5. **Amputation incomplete or uncontrolled bleeding**: Hemorrhage control per ITC; splint as necessary.
6. **Care of amputated parts:**
   - Attempt to locate all severed parts. Gently remove gross debris but do not remove any tissue; do not irrigate.
   - Wrap in saline-moistened (not wet) gauze, towel, or sheet. Do NOT immerse directly in water or saline.
   - Place in water-proof container and seal. Surround w/ cold packs or place in second container filled w/ ice/cold water. Avoid overcooling or freezing the tissue. Note time cooling of part began.

CRUSH SYNDROME (CRITICAL)

Compression of a muscle mass (w/ distal pulses present) 4 hours or more (2 hours w/ hypothermia)

5. **ITC** special considerations:
   - Obtain baseline ECG before release if possible; continue ECG monitoring after release.
   - Start IV NS TKO prior to compression release. Run wide open after release. Give 200 mL IVF challenges in elderly – monitor for fluid overload.
   - **Assess for hyperkalemia** w/ **cardiotoxicity:** Peaked narrow T waves w/ shortened QT to flattened or absent P waves, prolonged PRI, wide QRS, sine-wave pattern (QRS merges w/ T wave), asystole. If present:
     - **SODIUM BICARBONATE 50 mEq** slow **IVP** over 5 min followed by 20 mL NS IV flush
     - **No IV: ALBUTEROL 5 mg continuous neb up 20 mg** (throughout transport) [BLS]
     - OLMC may order use of both
6. If HR > 100, restless, ↑RR, wide QRS, long PR interval, or peaked T waves after above: **IV NS up to total of 3 L** over 1st 90 minutes following release of compression unless contraindicated. (Ensure clear lung sounds, no shortness of breath)
7. **Assess for compartment syndrome**: If present do not elevate or cool limb.

IMPALED OBJECTS (EMERGENT to CRITICAL depending on location):

5. Never remove an impaled object unless it is through the cheek and poses an airway impairment, and/or it would interfere with (assisted) ventilations, chest compressions, or transport.
6. Stabilize object with bulky dressings; insert gauze rolls into the mouth to absorb excess blood.
7. Elevate extremity with impaled object if possible.

SUSPENSION injury (CRITICAL): "Orthostatic shock while suspended" Condition in which a person is trapped in an upright position within a safety harness without any movement for a period of time obstructing normal venous return from legs to torso. May result in loss of consciousness due to ↓cerebral blood flow.

At risk for **Reflow Syndrome**: Occurs when toxins that accumulated in pooled blood suddenly return to body after pt lies flat following suspension release. Observe for **significant HYPERKALEMIA** as noted above under Crush Syndrome.

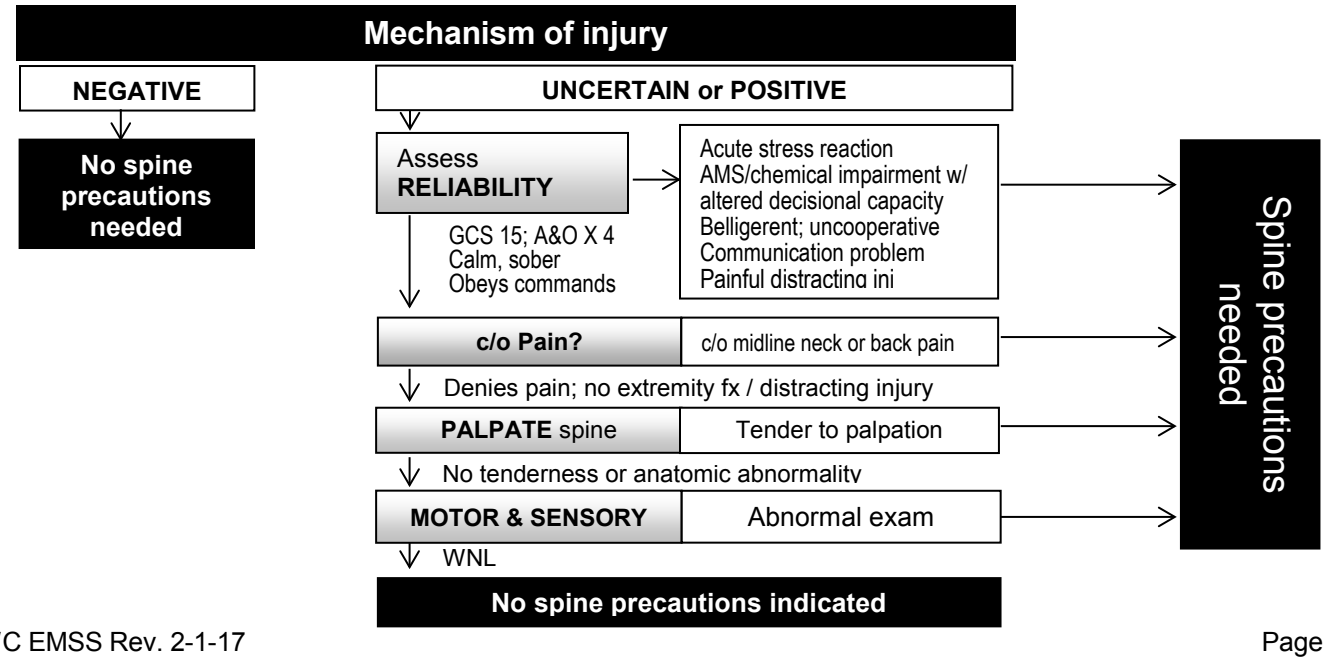
5. Prior to rescue**: Lift legs into a sitting position** if at all possible.
6. **ITC** special considerations:
   - Obtain baseline ECG before release if possible; continue ECG monitoring after release.
   - Start IV NS TKO prior to suspension release if possible. Run wide open after release up to 1 L.
7. Once released from suspension - **Do not allow pt. to stand up or lie flat**. If conscious: Position sitting up with legs bent at the hips and knees for at least 30 min. If unconscious, place on side w/ knees drawn up to chest.
8. Treat dysrhythmias per appropriate SOP. If significant hyperkalemia suspected: Rx per Crush Syndrome.

SPINE TRAUMA: Adult & peds

Current science: No proven benefit of maintaining rigid spine immobilization with a backboard during EMS transport of a trauma pt. Use of a long board, short board or KED is NOT a benign procedure. A backboard can induce pain, agitation, and respiratory compromise, & decrease tissue perfusion at pressure points leading to pressure sores. Use during transport judiciously, so potential benefits outweigh the risks. A backboard or similar device may be useful to facilitate spine precautions during extrication. Time on backboards should be minimized. Securing a pt to a stretcher w/o a backboard, with or without a c-collar is acceptable for maintaining spine precautions during transport. (NAEMSP, 2013)

Definition of selective spine precautions: Indicated by MOI + lack of reliability; spine pain; tenderness to palpation, motor/sensory deficits. Manually stabilize head & neck. Unless necessary to maintain an open airway/other compelling reasons, keep neck/back in original position (of a deformity) until exam is done. NEVER apply TRACTION to the NECK. If exam is normal; have pt move to axial alignment. Stop if pain or resistance; apply an appropriately sized c-collar (unless contraindicated). Secure head, neck, and torso to a stable reference point (scoop stretcher or firm padded surface) with blocks, blanket roll, or head immobilizer so flexion, extension, and/or rotation is minimized. Fill voids & shim sides of pt. if necessary. If using a scoop stretcher or spine board, secure device & patient to ambulance cot with appropriate straps.

1. **ITC** special considerations: Assess pt in position found. Implement care by integrating both pages of spine trauma SOP.
   - Frequently reassess airway/ventilations ($ETCO_2$), ability to talk; muscles used to breathe.
   - Prepare to intubate (DAI) or support ventilations if RR/depth diminishes & ventilatory failure imminent/present
   - Monitor for airway compromise or aspiration in immobilized pts w/ N / V or with facial/oral bleeding: **ONDANSETRON** prn.
   - Treat hypotension: IVF per ITC; keep adult MAP 85-90; assess for neurogenic shock (See next pg); protect paralyzed limbs
   - Prevent hypothermia: SNS disrupted w/ injury above T6; may have altered thermoregulation (poikilothermia)
   - **Pain**: Reduce standard dose by ½ - judicious use of opiates. Avoid resp. depression; preserve neuro function
2. **Assess scene/MOI to determine risk of injury**; MOI alone does not determine need for spine precautions
3. **Establish reliability:** Must appear calm, cooperative, alert, and perform cognitive functions appropriately with NO AMS, acute stress reaction, brain injury, chemical impairment, altered decisional capacity, distracting painful injuries, language or communication barriers
4. **Rapid neuro exam for evidence suggesting spine injury**. (See notes next page)
5. **Selective spine precaution guidelines**: See below - Additional caveats:
   - **Penetrating trauma** to head, neck, or torso: No spine precautions
   - **Ambulatory at scene** or long transport time: apply c-collar and secure to firm padded surface (stretcher) w/o scoop or board
   - **Stable pt./scenes; in vehicle and no injury**: apply c-collar; adult / child in booster seat may self- extricate onto stretcher. Extricate smaller child while strapped in car seat.
   - **Stable pts/scene; in vehicle with injury**: KED (vest-type device) or short board to remove
   - **Unstable location or pt**; in vehicle: Rapid extrication (lift & slide onto long board); move to cot for evaluation
   - **Children** are abdominal breathers, place straps over chest/pelvis, not across abdomen. Heads are disproportionately large. Board should have recess for head or elevate torso 1-2 cm to avoid neck flexion when immobilized.
   - If extricated onto a backboard**: KEEP ON padded board** w/ full spine precautions if: unreliable; distracting injury, C/O spine pain, tenderness to palp; pain on movement; spine deformity; new onset paralysis/paresis, or abn sensory exam. **If none of these exist: remove from board.**
6. If nonresponsive to verbal efforts to calm them or uncooperative in remaining still:
   - Restrain prn per system policy/procedure. Document reasons for use.
   - **Assess need for sedation**: If no loss of consciousness or resp depression; SBP ≥ 90 (MAP≥ 65): **MIDAZOLAM** (standard dose)



SPINE TRAUMA cont.

Positive (+) mechanisms resulting in higher risk for injury

- **MVC**: Intrusion > 12 in. occupant site or > 18 in any site; vehicle telemetry data consistent with high risk of injury motorcycle crash > 20 mph
- Ejected (partial or complete) from vehicle; death in same passenger compartment
- **Falls**: adult ≥ 20 ft (one story = 10 ft); elderly ≥ 65 (all falls); Children aged < 15 yrs: > 10 ft or 2-3 times their height.
- **Auto v. pedestrian**/bicyclist thrown, run over, or with significant (> 20 mph) impact (All elderly)
- Penetrating injury to neck or near the spine; diving injury

Uncertain mechanisms – evaluate carefully for evidence of injury

- Moderate to low velocity **MVC** (< 35 mph) or pt. ambulatory at scene w/o evidence of + mechanism; rollover
- **Falls**: adult < 20 ft; children < 15 years: < 10 ft
- **Auto v. pedestrian**/bicyclist with possible injury (< 20 mph) impact; **Motorcycle crash** < 20 mph
- Isolated minor head laceration/injury without positive mechanism for spine injury
- Syncopal event in which a now reliable pt. was already seated or supine prior to syncope or was assisted to a supine position by a bystander

Negative mechanisms requiring no spine precautions

- Non-traumatic back pain or back spasm; isolated extremity trauma not involving the head or spine

Clinical exam findings suggesting positive (+) spine injury:

- **Pain** or pressure in neck, head, or back (patient complaint); spine **pain/tenderness/deformity** to **palpation**
- **Paralysis/paresis/**abnormal motor exam (finger abduction/adduction; finger/hand extension; foot plantar flexion; foot/great toe dorsiflexion) in one or more limbs
- **Paresthesia** (back of head; upper/lower extremities): tingling, numbness, burning, electric shock at or below level of injury
- Abnormal **P**erception**/**response to pain stimulus (sharp/dull or deep pressure) (thorax, arms or legs)
- Head trauma with altered mental status; **Pr**iapism; **P**roprioception (position sense) deficit
- Absence of sweating below level of injury; spinal shock; neurogenic shock; abnormal breathing after injury (diaphragm only)
- Head tilt and/or "Hold-up" **P**osition of arms

Recommendations for protective equipment removal (helmets & shoulder pads in football, hockey and lacrosse)

Athletic protective equipment varies by sport/activity; and styles of equipment differ within a sport/activity. The sports medical team must be familiar with the types of protective equipment specific to the sport and techniques for equipment removal.

- Due to advances in technology, the decision to remove protective equipment should be made collaboratively by a qualified athletic trainer (if present on scene), EMS & OLMC. Equipment removal should be directed by those with the highest level of expertise and performed by at least 3 trained rescuers competent in the procedure at the earliest possible time (prior to transport). Do not remove equipment until at least 3 persons can assist unless an extreme airway emergency exists. Removal allows expedited access to the airway and chest (NATA, 2015).
- Remove equipment if airway cannot be secured with the mask/screen in place.
- If equipment is left on; pad around the helmet, neck and shoulders to fill any gaps and maintain axial alignment.

Full-face motorcycle helmets: EMS should remove (Rationale):

- They can increase forward flexion of neck when patient is placed on a backboard or scoop stretcher.
- The airway cannot be observed with helmet in place

Contraindications to helmet removal:

- Paresthesia or neck pain during removal; suggests worsening stretch or pressure on nerve endings.
- Healthcare providers with minimal skills in removal (extreme caution if attempting to remove)

(NATA Inter-Association Task Force's Prehospital Care of the Spine-Injured Athlete

NEUROGENIC SHOCK (CRITICAL): Distributive shock due to loss of sympathetic tone seen in high level paraplegia (T1-T4) or tetraplegia resulting in SBP < 90 (vasodilation); **HR < 60** (unopposed Vagal tone); skin warm/dry below injury; $ETCO_2$ 31 or less.
Consider other causes of hypotension in an acute trauma pt. including: hemorrhage, tension pneumothorax, myocardial injury, pericardial tamponade

- NS IVF challenges in consecutive 200 mL increments up to 1 L to achieve/maintain SBP ≥ 90 (MAP≥ 65)
  Repeat BP assessments after each 200 mL and reassess lung sounds. Avoid fluid overload.
- ↓ HR & BP persist: **ATROPINE 0.5 mg rapid IVP (Peds:** 0.02 mg/kg IV/IO minimum 0.1 mg; max adult dose)
  May repeat q. 3 minutes to a max dose for age: Adult: 3 mg IVP / Peds 2 mg.
- ↓ BP persists: **NOREPINEPHRINE 8 mcg/min (2 mL/min IVPB),** adjust upwards in 2 mcg/min (0.5 mL/min) increments. (Max 20 mcg/min). Target SBP ≥ 90 (MAP ≥ 65). Retake BP q. 2 min until desired BP reached, then every 5 min. Maintenance: 2 to 4 mcg/min (0.5 mL to 1 mL/min) OR (Dose: 0.03 mg IVP with caution)

MULTIPLE PATIENT INCIDENTS

MPIs in Region IX are governed by MABAS Divisions and County or System Multiple Patient Management (MPM) Plans. Roles may vary. Allows for scalable response. It is recommended that at least the following are designated for EMS purposes: Triage, Treatment, &Transportation groups.

	Small scale incident	Medium to large scale incident
Definition/trigger **Scale incident based on resources**	# of pts, nature of injuries, and resources that can arrive at scene w/in 15 minutes (secondary response time) make normal level of EMS care achievable for most seriously injured All time-sensitive patients can be transported within a 10 min scene time. **"Business as usual"- within scope of normal operation**	▪ # of pts and/or nature of injuries make normal level of EMS stabilization and care unachievable; **and/or** ▪ # responders/ambulances that can be brought to site within secondary response times is INSUFFICIENT to manage scene and provide normal levels of care and transport under normal operating procedures **and/or** ▪ Stabilization capabilities of hospitals that can be reached within ground transport time of 30 min are INSUFFICIENT to handle all pts. May need to activate disaster plans.
Triage required	YES – all persons on scene; using START/JUMPstart	
Triage **tags**	Optional	Mandatory
PCR/EHRs	Mandatory	Optional; may use triage tag only
Pt distribution; usual transport patterns	Apply	Do not apply; Transport times > 30 min OK
Trauma Center criteria	Apply	Do not apply
OLMC when transporting	Mandatory	Not required; Rx per SOP
# in pt compartment + EMS responder	1 ALS + 1 BLS or 2 BLS if no HIPAA violation	1 stretcher pt; 3 seated or 2 stretcher pts - **all occupants must be safely secured**
Refusal process	Applies	Attempt- may not be possible

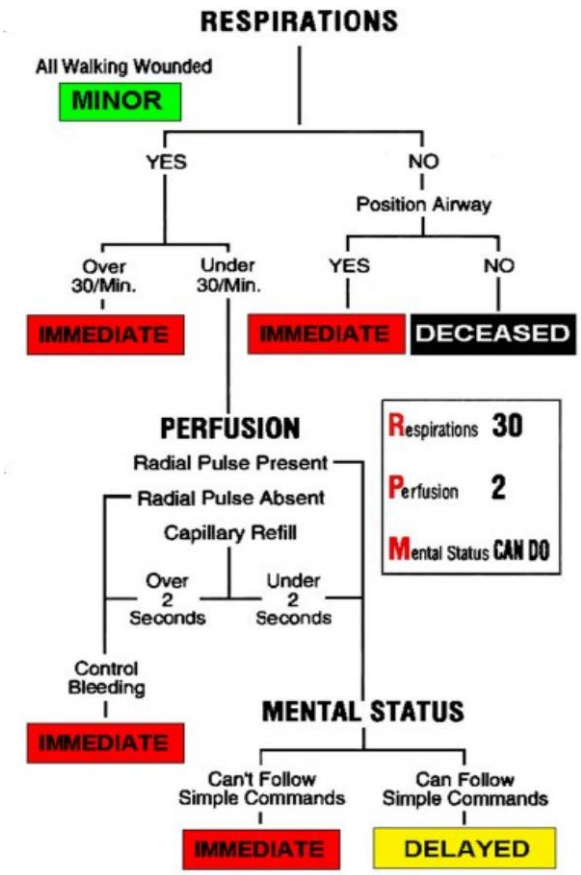
1. **Scene size up**; Determine if additional help is needed
   EMS Responder #1: Notify dispatch. Call for an officer; describe incident: nature, location, presence of debris, hazards, traffic, entrapments, estimated # patients, ask dispatch to alert Resource Hospital if possible med-lg scale incident; help with triage/treatment when initial communication is complete.
   EMS Responder #2: Begin triaging all patients using Start/JUMPstart
2. First arriving EMS *personnel/officer/acting officer* becomes **initial IC** and **establishes scene command.** Determines scale of incident (small, medium-large), builds resources, makes assignments; deploys ID vests if escalates/mutual aid involved to ID key personnel.
   Medical group appointed; informs IC re needed resources (additional amb., helicopter, personnel, equipment)

TRIAGE
- Primary triage (START or JumpStart); control bleeding w/ hemostatic gauze/tourniquets as you triage; manually open airway
- Notify & update IC regarding # of pts & triage categories (R-Y-G-deceased)
- Assure pts are moved to treatment area (if established), when triage done report to MED for reassignment

TREATMENT
- Establish/manage (R-Y-G) treatment areas; ensure ongoing secondary triage (w/ revised trauma scoring); provide Rx as able per SOP
- Prioritize pts for transport (most serious based on RTS go first); coordinate departures w/ transportation

TRANSPORTATION
- Transport up to **2** of the most critical pts to each hospital that can be reached in 30 min to help clear scene.
- **If small-scale incident**: Contact hospital (per local policy/procedure) to distribute remaining patients.
- **If med-large scale incident**: Contact **Resource Hospital** (RH) ASAP: Relay nature of incident; # pts; categories; age groups, functional needs; need for decontamination. Let them know which hospitals are already getting their first 2 pts. RH shall assess receiving hospital capabilities, triage locations, & relay info to scene. Exchange call back numbers.
- Establish **loading area** accessible to **treatment area**, that allows safe/coordinated access & egress
- Request ambulances from staging. Assign pts to ambulances; ensure appropriate loading (prioritizing pts based on triage/trauma score). Notify amb crew of destination and location of hospital triage intake/decon; provide maps prn
- Determine hospital destinations based on traffic patterns, hospital resources available from OLMC, and acuity. Attempt to evenly distribute pts – do not overburden one facility. Preferable (not mandatory) to keep families together.
- Log/scan triage tag #, destination, agency/vehicle & departure time
- Update IC and RH as info becomes available. Notify RH when scene clear or if more hospitals are needed.

Depending on nature and magnitude of incident, EMS MD (designee) or State Medical Director may suspend normal EMS operations and direct that all care be conducted by SOP and/or using personnel and resources as available.



START TRIAGE: For Primary triage only

Red - Priority 1

- Respirations >30
- Resp resume after head tilt
- Delayed capillary refill (> 2 sec)
- Pulse: radial absent/carotid present
- AMS; cannot follow commands
- Uncontrolled bleeding

Yellow - Priority 2

Non-ambulatory; all others:
RR <30; + radial pulse; can follow commands

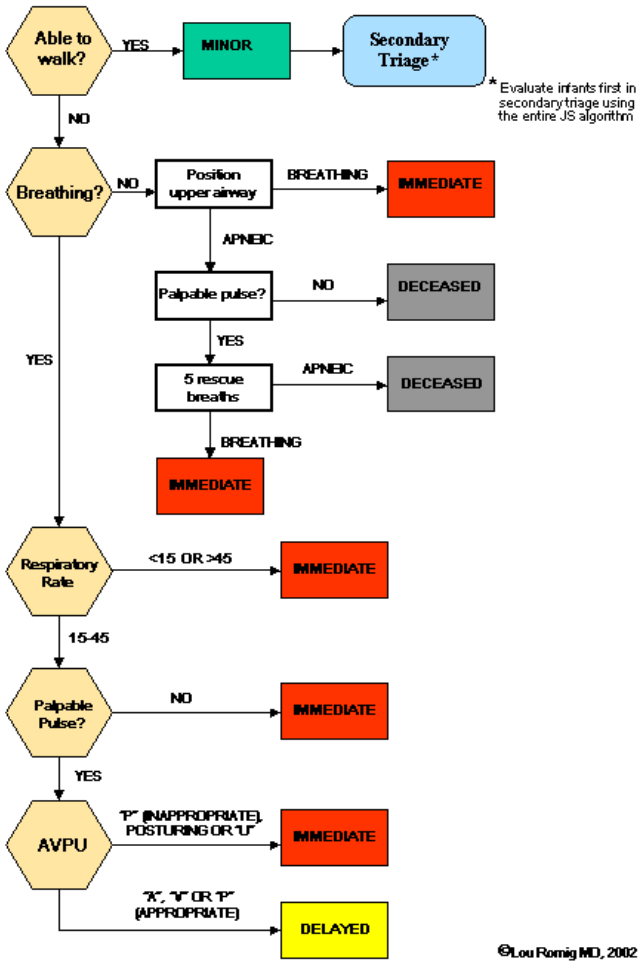
Green - Priority 3

Can walk; Direct to a *specific location*

Deceased -Priority 0

No respirations after opening airway

Secondary Triage: Uses the **Revised Trauma Score** (RTS) to determine triage priority: **GCS, RR, & SBP.** See p. 40
Scores range from 0-12
12: Priority 3 (green)
11: Priority 2 (yellow)
10 or less: Priority 1 (red)



JUMP START

Red - Priority 1

- Respirations < 15 or >45
- Apneic & breathes after opening airway
- Breathes after 5 rescue breaths
- No pulse w/ RR 15-45
- Unresponsive / Inap. pain response
- Uncontrolled bleeding

Yellow - Priority 2

Can't walk; RR 15-45; + pulse; "
A", "V" or appropriate "P" pain response

Green - Priority 3

- Can walk
- Infants may appear to have no major injuries
- Direct to a *specific location* for secondary triage

Deceased - Priority 0

- No breathing after airway opened and 5 rescue breaths given
- No respiration & no palpable pulse

ALL patients MUST be re-evaluated for the acuity of their injuries using Secondary triage.

HAZARDOUS MATERIALS INCIDENTS

1. **Scene safety:**
   - If hazard is suspected, approach site w/ extreme caution, position personnel, vehicles, and command post at a safe distance (200-300 ft) upwind of the site.
   - Protect emergency responders: PPE including respiratory protection. Standard bunker gear with SCBA provides 3-30 min of protection from nerve agents. Chemical protective clothing should be worn when local and systemic effects of possible agents are unknown. www.atsdr.cdc.gov/MHM/mmg170.html
   - Identify all potentially exposed victims and do not allow them to leave the scene.
2. **Scene size up:**
   - Consider dispatch information (multiple persons seizing or having difficulty breathing)
   - Does scene look routine? Anything unusual? Vapor clouds or mists? Look for obvious area impacted.
   - Establish hot & warm zones & perimeters Isolate/secure area by establishing boundary of the contaminated area and a non-contaminated buffer area. Consider need for immediate evacuation of downwind populations.
   - Identify the agent; gather information about the incident if possible.
3. **Send info**
   - Relay size up information to appropriate agencies and personnel ASAP.
   - Consider need for assistance: notify Haz Mat teams ASAP. State & Local governmental agencies - may need water control, natural resources and public utilities for full response.
   - Notify receiving hospital(s) ASAP. Notify Resource Hospital if mass casualty incident.
   - Activate Regional EMS Disaster plan.
4. **Use National Incident Management System (NIMS): Set up the medical group**
   Initiate command-based decisions regarding the need for additional EMS personnel and patient triage.
5. **Initiate Start (JumpSTART) triage**
   - Prepare personnel and equipment for entry into the contaminated area
   - **If possible radiation:** Enter contamination zone using a radiation detector (alpha, beta gamma), survey meter, and pencil or thermo luminescent dosimeters if immediately available to measure radiation levels.
   - Triage as soon as feasible, knowing that decon may need to be in place first.
6. **Treatment**
   - Rescue victims if possible; provide life-saving care in the hot zone and move pts to the warm zone for further treatment and monitoring. Treat all patients as contaminated until proven otherwise.
   - **ITC**: Counter poisons w/antidotes & supportive care; follow appropriate SOP if time and personnel allows.
     If possible nerve gas incident: See CHEMICAL AGENTS SOP.
   - If dermal chemical exposure: Determine decontamination needs: establish decon area; avoid cross-contamination; decontaminate pts/rescuers
   - Cover open wounds with dressings and roller bandage. Do not use tape.
7. **Contact OLMC**
   - Location of incident and number of victims
   - Medical status of victims if known
   - Source and nature of contamination/exposure
   - Route of contamination: external or internal (ingestion/inhalation)
   - Need for decontamination at hospitals
   - Request directions from receiving hospital for victim decontamination entry point.
8. **Confine contamination for transport:**
   - Confine radiologic contamination. Transport contaminated victims by positioning a clean stretcher on the clean side of the control line with a clean sheet to receive and cover the victim. Tuck the clean sheet around the patient to reduce risk of contaminating the ambulance.
   - Rescuers should remove outer protective clothing/gloves and don clean gloves for handling patient enroute.
   - Cover floor of ambulance with a securely taped sheet or paper to ↓ possibility of contaminating ambulance.
9. **Decontamination at hospital:** If radioactive exposure: Rescue personnel should be thoroughly surveyed for contamination. Victims' clothing and rescuers' contaminated protective outer clothing should be bagged, labeled "Radioactive - DO NOT DISCARD", and left at the control area. Shower as appropriate under the direction of the radiation safety officer.
   Lock the ambulance until it can be monitored for contamination.

If assistance is needed, 24 hour hot line numbers for radiologic exposures:
- Radiation Emergency Assistance Center/Training Site (REACT/TS) in Oak Ridge, TN (615) 576-3131 or
- Illinois Dept. of Nuclear Safety: (217) 785-0600

CHEMICAL AGENTS

Chemical agents are released into the air as a vapor or a liquid form. Onset of action or toxicity can occur within minutes up to a few hours depending on concentration of the gas. Upon arrival, may see many people "down" in need of immediate attention. This may be the only indication/ sign that there has been a chemical release. Scene safety is paramount. Routes of exposure: Inhalation, absorption, ingestion.

Nerve agents: Highly poisonous chemicals that disrupt the nervous system. Can be dispersed in liquid and aerosolized forms. G series: sarin, soman, & tabun. Act like a vapor and disperse quickly. V series: VX (more viscous).

Cholinergic S&S: Salivation/sweating, **l**acrimation, **u**rination, **d**efecation, **g**astrointestinal distress, **e**mesis, **b**reathing difficulty with bronchospasm and copious secretions, **a**rrhythmias, **m**iosis (pinpoint pupils) resulting in blurred vision, headache, unexplained runny nose, chest tightness, jerking, twitching, staggering, seizures, coma, apnea, death

S&S vesicants (blistering agents), e.g., mustard gas: Garlic odor, erythema (reddened skin), blistering w/in 2 hrs of vapor exposure, tearing, itching, CNS effects (lethargy, sluggishness, and apathy), respiratory failure.

See Dept of Homeland Security (DHS). National Preparedness Guidelines.
www.dhs.gov/xlibrary/assets/National_Preparedness_Guidelines.pdf

- **PPE:** All those entering a hot zone or working a decon station must wear full protection: body & respiratory
- Suction, O_2 15 L/NRM; support ventilations with BVM prn. As soon as adequate equipment and personnel allow: monitor quantitative waveform capnography (if available), SpO_2 & ECG, & obtain vascular access as able.

Counter poison: Give antidotes for NERVE AGENT exposures

- Each **Mark I kit** consists of 2 autoinjectors and the **DuoDote kit** consists of 1 autoinjector containing
  Atropine sulfate (**Atropine**) 2 mg in 0.7 mL + Pralidoxime chloride (**2 PAM**) 600 mg in 2 mL
  All IM injections to be given in the vastus lateralus muscle (outer middle thigh)
  DuoDote: Do NOT remove Gray safety release until ready to use. NEVER touch green tip (needle end)
- **Indications:** S&S of nerve agent or organophosphate exposure or when treating victims of a severe exposure in the hot zone. May be given by any EMS personnel with appropriate training. May be self-administered.
- **Contraindications**: Do not use *Auto-Injectors* for prophylaxis or on children < 88 lbs (40 kg)
- When a nerve agent has been ingested, exposure may continue for some time due to slow absorption from the lower bowel and fatal relapses have been reported after initial improvement. Continue monitoring and transport.
- **If dermal exposure**: Decontamination is critical using standard decon procedures. Avoid cross-contamination.
- **Contact Resource Hospital to alert them of incident and to request Chem Pac supplies**. RH alert receiving hospitals

Hot zone - severe exposures

Adult/Children ≥ 88 lbs (40 kg) **Mark I kit *or DuoDote Auto-injector* 1 dose;** tag pt. to note dose; remove ASAP to warm zone.	**Children < 88 lbs (40 kg):** Remove to warm zone

Rx in WARM zone: based on patient size & severity of S&S (IDPH protocol)

Patient age/size	**Mild:** Unexplained runny nose, tightness in chest, SOB, bronchospasm w/ wheezing **Mod:** Above + vomiting/diarrhea, pinpoint pupils, drooling, excessive sweating, abd cramps, invol urination or defection, HA, muscle fasciculations/twitching, staggering		**Severe symptoms** Coma, paralysis, cyanosis, apnea, seizures***	
	Atropine dose	2 PAM dose	Atropine dose	2 PAM dose
Infant (< 7 kg)	0.25 mg IM	*15 mg/kg IM	0.5 mg IM	*25 mg/kg IM
Infant (7-13 kg)	0.5 mg IM&	*15 mg/kg IM	1 mg IM	*300 mg IM
Child (14-25 kg)	1 mg IM	*300 mg IM	2 mg IM	*600 mg IM
Child (26-40 kg)	2 mg IM	*600 mg IM	4 mg IM	*1200 mg IM
Adult/Child ≥ 88 lbs (40 kg)	1-2 Mark I kits *or DuoDote injector* 2 doses OR Atropine 2-4 mg IM (X 2) and *2-PAM: 600-1200 mg IM		3 Mark I kits *or DuoDote injectors* in rapid succession OR **Atropine 6 mg IM and *2-PAM: 1800 mg IM	
Elderly/frail	Atropine 1 mg IM + *2 PAM 10 mg/kg IM		Atropine 2-4 mg IM +*2 PAM 25 mg/kg	

Notes on drug use

- ***Prepare 2-PAM solution** from ampule containing 2-PAM 1 Gm desiccated (powder). Inject 3 mL NS, 5% distilled or sterile water into ampule; mix w/o shaking. Resulting solution = 3.3 mL of 300 mg/mL.
- **Repeat atropine (2 mg IM) at 3-5min intervals until secretions have diminished and breathing is comfortable or airway resistance has returned to near normal or drug supply is depleted.
- If seizures are not stopped w/ atropine/2-PAM: **MIDAZOLAM standard dosing** for seizures

ACTIVE SHOOTER RESPONSE

Purpose: Describe the roles and responsibilities of EMS when working with law enforcement personnel at or near an incident of mass violence. In all cases, law enforcement is considered the lead agency on these incidence and EMS personnel shall follow PD instructions as appropriate.

Definitions:

Active shooter event - vent involving one or more individuals actively engaged in causing death and/or great bodily harm using firearms in a confined and/or populated area

Ballistic Protective Equipment - Protective vest, helmet, and eyewear that are made to protect the wearer from ballistic threats such as gunfire, shrapnel, or sharp objects meant to do bodily harm.

Patient Collection Point – The physical location used for the assembly, triage, medical stabilization and subsequent evacuation of casualties. The PCP may be located in a secured area within the Warm Zone. The scene size or layout will dictate the need and location of a PCP. If used, The PCP is most beneficial when it is located in an area that is near an exit that is easily accessible to a drive or parking lot for patient evacuation via an ambulance or other transport vehicle. He PCP shall be force protected by PD at all times. Depending on the size of a building campus, etc, there may be multiple PCPs established.

Clear – Indicates an area has been checked by law enforcement personnel and no threats where identified.

Cold zone – An area where there is little or no threat, due to the geographic distance from the threat or the area has been secured by PD.

Concealment – A location that hides an individual from view but does not provide ballistic protection.

Contact team – The initial team of police officers who form at the scene and deploy to the shooter's location, make contact with and eliminate the threat to prevent further injury and/or loss of life.

Cover – A location that hides an individual from view and provides ballistic protection (metal door, brick or concrete wall)

Hard lockdown – Specific to schools and is used when a serious/volatile situation exists that could jeopardize the physical safety of the students and staff. When in effect, occupants of the building will ignore all bells and fire alarms unless they receive verbal instructions from local emergency responders or the conditions warrant the evacuation of the area (fire, structural damage). No one is allowed to enter or exit the building. On duty Shift Commanders shall be notified by dispatch if any hard lockdowns occur within their response areas.

Hot zone – Scene of a dynamic environment where a current, active threat is known or believed to be present. This area is typically occupied by law enforcement Contact Teams only.

Level-2 staging – Used when Incident Command (IC) identifies the need to maintain a reserve of resources near the scene. Places all reserve resources in a central location and requirement implementation of a Staging Officer. \

Rescue Group Supervisor (RGS) – A FD member whose job is to coordinate the FTF teams and the PCP. The PCP shall be created by the RGS in coordination with the PD members assigned to the Rescue Task Force (RTF). The RGS will oversee triage and treatment of the patients. The RGS will communicate with the Transportation Officer to coordinate transport of patients from the PCP to a healthcare facility/hospital.

Rescue Task Force – A coordinated group of Police and Fire/EMS personnel whose responsibilities are to provide initial basic trauma care to the critically injured and to extract them from the Warn Zone to an area where they can receive definitive care/and/or transportation to the hospital. These RTF teams treat, stabilize, and remove the injured while in a rapid manner under the force protection of PD personnel. They shall wear BPE. It is recommended that a RTF consist of 2 or 3 medically trained responders (paramedics preferred) and 2 or 3 armed law enforcement personnel. Multiple RTFs can be formed based on the needs of the incident and shall be designated as RTF1, RTF2 etc.

Safe Corridor/Pathway – A route identified and secured by law enforcement personnel and designated for the safe ingress and egress of first responders, victims, and evacuees. May also be used after the incident is stabilized to prevent the accidental spoliation of evidence by first responders.

Secured – Indicates that an area has been completely checked by law enforcement, no threats exist, and entry points to the area are actively protected by armed PD personnel.

Soft lockdown – Procedure specific to schools used when conditions outside of the school building could potentially pose a threat to the safety of students and staff. Second, a situation in the building where the school or local emergency responders need to keep students and staff in their classrooms and away from an incident or activity. During soft lockdowns, student and staff can continue normal classroom activities, but shall not leave the classroom or officers until advised to do so. No one may enter or leave the building until ended. The on-duty Shift Commander shall be notified by dispatch of any Soft Lockdowns within their response areas.

Warm Zone – Area of indirect threat (law enforcement may have cleared or isolated the threat to a level of minimal or mitigated risk). Considered cleared, but not secured. A RTF entry team can deploy in this area with PD protection, to treat and/or evacuate victims.

GUIDELINES

1. **Response and staging**: Initial responding EMS teams shall stage at safe locations out of the line-of-sight and away from the scene. Non-transport vehicles (not being used as RTFs) should block roads leading to the scene when PD or Public Works (PW) vehicles are not available. Drivers of these vehicles shall remain with their vehicles and watch for responding emergency personnel and move the vehicles as needed.

2. As quickly as possible, **establish Incident Command (IC) and Unified Command (UC)** per local policy.
3. **Communications**
   - Between FDs/EMS: Use MABAS frequencies
   - Between FDs & PD: Use police-band radio that allows FD IC to monitor radio traffic. If PD is operating in "radio silence", FD shall not transmit over the radio

4. **School Access**: Determine if on Hard or Soft Lockdown. Access to classrooms only possible with a key or through an exterior window. PD has access to interior door keys located in a key box on the building. May be barriers placed at intersections to stop traffic from entering area around the scene. Keep EMS informed of road blockages that may impact their response to or from scene. Expect unauthorized persons (family members, media) attempting to gain access to scene. Attempt to limit this as able; request resources to handle situation professionally. EMS shall not engage with hostile citizen. Notify Unified command ASAP. PD should establish a "Reunification Site". Parents should be directed to that location.

5. **Explosive Devices:** Consider possibility of explosive devices at scene. If responding to the report of one explosive, consider presence of a secondary device in the immediate or adjacent areas. If an item seems suspicious and suspected of being an explosive device, immediately withdraw and contact UC. They shall request the County Bomb Squad to the scene.
   For events including Improvised Explosive Devices (IEDs), consider fire hazards secondary to the initial blast. Ensure that gas lines and valves have not been compromised. IC should consider upgrading response to include special teams if needed (Haz-Mat for chemical explosions, TRT for structural collapse).

6. **Patient transport**: Coordinated with the EMS Group by the Transportation Officer plus the RGS. FD personnel shall follow current EMS System policies pertaining to Multiple Patient Incidents and anticipate the possibility that patients who have self-evacuated may seek treatment. Only patients with life-threatening injuries should be considered for immediate transport to the hospital. Transporting pts with minor injuries first will deplete resources available on scene to treat and transport those more seriously injured. Direct all self-evacuated patients to the treat, treatment and transport area established in the Cold Zone for secondary triage and transport decisions.

7. **Incident Command**: Should establish the following: EMS Group, Rescue Group
   - Attempt to obtain accurate number of wounded patients; ensure adequate resources to handle them; form RTFs to deploy when requested by PD; have them equip themselves with appropriate BPE, medical supplies and pt carrying devices so they are ready to respond; consider elevating incident to a higher alarm before resources are required.
   - Establish Level 2 staging area in coordination with PD; clear route to scene for emergency vehicles; assign staging officer
   - Consider requesting a Command Van from MABAS Division.
   - Use passport system to maintain accountability of RTFs
   - May need Rehab Group

8. **EMS Group**
   - Identify treatment area in Cold Zone for patients with minor injuries. Broadcast to all units so everyone knows where these patients should go. Drive to treatment area if needed.
   - Appoint Triage Officer, Treatment Officer, and Transportation Officer
   - If patients with minor injuries must be transported prior to threat being eliminated, consider taking them to further hospitals reserving the nearest hospitals for severely injured patient who may still be evacuated.
   - Coordinate a route for access and egress of EMS vehicles. Ask PD to help keep it clear.
   - Notify Resource Hospital ASAP that you are on scene with an Active Shooter/mass violence incident; known number of casualties and possibility that there could be more.
   - Gather medical supplies from FD vehicles including mass casualty bags if on site.

9. **Rescue Task Force (RTF)**
   - Don BPE/PPE (ballistic vest, helmet, eyewear, EMS gloves in a safe area, prior to making entry into warm zone
   - Should be equipped with Active Shooter "Sling" packs willed with appropriate trauma supplies, webbing, and evacuation litters.
   - PD escort may need to engage a threat, leaving them unprotected. RTFs should take cover behind protective barriers, e.g., brick walls, vehicles (or at least use concealment if suitable protective barriers unavailable
   - Once inside Warm Zone: RTFs move in a coordinated manner as directed by PD. Once patient(s) identified, advise IC of # and location; stop bleeding if possible; cover chest wounds with vented dressing, open airways manually and continue on in search of more casualties until no more patients are found in the Warm Zone. Then begin patient extraction. If resources allow, one RTF may begin patient movement to PCP while initial RTF is still making patient contacts.
   - PD providing force protection for RTFs will determine safest path of travel for entry and exit, which may include going through a window.
   - When RTFs are leaving Warm Zone, PD members of RTF will protect group as effectively as possible.

10. **Transport of injured Police Officer**: When PD is the transported patient, EMS personnel should stay at hospital and act as a liaison until a representative of law enforcement arrives. EMS should attempt to secure officer's weapon at scene by having an on-scene PD officer take control of the patient's weapon(s). If unable, EMS shall secure patient's weapon(s) in the ambulance gun safe.

11. **Tactical EMS (TEMS) personnel shall operate under specific local policies and procedures that should be appended to these SOPs/SMOs.**

WIDESPREAD DISEASE OUTBREAK

BIOLOGICAL agents

Difficult to detect due to their latent effects. Biological threat, e.g. Anthrax, Botulism, Bubonic/Pneumonic Plague, Cholera, Diphtheria, Ebola, Smallpox, staphylococcal Enterotoxin B, Tularemia, Viral Hemorrhagic Fever, bio-engineered agents, and ricin (seed from the castor plant, extreme pulmonary toxicity w/ inhalation).

S&S: Early surveillance critical: Because of the long incubation period, the ability to recognize biological attack is difficult. Detection will most likely occur by an increase in calls of similar symptoms:

- Fever, chills
- Diarrhea
- Pharyngitis (sore throat)
- Blurred or double vision
- Jaundice
- Respiratory insufficiency or distress
- Swollen lymph nodes
- Muscle paralysis
- Skin lesion that look like small pox
- Malaise
- Cough

- For all possible exposures to biological agents apply appropriate PPE; and ask about travel history.
- If patient is coughing, place an N-95 mask on all rescuers and a surgical mask on the patient.
  Cover all lesions with dressings. If copious diarrhea, consider use of fluid repellant sheets and gowns.
- Consult recommendations from CDC relative to post-exposure treatment and/or vaccination for rescuers.
  CDC website: www.CDC.gov **800-CDC-INFO (800-232-4636)** **TTY: (888) 232-6348**

- Initiate System-wide Crisis Response policy/procedures as appropriate. Notify Resource Hospital of trends.
- Depending on the nature and magnitude of an incident, the System EMS MD or designee or State Medical Director may suspend EMS operations as usual and direct that all care be conducted by SOP and/or using personnel and resources as available.
- Expanded scope of practice may be authorized by EMS MD or Medical Director of Public Health including assessment, distribution of prophylaxis, altered transport parameters.

IEMA phone contacts

Director ..... (217) 782-2700
Coordinator, Region 9 ..... (618) 662-4474
24 hour dispatch number ..... **(217) 782-7860**

See charts in Appendix for more detail (pp. 107-109)

ABUSE & Maltreatment: DOMESTIC, SEXUAL, ELDER

Persons protected by the Illinois Domestic Violence Act of 1986 include:

- Person abused by a family or household member
- High-risk adult w/ disabilities who is abused, neglected, or exploited by a family or household member
- Minor child or dependent adult in the care of such person
- Person residing or employed at a private home or public shelter which is sheltering an abused family or household member

EMS personnel shall provide immediate, effective assistance and support for victims and witnesses of domestic or personal violence. Dispatchers should use utmost discretion prior to canceling a call for service, if based solely on a request for cancellation by a person other than the original complainant.

If any form of abuse, maltreatment, harassment, intimidation, or willful deprivation are suspected:

1. Assure scene safety. If offender is present; weapons are involved; the offender is under the influence of drugs and/or alcohol; and/or there are children present: call for police backup.
2. **IMC** special considerations:
   - Provide psychological support
   - Discourage patients from changing clothes, urinating, or washing away signs of the abuse
   - Treat obvious injuries per appropriate SOP
   - Cooperate with police to use all reasonable means to prevent further abuse or neglect
3. Illinois law requires EMS personnel to give suspected abuse victims **information on services** available to them
   - Inform them that they do not have to tolerate any abusive behavior.
   - Inform them that they and members of their family have the right to be protected from abuse and to press criminal charges against offenders.
   - Assure pt. that the violence was not their fault and encourage them to seek medical attention.
   - See System-specific Domestic/Interpersonal Violence policies.
4. Report your suspicions to the receiving hospital. Clearly document all scene factors and physical signs and symptoms that support your suspicions of abuse/violence.
5. If patient is < 18 years old; see Suspected Child Abuse or Neglect SOP.

National Domestic Violence Hotline at 1-800-799-7233

National Sexual Assault Hotline at 1-800-656-HOPE (4673)

Elder Abuse/Neglect Hot Line Number:

EMS personnel are mandatory reporters of suspected elder abuse. Call the following:

IDPH ABUSE HOTLINE: 1-800-252-4343

Department of Aging: 866-800-1409

TRAUMA IN PREGNANCY

1. **ITC** special considerations: Same immediate priorities. Pregnancy does not limit or restrict any resuscitative Rx.
   - Stabilize mom first as fetus's life depends on the mother's.
     Mom may compensate at the expense of the fetus. Baby may be in jeopardy while mom appears stable.
   - Upper airways are congested due to increased blood and swollen capillaries.
     Intubate gently if necessary; may need one size smaller ET tube; avoid nasal route.
   - **O_2** 12-15 L by tight fitting mask even w/o respiratory distress until $SpO_2 \geq 96\%$;
     SpO_2 must be > 94% for adequate fetal oxygenation.
   - Hypotension: SBP < 90 (MAP 65) or < 80% of baseline. **Warm NS IVF challenges** in consecutive 200 mL increments. Repeat as necessary – **permissive hypotension contraindicated** (maintain SBP >90; MAP ≥65).
   - If spine precautions indicated and gestational age > 20 weeks:
     Tilt patient to either side by raising the side of the board and supporting board with blanket rolls.
     Manually displace uterus to side. Avoid Trendelenburg position.
   - Take BP while mother is seated or tilted towards side if gestational age > 20 wks.
   - **Pain management – Fentanyl:** Category C – Consult with OLMC. The potential benefits to the mother must be balanced against possible hazard to the fetus.
2. **Serial abdominal exams**: Note abdominal shape & contour
   - Inspect for deformity, contusions, abrasions, punctures, and wounds
   - Attempt to auscultate fetal heart tones (FHTs) or assess fetal activity per policy if > 20 wks - Ave. 120-160/min.
   - Palpate abdomen to determine uterine tenderness/irritability & fundal height. Fundus is level w/ navel at 20 wks with one baby. Assess rigidity of uterus vs. abdominal wall, leakage of amniotic fluid (presence of meconium/blood), presence/absence of fetal movements.
   - **If contractions present**: Assess duration, frequency, strength; pain scale; check for imminent delivery.
   - **Vaginal bleeding**: May be earliest sign of placental separation, abortion or preterm labor; May indicate injury to GU tract. Note presence, amount, color, consistency of blood. Do not pack vagina.
   - **If bag of waters ruptures** in your presence: evaluate color, consistency, odor, quantity of fluid.
     Port wine: abruptio placenta; green: meconium; foul smelling: infection; assess for prolapsed cord.
3. Prepare to deliver if signs of imminent birth are present.

Parameter	Normal	Changes in pregnancy
Blood volume	4-5 L	Increased 40-50%; May NOT show S&S of shock (VS changes) until ≥ 30% blood loss
HR	70	Increased 10-15 BPM higher than prepregnant state
Blood pressure	110-120/70	Decreased 10-15 mmHg in 2nd trimester; returns to nml 3rd trimester Beware supine hypotensive syndrome > 20 wks Venacaval & aortic compression when supine ↓ RV preload & CO by 30-40%
Cardiac output	4-5 L/min	Increased 20-30%
Hematocrit/hemoglobin	13-15 / 40	Decreased due to plasma dilution (physiologic anemia)
$ETCO_2$	35-45	25-32 > 10 wks gestation: Maternal hyperventilation nml (gradient for gas exchange w/ fetus)
Gastric motility	Normal	Decreased; prone to vomiting & aspiration. Last meal unreliable indicator of gastric contents. Decreased motility mimics silent abdomen.

- Pregnancy influences patterns of injury/clinical presentations following trauma. Highest risk in moms with injuries to thorax, abdomen, and pelvis
- Prime causes of fetal death d/t trauma: placental abruption (50-80%); maternal death (~10%); maternal hypovolemic shock (<5%)
  60% - 70% of fetal deaths occur following minor maternal injuries.
  Risk for fetal injury highest in 3rd trimester when head is engaged, torso exposed, & ratio between fetus & amniotic fluid is lowest
- Peripheral vasodilation causes ↑ peripheral circulation in 1st & 2nd trimesters**. Pt in shock may be warm and dry**.
- Maternal shock causes uterine vasoconstriction that ↓ blood flow to fetus by 20% - 30% before BP changes in mom.
- Will see changes in fetal HR pattern if FHTs can be assessed.
- Stretched abdominal wall **masks guarding, rigidity, & rebound tenderness**. Palpation exam unreliable in trauma. Less able to detect abdominal bleeding clinically. Bladder vulnerable to rupture w/ direct trauma to suprapubic area. Appendix in RUQ in late pregnancy due to upward shifting of abdominal organs.

CHILDBIRTH

PHASE I: LABOR

1. Obtain history and determine if there is adequate time to transport to hospital with OB services
   - Gravida (# of pregnancies); para (# of live births)
   - Number of miscarriages, stillbirths, abortions or multiple births
   - Gestational age in weeks: Due date (EDC) or last menstrual period (LMP)
   - Onset, strength, duration & frequency of contractions (time from beginning of one to the beginning of the next)
   - Length of previous labors in hours
   - Status of membranes ("bag of waters") - intact or ruptured
     If ruptured, inspect for prolapsed cord & evidence of meconium. Note time since rupture.
   - Presence of vaginal bleeding/discharge ("bloody show")
   - **High-risk concerns**: Lack of prenatal care, drug abuse, teenage pregnancy, mom 35 yrs & older; history of diabetes, HTN, CV and other pre-existing diseases that may compromise mother and/or fetus, pre-term labor (< 37 wks), previous breech or C-section, or multiple fetuses.
2. **IMC** special considerations:
   - Maintain eye contact; coach her to pant or blow during contractions.
   - If mother becomes hypotensive or lightheaded: turn on her side; O_2 12-15 L/NRM; NS IVF challenges in 200 mL increments, if indicated.
3. Inspect for S&S imminent delivery: bulging/crowning during contraction, involuntary pushing, urgency to move her bowels
   - **IF DELIVERY NOT IMMINENT**: Allow pt. to assume most comfortable position; transport to hospital w/ OB services
   - **IF DELIVERY IS IMMINENT:** (contractions 2 min apart or less, or any of the above are present)
     - **Do not attempt to restrain or delay delivery unless prolapsed cord is present**.
     - Provide emotional support; mom is in pain and may not cooperate
     - Position semi-sitting (head up 30°) w/ knees bent or on side on a firm surface, if possible.
     - Wash hands w/ waterless cleaner. Put on **FULL** BSI. Remove clothing below her waist if able.
     - Open OB pack; maintain cleanliness of contents; place absorbent materials beneath perineum and drapes over abdomen, each leg, & beneath perineum. Prepare bulb syringe, cord clamps, scalpel, and chux to dry and warm infant. Ready neonatal BVM, NRM, resuscitation equipment, and O_2 supply. Prepare neonatal warmer if available.

PHASE II: DELIVERY

1. **HEAD**: Allow head to deliver passively.
   - Control rate of descent by placing palm of one hand gently over occiput.
   - Protect perineum with pressure from other hand.
   - If amniotic sac still intact, gently twist or tear the membrane.
2. **After head is delivered:**
   - **No meconium**: Do not suction during delivery to avoid Vagal stimulation and fetal bradycardia.
   - **Meconium present**: Gently suction mouth then nose w/ bulb syringe.
     Anticipate need for resuscitation of a nonvigorous infant after delivery.
   - Feel around neck for the umbilical cord (**nuchal cord**). If present, attempt to gently lift it over baby's head.
     If unsuccessful, double clamp and cut cord between the clamps.
   - Support head while it passively turns to one side in preparation for shoulders to deliver.
3. **SHOULDERS:**
   - Gently guide head downwards to deliver upper shoulder first
   - Support and lift the head and neck slightly to deliver lower shoulder.
   - **If shoulder dystocia**: Gently flex mother's knees alongside her abdomen.
     Attempt to rotate anterior shoulder under symphysis pubis.
4. The rest of the infant should deliver quickly with next contraction.
   Firmly grasp infant as it emerges. Baby will be wet and slippery.
5. Note date and time of delivery. Proceed to **POST-PARTUM CARE**

NEWBORN AND POST-PARTUM CARE

NEWBORN

1. Assess newborn's ABCs. If distressed: → Newborn Resuscitation SOP
2. Care immediately after delivery:
   - Keep infant level with uterus or place on mom's abdomen in a 15° head-down position (unless preterm, then keep horizontal) until cord stops pulsating.
   - Suction mouth, then nose using bulb syringe; repeat as necessary.
   - Ventilations should begin in 30 sec. Gently rub back or flick soles of feet. If no ventilations → Newborn resuscitation
   - Dry and warm infant, wrap in blanket or chux. Cover head with stockinette cap.
3. **When cord pulsations stop: Clamp cord at 6" and 8"** from infant's body; cut between clamps with sterile scalpel
   - If no sterile implement available, clamp cord but do not cut; safely secure infant for transport.
   - Check cord ends for bleeding.
4. Obtain **1 minute APGAR score**. If 6 or less: → Newborn Resuscitation SOP
   - If RR < 40: assist with neonatal BVM; → Newborn Resuscitation SOP
   - If dusky but breathing spontaneously at a rate of ≥ 40/min:
     Place neonatal NRM 1" from the baby's face with blow-by oxygen at 10 L/min.
5. Place ID tags on the mother and infant with mother's name, delivery date and time, infant gender
6. Obtain **5 minute APGAR score**.
7. **Transport considerations**: Transport baby in an infant car seat secured so the infant rides facing backwards. Pad around infant prn. Do NOT carry infant to ED or OB unit in rescuer's arms due to risk of infection & trauma. Transport mom & baby to a hospital with OB services (keep together if safe transport possible). Do not separate in two different ambulances unless absolutely necessary.

APGAR Assessment	0	1	2
Appearance (color)	Blue or pale	Blue hands or feet	Entirely pink
Pulse (heart rate)	Absent	< 100	≥ 100
Grimace (reflex irritability)	Absent	Grimace	Cough or sneeze
Activity (muscle tone)	Limp	Some extremity flexion	Active motion
Respirations (effort)	Absent	Weak cry, < 40	Strong cry

Infant's patient care report - Document the following:

1. Date and time of delivery
2. Presence/absence of nuchal cord. If present, how many times.
3. Appearance of amniotic fluid, if known; especially if green, brown, or tinged with blood
4. APGAR scores at 1 minute and 5 minutes
5. Time placenta delivered and whether or not it appeared intact (if applicable)
6. Any infant resuscitation initiated and response

MOTHER

1. Placenta should deliver in 20-30 minutes. If delivered, collect in bag from OB kit and transport for inspection. Do **NOT** pull on cord to facilitate delivery of the placenta.
   DO NOT DELAY TRANSPORT waiting for PLACENTA to deliver
2. Mother may be shivering; cover with a blanket
3. If perineum is torn and/or bleeding, apply direct pressure with sanitary pads and have patient bring her legs together. Apply cold pack (ice bag) to perineum (over pad) for comfort and to reduce swelling.
4. If blood loss > 500 mL: or S&S of shock/hypoperfusion:
   - **IV NS** fluid challenges in 200 mL increments titrated to patient response
   - Massage top of uterus (fundus) until firm
   - Breast feeding may increase uterine tone. (Do not transport with baby breastfeeding)
5. If blood loss continues despite above with SBP < 90 (MAP < 65); transport ASAP; alert OLMC

DELIVERY COMPLICATIONS

Time sensitive pts

BREECH BIRTH

- A footling/frank breech generally delivers in 3 stages: legs → abdomen; abdomen → shoulders, and head.
- Two of the most dangerous times for the infant (risk of hypoxia) are after delivery to the abdomen (cord can become compressed against the pelvic inlet as the head descends) and after delivery of the torso and shoulders, awaiting delivery of the head.

1. **IMC** special considerations:
   - IV NS; anticipate need for pressure infusers
   - Obtain a quick pregnancy history per the Emergency Childbirth SOP
   - Prepare for delivery per Emergency Childbirth SOP if birth is imminent
2. Prepare to transport with care enroute if only the buttocks or lower extremities are delivered.
   Stay on scene for **ONE** contraction if the baby is delivered to the shoulders, while attempting delivery of the head.
   If enroute, stop the vehicle to attempt delivery of the head.

Delivery Procedure

3. **Legs delivered**: Support baby's body wrapped in a towel/chux.
   If cord is accessible, gently palpate for pulsations. Do not manipulate cord more than necessary.
   Attempt to loosen the cord to create slack for delivery of the head.
4. **After torso and shoulders are delivered**: Gently sweep down the arms.
   - If face down may need to lower body to help deliver head. **Do not hyperextend the neck**.
   - Apply firm pressure over mother's fundus to facilitate delivery of the head.
   - **NEVER ATTEMPT TO PULL THE INFANT BY THE LEGS OR TRUNK FROM THE VAGINA**.
     May precipitate an entrapped head in an incompletely dilated cervix or it may precipitate nuchal arms
5. **The head should deliver in 30 seconds** (with the next contraction).
   - If **NOT**, reach 2 gloved fingers into vagina to locate baby's mouth and pull chin down.
     Push vaginal wall away from baby's mouth to form an airway.
   - Keep your fingers in place and transport immediately, alerting the receiving hospital of the baby's position.
     Keep delivered portion of baby's body warm and dry.
6. If head delivers: anticipate neonatal distress. Refer to Newborn Resuscitation SOP as necessary.
7. Anticipate maternal hemorrhage after the birth of the infant. Refer to Post-Partum Care of Mother.

Note: Single limb presentation (arm, leg) or other abnormal presentations may require C-section.
Do **NOT** attempt field delivery.

PROLAPSED CORD

Check for prolapsed cord whenever a patient claims her bag of water has ruptured.

1. **IMC** special considerations: O_2 12-15 L/NRM
2. Elevate the mother's hips. Instruct the patient to pant during contractions.
3. Place gloved hand into vagina and place fingers between pubic bone and presenting part, with cord between fingers.
   Apply continuous steady upward pressure on the presenting part.
4. Avoid cord manipulation as much as possible. Cover with a moist dressing and keep warm.
5. Transport with hand pressure in place.

UTERINE INVERSION

1. **IMC** special considerations: O_2 12-15 L/NRM; IV NS titrated to patient response
2. Anticipate significant hemorrhage
   If only partially extruded: ONE attempt to replace uterus per protocol. Push fundus toward vagina with palm of hand.
3. Apply saline moistened sterile towels or dressings around uterus.

NEWBORN RESUSCITATION (APGAR = 6 OR LESS)

Time sensitive pt

- Majority of newborns require no resuscitation beyond drying, warming, mild stimulation, and airway suctioning. Those that do may be critically ill and need expeditious transport to a hospital with OB capabilities.
- **Acrocyanosis,** blue discoloration of the distal extremities, is a common finding in the newly born infant. Differentiate from central cyanosis.
- **Periviable birth** (Delivery between 20 - 26 wks of gestation): Factors that influence survivability: gestational age; birth weight; gender (female), singleton birth, use of antenatal steroids.

  It is difficult to determine gestational age in the field. If there is any possibility that the baby may be >20 weeks gestation and has any of these: cyanosis with **spontaneous ventilations, a detectable slow heart beat by auscultation, or spontaneous movements:** keep warm; begin chest compressions; and transport immediately to a center with advanced levels of neonatal (Level III NICU) care.

  This does not mean that resuscitation should always be started on an extremely preterm lifeless baby or that every possible intervention needs to be offered. Consider parental wishes and call OLMC if any doubt as to the best course of action.

1. **First assessments**: Term gestation? Good tone? Breathing or crying? Note **APGAR** scores at 1 & 5 minutes. Do not wait for APGAR score to begin resuscitating an infant in obvious distress. If 5 min APGAR 6 or less: obtain additional scores q. 5 min until arrival at hospital.
2. **Warm and dry** the baby. Wrap in linens, infant warming swaddler if available, and cover the head. **Stimulate** by flicking the soles of the feet and/or rubbing the back.
3. **If weak cry, signs of respiratory distress, poor tone, or preterm gestation: Position** supine with 1" pad under back/shoulders to align head & neck in neutral position. Clear airway as needed. **Suction** mouth then nose with a bulb syringe. Monitor HR.
4. **If HR > 100 & adequate resp effort; monitor for central cyanosis:** provide blow-by oxygen as needed

4. **HR > 100; apneic or significant respiratory distress:**
   - Ventilate with **neonatal BVM at 40-60 BPM on ROOM AIR**
     Use only enough volume to see chest rise
     First breath will require a little more pressure (30-40 cm H_2O) to begin lung inflation
   - Suction the nose/oropharynx with bulb syringe to remove secretions
   - Apply **peds SpO_2** to right upper extremity (wrist or medial aspect of palm)

Targeted SpO_2 after birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

BRADYCARDIA (HR < 100 beats per minute)

5. **If apneic/gasping respirations, RR < 40 or central cyanosis**
   Continue to **ventilate at 40-60/neonatal BPM**, add **15 L O_2**
6. **If HR remains < 60 beats/minute despite adequate assisted ventilations for 30 seconds:**
   - Continue assisted ventilations with 15 L O_2/neonatal BVM (avoid pressure over eyes), and
   - **Begin chest compressions** over lower ⅓ of sternum; approx. ⅓ the depth of the chest; using two thumbs-encircling hands for 2 rescuers or 2 fingers at a rate in a 3:1 ratio: 90 compressions & 30 breaths/minute.
7. **If adequate ventilations cannot be achieved by BVM:** Go to Peds Airway Adjuncts SOP
   Continue to attempt ventilations with neonatal BVM and transport.
8. If **HR remains < 60/min** despite warming, stimulation, 15 L O_2/neonatal BVM and chest compressions:
   Assess ECG using peds pads/paddles.
   EPINEPHRINE (1 mg/10 mL) **0.01 mg/kg** (0.1 mL/kg) **IVP**/IO. If arrest: immediate IO if no other IV access in place.

Epinephrine dosing repeat q. 3-5 min if indicated			
Wt.	Total drug volume	Wt.	Total drug volume
1 kg (2.2 lbs)	0.1 mL	3 kg (6.6 lbs)	0.3 mL
2 kg (4.4 lbs)	0.2 mL	4 kg (8.8 lbs)	0.4 mL
If hypoglycemic; $D_{10}W$ 0.5 m/kg (5 mL/kg)			
2 kg = 10 mL	3 kg = 15 mL	4 kg = 20 mL	5 kg = 25 mL

9. **Assess heel-stick glucose:** Neonatal hypoglycemia - **glucose level < 30 mg/dL** in first 24 hours of life. Rx as above.
10. **Once ventilations and HR adequate:** Provide warm environment**; c**ontinue to support ABCs; O_2 neonatal NRM prn

OBSTETRICAL COMPLICATIONS

Time sensitive pts

BLEEDING IN PREGNANCY

Threatened miscarriage / Ectopic pregnancy / Placenta previa / Abruptio placenta

1. **IMC** special considerations:
   - Position patient on side if > 20 wks gestation
     Raise either side of backboard if spine motion restriction is necessary; manually displace uterus to side
     Obtain BP while patient is positioned on side
   - **O_2** 12-15 L by tight fitting mask even w/o respiratory distress until $SpO_2 \geq 96\%$;
     SpO_2 must be > 94% for adequate fetal oxygenation.
   - Anticipate significant bleeding/shock. If AMS or signs of hypoperfusion:
     Warm NS IV fluid challenges in 200 mL increments **titrated to patient response**. Repeat as necessary.
     Permissive hypotension is contraindicated in pregnant women. Maintain SBP ≥ 90 (MAP≥ 65).
   - Obtain pregnancy history per Emergency Childbirth SOP
   - Ask about the onset, provocation, quality, region, radiation, severity, and duration of abdominal pain
2. Complete serial abdominal exams per OB Trauma SOP
3. Note type, color, amount, and nature of vaginal bleeding or discharge
   If tissue is passed, collect and transport to hospital with patient
4. See notes on bleeding/shock in OB Trauma SOP

PRE-ECLAMPSIA OR HYPERTENSION OF PREGNANCY

Diastolic BP > 90 with additional signs that include, but are not limited to, moderate to severe fluid retention/edema, rapid weight gain (>10 lbs in one week), headache, diplopia or blurred vision, photophobia, confusion, irritability, AMS, epigastric distress; nausea/vomiting; claims to be spilling protein in urine.

1. **IMC** special considerations:
   - **GENTLE HANDLING,** quiet environment
   - Position patient on side if > 20 wks gestation. Manually displace uterus to the side
     Obtain BP while patient is positioned on side
   - Obtain pregnancy history per Emergency Childbirth SOP; *monitor FHTs if possible*
   - Anticipate seizures; prepare suction, MAGNESIUM, MIDAZOLAM
   - If AMS: Assess glucose level. Rx per hypoglycemia SOP
   - Minimal CNS stimulation. Do **NOT** check pupil light reflex
   - Lights and sirens may be contraindicated. Contact OLMC for orders
2. **MAGNESIUM** (50%) **2 Gm** in NS to total volume 20 mL (slow IVP) over 5 min
   (Alt. 2 Gm in 50 mL NS IVPB on mcgtt tubing over 10 min). Max 1 Gm / minute.
   Begin on scene, continue enroute. Put gauze moistened in cold water or cold pack over IV site to relieve burning.
   Anticipate seizures; prepare suction

If generalized tonic clonic seizure activity (ECLAMPSIA):

3. **MAGNESIUM** (50%) **2 Gm** in NS to total volume 20 mL (slow IVP) over 5 min
   (Alt. 2 Gm in 50 mL NS IVPB on mcgtt tubing over 10 min). Max 1 Gm / minute.
   If pt. received 2 Gm for preeclampsia prior to experiencing a seizure, may give an additional 2 Gm to Rx seizure
4. **If seizure persists after magnesium:**
   MIDAZOLAM 2 mg increments IVP/IO q. 30-60 sec (0.2 mg/kg IN*)* **up to 10 mg IVP/IO/IN** titrated to stop seizure.
   If IV/IO unable and IN contraindicated: IM dose 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose.
   All routes: may repeat to total of 20 mg prn if SBP ≥ 90 (MAP ≥ 65) unless contraindicated.
   If chronic dx (HF); and/or on opiates or CNS depressants: ↓ total dose to 0.1 mg/kg.

PEDIATRIC PATIENTS (12 years or younger)

Age definitions

Newborn:	Neonate in first minutes to hours following birth	**Infant**:	Neonates to 12 months
Neonate:	Infants in the first 28 days of life	**Child**:	1 to 12 years

Special considerations

- Assessments & interventions must be based on the individuality of each child in terms of age, size, developmental and metabolic status.
- **Communications guidelines**: Look at their faces for clues to well-being. Keep small children w/ caregivers if at all possible. Do assessments while they are being held. Speak slowly & calmly in words they understand.
- Younger children do not appreciate time. Explain things in "need to know" time.
- **Fear**: Use non-medical techniques, i.e., pacifiers, toys, to calm child: Let them play with penlights, etc.
- **Pain**: Children do not localize pain well. Defer painful part of exam to last if possible.
- **Shock:** Children can maintain their SBP until a 30% volume loss, and then crash rapidly.
- Prone to heat loss & **cold stress** which may result in acidosis, hypoxia, bradycardia, hypoglycemia & cardiac arrest.
- **Gastric distention** develops from crying → ventilatory impairment.

PEDS INITIAL MEDICAL CARE

Assess for causative factors of distress: Hypoxemia, acidosis, hypovolemia (dehydration), hypoglycemia, hypothermia, tension pneumothorax, cardiac tamponade, shock, poisoning/ingestion, or severe infection; initiate resuscitative measures.

1. **Scene size up**: Situational awareness; dynamic risk assessment –Assess/intervene as needed:
   - Scene safety; control and correct hazards; remove pt/crew from unsafe environment ASAP; if potential crime scene, make efforts to preserve integrity of possible evidence
   - Nature of illness; scan environment for clues; DNR/POLST orders
   - Universal blood/body secretion & sharps precautions; use appropriate personal protective equipment prn
   - Number of patients; triage / request additional resources if needed. Weigh risk of waiting for resources against benefit of rapid transport to definitive care. Consider if medium or large scale MPI declaration is needed.
2. **PRIMARY ASSESSMENT/RESUSCITATION**: establish rapport with patient/significant others
   - **General impression:** age, gender, preferred position, purposeful movements
     Pediatric assessment triangle: General appearance; work of breathing; circulation to the skin
     Observe response to environment (recognize parents/pets/toys), obvious respiratory distress or extreme pain, odors, muscle tone (good or limp), movements (spontaneous/ purposeful), irritable, consolable/non-consolable
   - Estimate size using a length-based tape (Broselow or equivalent)
   - Determine if immediate life threat exists and resuscitate as found
   - **Level of consciousness** using AVPU or Peds GCS; chief complaint S&S
     If unconscious, apneic or gasping, & pulseless START QUALITY CPR – see appendix
   - **AIRWAY**: snoring, gurgling, stridor, silence; consider possible spine injury
     Initiate **selective spine precautions** if indicated; vomiting/seizure precautions
     - Reposition; suction prn using size-appropriate catheter; appropriately-sized airway adjuncts.
       Limit suction application to 5 sec. Monitor ECG for bradycardia during procedure.
       If child is intubated: Max suction of -80 to -120 mmHg; higher suction pressures OK for mouth/pharynx
     - **If Obstructed**: Go to AIRWAY OBSTRUCTION SOP
     - Vomiting and seizure precautions as indicated
   - **BREATHING/gas exchange/adequacy of ventilations**: Assess/intervene as needed:
     Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing), position, air movement, symmetry of chest expansion; accessory muscle use (nasal flaring); retractions, head bobbing, expiratory grunting. Lung sounds if in ventilatory distress.
     - **SpO_2** if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O_2 if able. Clinical recognition of hypoxia may not be reliable. SpO_2 unreliable in pts w/ poor peripheral perfusion, CO poisoning or methemoglobinemia. If SpO_2 abnormal; move sensor to central site and reassess.
     - **$ETCO_2$** number & waveform if possible ventilatory/perfusion/metabolic compromise

     Reduce anxiety if possible to decrease O_2 demand & work of breathing.

     Anticipate deterioration or imminent respiratory arrest if: Increased or decreased RR esp. if accompanied by S&S of distress, increased effort; poor chest excursion; diminished peripheral lung sounds; gasping or grunting; decreased LOC or response to pain; poor skeletal muscle tone; or cyanosis.

PEDS INITIAL MEDICAL CARE

Correct hypoxia/assure adequate ventilations: Target SpO_2: 94%-98%

- O_2 1-6 L/Peds NC: Adequate rate/depth; minimal distress; SpO_2 92%-94%
- O_2 12-15 L/Peds NRM: Adequate rate/depth: mod/severe distress; SpO_2 < 92%
- O_2 15 L/ Peds BVM: Apnea and/or shallow/inadequate rate/depth with mod/severe distress; unstable
  Ventilate 1 breath every 3 to 5 sec; just to cause visible chest rise.

- **CIRCULATION / PERFUSION / HYDRATION / ECG**:
  - **Pulse**: General rate (consider activity & stress levels), quality, & regularity of central vs. peripheral pulses
    If NO central pulse & unresponsive OR pulse present but < 60 in infant or child with poor perfusion:
    Begin quality CPR – See appendix – appropriate SOP for rhythm/condition.
  - **Perfusion**: Mental status; skin: color, temperature, moisture; cap refill on a warm area of the body
  - **Hydration status**: General appearance (restless, irritable, lethargic, or unconscious; anterior fontanelle in infants, breathing (normal or deep); mucous membranes, skin turgor, presence/absence of tears when crying; urine output (# diapers)

Conditions requiring rapid cardiopulmonary assessment and potential cardiopulmonary support*:

- **Monitor ECG if unstable**. Standard size electrodes/defib pads may be used in children > 10 kg. (Use largest size that fits chest wall w/o touching with 3 cm between them). Prepare peds defib paddles if no pads.
  Peds ECG: PR & QRS intervals are shorter Be alert for conduction abnormalities in what looks like "normal" intervals or complex durations in young children. T waves normally inverted V1-V3 up to 8 yrs.
  Consider need for peds 12 L ECG; based on chief complaint or PMH: same criteria as adults
  ALS patients do not necessarily require ongoing ECG monitoring or transmission of a strip to OLMC.
  If ECG is run, attach/append to PCR/EHR left at, faxed to, or downloaded to, the receiving facility.
- **Treat rate/rhythm/pump/volume/volume distribution disorders per appropriate SOP**.
  Most peds arrhythmias caused by hypoxemia, acidosis, or hypotension.
  Vascular access: Actual/potential volume replacement and/or IV meds prior to hospital arrival
  0.9% NS – Catheter size, access site, & infusion rate based on pt size, hemodynamic status; SOP or OLMC
  Peripheral IV challenging in infants/children during emergency – may use IO if unresponsive.
  Limit time spent establishing peripheral venous access in critically ill or injured child.
  If hypovolemic: **NS 20 mL/kg** IVP/IO in < 20 minutes. May repeat X 2 if necessary.
  Do not delay transport of time-sensitive pts to establish elective vascular access on scene

***Conditions requiring rapid cardiopulmonary assessment and/or potential cardiopulmonary support**

- Respiratory rate > 60 breaths/min Cyanosis or a decreased SpO_2 despite administration of O_2
- Increased work of breathing (retractions, nasal flaring, grunting), respiratory fatigue and/or failure
- Heart rates: (Weak, thready, or absent peripheral pulses) Child ≤ 8 years: < 80 BPM or > 180 BPM
  Child > 8 years: < 60 BPM or > 160 BPM
- Poor perfusion, dysrhythmias; chest pain
- Altered LOC (syncope, unusual irritability or lethargy or failure to respond to parents or painful procedures)
- Seizures
- Trauma
- Post-ingestion of toxic substance
- Fever with petechiae
- Burns involving > 10% BSA
- Hypoglycemia

- **Disability**: Brief pupil check; mental status using peds GCS (see below); ability to move all four extremities.
  If AMS or cardiac arrest - glucose level: If < 70: Treat per Hypoglycemia SOP
- **Expose** and examine as indicated/**E**nvironmental control: keep warm with protected hot packs/blankets/warmers as able

PEDIATRIC GLASGOW COMA SCORE

Eye Opening		Best Verbal Response						Best Motor Response	
Spontaneously	4	> 5 years Oriented/ converses	5	2-5 years Oriented, appropriate words/phrases	5	< 2 years Coos, babbles Appropriate words	5	Moves spontaneously and purposefully; obeys commands	6
To speech	3	Disoriented/ Converses	4	Confused	4	Irritable; cries but consolable	4	Localizes pain/ withdraws to touch	5
To pain	2	Inappropriate words	3	Inappropriate words/ Persistent cry	3	Cries to pain, inconsolable	3	Withdraws from pain	4
None	1	Incomp. sounds	2	Incomprehensive snds	2	Moans/grunts to pain	2	Abnormal flexion	3
		None	1	None	1	None	1	Abnormal extension	2
								None	1

PEDS INITIAL MEDICAL CARE cont.

3. **SECONDARY ASSESSMENT**
   - **Vital signs** - BP (MAP): Obtain 1st BP manually; use size-approp. cuff (min. ⅔ length upper arm), trend pulse pressures; orthostatic changes if indicated; Pulse: rate, quality, rhythmicity (appropriate site) count HR 30-60 sec; Respirations: rate, pattern, depth; Temp if indicated
   - If **FEVER**: Assess causes; hydration status. If dehydrated, may attempt IV X 1. If successful: NS 20 mL/kg IVP
     - Passively cool by removing all clothing but diaper/ underwear. Cover lightly. Do not induce shivering.
     - Do not give over-the-counter anti-fever meds unless ordered by OLMC. ASA contraindicated.
   - **Chief complaint; Hx of present illness; SAMPLE history**
     - **S&S: OPQRST** (symptom onset, provocation/palliation, quality, region/recurrent/radiation, severity, time); quantify pain using a pain scale that is consistent with the pt's age, condition, and ability to understand.
     - Age <4 yrs: Observational scale such as FLACC (see appendix)
     - Age 4-12 yrs: Self-report scale such as Wong-Baker Faces, numeric or verbal scales
     - **Allergies** (meds, environment, foods), **Medications** (prescription/over-the-counter – bring containers to hospital if possible), **PMH** (medic-alert jewelry; advance directives; medical devices/implants); **Last oral intake**/LMP **Events** leading to illness. In pts with **syncope, seizure, AMS, cardiac arrest, or acute stroke:** bring witness to hospital or obtain their **contact phone number** to provide to ED.
   - **Review of systems** based on chief complaint; S&S; practitioner scope of practice, and pt level of acuity
     - Head, eyes, ears, nose, throat/neck; jugular veins
     - Chest: Symmetry, chest wall movement; deformity, retractions; lung/heart sounds
     - Abdomen/pelvis/GU/reproductive organs: Inspect contour, symmetry; discoloration; pain; changes in function; auscultate bowel sounds; palpate (light); assess for rebound tenderness if S&S peritonitis
     - Extremities: Edema, pulses, discoloration; warmth, pain, motor/sensory changes/deficits
     - Back/flank: pain, discoloration
     - Neurologic: Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
     - Skin: color (variation), moisture, temp, texture, turgor, lesions/breakdown; hair distribution; nails

4. **Position:** Semi-Fowler's or position of comfort unless contraindicated or otherwise specified
   AMS: Place on side or elevate head of stretcher 10-30° unless contraindicated, to minimize aspiration

5. **Nausea: ONDANSETRON** 0.15 mg/kg (max **4 mg) ODT** [BLS] or slow IVP over no less than 30 sec [ALS].
   May repeat once in 10 min to a max of 8 mg.

6. **Pain:** Pharmacologic and non–pharmacologic (parental presence, distraction, topical use of cold packs) options should reflect a pt–centered approach based on specific needs. Consider pt. status, responder scope of practice, risks/benefits of each strategy. Provide individualized pain mgt. regardless of transport interval.
   If SBP ≥ minimum for age: **PEDS STANDARD DOSE:**

   FENTANYL: If > 2 yrs: 1 mcg/kg (round to closest 5 mcg -max single dose 100 mcg) IVP/IN/IM/IO.
   May repeat once in 5 min: 0.5 mcg/kg (max 50 mcg). Max total dose per SOP: 150 mcg (1.5 mcg/kg)
   Additional doses require OLMC: 0.5 mcg/kg q. 5 min up to a total of 3 mcg/kg (300 mcg) if indicated & available

   Peds -sedation: Children <6 yrs (esp. those < 6 mos) may be at greater risk for an adverse event from sedation and/or opiate pain medication. They are particularly vulnerable to the medication's effects on ventilatory drive, airway patency and protective airway reflexes.

   Safe sedation of children requires a systematic approach that includes the following:
   - Close supervision by qualified EMS practitioner(s)
   - Pre-sedation evaluation for underlying medical conditions that would place child at risk from sedating medications
   - Airway exam for large (kissing) tonsils or anatomic airway abnormalities that might increase risk from sedating meds
   - Clear understanding of medication actions, side effects, and drug interactions
   - Appropriate training and skills in pediatric sedation and airway/ventilator management to allow rescue of the pt
   - Age and size appropriate equipment for airway management and vascular access
   - Appropriate medications and reversal agents (per local policy/procedures)
   - Sufficient staff to provide medication and monitor patient
   - Appropriate physiologic monitoring and continuous observation before, during, and after the procedure
   - Practitioners must have the skills and age and size-appropriate equipment based on their scope of practice to rescue a child from a level of sedation that is deeper than desired, apnea, laryngospasm, and/or airway obstruction. This includes the ability to open the airway, suction secretions, perform successful bag-mask ventilations, insert an oral airway, a nasopharyngeal airway, an extraglottic airway, and rarely perform tracheal intubation per local policy/procedures. (Am Acad of Pediatrics, 2016)

7. **Ongoing assessment**: Reassess VS and pt responses to interventions. Every transported pt should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
   Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings
8. **Transport** all infants and children in an approved child restraint system, per the Illinois Child Passenger Protection Act (P.A. 83-8) eff. Jan. 1, 2004. Do not allow child to be held in anyone's arms or lap during transport.
9. **Selection of receiving facility**: Transport children to the closest ED approved for Pediatrics (EDAP).
   Stable pts may be transported to an alternate or more distant requested facility per local policy/procedure and/or with prior OLMC authorization.
10. **Refusal of service**: All peds refusals must have OLMC contact per System policy even if parent /guardian consents to release.

Age	Weight kg	Normal Systolic BP Ages 1-10 90 + (2 X age in yrs)	SBP minimums 70 + (2 X age in yrs)	Heart rate	Resp rate
Neonate (0-28 days)	3	>60 mmHg	>60 mmHg	100-180	30-60
Infant 1-12 mos	4-10	> 90 mmHg	>70	110-160	30-60
2 yr	12	>94	>70	90-150	24-40
4 yr	16	>98	>75	90-150	22-34
6 yr	20	>102	>80	70-120	18-30
8 yr	26	>106	>80	70-120	18-30
10 yr	32	>110	>90	70-120	18-30
12 yr	41	>110	>90	60-110	12-16

Children with SPECIAL HEALTHCARE NEEDS (CSHN)

- Track CSHN in your service area; become familiar with the child and their anticipated emergency care needs.
- Refer to child's emergency care plan, if available. Is current presentation significantly worse than their baseline? Caregivers are best source of info on meds, normal baselines, functional levels, usual color, RA SpO_2 readings, likely complications, equipment operation and troubleshooting, and emergency procedures.
- **Assess in a systematic and thorough manner**. Observe for ↑ or ↓ RR, use of accessory muscles, retractions, cyanosis, extremity edema, hydration status; palpate for ↑ or ↓ HR, decreased peripheral pulses, cool extremities, poor cap refill; listen carefully for crackles or wheezes. If child has known paralysis carefully examine extremities for injury.
- Anticipate differences in anatomy, physical & cognitive development, possible surgical alterations or mechanical adjuncts.
- **Common home therapies:** respiratory support (O_2, apnea monitors, pulse oximeters, BiPAP/CPAP, mechanical ventilators, chest physical therapy vest), IV therapy (central venous catheters), multiple meds, nebulizer machines, feeding tubes and pumps, urinary catheters or dialysis (continuous ambulatory peritoneal dialysis), biotelemetry, ostomy care, orthotic devices, communication or mobility devices, or hospice care.
- Maintain appropriate age/developmental level communication and remain sensitive to parents/caregivers & child.
- Ask parents for child's daily medical record notebook or medical information form to take to hospital. Ask caregiver to accompany EMS to hospital to continue assisting w/ child's care if possible.

BLS Interventions:

1. **Assess and support ABCDs**: Closely monitor airway, RR, HR & mental status. Support airway of those who have difficulty handling oral secretions (severe cerebral palsy, mental retardation). Provide O_2 (or manual resuscitation) when indicated. If child normally has a bluish color or SpO_2 <90%, use extreme caution in giving O_2. Give just enough to return to normal baseline.
2. Suction the nose, mouth, or tracheostomy tube as needed.
3. **Positioning**: place in position of comfort. If "*tet spell*" from tetralogy of Fallot, position on side with knees pulled to chest to ↑ systemic resistance.
   If shunt failure; sit up if possible to ↓ICP. Protect weak or paralyzed limbs. Do not attempt to straighten contracted extremities. Support with pillows/ towels in a position of comfort. Most respond best to slower movements & secure contact.
4. Flashing ambulance strobe lights can trigger a seizure in a child w/ known seizure disorder. Cover their eyes or turn off lights, if safety allows, when moving child in and out of the ambulance.
5. Technology-assisted children may experience an emergency if equipment fails to function. Use EMS equipment to support child.

ALS Interventions

6. Consider need for **intubation** if in respiratory failure
7. **Vascular access** if IV meds or fluids needed. If chronic cardiac condition: IVF only per OLMC. NS 20 mL/kg IVF bolus if hypoperfused. If on anticoagulant like Coumadin (warfarin), use caution when starting IV or when handling child. They bruise easily and may have difficulty clotting.
8. Avoid placing **defib pads** over internal pacemaker generator (usually found in upper chest).
9. Consider use of inotropes (epinephrine) w/ severe hypotension unresolved with fluid boluses.
10. Rx **seizures** per SOP; monitor ECG as arrhythmias may be present in CSF shunt failure.
11. **Decompress stomach** by venting (opening) feeding tube if abdomen is distended.

Chronic respiratory or cardiac problem notes:

- If > 6 yrs and has a peak flow meter at home, ask child to blow into monitor to determine current reading. If < 50% "personal best" or unable to blow into the meter, child is in severe distress (red zone).
- Ask caregiver if any meds have been given in last 2 hrs to reverse respiratory distress. If yes, monitor for med effects. Base further management on therapies already given at home.
- If infant receives home O_2 therapy of 2 L or less by NC and presents in respiratory distress, do not give more than 2 L/NC. Increase O_2 delivery with blow-by O_2 or placing a facemask at no less than 6 L/min over child's nose & mouth.
- Take appropriate steps so child does not inhale noxious fumes from running ambulance.

Osteogenesis Imperfecta: Use extreme caution when moving child or taking BP. Use a draw sheet. Hare traction contraindicated. Pad between stretcher straps and child. Drive cautiously. Avoid sudden jolts that could cause a fracture.

Sickle cell disease:

- Vaso-occlusive crisis is very painful. Place warm compresses over swollen joints. Request OLMC orders for pain med.
- Very susceptible to infection d/t malfunctioning spleen. ✓ for fever, abd pain. S&S of stroke suggest a medical emergency.
- Vascular access challenging d/t frequent sticks. Give 20 mL/kg IVF bolus if signs of shock.

Hemophilia: Bleeding will not stop w/ conventional methods. Needs missing clotting factors at hospital.

Leukemia: Fever is an emergency; immune system is suppressed. Wear masks and gloves when caring for pt.

PEDS AIRWAY ADJUNCTS

CHILDREN < 12 years of age shall have airways secured using BLS adjuncts & interventions

If unable to secure airway with BLS interventions: May make 1 attempt at advanced airway per OLMC only

ADOLESCENTS > 12 yrs: Manage airways per adult SOPs

Possible indications for advanced airway in children

- Persistent airway impairment, ventilatory failure (apnea, RR <10 or >40; shallow/labored effort; $SpO_2 \leq 92$; increased WOB (retractions, nasal flaring, grunting) $\rightarrow$ fatigue
- Inability to ventilate/oxygenate adequately after insertion of OP/NP airway and/or via BVM
- Need for $\uparrow$ inspiratory or positive end expiratory pressures to maintain gas exchange or sedation to control ventilations.

Contraindications/restrictions for DAI: Coma with absent airway reflexes or known hypersensitivity/allergy to drugs

1. Consider and Rx causes of obstruction; position, suction, manual maneuvers, medications if an allergic reaction, consider need for direct laryngoscopy and removal of FB; attempt to ventilate w/ peds BVM
2. AMS & airway patent: Gag reflex present: > 4 yrs: NPA; No gag reflex: OPA
   Airway remains impaired: <12 years of age: Consider need for advanced airway: Contact OLMC
   Asses SpO_2, evaluate before & after airway intervention; confirm patent IV; ECG monitor
3. **Position:** Age < 8; pad under torso; Age ≥ 8: Sniffing position with pad under occiput
4. **Preoxygenate:** O_2 12-15 L/NRM or BVM every 3 to 5 sec. for 3 min. just to see the chest rise
5. Assess for difficult intubation, i.e., mobility of the mandible, loose teeth or F/B
6. **Prepare equipment**
   - Check suction source; attach rigid tip (Yankauer/tonsillar); prepare advanced airway and cricothyrotomy equipment
   - Select ET and/or alternate airway (King if taller than 4 ft) based on child's size, not chronological age
     Measure w/ Broselow tape up to 35 kg Cuffed ETT ID (mm) = 3.5 + (age/4) or size of 5th finger
   - Prepare tubes one size larger and one size smaller than the one estimated
7. **DAI premedications**
   - Gag reflex present: **BENZOCAINE** 1-2 second spray, 30 seconds apart X 2 to posterior pharynx
   - Pain: **FENTANYL: 1 mcg/kg** (round to closest 5 mcg **-max 100 mcg)** IVP/IN/IM/IO.
     May repeat X1 at 0.5 mcg/kg (max 50 mcg) in 5 min to a max of 1.5 mcg/kg/SOP
8. **DAI Sedation: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM
   Allow for clinical response before DAI (if possible); See notes on peds sedation in IMC
9. **Intubate per procedure**: Maintain O_2 6 L/NC during procedure
   - Apply lip retraction, external laryngeal pressure; in-line stabilization if indicated
   - Monitor VS, level of consciousness, skin color, $ETCO_2$ (if available), SpO_2 q. 5 min. during procedure
   - Interrupt DAI if HR < 60 or SpO_2 < 94%: 1 breath q. 3-5 sec w/ O_2 15 L//Peds BVM until condition improves.
10. **Confirm tube placement**
    - Monitor $ETCO_2$ (quantitative waveform capnography preferred)
    - Ventilate and observe chest rise; auscultate over epigastrium, bilateral anterior chest, and midaxillary lines
    - If $ETCO_2$ not detected, confirm position with direct laryngoscopy
4. **If successful:**
   - O_2 15 L/peds BVM ventilate every 3 to 5 seconds just to see chest rise
   - Inflate cuff if present (avoid overinflation); note ET depth: diamond on ETT level w/ teeth or gums (3 X ID ETT)
   - Secure ETT with commercial device. Reassess $ETCO_2$ & lung sounds. Apply lateral head immobilization.
   - **Post-intubation sedation** if SBP > 70 + 2 X age or ≥ 90 if 10 -12 yrs: **MIDAZOLAM 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM)** (max single dose 5 mg). May repeat to total of 10 mg based on size and BP.
   - Continue to monitor $ETCO_2$ or capnography to confirm tracheal placement.
12. **If intubation unsuccessful and good air exchange** w/ peds BVM: Continue ventilations/BVM.

    If unable to intubate or adequately ventilate with BVM: Consider need for needle cricothyrotomy.

If intubated & deteriorates, consider: **D**isplacement of tube, **O**bstruction of tube, **P**neumothorax, **E**quipment failure (DOPE)

PEDIATRIC FOREIGN BODY AIRWAY OBSTRUCTION

S&S partial airway obstruction:

• Stridor	• Wheezing	• Diminished/absent lung sounds	• Hoarseness
• Choking	• Grunting	• Altered mental status	• Drooling
• Tachypnea	• Tripod position	• Retractions	• Accessory muscle use

1. **Begin BLS IMC:**
   - Assess degree of airway impairment
   - Confirm severe airway obstruction: Determine responsiveness and sudden breathing difficulty, ineffective or silent cough, weak or silent cry
   - Position patient to open airway
   - Suction as necessary
   - Monitor for cardiac dysrhythmias (if able) and/or arrest

CONSCIOUS

ABLE TO SPEAK, COUGH, or CRY:

2. **Complete IMC**: Do not interfere with patient's own attempts to clear airway by coughing or sneezing

CANNOT SPEAK, COUGH, or CRY:

3. Child 1-12 yrs.: Abdominal thrusts with patient standing or sitting
   Infant < 1 yr: Up to 5 back slaps and up to 5 chest thrusts
4. **If successful**: Complete **Initial Medical Care** and transport
5. **If still obstructed:**
   - Repeat step 3 while enroute until effective or patient becomes unresponsive (see below).
   - Monitor for cardiac dysrhythmias and/or arrest.

UNCONSCIOUS

Any time efforts to clear the airway are successful complete **Initial Medical Care**

2. Open airway using chin lift & look for foreign body in the mouth/pharynx.
   If visible, remove it w/ a finger sweep or suction. Do not perform a blind finger sweep.
   Attempt to ventilate.
3. **If still obstructed:** Begin CPR

ALS interventions:

4. Perform **direct laryngoscopy** as soon as possible to inspect for F/B. Remove w/ forceps.
5. **Still obstructed and unable to ventilate**
   - Intubate and attempt to push the F/B into right mainstem bronchus, pull ET back and ventilate left lung.
   - Treat per Peds IMC and Peds Airway Adjuncts SOPs.

PEDS RESPIRATORY ARREST

Time sensitive pt

Apnea with detectable cardiac activity. Different from respiratory compromise leading to assisted ventilation.

1. **IMC special considerations:**
   - Position patient to open airway; if unconscious: use jaw thrust or head tilt-chin lift.
   - Assess possible causes and Rx per appropriate SOP: F/B obstruction, respiratory illness, trauma, infection, near drowning, poisoning/OD, burn/smoke inhalation.
   - If possible spine injury; provide manual spine precautions while opening airway.

Breathing resumes	**Breathing not resumed definite pulse present**
2. Secure airway per Peds IMC; **O_2** 15 L/peds NRM.	2. Ventilate with OPA & peds BVM 1 breath every 3 -5 sec Unable to ventilate: Peds Airway Adjuncts SOP. Recheck pulse every 2 minutes.
3. **If normal perfusion:** ▪ Support ABCs; observe ▪ Complete primary assessment ▪ Keep warm	3. **If hypoperfusion:** ▪ Establish vascular access **NS IV/IO** per Peds IMC. ▪ Monitor ECG & Rx dysrhythmias per Peds SOPs ▪ Refer to shock protocols and support perfusion.

4. **If possible narcotic/opioid OD:**
   NALOXONE 0.1 mg/kg (max single dose 0.4 mg) **IVP/IN/**IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [EMTs/EMRs: IN and IM]
5. **Assess glucose**. If < 70: treat per Peds Hypoglycemia SOP

SUDDEN INFANT DEATH SYNDROME (SIDS)

SIDS is the sudden death of any infant or young child that is unexplained by history and an autopsy.

1. Confirm the absence of VS.
2. In most cases the baby is not discovered until there are long-term indications of death.
   - If child meets criteria for triple zero, do not move the body, notify police.
   - If the child does not meet criteria for triple zero, begin resuscitation per appropriate SOP.
3. Document the time, location, and circumstances in which the child was found.
4. Treat the body with gentleness and dignity. Assist the caretaker/parent(s) in coping with their initial grief reactions. Be prepared for disbelief, denial, anger, guilt, confusion, anxiety, terror, sadness, crying, and/or hysteria.
5. Be extremely cautious about what you tell the parents. In their grief, they will not remember instructions and may be very sensitive to any statements that may imply that they should or should not have acted differently before your arrival. Give them one clear instruction at a time; keep your words simple.

Brief Resolved Unexplained Events [BRUE] (formerly known as ALTE -apparent life-threatening event)

Event in an infant <1 yr. when observer reports a sudden, brief, and now resolved episode of ≥1 of the following: **(1) cyanosis or pallor; (2) absent, decreased, or irregular breathing; (3) marked change in muscle tone (hyper- or hypotonia); and (4) altered level of responsiveness**. Diagnosed only when there is no explanation for a qualifying event after an appropriate history and physical examination.
Classified as lower or higher-risk, based on history and physical examination.

BLS

1. Obtain complete history/circumstances associated with event or symptoms: Severity, duration & nature of event
   Assess for concurrent S&S: fever, cough, runny nose, vomiting, diarrhea, rash, labored breathing.
   Prior history of BRUE event in last 24 hrs; family Hx of SIDS.
2. Treatment/interventions performed prior to EMS arrival
3. Hx premature birth before 37 wks gestation. PMH of cardiac, neurologic, respiratory or chromosomal anomalies; Hx of GERD
4. Complete VS; observe for S&S resp distress (grunting, nasal flaring, retractions); color (pallor, cyanosis, normal)
5. Mental status exam: alert, tired, lethargic, unresponsive, irritable.
6. Physical exam for external S&S of trauma
7. ECG, SpO_2, glucose monitoring; support ABCs per peds IMC. All should be transported to EDAP/PCCC.

PEDS ALLERGIC Reaction
ANAPHYLACTIC Shock

1. **IMC** special considerations:
   - Repeat assessments for patent airway, airway edema; wheezing, respiratory effort & adequacy of perfusion
   - Ask about a history of allergies vs. asthma; determine if EpiPen used
   - Apply venous constricting band proximal to bite or injection site if swelling is ↑ rapidly
   - Attempt to identify and/or remove inciting cause: scrape away stinger
   - Apply ice/cold pack to bite or injection site unless contraindicated
   - Do NOT start IV, give meds, or take BP in same extremity as a bite or injection site

LOCAL Reaction: No AMS, hives and edema at site of exposure or GI distress after food ingestion — **BP WNL for child**

2. Observe for progression and transport

Lower acuity: Mild SYSTEMIC Reaction — SBP > 70 +(2 X age) or ≥ 90 if 10 -12 yrs

S&S: Peripheral tingling, warmth, fullness in mouth and throat, nasal congestion, periorbital swelling, rash, itching, tearing, and sneezing

2. **DIPHENHYDRAMINE 1 mg/kg** (max 50 mg) **PO** [BLS] **/ IVP** [ALS]

EMERGENT: Moderate SYSTEMIC Reaction — SBP > 70 +(2 X age) or ≥ 90 if 10 -12 yrs

S&S: Above PLUS bronchospasm, dyspnea, wheezing, edema of airways, larynx, or soft tissues; cough, flushing, N&V, warmth, or anxiety

2. **EPINEPHRINE** (1mg/1mL) **0.01 mg/kg** (max single dose 0.3 mg) **IM** (vastus lateralus muscle) [BLS]
   - Typical dosing: 15 to 29 kg (33–65 lbs): **0.15 mg** >30 kg (66 lbs): **0.3 mg**
   - May repeat X 1 in 5-10 min prn; **DO NOT DELAY TRANSPORT waiting for a response**
3. **DIPHENHYDRAMINE 1 mg/kg** (50 mg max) **IVP** [ALS]; if no IV give **IM** [BLS]
4. If wheezing: **ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg** via HHN/mask. Add O_2 6 L/NC if SpO_2 <94% [BLS]

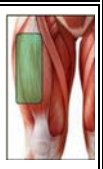
CRITICAL: Severe SYSTEMIC Reaction/ANAPHYLACTIC Shock — Hypotensive for age

Life-threatening Time sensitive pt

Likely allergy; 2 or more of the following occurring rapidly after exposure:
- **Skin signs**: Itching, flushing, hives, swelling/edema
- **Respiratory compromise**: Severe dyspnea, hypoxia, decreased/absent lung sounds, wheeze, stridor, hoarseness
- **Cardiovascular collapse:** HYPOTENSION; dysrhythmias; syncope, or coma

Others: GI edema (dysphagia, intense abdominal cramping/pain, diarrhea, vomiting)

2. **IMC** special considerations:
   EPINEPHRINE (1 mg/1mL) **0.01 mg/kg** (max single dose 0.3 mg) **IM** (vastus lateralus muscle) [BLS]
   Typical dosing: 15 to 29 kg (33–65 lbs): **0.15 mg** >30 kg (66 lbs): **0.3 mg**
   - If airway/ventilations severely compromised: Rx per Peds Airway Adjuncts SOPs
   - **IV NS fluid challenge 20 mL/kg IVP/IO** X 3 if indicated; Goal BP adequate for age/size; CPR if indicated
   - DO NOT DELAY TRANSPORT waiting for response



As soon as vascular access is successful:

3. **EPINEPHRINE** (1 mg/10mL) titrate in **0.01 mg/kg** (0.1 mL/kg) doses q. 1 min up to max total 1 mg [IM + IVP/IO]
   Reassess after each 0.01 mg/kg.
   If no IV/IO: May repeat EPI (1mg/1mL) 0.15 mg - 0.3 mg IM as above in 5 min [BLS]
   If additional doses are needed; contact OLMC
4. **DIPHENHYDRAMINE** 1 mg/kg (max 50 mg) IVP/IO; if no IV/IO give IM [BLS]
5. If wheezing: **ALBUTERO**L 2.5 mg (3 mL) **& IPRATROPIUM** 0.5 mg /HHN/mask or peds BVM [BLS].
   May repeat X 1 enroute. [BLS]. If additional doses are needed due to long transport time: Contact OLMC

If cardiac arrest occurs – Begin quality CPR; Prolonged CPR indicated while S&S of anaphylaxis resolve
- Start 2nd vascular access line; give IVF as rapidly as possible (up to 20 mL/kg) (use pressure infusers if available)
- **EPINEPHRINE** (1mg/10mL) **0.01 mg/kg** up to 1 mg **IVP/IO q. 2 min** (high dose); treat dysrhythmias per appropriate SOP

PEDS ASTHMA

1. **IMC** special considerations:
   - Evaluate ventilation/oxygenation (SpO_2), WOB, accessory muscle use, degree of airway obstruction/ resistance, speech/cry, cough, lung sounds, mental status, fatigue, hypoxia, CO_2 narcosis and cardiac status.
   - Obtain SAMPLE Hx: triggers for attacks; usual severity of attacks; current asthma meds; time and amount of last dose; duration of this attack.
   - **If wheezing w/o Hx of asthma**: Consider FB aspiration, respiratory infection, cardiac cause
   - Assess for pneumonia, atelectasis, pneumothorax or tension pneumothorax
     If tension pneumothorax (↓ BP, ↓ /absent lung sounds affected side): Needle pleural decompression
   - **Airway/Oxygen per Peds Airway Adjuncts SOPs** if near apnea, AMS, fatigue, hypoxia, or failure to improve with maximal initial therapy
   - **IV access:**
     - **Mild distress**: No IV usually necessary
     - **Moderate to severe distress**: IV NS titrated to maintain hemodynamic stability
   - **Monitor ECG**. Bradycardia signals deterioration of patient status

Lower Acuity to EMERGENT: Mild to Moderate distress with wheezing and/or cough variant asthma;SpO_2 ≥ 95%:

2. **ALBUTEROL 2.5 mg** (3 mL) & **IPRATROPIUM** 0.5 mg via HHN or mask

BLS

   - Supplement w/O_2 6 L/NC if patient is hypoxic and using a HHN
   - **Begin transport as soon as started**. Do not wait for a response.
   - Continue enroute [BLS]. May repeat X 1 as needed.

CRITICAL (Severe distress): Severe SOB, orthopnea, use of accessory muscles, speaks in syllables, tachypnea, lung sounds diminished or absent; exhausted; HR & BP may be dropping; SpO_2 ≤94%

Time sensitive pt

2. **EPINEPHRINE** (1 mg/1mL) **0.01 mg/kg** (0.01 mL/kg) to a max of 0.3 mg (0.3 mL) IM [BLS].
   Typical dosing: 15 to 29 kg (33–65 lbs): **0.15 mg** ≥ 30 kg (66 lbs): **0.3 mg**
   - Caution: Experiencing significant side effects (tachycardia) to Albuterol
   - Begin **transport as soon as Epi is given. Do not wait for a response.**
   - May repeat X 1 in 10 minutes if minimal response

   Follow immediately with

   ALBUTEROL 2.5 mg & IPRATROPIUM 0.5 mg via HHN, mask, or BVM
   Continue enroute [BLS]. May repeat X 1 as needed.

3 **If severe distress persists:**

   MAGNESIUM (50%) **25 mg/kg** (max 2 Gm) mixed with NS to total volume of **20 mL** (slow IVP) over 10 min or (Alt. in **50 mL IVPB** on mcgtt tubing) over 10 min. Max 1 Gm/5 min.
   Put gauze moistened in cold water or cold pack over IV site to relieve burning.

4. Go to appropriate SOP if HR < 60 or patient becomes pulseless or apneic

Cough Variant Asthma: Pediatric asthma may present differently from the adult form. Children may not wheeze, but may continuously cough for 20-30 min after excitement or exercise (cough variant asthma), or they may abruptly vomit. Even incremental edema/bronchoconstriction may cause severe air exchange problems due to the small diameter of their airways.

The inability of peds patients to increase their tidal volumes often results in markedly ↑ RR which rapidly dehydrates the airways and accelerates the development of mucous plugs. Hypoxemia & hypercarbia lead to acidosis and bradycardia. Treat aggressively.

CROUP / EPIGLOTTITIS / RSV / Bronchiolitis

1. **IMC** special considerations:
   - **Asses level of consciousness**: alert, tired, restless to lethargic, unresponsive
   - **Assess air entry** (normal, mild delay, diminished); **lung sounds** (clear, wheezes, crackles, diminished)
   - **Signs of distress**: (grunting, nasal flaring, retracting, stridor); weak cry or inability to speak full sentences
   - **Color** (pallor, cyanosis, normal)
   - **Hydration status** (+/- sunken eyes, delayed cap refill, moisture of mucus membranes, fontanelles)
   - **If airway/ventilatory distress**: Prepare airway/suction equipment; O_2 15 L/peds NRM; assess tolerance to O_2 administration; if inadequate ventilations: O_2 per Peds BVM
     Do NOT attempt NPA/OPA, intubation, glottic visualization, or vascular access unless CR collapse.
   - **Avoid agitation**. Allow adult to hold upright in position of comfort until transport. Transport in sitting position if possible.
   - **Monitor SpO_2** for hypoxia and **$ETCO_2$** for ventilatory, perfusion, & metabolic deficits if sensors available
   - **Monitor ECG** for changes in heart rate. Bradycardia signals deterioration.

CROUP: 1-3 day Hx inflammation & edema of larynx, trachea and bronchi usually caused by a virus; producing respiratory distress, dyspnea; ↑ RR; marked stridor, retractions, hoarse voice, barking cough, low grade fever

Emergent - Critical: Time Sensitive

Lower acuity: NONE TO MILD cardiorespiratory compromise: Peds IMC & transport.

Emergent to CRITICAL: Moderate to severe cardiorespiratory compromise: Cyanosis, marked stridor or respiratory distress. If toxic-appearing, consider bacterial tracheitis or epiglottitis.

2. Nebulize **EPINEPHRINE** (1 mg/10mL) **0.5 mg** (5 mL) **w/ 6 L O_2**/HHN/mask (aim mist at child's face) or /BVM.
   Do not delay transport setting up medication. Consider possible epiglottitis and Rx as below if obstruction progresses.

EPIGLOTTITIS: Usually caused by bacterial infection; rapid onset with drooling; dysphonia (difficulty speaking); dysphagia (difficulty swallowing);distressed inspiratory efforts/respiratory distress; nasal flaring, ashen, gray color; retractions; inspiratory stridor or wheezes (not as loud as croup); high fever

Time Sensitive pt

EMERGENT: None to mild cardiorespiratory compromise: No cyanosis, effective air exchange:

2. Peds IMC only. Sit up; anticipate rapid deterioration of condition and be prepared for below.

CRITICAL: Moderate to severe cardiorespiratory compromise:
Bradycardia, AMS, marked ventilatory distress, retractions, ineffective air exchange, and/or actual or impending respiratory arrest.

2. Nebulize **EPINEPHRINE** (1 mg/10mL) **0.5 mg** (5 mL) **w/ 6 L O_2**/HHN/mask (aim mist at child's face) or /BVM.
   Position to optimize air exchange (upright); do not delay transport setting up medication.
3. **If continued inadequate ventilations/oxygenation:** Position supine in sniffing position; O_2/high flow NC/mask
   If ventilatory failure: 15L O_2/Peds BVM at age-appropriate rate using slow compressions of bag.
   If unable to ventilate: Temporarily stop ambulance; provide airway per Peds Airway Adjuncts SOP: Least invasive way possible
   Be prepared for airway status to worsen after unsuccessful intubation attempt.

Respiratory Syncytial Virus (RSV)/Bronchiolitis: Child <2 w/ S&S of **bronchiolitis** or pneumonia. Early S&S like common cold: runny nose, cough, mild fever. Breathing becomes more labored w/ fever. Severe: retractions; apnea; prolonged expiration w/ air trapping and wheezing; RR rapid and shallow; w/ increasing exhaustion child may develop respiratory/cardiac arrest.

Time Sensitive pt

EMERGENT: None to mild cardiorespiratory compromise: Peds IMC only. Anticipate rapid deterioration

CRITICAL: Moderate to severe cardiorespiratory compromise:
Bradycardia, AMS, marked ventilatory distress, retractions, ineffective air exchange, and/or actual or impending respiratory arrest.

2. Nebulize **EPINEPHRINE** (1 mg/10mL) **0.5 mg** (5 mL) **w/ 6 L O_2**/HHN/mask (aim mist at child's face) or /BVM.
   Position to optimize air exchange (upright); Do not delay transport setting up medication.
3. **If continued inadequate ventilations/oxygenation:** Position supine in sniffing position; O_2/high flow NC/mask
   If ventilatory failure; 15L O_2/Peds BVM at age-appropriate rate using slow compressions of bag.
   If unable to ventilate: Temporarily stop ambulance; provide airway per Peds Airway Adjuncts SOP: Least invasive way possible.

PEDS BRADYCARDIA with a PULSE

Search for and treat possible contributing factors:

- Hypoxia or ventilation problem
- Hypovolemia
- Hydrogen ion (acidosis)
- Hyper/hypokalemia & metabolic disorders
- Hypoglycemia
- Hypothermia
- Toxins
- Tamponade, cardiac
- Tension pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma (hypovolemia, ↑ ICP, brain stem compression)
- Hx. heart surgery (risk sick sinus syndrome or heart block)
- Excessive vagal stimulation

1. **IMC** special considerations: Assess glucose: if < 70: Dextrose per Hypoglycemia SOP

LOWER ACUITY: None to mild cardiorespiratory/perfusion compromise

Alert, oriented, well perfused, and SBP normal for age

2. Assess and support ABCs as needed.

EMERGENT to CRITICAL: Moderate to Severe cardiorespiratory compromise

Time sensitive pt

Clinically symptomatic bradycardia for age or a rapidly dropping HR despite adequate oxygenation and ventilation associated with poor systemic perfusion, pale/cyanotic/mottled; diaphoretic, hypotension for age, respiratory difficulty/hypoxic, altered consciousness

2. **IMC special considerations cont.**
   - If unconscious and unresponsive to pain: Airway/ventilations using Peds IMC and Peds Airway Adjuncts SOP
   - Initiate CPR if HR < 60 in infant/child ***and*** poor systemic perfusion despite O_2 and ventilation: Compression to ventilation ratio 15:2 (30:2 if single provider)
   - IV/IO NS TKO: If S&S of hypovolemia: **NS 20 mL/kg IVP/IO**; may repeat X 2 if necessary
   - ECG monitoring; consider need for 12-lead ECG
   - Assess glucose: treat hypoglycemia per PEDs Glucose Emergencies SOP

Check for pulse and rhythm changes after each fluid bolus or drug:
Proceed to next step only if bradycardia & hypoperfusion persists:

3. **EPINEPHRINE** (1mg/10mL) **0.01 mg/kg** (0.1 mL/kg) up to 1 mg **IVP/IO every 3-5 minutes as needed.**

If bradycardia is due to ↑ vagal tone (intubation attempts), cholinergic drug toxicity, or persists after epi:

4. **ATROPINE 0.02 mg/kg rapid IVP/IO** unless contraindicated
   Contraindications: 2˚ Mobitz type II or 3˚ AVB w/ wide QRS; abnormal function of SA node; transplanted hearts (lack vagal innervation)
   - Minimum dose: 0.1 mg Max single doses - Child: 0.5 mg; Adolescent (13-17 yrs): 1 mg
   - May repeat X 1 in 5 min up to a max total dose of **1 mg** in a child; **2 mg** in an adolescent.

If epinephrine and atropine ineffective or contraindicated or no vascular access

5. Initiate **external pacing** if available at age-appropriate rate and lowest mA that achieves electrical and mechanical capture unless contraindicated
   Pacing not helpful for peds w/ ↓ HR due to post-arrest hypoxia/ischemic myocardial insult, resp. failure, or asystole
   Standard sized pace/defib electrodes may be used in children > 15 kg
   *Assess need for sedation and pain management as below

*IF SBP ≥ 70 + (2X age) or if 10-12 yrs: ≥ 90:

Sedation: MIDAZOLAM 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (max single dose 5 mg).
May repeat prn to total of 10 mg based on size, BP, & patient response.

Pain: **Moderate to severe pain, 2 yrs or older, and not contraindicated**:
FENTANYL standard dose: 1 mcg/kg (round to closest 5 mcg **-max 100 mcg)** IVP/IN/IM/IO.
May repeat once 0.5 mcg/kg (max 50 mcg) in 5 min to a max of 1.5 mcg/kg/SOP
Additional doses require OLMC. May repeat 0.5 mcg/kg q. 5 min up to a total of 3 mcg/kg (max 300 mcg)

PEDS NARROW QRS COMPLEX TACHYCARDIA

QRS 0.09 seconds or less in children > 3 years

Search for and treat possible contributing factors:

- Hypoxemia
- Hypovolemia/dehydration
- Hydrogen ion (acidosis)
- **Hyper**thermia
- Hyper/hypokalemia
- Tamponade, cardiac
- Tension pneumothorax
- Toxins/poisons/drugs
- Thromboembolism, coronary or pulmonary
- Pain
- Infection

Probable Sinus Tachycardia	**Probable supraventricular tachycardia** (SVT)
• History compatible w/ shock (dehydration/hemorrhage)	• History often vague & nondescriptive
• P waves present/normal	• P waves absent/abnormal
• HR often varies w/ activity; responsive to stimulation	• HR not variable w/ activity
• Variable RR w/ constant PR	• Abrupt rate changes w/ termination
• Infants: Rate usually < 220 BPM	• Infants: Rate usually > 220 BPM
• Children: Rate usually < 180 BPM	• Children: Rate usually > 180 BPM

Clinical presentations:

- Cardiorespiratory stability is affected by child's age, duration of SVT, prior ventricular function, and HR
- Older children C/O lightheadedness, dizziness, shortness of breath, chest discomfort, or note fast HR
- Infants: Fussiness, poor feeding, lethargy; may be undetected for long periods until low CO and shock develop

1. **IMC** special considerations:
   - NO cardiorespiratory compromise: Assess and support ABCs.
   - Obtain, review, and transmit 12-lead ECG if practical & available.
   - Establish NS TKO in proximal vein (AC); protect with arm board.
   - Defer vascular access until after cardioversion if unconscious.
   - If hypovolemic: **NS fluid bolus 20 mL/kg IVP** followed by re-evaluation.

Lower Acuity to EMERGENT: Mild to Moderate cardiorespiratory or perfusion compromise

Alert, HR > 150, SBP ≥ 70 + (2X age) or if 10-12 yrs: ≥ 90; normal perfusion and level of consciousness

2. If probable SVT: Assess need for vagal maneuvers (Monitor ECG, have child blow through a narrow lumen straw)
3. **ADENOSINE 0.1 mg/kg** (max 6 mg) **rapid IVP** follow w/ 5-10 mL NS flush
   Second dose: **0.2 mg/kg** (max 12 mg) **rapid IVP** follow w/ 5-10 mL NS flush
4. If rhythm improves but continued hypoperfusion: Refer to shock SOP.
   If no rhythm improvement: proceed to severe cardiorespiratory compromise.

CRITICAL: SEVERE cardiorespiratory compromise:

Time sensitive pt

Instability related to HR often > 200-230 beats per minute; may present with HF w/ ↓ peripheral perfusion, ↑ work of breathing, altered LOC, or hypotension

2. **IMC** special considerations in conscious patient:
   - If IV/IO in place: May give brief trial of meds while preparing for cardioversion. See above.
   - IF SBP > 70 + (2X age): Sedate prior to cardioversion: **MIDAZOLAM 0.1 mg/kg IVP/IO** (0.2 mg/kg IN) (max single dose 5 mg). May repeat to total of 10 mg based on size and BP. If condition is deteriorating, omit sedation.
3. **Synchronized cardioversion at 0.5 - 1 J/kg**
   If delays in synchronization and condition critical, go immediately to unsynchronized shocks.
4. **Cardioversion successful:** Support ABCs; observe
5. **Cardioversion unsuccessful: Synchronized cardioversion at** 2 J/kg
   Re-evaluate rhythm & possible causes (metabolic or toxic). Treat possible causes.

PEDS WIDE COMPLEX TACHYCARDIA with Pulse

Rate > 120 - (QRS 0.12 sec or longer) – VT; SVT with aberrancy, WPW; torsades de pointes

Search for and treat possible contributing factors:

- Hypoxemia
- Hypovolemia
- **Hypo**thermia
- Hyper/hypokalemia; hypoglycemia
- Tamponade, cardiac
- Tension pneumothorax
- Toxins/poisons/drugs
- Thromboembolism
- Pain
- Congenital heart disease
- Cardiomyopathy, myocarditis
- Prolonged QT syndrome.

1. Uncommon. Assess for hypoperfusion, cardiorespiratory compromise, & acidosis. May be difficult to diagnose in small children due to narrower QRS complex. May go unrecognized until child acutely decompensates.
2. **IMC**: Support ABCs as needed; determine need for advanced airway management
   - Obtain, review and transmit 12 lead ECG if available; **determine rhythm & stability ASAP.**
   - If unconscious, defer IV until after cardioversion.
   - Apply peds defib pads if available or prepare peds defib paddles.
   - Assess cardiac rhythm in more than one lead. Assess for S&S of HF.
   - HR varies from near normal to > 300. Confirm wide QRS (>0.08 s in infants; >0.09 s children > 3 years).

EMERGENT: None to Moderate cardiorespiratory compromise

Alert, HR > 150, SBP ≥ 70 + (2X age) or if 10-12 yrs: ≥ 90; normal perfusion and level of consciousness

Regular Monomorphic VT; polymorphic VT w/ normal QT interval; WPW; Irregular wide complex tachycardia; AF w/ aberrancy; AF w/ WPW (short PR, delta wave)	**Irregular Polymorphic VT w/ Prolonged QT / Torsades de Pointes**
Contact OLMC first 3. **AMIODARONE 5 mg/kg** (max 150 mg) mixed with NS to total volume of **20 mL IVP** or (Alt. in **50 mL IVPB** on mcgtt tubing) over 20 mins.	3. **MAGNESIUM** (50%) **25 mg/kg** (max 2 Gm) mixed with NS to total volume of **20 mL** (slow **IVP**) or (Alt. in **50 mL IVPB** on mcgtt tubing) over 10 min. Max 1 Gm/5 min. Put gauze moistened in cold water or cold pack over IV site to relieve burning.

CRITICAL: SEVERE cardiorespiratory compromise:

S&S compromised tissue perfusion, shock, and impaired level of consciousness

Time sensitive pt

3. **IMC** special considerations
   - If IV placed: may give brief trial of meds while preparing for cardioversion. See above.
   - **Sedation**: If responsive & SBP > 70 + (2X age): **MIDAZOLAM 0.1 mg/kg IVP** (0.2 mg/kg IN) (max single dose 5 mg). May repeat X 1 up to 10 mg if needed & SBP > 70 + (2X age).
     If condition is deteriorating, omit sedation.
4. **All but torsades** (see above): **SYNCHRONIZED CARDIOVERSION at 0.5 – 1 J/kg.**
   Torsades de pointes: **DEFIBRILLATE** at 0.5 - 1 J/kg see below
   - HR generally > 220 before cardioversion necessary in children.
   - If not possible to synchronize and clinical condition critical, go immediately to unsynchronized defibrillation
   - Assess ECG and pulse after each shock delivery.
   - Treat post-cardioversion dysrhythmias per appropriate SOP.
5. **If cardioversion successful:**
   - Complete ALS IMC: Support ABCs; observe; keep warm; transport.
   - If VT returns after successful cardioversion, start protocol at last intervention.
6. **If VT persists:**
   - Complete ALS IMC; re-evaluate rhythm & possible causes (metabolic or toxic).
     AMIODARONE 5 mg/kg (max 150 mg) mixed with NS to total volume of **20 mL IVP** or (Alt. in **50 mL IVPB** on mcgtt tubing) over 20 minutes
   - **Synchronized cardioversion at 2 J/kg** after ½ of the Amiodarone dose
   - Complete the medication even if patient converts after shock delivery provided BP is normal for age.

PEDS VENTRICULAR FIBRILLATION
PULSELESS VENTRICULAR TACHYCARDIA

Use "Pit crew" or "Team" approach to cardiac arrest management per local policy/procedure.
Pts should not be moved while CPR is progress unless in a dangerous environment/adverse climate or pt is in need of intervention not immediately available (trauma). CPR is better and has fewer interruptions when resuscitation is conducted where the pt. is found. Continue resuscitation for at least 30 minutes (non-trauma) before moving.

Begin **BLS IMC** – All care is organized around 2 minute cycles of CPR in C-A-B priority – unless arrest is caused by hypoxic event – multiple steps may be done simultaneously if personnel resources allow

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction prn; **simultaneously** Assess pulse: If not definitively felt in <10 sec - **Begin quality CPR with compressions** (See p. 89).
- **Apply defib pads** with chest compressions in progress as soon as monitor [ALS]/AED [BLS] is available
  Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)
- **Shockable?** Resume compressions while charging monitor; charge to device specific joules see below
  Pause compressions (< 5 sec) just long enough to deliver shock (after a compression -not a ventilation)
  - **BLS**: **AED** Children < 8 yrs of age (up to 25 kg): use AED w/ pediatric attenuator if available
    Children 8 yrs and older: Use adult AED
  - **ALS:** Cardiac monitor
- **Defibrillate: 1 shock:** Manual **2 J/kg** (AED device specific); (adult energy in children > 50 kg)
  Resume chest compressions immediately for 2 min (5 cycles).
  NO rhythm/pulse check until after 2 min of CPR unless pt. wakes or begins to move extremities.
- **Airway/ventilations**: Attach impedance threshold device and capnography (if available) between mask and bag
  Witnessed arrest; shockable rhythm: Delayed PPV; do 3 cycles (200) compressions before ventilating; *O_2/NRM*
  Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O_2 when available

The following need to be accomplished simultaneously in separate time cycles

After each 2 min cycle of CPR
(use real-time CPR feedback device if available):

Check rhythm & $ETCO_2$ – as above

Shockable? Resume compressions and deliver shocks as above **after a compression**
Manual 4 **J/kg**
Biphasic & AED - device specific
Resume compressions immediately

Not shockable? Asystole/PEA; resume compressions

Organized rhythm? ✓palpable pulse → ROSC

Switch compressors during rhythm ✓

NO rhythm/pulse check until after 2 min of CPR unless pt wakes or move extremities

Repeat pattern as long as CPR continues - PLUS

If persistent/refractory VF: change pad location to A-P

ALS interventions with no interruption to CPR

- Establish vascular access (IV/IO): NS TKO. If dehydrated, hypovolemic: NS 20 mL/kg IVP. May repeat X 2 prn.
- **When IV/IO available,** give meds during CPR:
  EPINEPHRINE (1mg/10mL) **0.01 mg/kg** (0.1 mL/kg) up to 1 mg **IV/IO.** Repeat q. 3-5 min as long as CPR continues.
- **AMIODARONE** 5 mg/kg IVP/IO**.** Max single dose 300 mg.
  After 5 min: **AMIODARONE** 2.5 mg/kg (max 150 mg) IVP/IO
- **Airway per Peds Airway Adjunct SOP** (Advanced airway NOT a priority if ventilations adequate w/ BVM)
  After advanced airway: give 1 breath every 3-5 sec. No hyperventilation; no compression pause for breaths

As time allows: ✓Hs & Ts (treat appropriately)

If possible opioid OD: Naloxone standard dosing

SODIUM BICARBONATE 1 mEq/kg IVP/IO: Only if arrest is caused by a bicarb-responsive acidosis (DKA/tricyclic antidepressant or ASA OD, cocaine or diphenhydramine) or known hyperkalemia.

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO_2, $ETCO_2$ q. 5 min.

- Support ABCs; **remove impedance threshold device;** assist ventilations / start 2nd IV if needed
  Do not hyperventilate even if ↑ $ETCO_2$; titrate O_2 to SpO_2 94% (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- **BP support is high priority**: If SBP < 70: **IV WO** while prepping **NOREPINEPHRINE 1 mcg/kg/min IVPB);** increase in increments of 0.5 mcg/kg/min to a max dose of 2 mcg/kg/min titrated to SBP > 70 + (2X Age).
  Retake BP q. 2 min until desired BP reached, then every 5 min.
  Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA.
- 12 L ECG ASAP after ROSC; assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:

- Chemical cold packs to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

Refer to specific SOPs: **Hypothermia** (p. 29); Peds **Poisoning/OD** (p. 83-84)

PEDS ASYSTOLE / PEA

- Use "Pit crew" or "Team" approach to cardiac arrest management per local policy/procedure.
- Pts should not be moved while CPR is progress unless in a dangerous environment/adverse climate or pt is in need of intervention not immediately available (trauma). CPR is better and has fewer interruptions when resuscitation is conducted where the pt. is found. Continue resuscitation for at least 30 minutes (non-trauma) before moving or seeking order to cease resuscitation.

Search for and treat possible contributing factors (Hs & Ts):

- Hypoxia (ventilate/O_2)
- Hypothermia (core rewarm)
- Toxins (**opiate? Naloxone**; TCA? $NaHCO_3$)
- Hypovolemia (IVF boluses)
- Hypo/**hyper**kalemia ($NaHCO_3$)
- Tamponade, cardiac
- Thrombosis (coronary/pulmonary)
- H ion (acidosis; $NaHCO_3$)
- Hypoglycemia (✓glucose)
- Tension pneumothorax (✓ lung snds; pleural decompression)

Begin **BLS IMC** – All care is organized around 2 minute cycles of CPR in C-A-B priority unless arrest is caused by hypoxic event – **multiple steps may be done simultaneously** if personnel resources allow

- Determine unresponsiveness; open airway (manually); assess for breathing/gasping; suction prn; **simultaneously** Assess pulse: If not definitively felt in <10 sec - **Begin quality CPR with compressions** (See p. 89)
- **Apply defib pads** with chest compressions in progress **as soon as monitor** [ALS]/**AED** [BLS] **is available**
  - **BLS**: **AED** Children 1 to 8 yrs of age (up to 25 kg): use AED w/ pediatric attenuator if available
    Children 8 yrs and older: Use adult AED
  - **ALS:** Cardiac monitor

  Check rhythm: Pause compressions just long enough to determine if rhythm is shockable (< 5 sec)

  Not Shockable? [ALS] confirm asystole/PEA in 2 leads. Resume compressions immediately
  No rhythm/pulse check until after 2 min of CPR unless pt wakes or begins to move extremities (see below)
- **Airway/ventilations**: Attach impedance threshold device and capnography (if available) between *mask and bag*
  Witnessed arrest: Delayed PPV; do 3 cycles (200) compressions before ventilating; O_2/NRM
  Unwitnessed arrest: BLS airways; ventilate with BVM; CPR at 30:2 ratio (5 cycles = 2 min); give 15 L O_2 when available

The following need to be accomplished simultaneously in separate time cycles

After each 2 min cycle of CPR
(use real-time CPR feedback device if available):

Check rhythm & $ETCO_2$ – as above

Not shockable? → Asystole/PEA/no shock advised; continue CPR

Organized rhythm? ✓palpable pulse → ROSC

Switch compressors during rhythm ✓

NO rhythm/pulse check until after 2 min of CPR unless pt wakes or move extremities

Repeat pattern as long as CPR continues

ALS interventions with no interruption to CPR

- Establish vascular access (IV/IO): NS TKO. If dehydrated, hypovolemic: NS 20 mL/kg IVP. May repeat X 2 prn.
- **When IV/IO available,** give meds during CPR:
  EPINEPHRINE (1mg/10mL) **0.01 mg/kg** (0.1 mL/kg) up to 1 mg **IV/IO.** Repeat q. 3-5 min as long as CPR continues.
- **Airway per Peds Airway Adjunct SOP** (Advanced airway NOT a priority if ventilations adequate w/ BVM)
  After advanced airway: give 1 breath every 3-5 sec
  No hyperventilation; no compression pause for breaths

As time allows: ✓Hs & Ts (treat appropriately)

If possible opioid OD: Naloxone standard dosing

SODIUM BICARBONATE 1 mEq/kg IVP/IO: Only if arrest is caused by a bicarb-responsive acidosis (DKA/tricyclic antidepressant or ASA OD, cocaine or diphenhydramine) or known hyperkalemia.

Return of spontaneous circulation (ROSC): Watch for abrupt rise in capnography; assess VS; ECG, SpO_2, $ETCO_2$ q. 5 min.

- Support ABCs; **remove impedance threshold device;** assist ventilations / start 2nd IV if needed
  Do not hyperventilate even if ↑ $ETCO_2$; titrate O_2 to SpO_2 94% (avoid hyperventilation and hyperoxia); follow appropriate SOP.
- **BP support is high priority**: If SBP < 70: **IV WO** while prepping **NOREPINEPHRINE 1 mcg/kg/min IVPB);** increase in increments of 0.5 mcg/kg/min to a max dose of 2 mcg/kg/min titrated to SBP > 70 + (2X Age).
  Retake BP q. 2 min until desired BP reached, then every 5 min.
  Keep fingers on pulse & watch SpO_2 pleth on monitor for 5 min to detect PEA.
- 12 L ECG ASAP after ROSC; assess glucose (Rx hypoglycemia)

If patient remains unresponsive to verbal commands w/ no contraindications:

- Chemical cold packs (CCP) to cheeks, palms, soles of feet; if additional CCP available, apply to neck, lateral chest, groin, axillae, temples, and/or behind knees.
- Avoid hyperthermia & hyperglycemia

Refer to specific SOPs: **Termination of Resuscitation** (p. 8); **Hypothermia** (p. 29) ; Peds **Poisoning/OD** (p. 83-84)

PEDS ALTERED MENTAL STATUS

AMS: Consider possible etiologies; use appropriate SOPs

- **A**: Alcohol and ingested drugs/toxins; ACS/HF, arrhythmias, anticoagulation
- **E**: Endocrine/exocrine, particularly thyroid/liver; electrolyte/fluid imbalances; ECG abnormalities: prolonged QT; Brugada syndrome (incomplete RBBB pattern in V1/V2 w/ ST segment elevation
- **I**: Insulin disorders: hypoglycemia; DKA/HHNS
- **O**: O_2 deficit (hypoxia), opiates, overdose, occult blood loss (GI/GU)
- **U**: Uremia; other renal causes including hypertensive problems
- **T**: (recent) Trauma, temperature changes
- **I**: Infections, both neurologic and systemic
- **P**: Psychological; massive pulmonary embolism
- **S**: Space occupying lesions (epi or subdural, subarachnoid hemorrhage, tumors); stroke, shock, seizures

Syncope differential

- **H** Head injury
- **E** Epilepsy
- **A** Aneurysm
- **D** Drugs/psychiatric causes
- **H** Hypoxia or heart disease
- **E** Embolism
- **A** Arrhythmia
- **R** Respiratory (hyperventilation or breath-holding)
- **T** Thoracic outlet syndrome
- **V** Vasovagal
- **E** Ectopic (pregnancy-related hypotension)
- **S** Situational, sepsis
- **S** Sinus sensitivity
- **E** Electrolytes
- **L** Lung (pulmonary embolism)
- **S** Subclavian steal syndrome

Scene size up:

- Inspect environment for bottles, meds/drugs, letters/notes, sources of toxins suggesting cause
- Ask bystanders/patient about symptoms immediately prior to change in mentation; S&S during event; duration of event, resolution of event (spontaneous, after interventions)

Secondary assessment: Special considerations

- Level of consciousness using GCS adjusted for Peds
- **A**ffect; **B**ehavior: consolable or non-consolable agitation
- **C**ognitive function (recognition of familiar objects; ability to answer simple questions); hallucinations/delusions
- Memory deficits; speech patterns
- Inspect for Medic alert jewelry, tags, body art
- General appearance; odors on breath; evidence of alcohol/drug abuse; trauma
- VS: observe for abnormal respiratory patterns; ↑ or ↓ T; orthostatic changes
- Skin: Lesions that may be diagnostic of the etiology
- Neuro exam: Pupils/EOMs; visual deficits; motor/sensory exam; ✓ for nuchal rigidity; EMS stroke screen

1. **IMC** special considerations:
   - Suction cautiously prn; seizure/vomiting/aspiration precautions
   - GCS ≤ 8: Treat per Peds Airway SOP
   - O_2 12-15 L/Peds NRM or BVM. Assist ventilations at 1 breath every 3 -5 sec.
   - If SBP < 70 + (2 X Age): **IV NS** 20 mL/kg IVP. May repeat X 2 if indicated.
   - Position patient on side unless contraindicated
   - If supine: maintain head and neck in neutral alignment; do not flex the neck
   - Monitor ECG continually enroute; consider need for 12 L ECG (long QT syndromes); Rx dysrhythmias per SOP
   - Monitor for S&S of ↑ ICP: reduce environmental stimuli
   - Document changes in the Peds GCS & VS
2. Obtain and record **blood glucose level** per System procedure (capillary and/or venous sample).
   If < 70: Treat per Peds Hypoglycemia SOP
   Observe and record response to treatment; recheck glucose level; may repeat Dextrose prn.
   If 70 or greater: Observe and continue to assess patient
3. If possible **opiate/synthetic opiate toxicity** w/ AMS and slow respirations for age; may have small pupils:
   NALOXONE 0.1 mg/kg (max single dose 0.4 mg) **IVP/IN/**IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [EMTs/EMRs: IN and IM]

PEDS GLUCOSE/DIABETIC EMERGENCIES

Note: Peds patients have high glucose requirements and low glycogen stores.
During periods of ↑ energy requirements, such as shock, they may become hypoglycemic.

1. **BLS IMC** special considerations:
   - Obtain PMH; ask about history of diabetes (type 1 or 2); (Type 2 incidence is rising in children)
   - Determine time and amount of last dose of medication/insulin and last oral intake
   - Vomiting and seizure precautions: prepare suction
   - Obtain and record **blood glucose level** (capillary and/or venous sample) for all peds pts w/ AMS, shock, or respiratory failure. Use heel-stick to obtain blood sample in infants 12 mos or less.

Blood sugar < 70 or S & S of hypoglycemia

2. **BLS**: If GCS is 14-15 and patient is able to swallow: oral glucose in the form of paste, gel, or liquid if available
3. **ALS:** If borderline glucose level (60-70) & symptomatic: give ½ Dextrose dose (see below)
4. **Children and Infants (up to 50 kg or 110 lbs) if bG < 60:**
   - **DEXTROSE 10%** (25 g/250 mL) **0.5g/kg up to 25 g** (5mL/kg). See dosing chart on page 100.
     For smaller children, draw up desired volume into a syringe and administer slow IVP.
     Observe pt for improvement while dose is given.
   - If S&S of hypoglycemia fully reverse and pt becomes decisional after a partial dose, reassess bG.
     If >70; close clamp to D10% IV and open 0.9 NS TKO.

   If bG is borderline 60-70 and symptomatic: Give ½ of the dose as listed above.
5. If no IV/IO: **GLUCAGON < 20 kg**: 0.03 mg/kg (0.5 mg) IM/IN; ≥ 20 kg :1 mg IN/IN [BLS]
   Vastus lateralus muscle
6. Observe and record response to treatment; recheck glucose level
   - **If 70 or greater**: Ongoing assessment
   - If no improvement after first D10% dose **and** bG remains <70: give additional D10% 0.5 g/kg (5 mL/kg) up to 25 g IVPB 5 minutes after initial dose followed by reassessment.
7. If parent or guardian refuses transport, they must be advised to feed the child before EMS leaves the scene.

Ketoacidosis (DKA)

Pts may be hyperglycemic and NOT be in DKA or HHNS.

Patients must present with a combination of dehydration, acidosis, and hyperglycemia.

- **Dehydration**: Tachycardia, hypotension, ↓ skin turgor, warm, dry, flushed skin, N/V, abdominal pain
- **Acidosis**: AMS, Kussmaul ventilations, seizures, peaked T waves, and ketosis (fruity odor to breath)
- **Hyperglycemia**: Elevated blood sugar; most commonly 240 or above.

Note: EMS personnel shall not assist any patient in administering insulin.

2. **IMC special considerations:**
   - Monitor ECG for dysrhythmias and changes to T waves.
   - **IV NS 10 mL/kg IV/IO** over 1 hour unless demonstrating signs of hypovolemic shock or instructed by OLMC to increase the volume to 20 mL/kg. Patient may have large fluid deficits.
     Auscultate lung sounds after each 50 mL.
   - Maintain SBP at age-appropriate minimum or above: Children 10 or less: > 70 + (2 X age in yrs).
   - Monitor for development of cerebral edema.
3. Observe and record response to treatment.

PEDS DRUG OVERDOSE / POISONING

Case by case determination if time sensitive

Anxiety/serotonin syndrome: MIDAZOLAM 0.1 mg/kg **slow IVP** (0.2 mg/kg IN/IM) (Max single dose **5 mg)** q. 2 min up to 10 mg based on size, BP
Tonic clonic seizures: **MIDAZOLAM** 0.1 mg/kg IVP/IO **q. 30-60 sec** (0.2 mg/kg IN/IM) (Max single dose **5 mg)** up to 10 mg IVP/IN/IO/IM
NALOXONE 0.1 mg/kg (2mg/2mL)(max single dose 0.4 mg) **IVP/IN/**IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg. [EMTs/EMRs: IN and IM]

GENERAL APPROACH

1. **History**: Determine method of injury: ingestion, injected, absorbed, or inhaled; pts often unreliable historians.
2. **IMC** special considerations:
   - Uncooperative behavior may be due to intoxication/poisoning; do not get distracted from assessment of underlying pathology
   - Anticipate hypoxia, respiratory arrest, seizure activity, dysrhythmias, and/or vomiting
   - Airway access / control per Peds Airway Adjuncts SOP
   - Support ventilations w/ 15L O_2/Peds BVM if respiratory depression, hypercarbic ventilatory failure
   - NS IV/IO titrated to adequate perfusion (SBP ≥70 + 2X age; 10-12 yrs SBP ≥ 90); monitor ECG
   - Monitor ECG if AMS, tachycardic, bradycardic, hypotensive; or HR irregular
   - Impaired patients should be treated and transported. Call OLMC if parent/guardian wishes to refuse transport
3. If AMS, seizure activity, or focal neurologic deficit: **Obtain blood glucose**; If < 70: treat per Peds Hypoglycemia SOP
4. If possible opiate toxicity w/AMS + respiratory depression/arrest: **NALOXONE** as above
5. **Anxiety/serotonin syndrome: MIDAZOLAM** as above titrated to response
   Tonic clonic seizures: **MIDAZOLAM** as above titrated to stop seizure.
6. **If excited delirium, violent, severe agitation: KETAMINE** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM
   May repeat at ½ dose after 10 min up to max of 4 mg/kg (500 mg). See peds dosing table p. 101.

BETA BLOCKER "LOLs" - See list on Pulmonary Edema/Cardiogenic shock SOP.

6. If ↓ BP: Limit fluid boluses to 5-10 mL/kg; reassess after each bolus due to high freq. of heart dysfunction
7. If P < 60 + SBP < 70 & unresponsive to epinephrine, atropine, & pacing per Peds Bradycardia w/ Pulse SOP:
   GLUCAGON 0.03 mg/kg IV/IN/IO/IM; **< 20 mg** max 0.5 mg; **≥ 20 kg :** max 1 mg.

CYCLIC ANTIDEPRESSANTS: Adapin, Amitriptyline, Amoxapine, Anafranil, Ascendin, Desipramine, Desyrel, Doxepin, Elavil, Endep, Imipramine, Limbitrol, Ludiomil, Norpramine, Pamelor, Sinequan, Triavil, Tofranil, Vivactil
These do **NOT** include serotonin reuptate inhibitors (SSRIs) like Paxil, Prozac, Luvox, Zoloft

6. IF ↓ BP: **IV NS** fluid challenge **10 mL/kg IVP/IO**(to offset alpha receptor blockade). May repeat until BP stable.
7. **SODIUM BICARB 1 mEq/kg IVP**. Repeat X1 if ↓ BP, deterioration of mental status, wide QRS, or dysrhythmias

DEPRESSANTS: ***Barbiturates*****:** Phenobarbital, Seconal (secobarbital)I ***Benzodiazepines*****:** diazepam (Valium), midazolam (Versed), lorazapem (Ativan), Librium, flunitrazepam (Rohypnol) - Relatively non-toxic except when combined with other CNS depressants (ETOH). ***GHB****:* Cherry meth, Easy lay, G-riffic, Grievous body harm, liquid ecstasy, liquid X, liquid E, organic quaalude, salty water, scoop, soap, and somatomax; SSRIs

6. Observe for CNS depression, respiratory depression, apnea, nystagmus, ↓ P, ↓ BP, seizures. Supportive care.

Dextromethorphan (DXM): Active ingredient in over-the-counter cough-suppressants. Liquid & capsule/tablet forms. Abuse referred to as "Robotripping" referring to Robitussin®, and using "Skittles" or "Triple C's" due to red pill forms in Coricidin Cough & Cold® products. Acts as a dissociative anesthetic with increasing effects depending on amount consumed. Clinical effects may **mimic ketamine** (including nystagmus).

6. Supportive care: Check for salicylate or *acetaminophen intoxication*, as preparations are often coformulated. If coformulated with *diphenhydramine*, look for S&S of tricyclic antidepressant-like sodium channel blockade (wide QRS and/or abnormal R wave in aVR).
7. Treat sodium channel blockade toxicity with sodium bicarbonate (See cyclic antidepressants)

HALLUCINOGENS: Lysergic acid diethylamide (LSD), phencyclidine (PCP, Angel dust, TIC); cannabis, ketamine, methoxetamine (MXE) -analog of ketamine, both have structural similarity to PCP. Synthetic cannabinoids come as white or off-white powders, or may be combined with various plant products and sold as *Spice, K2, Chill Zone, Sensation, Chaos, Aztec Thunder, Red Merkury,* and *Zen*.. May be ingested or insufflated (if powdered chemicals) or smoked when mixed with other plant products. Liquid forms increasingly popular for use in electronic cigarette devices. Belong to varied classes of designer drugs and do not resemble THC in chemical structure.

S&S: Variable (mild to significant paranoia and agitation resulting in self-harm); nystagmus, AMS (out-of-body experiences), significant analgesia

6. Supportive care, quiet environment devoid of stimulation (lights, noise and touch)

INHALANTS: Caustic agents in form of gasses, vapors, fumes or aerosols. Ex: Gases - CO, NH_4 (ammonia), chlorine, freon, carbon tetrachloride, methyl chloride, tear gas, mustard gas, nitrous oxide; spray paint (particularly metallics); household chemicals like cooking spray, furniture polish, correction fluid, propane, mineral spirits, nail polish remover, aerosol propellants, glue, oven cleaners, lighter fluid, gasoline and solvents.

Mechanisms of abuse: Sniffing, huffing, bagging**. S&S**: alcohol-like effects - slurred speech, ataxic movements, euphoria, dizziness and hallucinations; may also include bad headache, N/V, syncope, mood changes, short-term memory loss, diminished hearing, muscle spasms, brain damage, non-cardiogenic pulmonary edema, and dysrhythmias. Sniffing volatile solvents can affect the nervous system, liver, kidneys, blood, bone marrow and severely damage brain. Can suffer from "sudden sniffing death" from a single session of inhalant use.

6. Look for discoloration, spots or sores around the mouth, nausea, anorexia, chemical breath odor and drunken appearance. Supportive care.

OPIATES: *Codeine, fentanyl* (Duragesic, Sublimaze, Actiq), *heroin*, *hydrocodone* (Vicodin, Norco, Lortab, Lorcet), *hydromorphone* (Dilaudid, Exalgo, Opana ER), *meperidine* (Demerol), *methadone* (Dolophine, Methadose, Diskets), *morphine* (MS Contin, Kadian, Roxanol, Morphine Sulfate ER), *oxycodone* (Oxycontin, Percodan, Percocet), *propoxyphene* (Darvon, Darvocet), *diphenoxylate/atropine* (Lomotil), Roxanol, Talwin, *tramadol* (Ultram), Tylox, Wygesic

6. If AMS and RR < 12 (pupils may be small): **NALOXONE standard dose** (top previous page)
7. Assess need for restraints; monitor for HTN after opiate is reversed if speedballs are used

ORGANOPHOSPHATES (cholinergic poisoning): Insecticides, bug bombs, flea collars, fly paper, fertilizers, WMD drugs "SLUDGE" reaction (salivation, lacrimation, urination, defecation, GI distress, emesis). May also exhibit ↑ bronchial secretions, ↓ P, pinpoint pupils

6. Haz mat precautions; remove from contaminated area; decontaminate as much as possible before moving to ambulance.
7. **ATROPINE 0.02 mg/kg (minimum 0.1 mg) rapid IVP/IM**: Repeat q. 3 min until improvement (reduction in secretions). Usual atropine dose limit does not apply – See WMD Chemical Exposures. Cholinergic poisonings cause an accumulation of acetylcholine. Atropine blocks acetylcholine receptors, thus inhibiting parasympathetic stimulation. Also see Chemical Agents SOP.

STIMULANTS: Amphetamines: Benzedrine, Dexedrine, Ritalin, Methamphetamine (crystal, ice); **ECSTASY:** "Molly" -MDMA (methylene-dioxy-methamphetamine), designer drug used at "rave" parties with stimulant and hallucinogenic properties. Produces feelings of increased energy and euphoria and distorts users' sense and perception of time. May have S&S of serotonin syndrome (hyperthermia, HTN, tachycardia, AMS, ophthalmic clonus, hyper-reflexia, clonus, muscle rigidity, and bruxism (teeth grinding-users known to use pacifiers). Suspect if pt is holding a Vicks vapor rub inhaler; anticipate seizures). **COCAINE** ("Coke", "Crack", "Blow", "Rock"), **ephedrine, PCP; BATH SALTS** produce clinical effects like amphetamines or other stimulants. Sympathomimetic effects (↑ HR, BP & Temp; diaphoresis; agitation; hallucinations and psychotic S&S

6. Supportive care for sympathomimetic effects and AMS; prepare to secure pt safety with restraint if necessary
   Treat tachycardia, dysrhythmias, cardiac ischemia, and hyperthermia per appropriate SOP.
7. If agitated, seizures, serotonin syndrome &/or HTN crisis. **MIDAZOLAM** standard dose (top previous page)
   If excited delirium, violent, severe agitation **KETAMINE** standard dose (top previous page)
8. If hallucinations: quiet environment devoid of stimulation (lights, noise and touch)

CARBON MONOXIDE POISONING

1. **IMC** special considerations:
   - Use appropriate Haz-mat precautions & PPE; remove patient from CO environment as soon as possible
   - O_2 12-15 L/NRM or BVM; ensure tight seal of mask to face; SpO_2 **UNRELIABLE** to indicate degree of hypoxemia
   - Vomiting precautions; ready suction; monitor ECG
   - Keep patient as quiet as possible to minimize tissue oxygen demands
   - CO screening per System policy if available. If using CO-oximeter >12% abnormal, (<3% CO normal, smokers may have as high as 10%); use manufacturer standard levels if given; carefully assess for clinical correlation due to questionable device sensitivity.
2. Transport lower acuity/stable patients to nearest hospital
   Severely confused/hemodynamically stable: Consider transporting directly to a facility w/ a hyperbaric chamber (OLMC order).
   CRITICAL: If in respiratory/cardiac arrest or airway unsecured, transport to nearest hospital.

Hyperbaric oxygen chambers

Advocate Lutheran General Hospital	847/ 723-5155	24/7
St. Luke's Medical Center (Milwaukee)	414/ 649-6577	24/7

CYANIDE EXPOSURE (CRITICAL)

Time sensitive patient

Toxic twins: Consider cyanide poisoning in presence of smoke/fire if patient has soot in nose/mouth/oropharynx plus confusion//disorientation, AMS, coma, respiratory or cardiac arrest. **Also consider in the presence of** silver recovery, electroplating solutions, metal cleaning, jewelry cleaners, and a metabolic product of the drug amygdalin (laetrile).
http://emergency.cdc.gov/agent/cyanide/erc74-90-8pr.asp
Assess for hypotension, CNS depression, metabolic acidosis, soot in nares or respiratory secretions, rapid CV collapse, central apnea, and seizures.

1. PPE including SCBA; evacuate danger area
2. **IMC** per Peds Drug OD/Poisoning SOP; decontaminate as necessary. Do NOT direct water jet on liquid.
   Absorb liquid in sand or inert absorbent and remove to a safe place. Remove vapor cloud w/ fine water spray.
   Remove contaminated clothing and wash skin with soap and water for 2-3 min.
3. Establish OLMC ASAP so receiving hospital is prepared for your arrival
4. If hypotensive or pulseless: **NS 20 mL/kg IVP/IO**. May repeat X 2 as needed; CPR as indicated.
5. Per OLMC: Cyanide-antidote if available: **AMYL NITRITE** inhalants 1 per min X 12 min *OR* **HYDROXOCOBALAMIN** 70 mg/kg (max 5 gm)(one vial) given IVPB over 15 min. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g.

POISON CONTROL CENTER #: 1-800-222-1222
www.illinoispoisoncenter.org

PEDS SEIZURES

History

- History/frequency/type of seizures
- Prescribed meds and patient compliance; amount and time of last dose
- Recent or past head trauma; predisposing illness/disease; recent fever, headache, or stiff neck
- History of ingestion/drug or alcohol abuse; time last used

Consider possible etiologies

- Anoxia/hypoxia
- Cerebral palsy or other disabilities
- Metabolic (glucose, electrolytes, acidosis)
- Trauma/child abuse
- Anticonvulsant withdrawal/noncompliance
- Infection (meningitis, fever)
- Toxin/intoxication (cocaine, cyclic)
- Epilepsy

Exam: Observe and record the following

- Seizure description: focus of origin (one limb or whole body), progression and duration; presence of an aura, simple/complex; partial/generalized (focality/muscle activity); eye deviation prior to or during seizure; incontinence; trauma to the oral cavity; or abnormal behaviors (lip smacking); duration of loss of consciousness.
- Duration and degree of mental status changes in postictal period.

1. **IMC** special considerations:
   - Clear and protect airway. No bite block. Vomiting/aspiration precautions, suction prn
   - Protect patient from injury; do not restrain during tonic/clonic movements
   - Position on side during postictal phase unless contraindicated
   - If history of generalized tonic/clonic seizure activity: consider need for IV NS TKO
2. **If generalized tonic/clonic seizure activity present:**
   MIDAZOLAM 0.1 mg/kg IVP/IO q. 30-60 sec (0.2 mg/kg IN/IM) (Max single dose **5 mg)** up to 10 mg IVP/IN/IO/IM to stop seizure. If seizures persist: Contact OLMC for additional orders.
3. Identify and attempt to correct reversible precipitating causes (see above).
   Assess **blood glucose**.
   If < 70: **DEXTROSE** or **GLUCAGON** per Peds Hypoglycemia SOP.

Febrile seizures: Febrile seizures are the most common seizure disorder in childhood, affecting 2% to 5% of children between 6 to 60 months. Simple febrile seizures are defined as brief (< 15-min) generalized seizures that occur once during a 24-hr period in a febrile child who does not have an intracranial infection, metabolic disturbance, or history of afebrile seizures.

- Assess hydration status. If dehydrated, may attempt IV X 1. If successful: NS 20 mL/kg IVP.
- Reassure/calm child and parents/guardians.
- Passively cool by removing all clothing but diaper/ underwear. Cover lightly. Do not induce shivering. Temp may rebound and may cause another seizure.
- NPO (Do not give over-the-counter anti-fever medications unless ordered by OLMC.)
- ASA is contraindicated in unknown viral situations.

If persistent seizures or status epilepticus when no IV/IO is placed and IN contraindicated or not advised: .**Intrarectal (IR) Diastat (diazepam) if available on scene:**

- **Dose:** 0.5 mg/kg (max. 20 mg)
- Lubricate tip with water-soluble jelly.
- Insert syringe 2 in into rectum. Instill medication.
- Hold buttocks together to avoid leakage after instillation of medication.
- If already given by parent: Monitor for resp depression. Call OLMC before giving additional anticonvulsant meds.

Generalized seizures	
Tonic clonic (grand mal)	Aura, muscle rigidity, rhythmic jerking, postictal state. Lasts seconds to 5 min or more.
Absence (petit mal)	Vacant look & is unaware of anything for brief time then returns to normal. No focal tonic-clonic movements.
Myoclonic	Sudden startle-like episodes (body briefly flexes or extends). Occurs in clusters of 8-10, often multiple times a day.
Partial seizures	
Simple partial	Limited to one part of brain, affected area directly related to muscle group involved. Child is aware.
Complex partial	Similar to simple, except child is unconscious
Psychomotor	Hallucinations involving an unusual taste, smell, or sound. Feelings of fear or anger. Repetitive fine-motor actions such as lip smacking or eye blinking. May progress to tonic-clinic seizure.

PEDS INITIAL TRAUMA CARE

SCENE SIZE UP: Same as adult ITC with the following considerations

- Where/in what position was child found? Was the child secured in an infant/child or booster seat?
- Explore MOI carefully including possible indicators of abuse or neglect.

PRIMARY ASSESSMENT

1. **General impression**: Age, gender; wt.; general appearance, position / surroundings; obvious injuries/bleeding, purposeful movements
   Pediatric assessment triangle: General appearance; work of breathing; circulation to the skin.
2. **Determine if immediate life threat exists and resuscitate as found**
3. **Level of consciousness:** AVPU or peds GCS; chief complaint S&S
4. Sequencing priorities if exsanguinating hemorrhage: C-A-B-C-D-E: Hemorrhage control first.

   AIRWAY/SPINE: snoring, gurgling, stridor, silence. Consider possible spine injury
   - Open/maintain using position, suction, adjuncts & manual spine precautions prn (Peds Airway Adjunct SOP); vomiting/seizure precautions
   - Once airway controlled: Apply appropriate size c-collar + selective spine precautions if indicated. If backboard used: Position infants/children < 2 yrs supine w/ a recess for head or pad under back from shoulders to buttocks
5. **BREATHING/gas exchange/adequacy of ventilations: Assess/intervene as needed**
   - Spontaneous ventilations; general rate (fast or slow); depth, effort (work of breathing)
   - Air movement, symmetry of chest expansion; accessory muscle use; retractions; lung sounds if vent. distress
   - SpO_2 if possible hypoxia, cardiorespiratory or neurological compromise. Note before & after O_2 if able.
   - $ETCO_2$ number & waveform if possible ventilatory/perfusion/metabolic compromise

   Correct hypoxia/assure adequate ventilations: Target SpO_2: 94%-98%
   - **Oxygen 1-6 L/NC**: Adequate rate/depth; minimal distress and $SpO_2 \geq 95$
   - **Oxygen 12-15 L/NRM:** Adequate rate/depth: mod/severe distress; S&S hypoxia or as specified in protocol
   - **Oxygen 15 L/ BVM:** Inadequate rate/depth: mod/severe distress; unstable
     Ventilate at 1 breath every 3 to 5 seconds. Avoid hyperventilation.
   - If **tension/open pneumothorax or flail chest** Rx per adult Chest Trauma SOP
6. **CIRCULATION/perfusion**: Compare carotid/brachial pulses for presence, general rate, quality, regularity, & equality; assess skin color, temperature, moisture, capillary refill
   - No carotid pulse & unresponsive OR pulse present but < 60 in infant or child with poor perfusion: **Begin CPR** See Adult Traumatic Arrest; Quality CPR see appendix – go to appropriate SOP for rhythm/condition.
   - Assess type, amount, source(s) and rate of bleeding; **hemorrhage control**:
     - Direct pressure; pressure dressings to injury. If direct pressure ineffective or impractical:
     - Pack wound w/ topical **hemostatic gauze**/ apply direct pressure. Freq. ✓ for bleeding.
     - **Limb w/ uncontrolled bleeding**: **Tourniquet** 2-3 cm proximal to wound; not over a joint; tighten until bleeding stops/distal pulse occluded. If bleeding continues, place 2nd proximal to 1st. Should be visible/well marked (time applied), do not remove. Anticipate pain.
     - **Pelvic fx**: Wrap w/ sheet, pelvic binder, or secure pelvis in upside down KED
   - If suspected cardiac tamponade, blunt aortic or cardiac injury → **Chest Trauma SOP**
   - **Vascular access:** Indicated for actual/potential volume replacement and/or IV meds prior to hospital arrival
     Base catheter size & infusion rate on pt. size, hemodynamic status
     IV 0.9% NS (warm if possible): **NS 20 mL/kg IVP** if S&S of hypoperfusion present.
     Repeat rapidly X 2 if HR, LOC, capillary refill & other S&S of perfusion fail to improve); do not exceed BP targets. Excess IVF may lead to uncontrolled hemorrhage, hypothermia, hypocoagulable state, & abdominal compartment syndrome
     - Do not delay transport in time-sensitive patients to establish vascular access on scene
     - **Indications for IO**: Pts in extremis needing urgent IVF and/or medications, esp. if circulatory collapse; difficult, delayed or impossible venous access; burns or injuries preventing venous access at other sites
     - Limit 2 attempts/route unless situation demands or authorized by OLMC to continue
     - Peripheral IV may be attempted enroute; IO should be placed while stationary
   - Monitor ECG if actual or potential cardiorespiratory compromise – integrate appropriate SOP
7. **Disability:** Rapid neuro assessment: Peds GCS; pupils; ability to move all four extremities (S&S ↑ICP or herniation) If AMS: blood glucose per System procedure. If < 70: Treat per Hypoglycemia SOP.
8. **Pain mgt. If > 2 yrs &** SBP ≥ minimum for age: **FENTANYL -** standard dose per peds IMC
   Nausea: **ONDANSETRON** – standard dose per IMC
9. **E**xpose/**e**nvironment: Undress to assess as appropriate. Keep patient warm

TRANSPORT DECISION

- **Pts meeting Level I or II trauma center criteria are time-sensitive**. Attempt to keep scene times ≤10 minutes. Document reasons for delay. Repeat primary assessment & perform secondary assessment enroute.
- **Transport to nearest appropriate hospital per Region triage criteria** or OLMC orders
- Scene use of helicopter based on System Guidelines

Peds ITC: Secondary Assessment

Continue selective spine motion restriction if indicated - see SCI SOP pp 49-50

1. Obtain baseline VS: BP (MAP if able) – Obtain 1st BP manually; trend pulse pressures; Pulse: rate, quality, rhythmicity Respirations: rate, pattern, depth Temp if indicated
   SAMPLE history: OPQRST of chief complaint/pain using appropriate pain scale consistent with the pt's age, condition, and ability to understand; **Allergies** (meds, environment, foods), **Medications** (prescription/over-the-counter – bring containers to hospital if possible), **PMH** (medic-alert jewelry; medical devices/implants); **Last oral intake**/LMP; **Events** leading to injury
2. **Review of Systems: D**eformities, **c**ontusions, **a**brasions, **p**unctures/penetrations, **b**urns, **l**acerations, **s**welling, **t**enderness**, i**nstability, **c**repitus, and distal **p**ulses, **m**otor/**s**ensory deficits **+ the following** based on chief complaint; S&S; scope of practice, and pt. level of acuity
   - **HEAD, FACE, EYES, EARS, NOSE, MOUTH:** Drainage; re-inspect pupils for size, shape, equality, and reactivity; conjugate movements; gaze palsies; gross visual acuity; eye level (symmetry), open & close jaw; malocclusion.
   - **NECK:** Carotid pulses, jugular veins, sub-q emphysema, c- spines; temporarily remove anterior c-collar to assess neck prn
   - **CHEST:** Auscultate lung/heart sounds
   - **ABDOMEN**: Signs of injury/peritonitis by quadrant: contour, visible pulsations, wounds/bruising patterns, pain referral sites, localized tenderness, guarding, and rigidity
   - **PELVIS/GU:** Inspect perineum for blood at urinary meatus, rectum
   - **EXTREMITIES:** Inspect for position, false motion, skin color, and signs of injury
   - **BACK/flank:** Note any muscle spasms
   - **Neuro:** Affect, behavior, cognition, memory/orientation; select cranial nerves (procedure); motor/sensory; ataxia
   - **SKIN/SOFT TISSUE:** Color (variation), moisture; temp, lesions/wounds; sub-q emphysema
3. **Ongoing assessment**: Reassess VS and pt responses to interventions. Every transported pt should have at least 2 sets of VS.
   Stable: At least q. 15 min & after each drug/cardiorespiratory intervention; last set should be taken shortly before arrival at receiving facility
   Unstable: More frequent reassessments; continue to reassess all abnormal VS & physical findings
4. Report pertinent positive/negative signs as able; any major changes from primary assessment
5. Document Pediatric Trauma Score parameters on ePCR/EHR
6. **All refusals must have OLMC contact** per System policy even if parent /guardian consents to release.
7. EMS "time-out" to allow for an **uninterrupted handover report** after hospital arrival to ensure continuity of care - especially if written or electronic ePCRs/EHRs are not left/downloaded at the time of pt handoff (ACS, 2014).

PEDIATRIC TRAUMA SCORE: Age 12 and under

Component	+2	+1	-1
Size	> 20 kg (40 lbs) (> 5 yrs)	11 - 20 kg (1-5 yrs)	≤ 10 kg (22 lbs) (≤ 1 year)
Airway	Normal	Maintainable using position/chin lift	Unmaintainable or intubated
SBP *or* pulse palpable	> 90 mmHg; at wrist	50-90 mmHg; at groin	< 50 mmHg; no pulse palpable
CNS	Awake	Lost consciousness / Obtunded	Coma; unresponsive
Skeletal injury	None	Closed fracture	Open/multiple fractures
Open wounds	None	Minor	Major or penetrating

Scores range from -6 to +12
A PTS of < 8 usually indicates the need for evaluation at a Trauma Center.

TRAUMATIC ARREST	Peds ITC; pleural decompression per adult traumatic arrest SOP; Rx rhythm per peds SOP
HEAD Trauma	Peds ITC; Rx. seizures per Peds Seizure SOP
SPINE Trauma	Peds ITC; Assess & Rx per adult SCI SOP pp. 49-50 **Asses need for chemical restraint**: If patient will not remain motionless despite verbal warning and BP WNL for age, consider need for **MIDAZOLAM 0.1 mg/kg slow IVP/IM** (0.2 mg/kg IN/IM) (max single dose 5 mg). May repeat to a total of 10 mg based on size and BP.
CHEST Trauma	Peds ITC; follow adult SOP for specific injury interventions
EYE/FACIAL Trauma	Peds ITC; follow adult SOP for specific injury interventions
MUSCULOSKELETAL	Peds ITC; follow adult SOP for specific interventions; size-approp. doses of fentanyl, midazolam, sodium bicarbonate

SUSPECTED CHILD ABUSE OR NEGLECT

1. **ITC** special considerations:
   - Recognize any act or series of acts of commission or omission by a caregiver or person in a position or power over the patient that results in harm, potential for harm, or threat of harm.
   - These situations may involve safety issues for responding providers, so take appropriate steps to protect the safety of responders as well as bystanders.
   - Assess environmental factors that could adversely affect a child's welfare; **get the patient out of immediate danger.**
   - Observe child's interactions with parents/guardians.
   - Assess for injuries that may be the result of acute or chronic events: Injury patterns that do not correlate with the Hx or anticipated motor skills based on child's growth and developmental stage; and/or
   - Discrepancies in the history obtained from the child and care-givers.
   - Attempt to preserve evidence whenever possible.

2. Do not confront suspected perpetrators of abuse/maltreatment. Treat obvious injuries per appropriate SOP.

3. Prepare to transport. If parent/guardian refuses to allow removal of the child, remain at the scene.
   Contact police and request that the child be placed in temporary protective custody pending medical evaluation.

4. If police refuse to assume temporary protective custody, request that they remain at the scene.
   Contact OLMC; ask an on-line physician to place the child under temporary protective custody.
   Temporary Protective custody: A physician is authorized to take temporary protective custody if circumstances of the child are such that in his/her judgment continued stay or return to the custody of the parent, guardian, or custodian, presents an environment dangerous to the child's life or health. (325 ILCS 5/5) (from Ch. 23, par. 2055)
   If protective custody is secured, transport the child against the parent/guardian wishes.

5. If the parent/guardian physically restrains your efforts to transport the child, inform the police. Request their support in transporting the child.

CHILDREN SUFFERING FROM SUSPECTED ABUSE OR NEGLECT
SHALL NOT REMAIN IN AN ENVIRONMENT OF SUSPECTED ABUSE
UNLESS POINTS 3, 4 AND 5 OF THIS SOP
HAVE BEEN PURSUED IN VAIN TO REMOVE THE CHILD.

6. Notify the receiving physician or nurse of the suspected abuse upon arrival.

7. **EMS personnel are mandated reporters under the Illinois Child Abuse and Neglect Act**.
   - Report suspicions of child abuse or neglect to the Department of Children and Family Services per System Policy
   - Reports must be filed, even if the hospital will also be reporting the incident.
   - This includes both living and deceased children encountered by EMS personnel.

DCFS 24 hour hotline number: 1 - 800 - 25 - ABUSE

   - File a written report with DCFS within 24 hours of filing a verbal report.

8. Thoroughly document the child's history and physical exam findings on the ePCR/EHR. Note relevant environmental/ circumstantial data in the comments section of the run sheet or supplemental reports.

Note: **For further information on reporting suspected child abuse, penalties for failing to report and immunity for reporters, refer to system-specific policies.**

CPR/Resuscitation Guidelines for Adults, Children, Infants			
Age group	**Adults**	**Children**	**Infants**
Recognition of cardiac arrest	Check for responsiveness No breathing or only gasping – check simultaneously with… No definite pulse felt within 10 sec; Compressions should start w/in 10 sec of arrest recognition		
Compression/ventilation ratio **before** adv airway	30:2 (1 or 2 rescuers)	30:2 - single rescuer; 15:2 – 2 HCP rescuers	
CPR **sequence**	CAB – unless hypoxia-related arrest (drowning)		
Compression **rate**	100-120/min (100-110 when using RQP) avoid rate >120 (use audible prompt for correct rate)		
Compression **depth**	2" – 2.4" (5-6 cm)	At least ⅓ AP chest depth (~2 in)	At least ⅓ AP chest depth (~1½ in)
Hand location	2 hands; lower ½ of sternum	2 hands or 1 hand (very small child) on lower ½ of sternum	1 rescuer: 2 fingers center of chest, just below nipple line 2 or more rescuers: 2 thumb–encircling hands center of chest, just below nipple line
Chest wall **recoil**	Allow full recoil after compression; lift hand slightly off chest		
Rotation of compressors	Every 2 min during ECG rhythm checks (should take < 5 sec)		
Compression **interruptions**	Maximize compression time; limit interruptions to < 5 seconds Ideally, pause only for ventilations (until advanced airway), rhythm check & shock delivery		
Use of **mechanical chest compression** device	ILCOR & ERC recommend against routine use; if < 5 rescuers on scene or transport needed, may apply after 2nd two-minute round of CPR; after vascular access & 1st drugs given per local policy/procedure		
Verification of quality CPR If available; use real-time CPR feedback devices Quantitative waveform **capnography** if available	Capnography between *RQP* and bag; assess at least q. 2 min (w/ rhythm check) Reflects airway patency and ventilations; prevents hyperventilation (shows rate) If $ETCO_2$ <10 mmHg, improve CPR quality; Predicts ROSC; if <10 for 20 min, ROSC unlikely Abrupt & sustained rise seen just before clinical S&S of ROSC (pulses) $ETCO_2$ levels may decrease 1-2 min after epi due to ↓ pulmonary blood flow		
Airways	Head tilt, chin lift (SCI: jaw thrust); BLS airways before BVM ventilations Adv airway: No evidence to support early placement. Consider placing w/o interrupting chest compressions after 3 min preoxygenation; first defib; vasc access; & 1st drugs. Insert sooner if BVM ventilations unsuccessful.		
Ventilations Monitor RR w/ $ETCO_2$ if available	Witnessed arrest; shockable rhythm: Delayed PPV; 3 cycles (200) compressions O_2/NRM BVM 2 hands tight face-mask seal during compressions; compressor squeezes bag RQP/ITD attached to mask/advanced airway if available After advanced airway: Do not pause chest compressions for ventilations Avoid hyperventilation (watch rate & volume): Adult: 10/BPM unless asthmatic (6-8/min) Just enough volume for visible chest rise; give O_2 15L/min when available		
Defibrillation	Attach/use AED/cardiac monitor as soon as available Apply pads w/ compressions continuing; do CPR while defibrillator is charging Minimize compression pauses to shock (< 5 sec); defib after a compression/not a breath Resume compressions immediately after each shock; no ECG/pulse check If persistent/refractory VF after amiodarone & multiple shocks: add 2nd set of pads A-P If 2 monitors available – consider dual sequential defibrillation Philips: ↑ defib energy to 200 J; ZOLL biphasic: max = 200 J; Physio LP12/15: max = 360 J		

CAPNOGRAPHY		
ABSENT	**DECREASED**	**INCREASED**
M E T A B O L I S M		
Malfunction: sensor/monitor ✓ sensor; exhale into	Hypothermia	Hyperthermia; Shivering Pain
P E R F U S I O N		
Arrest w/o CPR Exsanguination	Shock; cardiac arrest w/ CPR Pulm embolism; ↓ Cardiac output	↑ Cardiac output Reperfusion after ROSC
V E N T I L A T I O N		
Apnea; ET extubation; ET obstruction; Esophageal tube	**HYPER**ventilation Bronchospasm; Mucus plugging	**HYPO**ventilation; Resp depression COPD

Region IX Drug Appendix

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
ACETAMINOPHEN *(Tylenol, Actamin, Apra, Mapap, Q-Pap, Tactinal, Tempra, Tycolene, Vitapap)*	***Adults & adolescents*** *≥50 kg: 650 mg PO; max single dose 1000 mg* ***Adults and adolescents*** *<50 kg: 12.5 mg/kg, max single dose: 15 mg/kg*	*Antipyretic* *Analgesic*	**Not adopted in NWC EMSS** *Minor to mod pain: headache, muscle aches, arthritis, backache, toothaches, colds, and fever*	*Severe liver disease*	*Severe skin reaction that can be fatal: redness or rash that spreads and causes blistering and peeling.*
ADENOSINE (Adenocard)	**Adults:** 6 mg rapid IVP followed by 20 mL NS **Repeat**: 12 mg rapid IVP followed by 20 mL NS **Peds**: 0.1 mg/kg rapid IVP (max 1st dose 6 mg) followed by 5-10 mL NS rapid IVP. May repeat X1: 0.2 mg/kg followed by 5-10 mL NS rapid IVP. Max single dose: 12 mg Larger doses may be needed in pts on theophylline (Theodur, Slobid), caffeine, or theobromide Reduce dose to 3 mg in pts taking dipyrimadole (Persantine) or carbamazepine (Tegretol) or w/ transplanted hearts	Class: Endogenous nucleoside; antiarrhythmic - Temporarily slows/blocks conduction thru AV node - Interrupts AV reentry pathways - Neg chronotropic/ dromotropic Very short half life Onset & peak: 10-30 sec Duration: 30 sec Conversion rates - 6 mg = 60% - 12 mg =92%	- Symptomatic narrow complex tachycardia (PSVT) ~~(including WPW)~~ unresponsive to vagal maneuvers - Stable, regular, monomorphic wide QRS complex tachycardia unresponsive to amiodarone (OLMC only) **Perform 12L ECG prior to administration** Proximal IV; use med port closest to pt	**Contraindications** - Asthma -may cause bronchospasm - Bradycardia - 2° or 3° AVB (except those w/ a functioning pacemaker) - SA node disease - Will not terminate known AF/A-flutter, but will slow AV conduction to identify waves **Precautions** - WPW: may ↑ vent rate - Heart transplant (prolonged asystole reported)	Warn pt about flushing (face), SOB, & chest pressure or pain BEFORE administration. Explain that S&S will last < 10 sec. - Transient dysrhythmias at time of conversion: sinus arrest w/ vent., junctional, & atrial escape beats; AF, SB, ST, AVB – last seconds, resolve w/o intervention - VF & asystole have occurred, usually in pts on digoxin or verapamil - Bronchospasm, dyspnea - ↓ BP - Headache, dizziness - N/V
ALBUTEROL (Proventil, Ventolin, ProAir, AccuNeb) 2.5 mg / 3 mL BLS	**Bronchospasm**: 2.5 mg / HHN, mask or in-line w/ CPAP or BVM; O_2 at 6-8 L depending on unit until mist stops (5-15 min). Give w/ ipratropium unless contraind. May repeat X 1. **Hyperkalemia**: 5-mg continuous neb up to 20 mg over 15 min. DO NOT wait at scene for response. Begin Rx & transport ASAP.	- Selective beta-2 agonist - smooth muscle relaxant causes bronchodilation - Helps return potassium into cells by activating the sodium potassium pump at the cell membrane Onset: 5-15 min Peak: 30-90 min SE from MDIs are blunted by using a spacer device	- Bronchospasm associated w/asthma, COPD, allergic reactions; croup, or cystic fibrosis - Hyperkalemia	**Precautions** Cardiac stimulant. Use w/ caution in pts w/ ACS, dysrhythmias, symptomatic tachycardia, diabetes, HTN, seizures; or active labor. Hypoxia may ↑ incidence of CV SE	**CNS**: Tremors, nervousness, anxiety, dizziness, HA **CV:** ↑ HR; ↑ or ↓ BP, palpitations, dysrhythmias, chest pain, angina **GI:** nausea/vomiting **Resp**: Paradoxical bronchospasm, hypoxia d/t ventilation/perfusion mismatch **Metabolic:** hypokalemia

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
AMIODARONE	**Adult: VT w/ pulse**: **150 mg** in 7 mL NS **slow IVP** over 10 min (Alt. 150mg in 100 mL NS IVPB on mcgtt tubing over 10 min) **VF/Pulseless VT:** 1st dose: 300 mg IVP/IO 2nd dose: 150 mg IVP/IO Onset: 1-30 min; Duration: 1-3 hrs **Peds VT: 5 mg/kg** (max 150 mg) mixed with NS to total volume **20 mL IVP** or (Alt. in **50 mL IVPB** on mcgtt tubing) over 20 min. **Peds VF**: 5 mg/kg IVP: Max single dose 300 mg.	Antidysrhythmic – predominately Class III; properties of all 4 Vaughn-Williams classes (delays repolarization prolonging action potential; slows AV conduction; **prolongs** AV refractory period & **QT interval**, slows vent. conduction (widens QRS), blocks Na, K, Ca channels, & α / β receptors - Neg. chronotropic & dromotropic effects - Vasodilates = ↓ cardiac workload and myocardial O_2 consumption	- VT (regular, wide complex tachycardia w/ normal QT stable pt w/ pulse - VF/PVT -OLMC may order for (SVT, A-fib/flutter) Less proarrhythmic effects than other class I or III antidysrhythmics	**Contraindications** - Bradycardia; 2˚-3˚ AVB - Torsades de Pointes - Stop infusion if QRS widens to >50% of baseline Avoid during breastfeeding **Precautions:** Acquire 12-L before giving to VT w/ pulse or SVT Incompatible with bicarb Liver failure	Monitor BP & ECG when given to pt w/ perfusing rhythm - **VT:** If ↓ BP occurs: slow rate or stop drug - **VF:** Post-ROSC. ↓ BP - Rx. w/ fluids/ n*orepinephrine* - Bradycardias - Nausea
ASPIRIN (Acetylsalicylic acid, "ASA") 81 mg tabs	324 mg chewable tabs (4 tabs 81 mg) chewed and swallowed while prepping for 12 L Sips of water help dissolve tabs and move drug out of mouth & esophagus where it can irritate lining. Onset: 5-30 min Peak: 15 min – 2 hr	Class: Salicylate - Antiplatelet: Prevents clot from getting bigger by preventing platelet aggregation; blocks formation of thromboxane A2 - Blocks prostaglandin release (antipyretic, analgesic) - Non-steroidal anti-inflammatory drug (NSAID)	Suspected ACS, angina equivalents, & AMI regardless of pain unless contraindicated or an adequate dose of immediate-release ASA can be verified as taken.	Children ≤ 18; AMS Chest pain/STEMI following recent trauma (esp. head) prior to CT Possible stroke or ICH Currently vomiting; surgery within 2 wks, bleeding disorders; ≥ 6 mos pregnant; active peptic ulcer/severe liver disease	**- GI**: Nausea/vomiting; irritation/bleeding - Prolonged bleeding time - Asthma pts may have ASA sensitivity; cause bronchospasm
ATROPINE ***DuoDote Auto-injector*** dosing – see Chemical agents SOP	**Symptomatic bradycardia**: 0.5 mg rapid IVP/IO q. 3-5 min to max.3 mg **Cholinergic poisoning:** *See chart Chemical Agents.* No dose limit. **Peds**: 0.02 mg/kg IV/IO Min. 0.1 mg; **Max doses** Child single dose: 0.5 mg Child total dose: 1 mg Adolescent single dose 1 mg Adolescent total dose 2 mg	Class: Anticholinergic (parasympathetic blocker) - Indirectly ↑ HR and AV conduction - ↓ GI motility - Dries secretions - Dilates bronchioles Slow administration (resulting in low dose) or dose <0.5 mg in an adult may worsen bradycardia	- Symptomatic bradycardia (most likely to work if QRS is narrow) - Cholinergic poisonings (organophosphates/ WMD gasses) - Neurogenic shock	**Contraindications:** - Asymptomatic bradycardia - AVB below His-Purkinje level: 2° AVB M II 3°AVB w/ wide QRS - Unlikely to be effective in pts w/ heart transplant **Caution with:** - Cardiac ischemia or AMI– HR determinant of O_2 demand; excessive tachycardia can worsen ischemia/infarction - Avoid in hypothermic bradycardia	**CNS**: Sensorium changes, drowsiness, confusion, HA **CV**: ↑ HR; ↑ myocardial O_2 demand **Eyes**: Dilated (not fixed) pupils, blurred vision (rel. contraindication – narrow-angle glaucoma) **Skin**: Warm, dry, flushed Drying of secretions (mouth, nose, eyes, bronchioles)
BENZOCAINE 20% (Hurricaine, Americaine, Cetacaine)	1-2 sec spray, 30 seconds apart X 2; use straw to spray deep post. pharynx Onset: Immediate Duration: 5-10 min	Class: Local anesthetic, ester type (tetracaine, cocaine, procaine) - Topical anesthetic for mucus membranes - Helps suppress gag reflex	To suppress gag reflex prior to DAI	Hypersensitivity to "caines" Use minimum dose in pts at risk of complications due to methemo-globinemia (asthma, COPD, heart disease, smokers) & at ↑ risk of methemoglobinemia (< 4 mos)	- Suppressed gag reflex - Unpleasant taste - Methemoglobinemia: Pale, blue/grey skin, HA, lightheadedness, dyspnea, anxiety, fatigue, ↑ HR

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
Calcium gluconate 2.5% gel (Optional per local need)	Flush area w/ water. Apply gel directly from tube and massage into burned area. Apply frequently (q. 15 min) until pain relieved. Hand burns: apply liberal amount of gel to area, have pt put on a vinyl glove and wiggle fingers, opening and closing hand. Change gel & glove every 5 min by removing glove, wiping off gel, then reapplying as before.	Clear, viscous, colorless, odorless, water soluble gel Reacts with hydrofluoric acid to form insoluble, non-toxic calcium fluoride. May immerse gloved hand into ice water for up to 3-5 min. Remove hand from water, rewarm, then reintroduce into water for another 3-5 min.	Hydrofluoric acid burns to skin with high potential for deep tissue burns and bone damage. Significant pain relief should occur w/in 30-40 min	**Contraindications:** - Hypercalcemia - Sarcoidosis - Severe hypokalemia **Precautions:** External use only Rescuers should wear appropriate HF-protective gloves (neoprene) and other safety equipment.	Ensure adequate ventilation at all times None; painless to apply Helps prevent risk of hypocalcemia from burn
DEXTROSE 10% (25 g/250 mL) IVPB	See glucose emergencies SOP for dosing instructions. **Adult: bG 60-70: 12.5 grams** (**125 mL** or ½ IV bag) **Adult: bG < 60** (no pulm. edema: **25 gms (250 mL**) run WO **PEDS: 0.5 g/kg** (5 mL/kg) (0.1 g/1 mL in solution). See dose chart p. 101 Max initial dose: 25 g	Class: carbohydrate Same amt of dextrose as in D50% solution (25 Gm); more dilute	Hypoglycemia: bG <70 and/or S&S hypoglycemia and bG reading unavailable **If HF or Hx of HF & lungs clear:** dose as usual, slow infusion rate to 50 mL incr. followed by reassessment **If HF & crackles or wheezes:** Call OLMC for orders	bG normal or high Do not give sub-q or IM ✓ patency before infusing Giving too forcefully can result in loss of IV line and damage to surrounding tissues. If IV infiltrates / IVF extravasates, stop infusion & inform OLMC If transport refused after dextrose, assure that they eat & call PCP.	Hyperglycemia. SE not as likely with D10% as D50%: hyperosmolarity, hypervolemia, phlebitis, pulmonary edema, cerebral hemorrhage, & cerebral ischemia
DIPHENHYDRAMINE (Benadryl)	**Lower acuity**: **1 mg/kg** (max 50 mg) PO [BLS] **Emergent: 50 mg IVP** [ALS]; if no IV give **IM** **Critical** Rx: **50 mg IVP/IO**; if no IV/IO give IM **Peds**: 1 mg/kg (max 50 mg) PO [BLS] if available]; slow IVP/IO [ALS] over 2 mins; if no IV/IO give IM	Antihistamine: H1 blocker Peak: 1 hr Half-life: 2.5-9 hrs Does not reverse histamine; prevents more from being released. Will not act as fast as epinephrine.	- Allergic reactions/ anaphylaxis **- Per OLMC:** Dystonic reactions due to phenothiazines (Thorazine, Compazine, Stelazine, Prolixin)	Acute asthma attack Hx asthma w/ current allergic reaction – OK to use **Precautions**: - Do not give sub-q - Peds likely to have CNS stimulation (vs. sedation) - Angle closure glaucoma - Prostatic hypertrophy	**CNS**: Drowsiness, blurred vision, dilated pupils, hallucinations, vertigo, weakness, ataxia **Resp**: thickened bronchial secretions **CV:** ↑ HR; ↓ BP **GI:** Dry mouth, N / V

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
DOPAMINE *(Intropin)* *Alternate drug if no norepinephrine* 400 mg in 250 mL or 800 mg/500 mL D_5W or NS	**Beta (ß) dose**: 2-10 mcg/kg/min (start at 5) **Alpha (α) dose**: 10 mcg/kg/ min. May titrate up to 20 mcg/kg/min to maintain SBP ≥ 90 (MAP ≥ 65) or acceptable peds SBP. Onset: within 5 min Use lowest dose to minimize SE Use large vein and ✓ IV patency before infusing	Class: endogenous catecholamine; SNS agonist; precursor to norepinephrine, stimulates dopaminergic, ß-1 & alpha receptors (dose dependent) - **ß dose:** ↑ HR; SV, contractility; SBP, CO; & renal blood flow - **α dose:** above cardiac effects plus vasoconstriction; ↑ SVR, ↑ preload, ↑afterload, & ↑ BP; ↓ renal blood flow (high dose)	**ß dose**: Inotrope: Cardiogenic shock; bradycardia and/or ROSC w/ hypotension **α (pressor) dose**: Neurogenic, septic, anaphylactic shocks ***Calculation tip***: **ß dose:** Take 1st 2 # of wt. in lbs; subtract 2 = mcgtts/min. Ex: 150 lbs = 13 mcgtts/min **α dose:** double mcgtts	**Contraindications:** - Tachydysrhythmias (↓ BP due to rate problem) - Adrenal tumor **Interactions:** Deactivated by alkaline solutions **Use w/ caution:** - Occlusive vasc. disease - Hypovolemic shock: Pressors not a substitute for hemostasis & IVF replacement	**CNS**: H/A, dizziness **CV**: ↑ HR ; palpitations, ectopy, ↑ **O_2 demand;** risk of ACS, dysrhythmias, vasoconstriction **Resp:** SOB **Eyes**: dilated pupils **Skin**: may cause tissue necrosis if infiltrates; notify hospital ASAP
EPINEPHRINE (Adrenalin) 1mg/1mL IM: BLS Do not inject IVP Give all IM injections into vastus lateralus muscle of leg 1mg/10 mL IVP/IO/ neb ALS	**<u>1mg/1mL</u>** <u>(old 1:1,000)</u> **Adult Emergent Allergic rxn/ critical asthma:** 0.3 mg IM. May repeat X 1 in 5-10 min. **Adult Anaphylaxis no IV/IO:** 0.5 mg IM **Peds allergic rxn/severe asthma:** 0.01 mg/kg (0.01 mL/kg) to a max of 0.3 mg (0.3 mL) IM. **Typical dose:** ≥ 30 kg (66 lbs): 0.3 mg 15 to 29 kg (33–65 lbs): 0.15 mg May repeat X 1 in 5 -10 min prn **<u>1mg/10 mL</u>** <u>(old 1:10,000)</u> **Adults: Pulseless arrest:** 1 mg IVP/IO q. 3-5 min. **Anaphylaxis:** titrate in 0.1 mg IVP/IO doses q. 1 min to a total max dose of 2 mg [IM + IV/IO] (Reassess after each 0.1 mg increment. **Anaphylaxis w/ cardiac arrest:** 1 mg IVP/IO q. 2 min (high dose) **Peds anaphylaxis**: titrate in 0.01 mg/kg (0.1 mL/kg) doses q. 1 min to max total 1 mg [IM+IVP/IO] **Severe croup/epiglottitis/ bronchiolitis/RSV**: Nebulize 0.5 mg (5 mL) w/ 6 L O_2 **Peds bradycardia/cardiac arrest:** 0.01 mg/kg up to 1 mg IV/IO q. 3-5 min	Catecholamine; SNS agonist – dose dependent **Low dose** (< 0.3 mcg/kg/min) **(IM) – ß-2** dominates: Relaxes bronchial smooth muscle (bronchodilator); constricts bronchial arterioles (α stimulation) to relieve congestion & edema. Inhibits histamine release & antagonizes effects on end organs **ß-1 effects** - ↑ Automaticity; myocardial electrical activity - ↑ HR (+ chronotropic) - ↑ CO (+ inotropic) - ↑ Conduction velocity (+ dromotropic) **High dose** (> 0.3 mcg/kg/min) (IVP/IO): ß + alpha (α dominates) - Peripheral vasoconstrictor; ↑ SVR & BP Makes CPR more effective - ↑ coronary perf. pressure - ↑ brain perfusion - ↑ vigor & intensity of VF to ↑ success of defib. - Shortens repolarization - May generate perfusing rhythm in asystole or bradydysrhythmias	**<u>1mg / 1 mL see dosing</u>** - Allergic reaction (IM) - Anaphylaxis: no IV/IO: IM - Asthma **<u>1mg / 10mL- see dosing</u>** - All pulseless arrests: VF/pulseless VT, asystole, PEA (IV/IO) - Symptomatic bradycardia in peds - Anaphylaxis IV/IO - Severe croup/epiglottitis/ bronchiolitis/RSV (HHN) If needed: Epi 1mg / 10mL can be constituted by adding 9 mL of NS to epi 1mg/1mL. Inactivated in an alkaline solution - don't mix w/ bicarb in IV tubing at the same time	**Contraindications:** VT due to cocaine use (may be considered if VF) **None:** cardiac arrest or anaphylaxis **Precautions:** Give O_2, monitor ECG & VS when giving Epi **Use IM w/ caution if**: - HR > 100 - Hx. CVD/HTN - Current HTN, HF - ß blockers antagonize cardiostimulating and bronchodilating effects (will produce only α effects) - Alpha blockers antagonize vasoconstricting & hypertensive effects of epi - Digitalis (causes heart to be sensitive to epi → dysrhythmias) - MOA inhibitors, TCAs, levothyroxine sodium potentiate effects: (results in severe HTN) - Pregnancy	Elderly at higher risk for SE **CNS**: HA, anxiety, restlessness, dizziness, tremors, excitability, lightheadedness **CV**: ↑ HR, palpitations, tachydysrhythmias, ventricular ectopy, high dose may produce vasoconstriction, may compromise perfusion; HTN, angina, ↑ myocardial O_2 consumption; can cause worsened ischemia **GI**: N/V **Skin**: Pallor; necrosis at injection site

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
ETOMIDATE (Amidate) Supplied 40 mg/20 mL	0.5 mg/kg IVP/IO Bring unused portion to ED **Dose guide** 90-99 lbs: 20-22 mg 100-124 lbs: 23-25 mg 125-149 lbs: 28-31 mg 150-174 lbs: 34-37 mg >175 lbs: 40 mg	Sedative-hypnotic without analgesic activity; effects are dose related – light sleep to unconscious **Time to effect**: 15-45 sec **Duration:** Dose dependent; usually 3-12 min	Drug assisted intubation for all adults except those with asthma or if contraindicated **Alternative:** Ketamine if etomidate is not available	**Contraindications** - Septic shock d/t adrenal suppression - Children less than 10 yrs **Precautions:** - Pregnancy (benefit/risk) - Use large proximal vein to reduce pain at inj site	**MS**: Myoclonus **Resp**: Hyper/hypo ventilation; apnea; laryngospasm **CV:** HTN or ↓ BP; ↑ or ↓ HR **GI**: N/V Adrenal suppression (↓ cortisol levels) SE more likely w/ ↓ renal function
FENTANYL Citrate Supplied: 100 mcg / 2mL ampules or vials May give IVP/IN/IM/IO	**1 mcg/**kg (round to nearest 5 mcg) up to **100 mcg** **May repeat once** in 5 min: 0.5 mcg/kg (max 50 mcg) to a total of 1.5 mcg/kg /SOP. **Elderly** (>65), **debilitated or SCI: 0.5 mcg/kg** (max 50 mcg). **Additional doses require OLMC**. May repeat 0.5 mcg/kg q. 5 min to total of 3 mcg/kg (300 mcg) prn & if available. **Elderly/debilitated/SCI** may be susceptible to adverse effects (resp depression & CV effects) &/or have kidney or liver dysfunction resulting in lower clearance rates. Pts on chronic opioid therapy/ Hx opioid abuse may need higher doses to achieve adequate therapeutic effect.	**Class**: Synthetic opiate Short acting narcotic **Onset**: minutes (sl. delayed w/ IN vs. IV route) **Peak**: 3-5 min (sl. lower peak with IN vs. IV) **Duration** 30-60 min Less histamine release than morphine. Histamine causes vasodilation, tachycardia, and itching. Fentanyl better for STEMI. **Goal**: Pain is tolerable upon ED arrival or all pain relieving options have been exhausted or pain meds are contraindicated Assess/document response; reassess VS & pain severity after each dose. Can reverse with naloxone	Treatment of pain Pharmacologic and non–pharmacologic (distraction, cold pack) options should reflect a pt–centered approach based on specific needs. Consider pt status, responder scope of practice, risks/benefits of each strategy. Provide individualized pain mgt regardless of transport interval. The safety of FENTANYL in children younger than two years of age has not been established. Call OLMC. **Alternatives:** Morphine, Ketamine	**CONTRAINDICATIONS** - Intolerance to opiates - AMS (GCS <15) or mentation not approp for age/usual state - Respiratory depression - Hypotension - Acute/severe asthma - Myasthenia Gravis - Intermittent pain - Patients on depressant drugs **PRECAUTIONS**: - Avoid over sedation COPD - resp depression Concurrent use of alcohol, benzos, drugs of abuse - Cardiac Hx: bradydysrhythmias or those given amiodarone or Verapamil - Liver or kidney Dx: ↓ hepatic metabolism & renal excretion. - Pregnant women (Cat C) - Uncontrolled hypothyroidism	**Resp**: hypoventilation; SpO_2 < 90% on 15 L O_2 **CV**: Bradycardia (reverse w/ atropine), hypotension **CNS:** GCS < 15; sedation, confusion, dizziness, euphoria, seizures **Uncommon** **GI:** N/V (give ondansetron) **MS:** Muscle rigidity, myoclonic movements - Hives, itching, abd pain, flushing - Blurred vision, small pupils - Laryngospasm, diaphoresis, spasm of the sphincter of Oddi Anaphylaxis
GLUCAGON **[BLS: IN, IM]** GlucaGen: reconstitute by adding 1 mL sterile water for inj Lilly: Use only 1 mL diluent to reconstitute; do not use diluent w/ other drugs When reconstituting: Roll (don't shake) vial; do not mix with NS	**Hypoglycemia** adult no IV: **1 mg IM, IN** Anaphylaxis/bradycardia on ß blockers & refractory to usual Rx/β blocker OD 1 mg IVP/IO/IM/IN **Peds:** **≥ 20 kg :** 1 mg IVP/IN/IO/IM **< 20 kg**: 0.03 mg/kg (0.5 mg) IM/IN/IO up to 1 mg < 6 yrs: use mid-anterior/ lateral thigh for IM inj.	**Class**: Hormone produced using rDNA technology - ↑ blood glucose by converting liver glycogen stores to glucose - Cardiac stimulant (+ inotrope) - causes release of cate-cholamines & stimulates c-AMP in cells to ↑ cardiac output - Relaxes GI smooth muscle Onset IM: 5-20 min Peaks within 30 min Duration: 60-90 min	- Hypoglycemia w/o IV/IO - Anaphylaxis if a Hx of CVD, HTN, pregnant or on β blockers - Symptomatic bradycardia w/ pulse if on β-blockers & unresponsive to atropine, norepinephrine & pacing	**Contraindications** - Adrenal insufficiency - Adrenal tumor **Precautions:** - Not as effective for hypo-glycemia if no glycogen stores: peds, malnourished states, uremic or liver dx - Give supplemental carbohydrate ASAP	- GI: Vomiting common (protect airway before glucagon administration) - ↑ HR - Dyspnea

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
GLUCOSE GEL	*25 Gm orally*	*- Carbohydrate* *- Increases serum glucose level*	**Not adopted in NWC EMSS** *Hypoglycemia in awake patients with GCS 14-15 with intact gag reflex.*	*- AMS (GCS ≤ 13)* *- Absent gag or impaired airway reflexes* *- Hx recent seizure activity*	*Aspiration in patients with impaired airway reflexes*
HYDROXOCOBALAMIN (injection), Cyanokit *Powder For Injection: 5 g/vial* *Optional based on local need*	5 gm IV (one vial) given IVPB over 15 minutes. May repeat X 1 if available and response inadequate to 1st dose. Max total dose 10 g. After mixing with liquid, may be stored for up to 6 hrs at a temp not exceed 104 F.	Made of cyanocobalamin (vitamin B12) attached to cobalt. Reverses action of cyanide by binding to cyanide molecules. Each hydroxocobalamin molecule binds to 1 cyanide ion. Chemical reaction inactivates cyanide & releases cyano-cobalamin -excreted in urine.	Antidote for known or suspected cyanide poisoning.	**Common side effects**: Red colored urine (chromaturia), erythema, rash, nausea, headache, infusion site reactions **Other SE**: Eye swelling, irritation, redness, difficulty swallowing, abdominal discomfort, vomiting, diarrhea, indigestion, peripheral edema, chest discomfort, allergic rxn, memory impairment, dizziness, restlessness, dyspnea, throat tightness & dry throat, itching, hot flush. SpO_2 reading may be inaccurate. Possible serious SE: Serious allergic reactions, HTN	
IPRATROPIUM BROMIDE INHALATION SOLUTION, 0.02% (Atrovent) BLS	**Adult**: 0.5 mg (1 Unit-Dose Vial) added to albuterol/HHN /in-line neb **Peds** (off label): 0.25-0.5 mg added to albuterol/HHN/in-line neb Onset: 15-30 min Peak: 1-2 hours Duration: 4-8 hours	Class: Synthetic anti-muscarinic - Anticholinergic (parasympatholytic) bronchodilator w/ primarily a local, site-specific effect - Cholinergic tone often increased in pts w/ COPD	Bronchospasm assoc. w/ - Mod/severe allergic rxn - COPD/Asthma Considered relatively safe to use in pregnant women.	**Precautions:** - Pts allergic to MDI formulation (peanut allergy) may safely use neb solution: contact OLMC - Bladder neck obstruction - Prostate hypertrophy - Narrow-angle glaucoma	**GI**: Dry mouth, bitter taste in mouth, nausea **Eyes**: Blurred vision, dilated pupil (mist leak exposing eyes). Neb mouthpiece preferred over mask to avoid contact w/ eyes if glaucoma.
KETAMINE (Ketalar)	**DAI (Asthma):** 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM (adult & peds) **Excited delirium**: 2 mg/kg slow IVP (over 1 min) or 4 mg/kg IN/IM. May repeat at ½ dose after 10 min up to max dose of 4 mg/kg (500 mg). **Alt if no Fentanyl**: 0.5 mg/kg slow IVP (over 1 min) or IN/IM: 1 mg/kg; May repeat at ½ dose after 10 min. **IV injection -100 mg/mL** concentration should be diluted w/ equal volume of NS	Dissociative anesthetic, produces cataleptic-like state (pt's consciousness is dissociated from their nervous system) and profound analgesia N-methyl-D-aspartate (NMDA) receptor antagonist DEA schedule 3 controlled substance	Pre-DAI sedative for those with **hx of asthma or children** ≤12 years Sedation for agitated or violent behavior; **excited delirium** Non-narcotic alternative to fentanyl and morphine After giving: minimize stimulation (verbal/ auditory, tactile, visual).	Withhold if ↑ BP serious hazard - Hypertensive crisis - Use of methamphetamine or similar drug - Hyperthyroidism - Aortic dissection - Acute MI, angina, HF - Intracranial hemorrhage - Acute globe injury or glaucoma **Rx emergence reactions** w/ midazolam (standard dose for sedation), will ↓ incidence by 50% Caution in patients with schizophrenia, psychosis, or bipolar mania.	**CV**: Transient ↑ HR & HTN (SBP ↑10-50%); returns to pre-med levels w/in 15 min. Benzodiazepine may decrease CV effects. **CNS**: Psychosis (5-30%), ↑ ICP; dysphoria **MSK**: Rigidity, dystonic reaction, depressed reflexes **Psych**: Emergence reactions: anxiety, restlessness, confusion; disorientation, auditory & visual hallucinations, delirium, irrational behavior; lasting 2-24 hrs. **Resp**: Beta-adrenergic and vagolytic properties produce bronchodilation

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
LIDOCAINE 2% (xylocaine) 100 mg/5 mL Observe concentration carefully before administering	**IO line:** 1 mg/kg (max 50 mg) push slowly before flushing line w/ 20 mL NS IVP	**Class**: Antiarrhythmic & local anesthetic (amide-type)	- IO anesthesia in responsive pts before NS infusion	**Contraindications:** - Allergy to "caines", or local amide anesthetics - Bradycardia: Wide complex or AVBs **Use with caution:** - Hepatic or renal failure - Suspected recent use and toxic dose of cocaine	**CNS**: Drowsiness, ataxia, disorientation, dizziness, paresthesias, slurred speech, hearing/vision impairment **CV**: ↓ BP, ↓ HR, dysrhythmias, wide QRS, prolonged QT, cardiac arrest. May worsen conduction disturbances & slow vent. rate.
MAGNESIUM SULFATE 50%	**ADULT: Critical asthma/ Torsades, Pre-eclampsia** **2 Gm** in NS to total volume 20 mL (slow IVP) over 5 min (Alt. 2 Gm in 50 mL NS IVPB on mcgtt tubing over 10 min). Max 1 Gm / min. **PEDS: Critical asthma/ Torsades: 25 mg/kg** (max 2 Gm) mixed with NS to total volume of **20 mL** (slow IVP) or (Alt. in 50 mL IVPB on mcgtt tubing) all over 10 min. Max 1 Gm/5 min. **Eclampsia**: Adult dose: May repeat X 1 up to total 4 Gm IVP/IO if seizures occur	- Intracellular cation responsible for metabolic processes & enzymatic reactions. Critical in glycolysis (need for ATP production) - Membrane stabilizer - Blocks neuromuscular transmission and muscular excitability - Class V antidysrhythmic - Acts like a Ca blocker - causes smooth muscle relaxation (vaso and bronchodilator)	- Severe asthma that responds poorly to epi - Torsades de Pointes - Preeclampsia/ eclampsia to prevent/ Rx seizures **OLMC order**: Life-threatening ventricular dysrhythmias due to digitalis toxicity or to stop preterm labor	**Contraindications:** - Hypocalcemia - Heart block - Renal dysfunction **Precautions:** - Continuously monitor ECG RR & BP during administration - Patient on digitalis	Rapid admin ↑ risk: **CNS**: Lightheadedness, drowsiness, sedation, confusion **CV**: ↓ HR, dysrhythmia, vasodilation w/ ↓ BP **Respiratory**: Depression or arrest **MS:** Weakness, paralysis **Skin**: Flushing, sweating, pain at injection site (Put gauze moistened in cold water or cold pack over IV site to relieve burning) **Metabolic**: Hypothermia
MIDAZOLAM (Versed) Concentration for IN: 10 mg / 2 mL	If SBP ≥ 90 (MAP≥ 65): **Adult sedation for pacing and cardioversion:** 5 mg IVP/IN. **Anxiety, muscle relaxant:** 2 mg increments **slow IVP q. 2 min** (0.2 mg/kg IN) up to 10 mg prn titrated to response. **Generalized tonic clonic seizures**: **2 mg** increments **IVP/IO q. 30-60 sec IVP/IO** (0.2 mg/kg IN) up to 10 mg IVP/IO/IN titrated to stop seizure activity	Class: Benzodiazepine - Sedative/hypnotic - CNS depressant - Anxiolysis (↓ anxiety) - Amnestic (anterograde) - Skeletal muscle relaxant Potentiates GABA (major CNS inhibitory neurotransmitter). May potentiate action of other CNS depressants (Fentanyl, alcohol) – monitor closely **Onset** IV/IN/IO:30-60 sec (slower in doses < 0.2 mg/kg); IM 5-15 min	- Procedural sedation prior to DAI and/or cardioversion - Generalized tonic/clonic seizure activity - Severe anxiety/agitation - Muscle relaxant for long bone fractures - Stimulant-induced excited delirium, ACS, tachycardia, HTN crisis; (cocaine, amphetamines, ephedrine, PCP)	**CONTRAINDICATIONS** - Glaucoma - Hypotension (SBP <90) - Pregnancy unless seizing & unresponsive to magnesium if eclamptic **PRECAUTIONS:** Individualize dose based on age, SBP/MAP; weight, physical & clinical status, pathologic condition, concomitant meds, nature of indication	**CNS**: Drowsiness, sedation, confusion, amnesia, ataxia **Resp**: Respiratory depression, arrest **CV**: Hypotension, bradycardia/tachycardia

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
MIDAZOLAM (Versed) Continued Concentration for IN: 10 mg / 2 mL	**If IV/IO unable/IN contraindicated - IM:** 5-10 mg (0.1-0.2 mg/kg) max 10 mg single dose. **All routes:** May repeat to 20 mg prn if SBP≥ 90 (MAP≥ 65) unless contraindicated. **Peds Anxiety/serotonin syndrome:** 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (Max single dose **5 mg)** q. 2 min up to 10 mg based on size, BP, response.	**Duration**: 15-30 min If hypovolemic, elderly, debilitated, PMH chronic dx (HF/COPD); prone to ventilatory depression (SCI); and/or on opiates or CNS depressants: ↓ **total dose to 0.1 mg/kg**. **Peds seizures**: 0.1 mg/kg IVP/IO q. 30-60 sec (0.2 mg/kg IN/IM) (Max single dose **5 mg)** up to 10 mg IVP/IN/IO/IM to stop seizure. If seizures persist: Contact OLMC for orders.			
NALOXONE (Narcan) EMR/EMTs IN & IM	**Adult: If breathing:** 0.4 mg; repeat q. 30 sec until ventilations increase up to 4 mg **If apneic:** 1 mg. Repeat q. 30 sec until breathing resumes up to 4 mg. All additional doses require OLMC. **PEDS**: **0.1 mg/kg** (max single dose 0.4 mg) **IVP/IN/**IO/IM w/ repeat doses q/ 30 sec until ventilations increase up to 4 mg.	Class: Narcotic antagonist - Reverses effects of opiate drugs, narcotics/ synthetic narcotics Onset IV/IN: 1-2 min Onset IM: 2-10 min Half life: 30-81 min Half-life of naloxone often shorter than half-life of narcotic; repeat doses often required.	- Narcotic/synthetic narcotic OD w/ AMS & respiratory depression - Coma of unknown etiology with respiratory depression (may or may not have constricted pupils)	**Precautions:** - Rapid reversal may result in **opiate withdrawal** syndrome – agitated, combative, uncooperative, rapid HR. - Give O_2 while prepping med to prevent reversal tachycardia. - Use with caution in infants of addicted moms or pts dependent on opiates w/ CV disease (contact OLMC)	**CNS:** Tremor, agitation, combativeness, seizure (opioid antagonists stimulate the sympathetic NS) **CV:** ↑ HR, ↑ BP, dysrhythmias **Resp:** Hyperventilation **GI**: N / V Rare anaphylactic reactions & flash pulmonary edema reported after naloxone use.
NITROGLYCERIN (NTG) [Patient assist, BLS]	0.4 mg tabs SL or spray May repeat q. 3-5 min up to 3 doses for ACS and unlimited doses for pulmonary edema as long as SBP ≥ 90/DBP > 60. (MAP≥ 65) **If SBP 90-100 start IV prior to 1st NTG**: 200 mL fluid challenge if lungs clear Let tab dissolve naturally; may need to drop NS over tab if mouth is very dry Pt. should sit or lie down when receiving the drug Onset: 1-3 min	Class: Organic nitrate, vasodilating agent - Dilates coronary vessels, relieves vasospasm, and ↑ coronary collateral blood flow to ischemic myocardium - Vascular smooth muscle relaxant; dilates veins to ↓ preload. Higher doses dilate arterioles = ↓ afterload	- ACS w/ suspected ischemic pain - Pulmonary edema - Hypertensive crisis w/ chest pain/pulmonary edema	- Recent use of erectile dysfunction drugs: Viagra/ Levitra (vardenafil)w/in 24 hrs or Cialis (tadalafil) w/in 48 hrs - ↑ ICP; Glaucoma - Peds < 18 **Contraindications in ACS**: - BP < 90/60 or more than 30 mmHg below baseline - HR < 50 or > 100 w/o HF **Contraindications in HF** - BP < 90/60 **Use w/ caution/ not at all in preload dependent pts OLMC required):** - RV inferior wall infarction (ST elevated in V4R); start IV first; monitor closely for hypoperfusion	**CNS**: Headache, dizziness, poss. syncope **CV**: Hypotension (postural often transient; responds to NS) With evidence of AMI: Limit BP drop to 10% if normotensive, 30% if hypertensive, avoid drop <90. **GI:** SL admin – burning, tingling Flushed skin Methemoglobinemia

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
NOREPINEPHRINE bitartrate (Levophed) **See macrodrip dosing tables p. 110**	**Given IVPB into a large vein** (antecubital) Add 4 mg (4 mL) of Levophed (1 amp) to 1,000 mL D5W or NS. Concentration of drip: 4 mcg/mL **Adult: Initial dose**: 8 mcg/min (2 mL/min), adjust upwards in 2 mcg/min (0.5 mL/min) increments to max of 20 mcg/min prn to reach/ maintain SBP 90 (MAP ≥ 65) *OR 0.03 mg IVP with caution* Septic shock may need higher doses. **Maintenance**: 2 to 4 mcg/min (0.5 mL to 1 mL/min)	Catecholamine, synthesized, stored, and released from sympathetic neurons: Vasopressor acts on both α_1 and α_2 adrenergic receptors to cause vasoconstriction and an increase in peripheral vascular resistance. Beta 1 stimulant: ↑HR & CO Retake BP every 2 min from time drug is started until desired BP reached, then every 5 min ✓ infusion site frequently for patency. Avoid extravasation – inform hospital ASAP if it occurs.	Patients with severe hypotension (MAP < 60) Pressor agent used mainly to treat patients in vasodilatory shock states such as septic and neurogenic shock, while showing fewer adverse side-effects compared to dopamine Safety and effectiveness in peds pts has not been proven. Call OLMC prior to giving Pregnancy: May have adverse effects on fetus, call OLMC	Hypovolemic shock Do not give $NaHCO_3$ in IV line containing norepinephrine **Cautions:** - Pts receiving monoamine oxidase inhibitors (MAOI) or antidepressants of the triptyline or imipramine types - severe, prolonged HTN may result. -Asthma; -bisulfite sensitivity At high doses, and especially when combined with other vasopressors, it can lead to limb ischemia and limb death	**CV***:* Severe HTN; tachycardia. arrhythmias; severe peripheral and visceral vasoconstriction, ↓ renal perfusion and urine output, poor systemic blood flow despite "normal" BP, tissue hypoxia, and lactic acidosis **CNS:** Anxiety, confusion, HA (if HTN results), tremor **Resp***:* Dyspnea with or w/o respiratory difficulty **Skin:** Sweating, extravasation necrosis at injection site.
	Peds: 1 mcg/kg/min IVPB); increase in increments of 0.5 mcg/kg/ min to a max dose of 2 mcg/kg/min titrated to SBP > 70 + (2X Age).				
NORMAL SALINE (0.9% NaCl)	**TKO**: 15-30 gtts/min **Fluid challenges:** 200 mL increments repeated to achieve/ maintain hemodynamic stability **Sepsis**: **200 mL IV boluses** in rapid succession (max 30 mL/kg) to SBP ≥ 90 (MAP ≥ 65) **Peds:** 20 mL/kg IVP; may repeat X 2 prn	Class: Isotonic crystalloid Contains 154 mEq/L Na ions 154 mEq/L Cl ions	- Need for IV medications - Volume replacement	**Precautions:** Limit volume in pts w/ HF Limit volume to BP targets in trauma	- Fluid overload if excess volume/infused too rapidly - Pulmonary edema - pH is low: acidosis with high chloride load if given in large volumes
NITROUS OXIDE *(Nitronox, Entonox)* **Only approved by waiver**	*50% nitrous oxide and 50% oxygen; self-administered by mask*	*Class: Analgesic gas* *- CNS depressant* *- Alters perception of pain* *Onset: 2-5 min* *Short duration: 2-5 min*	*- Pain relief from musculoskeletal trauma, burns, kidney stones* *- May use to reduce procedural anxiety (IV access)*	*- AMS; ETOH/drug ingestion* *- TBI / facial / chest trauma (pneumothorax)* *- Bowel obstruction* *- Pregnant females* ***Precaution*** *- COPD – risk of pneumothorax* *- Use in well ventilated area*	*- Dizziness, light headedness* *- Drowsiness / sedation* *- Bizarre behavior* *- Slurred speech* *- Numbness/tingling in face* *- H/A; N/V*
ONDANSETRON (Zofran) (EMT may give per System policy)	**Adults:** 4 mg oral dissolve tablet or 4 mg IVP over no less than 30 sec. May repeat in 10 min to a total of 8 mg PO or IVP. **Peds**: 0.15mg/kg up to a total of 4 mg IVP or ODT	Selective 5-HT3 (serotonin) receptor antagonist Antiemetic May precipitate at stopper/ vial interface; vigorous shaking will resolubilize	Nausea/vomiting	Phenylketonuria (PKU): ODT contains aspartame that forms phenylalanine Don't push ODT through blister foil pkg; tabs are fragile	Rare: Transient blurred vision after rapid IV infusion Headache, lightheadedness Sedation Nausea/vomiting Diarrhea in children

Name	Dose/Route	Action	Indications for EMS	Contraindications (allergy in all drugs)/ Precautions	Side Effects
SODIUM BICARBONATE inj. 8.4% ($NaHCO_3$)	**Cyclic antidepressant OD**: 1 mEq/kg (1 mL/kg) IVP/IO Repeat dose if ↓ BP, AMS, QRS ≥ 0.12 sec, or dysrhythmias **Dialysis/renal failure arrest:** 50 mEq slow IVP/IO over 5 min. **Crush syndrome**: **50 mEq** slow **IVP** over 5 min followed by 20 mL NS IV flush	Class: Alkalinizing agent - buffers acidosis - Raises serum pH - ↓ uptake of cyclic antidepressants - Shifts K into cells **Notes:** ✓ IV patency before infusing. Flush IV line before & after administration	- Known hyperkalemia - Cardiac arrest with preexisting metabolic acidosis (severe renal disease/DKA); drug intoxications: cyclic antidepressants; ASA, Na blocking agents; cocaine, barbiturates, methyl alcohol, hemolytic reactions; diphenhydramine - Crush syndrome	- Alkalosis - Inability to ventilate Not useful or effective in hypercarbic acidosis (cardiac arrest and CPR w/o effective ventilations) - Incompatible with catecholamines or Ca agents in same IV line	**Electrolyte**: Metabolic alkalosis, ↑ Na, ↓ K, hyperosmolality, ↓ Ca, shifts oxyhb dissoc. curve to left, inhibits O_2 release to tissues. **CV**: ↓ VF threshold; impaired cardiac function **Skin**: Extravasation may cause chemical cellulitis, necrosis, tissue sloughing
TETRACAINE (0.5% solution Pontocaine)	1 gtt in affected eye; may repeat prn Bottle is single pt. use; give to RN receiving pt.	Topical anesthetic (ester type) for eyes Onset: 25 sec Duration: 15 min or longer	- Facilitate eye irrigation - Pain/spasm of corneal abrasions	- Hypersensitivity to ester-type anesthetics - Inflamed or infected tissue - Severe hypersensitivity to sulfite - Penetrating globe injury	- Local irritation & transient burning sensation; corneal damage w/ excessive use - Hypo or hypertension - Systemic toxicity from CNS stimulation: hearing / visual disturbances; bradycardia, muscle twitching, seizures
VERAPAMIL	5 mg SLOW IVP over 2 min (over 3 min in older patients) May repeat 5 mg in 15 min. Onset: Within 1-5 min Peak: 10-15 min Duration: 30-60 min, up to 6 hours	**Class**: Calcium channel blocker - Slows depolarization of slow-channel electrical cells - Slows conduction through AV node to control vent. rate assoc. with rapid atrial rhythms - Relaxes vascular smooth muscle - Dilates coronary arteries - ↓ afterload & myocardial contractility	- Stable SVT unresponsive to vagal maneuvers & adenosine - AF, A-flutter, or multifocal atrial tachycardia (MAT) w/ rapid ventricular response (Rarely converts AF to SR. If AF >48 hr, conversion to SR has risk of embolism) -Angina based on OLMC order	**Contraindications** - ↓ BP; HF, shock - Wide complex tachycardias of uncertain origin & poisoning/drug-induced tachycardia - 2°-3° AVB w/o funct. pacemaker; VT - WPW, short PR & sick sinus syndromes - Hypersensitivity - Peds **Precautions**: - May ↓ BP if used w/ IV or oral ß blockers, nitrates, quinidine	**CNS**: HA, dizziness **CV**: **↓ BP** from vasodilation, decreased myocardial contractility, sinus arrest, heart blocks, nodal escape rhythms, rarely bradycardia/ asystole **GI**: N/V **Skin:** Injection site reaction, flushing

Peds Doses Round up to next closest dose that can be given	**Amiodarone 5 mg/kg** (150 mg/3 mL) VT: max 150; VF 300	**Atropine 0.02 mg/kg** (1 mg/10 mL) Min 0.1 mg; Max child 0.5 mg; Adoles 1 mg	**EPINEPHRINE 1 mg/1 mL** 0.01 mg/kg IM max 0.3 mg	**FENTANYL** 100 mcg / 2 mL **1 mcg/kg (max 100** mcg); may repeat 0.5 mcg/kg in 5 min (max 50 mcg)	**EPINEPHRINE 1 mg/10 mL** 0.01 mg/kg IV/IO	**MAGNESIUM 25 mg/kg** (up to 2 Gm) 5 Gm/10 mL	**MIDAZOLAM** (10 mg/2 mL) 0.1 mg/kg IVP/IO **Calculations** at **(0.2 mg/kg** IN/IM).	**Ondansetron 0.15 mg/kg** (4 mg/2 mL) max single dose 4 mg
Weight	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mcg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**	**Dose mg / mL**
6.6 lbs = 3 **kg**	15 mg = 0.3 mL	0.06 mg = 0.6 mL			0.03 mg = 0.3 mL	75 mg = 0.15 mL	0.6 mg = 0.1 mL	
8.8 lbs = 4 kg	20 mg = 0.4 mL	0.08 mg = 0.8 mL			0.04 mg = 0.4 mL	100 mg = 0.2 mL		
11 lbs = 5 kg	25 mg =0.5 mL	0.1 mg = 1 mL			0.05 mg = 0.5 mL	125 mg = 0.25 mL		
13 lbs = 6 **kg**	30 mg = 0.6 mL	0.12 mg = 1.2 mL			0.06 mg = 0.6 mL	150 mg = 0.3 mL	1.2 mg = 0.2 mL	0.9 mg = 0.4 mL
15.4 lbs= 7 kg	35 mg =0.7 mL	0.14 mg = 1.4 mL			0.07 mg = 0.7 mL	175 mg = 0.35 mL		1 mg = 0.5 mL
17.6 lbs = 8 kg	40 mg =0.8 mL	0.16 mg = 1.6 mL			0.08 mg = 0.8 mL	200 mg = 0.4 mL	1.6 mg = 0.3 mL	1.2 mg = 0.6 mL
19.8 lbs = 9 kg	45 mg =0.9 mL	0.18 mg = 1.8 mL			0.09 mg = 0.9 mL	125 mg = 0.45 mL		
22 lbs = 10 **kg**	50 mg = 1 mL	0.2 mg = 2 mL	0.1 mg = 0.1 mL	10 mcg = 0.2 mL	0.1 mg = 1 mL	250 mg = 0.5 mL	2 mg = 0.4 mL	1.5 mg = 0.7 mL
24.2 lbs = 11 kg	55 mg = 1.1 mL	0.22 mg – 2.2 mL				275 mg = 0.55 mL		1.65 mg = 0.8 mL
26.4 lbs = 12 kg	60 mg = 1.2 mL	0.24 mg = 2.4 mL			0.12 mg = 1.2 mL	300 mg = 0.6 mL		1.8 mg = 0.9 mL
28.6 lbs – 13 kg	67.5 mg = 1.3 mL	0.26 mg = 2.6 mL				325 mg = 0.65 mL	2.5 mg =0.5 mL	
30 lbs = 14 **kg**	70 mg = 1.4 mL	0.28 mg = 2.8 mL			0.14 mg = 1.4 mL	350 mg = 0.7 mL		2 mg = 1 mL
33 lbs = 15 kg	75 mg =1.5 mL	0.3 mg = 0.3 mL	0.15 mg – 0.15 mL	15 mcg – 0.3 mL	0.15 mg – 1.5 mL	375 mg = 0.75 mL	3 mg = 0.6 mL	
35 lbs = 16 **kg**	80 mg = 1.6 mL	0.32 mg = 3.2 mL			0.16 mg = 1.6 mL	400 mg = 0.8 mL		2.4 mg = 1.2 mL
40 lbs = 18 **kg**	90 mg = 1.8 mL	0.36 mg = 3.6 mL			0.18 mg = 1.8 mL	450 mg = 0.9 mL	3.6 mg = 0.7 mL	
44 lbs = 20 **kg**	100 mg = 2 mL	0.4 mg = 4 mL	0.2 mg = 0.2 mL	20 mcg = 0.4 mL	0.2 mg = 2 mL	500 mg = 1 mL	4 mg = 0.8 mL	3 mg = 1.4 mL
48 lbs = 22 **kg**	110 mg = 2.3 mL	0.44 mg = 4.4 mL			0.22 mg = 2.2 mL		4.4 mg = 0.9 mL	3.3 mg = 1.6 mL
53 lbs = 24 **kg**	120 mg = 2.4 mL	0.48 mg = 4.8 mL			0.24 mg = 2.4 mL	600 mg = 1.2 mL		3.6 mg =1.8 mL
55 lbs = 25 kg	125 mg = 2.5 mL	**0.5 mg – 5 mL**		25 mcg = 0.5 mL	0.25 mg – 2.5 mL		**5 mg – 1 mL**	
57 lbs = 26 **kg**	130 mg = 2.6 mL	0.52 mg = 5.2 mL			0.26 mg = 2.6 mL		**Max single dose**	
62 lbs = 28 **kg**	140 mg = 2.8 mL	0.56 mg = 5.6 mL			0.28 mg = 2.8 mL	700 mg = 1.4 mL		**4 mg = 2 mL**
66 lbs = 30 **kg**	**150 mg = 3 mL**	0.6 mg = 6 mL	**0.3 mg = 0.3 mL**	30 mcg = 0.6 mL	0.3 mg = 3 mL		6 mg = 1.2 mL	**Max single dose**
70 lbs = 32 **kg**	160 mg = 3.2 mL	0.64 mg = 6.4 mL	**Max single dose**		0.32 mg = 3.2 mL	800 mg = 1.6 mL		
75 lbs = 34 **kg**	170 mg = 3.4 mL	0.68 mg = 6.8 mL		34 mcg = 0.7 mL	0.34 mg = 3.4 mL			
79 lbs = 36 **kg**	180 mg = 3.6 mL	0.72 mg = 7.2 mL			0.36 mg = 3.6 mL	900 mg = 1.8 mL	7.2 mg = 1.4 mL	
84 lbs = 38 **kg**	190 mg = 3.8 mL	0.76 mg = 7.6 mL			0.38 mg = 3.8 mL			
88 lbs = 40 **kg**	200 mg = 4 mL	0.8 mg = 8 mL		40 mcg = 0.8 mL	0.4 mg = 4 mL	1 Gm = 2 mL	8 mg = 1.6 mL	
99 lbs = 45 **kg**	225 mg = 4.5 mL	0.9 mg = 9 mL			0.45 mg = 4.5 mL	1.12 Gm = 2.2 mL	9 mg = 1.8 mL	
110-128 lbs/50-58 **kg**	250 mg = 5 mL	**1 mg = 10 mL**		**50 mcg = 1 mL**	0.5 mg = 5 mL	1.25 Gm = 2.4 mL	**10 mg = 2 mL**	

Peds CARDIOVERIONS /*DEFIBRILLATION J/kg				
Weight	**0.5 J/kg**	**1 J/kg**	**2 J/kg***	**4 J/kg***
6.6 lbs = 3 kg	1.5	3	6	12
13 lbs = 6 kg	3	6	12	24
22 lbs = 10 kg	5	10	20	40
26 lbs = 12 kg	6	12	24	48
30 lbs = 14 kg	7	14	28	56
35 lbs = 16 kg	8	16	32	64
40 lbs = 18 kg	9	18	36	72
44 lbs = 20 kg	10	20	40	80
48 lbs = 22 kg	11	22	44	88
53 lbs = 24 kg	12	24	48	96
57 lbs = 26 kg	13	26	52	104
62 lbs = 28 kg	14	28	56	112
66 lbs = 30 kg	15	30	60	120
70 lbs = 32 kg	16	32	64	128
75 lbs = 34 kg	17	34	68	136
79 lbs = 36 kg	18	36	72	144
84 lbs = 38 kg	19	38	76	152
88 lbs = 40 kg	20	40	80	160
99 lbs = 45 kg	22	45	90	180
110 lbs = 50 kg	25	50	100	200

PEDS KETAMINE (50 mg/mL concentration)
*****Calculated at 1 mg/kg dose*****
Alt if no Fentanyl: 0.5 mg/kg slow IVP (over 1 min) or IN/IM: 1 mg/kg
DAI/excited delirium: IVP DOUBLE these doses to 2 mg/kg; **IM/IN:** multiply X 4

Dextrose 10% (25 g/250 mL) (0.1 g/1 mL) Peds dose 0.5 g/kg (5 mL/kg) max initial dose 25 g			
Weight	**Dose g = mL**	**Weight**	**Dose g = mL**
6.6 lbs = 3 kg	1.5 g = 15 mL	59.4 lbs = 27 kg	13.5 g = 135 mL
8.8 lbs = 4 kg	2 g = 20 mL	61.6 lbs = 28 kg	14 g = 140 mL
11 lbs = 5 kg	2.5 g = 25 mL	63.8 lbs = 29 kg	14.5 g = 145 mL
13.2 lbs = 6 kg	3 g = 30 mL	66 lbs = 30 kg	15 g = 150 mL
15.4 lbs= 7 kg	3.5 g = 35 mL	68.2 lbs = 31 kg	15.5 g = 155 mL
17.6 lbs = 8 kg	4 g = 40 mL	70.4 lbs = 32 kg	16 g = 160 mL
19.8 lbs = 9 kg	4.5 g = 45 mL	72.6 lbs = 33 kg	16.5 g = 165 mL
22 lbs = 10 kg	5 g = 50 mL	74.8 lbs = 34 kg	17 g = 170 mL
24.2 lbs = 11 kg	5.5 g = 55 mL	77 lbs = 35 kg	17.5 g / 175 mL
26.4 lbs = 12 kg	6 g = 60 mL	79.2 lbs = 36 kg	18 g = 180 mL
28.6 lbs – 13 kg	6.5 g = 65 mL	81.4 lbs = 37 kg	18.5 g = 185 mL
30.8 lbs = 14 kg	7 g = 70 mL	83.6 lbs = 38 kg	19 g = 190 mL
33 lbs = 15 kg	7.5 g = 75 mL	85.8 lbs = 39 kg	19.5 g = 195 mL
35.2 lbs = 16 kg	8 g = 80 mL	88 lbs = 40 kg	20 g = 200 mL
37.4 lbs = 17 kg	8.5 g = 85 mL	90.2 lbs = 41 kg	20.5 g = 205 mL
39.6 lbs = 18 kg	9 g = 90 mL	92.4 lbs = 42 kg	21 g = 210 mL
41.8 lbs = 19 kg	9.5 g = 95 mL	94.6 lbs = 43 kg	21.5 g = 215 mL
44 lbs = 20 kg	10 g = 100 mL	96.8 lbs = 44 kg	22 g = 220 mL
46.2 lbs = 21 kg	10.5 g = 105 mL	99 lbs = 45 kg	22.5 g = 225 mL
48.4 lbs = 22 kg	11 g = 110 mL	101.2 lbs = 46 kg	23 g = 230 mL
50.6 lbs = 23 kg	11.5 g = 115 mL	103.4 lbs = 47 kg	23.5 g = 235 mL
52.8 lbs = 24 kg	12 g = 120 mL	105.6 lbs = 48 kg	24 g = 240 mL
55 lbs = 25 kg	12.5 g = 125 mL	107.8 lbs = 49 kg	24.5 g = 245 mL
57.2 lbs = 26 kg	13 g = 130 mL	110 lbs = 50 kg	25 g = 250 mL

Weight	Dose mg = mL	Weight	mg = mL	Weight	mg = mL	Weight	mg = mL	Weight	mg = mL
6.6 lbs = **3 kg**	3 mg = 0.06 mL	30.8 lbs = **14 kg**	14 mg = 0.28 mL	52.8 lbs = **24 kg**	24 mg = 0.48 mL	72.6 lbs = **33 kg**	33 mg = 0.66 mL	92.4 lbs = **42 kg**	42 mg = 0.84 mL
8.8 lbs = **4 kg**	4 mg = 0.08 mL	33 lbs = **15 kg**	15 mg = 0.3 mL	55 lbs = **25 kg**	25 mg = 0.5 mL	74.8 lbs = **34 kg**	34 mg = 0.68 mL	94.6 lbs = **43 kg**	43 mg = 0.86 mL
11 lbs = **5 kg**	5 mg = 0.1 mL	35.2 lbs = **16 kg**	16 mg = 0.32 mL	57.2 lbs = **26 kg**	26 mg = 0.52 mL	77 lbs = **35 kg**	35 mg = 0.7 mL	96.8 lbs = **44 kg**	44 mg = 0.88 mL
13.2 lbs = **6 kg**	6 mg = 0.12 mL	37.4 lbs = **17 kg**	17 mg = 0.34 mL	59.4 lbs = **27 kg**	27 mg = 0.54 mL	79.2 lbs = **36 kg**	36 mg = 0.72 mL	99 lbs = **45 kg**	45 mg = 0.9 mL
15.4 lbs= **7 kg**	7 mg = 0.14 mL	39.6 lbs = **18 kg**	18 mg = 0.36 mL	61.6 lbs = **28 kg**	28 mg = 0.56 mL	81.4 lbs = **37 kg**	37 mg = 0.74 mL	101.2 lbs = **46 kg**	46 mg = 0.92 mL
17.6 lbs = **8 kg**	8 mg = 0.16 mL	41.8 lbs = **19 kg**	19 mg =0.38 mL	63.8 lbs = **29 kg**	29 mg = 0.58 mL	83.6 lbs = **38 kg**	38 mg = 0.76 mL	103.4 lbs = **47 kg**	47 mg = 0.94 mL
19.8 lbs = **9 kg**	9 mg = 0.18 mL	44 lbs = **20 kg**	20 mg = 0.4 mL	66 lbs = **30 kg**	30 mg = 0.6 mL	85.8 lbs = **39 kg**	39 mg = 0.78 mL	105.6 lbs = 48 **kg**	48 mg = 0.96 mL
22 lbs = **10 kg**	10 mg = 0.2 mL	46.2 lbs = **21 kg**	21 mg = 0.42 mL	68.2 lbs = **31 kg**	31 mg = 0.62 mL	88 lbs = **40 kg**	40 mg = 0.8 mL	107.8 lbs = 49 **kg**	49 mg = 0.98 mL
24.2 lbs = **11 kg**	11 mg = 0.22 mL	48.4 lbs = **22 kg**	22 mg = 0.44 mL	70.4 lbs = **32 kg**	32 mg = 0.64 mL	90.2 lbs = **41 kg**	41 mg = 0.82 mL	110 lbs = 50 **kg**	50 mg = 1 mL
28.6 lbs – **13 kg**	13 mg = 0.26 mL	50.6 lbs = 23 **kg**	23 mg = 0.46 mL						

Adult FENTANYL dosing

Concentration: 100 mcg / 2 mL (50 mcg / mL)
1 mcg/kg (max 100 mcg 1st dose) IV/IN/IO**;**
may repeat 0.5 mcg/kg in 5 min (max 50 mcg)
Elderly (>65), debilitated, SCI: 0.5 mcg/kg (max 50 mcg)
Contact OLMC for children < 2 and higher doses

Weight	1 mcg/kg	0.5 mcg/kg
	Dose = Amount	**Dose = Amount**
132 - 150 lbs = 60-68 kg	**60 mcg** = 1.2 mL	**30 mcg** = 0.6 mL
154 - 172 lbs = 70-78 kg	**70 mcg** = 1.4 mL	**35 mcg** = 0.7 mL
176 - 194 lbs = 80-88 kg	**80 mcg** = 1.6 mL	**40 mcg** = 0.8 mL
198 - 216 lbs = 90-98 kg	**90 mcg** = 1.8 mL	**45 mcg** = 0.9 mL
220-238 + lbs = 100-108 kg	**100 mcg** = 2 mL	**50 mcg** = 1 mL

Additional adult ketamine doses

lbs = kg	Dose = Amount	lbs = kg	Dose = Amount
242 lbs = **110 kg**	**220 mg** = 4.4 mL	286 lbs = **130 kg**	**260 mg** = 5.2 mL
253 lbs = **115 kg**	**230 mg** = 4.6 mL	297 lbs = **135 kg**	**275 mg** = 5.5 mL
264 lbs = **120 kg**	**240 mg** = 4.8 mL	308 lbs = **140 kg**	**280 mg** = 5.6 mL
275 lbs = **125 kg**	**250 mg** = 5 mL	319 lbs= **145 kg**	**290 mg** = 5.8 mL

Adult KETAMINE doses

Concentration: (50 mg/mL)
Calculated at 2 mg/kg
Double for IM/IN
Max dose: 500 mg

2 mg/kg
Dose=amount
120-136 mg = 2.4-2.6 mL
140-156 mg = 2.8-3 mL
160-176 mg = 3.2-3.5 mL
180-196 mg = 3.6=3.8 mL
200-216 mg=4-4.4 mL

Celsius (°C) to Fahrenheit (°F) conversion

°C	°F	°C	°F
43	109.4	**30**	**86**
42	107.6	29	84.2
41	105.8	28	82.4
40	104	27	80.6
39	102.2	26	78.8
38	100.4	25	77
37	**98.6**	24	75.2
36	96.8	23	73.4
35	95	22	71.6
34	93.2	21	69.8
33	91.4	20	68
32	90.6	19	66.2
31	87.8	18	64.4

Approved drug routes: Listed next to drug in the order they should be attempted unless dose varies by route. **IN generally preferred prior to IO or IM unless contraindicated.**

IM: diphenhydramine, Duodote autoinjectors, epinephrine (1 mg/1 mL), fentanyl, glucagon, ketamine, midazolam, naloxone
IN: fentanyl, glucagon, ketamine, midazolam, naloxone
IO: Same as IVP
IR: diazepam (Diastat) – See peds seizures
IVP: adenosine, amiodarone (VF), atropine, diphenhydramine, epinephrine (1 mg/10 mL), etomidate, fentanyl, glucagon, hydroxocobalamin, ketamine, lidocaine, midazolam, naloxone, ondansetron, sodium bicarbonate, verapamil
IVPB: amiodarone (VT), dopamine, Dextrose10%, magnesium, norepinephrine
Neb: albuterol, epinephrine (1mg /10mL), ipratropium
PO: Aspirin, diphenhydramine, ondansetron
SL: NTG
Topical: benzocaine, calcium gluconate, tetracaine
Inhaled: *Nitrous oxide by waiver only*

Notes on drug routes

IM preferred site: Vastus lateralus muscle mid-lateral thigh

IN: ✓ nostrils for secretions/obstructions; suction; remove NPA; max 1 mL/nostril; divide total dose into 2 syringes; seat MAD tip firmly into nostril; BRISKLY depress syringe plunger to atomize medication. DO NOT have pt inhale during med administration.

IO contraindications: Fx in same extremity; infection at insertion site, significant previous orthopedic procedure at the site (IO in past 48 hrs; local vascular compromise; prosthetic limb or joint

IO in responsive pt: Flush w/ **lidocaine 1 mg/kg** slowly (max 50 mg)

All IO: put IV bag into pressure infuser

IVP in cardiac arrest: Follow drug w/ 20 mL NS bolus.

*Maximum QT Intervals based on Heart Rate							
HR (min)	RR Interval (sec)	Upper limits normal QT (sec)		HR (min)	RR Interval (sec)	Upper limits normal QT (sec)	
Decreasing	Increasing	**Men** Increasing	**Women** Increasing	Decreasing	Increasing	**Men** Increasing	**Women** Increasing
150	0.4	0.25	0.28	75	0.6	0.36	0.39
136	0.44	0.26	0.29	71	0.64	0.37	0.4
125	0.48	0.28	0.3	68	0.88	0.38	0.41
115	0.52	0.29	0.32	65	0.92	0.38	0.42
107	0.56	0.3	0.33	62	0.96	0.39	0.43
100	0.6	0.31	0.34	60	1	0.4	0.44
93	0.64	0.32	0.35	57	1.04	0.41	0.45
88	0.68	0.33	0.36	52	1.08	0.42	0.47
78	0.72	0.35	0.38	50	1.2	0.44	0.48

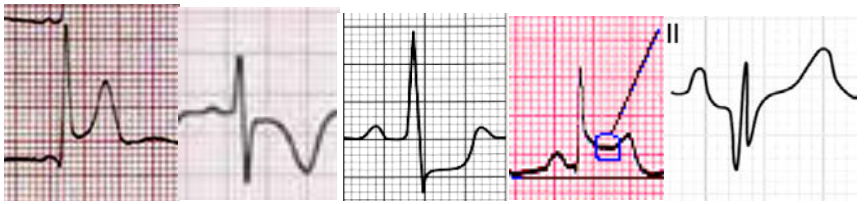
ACLS Scenarios: Core Concepts for Care-Based Learning (Cummins, 1996)

12-L ECG Indications (Angina or Anginal Equivalents):

- Discomfort (nose to navel, shoulder, arm, back)
- SOB/HF
- GI c/o (nausea, indigestion)
- Palpitations
- Dysrhythmia (VT/SVT)
- Diaphoresis
- Dizziness/Syncope
- Weak/tired/fatigued

Risk factors:

HTN Smoking Diabetes Cholesterol high Age MI / HF



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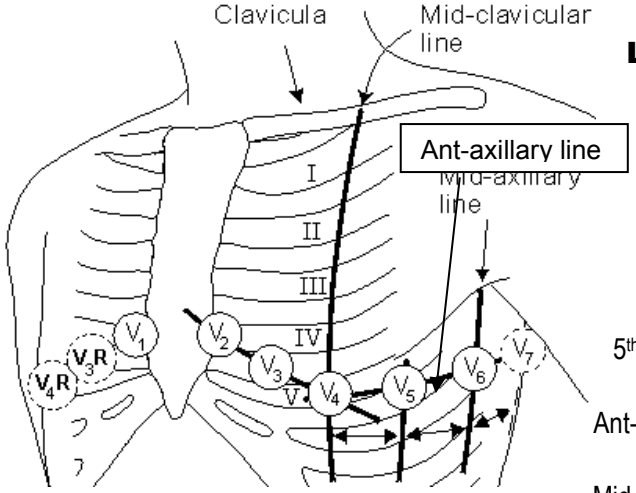


Lead Placement

V 1
4th ICS - R of sternum

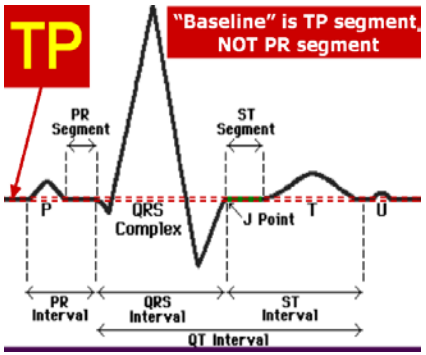
V 2
4th ICS - L of sternum

V 3
Midway between V2 & V4

V 4
5th ICS Mid-clavicular line

V 5
Ant-axillary line, level w/ V4

V 6
Mid-axillary line, level w/ V4



ISCHEMIA: **12 L CHANGES**
***Hyperacute T wave*:**
(sensitive, not specific, may occur early)
T wave inversion
(flipped - may precede ST elevation)
ST depression (consider reciprocal changes)
INJURY:
***ST elevation (STEMI)*:**
(>1mm (sm box) in 2 or > contiguous leads)
INFARCTION:
***Q waves* (New or old?)**
(> 0.04 sec/sm box; >25% height QRS)

Leads w/ Changes & Infarct Locations							
I	Lateral	~~aVR~~			V1	Septal	V4	Anterior
II	Inferior	aVL	Lateral		V2	Septal	V5	Lateral
III	Inferior	aVF	Inferior		V3	Anterior	V6	Lateral

DIANA:12L card

APPROVED Acronyms and Abbreviations

A

AAA.....abdominal aortic aneurysm
ACS..... acute coronary syndromes
ADH ..... antidiuretic hormone
ADL .....activities of daily living
AED..... automated external defibrillator
AIDS.....acquired immune deficiency syndrome
AIVR.....accelerated idioventricular rhythm
ALS ..... Advanced Life Support
AMA .....against medical advice
AMI.....acute myocardial infarction
amp .....ampule
AMS .....altered mental status
ANS .....autonomic nervous system
A&O .....alert & oriented
AP .....anterior-posterior
APGAR ..... appearance, pulse, grimace, activity, respirations
ARDS ..... acute respiratory distress syndrome
ASA.....aspirin
ASAP ..... as soon as possible
ATP ..... adenosine triphosphate (body's energy source)
AV .....atrioventricular
AVPU .....mental status: alert, verbal, pain, unresponsive
AVRT ..... atrioventricular reentry tachycardia

B

BLS .....Basic Life Support
bG .....Blood glucose
BP ..... blood pressure
BPM or bpm..... beats per minute
BSA..... body surface area
BSI ..... body substance isolation
BVM ..... bag valve mask

C

Ca ..... calcium
CAD ..... coronary artery disease
CC..... chief complaint
C-Collar .....cervical collar
cm .....centimeter
CMS .....circulation, motor, sensation
CNS .....central nervous system
c/o ..... complains of
CO..... carbon monoxide
CO_2 .....carbon dioxide
COPD..... chronic obstructive pulmonary disease
CPAP ..... continuous positive airway pressure
CPR .....cardiopulmonary resuscitation
CSF..... cerebral spinal fluid
CSHN.....children with special healthcare needs
CV or CVD ..... cardiovascular disease

D

D/C..... discontinue
D_5W ..... 5% dextrose in water
DBP.....diastolic blood pressure
DCFS ..... Department of Children and Family Services
DKA.....diabetic ketoacidosis
DM ..... diabetes mellitus
DNR .....do not resuscitate
DOA ..... dead on arrival
DOE .....dyspnea on exertion
DT .....delirium tremens
d/t .....due to
Dx..... diagnosis

E

ECG or EKG.....electrocardiogram
ECRN ..... Emergency Communications RN
ED.....emergency department
EDD .....esophageal detector device
EMS .....Emergency Medical Services
EMS MD ..... EMS Medical Director
EMSS ..... Emergency Medical Services System
EMT-B (EMT) .....Emergency Medical Technician - Basic
EMT-I ..... Emergency Medical Technician - Intermediate
EMT-P .....Emergency Medical Technician - Paramedic
EOMs.....extraocular movements
EOR ..... end of report
ETI .....endotracheal intubation
$ETCO_2$ ..... end tidal carbon dioxide (capnography)
ETA.....estimated time of arrival

F

FB .....foreign body
FiO_2 .....fraction of inspired O_2 (% O_2 delivered)
Fr ..... French (catheter/tube diameter)
Fx/fx .....fracture

G

GCS ..... Glasgow Coma Score
GERD .....gastro-esophageal reflux disease
GI ..... gastrointestinal
Gm .....gram
gtt.....drops
GU .....genitourinary

H

h or hr .....hour
HA .....headache
H_2O ..... water
HCO_3 .....bicarbonate
HEPA..... high efficiency particulate airborne mask
HF .....heart failure
HHN.....hand held nebulizer
HHNS ..... hyperosmolar hyperglycemic nonketotic syndrome
HR..... heart rate
HTN .....hypertension
Hx ..... history

I

IBOW ..... intact bag of waters
ICH..... intracranial hemorrhage
ICP.....intracranial pressure
IDPH .....Illinois Department of Public Health
IM.....intramuscular
IMC .....Initial Medical Care
IN ..... intranasal
IO ..... intraosseous
IR .....intrarectal
ITC .....Initial Trauma Care
IV ..... intravenous
IVF ..... intravenous fluids
IVP .....intravenous push
IVPB..... intravenous piggy back
IVR..... idioventricular rhythm

J

J ..... joules
JVD.....jugular venous distension

K

KED ..... Kendrick extrication device
kg ..... kilogram

L

L ..... liter
lbs ..... pounds
LLQ ..... left lower quadrant
L/minute ..... liters per minute
LMP ..... last menstrual period
LOC ..... level of consciousness
LUQ ..... left upper quadrant
LV ..... left ventricle
LVAD ..... left ventricular assist device

M

mA ..... milliamps (pacing)
MAP ..... mean arterial pressure
MAT ..... multifocal atrial tachycardia
mcg ..... microgram
mcgtts ..... microdrops
MERCI ..... Medical Emergency Radio Comm. of Illinois
mEq ..... milliequivalents
mg ..... milligram(s)
MIH ..... mobile integrated healthcare
min ..... minute
mL ..... milliliter(s)
mmHg ..... millimeters of mercury
MODS ..... multiple organ dysfunction syndrome
MOI ..... mechanism of injury
MPI ..... multiple patient incident
MVC ..... motor vehicle crash

N

NC ..... nasal cannula
NEMSIS ..... National EMS Information System
NP/NPA ..... nasopharyngeal airway
NPO ..... nothing by mouth
NRM ..... non-rebreather mask
NS ..... normal saline
NSR ..... normal sinus rhythm
NTG ..... nitroglycerin
N/V ..... nausea/vomiting

O

O_2 ..... oxygen
OB ..... obstetric
OP/OPA ..... oropharyngeal airway
Oriented X 1 ..... oriented to person
Oriented X 2 ..... oriented to person, place
Oriented X 3 ..... oriented to person, place, time
Oriented X 4 ..... oriented to person, place, time, event

P

P ..... pulse
PCI ..... percutaneous intervention
PCP ..... Primary Care Practitioner
pCO_2 or $PaCO_2$ ..... partial pressure of carbon dioxide
PEA ..... pulseless electrical activity
PEEP ..... positive end expiratory pressure
pH ..... hydrogen ion concentration
PHRN ..... Prehospital Registered Nurse
PID ..... pelvic inflammatory disease
PMS ..... pulses, motor, sensory
PND ..... paroxysmal nocturnal dyspnea
PO ..... per os (by mouth)
pO_2 ..... partial pressure of oxygen
POLST ..... practitioner orders for life sustaining treatment
PPE ..... personal protective equipment
PPV ..... positive pressure ventilation
PRI ..... P-R interval
prn ..... pro re nata or as needed
Pt ..... patient
PVC ..... premature ventricular contraction

Q

q. ..... every

R

R ..... respirations
RA ..... room air
RBOW ..... ruptured bag of waters
RN ..... Registered Nurse
R/O ..... rule out
Rh ..... rhesus factor (blood + or -)
ROM ..... range of motion
ROSC. ..... return of spontaneous circulation
RR ..... respiratory rate
RSV ..... respiratory syncytial virus
Rt ..... right
RTS ..... revised trauma score
RUQ ..... right upper quadrant

S

SA ..... sinoatrial node
SAH ..... subarachnoid hemorrhage
SBP ..... systolic blood pressure
SCI ..... spinal cord injury
SIDS ..... sudden infant death syndrome
SL ..... sublingual
SNS ..... sympathetic nervous system
SOB ..... shortness of breath
SOP/SMO ..... Standard Operating Procedures/Standing Medical Orders
SpO_2 ..... pulse oximetry
S&S ..... signs & symptoms
STD ..... sexually transmitted disease
Sub-Q ..... subcutaneous
SVR ..... systemic vascular resistance
SVT ..... supraventricular tachycardia

T

T ..... temperature
TB ..... tuberculosis
TBI ..... traumatic brain injury
TIA ..... transient ischemic attack
TKO ..... to keep open
TPN ..... total parenteral nutrition
Tx or Rx ..... treatment

U

URI ..... upper respiratory infection
UTI ..... urinary tract infection

V

V-fib or VF ..... ventricular fibrillation
VS ..... vital signs
VSD ..... ventricular septal defect
V-tach or VT ..... ventricular tachycardia
V_T ..... tidal volume

W

w/ ..... with
WNL ..... within normal limits
w/o ..... without
WOB ..... work of breathing

Y

y/o ..... year old

Symbols

α …alpha	.....	≥	equal to or greater than
@ at	.....	≤	equal to or less than
ß beta	.....	+	positive or plus
° degree	.....	#	number
↑ or ↓ increased or decreased	.....	~	approximately

Differential for SOB				
S&S	**HF/PE**	**AMI**	**COPD**	**Pneumonia**
SOB	+	+	+	+
Cough	-/+	-	+ / early am	+
Sputum	Frothy (pink)	-	Clear	Yellow/green
Fever	-	-	-	+
Sweats	+ Cold/moist	+ Cold/moist	-	+ / Hot
Chest pain	-	+/-	-	+/-
Chest pain nature	-	Heavy, tight	-	Sharp, pleuritic
Chest pain duration	-	Varies; usually > 20 min	-	Gradually worsening, then constant
Smoking Hx	+ Risk	+ Risk	Almost always	+/-
Hypertension	+ Risk	+ Risk	-	-
Cyanosis	+/-	+/-	+	+/-
Air entry to lungs	Good upper/worse at bases	Good	Poor	Patchy
Wheezing	+/-	+/-	Must have air entry to wheeze	+/- patchy
Crackles	+	+ with HF/ otherwise clear	-	+ patchy; isolated to infected lobes
BP	↑ is a risk factor; ↓ if severe S&S	↑ is a risk factor; ↓ if severe S&S	Usually unaffected; ↓ if severe S&S	Usually unaffected
Tachycardia	+/-	+/-	+	+

Heart Failure		COPD / Asthma
▪ **PMH**/meds for: CVD, CAD, MI, HF, HTN, cardiomyopathy, high cholesterol, ICD, bivent. pacing, DM, renal failure, smoking, alcoholism ▪ Meds: See list on HF SOP p. 22 ▪ Paroxysmal nocturnal dyspnea ▪ Orthopnea (multiple pillows to sleep) ▪ Dyspnea on exertion ▪ Cough: (non-productive or productive; frothy, clear, white, pink)	▪ Wt gain (tight shoes, belt, watch, rings) ▪ Fatigue ▪ Crackles or wheezes ▪ **Capnograph**: square waveform ▪ 12-L abnormal (acute MI, AF, LVH, ischemia, BBB, "age-undetermined infarct) ▪ S3 (3rd heart sound, after lub-dub, best heard at apex) ▪ JVD, pedal edema (RHF)	▪ **PMH**/meds for: asthma, COPD, chronic bronchitis, emphysema, smoking (steroids, broncho-dilators, anticholinergics) ▪ **Cough: productive – yellow/green** ▪ **S/S respiratory infection: fever, chills, rhinorrhea, sore throat** ▪ Exposure to known allergen ▪ **Capnograph**: "sharkfin" waveform ▪ Wheezes (initially expiratory)

Diana: hf-03-08

CPAP

Indications: Alert, intact airway/ventilatory drive: acute pulmonary edema; flail chest without pneumothorax; COPD/ asthma w/ severe distress; submersion incident, palliative care

Contraindications

- **AMS**; aspiration risk; inability to clear secretions; questionable ability to protect airway
- **Need for immediate intubation** and/or BVM ventilations, facial burns
- Consider intubation if imminent arrest, ↓ level of consciousness, severe hypotension, near-apnea, and/or copious frothy sputum
- Unstable respiratory drive; **ventilatory failure**
- Severe hemodynamic or ECG instability (**BP ≤ 90 & DBP < 60** mmHg or MAP < 65)
- Gastric distention; impaired swallowing, persistent vomiting, active upper GI bleed; possible esophageal rupture
- Compromise of thoracic organs (penetrating chest trauma); pneumothorax
- Facial anomalies that would complicate CPAP mask seal, epistaxis
- Uncooperative pt. or those unable to tolerate mask due to extreme anxiety, claustrophobia, or pain
- Pregnant

On-going care/monitoring

*Reassess RR/depth & lung sounds, SpO_2, $ETCO_2$ q. 3-5 min after CPAP applied
*Reassess VS q. 3-5 min; If BP starts to drop, gradually titrate PEEP from 10 down to 5. If SBP < 90 (MAP <65) remove CPAP.
*Continuously monitor for signs indicating need to D/C CPAP &/or intubate

Characteristics of Biologic, Nuclear, Incendiary, and Chemical Agents

BIOLOGIC AGENT CHARACTERISTICS

Disease	Transmitted man to man	Incubation Period	Duration of Illness	Lethality (approx. case-fatality rates)	Persistence of Organism
Inhalation anthrax	No	1-6 days	3-5 d (usually fatal if no Rx)	High	Very stable: spores remain viable>40 yrs in soil
Brucellosis	No	5-60 days (usually 1-2 m)	Weeks to months	<5% if untreated	Very stable
Pneumonic plague	High	2-3 days	1-6 days (usually fatal)	High unless Rx in 12-24 h	Up to 1 yr in soil; 270 d in live tissue
Tularemia	No	2-10 d (ave 3-5)	≥2 weeks	Moderate if untreated	Months (in moist soil/other media)
Q Fever	Rare	10-40 days	2-14 days	Very low	Months (on wood and sand)
Smallpox	High	7-17 d (ave 12)	4 weeks	High to moderate	Very stable
Venezuelan equine Encephalitis	Low	2-6 days	Days to weeks	Low	Relatively unstable
Viral hemorrhagic Fevers	Moderate	4-21 days	Death in 7-16 days	Zaire strain: high Sudan strain: moderate	Rel. unstable (depends on agent)
Botulism	No	1-5 days	Death in 24-72 hours; non-lethal illness lasts months	High unless respiratory support provided	Weeks (in nonmoving H_2O & food)
Staph enterotoxin B	No	3-12 h after inhalation	Hours	<1%	Resistant to freezing
Ricin	No	18-24 hours	Days (death w/in 10-12 d (ingestion)	High	Stable
T-2 mycotoxins	No	2-4 hours	Days to months	Moderate	Years (at room temperature)

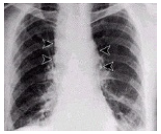
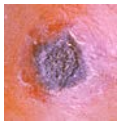
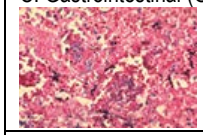
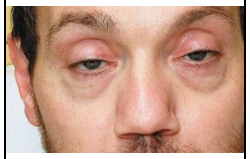
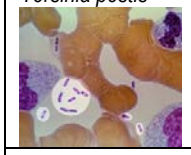
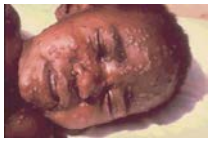
Source: Adapted from USAMRIID's *Medical Management of Biological Casualties Handbook* (www.usamriid.army.mil).

BIOLOGIC AGENT MATRIX

Signs/Symptoms by System		Anthrax	Plague	Tularemia	Brucellosis	Q Fever	Bacterial Diarrhea	Smallpox	Viral Encephalitis	Viral Hemorr-hagic Fever	Botulinum	Enterotoxins	Ricin	Mycotoxins
Respiratory	Nonproductive cough	X	X	X	X	X		X				X		
	Cough with bloody sputum		X											
	Chest discomfort	X	X	X	X	X				X			X	
	Shortness of breath	X	X	X								X	X	X
	Respiratory failure/distress	X									X	X	X	X
Circulatory	Abdominal pain	X	X	X			X	X		X		X		X
	Hypotension									X		X	X	X
	Shock	X								X		X		
	Hemorrhage			X						X				X
GI	Nausea		X			X	X			X		X	X	
	Vomiting		X	X			X	X	X	X	X	X	X	X
	Diarrhea		X	X			X		X	X	X	X		X
Skin	Skin lesions	X	X	X				X						X
	Skin inflammation							X		X				X
Neuromuscular	Drowsiness								X					
	Weakness/prostration		X	X	X	X		X			X		X	
	Progressive weakness of extremities										X			
	Muscular pain		X	X	X	X				X		X		
	Muscle rigidity							X						
	Flaccid paralysis, usually neck										X			
General	Chills		X	X	X	X		X		X		X		
	Fever	X	X	X	X	X	X	X	X	X		X	X	
	Fatigue	X			X									
	Headaches		X	X	X	X	X	X	X	X		X		
	Sore throat		X	X		X			X	X				
	Swollen lymph nodes	X	X	X									X	

X indicates signs/symptoms present.

BIOTERRORIST AGENTS

Disease	Signs & Symptoms	Incubation Time	Person-to-person transmission	Isolation	Diagnosis	Postexposure Prophylaxis Adults	Treatment for Adults
Anthrax *Bacillus anthracis* A. Inhalation  B. Cutaneous  C. Gastrointestinal (GI) 	Flu-like symptoms (fever, fatigue, muscle aches, dyspnea, nonproductive cough, headache), chest pain; possible 1-2 day improvement then rapid respiratory failure and shock. Meningitis may develop Intense itching followed by painless papular lesions, then vesicular lesions, developing into eschar surrounded by edema. Abdominal pain, nausea and vomiting, severe diarrhea, GI bleeding, and fever.	1 to 6 days (up to 6 wks) 1 to 12 days 1 to 7 days	None Direct contact with skin lesions may result in cutaneous infection None	Standard Precautions Contact Precautions Standard Precautions	Chest x-ray evidence of widening mediastinum; obtain sputum and blood culture. Sensitivity and specificity of nasal swabs unknown – do not rely on for diagnosis. Peripheral blood smear may demonstrate gram positive bacilli on unspun smear with sepsis Culture blood and stool.	Prophylaxis for 60 days: Ciprofloxacin* 500 mg PO 12h or Doxycycline 100 mg PO q 12h Alternative (if strain susceptible and above contraindicated): Amoxicillin 500 mg PO q 8h **In vitro* studies suggest that Levofloxacin 500 mg PO q 24h or Gatifloxacin 400 mg PO q 24h or Moxifloxacin 400 mg PO q 24h could be substituted Recommendations same for pregnant women and immunocompromised persons	Inhalation anthrax Combine IV/PO therapy for 60d Ciprofloxacin 500 mg q 12h or Doxycycline 100 mg q 12 h, AND 1 or 2 additional drugs (vancomycin, rifampin, imipenem clindamycin, chloramphenicol, clarithromycin, and if susceptible penicillin or ampicillin Cutaneous anthrax Ciprofloxacin 500 mg PO q 12h or Doxycycline 100 mg PO 12h Recommendations same for pregnant women and immunocompromised persons
Botulism *Botulinum* toxin 	Afebrile, excess mucus in throat, dysphagia, dry mouth & throat, dizziness, then difficulty moving eyes, mild pupillary dilation, nystagmus, intermittent ptosis, indistinct speech, unsteady gait, extreme symmetric descending weakness, flaccid paralysis; generally normal mental status	Inhalation: 12-80 hours Foodborne: 12-72 hours (2-8 days)	None	Standard Precautions	Lab tests available from CDC or Public Health Dept; obtain serum, stool, gastric aspirate and suspect foods prior to giving antitoxin. Differential diagnosis includes polio, Guillain-Barré, myasthenia, tick paralysis, stroke, meningococcal meningitis	Pentavalent toxoid (types A,B,C, D,E) 0.5 ml SQ may be available as investigational product from USAMRIID	Botulism antitoxins from public health authorities. Supportive care and ventilatory support. Avoid clindamycin and aminoglycosides.
Pneumonic Plague *Yersinia pestis* 	High fever, cough, hemoptysis, chest pain, N/V, HA. Advanced disease: purpuric skin lesions, copious watery or purulent sputum; resp failure in 1 to 6 days	2-3 days (2-6 days)	Yes, droplet aerosols	Droplet Precautions until 48 hrs of effective antibiotic therapy	A presumptive diagnosis may be made by Gram, Wayson or Wright stain of lymph node aspirates, sputum, or CSF with gram negative bacilli w/ bipolar (safety pin) staining	Doxycycline 100 mg PO q 12h or Ciprofloxacin 500 mg PO q 12h	Streptomycin 1 gm IM q 12h; or Gentamicin 2mg/kg, then 1 to 1.7mg/kg IV q 8h Alternatives: Doxycycline 200mg PO load, then 100mg PO q 12h or Ciprofloxacin 400 mg IV q 12h
Small pox 	Prodromal period: malaise, fever, rigors, vomiting, HA & backache. After 2-4 days, skin lesions appear & progress uniformly from macules to papules to vesicles & pustules, mostly on face, neck, palms, soles, & subsequently to trunk	12-14 days (7-17 days)	Yes, airborne droplet or direct contact w/ skin lesions or secretions until all scabs separate & fall off (3 to 4 wks)	Airborne (includes N95 mask) and Contact Precautions	Swab culture of vesicular fluid or scab, send to BL-4 lab. All lesions similar in appearance and develop synchronously as opposed to chickenpox. Electron microscopy can differentiate *variola virus* from varicella.	Early vaccine critical (in <4 days). Call CDC for vaccine. Vaccine immune globulin in special cases – call ASAMRIID 301-619-2833	Supportive care. Previous vaccination against smallpox does not confer lifelong immunity. Potential role for Cidofovir

CHEMICAL TERRORISM AGENTS AND SYNDROMES

Agents	Signs	Symptoms	Onset	Clinical Diagnostic Tests	Exposure Route and Treatment	Differential diagnosis
Nerve Agents: Sarin (GB); Tabun (GA): Soman (GD); Cyclohexyl Sarin (GF); VX; Novichok agents, other organophosphorus compounds: carbamates & pesticides	Pinpoint pupils Bronchoconstriction Respiratory arrest Hypersalivation Increased secretions Diarrhea Decreased memory & concentration Coma; seizures	**Moderate exposure:** Diffuse muscle cramping, runny nose, difficulty breathing, eye pain, dimming of vision, sweating, muscle tremors. **High exposure:** The above plus sudden loss of consciousness, seizures, flaccid paralysis (late sign)	Aerosols: Seconds to minutes Liquids: Minutes to hours	RBC or serum cholinesterase (whole blood) Treat based on S&S; lab tests only for later confirmation	**Inhalation and dermal absorption** Atropine (2mg) IV; q 5 min, titrate until effective; average dose 6 to >15mg -Use IM in the field before IV access -Establish airway for oxygenation) Pralidoxime chloride (2-PAM) 600-1800 mg IM or IV over 20-30 min (max 2 g IM or IV / hr). Repeat prn. Benzos to prevent seizures if >4 mg atropine given; ventilatory support	Poisoning from organophosphate and carbamate pesticides may occur as a result of occupational exposure Cyanide poisoning Myasthenia gravis
Cyanides: hydrogen cyanide (HCN) cyanogen chloride	**Moderate exposure:** Metabolic acidosis, venous blood O_2 level >normal, hypotension, "pink" skin **High exposure:** Above signs plus coma, convulsions, cessation of respirations and heartbeat	**Moderate exposure:** Giddiness, palpitations, dizziness, N / V, HA, eye irritation, hyperventilation, drowsiness **High exposure:** Immediate loss of consciousness, seizures & death within 1 to 15 min	Seconds to minutes	Pt off gassing bitter almond odor suggests cyanide Metabolic acidosis Cyanide (blood) or thiocyanate (blood or urine) levels; Treat based on S&S; lab tests for later confirmation	Inhalation, ingestion, & dermal absorption: 100% O_2 by mask/ ETI Amyl nitrite inhalants q 1-5 min Sodium nitrite (300 mg IV over 5-10 min) & sodium thiosulfate (12.5 g IV) Hydroxocobalamin 5 gm IV IVPB over 15 min. Repeat X 1 prn; max total dose 10 g.	Similar CNS illness can result from: Industrial/occupational exposure to HCN & derivatives; carbon monoxide exposure; hydrogen sulfide (H_2S) exposure from sewers, animal waste, industrial sources Poisoning from nerve agents
Vesicants/Blister Agents: sulfur mustard, lewisite, nitrogen mustard, mustard lewisite, phosgene-oxime	Skin erthyema and blistering; watery, swollen eyes; upper airways sloughing with pulmonary edema; metabolic failure, neutropenia & sepsis (esp. sulfur mustard, late in course)	Burning, itching, or red skin Mucosal irritation (prominent tearing, and burning and redness of eyes) Shortness of breath Nausea and vomiting	Lewisite, minutes; Sulfur mustard, hours to days.	Often smell of garlic, horseradish, and/or mustard on body Oily droplets on skin from ambient sources Urine thiodiglycol Tissue biopsy (USAMRICD)	**Inhalation and dermal absorption** Mustards no antidote For lewisite and lewisite/mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol) IM (rarely available) Thermal burn therapy; supportive care (respiratory support and eye care)	Diffuse skin exposure with irritants, such as caustics, sodium hydroxides, ammonia, etc. may cause similar syndromes Sodium hydroxide (NaOH) from trucking accidents
Pulmonary/ Choking Agents: phosgene, chlorine, diphosgene, chloropicrin, oxides of nitrogen, sulfur dioxide	Pulmonary edema with some mucosal irritation (greater) water solubility of agent = greater mucosal irritation) leading to ARDS or non-cardiogenic pulmonary edema Pulmonary infiltrate	Shortness of breath Chest tightness Wheezing Laryngeal spasm Mucosal and dermal irritation and redness	1-24 hours (rarely up to 72 hours); May be asymptoma-tic period of hours	No tests available but history may help identify source and exposure characteristics (majority of incidents generating exposures to humans involve trucking with labels on vehicle)	**Inhalation** No antidote Management of secretions: O_2 therapy; consider high dose steroids to prevent pulmonary edema (demonstrated benefit only for oxides of nitrogen) Treat pulmonary edema with PEEP to maintain PO_2 above 60 mm Hg	Mucosal irritation, airway reactions, and deep lung effects depend on the specific agent, especially water solubility
Ricin (castor bean oil extract)	Clusters of acute lung or GI injury; circulatory collapse and shock, tracheobronchitis, pulmonary edema, necrotizing pneumonia	**Ingestion**: Nausea, diarrhea, vomiting, fever, abdominal pain **Inhalation:** chest tightness, coughing, weakness, nausea, fever	18-24 hours 8-36 hours	ELISA (from commercial laboratories) using respiratory secretions, serum, and direct tissue	**Inhalation and Ingestion** No antidote Support care For ingestion: charcoal lavage	Tularemia, plague, and Q fever may cause similar syndromes, as may biological weapons and chemical weapon agents such as Staphyl-ococcal enterotoxin B and phosgene
T-2 myotoxins; Flusarium, Myrotecium, Trichoderma, Verticimonosporium, Stachybotrys	Mucosal erythema and hemorrhage (intestinal necrosis) Red skin, blistering Increased salivation Pulmonary edema Seizures and coma Liver/renal dysfunction	Dermal and mucosal irritation; blistering, necrosis Blurred vision, eye irritation, tearing Nausea, vomiting, and diarrhea Ataxia, coughing and dyspnea	2-4 hours	ELISA from commercial laboratories Gas chromatography/Mass spectroscopy in specialized laboratories	**Inhalation and dermal contract** No antidote Supportive care For ingestion: charcoal lavage Consider high dose steroids	Pulmonary toxins(O_3, NO_x, phosgene, NH_3) may cause similar syndromes though with less mucosal irritation.

Norepinephrine Macrodrip Tubing Rates for ADULTS

Concentration: 4 mg in 1000 mL NS (4 mcg/mL)

Initial Dosing: 8mcg/min (2mL/min)

Doses higher than the initial rate should RARELY be needed.
Continue to reassess BP; as soon as target levels are met, attempt to reduce doses incrementally

10 drip tubing (2mL/1min x 1min/20 drops= 2mL/20drops= 1mL/10drops 0.5mL/5 drops)

Mcg/min	*Drops per min	Drip rates
8 mcg/min	20 drops/min	Every 3 seconds
10	25	Every 2.4 seconds
12	30	Every 2 seconds
14	35	Every 1.7 seconds
16	40	Every 1.5 seconds
18	45	Every 1.3 seconds
20 mcg/min (MAX)	50	Every 1.2 seconds
MAINTENANCE		**(1mL/10 drops 2 to 4 mcg/min)**
4	10 drops/min	Every 6 seconds
2	5	Every 12 seconds

15 drip tubing (2mL/1min x 1min/30 drops= 2ml/30drops= 1mL/15 drops 0.5mL/7 drops)

Mcg/min	*Drops per min	Drip rates
8 mcg/min	*30 drops/min	Every 2 seconds
10	37	Every 1.6 seconds
12	42	Every 1.3 seconds
14	49	Every 1.1 seconds
16	56	Every 1 seconds
18	63	Every 0.9 seconds
20 (MAX)	70	Every 0.8 seconds
MAINTENANCE		**(1mL/15 drops 2 to 4 mcg/min)**
4	*15 drops/min	Every 4 seconds
2	7	Every 9 seconds

20 drip tubing (2mL/1min x 1min/40 drops= 2ml/40drops= 1mL/20drops 0.5mL/10 drops)

Mcg/min	*Drops per min	Drip rates
8 mcg/min	*40 drops/min	Every 1.5 seconds
10	50	Every 1.2 seconds
12	60	Every 1 seconds
14	70	Every 0.8 seconds
16	80	Every 0.7 seconds
18	90	Every 0.67 seconds
20 mcg/min (MAX)	100	Every 0.6 seconds
MAINTENANCE		**(1mL/20 drops 2 to 4 mcg/min)**
4	20 drops/min	every 3 seconds
2	10	every 6 seconds

Charts prepared by Kris Mullen, Paramedic (LGFD) Noreen Unti, RN (NCH) Checked by: Kate Koentz, PharmD

***For Accuracy: Count drops for 60 seconds**

****ALEXIAN BROTHERS**
800 Biesterfield
Elk Grove Village 60007
Main 847- 437-5500
Fax 847- 981-2002
ED 847- 981-3599
OLMC 847- 437-8118**

Central DuPage
25 N. Winfield
Winfield 60190
Main 630- 933-1600
Fax 630- 933-1234
ED 630- 933-6490
Tele 630- 665-3170

Condell
801 S. Milwaukee
Libertyville 60048
Main 847- 362-2900
Fax 847- 573-4282
ED 847- 990-5300
Tele 847- 362-2963

Elmhurst
200 Berteau (old)
York & Roosevelt Rd (new 6/11)
Elmhurst 60126
Main 331- 221-1000
Fax 331- 221-3738
ED 331- 221-0200
Tele 331- 221-0404

Glenbrook
2100 Pfingsten
Glenview 60026
Main 847- 657-5800
Fax 847- 657-5993
ED 847- 657-5632

****GLEN OAKS**
701 Winthrop
Glendale Heights 60139
Main 630- 545-8000
Fax 630- 545-8000
ED 630- 545-5700
OLMC 630- 545-5758**

Good Samaritan
3815 Highland Ave
Downers Grove 60515
Main 630- 275-5900
Fax 630- 275-1199
ED 630- 275-1165
Tele 630- 968-2150

****GOOD SHEPHERD**
450 W Highway 22
Barrington, IL 60010
Main 847- 381-9600
Fax 847- 842-4247
ED 847- 842-4444
OLMC 847- 381-9525**

Gottlieb
701 W North
Melrose Park 60160
Main 708- 681-3200
Fax 708- 681-7346
ED 708-681-7322

Highland Park
777 Park Ave W
Highland Park 60035
Main 847- 432-8000
Fax: 847- 480-3964
ED 847- 480-3751
Tele 847- 432-2294

Lake Forest
660 N Westmoreland
Lake Forest 60045
Main 847- 234-5600
Fax 847- 535-7801
ED 847- 535-6150
Tele 847- 535-7375

Loyola
2160 S First Ave
Maywood 60153
Main 888- 584-7888
Fax 708- 216-2089
ED 708- 216-8705
Tele 708- 343-4844

****LUTHERAN GENERAL**
1775 W Dempster
Park Ridge 60068
Main 847- 723-2210
Fax 847- 723-2277
ED 847- 723-5155
OLMC 847- 696-0743**

NIMC - Centegra
4201 Medical Circle Drive
McHenry 60050
Main 815- 344-5000
Fax 815- 363-9044
ED 815- 759-3100
Tele 815- 385-9080

****NWC EMSS Approved OLMC****

****NORTHWEST**
800 W Central
Arlington Heights 50005
Main 847- 618-1000
Fax 847- 618-4159
ED 847- 618-3920
OLMC 847- 259-9812
OLMC 847- 259-9767**
DR Jordan: **cell (847) 962-6008**
Connie pager: 708-999-0141

****RESURRECTION**
7435 W Talcott Ave
Chicago 60631
Main 773- 774-8000
FAX 773- 990-7632
ED 773- 792-5255
OLMC 773- 774-8455**

Sherman
1425 N Randall Road
Elgin 60123
Main 847- 742-9800
Fax 847- 492-8978
ED 847- 429-8750
Tele 847- 742-3530

****ST ALEXIUS**
1555 N Barrington Rd
Hoffman Estates 60194
Main 847- 843-2000
FAX 847- 755-7602
ED 847- 490-6930
OLMC 847- 843-3508**

St. Joseph (Provena)
77 N Airlite
Elgin 60123
Main 847- 695-3200
Fax 847- 622-2076
ED 847- 622-2069
Tele 847- 695-5797

Westlake
1225 West Lake Street
Melrose Park 60160
Main 708- 681-3200
Fax 708- 938-7082
ED 708- 938-7190

Woodstock – Centegra
3701 Doty Rd
Woodstock 60098
Fax 815- 334-3137
ED 815- 334-3900
Tele 815- 338-6521

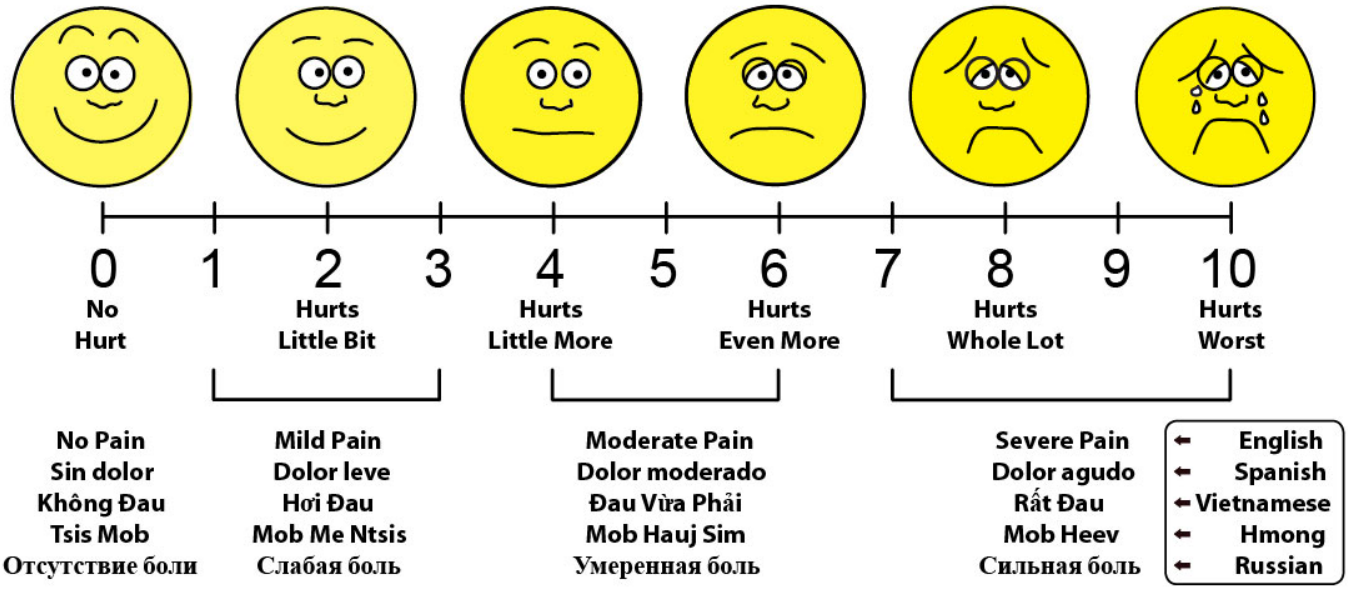
Hospital designations for specialty transport situations						
Region 9 Hospitals	**Location**	**EMS designation**	**STEMI Center**	**Trauma Center**	**Stroke Center**	**EDAP**
Alexian Brothers (Amita)	800 Biesterfield Road, Elk Grove	Associate	Yes	2; replant hands	Comprehensive	Yes
Centegra McHenry	4201 Medical Circle Dr, McHenry	Resource	Yes	2	Primary	Yes
Centegra Huntley	10400 Haligus Rd, Huntley	Associate	Yes	2	Primary	Pending
Centegra Woodstock	3701 Doty Rd, Woodstock	Associate	No	No	Primary	Yes
Delnor (Northwestern)	300 Randall Rd., Geneva	Resource	Yes	2	Primary	Yes
Glen Oaks (Amita)	701 Winthrop, Glendale Hts	Associate	Yes	2	Primary	Yes
Good Shepherd (Advocate)	450 W Highway 22, Barrington	Associate	Yes	2	Primary	Yes
Lutheran General (Advocate)	1775 W Dempster, Park Ridge	Resource	Yes	1; replantation	Comprehensive	PCCC
Mercy Med Ctr (Presence)	1325 N Highland Ave, Aurora	Associate	Yes	2	Primary	Yes
Northwest Community	800 W. Central, Arlington Hts.	Resource	Yes	2	Comprehensive	Yes
Rush Copley Med Center	2000 Odgen Ave, Aurora	Associate	Yes	2	Primary	Yes
Resurrection (Presence)	7435 W. Talcott, Chicago	Associate	Yes	No	Comprehensive pending	Yes
Saint Joseph (Presence)	77 N Airlite, Elgin	Resource	Yes	2	Primary	Yes
Sherman (Advocate)	1425 N Randall Road, Elgin	Resource	Yes	2	Primary	Yes
St. Alexius (Amita)	1555 Barrington Rd, Hoffman Est	Associate	Yes	2	Primary	Yes

Region 8 Hospitals	**Location**	**EMS designation**	**STEMI Center**	**Trauma Center**	**Stroke Center**	**EDAP**
Bolingbrook (Amita)	500 Remington Blvd, Bolingbrook	Associate	Yes	2	Primary	Yes
Central DuPage	25 N. Winfield Rd, Winfield	Resource	Yes	2	Comprehensive	PCCC
Edward Hospital	801 S Washington St, Naperville	Resource	Yes	2	*Primary	PCCC
Elmhurst Hospital	York & Roosevelt Rd, Elmhurst	Associate	Yes	2	Primary	Yes
Good Samaritan (Advocate)	3815 Highland, Downers Grove	Resource	Yes	1 (adults)	Primary	Yes
Gottlieb Memorial	675 W. North Ave, Melrose Park	Associate	Yes	2	Stroke ready	Yes
Hinsdale Hospital	120 N Oak St, Hinsdale	Associate	Yes	2	Primary	Yes
LaGrange Memorial	5101 S. Willow Springs, LaGrange	Associate	Yes	2	Primary	Yes
Loyola Medical Center	2160 S. 1st Ave., Maywood	Resource	Yes	1; burn center	Primary	PCCC
MacNeal Hospital	3249 S Oak Park Ave, Berwyn	Associate	Yes	2	Primary	Yes
Rush Oak Park Hospital	520 S Maple Ave, Oak Park	Associate	Yes	No	Primary	No
Westlake Hospital	1225 W Lake St., Melrose Park	Associate	No	No	Primary	Yes
West Suburban	3 Erie St, Oak Park	Associate	Yes	No	Primary	Yes

Region 10 Hospitals	**Location**	**EMS designation**	**STEMI Center**	**Trauma Center**	**Stroke Center**	**EDAP**
Condell (Advocate)	801 S. Milwaukee Ave, Libertyville	Resource	Yes	1 (adults)	Primary	Yes
Northshore Evanston	2650 Ridge Ave, Evanston	Resource	Yes	1	Primary	Yes
Northshore Glenbrook	2100 Pfingston, Glenview	Associate	Yes	2	Primary	Yes
Northshore Highland Park	777 Park Ave. West, Highland Park	Resource	Yes	2	Primary	Yes
Northshore Skokie	9600 Gross Point Road, Skokie	Associate	Yes	2	Primary	Yes
NWM Lake Forest	660 N Westmoreland, Lake Forest	**Associate	Yes	2	Primary	Yes
St. Francis (Presence)	355 Ridge Ave; Evanston	Resource	Yes	1	Primary	Yes
Vista Med Center East	1324 N Sheridan Rd, Waukegan	Resource	Yes	2	Primary	Yes

STEMI Center: Able to receive patients with suspected ST elevation myocardial infarctions
EDAP: Emergency Department approved for pediatrics
PCCC: Pediatrics Critical Care Center
*Note, this may change as Edward is applying to become a Comprehensive stroke center coming.
**Note this may change as they are making application to become a Resource Hospital

Wong-Baker FACES Pain Rating Scale



From Hockenberry MJ, Wilson D: Wongs Essentials of Pediatric Nursing , ed. 8, St. Louis, 2009, Mosby. Used with permission. Copyright Mosby.

FLACC Pain Scale - Children 2 mos to 7 yrs or those unable to communicate their pain. Scored in a range of 0–10 with 0 representing no pain. Each criteria scored at 0, 1 or 2.				**Score**
Category	**0**	**1**	**2**	
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw	
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up	
Activity	Lying quietly, moves easily	Squirming, shifting back & forth, tense	Ached, rigid, or jerking	
Cry	No cry (awake or asleep)	Moans or whispers, occasional complaint	Crying steadily, screams or sobs, frequent complaints	
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort	
			TOTAL	

Merkel, S.I. et al. (1997), The FLACC: A behavioral scale for scoring postoperative pain in young children. *Pediatric Nrs*, 23(3), 293-297.

Abbey Pain Scale Use to assess pain in people with dementia who cannot verbalize Score each as Absent 0; Mild 1; Moderate 2; Severe 3					**Score**
Vocalization: Whimpering, moaning, groaning, crying					
Facial expression: Looking tense, frowning, grimacing, looking frightened					
Change in body language: Fidgeting, rocking, guarding part of body, withdrawn					
Behavioral Change: ↑ confusion, combativeness, refusing to eat, alteration in usual patterns, difficulty sleeping, increased wandering, decreased social interactions					
Physiological change: T, P, or BP outside normal limits, perspiring, flushing or pallor					
Physical changes: Skin tears, pressure areas, arthritis, contractures					
0-2 No pain	3-7 Mild	8-13 Moderate	14+ Severe	**Total:**	

Assess if pain is acute; chronic; or acute on chronic for this patient